

Status of EUDET/ILC Grid @ DESY

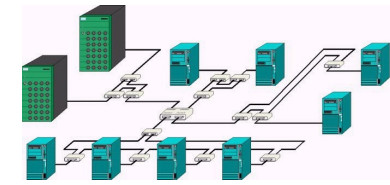
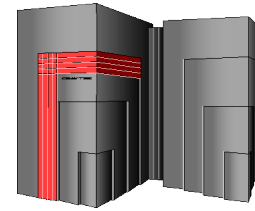
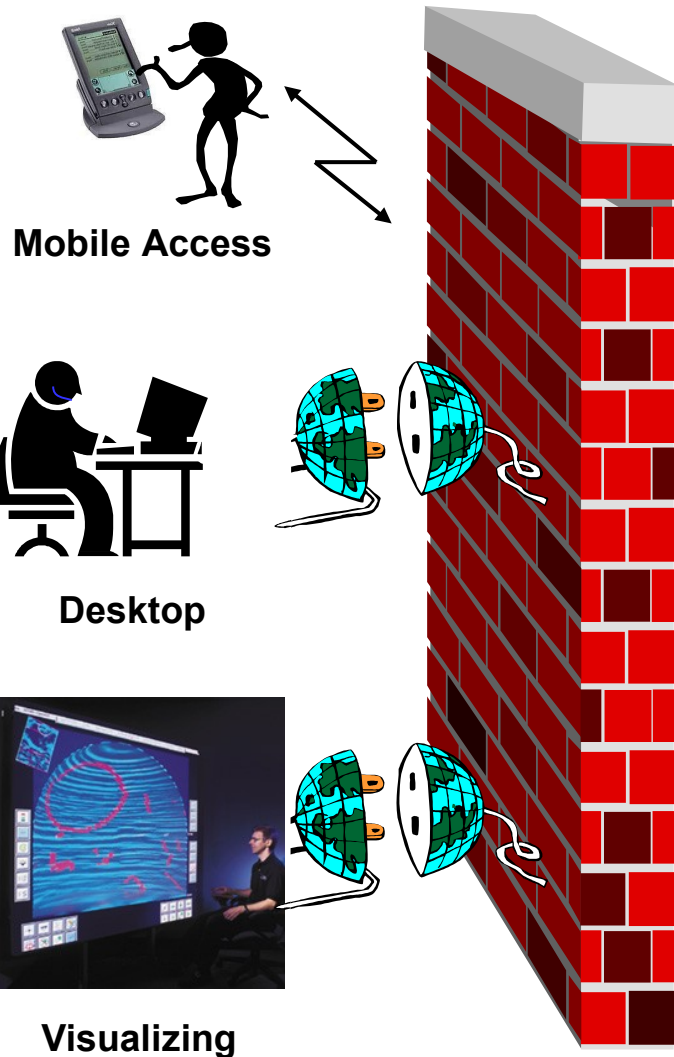
Frank Gaede
DESY

EUDET Annual Meeting
Amsterdam, October 6-8, 2008

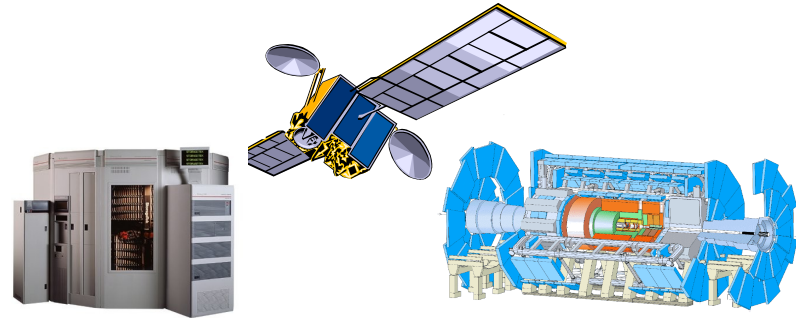
Overview

- Introduction
- the DESY Grid
 - user groups
 - hardware
 - performance
- usage of DESY Grid for ILC
 - Calice testbeam
 - LOI mass production
- summary

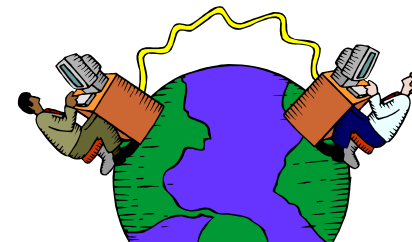
the Grid vision



Supercomputer, PC-Cluster



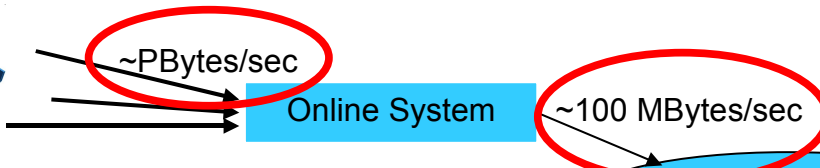
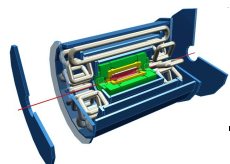
Data Storage, Sensors, Experiments



Internet, Networks

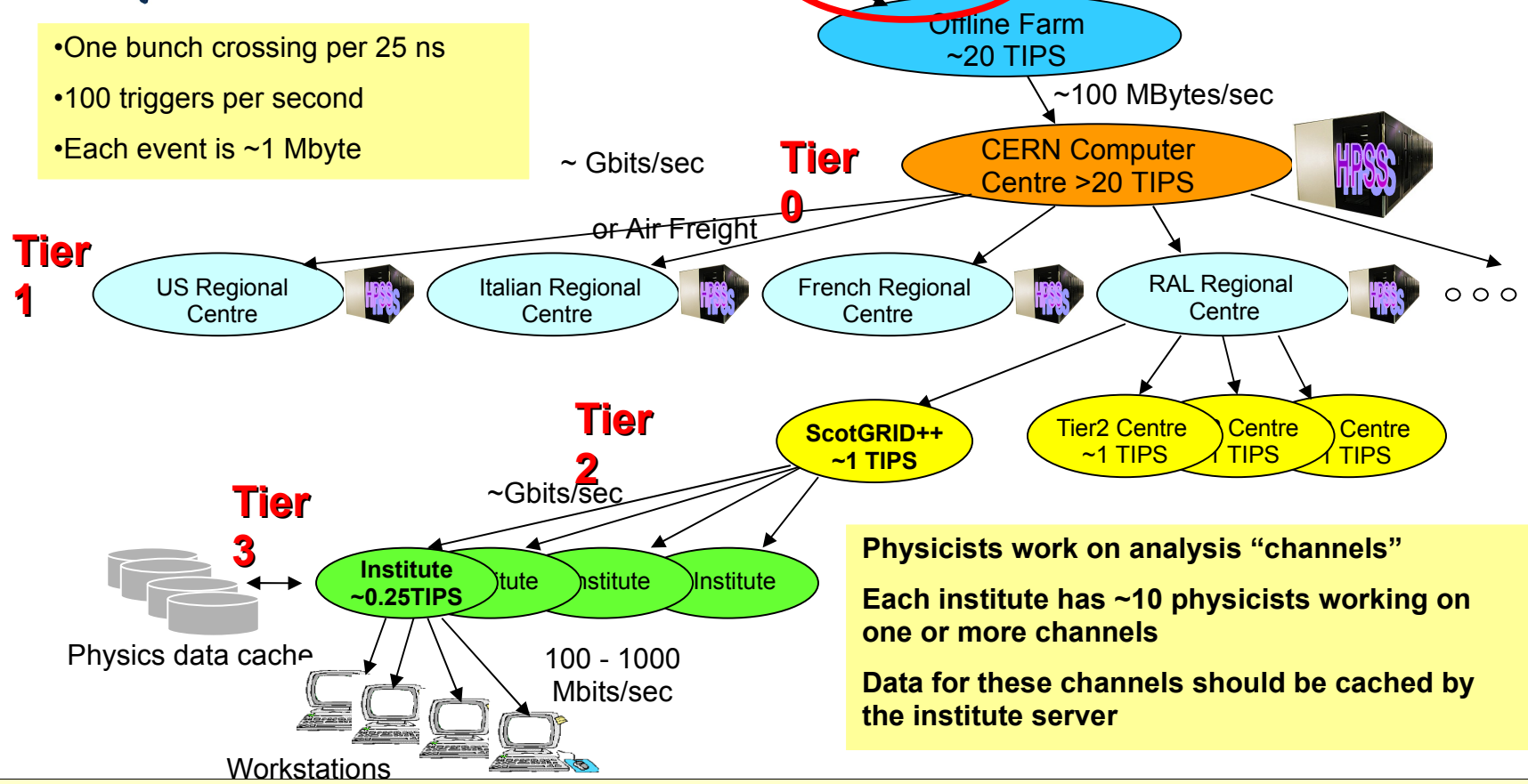
maybe not quite there yet ...

LHC Grid Computing



1 TIPS = 25,000 SpecInt95
 PC (1999) = ~15 SpecInt95

- One bunch crossing per 25 ns
- 100 triggers per second
- Each event is ~1 Mbyte



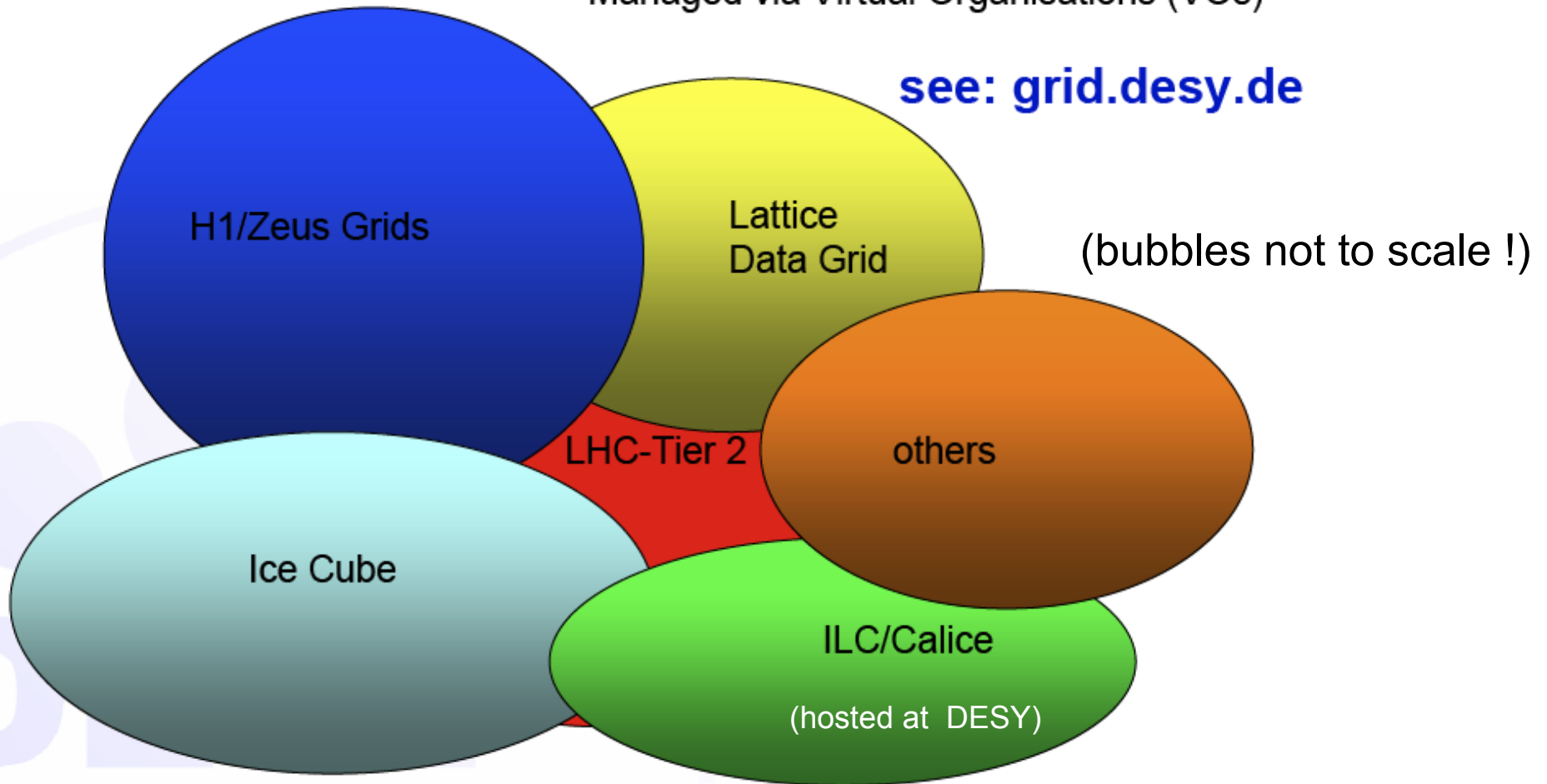
Physicists work on analysis “channels”
 Each institute has ~10 physicists working on one or more channels
 Data for these channels should be cached by the institute server

- Grid invented to cope with huge amount of LHC data
- Tier structure ensures distribution of data (and resources)
- DESY is Tier2 for Atlas and CMS (and LHCb)

user groups at DESY Grid

Managed via Virtual Organisations (VOs)

see: grid.desy.de



- the DESY Grid has a heterogenous user community
- 15 VOs are supported: hone, zeus, atlas, cms, ilc, calice...
- however: Grid hardware and middleware is as homogenous as possible

Grid Computing Resources

- Zeuthen:

- **452 Cores** -> **500 kSI2k** for DESY Grid
- **260 TB disk** for dCache, Lustre
- 200 TB disk in procurement process

- Hamburg:

- **1386 Cores** -> **2200 kSI2k** for DESY Grid
- **450 TB disk** for dCache, Lustre
- 450 TB in procurement process NAF dCache
- 450 TB in procurement process for Tier 2
- Total: ~ **2700 kSI2k for the Grid**

23kEUR through
EUDET (2006) !

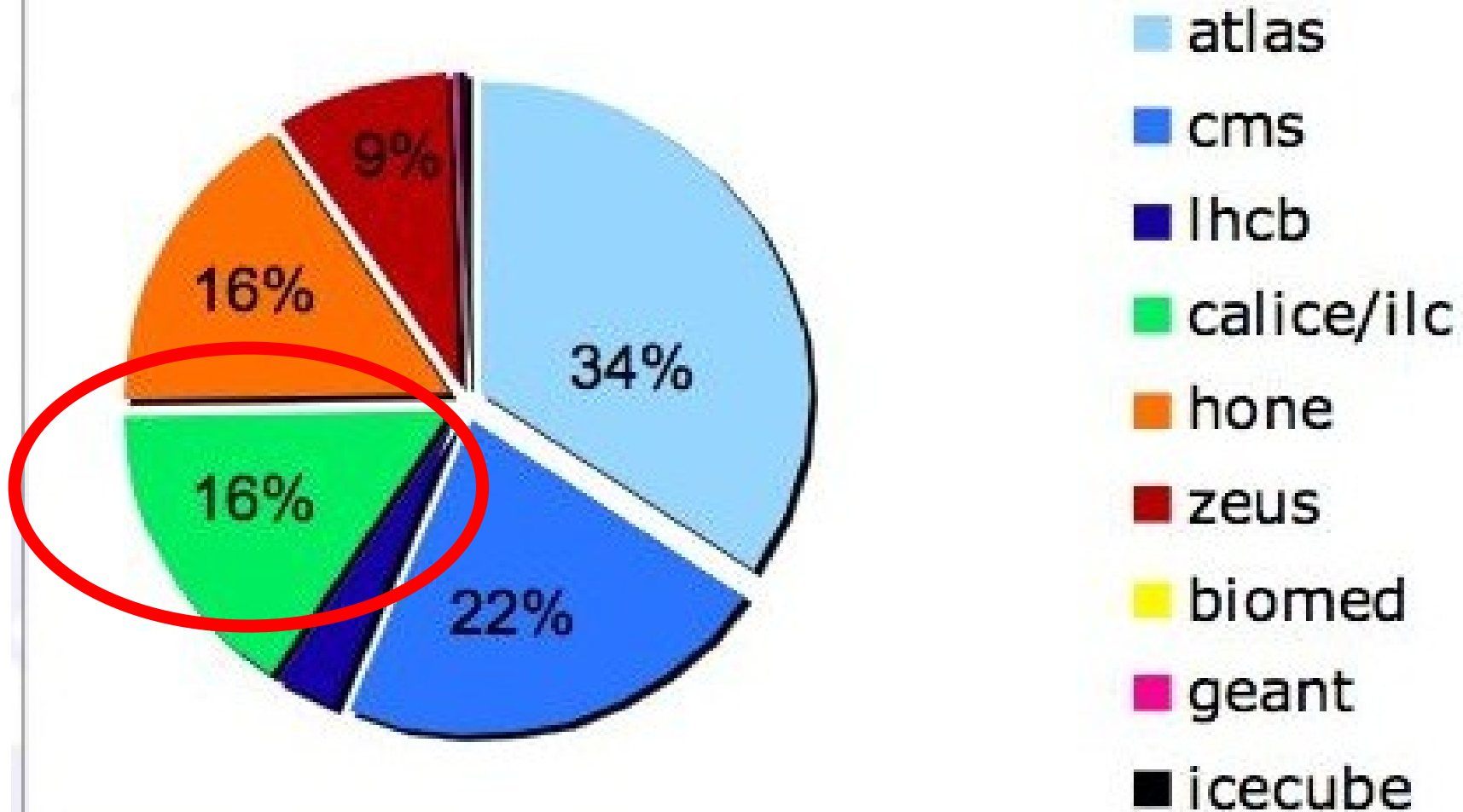
DESY Grid resource for LHC

A:= Atlas; C:= CMS; L:= LHCb

	2008	2009	2010	2011	2012	2013
CPU [kSI2k]	580 A	900 A	1720 A	2300 A	2890 A	3970 A
	540 C	1120 C	3060 C	4230 C	5390 C	6750 C
	325 L	810 L	810 L	810 L	810 L	810 L
Disk [TB]	260 A	440 A	740 A	1040 A	1340 A	1870 A
	200 C	230 C	300 C	440 C	580 C	710 C
	1 L	2 L	2 L	2 L	2 L	2,5 L
Tape [TB] officially not requested						
NAF upgrade in the range of the Atlas requests						

usage of DESY grid by ILC

**CPU utilization DESY Grid
(1.4.08-29.9.08)**



Reliability of the DESY Tier 2

	aug-08		may-08 jun-08 jul-08		
CH-CHIPP-CSCS (Switzerland, CHIPP)					
CSCS-LOG2	99 %	97 %	94 %	96 %	92 %
CN-IHEP (China, IHEP, Beijing)					
BEIJING-LOG2	99 %	98 %	85 %	79 %	95 %
CZ-Prague-T2 (Czech Rep., FZU A&S, Prague)					
prague_cesnet_log2	90 %	90 %	97 %	86 %	89 %
prague_log2	99 %	98 %	82 %	94 %	98 %
DE-DESY-ATLAS-T2 (Germany ATLAS Federation, DESY)					
DESY-HH	99 %	99 %	98 %	99 %	99 %
DESY-ZN	99 %	98 %	99 %	100 %	99 %
DE-DESY-RWTH-CMS-T2 (Germany, CMS Federation)					
DESY-HH	99 %	99 %	98 %	99 %	99 %
DESY-ZN	99 %	98 %	99 %	100 %	99 %
RWTH-Aachen	97 %	97 %	0 %	0 %	80 %
DE-FREIBURGWUPPERTAL (Germany, ATLAS Federation FR/W)					
UNI-FREIBURG	94 %	94 %	71 %	76 %	88 %

Grid storage for ILC/EUDET

- CALICE:
 - 30TB tb-cern
 - 4.7TB tb-desy
 - 6.1TB tb-fnal
- ILC:
 - 2.1TB LDC monte carlo
 - 19TB ILD-LOI Monte Carlo
- ILC/EUDET-JRA1:
 - 1.4TB 2007 testbeam data
 - 513G 2008

Calice Monte Carlo production

- <https://twiki.cern.ch/twiki/bin/view/CALICE/TbCernAugust2006>

Webpage Screenshots

- Software: Mokka-06-06-Calice02
- Tools: GRID and SRM at DESY, Hamburg.
- 300K events in 30 slcio files

The following MC production (001-030) were produced in DESY

alice/shaojun/. And
file, steer file and log

	Physics List	Random Seed	Events	Size	
001.slcio	LHEP	860100	0-9999	115974816	
002.slcio	LHEP	860200	10000-19999	116027556	
003.slcio	LHEP	860300	20000-29999	116235684	116005196
004.slcio	LHEP	860400	30000-39999	116114536	116048188
005.slcio	LHEP	860500	40000-49999	116114720	116017964
006.slcio	LHEP	860600	50000-59999	116111032	116087340

```
Controls
DefaultWeb
DESgroup
EGEE
ELFms
ETICS
EgeePtf
FIOgroup
Gaudi
GeneratorServices
GuidesInfo
HCC
Inspire
ILCBDSColl
ILCTPC
ICommTeam
Know
LAr
LCG
LCGAAWorkbook
LHCAccess

/Mokka/init/userInitString TIMEOUT_TO_RELAX_TMP 120
/Mokka/init/userInitInt SLEEP_BEFORE_RETRY 5

/Mokka/init/detectorModel TbCern0806_01_dchxy_new
/Mokka/init/globalModelParameter EcalTranslateX -27 mm
/Mokka/init/globalModelParameter EcalTranslateY -39.5 mm

/Mokka/init/randomSeed 4100
/Mokka/init/startEventNumber 0
/Mokka/init/slcioFilename Electron_45GeV_10kevt_TbCern0806_01_dchxy_new_001.slc
/Mokka/init/slcioDetailedShowerMode false
/Mokka/init/slcioWriteCompleteHepEvt true
/Mokka/init/slcioWriteMode WRITE_NEW

/Mokka/init/physicsListName LHEP
/Mokka/init/rangeCut 0.05 mm
```

Electron_45GeV_10kevt_TbCern0806_01_dchxy_new_025.slcio	LHEP	300251	240000-249999	116028476
Electron_45GeV_10kevt_TbCern0806_01_dchxy_new_026.slcio	LHEP	300261	250000-259999	116159624
Electron_45GeV_10kevt_TbCern0806_01_dchxy_new_027.slcio	LHEP	300271	260000-269999	116304916
Electron_45GeV_10kevt_TbCern0806_01_dchxy_new_028.slcio	LHEP	300281	270000-279999	116139464
Electron_45GeV_10kevt_TbCern0806_01_dchxy_new_029.slcio	LHEP	300291	280000-289999	116103760
Electron_45GeV_10kevt_TbCern0806_01_dchxy_new_030.slcio	LHEP	300301	290000-299999	116111600

S.Lu,MPI

ILD-LOI Monte Carlo production

- LOI-benchmark channels defined by WWS-SW panel
- also need SM background
- -> used large Whizard SM data set produced at SLAC
- -> produced $\sim 50 \text{ fb}^{-1}$

Process	fb^{-1}	#events ($\times 10^3$)	Process	#events
ee->2f	20	~ 2500	light quark 2f at 91.2 GeV	20000
ee->4f	50	~ 6000		
ee->6f	50	~ 100	tt (6f) at 350 GeV	20000
ee->hX	50	~ 20		
ee->gg(n*g)	10	~ 600		
nn(n*g)	20	~ 1700		
ee->ee	0.1	~ 200		
eg->eg	0.1	~ 650		
gg->X	0.1	~ 1000		
rest	1	~ 600		

- >15 M events
- ~ 80 CPU years
 - DESY, other sites (UK,F,...)
- 20 TB stored at DESY

using the Grid was the only way forward in order to get the resources that we needed for the LOI mass production !

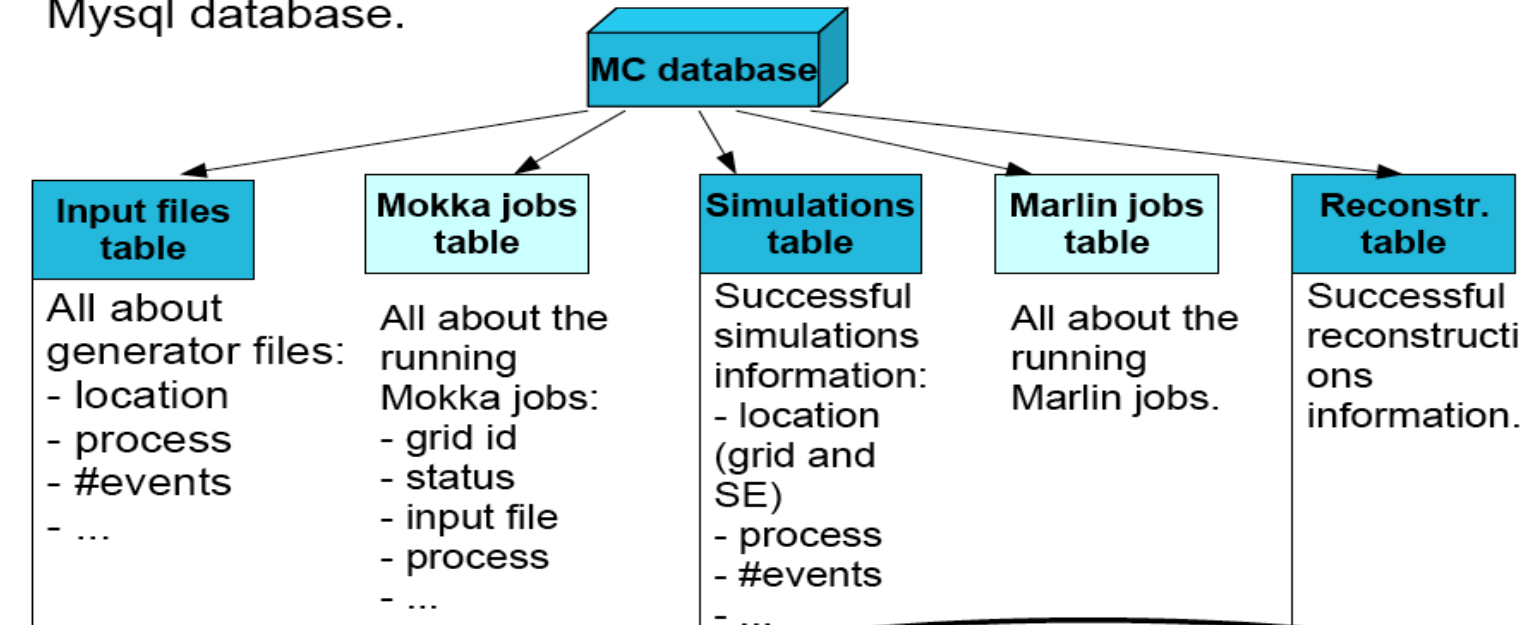
ilcsoft job submission scripts

- automated job submission scripts for **Mokka & Marlin** with direct access to MySQL database I.Marchesine
- keep track of job status (see next slide)
- register produced output files
- **job input:**
 - steering files
 - input files: stdhep, slcio
 - binaries (either on SE or installed locally)
- **job output**
 - slcio files – stored on Grid SE
 - tar ball: log files, steering files

Monte Carlo production DB

I. Marchesine

Mysql database.



Php based v

MySQLCC - [MCAdmin@flcweb01.desy.de:3306] Query Window

File Edit View Query Options HotKeys

ob	Output_File_Name	Status	Mokka_Version	Geant4_V	Co	M	Date	Resubnum	Co
235	rid-MCVS_2007_12_07_c	checked	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2007-12-07	0	
236	rid-MCVS_2007_12_07_c	checked	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2007-12-07	0	
237	rid-MCVS_2007_12_07_c	checked	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2007-12-07	0	
238	rid-MCVS_2007_12_07_c	Submitted	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2008-01-07	2	
239	rid-MCVS_2007_12_07_c	checked	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2007-12-07	0	
240	rid-MCVS_2007_12_07_c	new	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2007-12-07	0	
241	rid-MCVS_2007_12_07_c	checked	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2007-12-07	0	
242	rid-MCVS_2007_12_07_c	checked	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2007-12-07	0	
243	rid-MCVS_2007_12_07_c	checked	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2007-12-07	0	
244	rid-MCVS_2007_12_07_c	checked	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2007-12-07	0	
245	rid-MCVS_2007_12_07_c	Submitted	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2008-01-07	3	
246	rid-MCVS_2007_12_07_c	checked	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2007-12-07	0	
247	rid-MCVS_2007_12_07_c	checked	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2007-12-07	0	
248	rid-MCVS_2007_12_07_c	Submitted	cvsHEAD_2007_12_07	9.0version	i.mai	ivar	2008-01-07	3	

Result 1

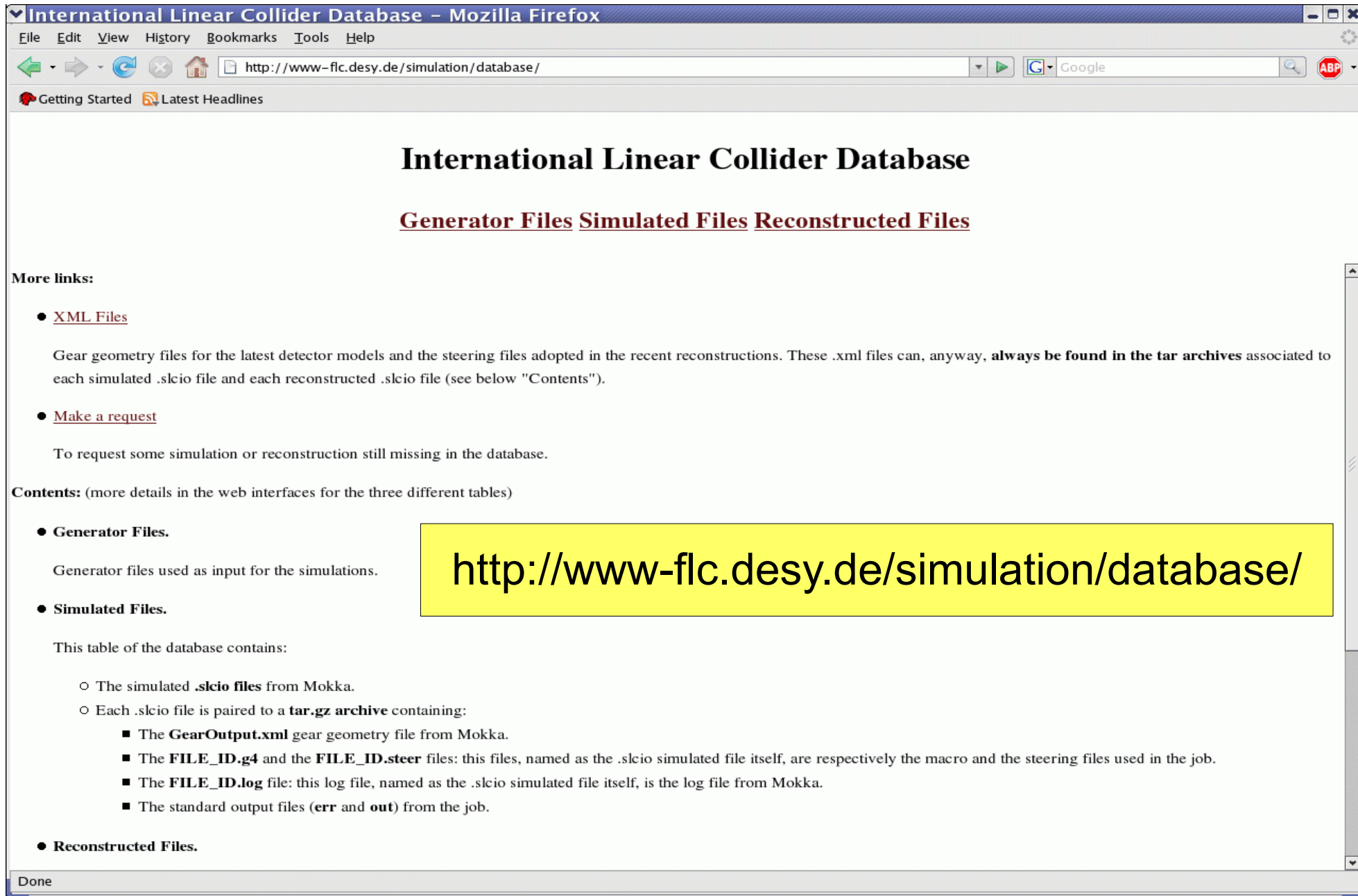
350 rows in set (0.02) sec
Query OK, 1 row affected (0.00) sec

Messages History Explain

Executing Query | Read Only

Monte Carlo file catalogue - DB

Frank Gaede, EUDET-Meeting, Amsterdam Oct. 6-8, 2008



The screenshot shows a Mozilla Firefox browser window displaying the International Linear Collider Database website. The browser's address bar shows the URL <http://www-flc.desy.de/simulation/database/>. The website content includes a main title, navigation links, a 'More links' section, and a 'Contents' section with detailed file descriptions. A yellow box highlights the URL in the address bar.

International Linear Collider Database

[Generator Files](#) [Simulated Files](#) [Reconstructed Files](#)

More links:

- [XML Files](#)
Gear geometry files for the latest detector models and the steering files adopted in the recent reconstructions. These .xml files can, anyway, **always be found in the tar archives** associated to each simulated .slcio file and each reconstructed .slcio file (see below "Contents").
- [Make a request](#)
To request some simulation or reconstruction still missing in the database.

Contents: (more details in the web interfaces for the three different tables)

- **Generator Files.**
Generator files used as input for the simulations.
- **Simulated Files.**
This table of the database contains:
 - The simulated **.slcio files** from Mokka.
 - Each .slcio file is paired to a **tar.gz archive** containing:
 - The **GearOutput.xml** gear geometry file from Mokka.
 - The **FILE_ID.g4** and the **FILE_ID.steer** files: this files, named as the .slcio simulated file itself, are respectively the macro and the steering files used in the job.
 - The **FILE_ID.log** file: this log file, named as the .slcio simulated file itself, is the log file from Mokka.
 - The standard output files (**err** and **out**) from the job.
- **Reconstructed Files.**

Done

<http://www-flc.desy.de/simulation/database/>

Monte carlo file catalogue – DB II

Frank Gaede, EUDET-Meeting, Amsterdam Oct. 6-8, 2008

International Linear Collider Simulations Database – Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www-flc.desy.de/simulation/databasesimulation/

Getting Started Latest Headlines

International Linear Collider Simulations Database

[Search Database](#) [Browse Database](#) [XML Files](#) [Make a request](#)

search DB for files wrt.: tag,run,process,E,date,B-field,...

PARAMETER	INPUT	EXAMPLE
Tag:		For the new productions select the tags: <ul style="list-style-type: none">• Test_500: first tests with the Whizard samples from SLAC• Test_SinglePar: test single particle production• Test_ZPole: test Z pole production• Test_350_Zh120: test Z higgs (120), CMS 350, pythia• Test_500_Zh120: test Z higgs (120), CMS 500, pandora pythia TAGS SUMMARY
Run ID:		m-5-4_cb_1000_noisr_ldc00sc_3.00t_r1690_l2730_qgsp_bert
Process:		cb,n ln1h,...
Center of Mass Energy [GeV]:		1000,500,...
Date of Production:		2006-02-19,2007,12,2006-05,...
Event Generator:		pythia,...
Detector Simulation:		mokka,mokka 5.4,...
Detector Model:		ldc00sc,ldc01_02sc,...
Physics List:		qgsp_bert, lcphys,...
B Field [T]:		3.0,4.0,...

Done

some Grid websites

- DESY Grid Web Sites:
 - <http://grid.desy.de/>
 - <http://grid.desy.de/ilc/>
 - <http://grid.desy.de/install/DESY-VO.html>
- Grid Computing Web Sites:
 - <http://gus.fzk.de/>
 - <http://cern.ch/lcg/>
 - <http://www.eu-egee.org/>
- ILC VO user registration:
 - <http://grid-voms.desy.de:8443/vomses>

Summary

- DESY Grid supports 15 VOs incl. ILC & CALICE
 - 1800 CPUs (3000kSI2k)
 - 700 TB storage (soon 1300 TB)
 - (largest activity LHC Tier2s)
- heavily used in last year(s):
 - calice testbeams and Monte Carlo
 - pixel telescope testbeam
 - ILD-LOI mass production

the Grid is used successfully by EUDET JRAs for data storage, processing and analysis

