


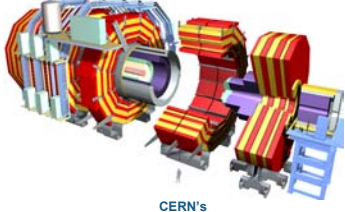






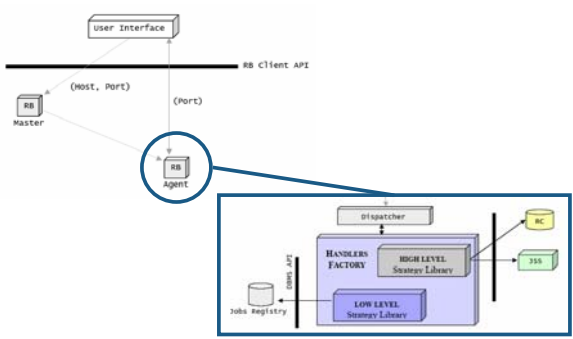


  
 London e-Science Centre [www.lesc.imperial.ac.uk](http://www.lesc.imperial.ac.uk)  
 Imperial College London   
**An OGSA Framework for Load-balancing European DataGrid Resource Broker**  
 William Lee  
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 London e-Science Centre [www.lesc.imperial.ac.uk](http://www.lesc.imperial.ac.uk)  
**European DataGrid**  
 Enabling access to geographically distributed computing and storage facilities.  
 Biological and Medical Applications   
 Earth Observation **CERN's Large Hadron Collider**  





  
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**Work Package 1 - Workload Management**  

- Define and Implement an Architecture for distributed scheduling and resource management
  - Resource Broker
  - Compute Elements
  - Replica Catalog
  - Job Submission Service

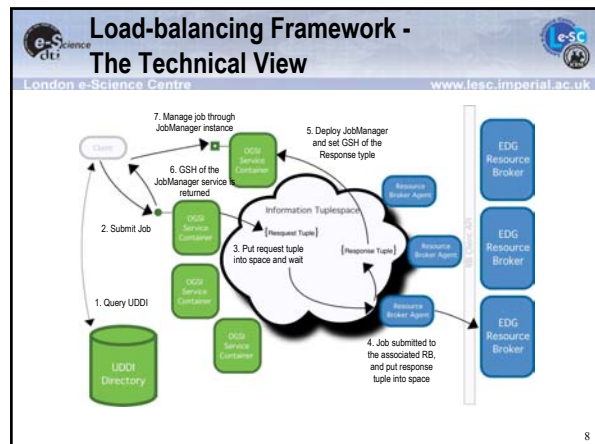
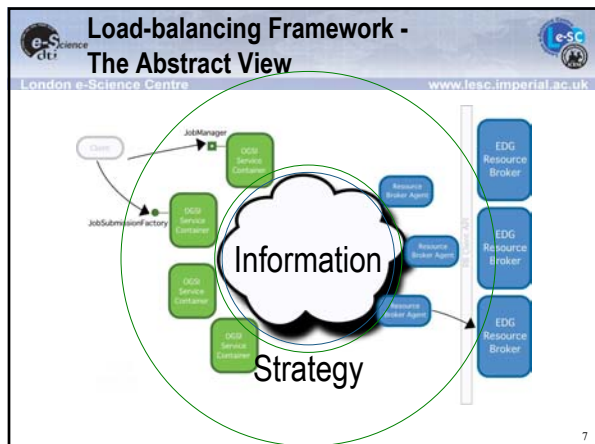

  
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**Work Package 1 - Workload Management**  



  
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**Resource Broker Architecture**  

- Client/Server model
- Providing Job Submission / Management Client API
- Java, C++, Python Applications can interact using the Resource Broker Client API
- Scalability of the Client/Server model...


  
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**An Open Grid Services Framework**  

- Transform Resource Broker to an interoperable service oriented architecture
  - JobSubmissionFactory
  - JobManager
- Resource Brokers dynamically participate in a Resource Pool
- Symmetric Services running on multiple OGSA Grid Containers



- ### Implementation
- Tuplespace -
    - Default Javaspaces Implementation
    - Transaction and Persistence
  - OGSA Container
    - Globus Toolkit 3.0.1
    - Extended Factory Provider to allow instances to be created on co-operating containers
    - Message-level security

- ### Discussions
- Interoperability
  - Decentralised
  - Transparency
  - Separating Information and Decision

- ### Future Works
- Notification to inform user of job status change
  - Security in Javaspaces
  - Generic Load-balancing framework and Job Submission Port Type
  - Performance Analysis

- ### Research Funding
- EPSRC/DTI Core e-Science Programme
    - The London e-Science Centre (THBB/C/008/00023)
  - Engineering Physical Science Research Council
    - RealityGrid (GR/R67699/01)
    - Discovery Net (GR/R67750/01)
    - Effective Multi-user Multi-job Resource Utilisation (GR/R74505/01)
    - High Performance Software Components (GR/N13371)
  - Wellcome
    - BAIR (066786/A/02/Z)
  - Biotechnology & Biological Sciences Research Council
    - Proteome Grid (28/BEP17014)
  - Natural & Environmental Research Council
    - GENIE

**Acknowledgements**

London e-Science Centre [www.lesc.imperial.ac.uk](http://www.lesc.imperial.ac.uk)

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- Technical Director: Dr Steven Newhouse
- Research Staff:
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**Equipment Funding**

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- Strategic Research Investment Fund (SRIF)
  - £3M to IC HPC (May 2001)
    - £1.9M Computing & Storage Resources
    - £750K Networking Infrastructure
    - £350K Refurbishment
- HEFCE Joint Research Equipment Initiative
  - An Open Multi-disciplinary Parallel Computing Resource for Imperial College (2001 – GR/R62083/01)
  - IC Informatics Grid (2000 – GR/R04034/01)
  - EPSRC Strategic Equipment Initiative (2000)
  - CFD Server for IC (1999 – GR/M92355)
  - A High Performance Parallel Server for multi-disciplinary activities at Imperial College (1996 – GR/L26100)

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**Collaborators**

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- Imperial College
  - High Energy Physics
  - Space and Atmospheric Physics
  - Computational Science (Aeronautics & Mech. Engineering)
  - Data Mining
- External
  - Manchester Centre for Novel Computing
  - QMW Centre for Computational Science
  - Condor Team, University of Wisconsin
- Industrial
  - Sun Centre of Excellence in e-Science
  - Intel Virtual European Centre of Excellence
  - Compusys

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