



THE WHITE ROSE GRID e-Science Centre

iREAD Project: iRODS Evaluation & Demonstration

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Objectives

- The **iREAD** project provides a 15 month evaluation of iRODS, within the context of the UK e-Science activities and initiatives.
- JISC funded, as part of e-Infrastructure programme
- Four main work-packages:
 - A demonstration implementation of the iRODS data management system on the White Rose Grid;
 - An evaluation of the iRODS system for fine-grained role-based access;
 - Analysis of the capabilities of iRODS for integration with existing e-Science SOA infrastructure and middleware systems;
 - An assessment of the maturity of the iRODS technology for integration with existing UK e-Science security infrastructures such as Grid-shib and Kerberos;



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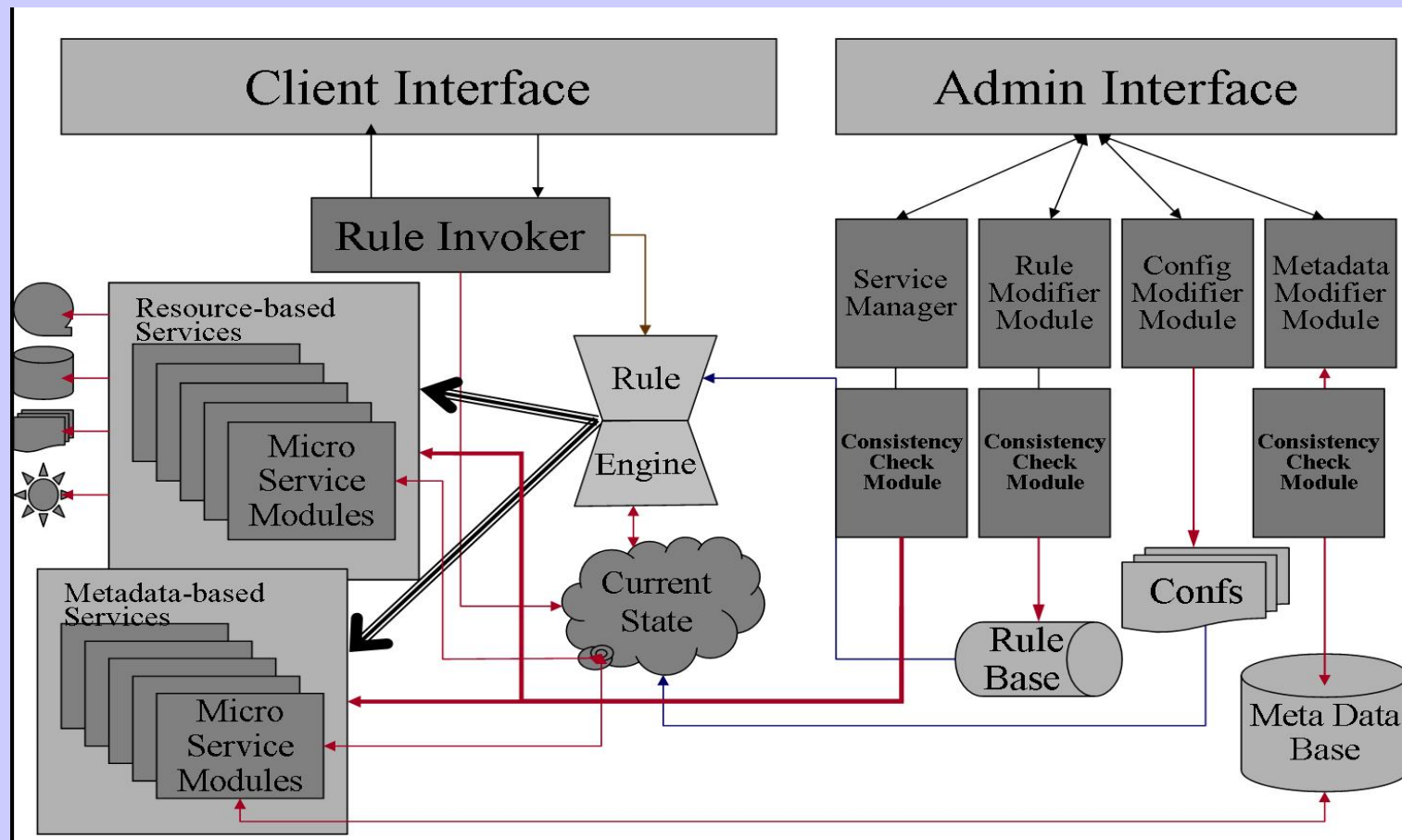
iRODS new features

- iRODS builds on the capabilities of SRB and moves it forward in several key areas:
 - iRODS offers users far more power to configure the middleware management structure of SRB, providing an adaptive middleware architecture (**AMA**).
 - Achieved by coding the processes that are being performed in the iRODS data grid system as **rules**. The rules explicitly control the operations that are being performed when a data access is requested within iRods.
 - These operations are called **micro-services** and are C-functions that are called when executing the rule body.



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iRODS Architecture





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iREAD Progress

- Developed a public demonstrator of iRODS on the WRG:
 - <http://www.wrg.york.ac.uk/iread>
- Documenting experiences with building and deploying iRODS
 - <http://www.wrg.york.ac.uk/iread/irods-installation-experience>
- Assessing integration within e-Science framework, showing how web-services can be invoked as part of an iRODS (automatic) workflow, with services invoked by iRODS rules
- Demonstrating how services can be built and deployed within a virtual collaboration environment; CARMEN Case study



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CARMEN Case Study

Sharing Data in iRODS Data System



Scientist A
Adds data to
Shared Collection

Scientist B
Accesses and
analyzes shared
Data

iRODS Data System

**Brain Data
Server, CA**

**Audio Data
Server, NJ**

**Video Data
Server, TN**

**iRODS
Metadata
Catalog**

Learning scientists can use iRODS as a "data grid" to share multiple types of data, near and far. iRODS Rules enforce and audit human subjects access restrictions.



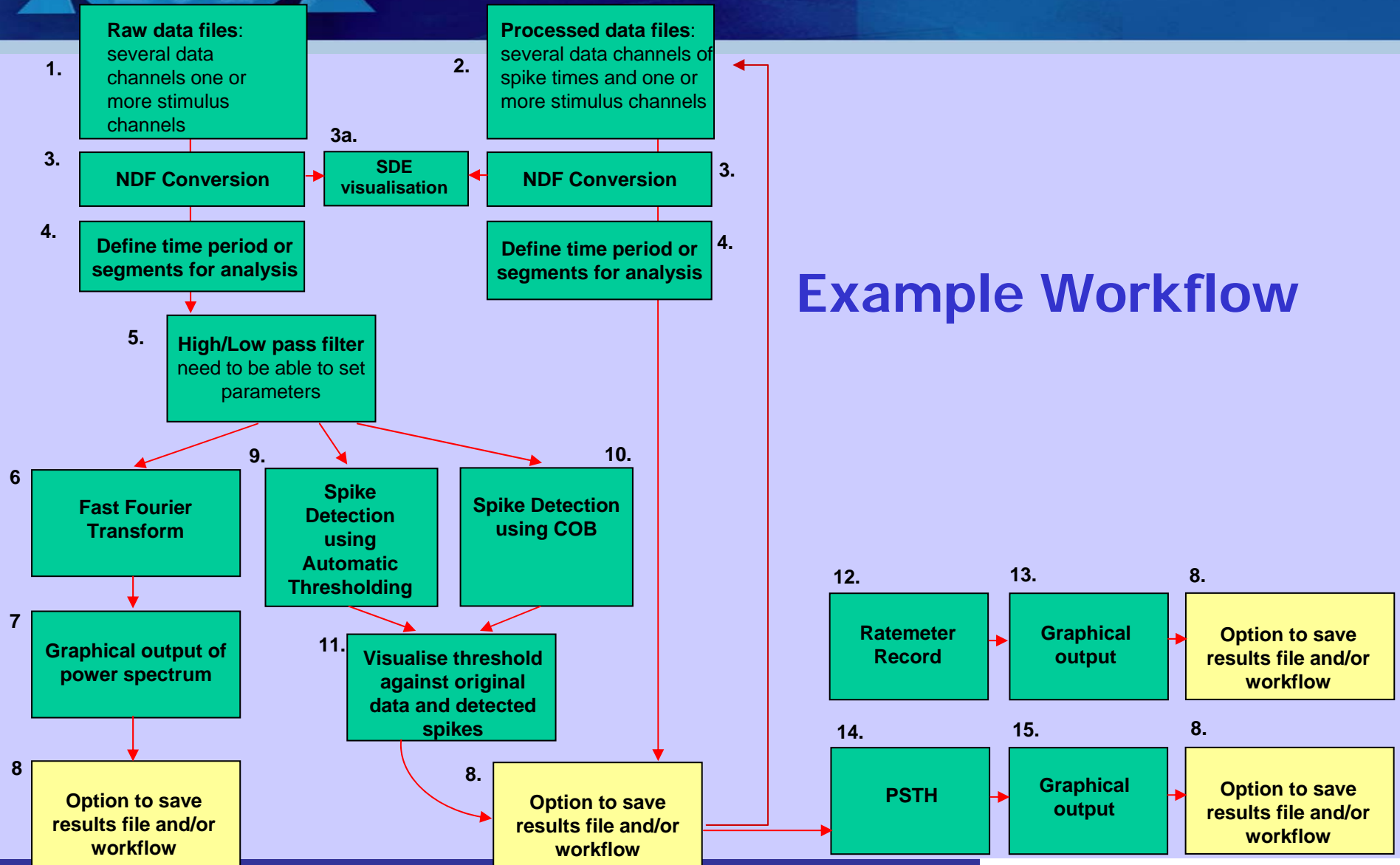
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CARMEN Activities

- CARMEN must support many diverse data formats and types;
 - Translators (web-services) have been built that provide means to move between proprietary formats and internal CARMEN Neurophysiology Data Format (NDF)
 - iRODS rules are being developed that provide automatic workflow invocation
- Data is translated without user intervention when:
 - Data is uploaded
 - Data is staged to an internal neuroscience workflow



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CARMEN progress

- Have demonstrated how remote services can be invoked as a rule within iRODS
- Currently completing the integration of the translators into the iRODS rule set
- Working on incorporation of security layer on services so that security credentials can be passed to services from iRODS without user intervention
- Looking at use of PYTHON, JAVA and Matlab API's to allow integration of other types of service within an iRODS rule



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Next Steps

- Migration of iRODS to CARMEN System (i.e. replace SRB)
- Further work on integration of fine grained role based access via e-Science infrastructures, e.g. Gris-Shib (in collaboration with study being carried out at Kings College)
- Completion of full evaluation report by May 2009
- Dissemination of results via workshops and OMII