

## White Rose Computational Grid



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## Outline

- About the White Rose Grid project
- Outcome of recent procurement
- Sun Grid Engine & Portal server (TCP)
- Interoperability with other Grid technologies
- WR e-Science projects
- DAME
- Summary

## The White Rose Consortium and the Grid

- The University Consortium comprises three of the Yorkshire region's most powerful research-based universities: Leeds, York & Sheffield
- Supports a variety of projects with industry; also studentships
- The White Rose Computational Grid project developed at a cost of £3.2M
- More information at: [www.whiterose.ac.uk](http://www.whiterose.ac.uk)

## The Geographical Location



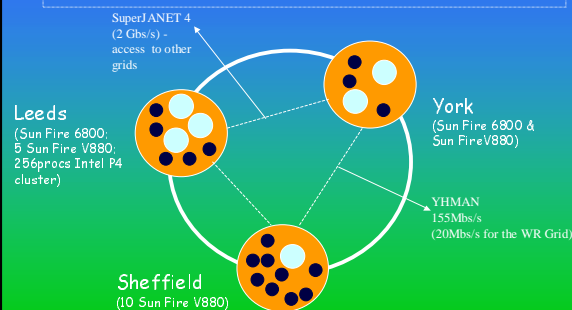
## About the White Rose Computational Grid project

- Involves Jim Austin (York), Geof Tomlinson (Sheffield) and Martin Doxey (WR)
- Allocated the UK Higher Education Funding Council grant in July 2001
- Started procurement in July 2001
- Ordered equipment in April 2002
- Service to commence in June/July 2002
- Many meetings, collaborative projects, and events are taking place

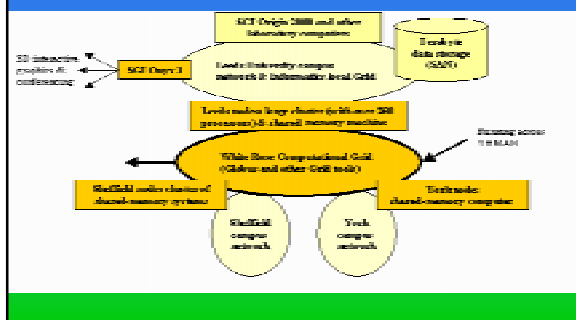
## About the White Rose Computational Grid project

- **Objectives**
  - To provide a stable, cost-effective, well-managed and responsive to user-needs, networked HPC service
  - To promote collaboration between the White Rose Universities and with the Region
  - To develop partnership with the supplier to progress research of mutual interest
  - To provide an effective infrastructure for e-Science projects
- Partners: Yorkshire Forward along with Esteem Systems, Sun Microsystems & Streamline Computing

## WRCG: set of campus grids



## Integration of the WR Grid into universities' facilities



## Employing Sun Grid Engine

- Four computational nodes: two at Leeds, one at York and one at Sheffield
- SGE master/shadow configuration to be decided
- Each node would have its own local database
- The LDAP based authentication mechanism to be used
- An HA cluster (Sun Blade 1000) also to be used for certificate serving and as an LDAP master

## Why SGE/TCP ?

- **Required**
  - Single environment
  - Seamless & transparent access to resources
  - Automatic job scheduling across network
  - Parallel & interactive job support
  - Fairshare/priority (the Share Tree Policy/the override) access to resources
  - Resource accounting
  - Comprehensive administrative control
  - Web portal access
  - the iPlanet Portal server integration into the WRCG LDAP authentication

## Global Grid integration

- Integration with Globus required
- TCP to be employed as an interface to Globus
- SGE resource broker to be tested
- Transition to a Regional Grid node employing SGE Enterprise Edition
- Integration with other e-Science grids

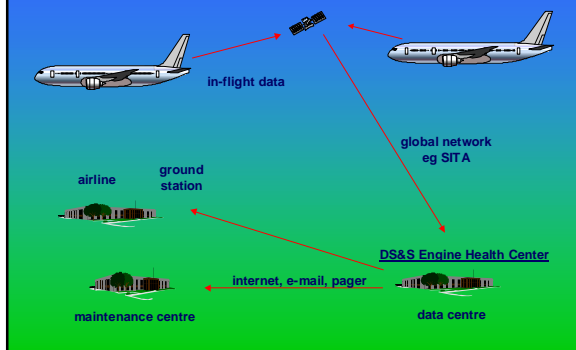
## e-Science projects

- **UK e-Science projects**
  - DAME (Distributed Aircraft Maintenance Environment) - Jim Austin
  - Collaborative Visualisation and Steering the demonstrator - Ken Brodrie
    - Concept of collaborative computational steering
    - Uses IRIS Explorer modular visualisation environment
  - Computational Geography demonstrator - Mark Birkin

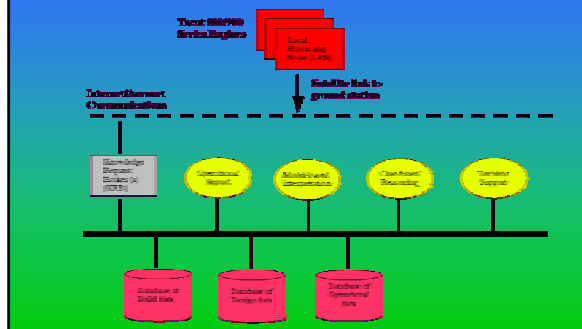
## DAME led by Jim Austin

- Focus
  - Distributed Aircraft Maintenance Environment
- Aim
  - to build a Grid test-bed for distributed diagnostics
- Partners:
  - Researchers from each of the White Rose Universities and Oxford University
  - Rolls Royce, its information system partner Data Systems & Solutions, and
  - Cybula Limited

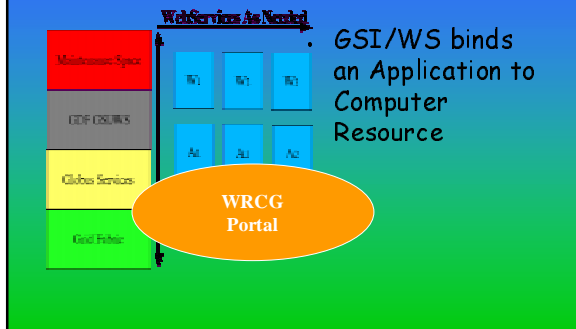
## Global in flight engine diagnostics



## Proposal architecture (1)



## Web maintenance services



## Summary

- Large investment in Grid computing to create advanced research backbone
  - Application driven
  - Quality of Service in a Grid
- The way forward with SGE/TCP iPlanet portal
- New way of collaborative working
- Deployment of the WR Grid to serve the regional needs and later other communities