



THE UNIVERSITIES OF LEEDS, SHEFFIELD AND YORK

THE WHITE ROSE GRID

The White Rose Grid

Peter M. Dew

White Rose Grid Team





THE UNIVERSITIES OF LEEDS, SHEFFIELD AND YORK

THE WHITE ROSE GRID

- Partners

- White Rose Universities

- Leeds, York and Sheffield

- Yorkshire Forward and White Rose

- Suppliers

- Esteem, Sun Microsystems and Streamline Computing





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- Funding
 - WRG
 - £2.8m. e-science initiative
 - Yorkshire Forward
 - £400K for outreach activities
 - YHMAN:
 - £1.3m. HEFCE funded 75%. Remainder by the University consortium
 - E-Science
 - £3m EPSRC & ESRC





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THE WHITE ROSE GRID

- The White Rose Grid
 - WR Grid provides the compute and data services needed to
 - Support scientific communities requiring high end computing resources to work more effectively
 - And provide more effective management of compute and data resources.
 - White Rose Consortium is an example of a virtual organisation





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THE WHITE ROSE GRID

• Objectives

- **e-Science research**: to strengthen, in partnership with industry, e-science research. The focus will be on the WRUC core areas: decision support, diagnostics and scientific programming environments
- **Enlarge scientific communities**: Support, and enlarge new scientific communities including bio-technology, aerospace, tissue engineering and healthcare
- **Cost effective HPC Resources**: Demonstrate more effective sharing of HPC by enable user to selective the most appropriate machine





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THE WHITE ROSE GRID

- **Objectives**

- **Outreach**: Develop White Rose research excellence and its relevance to knowledge by establishing a regional Grid facility available to regional universities and appropriate science based companies
- **Market assessment**: Assess potential regional demand on grid technology, in collaboration with Yorkshire Forward and our IT partners





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- E-Science Projects
 - Distributed Aircraft Maintenance Environment (Dame)
 - £3m e-science funded project over 3 years
 - Prof. Jim Austin
 - Distributed collaborative visualisation and problem solving environments
 - Prof. Ken Brodrie
 - Decision Making in the Health Sector
 - Prof. Mark Birkin





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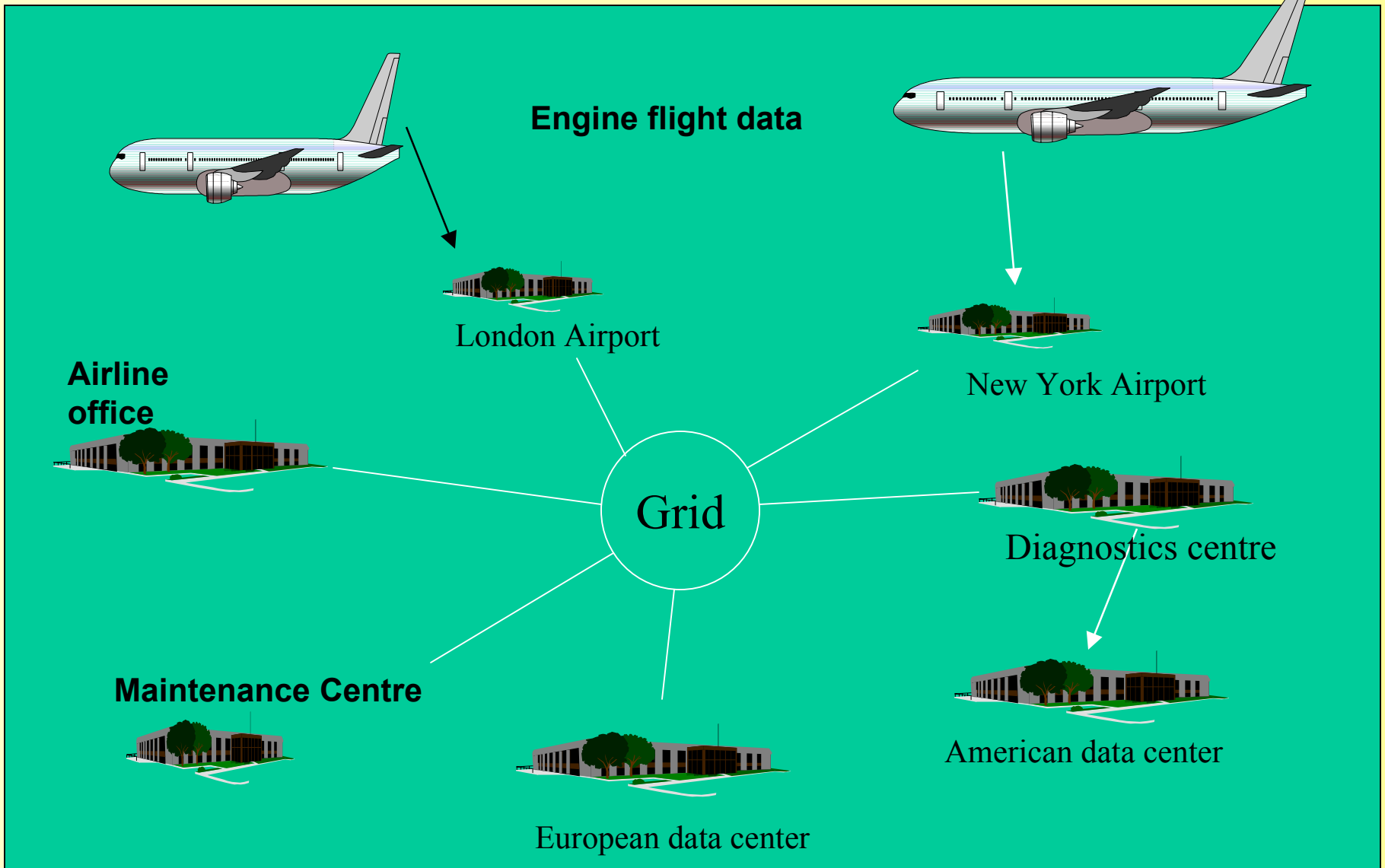
THE WHITE ROSE GRID

- **DAME Objectives**

- **DAME: Distributed Aircraft Maintenance Environment.**

- Demonstrate diagnostic capability on the GRID
- Examine timeliness properties of the GRID
- Demonstrate on the RR Aeroengine diagnostic problem



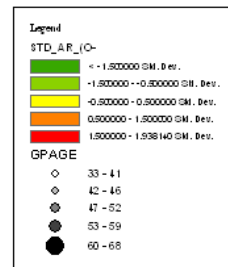
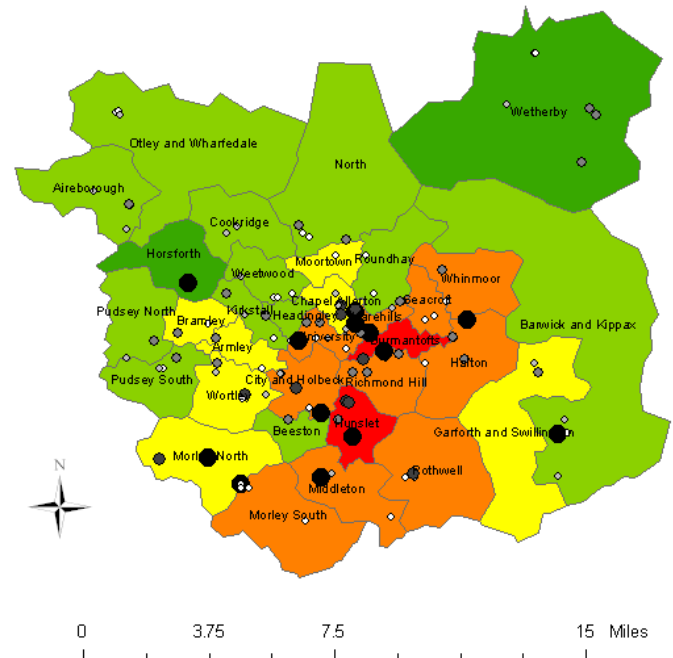




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- Urban and regional development issues
 - modelling cities
 - complicated and therefore interesting, but solvable public sector planning
- Health Care Planning with Data Driven Resource Allocation ('HYDRA')
 - Local practices to provide a screening service for colorectal cancer
 - Example of spatial decision support systems on the grid
 - ESRC Demonstrator





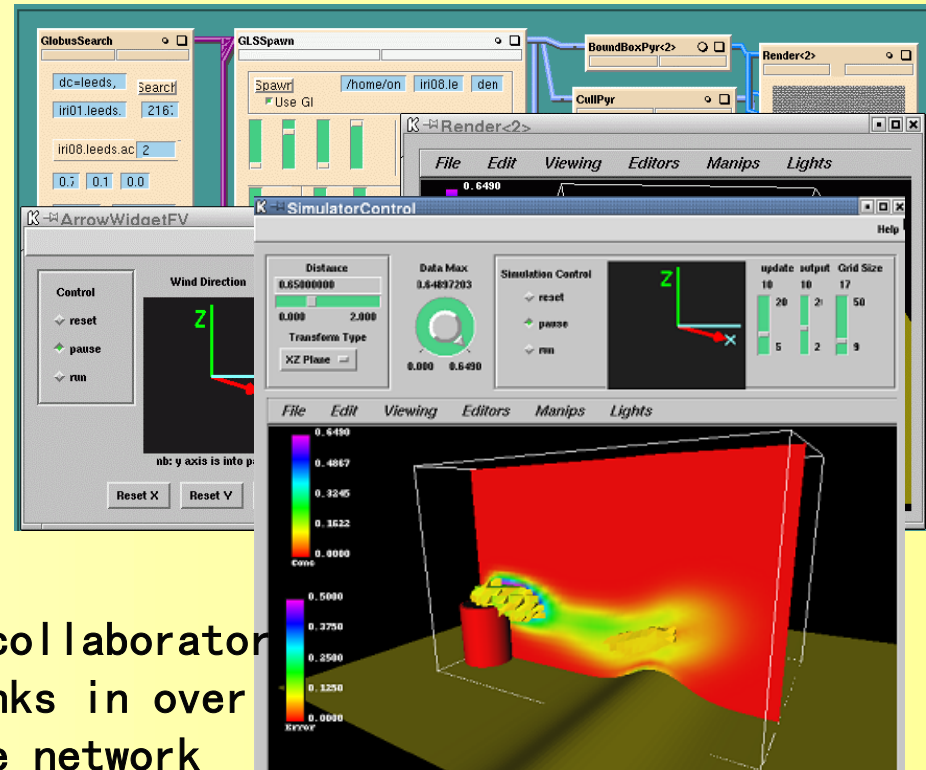
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- Collaborative Visualisation for e-Science

- Emergency scenario: release of toxic chemical
- Simulation launched on Grid resource, steered from desktop using IRIS Explorer
- Collaborators linked in remotely using COVISA toolkit
- Evolving into gViz with Oxford, Oxford Brookes, RAL, NAG, IBM and Streamline Computing

A collaborator links in over the network



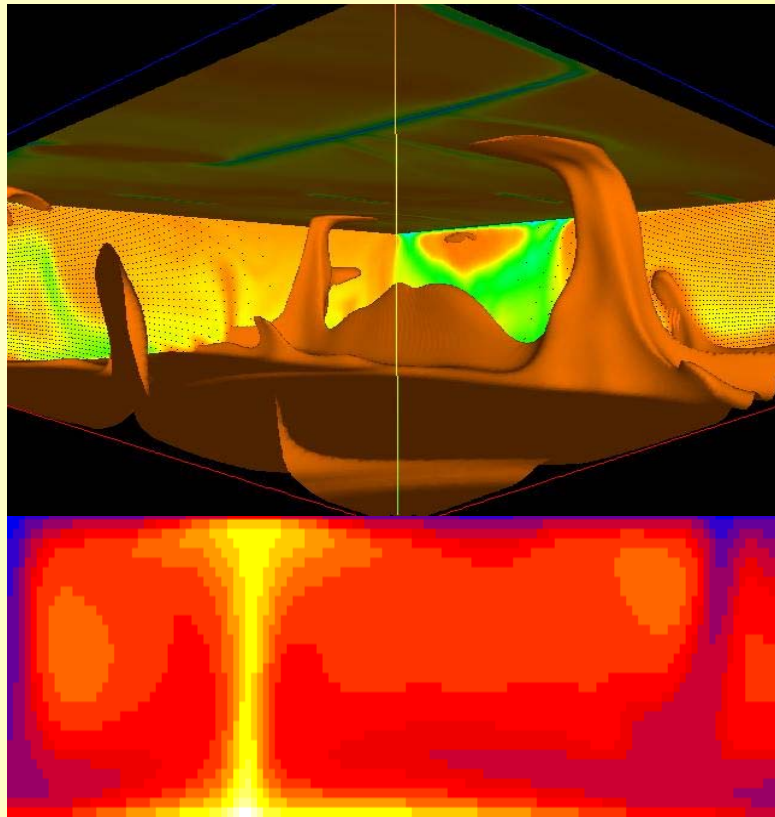
Dispersion of pollutant studied under varying wind directions





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Convection in the Earth's Mantle

The movement of tectonic plates on the Earth is driven by creeping convection of the solid silicate mantle at rates of cm/yr. Convective flow is simulated on the computer using large 3D time-dependent numerical solutions of the viscous flow and energy equations.

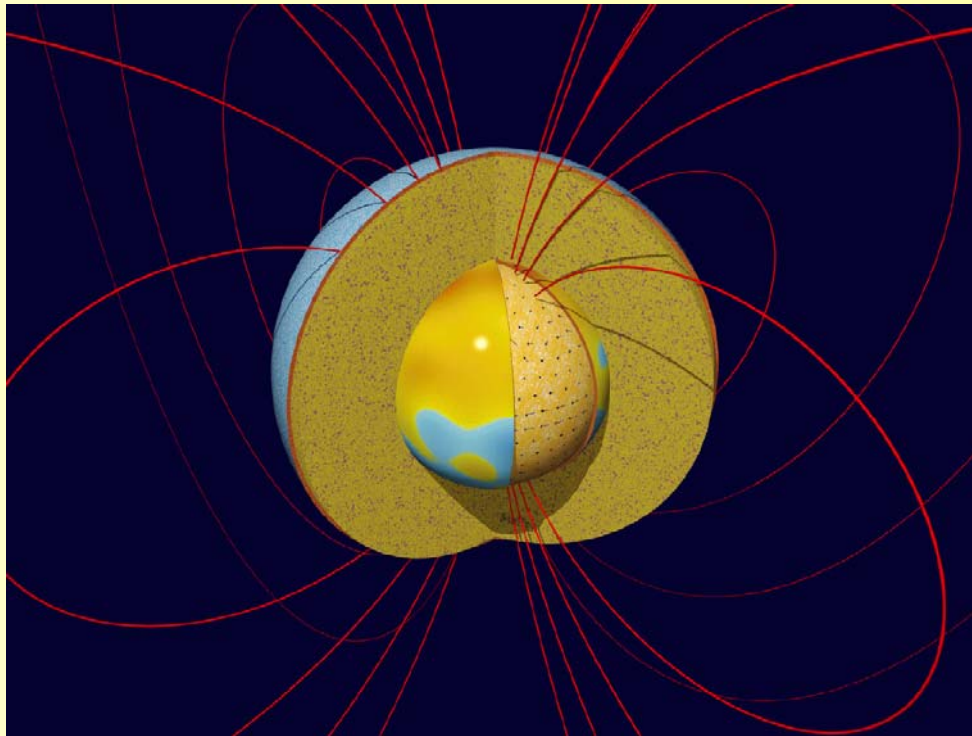
Geodynamics Group, School of Earth Sciences, University of Leeds





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Magneto-
hydrodynamics
in the Earth's liquid
iron core creates
the Magnetic Field

Geomagnetism Group, School of
Earth Sciences, University of
Leeds



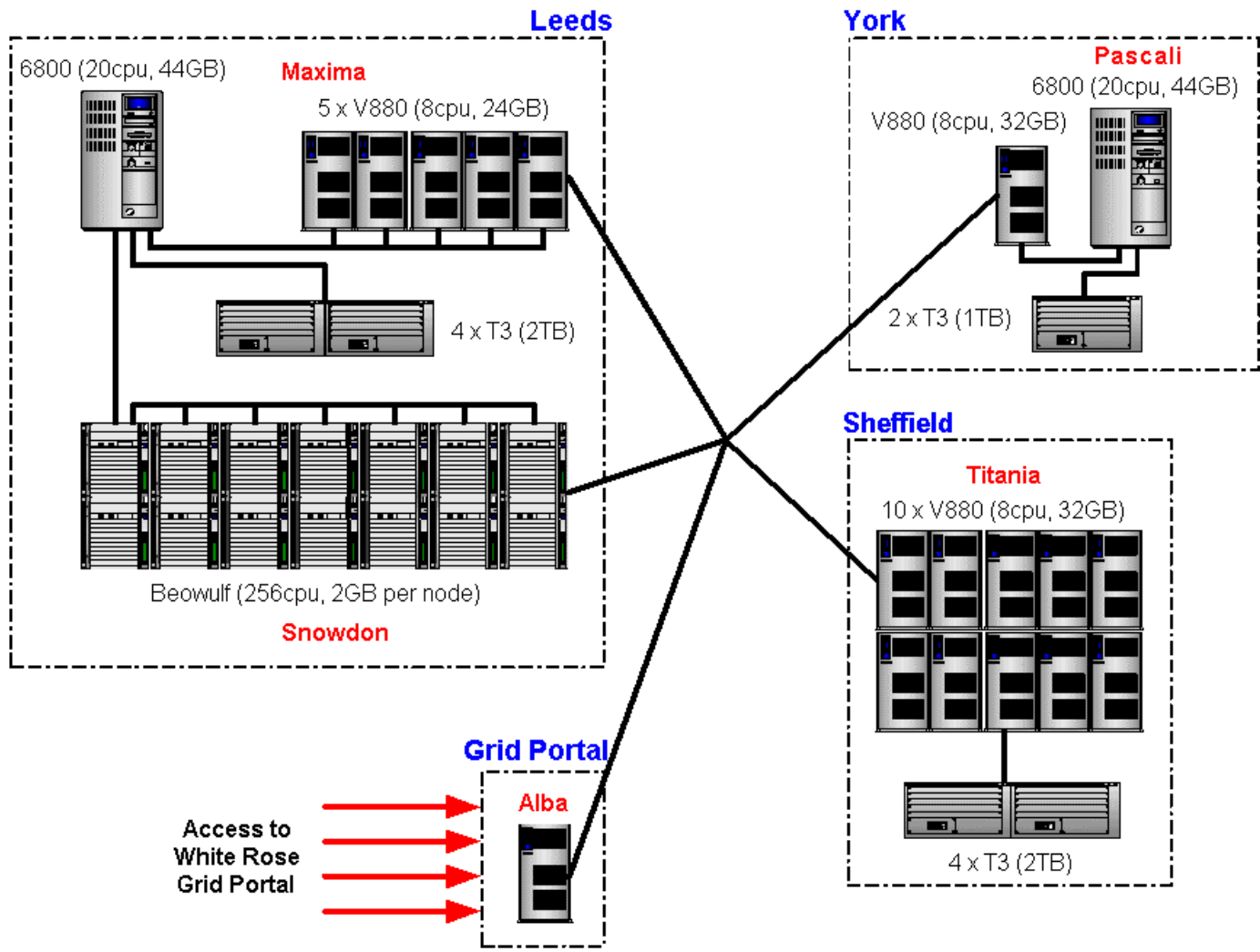


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- White Rose Grid
 - WR Grid provides the compute and data services needed to
 - Support scientific communities requiring high end computing resources
 - In WR and more generally within e-Science understand and demonstrate
 - More effective management of compute and data resources





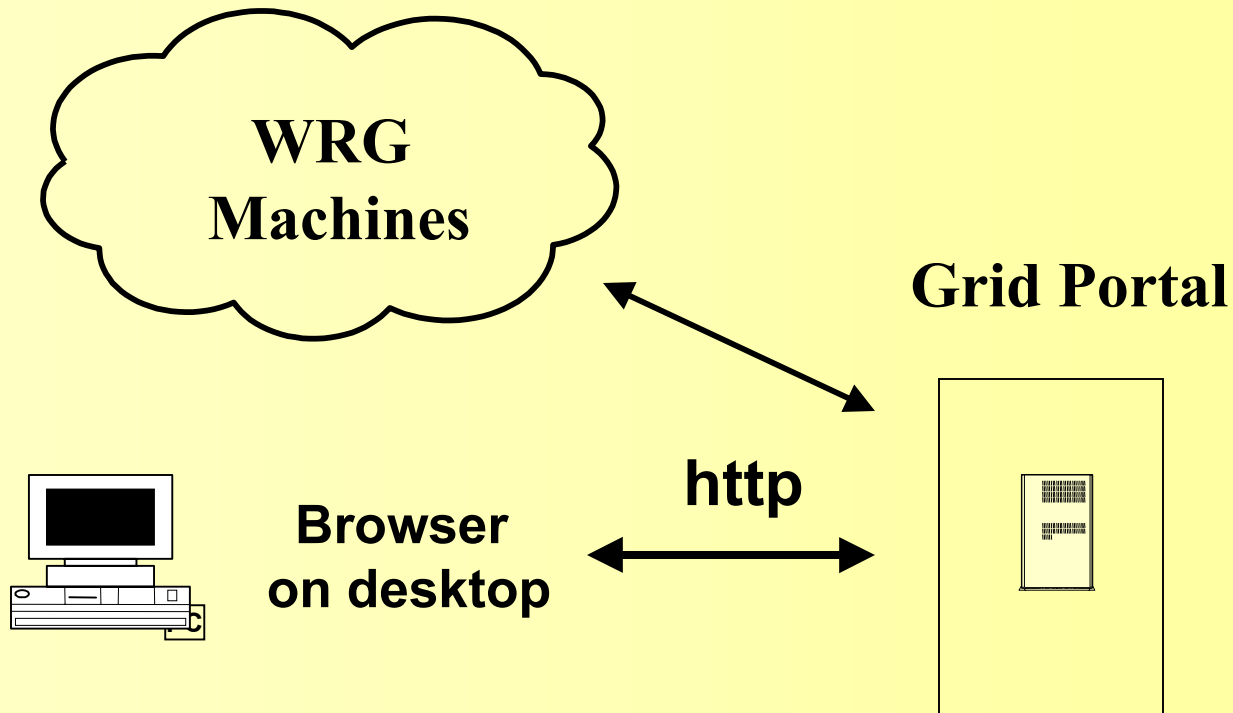
Named after White Roses





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Grid Applications

Grid Portals

Web Services

Resource Management

Data Management

Information Services

Grid Security Infrastructure

**Sun Grid Engine
(Leeds)**

**Sun Grid Engine
(York)**

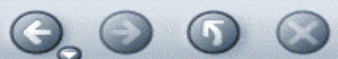
**Sun Grid Engine
(Sheffield)**

Maxima

Snowdon

Pascali

Titania



http://iri02.leeds.ac.uk:9080/damexto/damexto



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Welcome

Partners





Authenticate from Server

Username:

Password:

Authenticate from File

File:

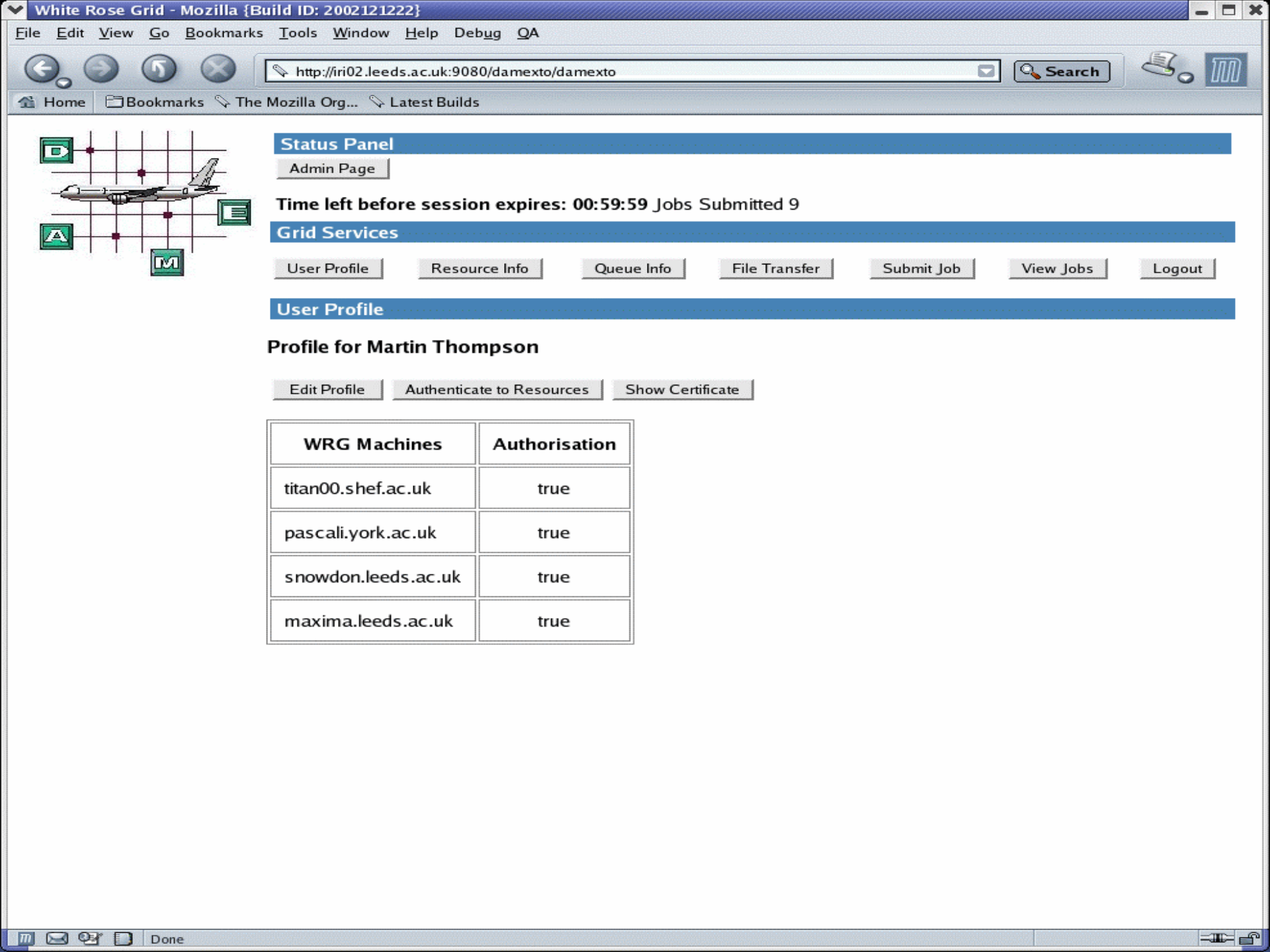
 UNIVERSITY OF LEEDS
  UNIVERSITY OF SHEFFIELD
  UNIVERSITY OF YORK

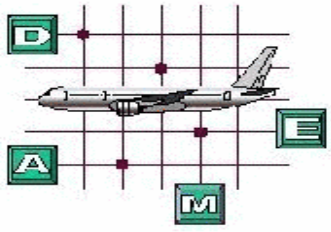
- Documents & Links
- [How to login to the portal](#)
 - [White Rose Grid](#)
 - [White Rose Consortium](#)
 - [UK e-Science](#)
 - [Grid Portal Development Kit](#)
 - [Java CoG](#)
 - [Globus](#)

- Projects
- [DAME](#)
 - [XTO](#)
 - [AURA-G](#)
 - [Hydra](#)



Welcome to DAME-XTO Portal





Status Panel

[Admin Page](#)

Time left before session expires: 00:59:53 Jobs Submitted 9

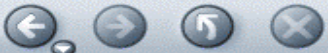
Grid Services

- [User Profile](#)
- [Resource Info](#)
- [Queue Info](#)
- [File Transfer](#)
- [Submit Job](#)
- [View Jobs](#)
- [Logout](#)

View Resources

View Resource Info from `ldap://iri23.leeds.ac.uk:2135/Mds-Vo-name=WRG Prototype,o=grid`

Hostname	Os name	Memory Ram Total sizeMB	Cpu speedMHz	Cpu Total count	Cpu Free 5minX100	Cpu model
titan00.shef.ac.uk	SunOS	24576	900	8	797	UltraSPARC-III+
pascal.york.ac.uk	SunOS	24576	900	8	693	UltraSPARC-III+
maxima.leeds.ac.uk	SunOS	24576	900	8	293	UltraSPARC-III+
snowdon.leeds.ac.uk	Linux	2013	2196	2	176	Intel(R) XEON(TM) CPU 2

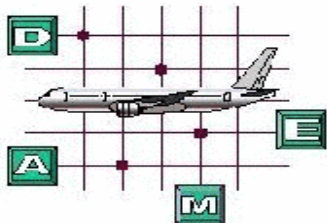


http://iri02.leeds.ac.uk:9080/damexto/damexto#

Search



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Status Panel

Admin Page

Time left before session expires: 00:52:26 Jobs Submitted 10

Grid Services

User Profile

Resource Info

Queue Info

File Transfer

Submit Job

View Jobs

Logout

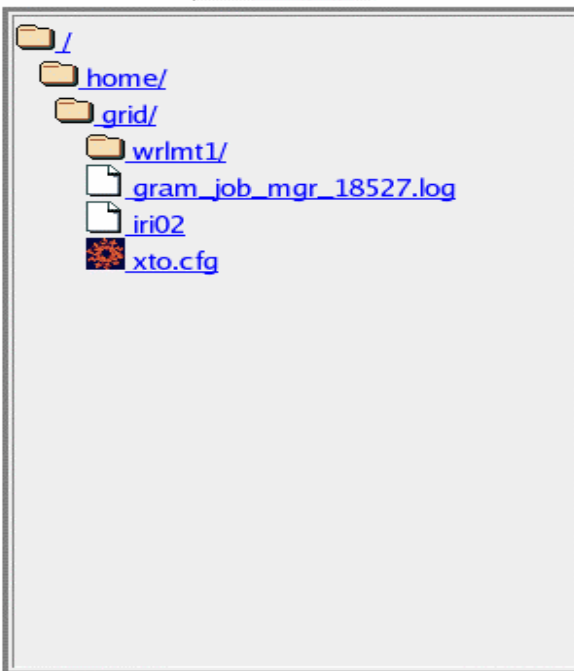
File Transfer

Display full file information

Host:

Directory: /home/grid/wrlmt1/

Selected File:



Host:

Directory: /home1/wr/wrlmt/

Selected File:

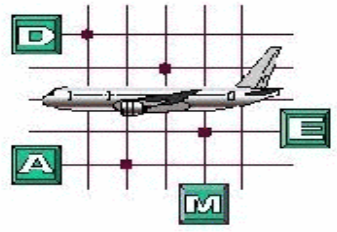




http://iri02.leeds.ac.uk:9080/damexto/damexto



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Status Panel

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Time left before session expires: 00:59:22 Jobs Submitted 9

Grid Services

[User Profile](#) [Resource Info](#) [Queue Info](#) [File Transfer](#) [Submit Job](#) [View Jobs](#) [Logout](#)

Job Submission

Job ID

WRG 710100x2

Data

Serial No.: Day: Month: Year: Engine Data:

71010.....7101004c.C01.....09:03:46.81.....04..Dec.2001	▲
71010.....7101005c.C01.....08:00:10.26.....05..Dec.2001	▨
71010.....7101006c.C01.....14:02:40.42.....06..Dec.2001	▼
71019.....7101912c.C01.....12:24:12.24.....12..Dec.2001	
71019.....7101917c.C01.....06:45:14.37.....17..Dec.2001	
71017.....7101703c.C01.....09:04:37.47.....03..Dec.2001	

Application

XTO Intel

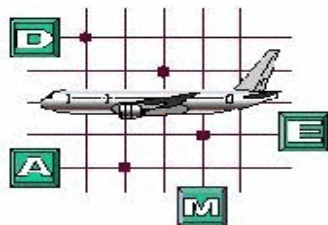
Compute Resource

Host Name: Job Manager:

Output

Output Directory: Wait? Email?

Submit



Status Panel

[Admin Page](#)

Time left before session expires: 00:56:07 Jobs Submitted 10

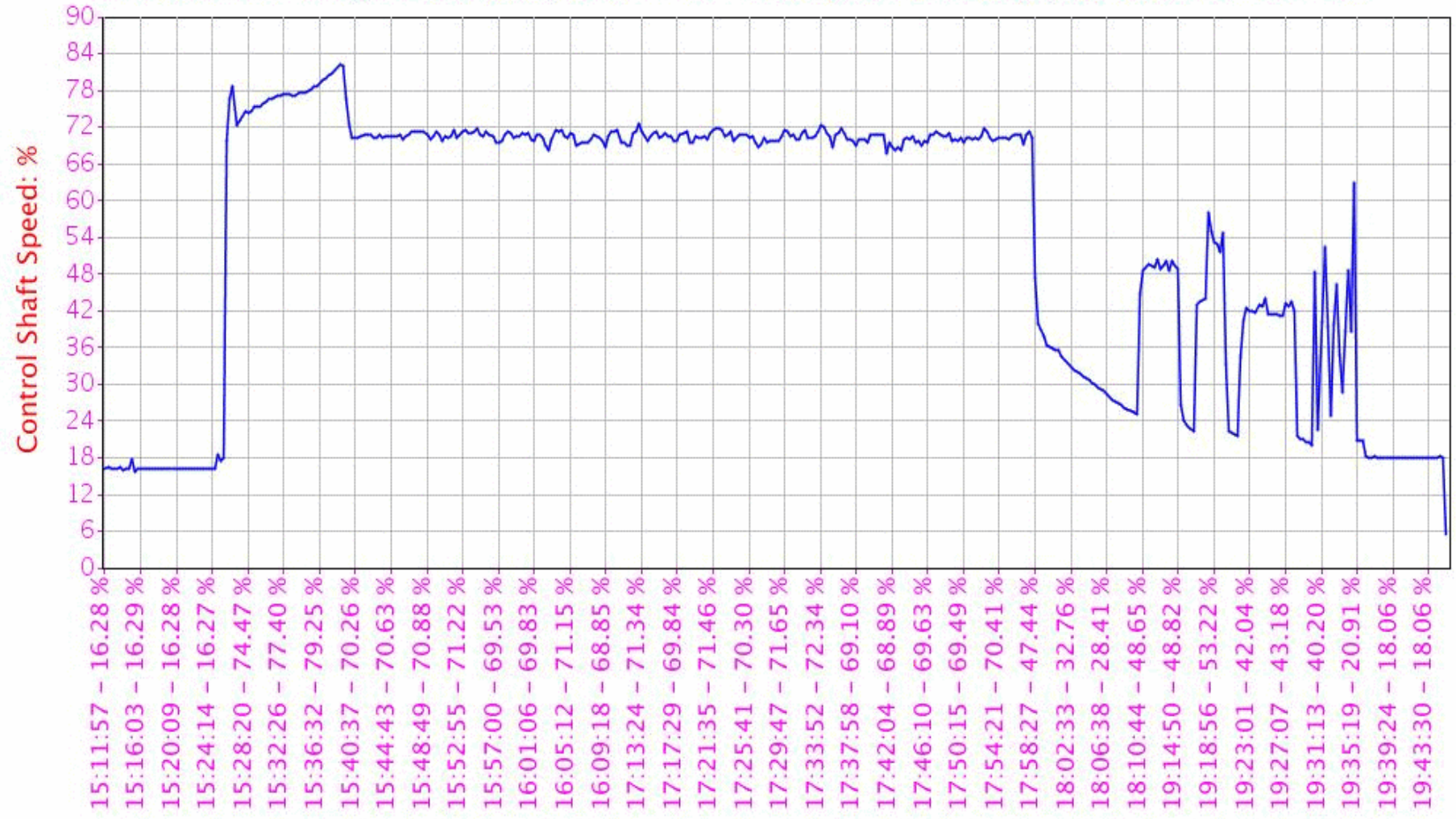
Grid Services

[User Profile](#)
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[Submit Job](#)
[View Jobs](#)
[Logout](#)

View Submitted Jobs

Job Name	Job Status	Time Submitted	Action
WRG 710100x2	ACTIVE	25-Jan-2003 18:10:45	Cancel Job
WRG 71017241	DONE	24-Jan-2003 18:19:51	View Chart
WRG 71017241	DONE	24-Jan-2003 18:04:06	View Chart
Fri 71017251	DONE	24-Jan-2003 17:51:30	View Chart
MInf demo	DONE	20-Jan-2003 16:59:00	View Chart
MInf demo	DONE	20-Jan-2003 16:58:52	View Chart
Mon 71017141	DONE	20-Jan-2003 13:43:04	View Chart
Thu 71017091	DONE	09-Jan-2003 12:21:42	View Chart
Wed 71017291	DONE	08-Jan-2003 20:34:53	View Chart

XTO ANALYSIS --



Time - Control Shaft Speed: %



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THE WHITE ROSE GRID

- Future Directions
 - Regional Outreach
 - Business
 - Universities
 - e-Science projects
 - Extension of DAME to new market sections
 - Problem Solving Environment for oil industry
 - Social sciences
 - Scientific communities





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- **Contact Points**

- **White Rose**

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- **University of Sheffield**

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 - Martin Thompson (Leeds/Esteem)
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 - Peter Froggatt (Sheffield)
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 - Joanna Schmidt (WR)
 - DAME Team
 - Georges Honore
 - Sarfraz Nadeem
 - Iain Gourlay

