



<http://www.grid-support.ac.uk>



<http://www.ngs.ac.uk>

The National Grid Service

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JISC





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Acknowledgements



- Some NGS and GOSC slides are taken from talks by Stephen Pickles, Technical Director of GOSC
- Also slides from Malcolm Atkinson on e-Science programme



Overview



- The UK e-science programme
- Grid Operations Support Centre
- The NGS



What is e-Infrastructure – Political view



- A shared resource
 - That enables science, research, engineering, medicine, industry, ...
 - It will improve UK / European / ... productivity
 - Lisbon Accord 2000
 - E-Science Vision SR2000
 - John Taylor
 - Commitment by UK government
 - Sections 2.23-2.25
 - Always there
 - c.f. telephones, transport, power, internet

Science & innovation investment framework 2004 - 2014

July 2004



department for education and skills

Gordon Brown
Chancellor of the Exchequer

Charles Clarke
Secretary of State for Education and Skills

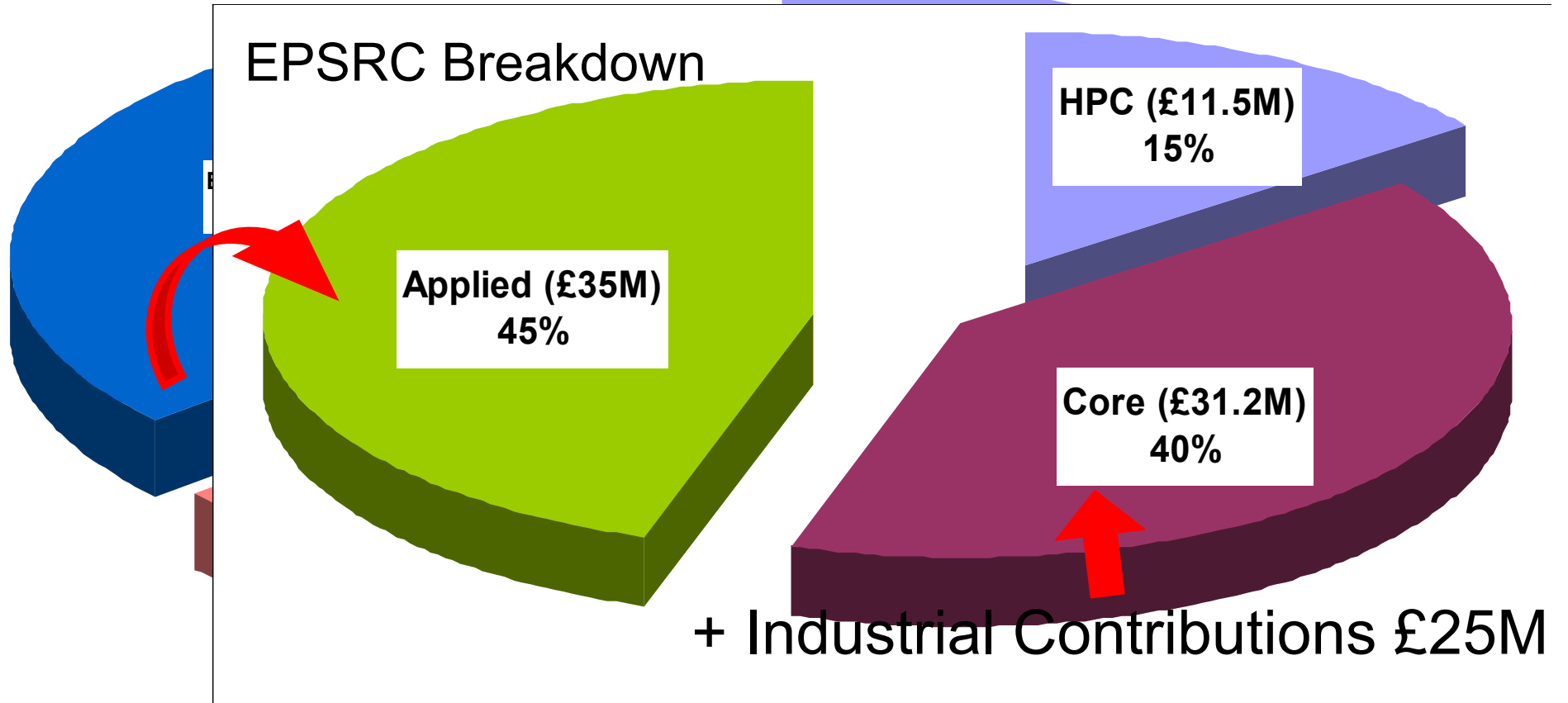
Patricia Hewitt
Secretary of State for Trade and Industry



UK e-Science Budget (2001-2006)



Total: £213M + £100M via JISC



Source: Science Budget 2003/4 – 2005/6, DTI(OST)

The e-Science Centres

GOSC

NGS National Grid Service

Globus Alliance

e-Science Institute

National Centre for e-Social Science

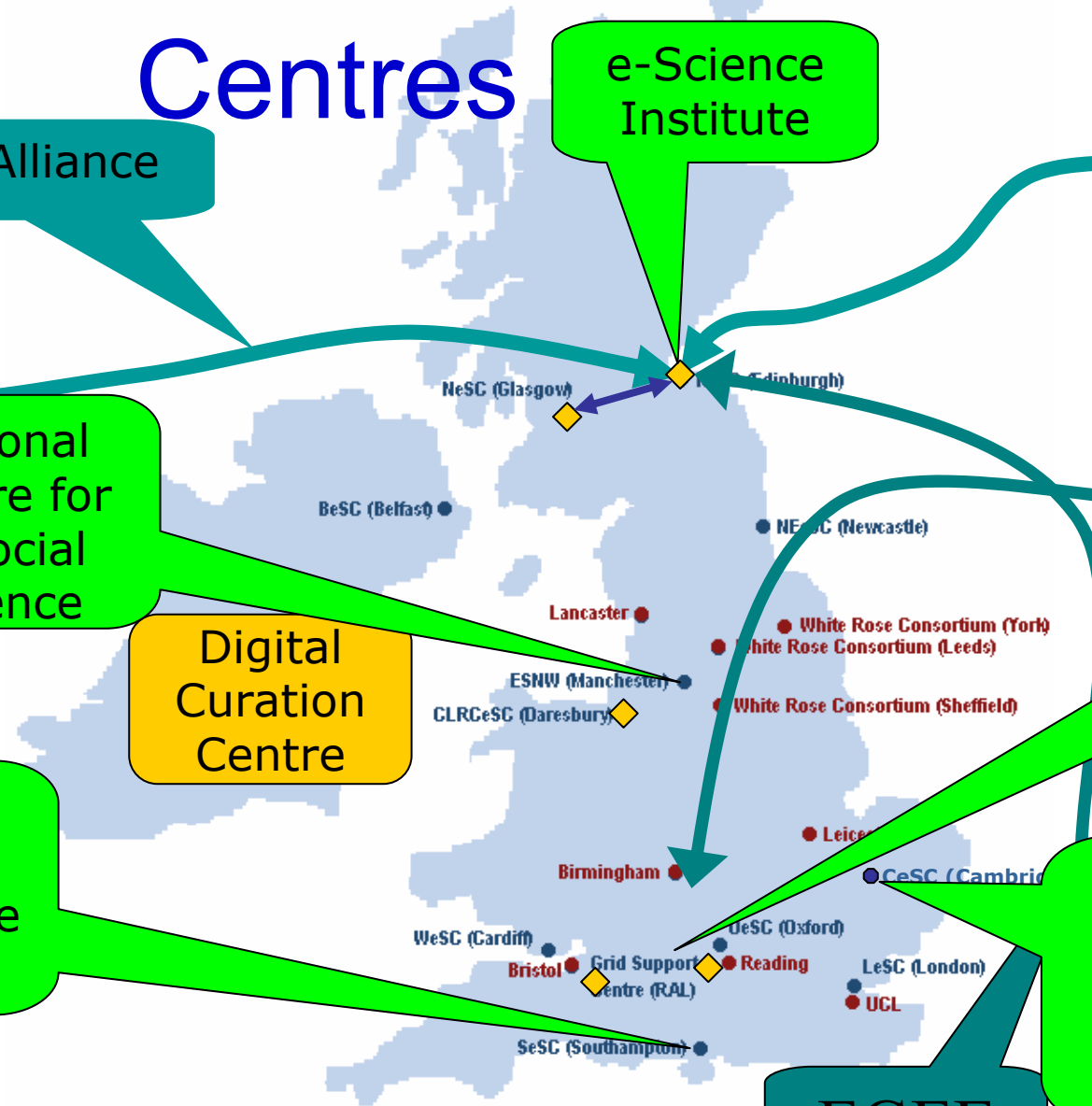
Digital Curation Centre

Open Middleware Infrastructure Institute

Grid Operations Support Centre

National Institute for Environmental e-Science

EGEE



<http://www.nesc.ac.uk/centres/>



The National Grid Service



The NGS is the core UK grid, intended for the production use of computational and data grid resources. NGS is the core service resulting from the UK's e-Science programme. NGS is supported by JISC, and is run by the Grid Operations Support Centre (GOSC).



GOSC



The Grid Operations Support Centre is a distributed “virtual centre” providing deployment and operations support for the UK e-Science programme.





Core NGS resources



- Nodes providing compute services
 - White Rose Grid, Leeds: grid-compute.leeds.ac.uk
 - Oxford e-Science Centre: grid-compute.oesc.ox.ac.uk
 - For list of compilers, software, ...
e.g. <http://www.ngs.ac.uk/sites/ox/software/>
- Nodes providing data services
 - Manchester: grid-data.man.ac.uk
 - Rutherford Appleton Lab. (RAL): grid-data.rl.ac.uk
- When you have joined the NGS you can access each of the core nodes.

<http://www.ngs.ac.uk/resources.html>



NGS software



- Authorisation, authentication built on GSI and UK certificates
- Computation services based on **Globus Toolkit 2**
 - Use compute nodes for sequential or parallel jobs, primarily from batch queues
 - Can run multiple jobs concurrently (be reasonable!)
- Data services:
 - **Storage Resource Broker:**
 - Primarily for file storage and access
 - Virtual filesystem with replicated files
 - **“OGSA-DAI”: Data Access and Integration**
 - Primarily for grid-enabling databases (relational, XML)
 - **NGS Oracle service**



<http://www.ngs.ac.uk>

UK National Grid Service - Providing Grid Computing for eScience - Microsoft Internet Explorer provided by CCLRC

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Address <http://www.ngs.rl.ac.uk/hardware.html> Go Links


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Hardware

The hardware is supplied by Clustervision who were chosen after a European Tender.

Compute Clusters

- 64 dual CPU Intel 3.06 GHz (1MB cache) nodes (Supermicro motherboard)
- 2GB memory per node
- 2x 120GB IDE disks (1 boot, 1 data)
- Gigabit network
- Myrinet M3F-PCIXD-2
- Front end (as node)
- Disk server (as node) with 2x Infortrend 2.1TB U16U SCSI Arrays (UltraStar 146Z10 disks)
- PGI compilers
- Intel Compilers, MKL
- PBSPro
- TotalView Debugger
- RedHat ES 3.0



UK National Grid Service - Providing Grid Computing f

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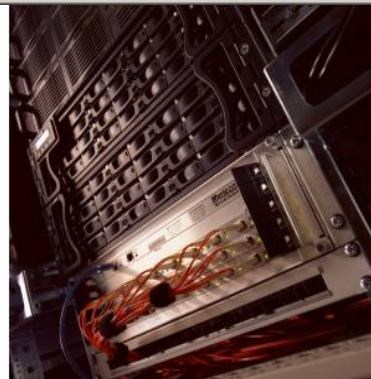
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Data Clusters

- 20 dual CPU Intel 3.06 GHz nodes (Supermicro motherboard)
- 4GB memory per node
- 2x120GB IDE disks (1 boot, 1 data)
- Gigabit network
- Myrinet M3F-PCIXD-2
- Front end (as node)
- 18TB Fibre SAN (Infortrend F16F 4.1TB Fibre Arrays (UltraStar 146Z10 disks)
-
- PGI compilers
- Intel Compilers, MKL
- PBSPro
- TotalView Debugger
- Oracle 9i RAC
- Oracle Application server
- RedHat ES 3.0



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Gaining Access



NGS core nodes

- data nodes at RAL and Manchester
- compute nodes at Oxford and Leeds

- all access is through digital X.509 certificates
 - from UK e-Science CA
 - or recognized peer

National HPC services

- HPCx



- CSAR

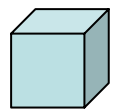
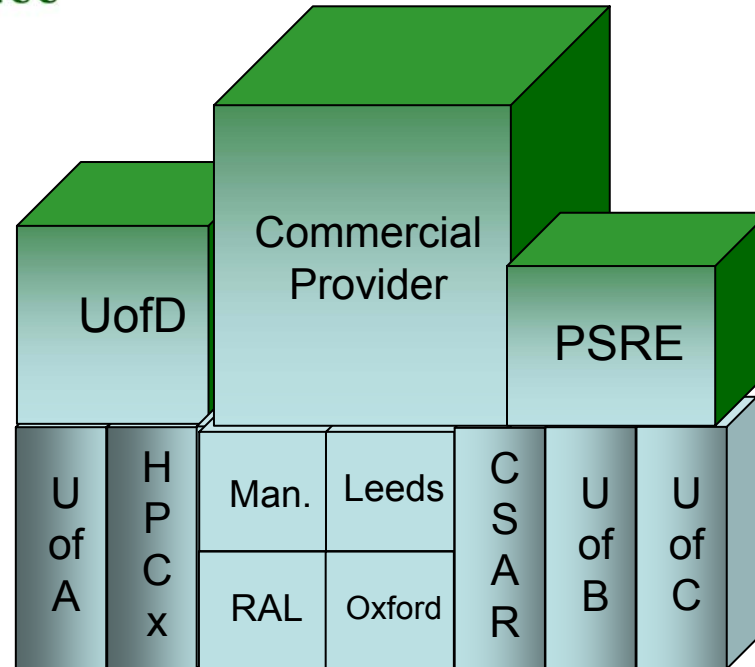


- Must apply separately to research councils

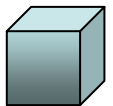
- Digital certificate and conventional (username/password) access supported



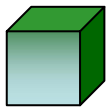
National
Grid
Service



NGS Core Nodes: Host core services, coordinate integration, deployment and support +free to access resources for all VOs. Monitored interfaces + services



NGS Partner Sites: Integrated with NGS, some services/resources available for all VOs Monitored interfaces + services



NGS Affiliated Sites: Integrated with NGS, support for some VO's Monitored interfaces (+security etc.)

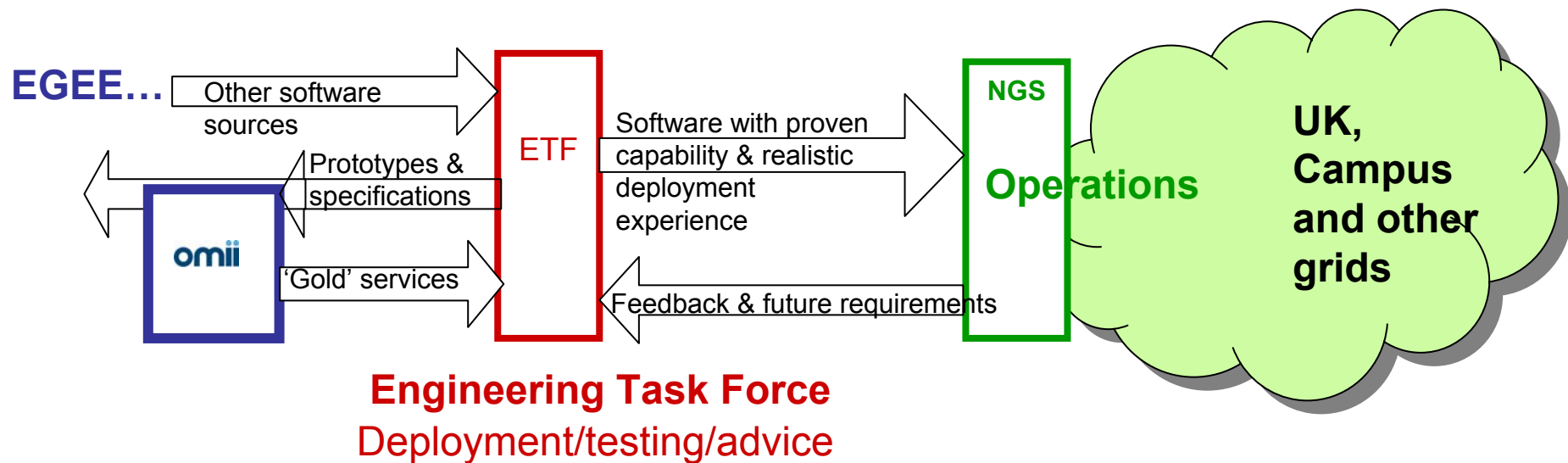




Managing middleware evolution



- Important to coordinate and integrate this with deployment and operations work in EGEE, LCG and similar projects.
- Focus on deployment and operations, NOT development.





Key facts



- **Production:** deploying middleware after selection and testing – major developments via Engineering Task Force.
- **Evolving:**
 - Middleware
 - Number of sites
 - Organisation:
 - VO management
 - Policy negotiation: sites, VOs
- **International commitment**
- **Gathering users' requirements – National Grid Service**



Web Sites



- NGS
 - <http://www.ngs.ac.uk>
 - To see what's happening: <http://ganglia.ngs.rl.ac.uk/>
- GOSC
 - <http://www.grid-support.ac.uk>
- CSAR
 - <http://www.csar.cfs.ac.uk>
- HPCx
 - <http://www.hpcx.ac.uk>



Summary



- NGS is a production service
 - Therefore cannot include latest research prototypes!
 - ETF recommends what should be deployed
- Core sites provide computation and also data services
- NGS is evolving
 - OMII, EGEE, Globus Alliance all have m/w under assessment by the ETF for the NGS
 - Selected, deployed middleware currently provides “low-level” tools
 - New deployments will follow soon
 - New sites and resources being added !