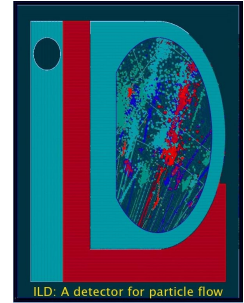# Grid Ressources (not only) for

Roman Pöschl

ILD Workshop – Jan. 2010 Paris/France Pre-Meeting

The Grid as the backbone for computing

- Only way to get to massive computing resources !!!

- Two vo's exist since 2005 in EGEE
  ilc and *calice*
- Support in Europe and Asia (Japan) and North America

- Work in the debris of 'non' LHC experiments

- Commitments from large sites for data storage exist
  in France and Germany
  What about other contries?

Review on 2008/09 Activities

- 'calice':
  - grid sites: UK(8), FR(3), DE(2), JP(2), NL, CZ, ES
  - #Jobs(08/09): 149k + 62k + 33k = 244k (DE,FR,UK)
  - CPU time: 0.4 Mh + 0.2 Mh + 0.1 Mh = 0.7 Mh = 80y
- 'ilc':
  - grid sites: UK(18), FR(4), DE(4), ES(2), JP(2), IL(2), RO(1)
  - #Jobs(08/09): 534k + 399k + 194k = 1127 k (DE,UK,FR)
    - CPU: 1.8Mh + 1.8 Mh + 0.7 Mh = 4.3 Mh = 500y
  - O(1-2%) of total EGEE grid or O(10%) of a large LHC experiment used by ILC
  - need to make sites aware of ILC needs once LHC data taking has started

20

cc in2p3 users meeting 18/1/10: In 2009 non-LHC vo's did benefit from the idle LHC resources!
ILC did run partially on 1000 CPUs (usually ~600)

A stroll through the major supporting countries

- Biased by personal proximity/experience to/with sites or dedicated meetings in the past

- Thanks to colleagues who provided input

Ressources in the UK

se2.ppgrid1.rhul.ac.uk
srm-ilc.gridpp.rl.ac.uk
gfe02.hep.ph.ic.ac.uk
gw-3.ccc.ucl.ac.uk
dc2-grid-64.brunel.ac.uk
dgc-grid-50.brunel.ac.uk
srm.glite.ecdf.ed.ac.uk
se01.dur.scotgrid.ac.uk
t2se01.physics.ox.ac.uk
fal-pygrid-30.lancs.ac.uk
bohr3226.tier2.hep.manchester.ac.uk
heplnx204.pp.rl.ac.uk
epgse1.ph.bham.ac.uk

- A lot of sites support ilc (and calice)

Red: major sites (according to my knowledge)

From calice I know that they several are very efficient in terms of job processing

- No detailed breakdown (sorry!!!)

Who is ilc national contact in the UK?

Ressources in Germany

National Contact: Frank Gaede (?)

Two major sites: DESY-HH and DESY-Zeuthen
DESY-HH is the center of ILC computing
all ilc simulation files and calice data are residing there!!!

```
For storage (DESY-HH) :

ilc-tape:
88Tb

ilc-disk-pools:
70Tb (12Tb - disk-only, generated)

calice-tape:
45Tb

calice-disk-pools:
 50Tb (15Tb - disk-only, generated)
```

```
For storage (DESY-Zeuthen) :

ilc/calice-tape:
No tape

ilc/calice-disk-pools:
25Tb (ou of 50 Tb)
```
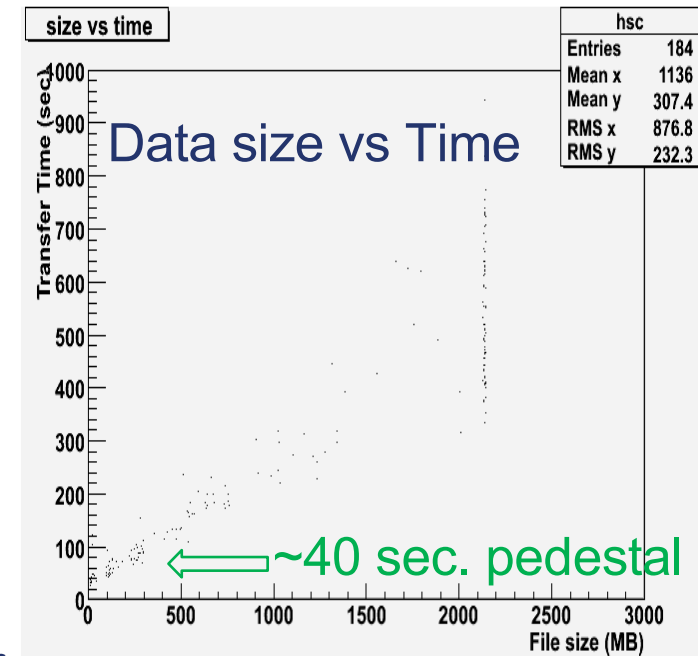
CPU: 5kHEPSPECS

CPU: 0.8kHEPSPECS

Smaller Sites: Uni Bonn, Uni Freiburg mainly for CPU
Storage for private studies

GRID in KEK (Nat. Contact. A. Miyamoto)

- **WNs**: Significantly augmented in Dec. '09.
  - ◆ Now, ~800 WNs operational. Plan to double WNs in March this year
  - ◆ So far, ILC (ILD) is the main consumer and encouraged to use,
    but still GRID is not easy to use compared to local CPU
- **SE** : some disks + HPSS tape system, which
  is shared by local batch server.
  - ◆ HPSS capacity depends on # of tapes (= \ )

- **Lessons from LOI studies.**
  - ◆ Large RTT between Japan and EU
    - Catalog access limits the transfer rate.
      Small size file transfer (<100MB) is not efficient
  - ◆ **Transfer speed: ~ 200kB/sec/port.**
    - Got time out in transfer exceeding 2GB.
    - Multiport transfer is crucial (usually 10 ports)
  - ◆ Successfully transfer all DSTs, but very limited number of Sim/Rec files.
    Hope improvements in future

Data size vs Time

hsc	
Entries	184
Mean x	1136
Mean y	307.4
RMS x	876.8
RMS y	232.3

~40 sec. pedestal

Ressources in France

National Contact: Andrea Sartirana, R. P.

Two major sites:

GRIF (Grid Ile de France):
Community of HEP Institutes in Paris Region (CEA, LLR, LPNHE, LLR)
Fairshare Mechanism: No "reserved" ressources

IN2P3 Computing Centre at Lyon (cc in2p3):

- Extremely Powerful Site (Details next slides)
- TIER 1 for LHC

Computing Ressources:
CPU: Request for 2010: 100 kSI2Kh (~4000 SI2Kd) ~0.4 kHS06h
Same request for 2009 (has been overrun by far in 2009)
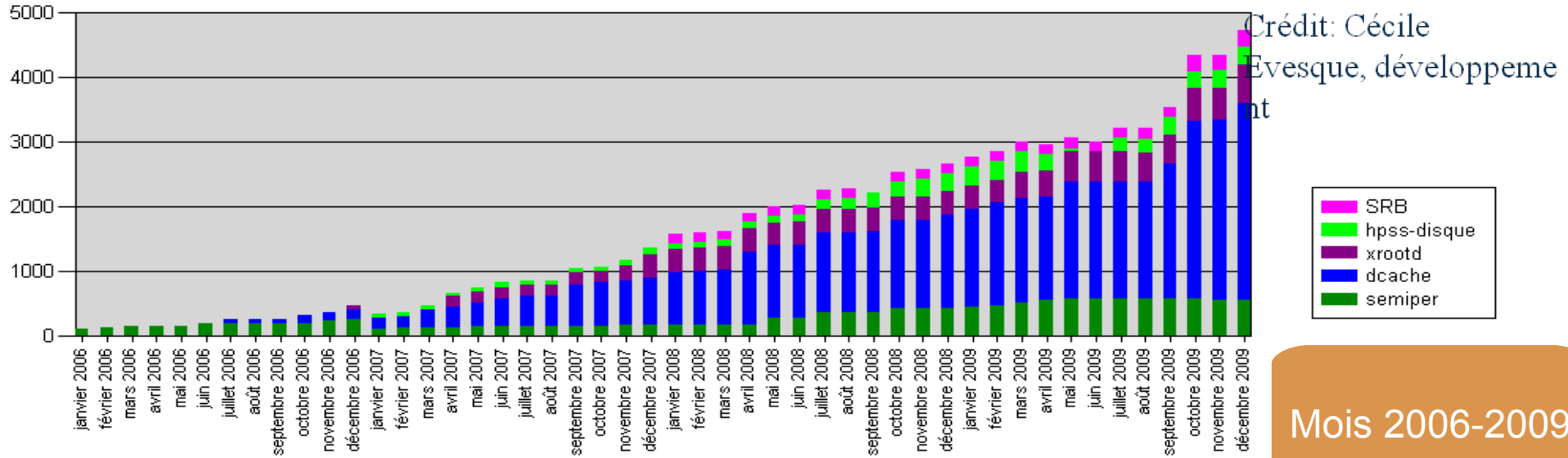Tape: ~90 TBYte occupied by ilc/calice
        ~20 TByte still available
         200 TByte requested for 2010

ILC and others at cc in2p3: Disk Space

Evolution mensuelle de l'Allocation Totale Disque - De 2006 à 2009

Crédit: Cécile Evesque, développement

Disque (To)

Mois 2006-2009

Legend:
- SRB
- hpss-disque
- xrootd
- dcache
- semiper

- Dcache: 3Po. (total)
- Top 5

Groupe	% des 3Po
• Atlas	• 36%
• CMS	• 17%
• LHCb	• 4%
• ILC	• 1.6%

G. Rahal

ILC and others at cc in2p3: CPU

Top 40 de la consommation des groupes de janvier à décembre 2009

ATLAS

BIO

ILC

Conso (1000 kSI2h) / echelle Log
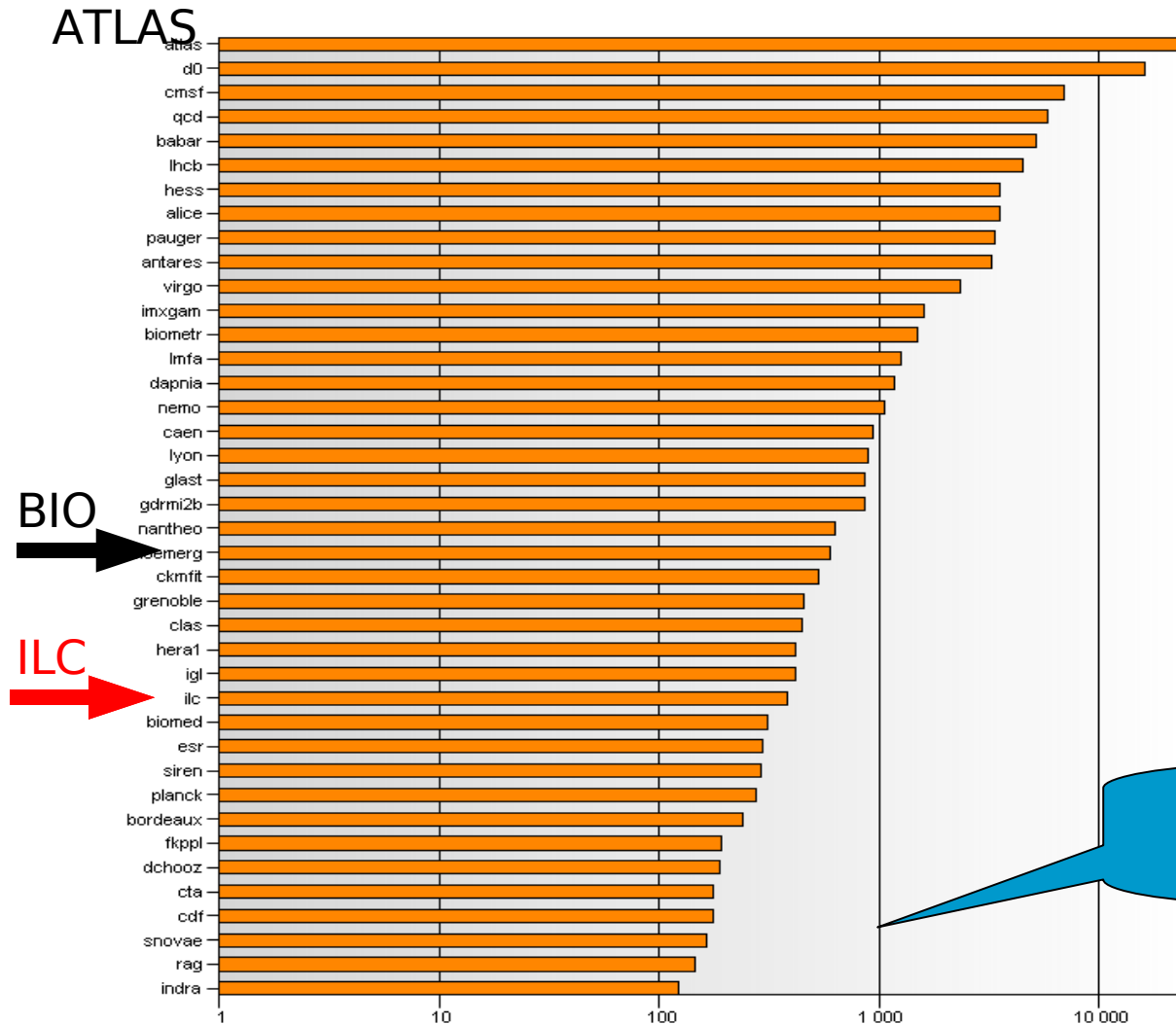
Top Utilisateurs: Atlas, D0, CMS, QCD, BaBar, LHCb

94.7% du CPU consommé par les expériences HEP, Astroparticules, Nucléaire

*1000 kSI2k == 4 kHS06*

Development of cc in2p3 until 2015

➢ ~40 groups with standard requirements (among which ilc)
  Typical in2p3 policy is that non LHC groups get 20% of ressources
➢ Takes LHC commitment into account
➢ LHC upgrade
➢ Significant increase of needs from astroparticle community
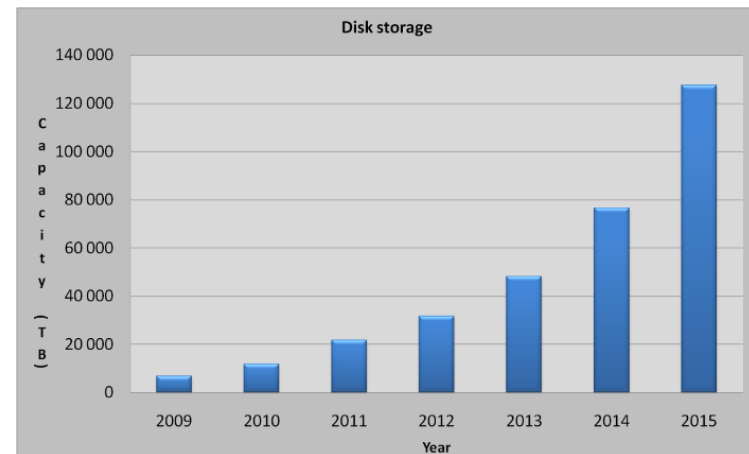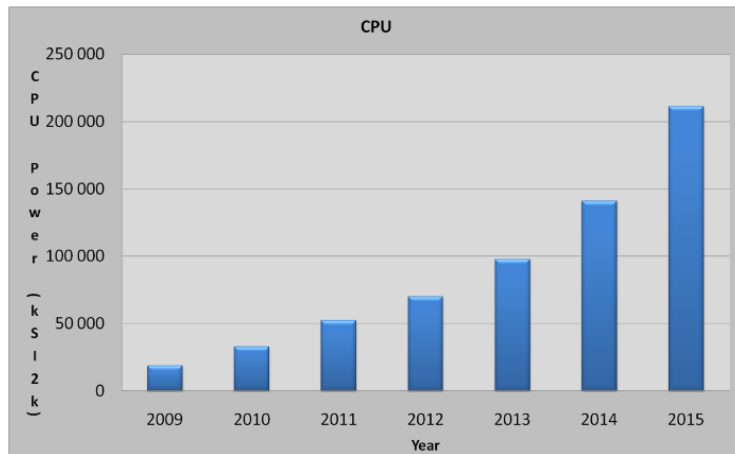
Extrapolation jusqu'en 2019: 216 racks et 3.2 MW de puissance électrique
(~5 MW avec le refroidissement)

Priority for 2010 - Networking

Establish good connection between Europe and KEK

UK ←→ DESY
? ~3-4 MByte/sec
? ~3-4 MByte/sec

10-15 Mbyte/sec sustained

<<1 MByte/sec

KEK

<<1 MByte/sec
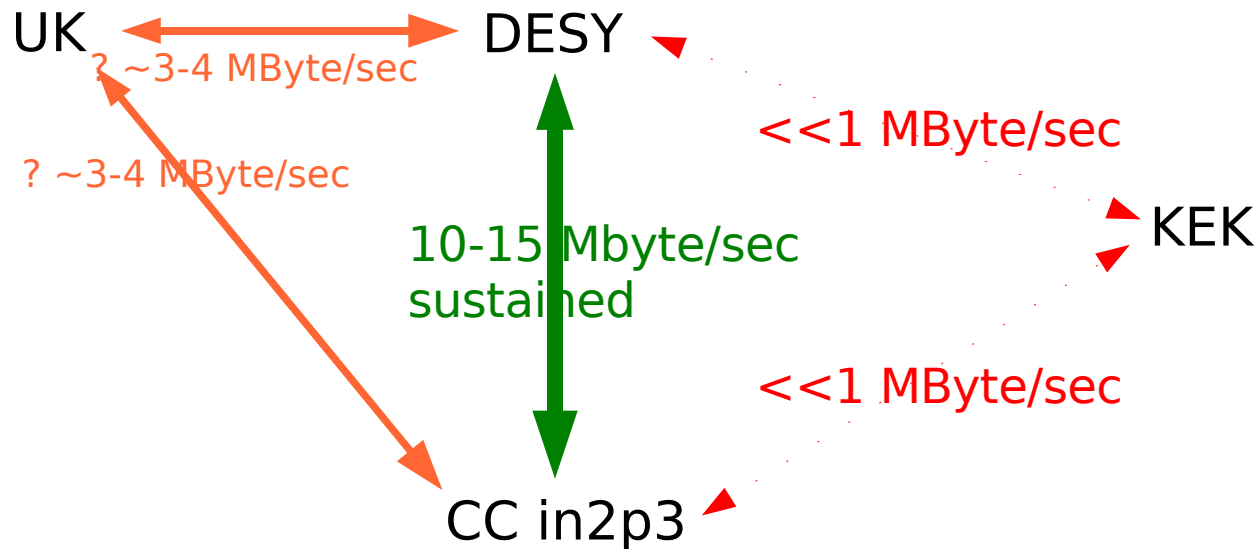
CC in2p3

- Transfer rate DESY <-> cc in2p3 fairly good

  Can we exploit connection via GridKA German TIER1?
- Default transfer rate within Europe allows to work
- Within ILD a good connection to KEK is vital

  Started to work in 2008 for cc in2p3, need to continue
  Need to create task forces
- What about hub to North America?

  Central Entry point would be FNAL
  Provide Ressources for ILC, Exploitation?
  Experience from SiD?

Summary

- Computing and Storage:
  - For 2010 I see no difficulties
  - Should make an estimate on ressources for 2011/12 at the end of 2010

- Networking:
  Establishment of good data transfer rates to KEK
  Would be my top priority for 2010

- Organisation:
  Each Ild (ILC) member state should name a contact person
  Definition of regional hubs