# SiGNET – Slovenian Production Grid

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**on behalf of SiGNET team**

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# Overview

- About SiGNET
- Status of production cluster
- ATLAS production
- Plans for the future

# SiGNET

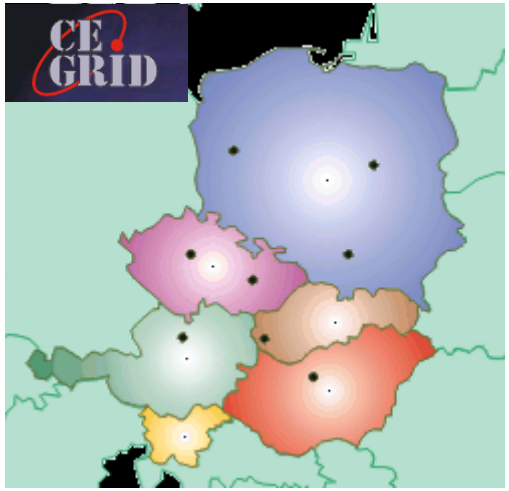
- What is SiGNET ?
- Slovenian Grid NETwork
- A two-faced creature
  - Cluster in EGEE (now)
  - NGI in Si (future)
- Please keep in mind Slovenia is a country of just 2 million people…

# SiGNET Roots

- Particle Physics Department of Jožef Stefan Institute, Ljubljana
- Active in ATLAS since 1996
- Facing ATLAS computing challenge
  - Grid essential to maintain home base
- Introduce (production) Grid to Slovenia
- Spin-off of HEP to society

# SiGNET History

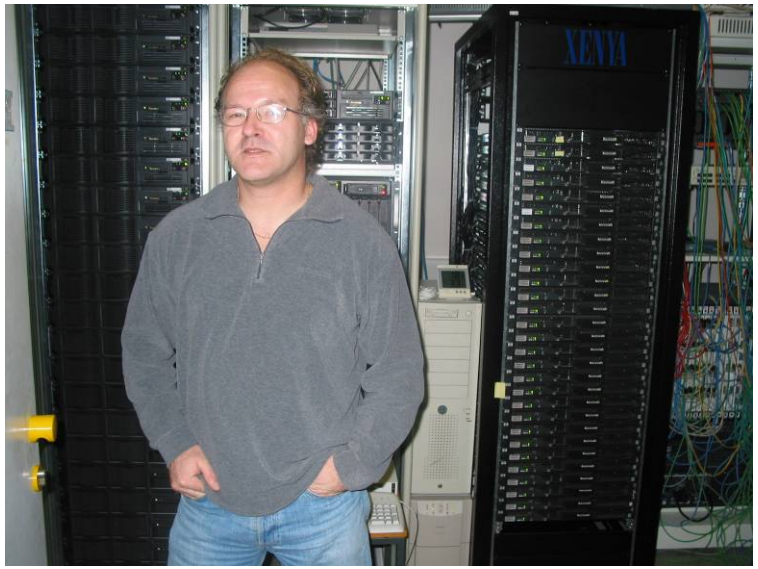
- CEGC foundation - January 03
- Acquisition of first cluster - late 03
- EGEE-I - April 04
- EGEE-II - April 06




| Resources | 2004 | 2005 | 2006 |
|---|---|---|---|
| Servers | 2 | 3 | 5 |
| CPU | 42 | 100 | 150 |
| Disk (TBy) | 2 | 8 | 25 |

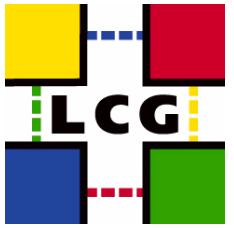
# SiGNET Team

- Most of the team from HEP (origin)
  - Andrej Filipčič
  - Jan Jona Javoršek
  - Matej Horvat
  - Borut Paul Kerševan
  - Dejan Lesjak



# SiGNET Activities

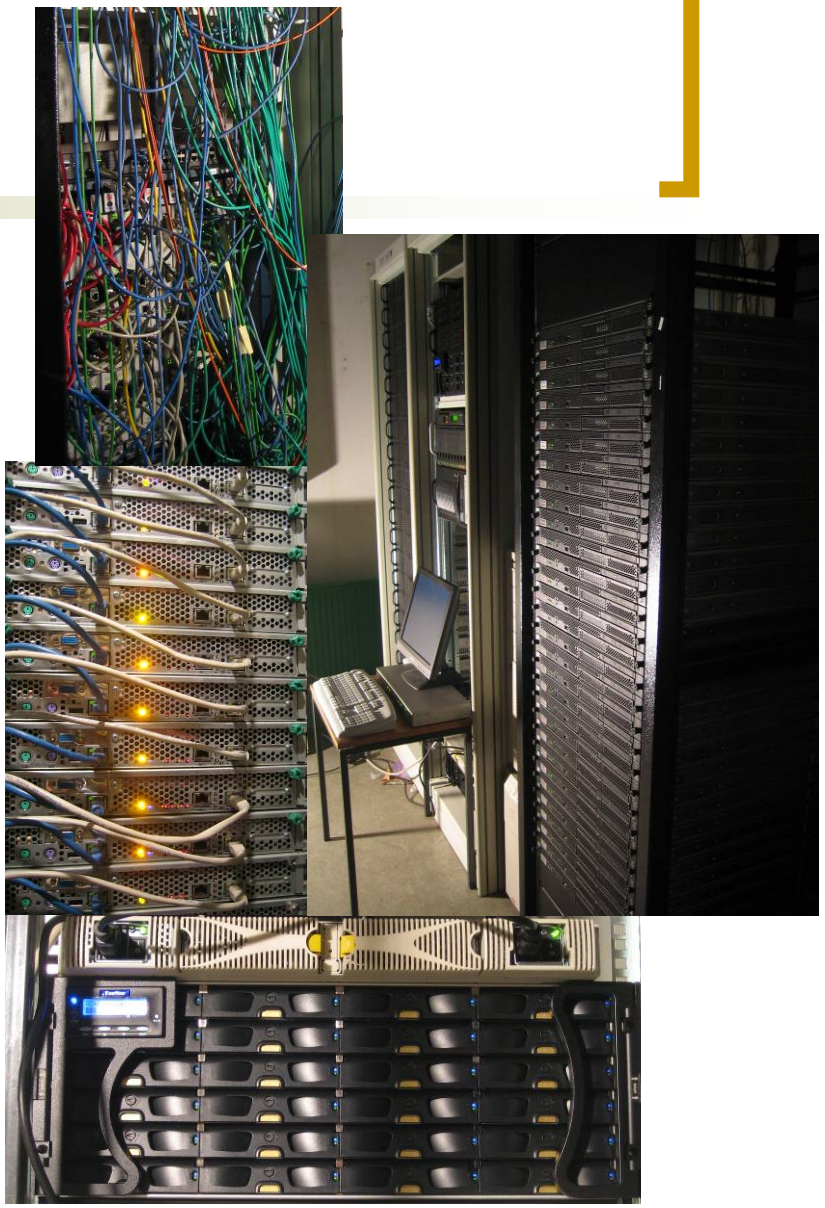
- LCG/EGEE computing element (CE) and storage element (SE)
- Nordugrid CE/SE
- ATLAS TIER-2 (formalities pending)
- CA authority (EUGridPMA)





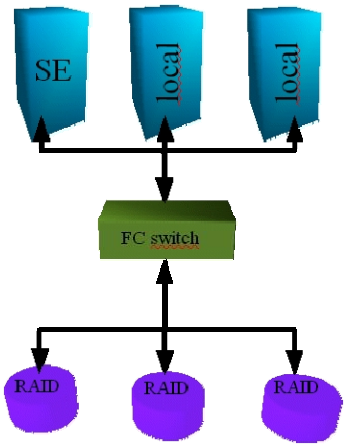
# SiGNET Cluster

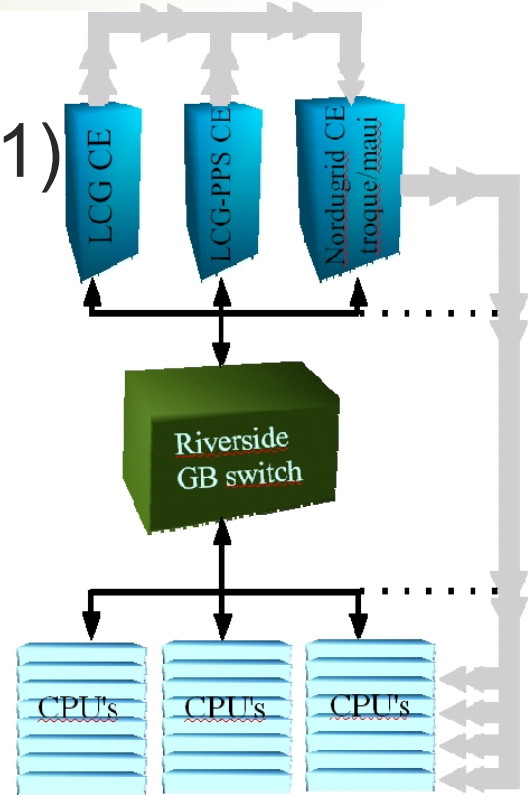
- 150 AMD processors
  - 51 rack mounts (dual Opteron)
  - 24 desktops (dual-core Athlon)
  - Performant Riverstone GB switch
- 25 TBytes disk space
  - 3 SATA-SCSI RAID units
  - Fibre channel switch
- Small tape/robot unit (8TB)
- 1Gb/s shared link to GEANT



# SiGNET Servers

- 3 NFS/AFS servers: (Gentoo 2006.1)
  - torque/maui,
  - Nordugrid CE/SE
- 2 gLite CE/SE (SLC3)
  - Production
  - Pre-production
- dCache server in testing phase (providing SE to both gLite and Nordugrid)



# Installed Software/Middleware

- Gentoo linux 2006.1
  - 2.6.17 kernel
  - torque/maui queuing system with afs patches
- Running ATLAS grid production via (several) chroot-ed SLC3 environments:
  - Single NFS image per system flavour - easy maintenance
  - Several OS-es available for all nodes concurrently
  - Negligible overhead as compared to XEN/vmware
  - Customizable authentication, FS access

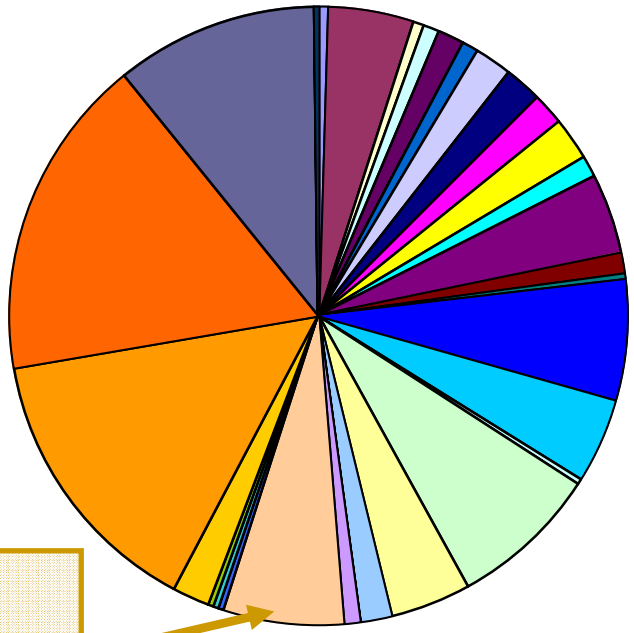
# Installed Software/Middleware

- Entering chroot in PBS scripts via custom shell (example: #!/usr/uchroot/uchroot.slci386)
- Operational grids:
  **all on the same cluster !**
  - gLite production (SiGNET)
  - gLite pre-production (PPS-SiGNET)
  - Nordugrid production

# ATLAS CSC (DC3) Performance

**ATLAS Production (January - April 2006) - Number of jobs**

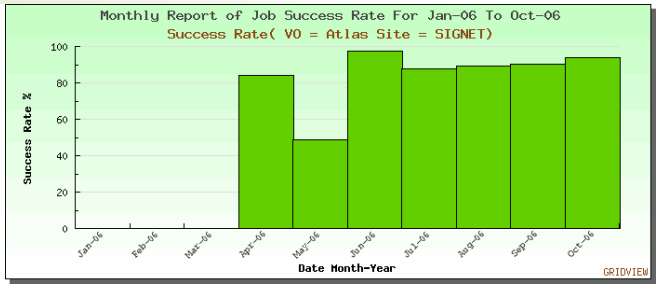
Total of 350K jobs
138 institutes
29 countries



- Austria
- Canada (non T1)
- Canada-T1
- CERN-T0
- Switzerland
- China
- Czech Rep.
- Germany-T1
- Germany (non T1)
- Spain-T1
- Spain (non T1)
- France-T1
- France (non T1)
- Greece
- Israel
- Italy-T1
- Italy (non T1)
- Japan
- NGDF-T1
- SARA
- Poland
- Portugal
- Russia
- Slovenia
- Slovakia
- Turkey
- Taiwan-T1
- UK-T1
- UK-T2
- US-T1
- USA (non T1)
- Yugoslavia
- Others

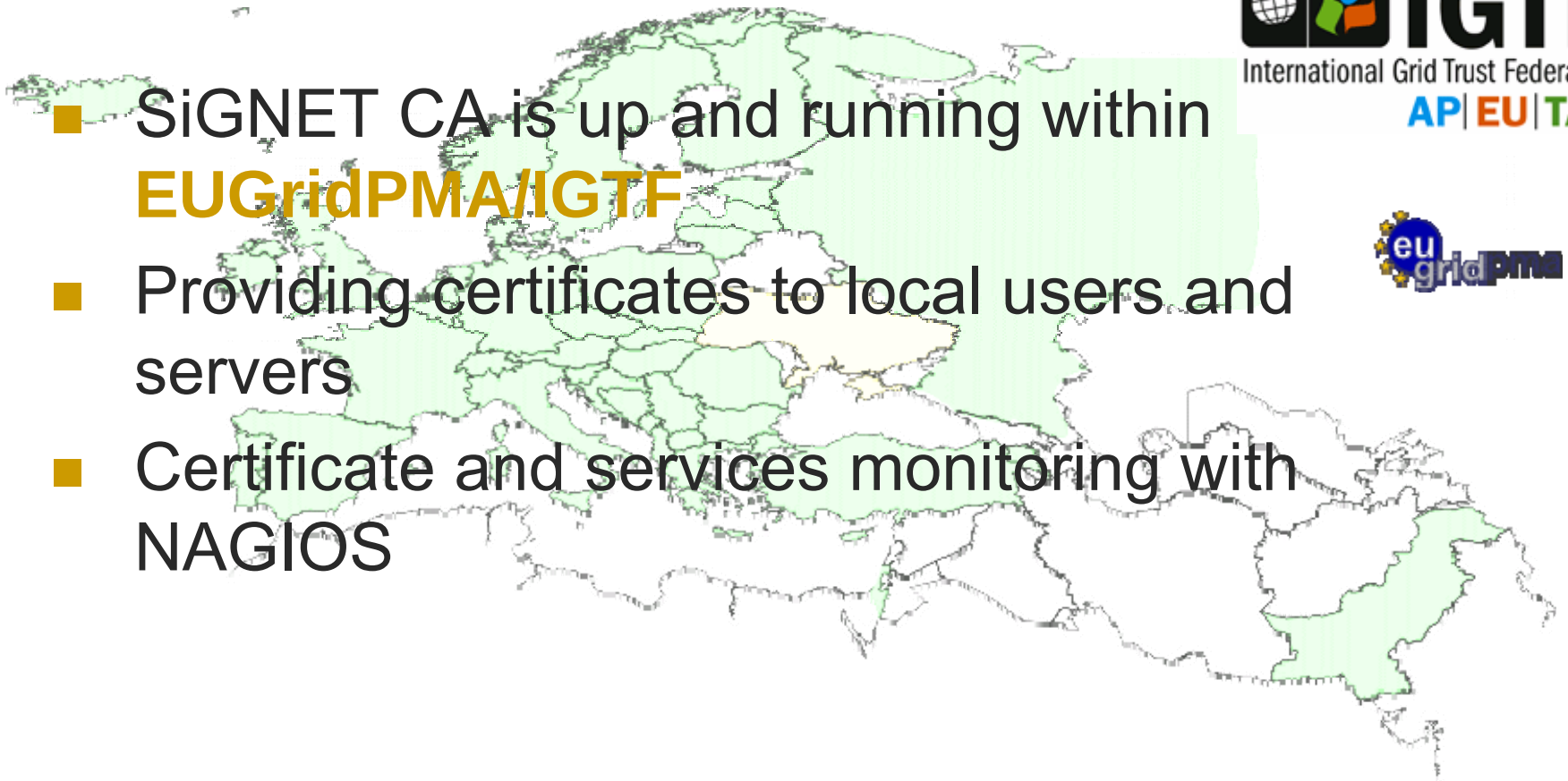
**SiGNET:**
**5% via NORDUGRID**
**1.1% via LCG**

# Middleware problems




- EGEE – gLite Lightweight Middleware for Grid Computing
  - high failure rate in ATLAS production
  - most due to interconnectivity
- Nordugrid – ARC NORDUGRID Grid Solution for Wide Area Computing and Data Handling
  - missing features for full ATLAS support
  - but high reliability
    - maximum recent throughput: 2500 (short) jobs/day, no failure !

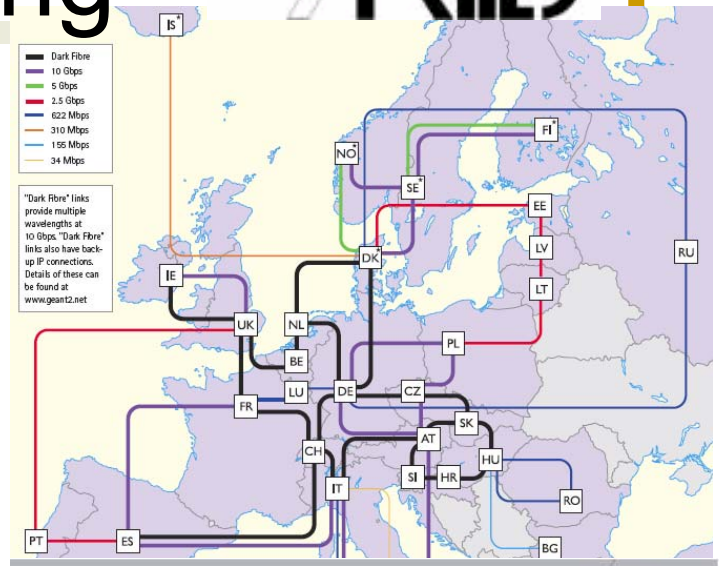
# CA Activities

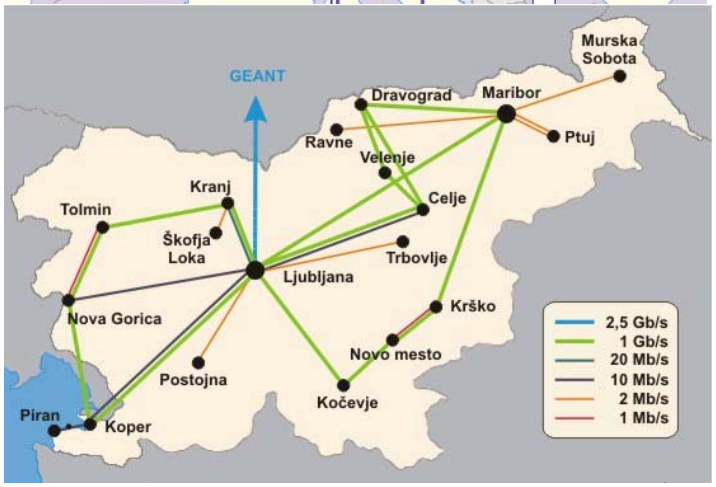


- SiGNET CA is up and running within **EUGridPMA/IGTF**
- Providing certificates to local users and servers
- Certificate and services monitoring with NAGIOS

# Slovenian Networking

- ARNES – Academic and Research NEtworking of Slovenia - Slovenian NREN
- Full national member of TERENA, shareholder in DANTE, member in CEENet and RIPE
- International connectivity through GEANT(2) – extensive use of dark fibre



# Plans up to 2008

- Formalize TIER-2 status in WLCG
- Increase #CPUs to total of ~300
- Increase disk space to ~150TB
- Provide support for Slovenian local VO
- 1Gb/s custom link to TIER-1 + 10Gb/s shared link within GÉANT2

# Plans to 2008 and beyond

- Develop TIER-2 to exploit LHC data

| WLCG TIER-2 SiGNET, Jožef Stefan Institute | Pledged | Planned to be pledged | | | |
|---|---|---|---|---|---|
| | 2006 | 2007 | 2008 | 2009 | 2010 |
| CPU (kSI2K) | 150 | 200 | 300 | 450 | 600 |
| Disk (Tbytes) | 20 | 50 | 150 | 200 | 300 |
| Nominal WAN (Gbits/sec) | 10 | 10 | nx10 | nx10 | nx10 |

- Disseminate Grid to other fields
- Establish true Slovenian NGI
  - **SiGNET**