

Nordic Grid Infrastructure Now and in the Future

First set of questions

1. What is NDGF?
2. Why are we here?

Brief History

- NorduGrid project (2001-2003)
 - Middleware: Architecture and First Implementation
 - Grid test-bed – in operation since August 2002
- Nordic grid middleware: ARC
 - Deployment of ARC at computing centers and clusters in Scandinavia
 - Participation in LHC Service Challenges
 - Forming of the NorduGrid middleware consortia (2005)
- NDGF Pilot Project
 - Two-year trial 2004-2005
 - Deployment of a pilot production facility
- NDGF 2006-2010
 - Funded (2 M€/year) by National Research Councils of four Nordic Countries

NDGF Vision

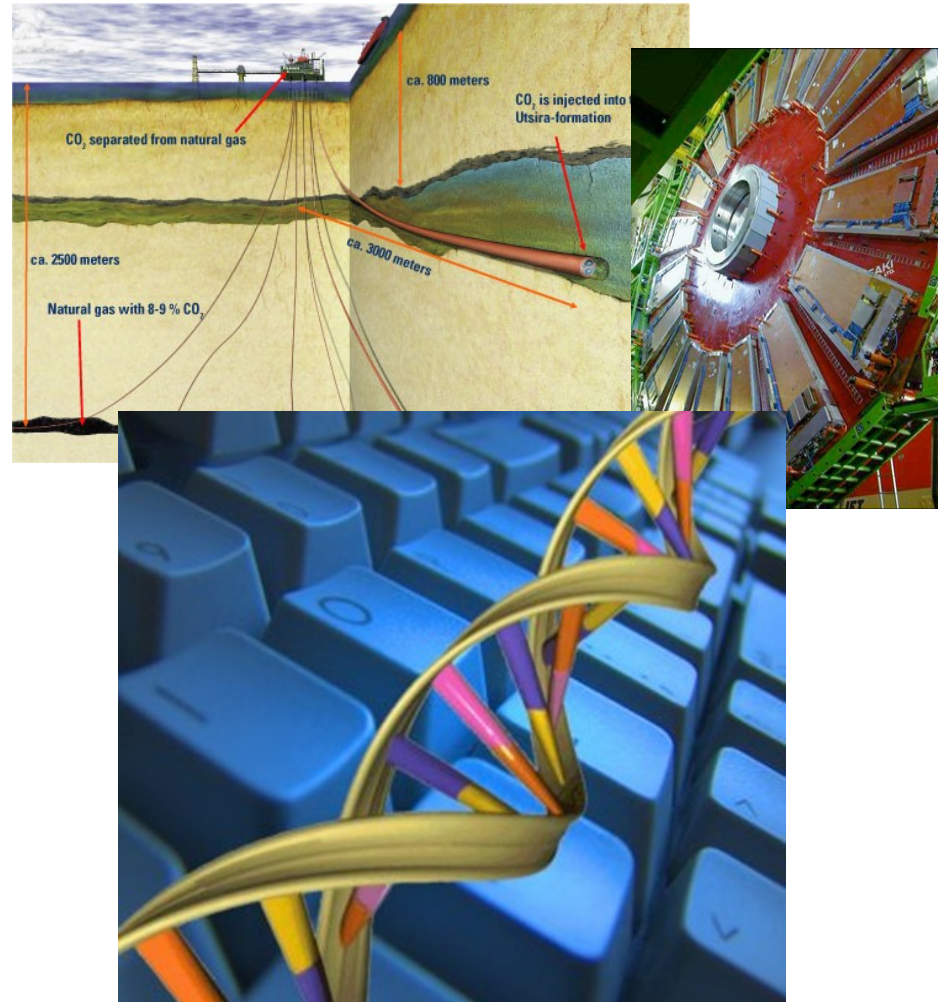
"To establish and operate a Nordic computing infrastructure providing seamless access to computers, storage and scientific instruments for researchers across the Nordic countries."

The NDGF mission

- Operate a Nordic production Grid building on national production Grids
- Operate a core facility focusing on Nordic storage resources for collaborative projects
- Develop and enact the policy framework needed to create the Nordic research arena for computational science
- Co-ordinate and host Nordic-level development projects in high performance and Grid computing.
- Create a forum for high performance computing and Grid users in the Nordic Countries
- Be the interface to international large scale projects for the Nordic high performance computing and Grid community.

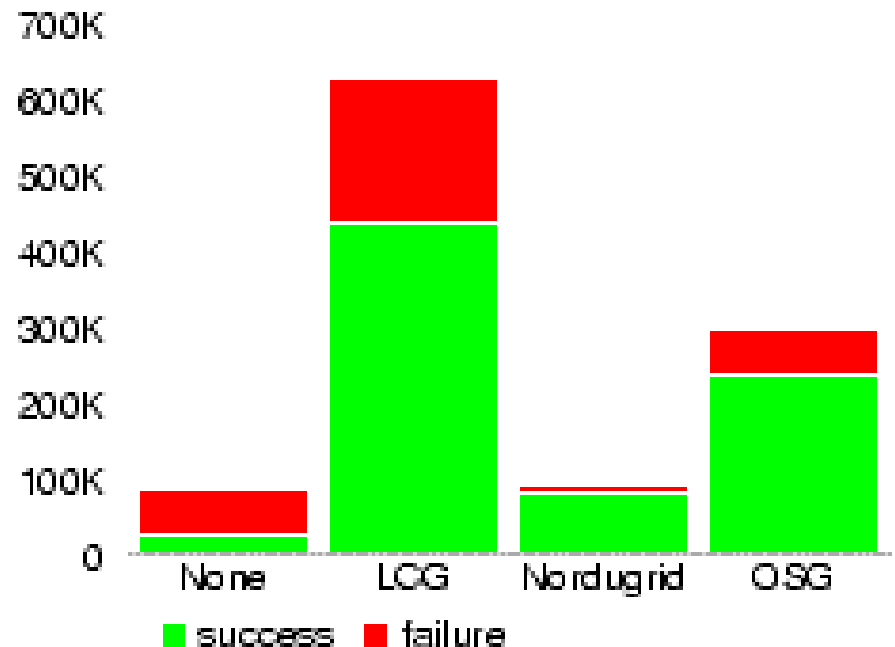
Grid Projects

- Nordic Tier-1
- BioGrid community grid
- CO₂ -sequestration community grid



Nordic Tier 1 status

- WLCG Status Report 2007:
 - NDGF has highest availability of all Tier-1s
 - Lowest proportion of failed computation jobs of all the grid infrastructures
 - Largest ATLAS Tier-1 in Europe and the 3rd largest in the world



Why are we here?

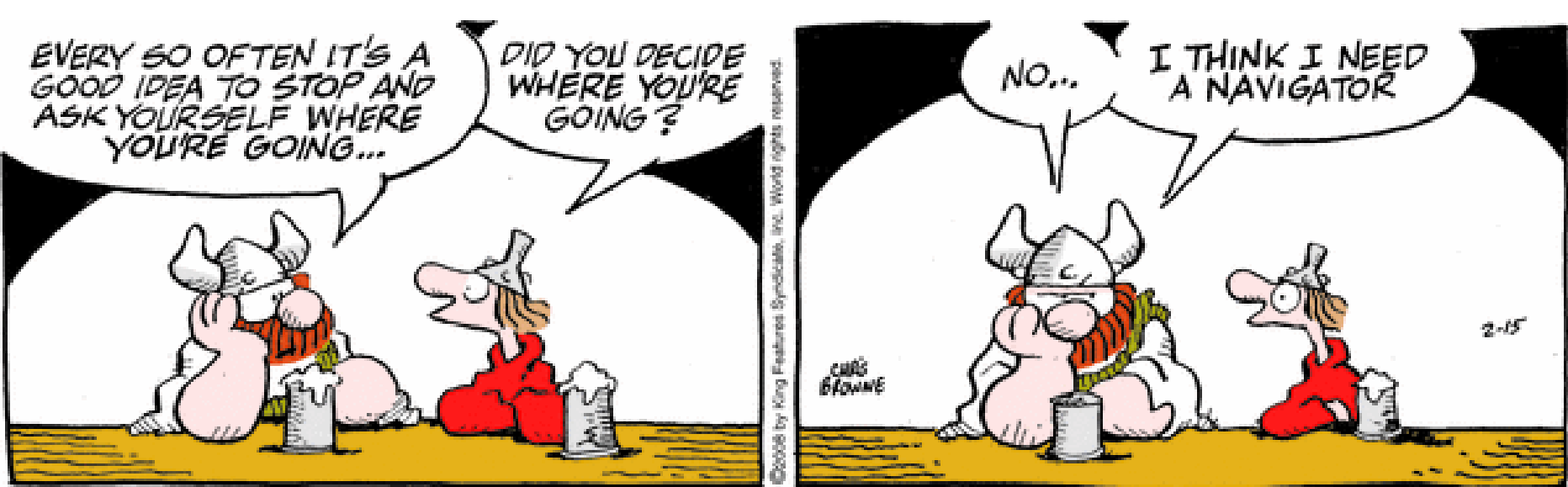
NDGF is technically very successful, but

...the political landscape is complicated:

- European, Nordic and national developments
- Many stakeholders (scientists, national HPC centers, NRENs,...)

The Nordic countries have many similarities, and some differences...





- NDGF Steering Board needs a strategic navigation tool
- NDGF project ends in 2010, what's next?
- The Nordic Data Grid *Facilitator*

Second set of questions:

- What should a future Nordic Grid Infrastructure include?
- What should a future Nordic Grid Infrastructure ***not*** include?

...end...

NORIA-net & Nordic eScience – The Nordic eScience Initiative

Two Ingredients

1. "Nordic eScience: Research, Education, and Sustainable Infrastructure Services; A strategy document for the Nordic Council of Ministers", 2007
3. "The Nordic eScience Initiative", A NORIA-net project funded by Nordforsk, 2008-2009

The Nordic eScience Strategy

- An ad hoc Working Group was appointed by NCM in 2007, chaired by Juni Palmgren, Sweden.
- To produce an *eScience strategy document*, focusing on Nordic cooperation on the policy level to make eScience a Nordic strength.
- Not just in terms of *ICT infrastructure*, but as an *enabling factor for advanced ICT applications*, which will serving society at large
- Technologies may exist – policy decisions lacking!
- NCM supplies a *political rationale and a cooperation platform* for stakeholders to jointly address the five Nordic Ministers.

eScience scope

- Three pillars of science
 - Theory, observation, computation
- Basic components
 - Mathematical modelling and simulation
 - Data collection and handling
 - Data visualization
 - Data processing (supercomputing or grid computing)
- Touches on many/all scientific disciplines
 - Traditional fields: physics, astronomy, theoretical chemistry etc..
 - Emerging fields: Social sciences, biology, medicine, earth sciences, humanities etc..

Nordic dimension

- Common cultural heritage
 - Language, welfare model
- History of cooperation
- Facing similar challenges
 - Globalization
 - new economies,...
- Advanced users of ICT
- Some infrastructures are present (NORDUnet, NDGF)



WORK IS THE CURSE OF THE DRINKING CLASS

Points of departure

- National HPC and eScience programmes
- Ongoing Nordic collaborations
 - NORUnet and Nordic Data Grid Facility (NDGF)
 - Nordic Grand Challenges Survey (March 2007)
 - NCoE's
 - Scientist initiated collaborations
- Efforts in Europe and beyond: EU FPs and ESFRI
 - Existing: eIRG, DEISA, EGEE, SIRENE, FP6 programmes,
 - New: Partnership for Advanced Computing in Europe (PRACE)
 - New: European Grid Initiative (EGI)
 - New: Preparatory phase for ESFRI roadmap projects; 35 projects with eScience interface. FP7 programmes.

Recommendations

Potential for added value by enabling:

- A Nordic eInfrastructure *eco-system* - shared Nordic resources
- Cooperation in key Nordic eScience *research and application programmes*
- A Nordic eScience *education programme*
- A *sustainable* (virtual) Nordic eScience *organisation and funding plan*

Concrete proposals

1. A programme for resourcing computational “grand challenge” research
2. A programme for establishing a Nordic infrastructure for databases and data repositories
3. A programme for Nordic eScience collaboration with The Baltics, Europe and beyond
4. Nordic Master and PhD education programme on eScience technologies.

Proposed Nordic eScience organisation

- Nordic eScience Committee, could be hosted by NordForsk.
 - Executive with own budget
 - Will lead the implementation of the joint Nordic eScience strategy.
- Advisory and Operational Committee(s)
 - Instrumental for the Strategic Committee in performing its tasks

NordForsk NORIA-nets

- Enhancing co-operation between Nordic national research and innovation financiers and managers
- Launching coordination activities leading to synergy effects, sustainable cooperation and joint investments within research funding and research policy
- Ca 7 NordForsk NORIA-nets start their activities early 2008

”The Nordic eScience Initiative”

A NORIA-net for Nordic eScience

- Follow up on Nordic eScience Strategy
- Liaise with stakeholders
- Identify funding sources and mechanisms
- Duration 2008-09
- Budget: 330' + 634', held in Nordforsk
- Project group: Representatives from national research councils (or appointees)

Specific Goals

- Establish a Nordic eScience Committee, including
 - Governance structure
 - Secretariat
 - Funding mechanisms
- Hold a Nordic eScience Conference

- Main task: Liaising with the stakeholders (like today)
- An eScience Committee must be well placed within the system of Nordic and national decision makers.
- Develop Action Plan for Nordic eScience
- Project personell:
 - Initially one person from each interested national research council or funding body,
 - working closely with Nordforsk
 - May later change into eScience committee or for streamlining the organisation towards relevant tasks.

Stakeholders

- NCM
- Nordforsk
- National research councils and funding agencies
- eInfrastructure providers
- Research community
- Industry
- ...

Summary

- A proposal for a Nordic eScience Strategy exists
 - Not detailed on eInfrastructures/Grid
 - Not formally endorsed by NCM
 - Further actions not decided by NCM
 - eScience NORIA-net could coordinate further actions (if NCM finds it appropriate)