

Grid deployment and support – the NGC, EGSC and SweGrid initiatives

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NGC - Nordic Grid Consortium

Grid Collaboration Between Nordic HPC Centres

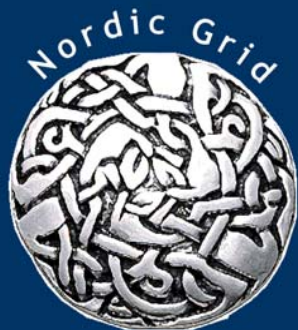
The Power of Collaboration

- Joint Grid middleware and application
- Networked computation, storage and visualization facilities as well as scientific instruments
- Production grid deployment
- Cycle sharing
- Common Portal for job submission
- Diversity of Platforms
- Sharing of Software and Data

Harnessing our Strengths

Collective resources:

- Processing 5 TFlop
- Primary storage 2 TB
- Disk 10 TB
- Tape 100 TB
- Visualization facilities



Nordic Grid Consortium

Founding Centres:



www.nordicgrid.net

The Nordic Grid Consortium

Initial Efforts

-  Establish working and trusted interoperability between security systems
-  Establish a NGC portal for job submission and user communication
-  Establish a common Problem Solving Environment based on CSC's Scientists Interface
-  Involve the user community

The Nordic Grid Consortium

Issues

-  **Security infrastructure**
-  **Resource sharing across national borders**
-  **Software sharing – licensees**
-  **Data Sharing - licensees**

The Nordic Grid Consortium

0.155 Gbps

0.622 Gbps

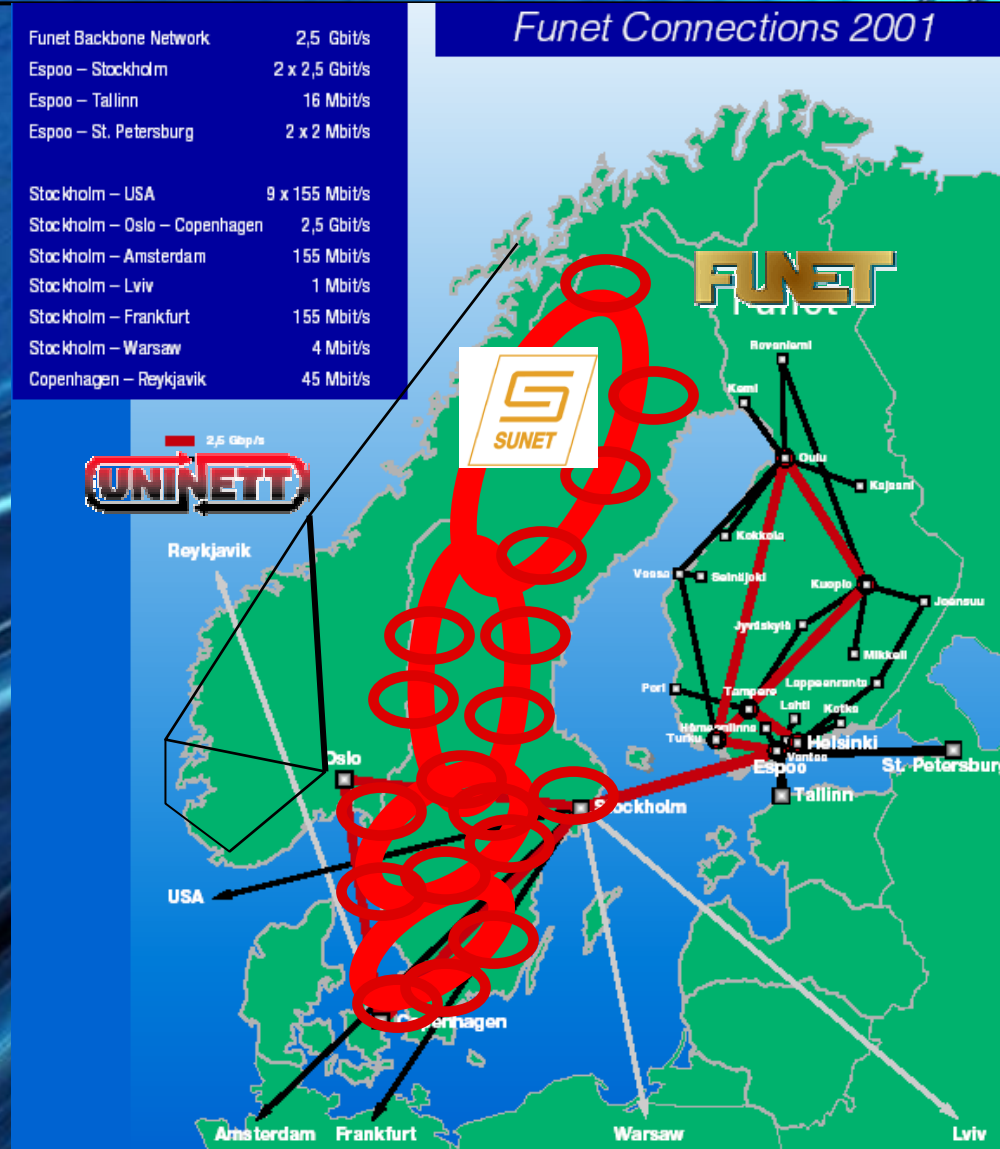
2.5 Gbps

10 Gbps

Funet Backbone Network	2,5 Gbit/s
Espoo – Stockholm	2 x 2,5 Gbit/s
Espoo – Tallinn	16 Mbit/s
Espoo – St. Petersburg	2 x 2 Mbit/s

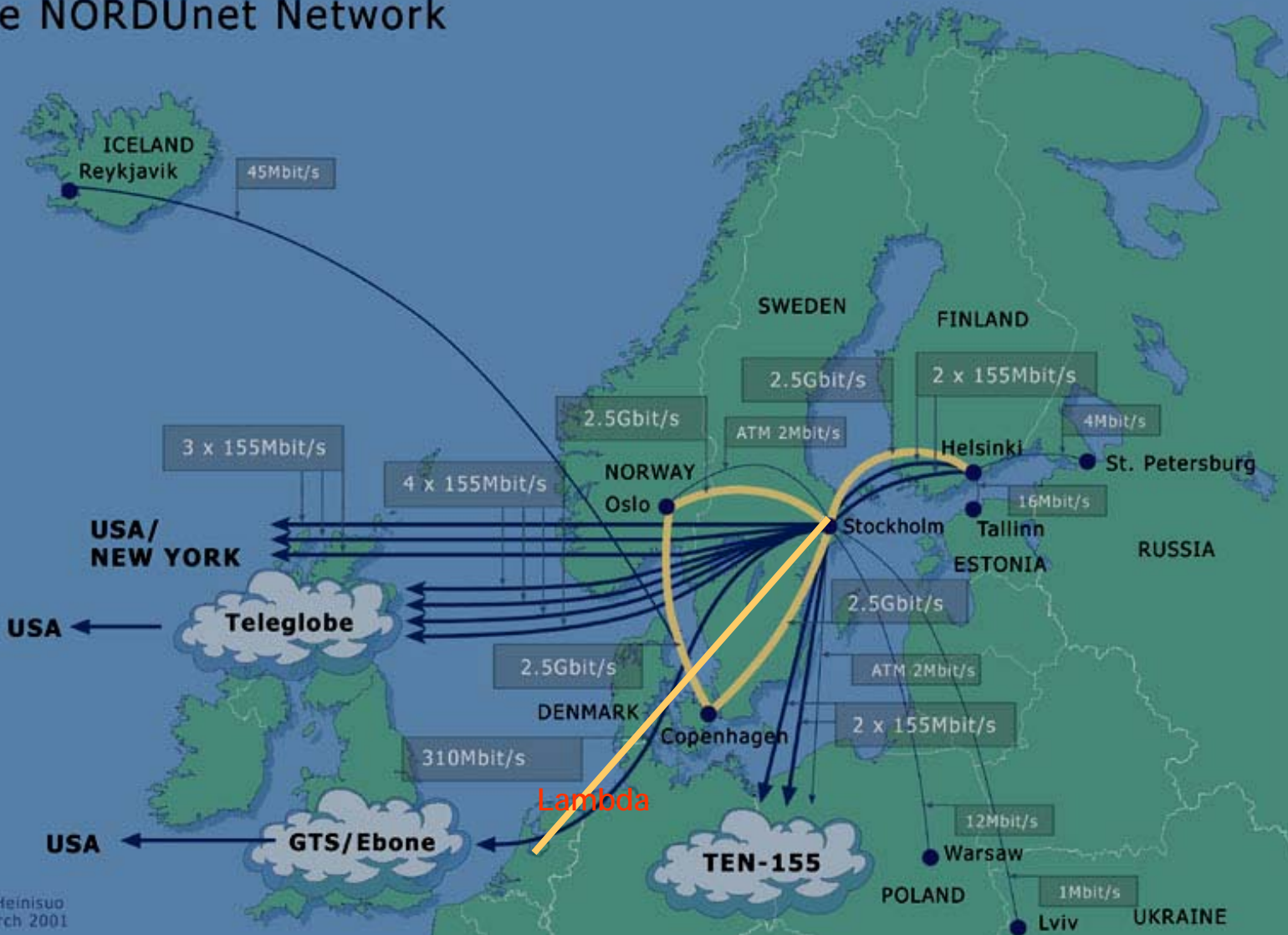
Stockholm – USA	9 x 155 Mbit/s
Stockholm – Oslo – Copenhagen	2,5 Gbit/s
Stockholm – Amsterdam	155 Mbit/s
Stockholm – Lviv	1 Mbit/s
Stockholm – Frankfurt	155 Mbit/s
Stockholm – Warsaw	4 Mbit/s
Copenhagen – Reykjavik	45 Mbit/s

Funet Connections 2001



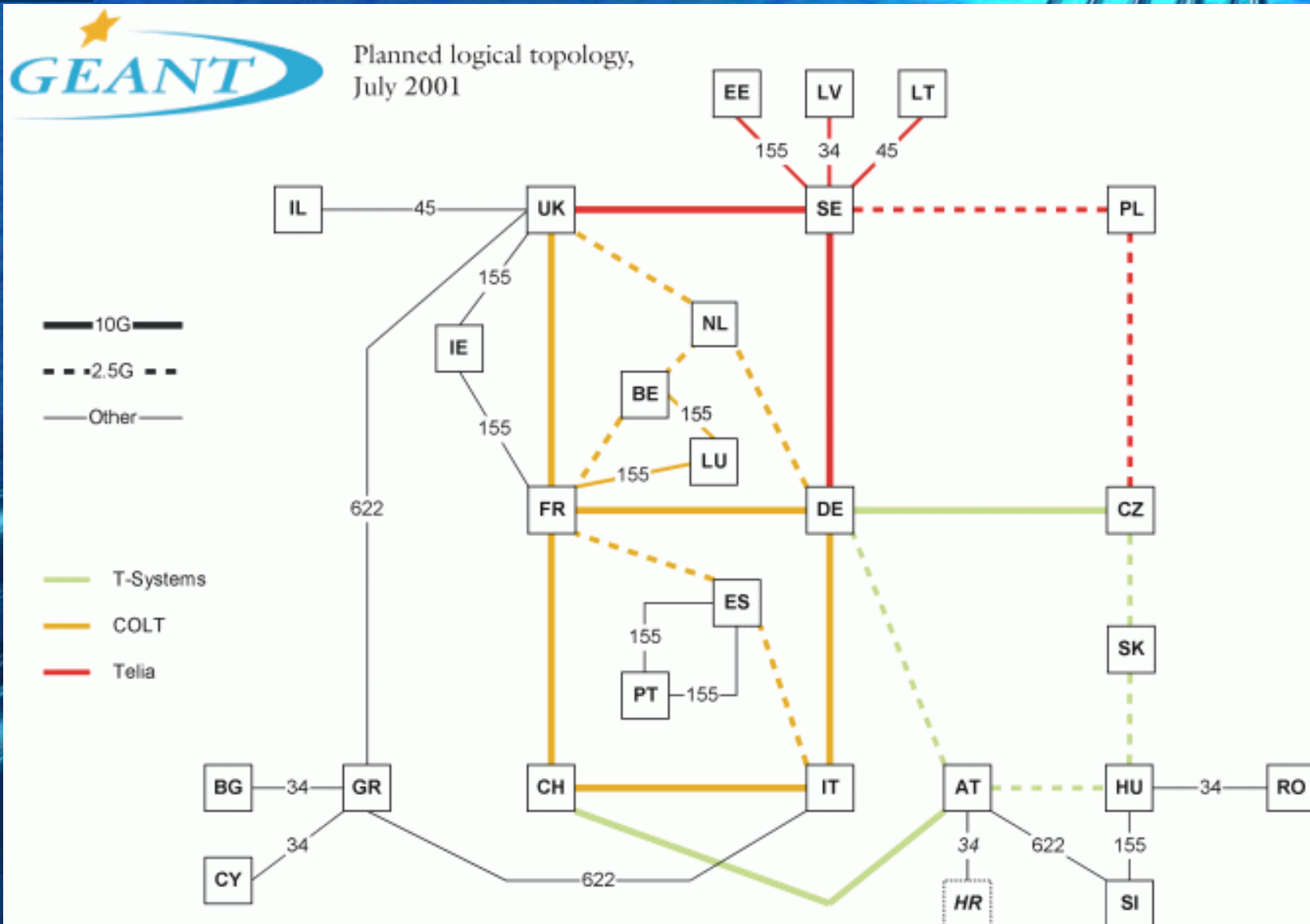
The Nordic Grid Consortium

The NORDUnet Network



Rami Heinisuo
15 March 2001

The Nordic Grid Consortium



Testbed: "Nordugrid"

November 2001



- The project was initiated by the Nordic High Energy Physics community
- Supported by the Nordic Council of Ministers via the Nordunet2 programme
- Start: May 2001, end: October 2002; extended 6 months
- Part of the EU DataGrid Testbed

Sites: Copenhagen, Oslo, Bergen, Lund, Linköping, Stockholm, Uppsala, Umea, Helsinki

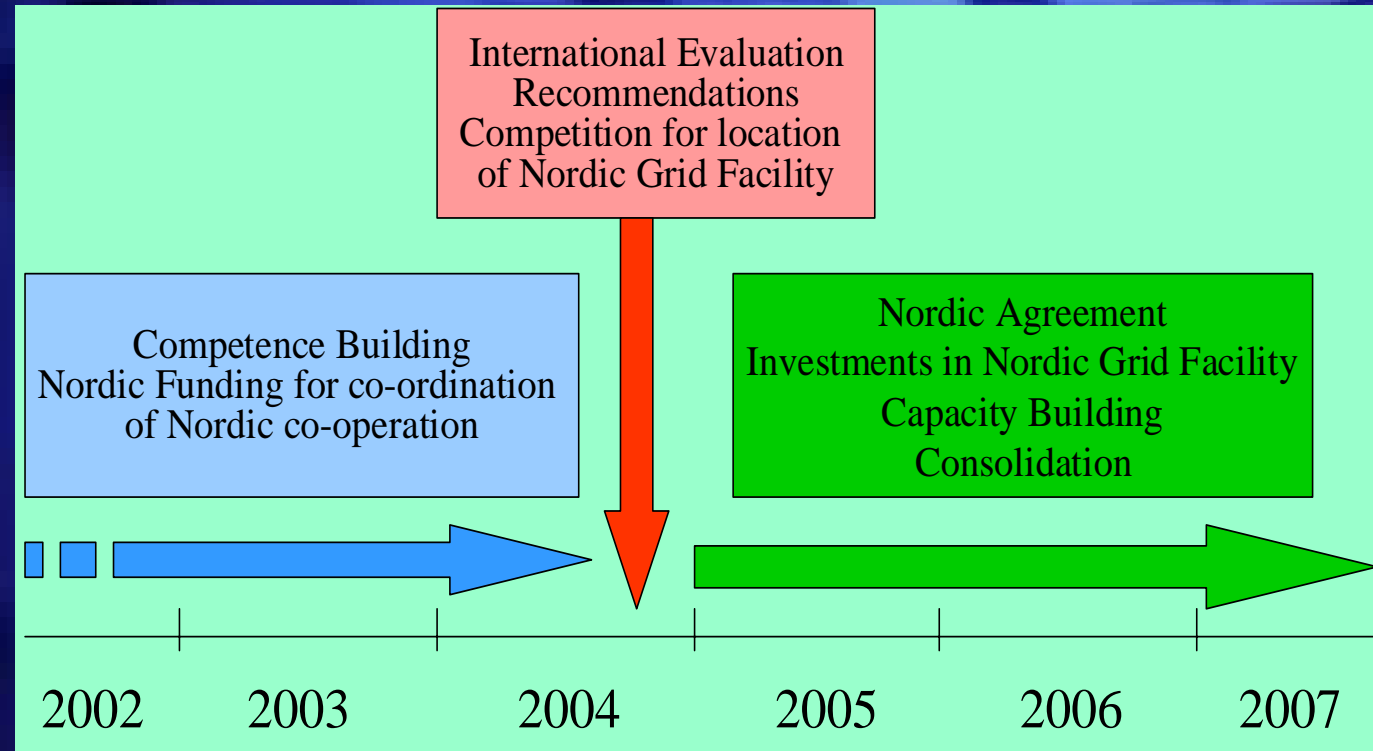
<http://www.nordugrid.org>

The Nordic DataGrid Facility Project

An initiative by NOS-N
(the Nordic Ministers
Committee for
Cooperation on
Research in Science)

Builds on interest from

- Biomedical sciences
- Earth sciences
- Space and astro sciences
- **High energy physics**



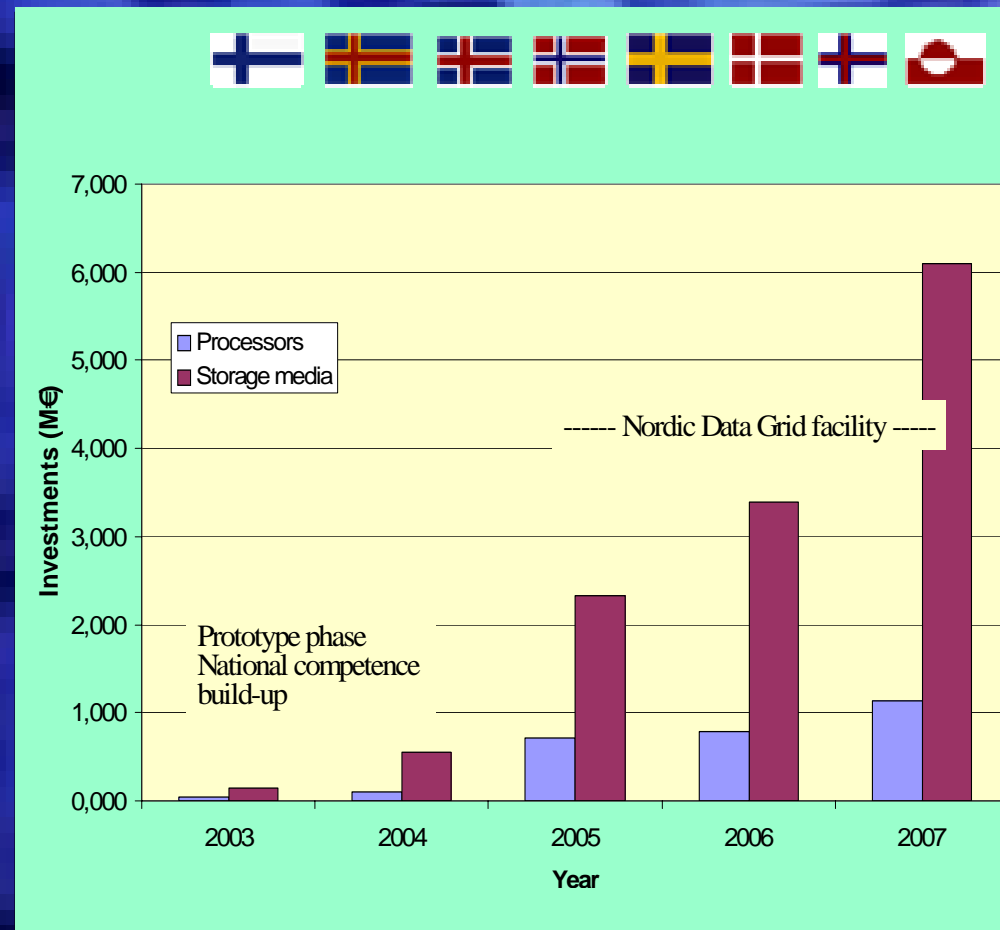
Prototype period 2002-2004
Funding 0.54 MEuro.

Capacity building 2004-2007
Scope 15 MEuro.

Nordic DataGrid Facility

- In 2004 the Nordic Data Grid Facility will be created.

- The Nordic Facility will be a Tier-1 Centre with a capacity of about 1700 x (Dual 1 GHz Intel PIII) plus file servers and tape robots.





EUROPEAN GRID SUPPORT CENTER

Provide support, training, and outreach programs aimed at ensuring the success of European deployment and use of Grids.
Operate a dedicated, professional operations capability for essential infrastructure elements and applications.

Meet the EGSC



Why the EGSC ?

- International cooperation is critical for the success of transnational Grids
- Successful Grid operations requires cooperation of multiple organizations for
 - Problem resolution
 - System support
 - User support
 - Software validation
- Sharing of scarce human expertise
- Education, Training and outreach

EGSC Strengths and Services

- Help-desk
 - Communication methods Web, E-mail, Phone
 - Middleware expertise
 - Application expertise
 - Regional presence
- Integrated bug-tracking
- Monitoring - statistics
- Certification of software/sites
- Interaction with key middleware R&D projects, such as Globus, NMI,

What the community wants

To determine the most effective way to reach the Grid Community a survey was taken to identify a range of technologies and support important to users. There were two parts to the UK Grid Support Center survey:

- A) Importance of various e-technologies (13 of them + 1 for others)
- B) Importance of existing support activities in the GSC (11 of them + 1 for others)

Asked them to score each for:

- A) Use within the project (Use)
- B) Need for support from the Grid Support Centre (Need)

In the responses there was a high correlation between Use and Need

www.grid-support.org



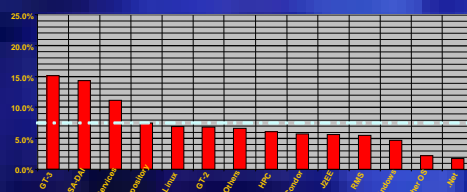
June 12, 2003

e-Infrastructures Athens

The technologies rated were the following:

- 01 GT-2
- 02 Web Services
- 03 GT-3
- 04 OGSA-DAI
- 05 Condor
- 06 J2EE
- 07 .Net
- 08 Windows
- 09 Linux
- 10 Other OS
- 11 RMS
- 12 Data Repository
- 13 HPC
- 14 Others

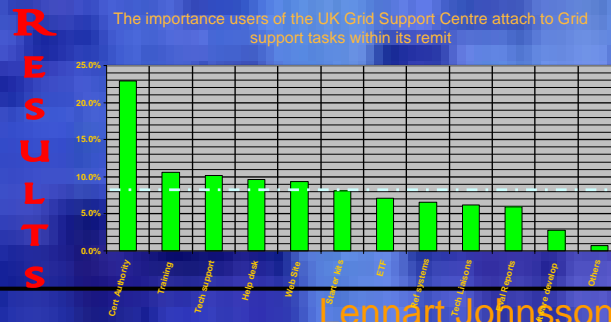
The importance users of the UK Grid Support Centre attach to Grid technologies



The support activities rated were the following:

- 01 Starter kits
- 02 Evaluation Reports
- 03 Web Site
- 04 Help desk
- 05 Technical support
- 06 Reference systems
- 07 Training
- 08 Certificate Authority
- 09 Software development
- 10 Technical Liaisons
- 11 Engineering Task Force (GT-2 grid)
- 12 Others

The importance users of the UK Grid Support Centre attach to Grid support tasks within its remit



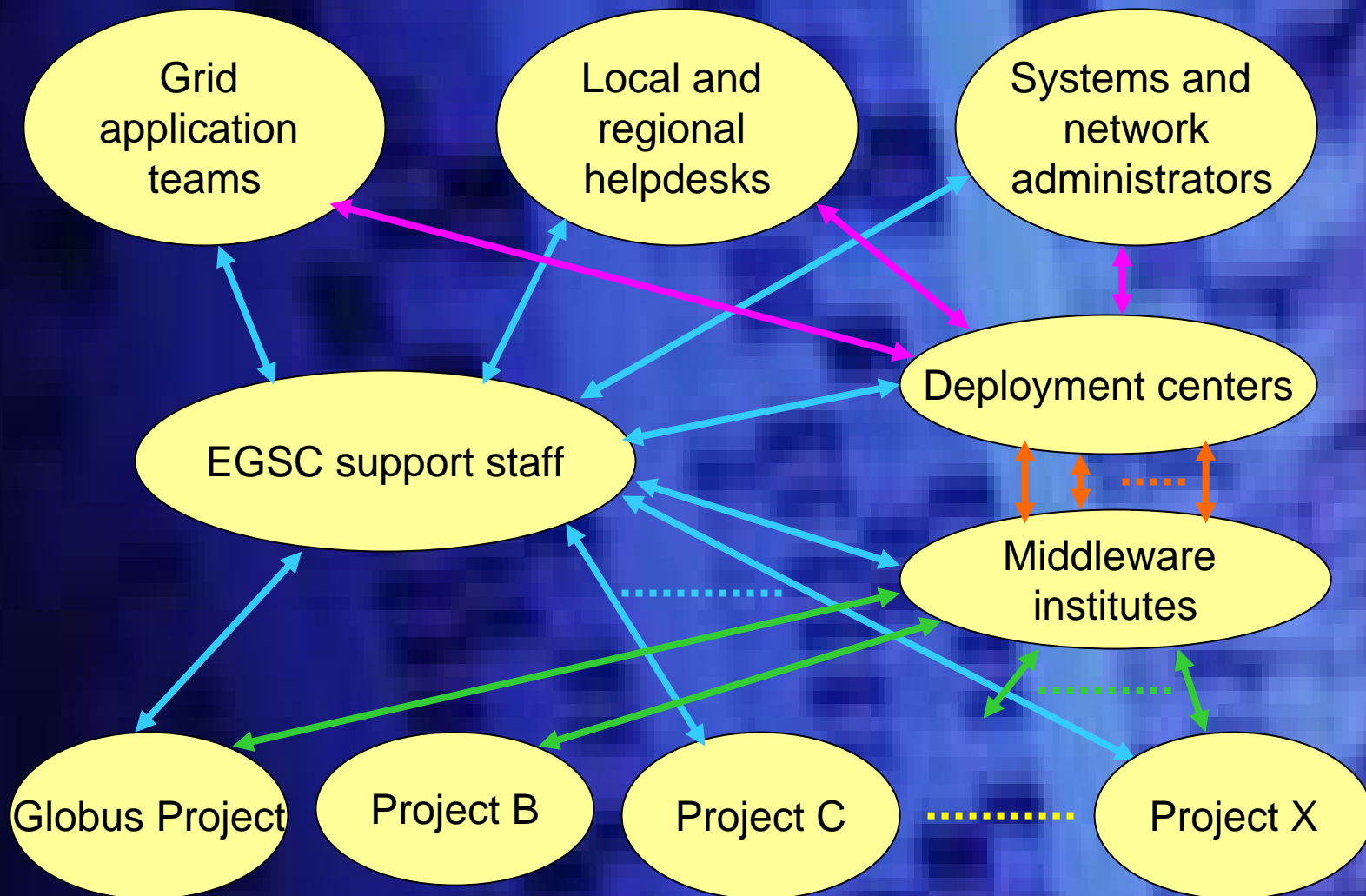
RESULTS

Lennart Johnson

EUROPEAN GRID SUPPORT CENTER



EGSC
supported
groups





Grid Support Survey – UK e-Science

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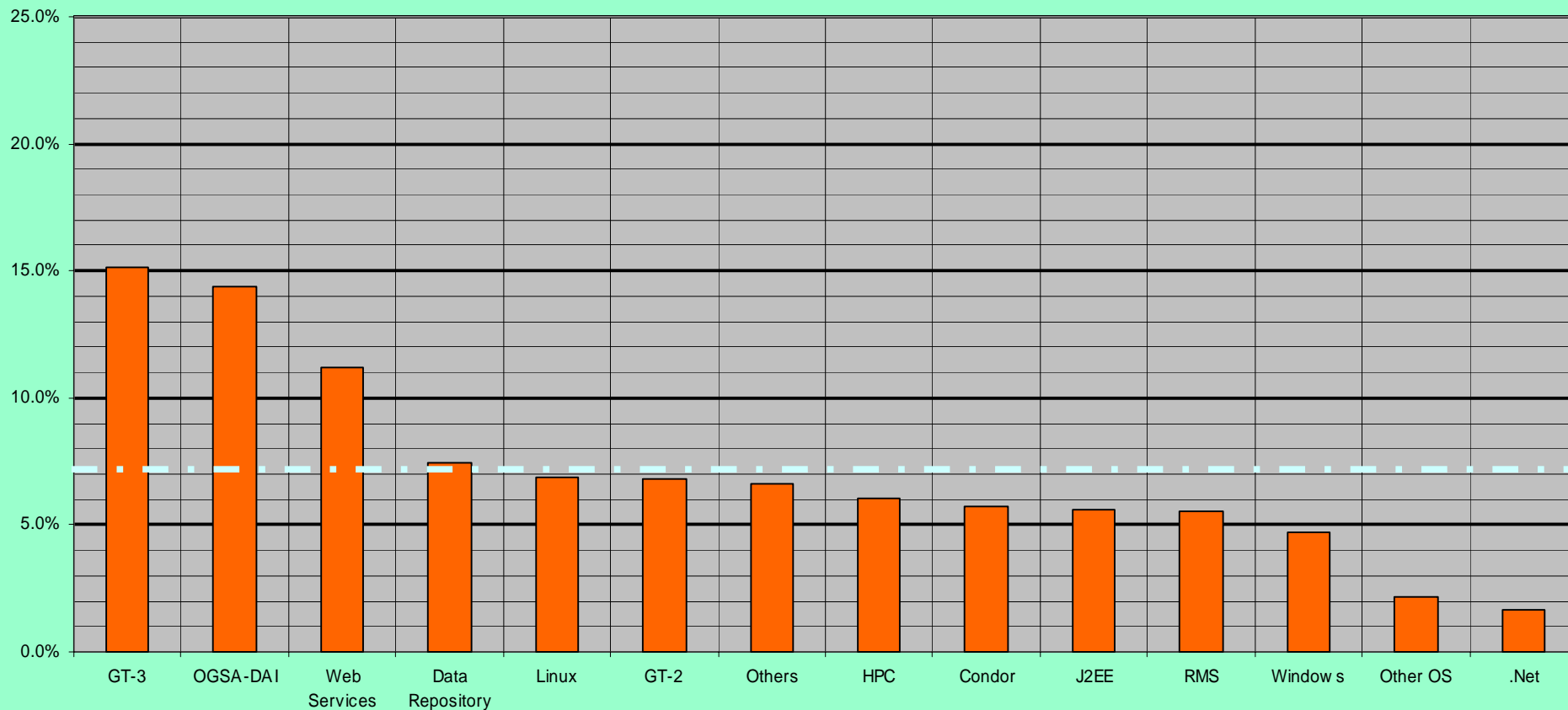
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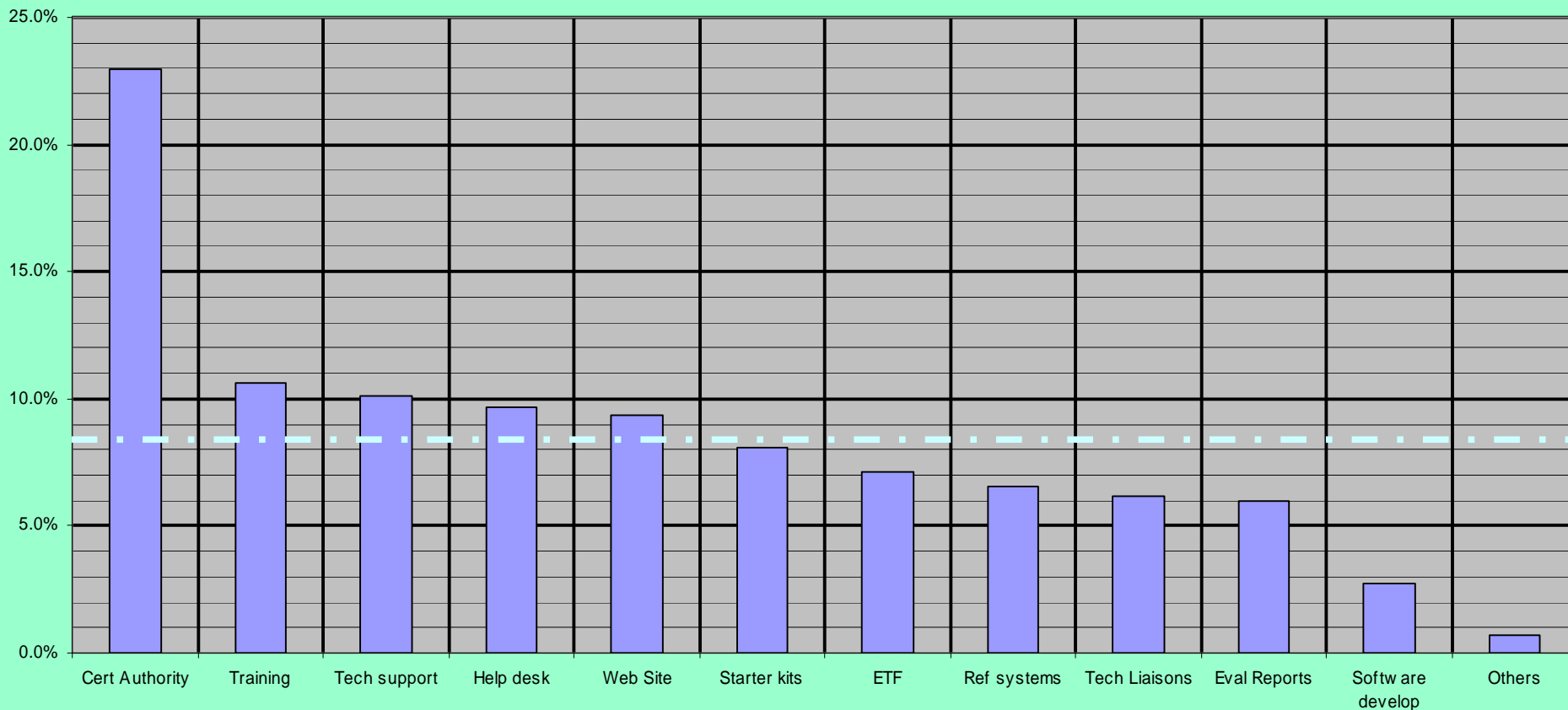


Importance of Technologies





Importance of support





Survey Lessons

Other technologies needed:

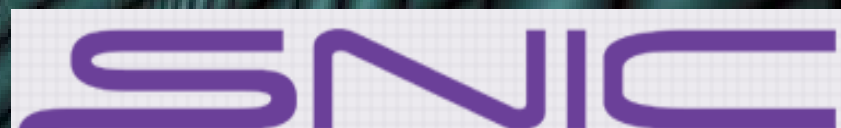
- a trusted (secure) database / data repository for various purposes such as host information and grid accounting data
- a UDDI registry
- a grid based on GT-3

Other support activities needed:

- a repository for the software from the projects
- the availability of a range of reference implementations of various technologies
- the need for advice on versions of products which work correctly with each other



SWEGRID



SWEGRID

- Six sites
 - Three sites with national or regional service obligations
 - Three University centers
- Throughput PC clusters at each site
 - ~100 processors
 - ~ 20 TB of disc
- Shared long term storage
- Use allocated through a National Allocations committee
- Funding 22.5 MSEK (2.5M EUR) from the Wallenberg foundation plus 6 staff positions from the Swedish Research Council
- Operational fall 2003

Grid Research

- Resource management and portals
Erik Elmroth and Bo Kågström, Dept. of Computing Science, Umeå University
- Data bases in Grid environments
Tore Risch, Dept of Information Technology, Uppsala University
- Grid security
Olle Mulmo and Lennart Johnsson, Dept. of Numerical Analysis and Computer Science, KTH

Nordic Efforts – A SNIC perspective



Issues

- Authentication, Authorization, Accounting, Privacy and Integrity
- Create production quality infrastructure
- Grids – fundamental shift from center/individual resources to Global Infrastructure
 - New business models
 - Cross national border use of resources
 - Software licensing
 - Data sharing-licensing

The Nordic Approach

- Build on existing regional cooperative models to avoid creating new administrative structures (when functioning well)
- Build on existing service structures (when functioning well and receptive to change) to conserve scarce human talent and avoid unnecessary tension, duplication and confusion among users
- Encourage (require) open standards for EU sponsored projects
- Encourage project participation in (community) standards activities