Computing Coordination Aspects for HEP in Germany

International ICFA Workshop on HEP Networking, Grid and Digital Divide Issues

for Global e-Science

- LCG for Experiments
  - ◆ Zeus, LHC
  - ◆ Planning for 2008
- The German e-Science program (D-Grid)
  - ◆ Scope, Goals and Schedule
  - ◆ HEP in D-Grid

Daegu, Korea
26.5.2005

Matthias Kasemann / DESY

Germany: LCG for Experiments

- Substantial improvement using LCG for experiments:
  - ◆ For ZEUS/HERA:
    - ➢ 50% MC production
  - ◆ ATLAS, CMS, Alice and LHCb
    - ➢ Data Challenge contributions ~ 10%
  - ◆ Actively participating in Service Challenges SC2 (and SC3 to come)
- Good Networking connectivity (national and international)
  - ◆ Tier1 with 10 GBit now
  - ◆ All (but 2) LHC HEP sites are connected to German Research network, plans for 2008 are:
    - ➢ 10 GBit: Tier1 and Tier2 sites and to CERN
    - ➢ 1 GBit: All LHC Universities

1 year ago...
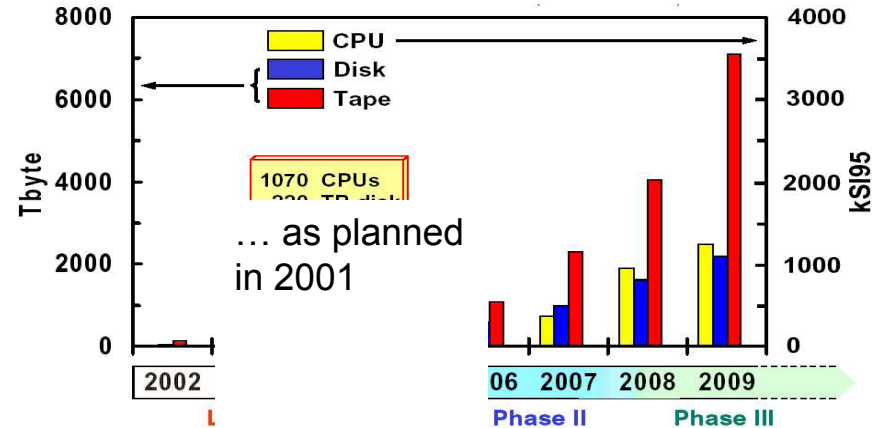

Today...

Germany: Tier1 Centre Plans

New and better understood Computing Models needs re-adjustment of Tier1 resources

- ◆ CPU is sufficient: MC moved to Tier2
- ◆ Substantial increase in disk requirements
- ◆ Higher Tape bandwidth required

Need to identify more funding...

Split 2008/9	ALICE	ATLAS	CMS	LHCb	SUM 2008/9
CPU Offered	4020	3020	1450	1290	9780
% of Total	29%	11%	10%	29%	16%
DISK Offered	465	306	246	109	1126
% of Total	7%	2%	3%	5%	3%
TAPE Offered	1900	1000	900	400	4200
% of Total	30%	10%	7%	19%	13%
G-Fraction planned	10%	10%	8%	5%	

Germany: Tier2 Centre Plans

Experiments Tier2 Plans

	# of Tier2's	Planned for Germany
ATLAS	~ 30	3 T2 centers
CMS	~ 25	1-2 T2 centers

No funding is secured by now,
   → only candidate sites

■ ATLAS Tier2 center candidates:

   ◆ 1) DESY, 2) MPI/LMU (Munich),
      3) Universities Wuppertal/Freiburg
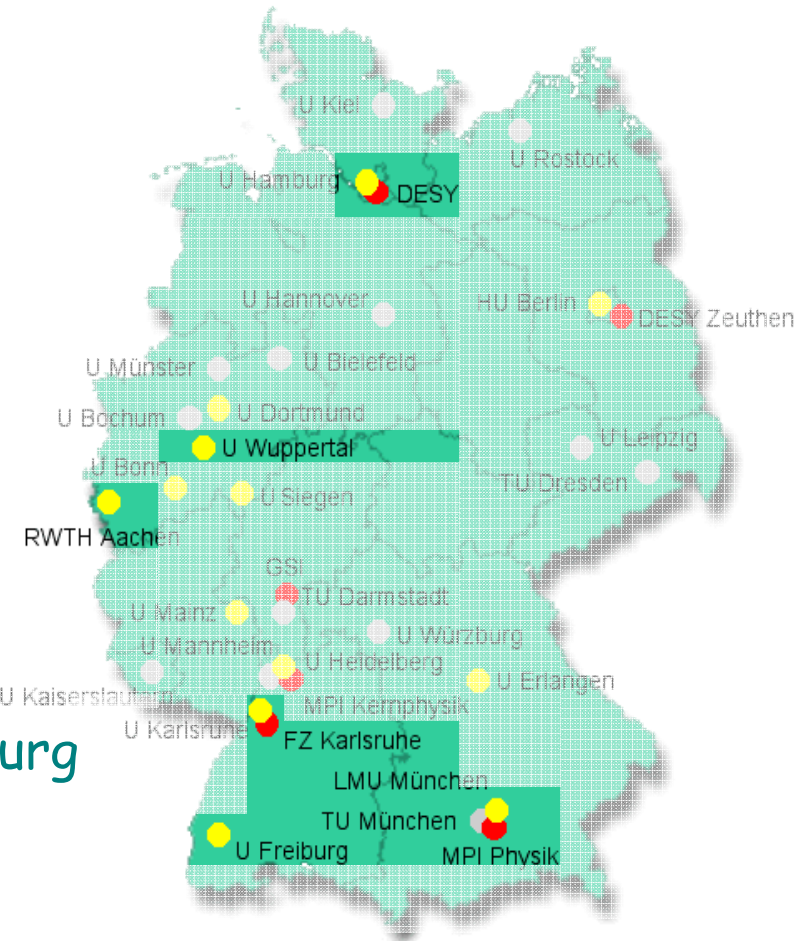
■ CMS Tier2 center candidates:

   ◆ 1) DESY, 2) University Aachen

■ LHCb: no Tier2 center planned, perhaps after 2009…

G-Tier1 could potentially served non-German Tier2 centers
   ◆ Discussions to continue…

The German e-Science program:

- Chances for HEP:
  - ◆ Additional resources to improve Grid Software for HEP with little strings attached
  - ◆ Increase footprint of MW knowledge and involvement
  - ◆ Improve grid software

- Challenges for HEP:
  - ◆ Very heterogeneous disciplines and stakeholders
  - ◆ LCG/EGEE is not basis for many other partners
    - ➢ Several are undecided, have little constraints...
    - ➢ Other need templates, portals...
  - ◆ HPC partners strong, favour UNICORE

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The German e-Science program: D-GRID

- Call for proposals, deadline was ~~22.10.2004~~ *Reapply June 6, 2005*
  - ◆ Approved projects to start ~~January 2005~~ *Sept. 2005*
- What will be funded:
  - ◆ 4-5 'Community Projects'
    - To be approved for 3 years
    - Funding for R&D only, some matching required
    - "R&D for application and community specific MW and network based services"
    - Results to be integrated in 'Integration project'
    - Budget: a total of 11M€

  - ◆ 1 Integration Project
    - "...to create a German e-Science infrastructure..."
    - To be approved for 2 years (initially)
    - To be based on existing components ('gap analysis')
    - Extended by R&D and results of Community Projects
    - Budget: 5M€

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Community Projects

- 1. Round: > 12 projects proposed, 7 selected
  - ◆ <u>Communities after round 1</u>: *One has to go still ...*
    HEP, Astronomy, Engineering, Climate & Earth, Biomedicine, Bioinformatics (Medical Imaging), Integration Project
  - ◆ HEP proposal was very well received

  "... too little coordination between projects..."

  "... projects too expensive..." (i.e. not enough money available)

  "... too many partners...", "... too unfocused...",...too..."

- Result is: try again *(...jump higher...)*
  - ◆ Delay of 9 months
  - ◆ A lot of work (and frustration)
    - ➢ Finding synergies
    - ➢ Reducing scope and cost
    - ➢ Rescheduling

HEP Community Projektvorschlag im Rahmen der BMBF Forschungsförderung auf dem Gebiet
e-Science und Grid-Middleware zur Unterstützung wissenschaftlichen Arbeitens

Überarbeiteter Projektvorschlag zur

Entwicklung von Anwendungen und Komponenten zur Datenauswertung in der Hochenergiephysik in einer nationalen e-Science Umgebung

im Rahmen eines Verbundvorhabens

Konsortialführer: Dr. Matthias Kasemann, DESY

Projektpartner:

Universität Dortmund
Technische Universität Dresden
LMU München
Universität Siegen
Universität Wuppertal
DESY Hamburg und Zeuthen
GSI Darmstadt

Assoziierte Partner:

Universität Mainz
Humboldt Universität Berlin
MPI für Physik München
Universität Karlsruhe
MPI Heidelberg
Leibniz-Rechenzentrum München
Rechenzentrum Garching MPG
John von Neumann Institut für Computing
Forschungszentrum Karlsruhe GmbH

Per Unterauftrag beteiligte Partner:

Universität Freiburg
Konrad-Zuse-Zentrum für Informationstechnik Berlin

HEP Community Grid: Goals

- Focus on tools to improve data analysis for HEP and Astroparticle Physics with 3 work packages:

  1. Data management
     1. Advanced scalable data management
     2. Job-and data co-scheduling
     3. Extendable Metadata catalogues
        for Astroparticle and Lattice QCD Physics

  2. Jobmonitoring and automated user job support
     1. Information services
     2. Improved Job failure treatment
     3. Incremental results of distributed analysis

  3. End-user data analysis tools
     1. Physics and user oriented jobscheduling, workflows
     2. Automatic job scheduling

All development is based on LCG / EGEE software and will be kept compatible.

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Integration Project (Karlsruhe)

Work packages:

- **FG 1: D-Grid-Basic-Software**
  - Globus, Unicore, **LCG**
  - GridSphere, GAT
  - Data Mgm't, Large Storage
  - Data-Interface
  - VO, Management, Tools

- **FG 2: Setup + Operation of the D-Grid Infrastructure**
  - Setup, Operation, Integration
  - Resource-Interoperability
  - Grid Benchmarking
  - Monitoring, Accounting, Billing

- **FG 3: Networks and Security**
  - VPN, Transport Protocols
  - AAI
  - Firewalls, CERT

- **FG 4: Project Coordination**
  - Sustained Business Models
  - D-Grid Office

Budget: 5 M€ for 2 years
  - Follow-up project very likely

HEP-CC in Germany: Summary

- **LCG for Experiments**
  - Very successfully increased footprint and usage of LCG for running and coming experiments in Germany
- **Planning for 2008 is progressing**
  - Plans for Tier1-Tier2 Infrastructure finalizing
  - Discussion about resources progressing
- **The German e-Science program (D-Grid) is an interesting Programs and is about to start.**
  - HEP is important partner
  - LCG/EGEE Compatibility and interoperability is important for us...

Thank you for this opportunity to present German Computing!