



# THE WHITE ROSE GRID e-Science Centre

## BROADEN

### Introduction

The White Rose Grid is a partner in the follow-on project to the successful DAME e-Science pilot project. The DAME concepts are maturing and heading towards commercial realisation through a DTI funded project called BROADEN (Business Resource Optimisation for Aftermarket and Design on Engineering Networks).

Rolls-Royce are the lead partners in the £4million project funded within the IEC Technology Programme, and one of their primary objectives is to build an internal pilot grid. This will support the integrated diagnostic tools from DAME and the associated large volumes of engine health monitoring data collected during ground-based testing at pass-off and overhaul. It will also support large-scale numerical simulations of high fidelity CFD (computational fluid dynamics) for design optimisation, and very large-scale agent-based modeling of aftermarket business processes, incorporating logistics and the supply chain.

### Grid Business Concepts

The business model presented by Rolls-Royce, and which underpinned the DAME project, was based on the management of the gigabytes of data that could be downloaded from Rolls-Royce state of the art engine monitoring technologies. A data model was developed that was based on the premise of the data being downloaded and held in remote repositories at airports and maintenance centres around the world. A fundamental challenge for the project was to develop Grid methods that could allow access to the data by a diverse range of stakeholders and which would

permit maximum business value from the data by permitting Rolls-Royce and partners to run fleet-wide diagnostic and prognostic services on the data, to monitor for problems and also to look at optimising the global maintenance services.

These ideas and concepts are now being developed on a large scale internal Rolls-Royce Grid managed by EDS, their prime IT contractor. The internal Grid will provide the opportunity to assess the DAME concepts at production levels scales; dealing with scalability of both the data management architecture and the decision support and data-mining tools.

### Challenges

The research challenges which will be addressed cover a number of diverse issues relating to the task of condition health management and large scale distributed data management and include:

- real-time intelligent feature extraction
- intelligent data mining
- decision support techniques

The large databases and the need for distributed access to the data make this a particularly challenging problem for the Grid.

### Partners

BROADEN is a DTI Inter-enterprise Technology Programme consortium comprising:

Rolls-Royce, EDS, LostWax, Oxford Bio-Signals, Cybula, Stream-Line Computing and the White Rose Universities of Leeds, Sheffield and York

### Further Information

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THE UNIVERSITIES OF LEEDS, SHEFFIELD AND YORK

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