CYFRONET

- Cyfronet - Academic Computer Center in Kraków
  - Computing center servicing needs of the whole scientific community in Kraków: Institute of Nuclear Physics, University of Science and Technology, Jagellonian University, Technical University ...
  - managing metropolitan network for the city of Kraków

- Large variety of computer hardware
  - mainframe computers and PC clusters
  - Small disk arrays and a large HP XP12000 FC+EVA disks

- Participates in multiple GRID project
  - WINIT, CROSSGRID, PELLUCID, GRIDSTART, PROACCESS, EGEE, COREGRID, K-Wf Grid, BalticGrid + national projects

- Long, wide experience in GRID technology
  - Cyfronet is a Regional Operations Center for Central European Federation

- More at http://www.cyfronet.pl

EGEE/LCG Resources

- Year 2005
  - 38x2 dual Xeon 2.4-2.8 GHz + 16x2 Itanium2 1.3 GHz
  - 2 TB small disk array

- Year 2005/2006
  - Improved power supply infrastructure and cooling system
  - Purchase of 120x2 dual Xeon 2.8 GHz, 2MB cache, 2GB RAM
  - Purchase of HP XP12000 disk array, 40TB FC + EVA disks

- Year 2006 current status
  - 270 CPUs working
  - 70 TB disk available + 50 TB just arriving

- Year 2007 plans
  - 40 new 4-core machines
  - Expansion of HP XP12000 storage to 200 TB

EGEE Cluster

- Use of EGEE cluster in Kraków
  - 3 LHC experiments: Atlas, LHCb, Alice
  - 7 other non LHC VOs

- HEP share of resources:
  - 55% CPUs, 70% disk

- Sharing between HEP experiments
  - ATLAS 70%, LHCb 20%, ALICE 10% of CPU

- Declared resources for LCG at the startup
  - 200 kSI2000 CPU, 50 TB Disk

- External Network Connection : 1 Gbit/s

- Future:
  - planned 2007 purchases show a good perspecitve for expanding site with increasing LCG needs in next years
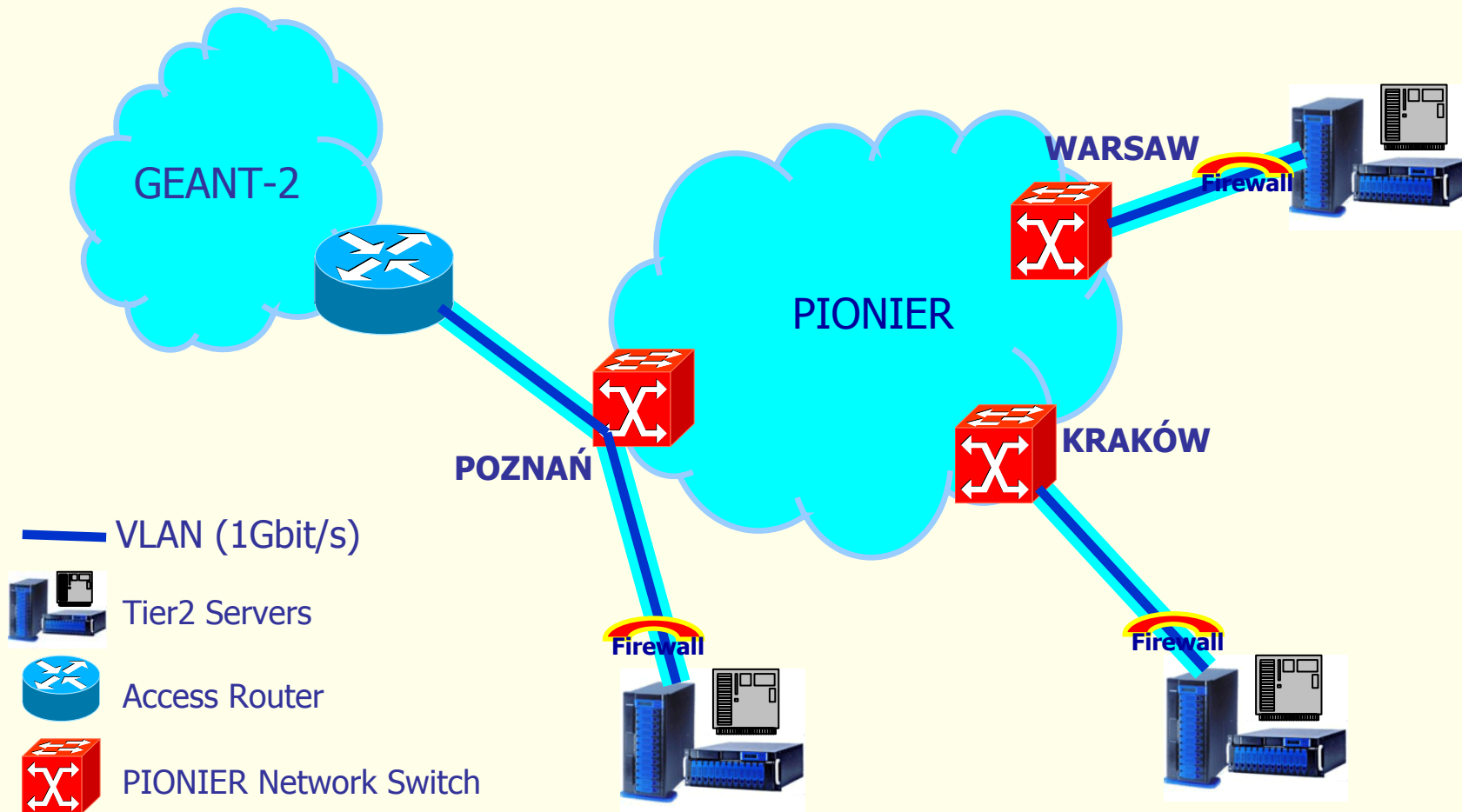
Polish Federated Tier2

- Polish Federated Tier2
  - Cyfronet (Kraków) + PCSS (Poznań) + ICM (Warsaw)

- Leading experiments at sites
  - Kraków (Atlas, LHCb), Poznań (Alice), Warsaw (CMS, LHCb)

- Staff at Kraków
  - 3 FTEs + representatives from experiments
  - Quick in response to problems, slower on weekends

- Partner Tier1 center is FZK Gridka, Germany

- Services at Kraków
  - CE / Batch system: Torque/Maui
  - SE / SRM: For storage access we use DPM
  - Other basic GRID services: BDII, RGMA, RB

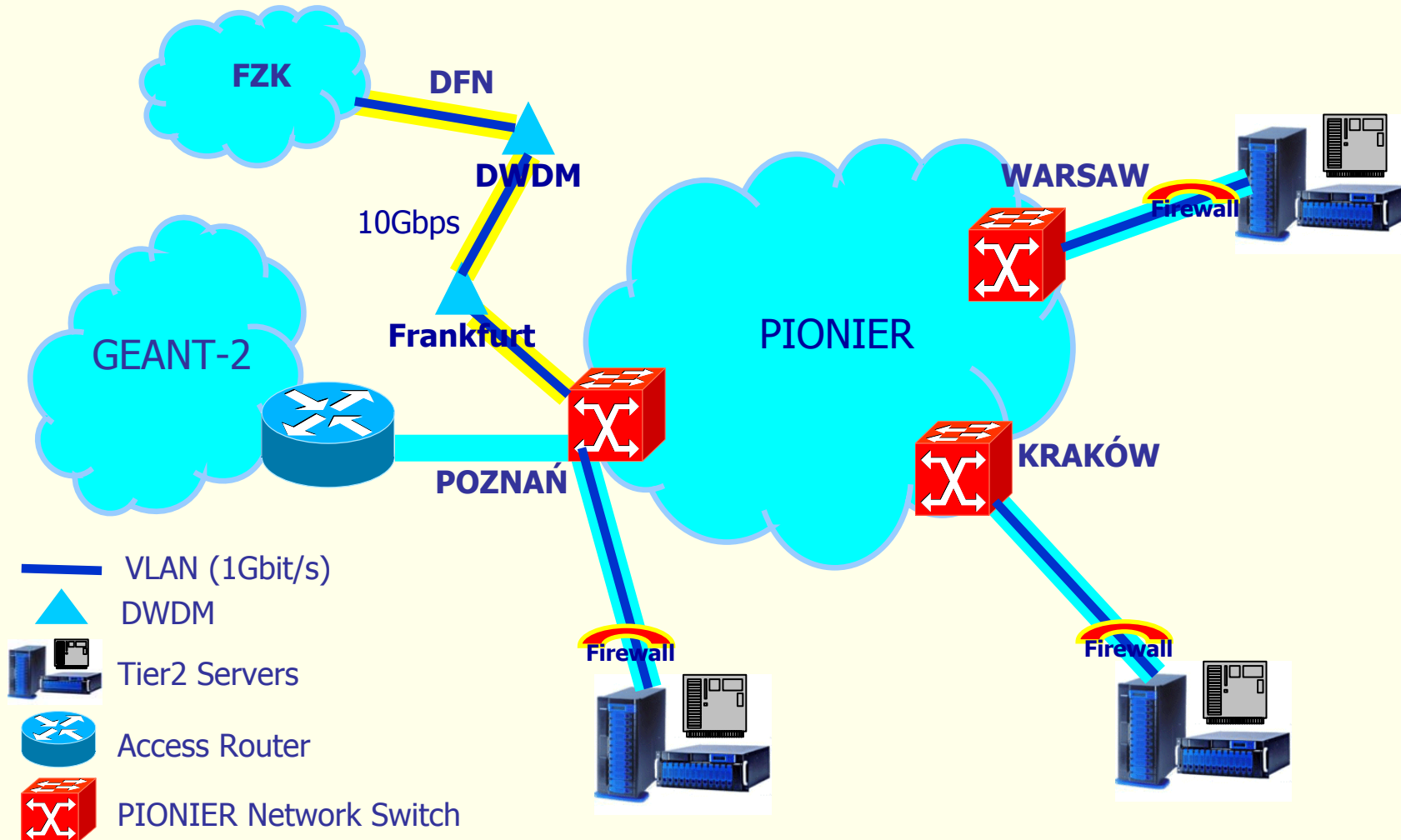- Cluster machines run SL3 operating system
  - gLite 3 installed

Network

- Inter connections between Polish sites
  - based on Polish academic network - Pionier
  - 1-2x10 Gbps links between major cities
  - Tier2 uses a dedicated VLAN link to Poznań (1 Gbps)

- Experience from tests
  - Pionier network based on Black Diamond BD6800 switches
  - Unable to run more than 300 Mbps TCP/IP single stream transfers due to switch architecture limitations
  - Currently using a separate lambda for Kraków-Poznań transfers (10Gbps)

- Pionier upgrade plans
  - Purchase of Foundry XMR switches
  - Replacing old BD6800 switches
  - Soon to be introduced on Poznań-Kraków link

- External route
  - Currently via public Geant-2 network
  - Separate 1 Gbps VLAN Kraków – FZK Gridka (under setup)

Polish Tier2 Network

GEANT-2

WARSAW

Firewall

PIONIER

POZNAŃ

KRAKÓW

Firewall

Firewall

—— VLAN (1Gbit/s)

Tier2 Servers

Access Router

PIONIER Network Switch

Cyfronet, Kraków, Andrzej Olszewski

Polish Tier2 Network

Cyfronet, Kraków, Andrzej Olszewski

SC4

- SRM preparations
  - May 2006: SRM at Kraków, Poznań, Warsaw ready on VLAN network
  - Tested for inter-Polish transfers of up to 40 MB/s on a single stream
  - Tested transfers to/from FZK, CERN and other sites with file transfers requested by local users at Kraków

- ATLAS FTS
  - June 2006: Kraków SRM configured and ready for SC4 tests
    - Transfer speed up to 100 MB/s with multiple file transfers to FZK
    - Transfers slower by 50% in FZK – Kraków direction
  - September 2006: Poznań SRM configured
    - delayed by hardware relocation

- ATLAS DDM software
  - Kraków SRM info introduced in July
  - Poznań ready for configuration

ATLAS SC4

- T0->T1 tests
    - Started June 15
    - DQ2 software used for distribution datasets to T1 sites
    - Transfers to TIER2s enabled later in July
    - CYFRONET participated in this first phase of SC4 tests
        - succeeded in having several succesfull transfers
    - Data transfers on requests from INP users
- T1<->T2 integration
    - Data transfer tests started September 10
    - FZK T1 Cloud participating sites:
      DESY-ZN, DESY-HH, CYF, WUP, FZU, CSCS
    - CYFRONET SRM stable working all the time during summer
    - Friday, September 15 network hardware failure in a distant site, connection broken, repaired on the next day!

FZK DQ2 Monitoring

Cyfronet, Kraków, Andrzej Olszewski

Datasets in CYF

LHCb at CYFRONET

- Tier-2 LHCb centers are relatively light
  - Practically pure CPUs
  - Relatively low network bandwidth (15 Mb/s)
- Two tier-2 centers for LHCb in Poland. CPUs at present:
  - Krakow - 40 processors x 2.8 GHz
  - Warsaw - 40 processors x 2.8 GHz
- 3 months of DC06 production
  - Poland produced 2.1 % events
    - 50 % Krakow – 50 % Warsaw

Cont.	%	events
uk	28.21	50,220,730
ch	19.27	34,297,444
it	15.60	27,774,483
fr	10.48	18,649,439
es	7.76	13,818,430
gr	5.21	9,270,608
de	4.17	7,420,989
nl	3.05	5,420,378
pl	**2.12**	**3,764,988**
bg	0.67	1,192,915
ru	1.73	3,087,052
ca	0.38	678,330
hu	0.26	461,154
il	0.22	398,109

Table from report last week

Issues & Concerns

- Serious issue
  - hanging grid commands (globus-url-copy, edg-gridftp- etc)
    - has consequences in hanging jobs, failing next step jobs, inefficient use of grid resources

- Smaller issues
  - no catalog listing function available in srm (dpm) software
  - no storage used space function available in dpm software
  - no easy way to list ATLAS dataset files present at a site

- Performance issue
  - lack of functionality replaced by heavy use of other functions
  - rare use of bulk operations leads to heavy load on catalog servers

Conclusions

- With sharing of data allowed between Tier2 sites, succesfull upgrade of computer hardware in 2006 and solid plans for expansion in 2007 Kraków CYFRONET is slowly becoming a full (small) Tier2 site for ATLAS

- Improving network allows to treat more distant sites on equall foot with local ones making CYFRONET an equal partner in German Tier1 cloud

- Good contacts with Tier1 FZK and the forming ATLAS GridKa cloud team for software installation, production and data management make me look optimistically at future cooperation perspectives