Finnish Grid Activities and M-grid

Nordic Grid Neighbourhood Seminar

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Finnish Grid Activities – HIP

- **M-Grid project**
  - Clusters deployed in Otaniemi and Kumpula, Portal
- **CERN OpenLab**
  - Open logbook project continues
    - Analysis and visualization tool for multimedia data sets
    - Grid Enabling of the application planned
    - Customers: Lausanne “Imagination Lab”, CERN Athena Experiment
  - Digital Pen and LHC@Home projects showcased in Cern 50-anniversary Open Day
- **Unosat collaboration**
  - MSc study “Mobile Grid services for Humanitarian community” leveraging GridBlocks Agent software

Finnish Grid Activities – HIP

- **NorduGrid related**
  - Top Level GIIS (Finnish GIIS), Connected cluster resources, Grid User Interfaces: NG Portal, JNI-Corba interfacing, Data management (M.Pitkänen), other student projects.
- **Helsinki Institute of Information Technology (HIIT) Collaboration**
  - Tekes funded Search-In-a-Box subcontracting, next generation open source search engine.
- **EU-EGEE**
  - Contributes resources to EGEE Security Work Package

Finnish Grid Activities – HIP

- **FeGIMa**
  - Federated Global Identity Management architecture
  - Enable grid commercialization in enterprise environments
    - Identity Federation, Trust Management and Policy Enforcement
  - Links 3 EU-IST focus areas, Grids, Global computing, eEurope smart-card charter
- **SATURN (VTT/HIP)**
  - Proposal for FET Global Computing II call
  - Coordinated by VTT
  - HIP is the Work Package leader in Key Applications
    - Streaming Grid, Software on Demand and Global Virtual Storage

Finnish Grid Activities – HIP

- **Netgate proposal (follow up to Netgest project)**
  - **Build prototype software integrating grid technology with emerging standard and best practices in Web and Mobile environments.**
  - **Emphasis on user authentication, authorization and charging (billing)**
  - **Work Packages**
    - **Federated Network Identity**
    - **Operator Authorised Transactions**
    - **Business Models and Service Scenarios**
    - **Grid Applications**

Finnish Grid Activities - CSC

- **ESO (European Southern Observatory)**
  - Development of a distributed data analysis for extensive astronomical data (Finnish in-kind contribution to ESO)
  - http://www.csc.fi/proj/eso/
- **ENACTS (Ending Dec. 2004)**
  - Reports and Surveys of current state and trends in Grid Computing and HPC
  - CSC contributes the User Survey (in collaboration with CINECA Italy)
  - http://www.enacts.org/

Finnish Grid Activities - CSC

- **EMBRACE**
  - Integrating major databases and Software tools in Bioinformatics
  - Evaluate technologies and implementation
- **DEISA**
  - 1st phase, Tightly coupled IBM centers in Europe, CSC to contribute 1 node of IBM SC (32 CPUs)
  - 2nd phase, extension to other platforms (eg. linux clusters, SGI)
  - CSC responsible for Dissemination
  - http://www.deisa.org/
- **NDGF**
  - 1 FTE funded by the Finnish Academy
  - Working towards being a more formal nordic grid collaboration

Finnish Grid Activities - CSC

- **Nordugrid**
  - Putting ARC middleware into production in Finland
  - Dissemination and Training in Finland
- **M-grid**
  - project coordinator
- **HAKA**
  - Interoperability between University user administration systems
    - common schema for student data
    - Shibboleth middleware
  - Improved access to services across universities for students

Finnish Grid Activities - VTT

- **CoreGRID**
  - **EU 6th FP**
  - **VTT pariticipates in th Programming models and System Architecture areas**
- **intelliGrid**
  - **Interoperability of information systems of participating organisations while maintaining privacy**
  - **Rapid joining and leaving a VO**
  - **VTT's interests are in collaboartive work in dynamic Vos using engineering applications characterised by distributed date with complex semantics**
  - **VTT is the dissemination manager for intelliGrid**

M-grid Users

- Geared primarily towards users in Material Sciences in the M-grid Consortium
  - Physicists, Chemists and some Bioscientists
- Mainly serial jobs, some ”pleasantly parallel” jobs
- Clusters are accessed both locally and via grid middleware
- Typical Applications
  - Gromacs
  - Gaussian
  - Dalton

M-grid Consortium

- **Coordinated by CSC**
  - **Ville Savolainen**
  - **Arto Teräs**
- **Chaired by Kai Nordlund (Helsinki University)**
- **Funding Application - November 2003**
- **Procurement**
  - **RFP April-June 2004**
  - **Vendor Chosen July 2004**
- **Cooperation between CSC and M-grid sites**

M-grid Consortium

- Center for Scientific Computing (CSC)
- Helsinki Institute of Physics

Physics and/or Chemistry departments/labs at the following universities:

- University of Helsinki
- Helsinki University of Technology
- University of Jyväskyla
- Tampere University of Technology
- University of Oulu
- Lappeenranta University of Technology
- University of Turku

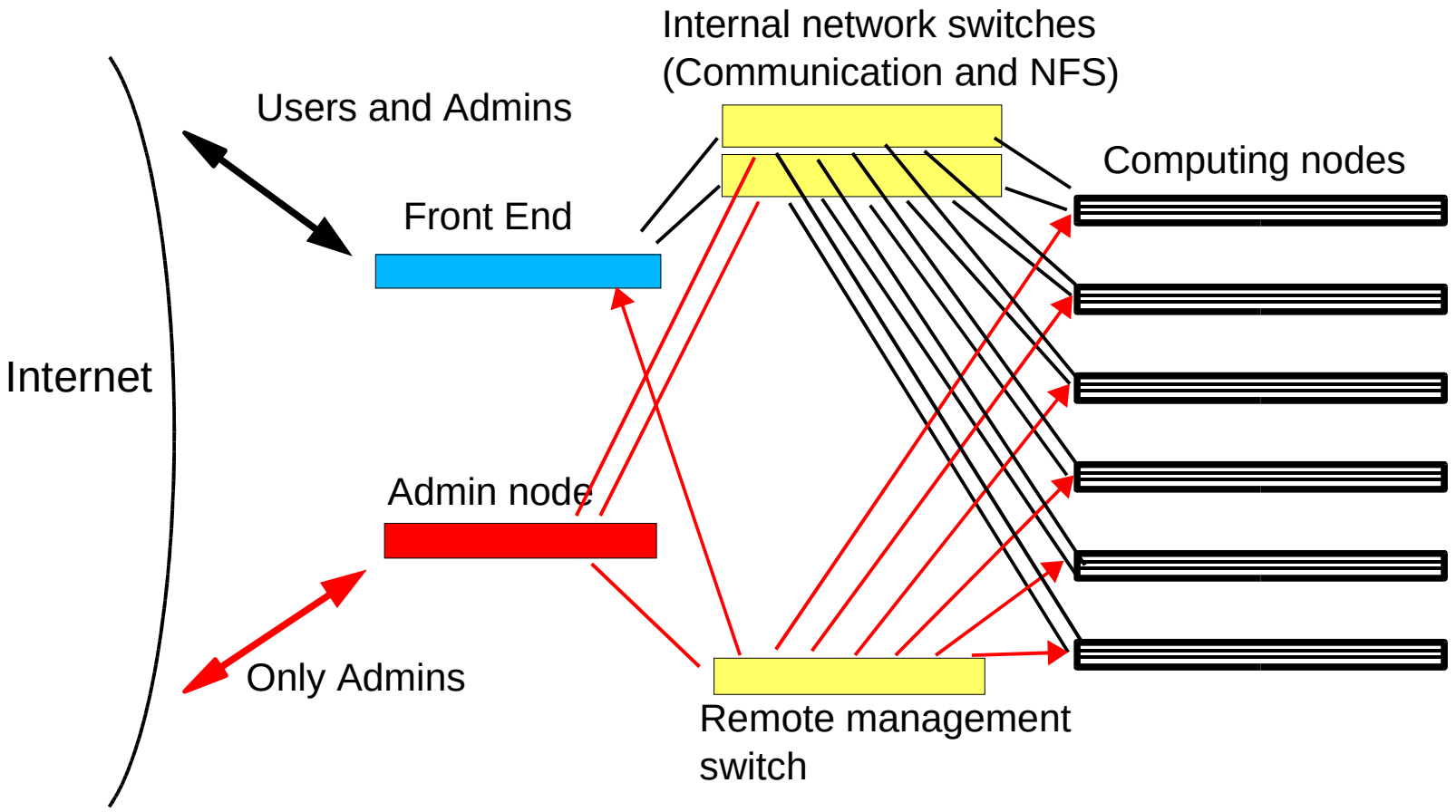
M-grid Funding

- **Finnish Academy Infrastructure Funding**
  - **20 Million Euros available to be applied for**
  - **Application deadline, November 17th, 2003**
  - **Applicants come up with 25%, if the application is accepted the Finnish Academy pay the other 75%**
  - **Value Added Tax applies to the Finnish Academy funding**
  - **Consortium: 208.8 kEuros**
  - **Finnish Academy: 623.4 kEuros**

M-grid - Hardware

- **Hardware**
  - Frontend - HP ProLiant DL585 (2 x Opteron 1.8-2.2 GHz)
  - Nodes - HP ProLiant DL145 (2 x Opteron 1.8-2.2 GHz)
  - Admin node - HP ProLiant DL145 (Opteron 1.6 GHz)
  - Storage (typically 1 - 2 TB)
  - Separate Gbit Ethernet Networks for Communication and NFS
  - Remote Administration
- **Hardware (Oulu)**
  - 62 Processor Dual Athlon MP 2800+

An M-grid Cluster



M-grid - Software

- **Operating System**
  - NPACI Rocks Cluster Distribution
  - Based on RedHat Enterprise Linux 3
- **Grid Middleware**
  - ARC middleware(Nordugrid)
    - compiled with Globus 3.2.1 libraries
  - Sun Grid Engine as LRMS

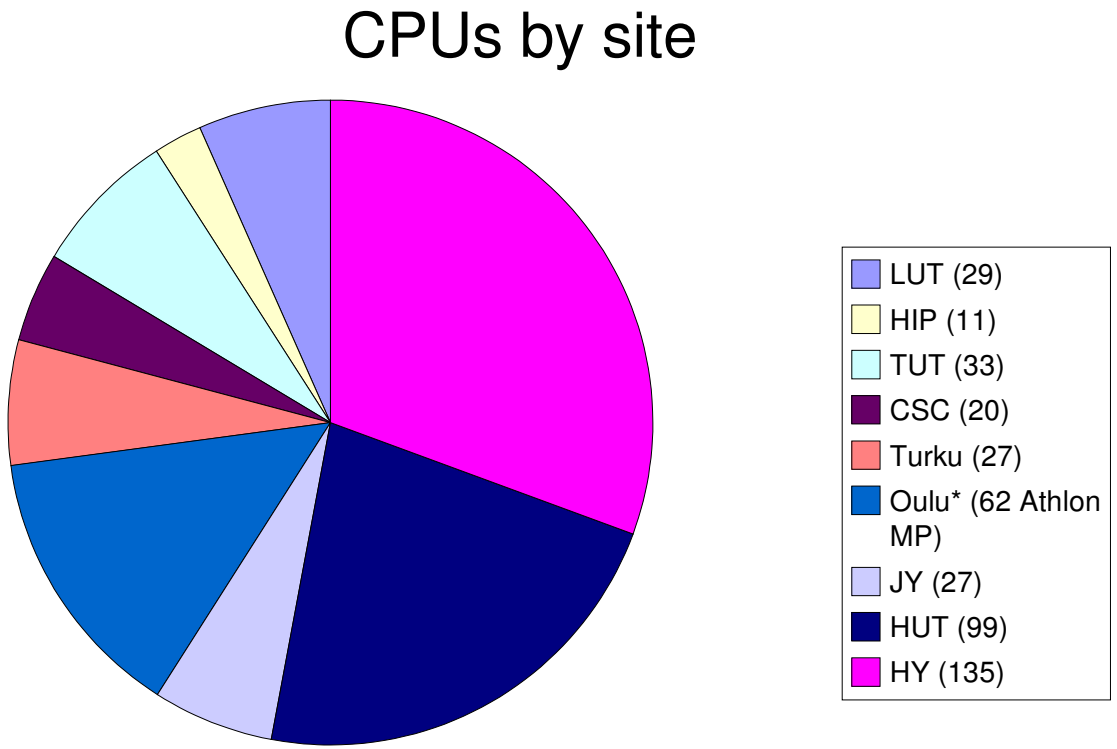
M-grid - Administration

- **Administrative tasks are divided between CSC and site administrators**
- **CSC**
  - **Maintain Operating System, LRMS, Grid middleware, certain libraries**
  - **Tools for system monitoring, integrity checking, etc.**
- **M-grid Site administrators**
  - **Admins are typically working for the department or lab, NOT I.T.**
  - **Install local applications, libraries, user support**
  - **System monitoring**
- **Regular meetings of administrators**
  - **M-grid administrator support network**

M-grid - Status

- Clusters delivered September 2004
- Installation September-October 2004
- Acceptance testing October-November 2004
- Grid middleware to be deployed December 2004 - January 2005

M-grid - Deployment



Further Reading 1

- Finnish Academy
  - http://www.aka.fi
- TEKES
  - http://www.tekes.fi
- CSC
  - http://www.csc.fi/grid/gsuomi.phtml.en
  - M-grid http://www.csc.fi/proj/mgrid/
- HIIT Search-in-a-box
  - http://cosco.hiit.fi/search/

Further Reading 2

- HIP
  - http://www.hip.fi
  - GridBlocks: http://gridblocks.sourceforge.net/
  - Netgest http://wikihip.cern.ch/twiki/bin/view/Main/NetGest
  - Openlogbook http://openlogbook.sourceforge.net/
- Shibboleth
  - http://shibboleth.internet2.edu/
- VTT
  - http://www.vtt.fi
  - coreGRID http://www.coregrid.net/
  - inteliGrid http://www.inteligrid.com/

Thank you

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  - for your undivided attention
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  - Tapio Niemi (HIP @ CERN)
  - Tomas Lindén (HIP @ Kumpula)

FeGIMa (1)

- Federated Global Identity Management architecture
- FeGIMa IP-proposal for FET Global Computing II call
  - 3-years, 25 partners, Sheffield Hallam University (UK) as Coordinator
  - From NGN: Gridcore (S), HIP (Fin), DCGC (DK)
  - Industry: eg. Sun Microsystems, Telefonica, Greek Telecom
- FeGIMa is the key vehicle
  - ... for enabling further progress in Grid & Global computing (GC)
- Enable Grid commercialisation in enterprise environments
  - Integration begins from Identity Federation and continues with Trust management and policy enforcement

FeGIMa (2)

- **FeGIMa links 3 EU-IST focus areas: Grids, GC and eEurope smart card charter**
- **Influence & Align efforts with EU-GridPMA**
  - **Introduce Circle-of-Trust between trusted third parties like Grid CAs, Government Identity registries, Police, Telco Operators, Financial Inst.**

Netgate

- **NetGate proposal is follow-up for NetGest-project**
- **Research goal**
- **Build prototypes of Grid technology integration with emerging standards and best practices in Web and Mobile environments in ICT -sector business with emphasis on how users are authenticated, authorized, and charged for novel B2B, B2C Grid applications.**
- **Work Packages**
- **Federated Network Identity**
- **Operator Authorized Transactions**
- **Business Models and Service Scenarios**
- **Grid Applications**

Netgest

- **Combining the Grid with commercial Internet and wireless solutions**
- **Developing service scenarios and demonstrations**
- **Evaluate business models based on technologies and service scenarios**
- **Three academic partners:**
  - **Telecom Business Research Center, Lappeenranta Technical university, University of Tampere, Wirlab Network Research Center (administrative coordination) & Helsinki Institute of Physics (technical coordination)**
- **Six industrial partners**
  - **Nokia Research Center, Nokia Mobile Phones, Valimo Wireless, Necsom, Cygate, Vaasan Läänin Puhelin, Alajärven Puhelinosuuskunta**