DEIC DANISH G-INFRASTRUCTURE COOPERATION

Director Professor Børge Obel Chairman of the Board

DeIC Danish e-Infrastructure Cooperation



For more information contact sekretariat@deic.dk



- A merger of Danish Center for Scientific Computing and Forskningsnettet
- Legal document passed 19. April 2012
- First official board meeting 25. April 2012



Forskningsnettet - past and present

- Established in 1996
- Delivers high capacity network connections and related services to Danish universities and research institutions, including research libraries, research hospitals and private companies in the research area.
- A virtual organisation with no direct employees
 - Network secretariat hosted by DTU
 - Network operations carried out by UNI-C
 - AAI secretariat hosted by Danish Agency for Culture
 - All in all a virtual staff of ≈ 25 persons (not all 100%)



High Performance Computing (HPC) within Danish e-Infrastructure Cooperation (DeIC): Organisation Specifics

National and decentralised organisation of HPC resources in Denmark

- University/ministry partnership
- 5 decentralised regional operating centres
- 1 centralised coordinating administration
- Board members from universities, abroad and industry



- 1. University of Copenhagen
- 2. Århus University
- 3. University of Southern Denmark (Odense)
- 4. Technical University of Denmark (Lyngby)
- 5. Ålborg University

4.0 01. COPENHAGEN

ZEALAN

OÂlborg

3.0

Odense



DelC Organisation (untill 1. January 2013)



DeIC Driftssamarbejde med universiteterne Internationale samarbejdspartnere

*PoP = Point of Presence. Den lokale Forskningsnet tilslutning på universiteterne

**Teknisk Referencegruppe: Gruppe bestående af PoP Administratorer og øvrige netansvarlige på de tilsluttede institutioner – gruppen medvirker i den tekniske udvikling af Forskningsnettet

***Computing center: Tidl. DCSC centre. Lokale semiautonome enheder på universiteterne

We note structural e-Infrastructure trends: High Performance Computing is becoming R&D 3ed pillar, added to *Theory* and *Empery*

- "Computational simulation offers to enhance, as well as leapfrog, theoretical and experimental progress in many areas of science critical to the scientific mission..." (US Department of Energy).
- "Computational science is one of the most important technical fields of the 21st century because it is essential to advances throughout society" (US President's Information Technology Advisory Committee)
- "Computational science has become the third pillar of the scientific enterprise, a peer alongside theory and physical experiment" (US President's Information Technology Advisory Committee)



We note structural e-Infrastructure trends: Growing HPC utilisation

- "The next 10 to 20 years will see computational science firmly embedded in the fabric of science – the most profound development in the scientific method in over three centuries" (US Department of Energy).
- "A host of technologies are on the horizon that we cannot hope to understand, develop, or utilize without simulation" (US National Science Foundation).



Approaching the right challenges at the right level:

International

European

Nordic

Danish national

Danish regional





Nordic-HPC

Hardware @ commercial host, abroad

Model	HP BI280cG6 Servers
СРИ	Intel Xeon E5649 (2.53GHz) - Westmere -EP
Memory	24GB / Node
Disk	250GB / Node
Total Number of Nodes	288
Total Number of CPU / Node	2
Number of Cores / CPU	6
Total Number of Cores in all Nodes	3456
Total Number of teraflops in all Compute Nodes	35TFlops
Storage System	X9320 Network Storage System with IBRIX Fusion Software
Total storage Capacity	71.6TByte
Interconnect	Infiniband QDR

3.456 "green" Cores with very low operations costs









We note structural e-Infrastructure trends: Consomption vs. Spécialisation & Infrastructure vs. Instrument

Infrastructure – Consumption

General purpose Linux clusters; general purpose (slow) storage



VS.

Instrument – Specialisation

Specialised HPC and storage architectures (typically controlled by big R&D communities, e.g. within ESFRI).



30. May 2012

New Mandate

- Name: DeIC Danish e-Infrastructure Cooperation
- Continue the tasks handled by DCSC and Forskningsnettet
- Intiate and develop new instruments to promote Danish e-science.
- Disseminate e-science to all forms and areas of research and educational activities
- Work for an appropriate public-private cooperation
- Support training and advisory activities and proactively work towards coordinated compentencies in the e-science area
- Facilitate international collaborations
- Contribute to the coherence and synergy between research institutions
- Find an appropriate sharing of responsibilities between national and local activities to ensure efficient use of resources and appropriate technical and scientific solutions.

DEIC DANISH G-INFRASTRUCTURE COOPERATION

Thank you for your attention





Budget

- Network and connected services no changes. 100% funded by the connected institutions
- Funding function (purchase of new equipment) 35 million over 3 years (2012-2015)
- National competence center (15 million over 3 years)
- New initiatives
- International cooperations
- Secretariat



The board

- Center Director Børge Obel, Interdisciplinary Center for Organizational Architecture, Aarhus University (chairman of the board)
- Institute Manager John Renner Hansen, Niels Bohr Institute, University of Copenhagen
- Chief Technology Officer Ingrid Melve, UNINETT A/S
- Institute Director Helle Rootzen, DTU Informatics, Technical University of Denmark
- Institute Manager Peder Thusgaard Ruhoff, Institute for Technology and Innovation, University of Southern Denmark
- Managing Editor Karen Skovgaard-Petersen, Society for Danish Language and Literature
- Director Malou Aamund, Microsoft Enterprise and Partner Group



2012

- Now: Appointment of task-force to strategy process
- August: Report from the task-force
- September: Board strategy seminar
- October: HPC Call
- October: Staff strategy seminar
- November: Formulation of four year strategy and action plan for 2013



Forskningsnettet – services

- National 10 Gbps internetconnections with direct acces to other international research network (through NORDUnet)
- Closed end-to-end connections
- Ad-hoc lightpaths
- Deployment of new connections
- DNS (+DNSSEC)
- NTP
- Mail-relay
- Eduroam
- iPass
- WAYF
- Server certificates, with * and long lifetime
- Personal certificates

- Incident Response
- Security newsletter
- Vulnarbility warnings
- Server scan
- Security trend reports
- Adobe Connect
- H.323 Video Conference
- Project: Operation announcements
- Project: Monitoring of connections behind firewalls



New services?

- A "dropbox-alike" service: FileSender
 Cloud-services...
- Storage
- Archiving
- Backup
- Long-term storage
- CPUs
- Maybe other types of infrastructure: Development platforms, database services

HPC-services...



Cloud services

Cloud-services in different versions:

- The "legal"
- The "cost-effective/green"
- The "super fast"
- The "secure high-availability solution"



Infrastructure/e-infrastructure

Common solutions:



Digitalt Humaniora Laboratorium (DigHumLab)

DigHumLab vil fungere som den samlede virtuelle indgang til alle relevante digitaliserede ressourcer med relevans for humanioras og samfundsvidenskabernes genstandsfelt i danske såvel som europæiske forskningsinfrastrukturer. DigHumLab bliver en national distribueret forskKonsortiepar Der kan konsta sig interesse og alle centrale ur museer. Aarhu at lede udarbej



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