ALICE Physics Data Challenge 3

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LHCC LCG Review
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ALICE Physic Data Challenges

| Period (milestone)	Fraction of the final capacity (%)	Physics Objective
06/01-12/01	1%	pp studies, reconstruction of TPC and ITS
06/02-12/02	5%	❖ **First test of the complete chain from simulation to reconstruction for the PPR** ❖ **Simple analysis tools** ❖ **Digits in ROOT format**
01/04-06/04	10%	❖ **Complete chain used for trigger studies** ❖ **Prototype of the analysis tools** ❖ **Comparison with parameterised MonteCarlo** ❖ **Simulated raw data**
01/06-06/06	20%	· **Test of the final system for reconstruction and analysis**

From PDC 2 to PDC 3

❖ The Physics Performance Report will be completed soon (!)
  – Its emphasis is on detector performance on soft physics
❖ The strategy makes use of *event mixing*
  – A *signal-free* parameterised *event* is *mixed* with signals
  – *Signal-free events* were reused up to 500 times
❖ Parameterisations developed from full simulation have been heavily used
❖ The new phase of physics simulations will be on hard physics, jets and jet quenching
  – At LHC, but also at RHIC, the mini-jet contribution is expected to increase for the production of particles in the central rapidity region
❖ Event mixing strategy has to be reviewed

Objectives of PDC 3

❖ We have to use a *real* (!) generator (HIJING) that contains (mini-)jets to simulate the *underlying event*

  – For p_t ~10-20 GeV/c → ~1 jet per event

  – For p_t ~200 GeV/c → 1000 jet/month (reuse events 50 times)

❖ Verify the ability to (simulate and) process ~10% of the data of a standard data-taking year

  – Evaluate consequences for the MW and offline frameworks

❖ See how much data we can simulate, process (including mixing) and analyse in 6 months on LCG and private resources

❖ Part of the raw data will be shipped to CERN and redistributed for reconstruction and analysis

❖ Due to start beginning 2004, moved to LCG-2 schedule

❖ Readiness <u>reviews</u> every two days!!

Merging

Alice event: 0, Run:0
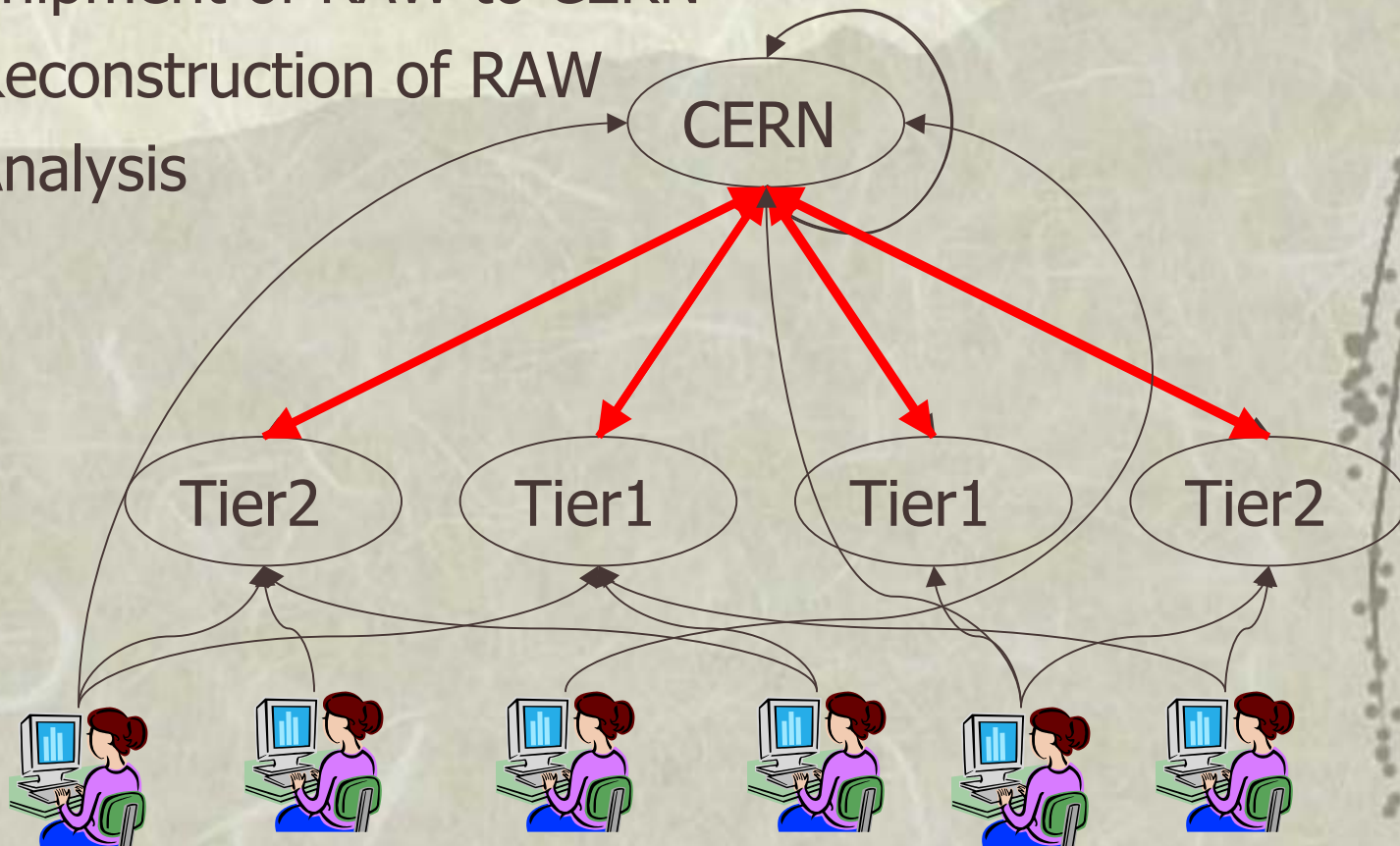Nparticles = 5191 Nhits = 110290

Signal-free event

Mixed signal
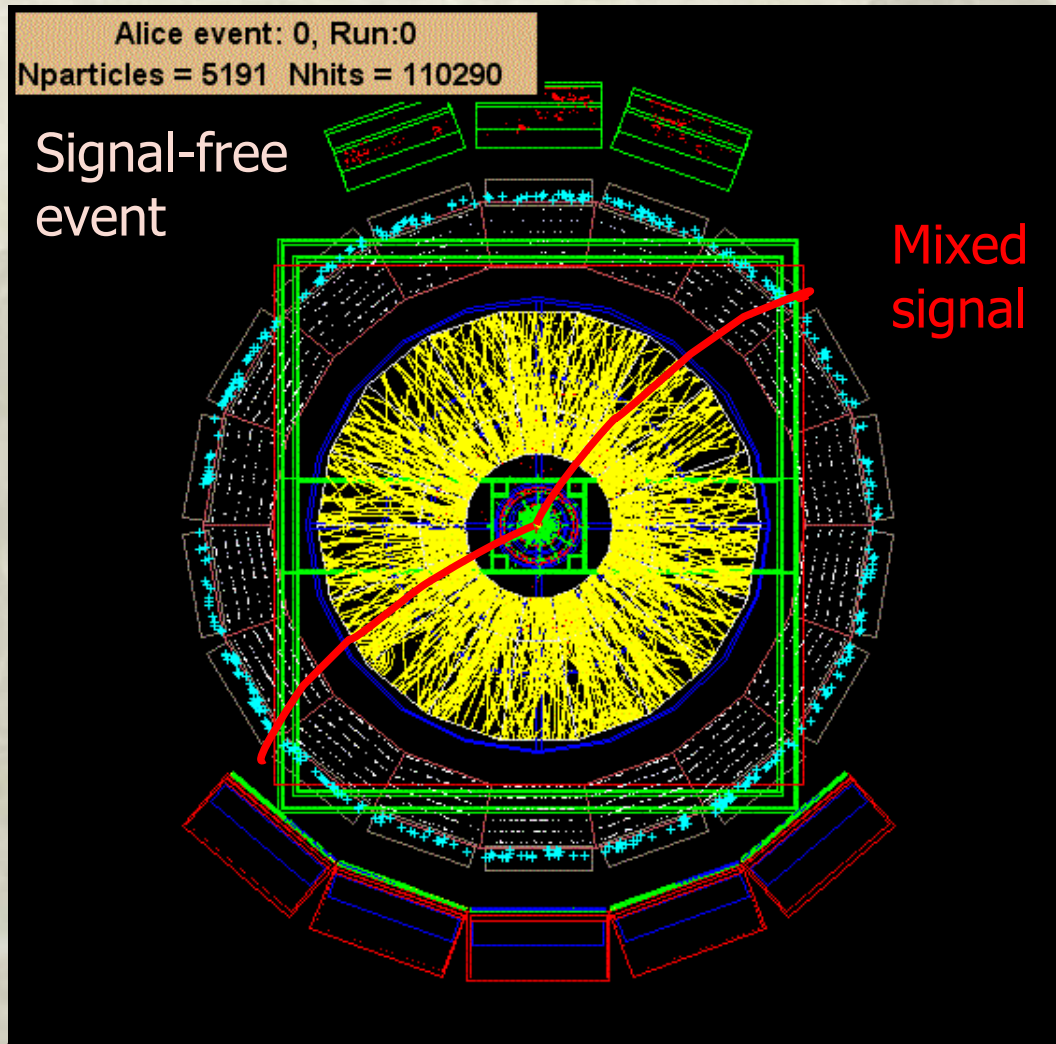
PDC 3 schema

Production of RAW
Shipment of RAW to CERN
Reconstruction of RAW
Analysis

AliEn job control

Data transfer

CERN

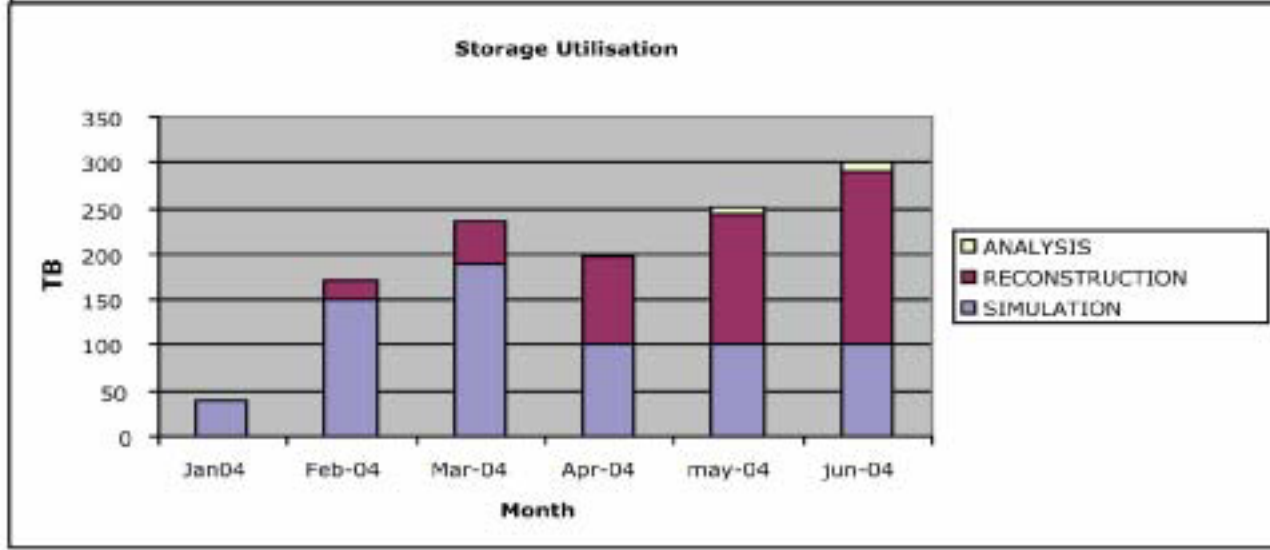Tier2   Tier1   Tier1   Tier2
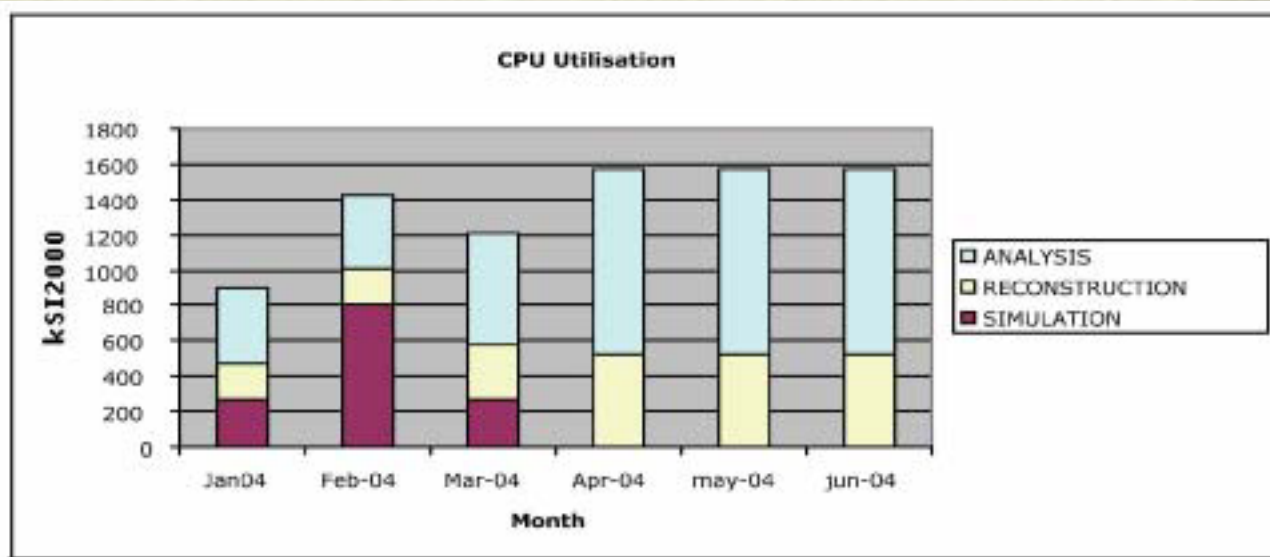
PDC 3 resources

A dynamic resource allocation would easily solve the deficit

ALICE PDC-3 & LCG

- All the production will be started via AliEn, the analysis will be done via Root/Proof/AliEn
- LCG-1 will be one CE element of AliEn, which will integrate seamlessly LCG and non LCG resources
- If LCG-1 works well, it will *suck* a large amount of jobs, and it will be used heavily
- If LCG-1 does not work well, AliEn will privilege other resources, and it will be less used
- In all cases we will use LCG-1 as much as possible
- We will not need to take any *decision*: the performance of the system will decide for us
- The figure of merit will be

$$Q^{LCG} = \frac{CPU^{LCG}_{good\ jobs}}{CPU^{LCG}_{available}}; \qquad Q^{AliEn} = \frac{CPU^{AliEn}_{good\ jobs}}{CPU^{AliEn}_{available}}$$
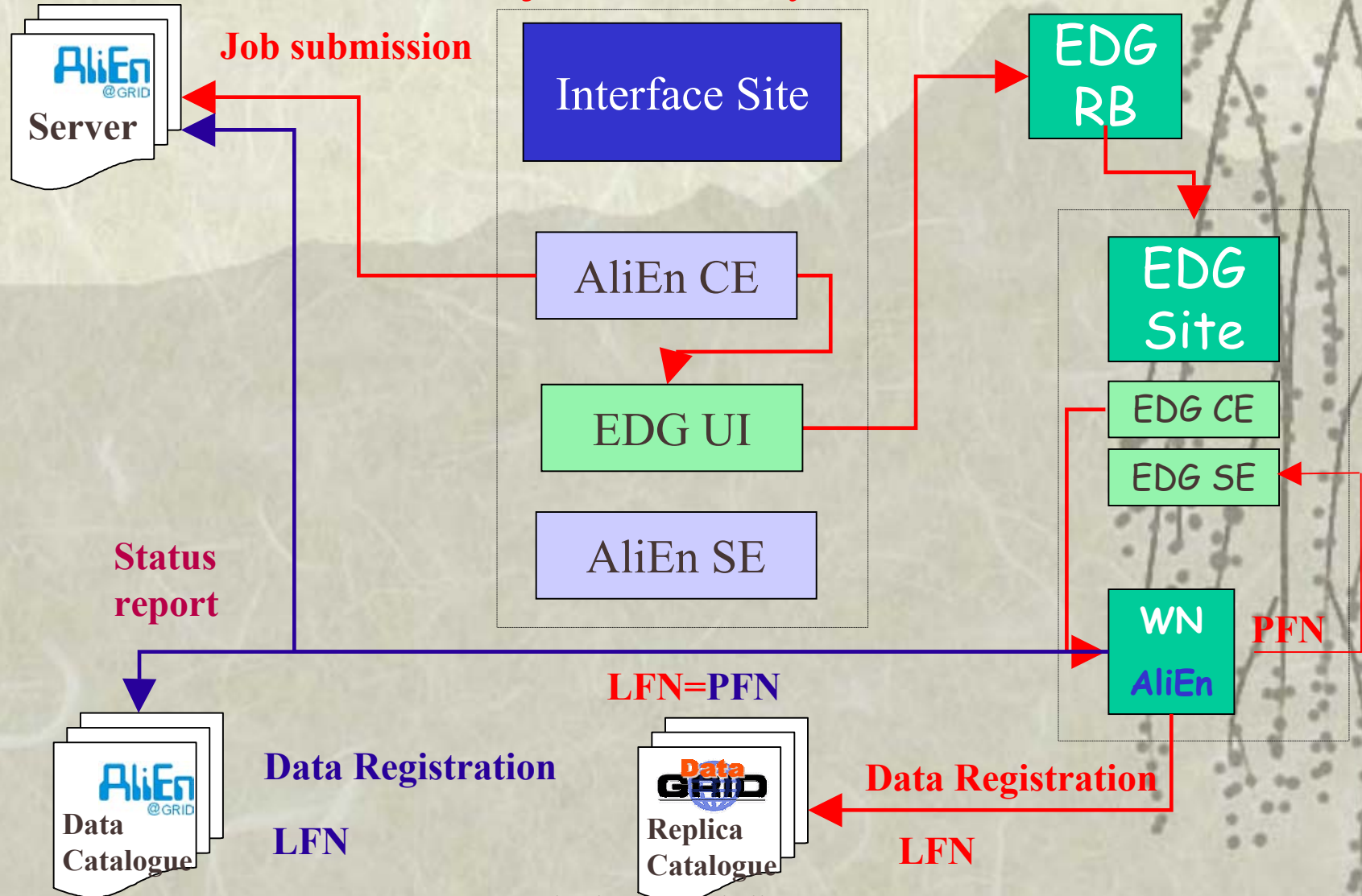
AliEn as a meta-GRID

S.Bagnasco DataTAG

AliEn – EDG Interface

Mar, 11th, 2003: first AliRoot job, driven by AliEn, run on EDG

Job submission

AliEn @GRID Server

Interface Site

EDG RB

AliEn CE

EDG UI

EDG Site

EDG CE

EDG SE

AliEn SE

Status report

WN **AliEn**

PFN

LFN=PFN

AliEn @GRID Data Catalogue

Data Registration

LFN

Data GRID Replica Catalogue

Data Registration

LFN

AliEn & LCG: Data Challenge
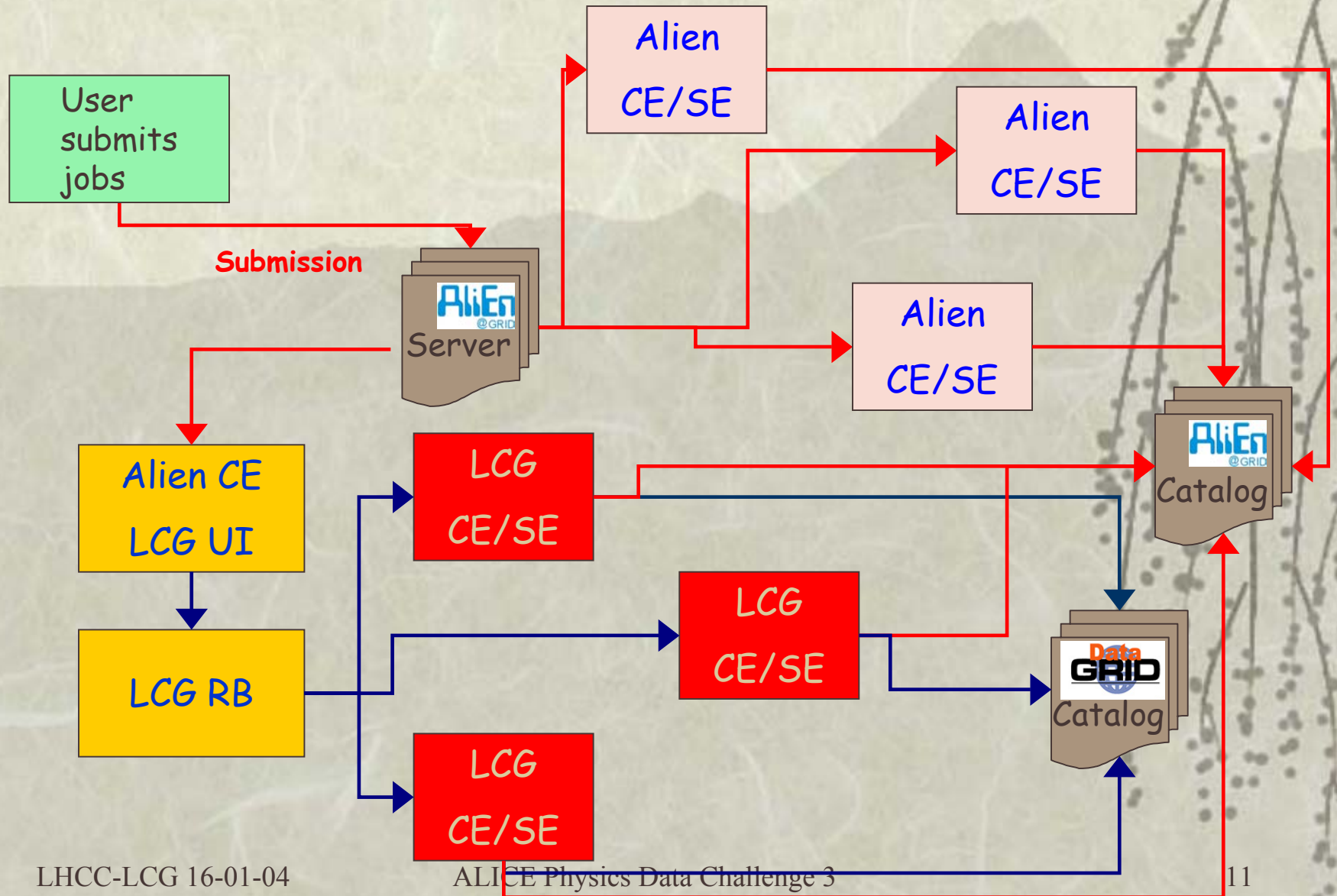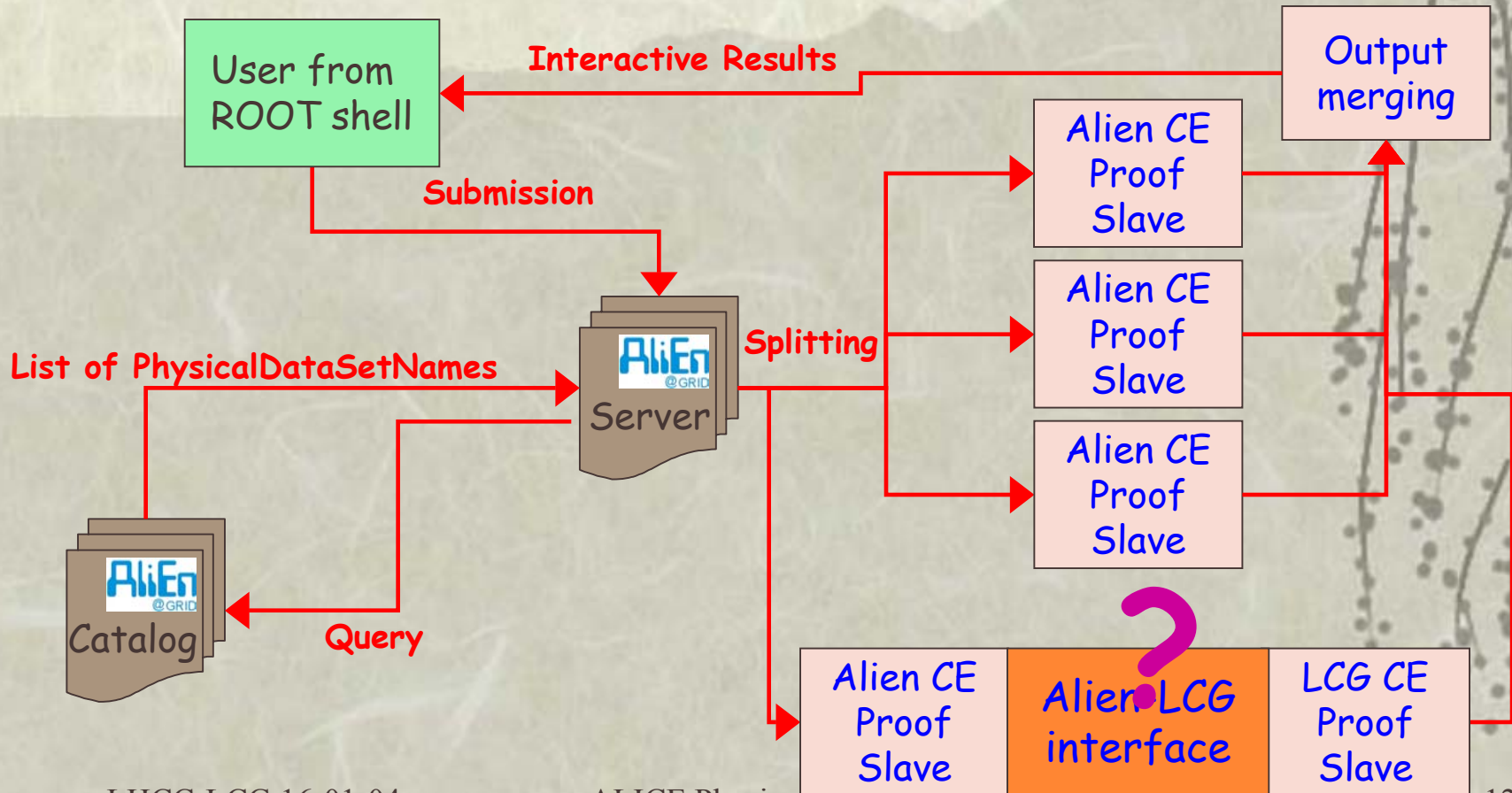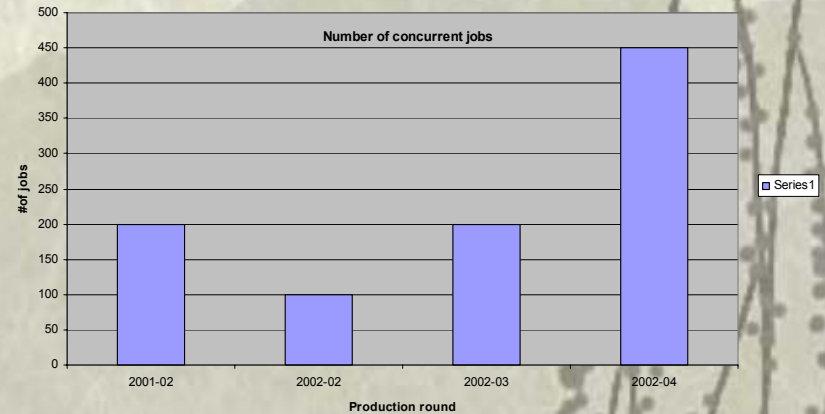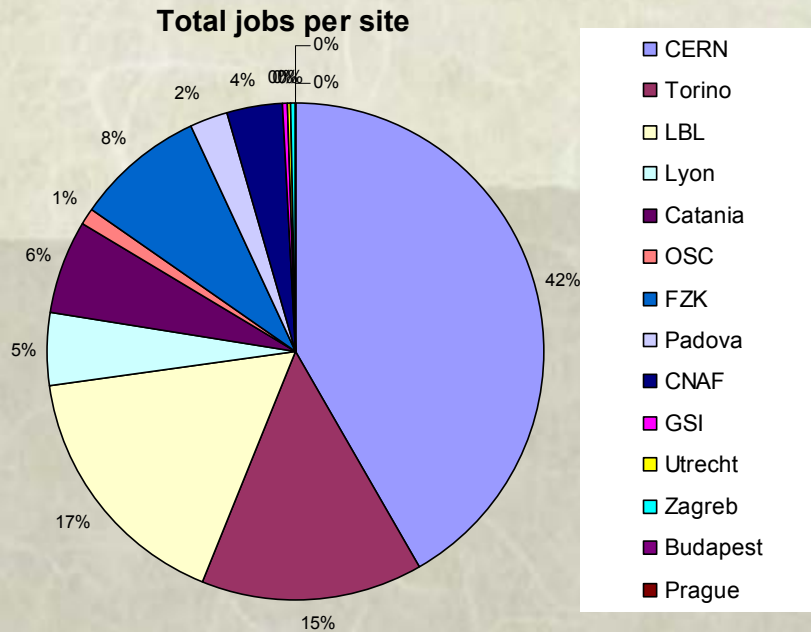
AliEn & LCG: Analysis

interactive management of a number of distributed CEs, with attached SEs

AliEn activity

Total jobs per site

Legend:
- CERN
- Torino
- LBL
- Lyon
- Catania
- OSC
- FZK
- Padova
- CNAF
- GSI
- Utrecht
- Zagreb
- Budapest
- Prague

Pie chart percentages: 42%, 15%, 17%, 5%, 6%, 1%, 8%, 2%, 4%, 0%, 0%, 0%

Number of concurrent jobs

#of jobs vs Production round

Production round	#of jobs
2001-02	200
2002-02	100
2002-03	200
2002-04	450

Series1

http://www.to.infn.it/activities/experiments/alice-grid
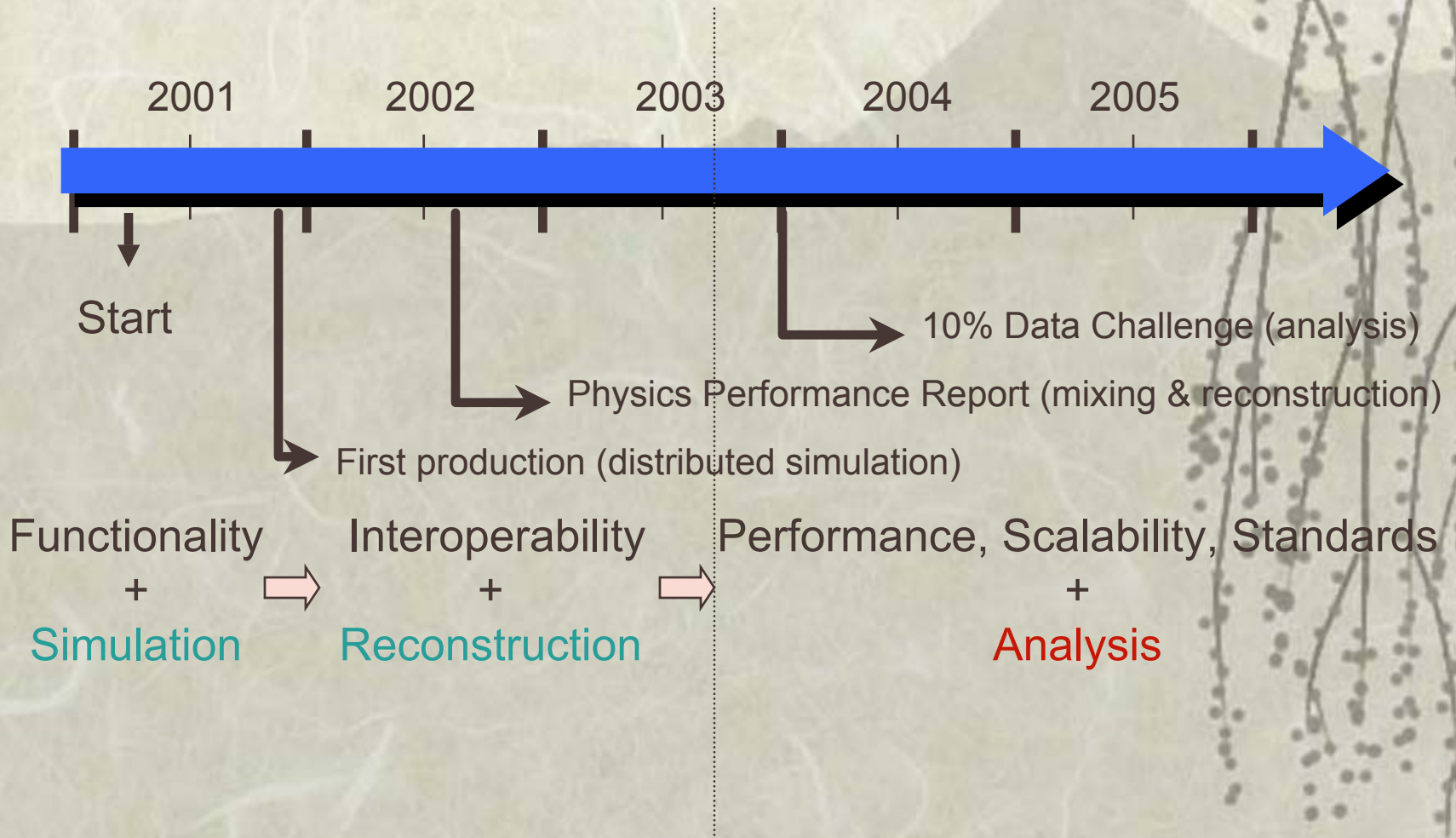
- 32 sites configured
- 5 sites providing mass storage capability
- 12 production rounds
- 22773 jobs validated, 2428 failed (10%)
- Up to 450 concurrent jobs
- 0.5 operators

Map labels: LBL/NERSC, OSU/OSC, Houston, Merida, Birmingham, NIKHEF, RAL, Saclay, Nantes, GSI, Krakow, Karlsruhe, Budapest, CERN, Padova, Lyon, Torino, Bologna, CRB, Bari, Cagliari, Catania, Capetown, ZA, Dubna, Yerevan, Kolkata, India

AliEn Timeline

2001   2002   2003   2004   2005

Start

10% Data Challenge (analysis)

Physics Performance Report (mixing & reconstruction)

First production (distributed simulation)

Functionality   Interoperability   Performance, Scalability, Standards
     +   ⇨   +   ⇨   +

Simulation   Reconstruction   Analysis