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# ReDReSS

## “Resource Discovery for Researchers in e-Social Science”

Rob Allan and Rob Crouchley

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### Main Aim of ReDReSS

“ to accelerate the development and awareness of a new kind of computing and data infrastructure for the social sciences; and to support the increasingly national and global collaborations emerging in many areas of social science”

(Funded by JISC and ESRC)

ReDReSS



LANCASTER  
UNIVERSITY

## The ReDReSS Project

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### "Resource Discovery for Researchers in e-Social Science"

The web-based resource discovery portal ReDReSS brings together and integrates all resources that are of value to the e-Social Scientist. Resources are presented as a co-ordinated series of stepping stones, taking the researcher from developing an awareness of what can be achieved using Grid technologies to finally using it in their own research. Initially the portal will raise awareness by providing illustrations of the potential of e-Social Science. Ultimately, it will include descriptions of, and pointers to, projects that are exemplars of e-Social Science research



Alexandra Square

ReDReSS extends the service provided by TRAMSS (Teaching Resources and Materials for Social Scientists, [trams.data-archive.ac.uk/index.asp](http://trams.data-archive.ac.uk/index.asp)) to make e-Science relevant to substantive researchers in the social sciences. The materials use different media such as online audio and video materials, real-time software middleware demonstrations, and Impatica PowerPoint presentations. These e-Learning resources are being developed under the ESRC-funded National Training and Support Service for Quantitative Social Science at Lancaster ([www.cas.lancs.ac.uk/ESRCdemo/maindemo.htm](http://www.cas.lancs.ac.uk/ESRCdemo/maindemo.htm)). All materials will be freely downloadable or available on CD.

<http://redress.lancs.ac.uk>

Lancaster eScience Centre  
Bowland College  
Lancaster University  
Lancaster LA1 4YF  
United Kingdom

ReDReSS

## Role

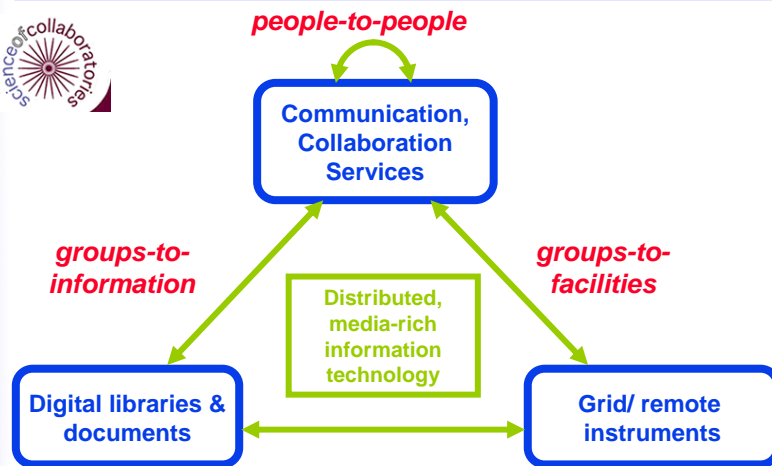
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- To help illustrate appropriate methodologies and software that admits the full complexity of substantive problems;
- To help articulate the middleware needs of social researchers;
- To help nurture and support a community of social researchers;
- To help to provide critical mass and improve the efficiency of interactions between the interested researchers, thus reducing the number of lost opportunities for social science;
- Provide technology for aggregating content.

"Teaching by Example and Collaboration!"

## Science of Collaboratories

ReDReSS

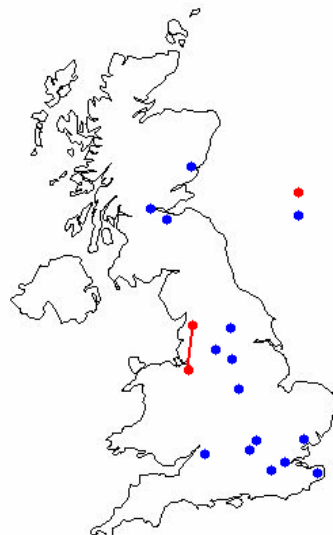


<http://www.scienceofcollaboratories.org/>

NSF Funded ITR

## The ReDReSS Community

ReDReSS



**Lancaster/Daresbury**  
**Other**  
**Contributors/Steering**  
**Committee**

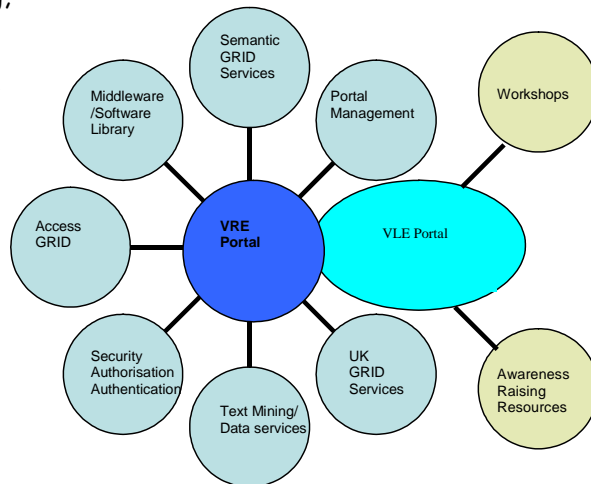
... plus other contributors  
in the UK (NCeSS), from  
the USA and Europe

Key components will be accessible on the Grid and linked  
into the portal and demonstrators

## Activities of the Project

ReDRESS

- Web Portal,
- Awareness raising, Wish lists,
- E-Lecture Series,
- Collaboration Tools,
- Distributed Services/ Resources.

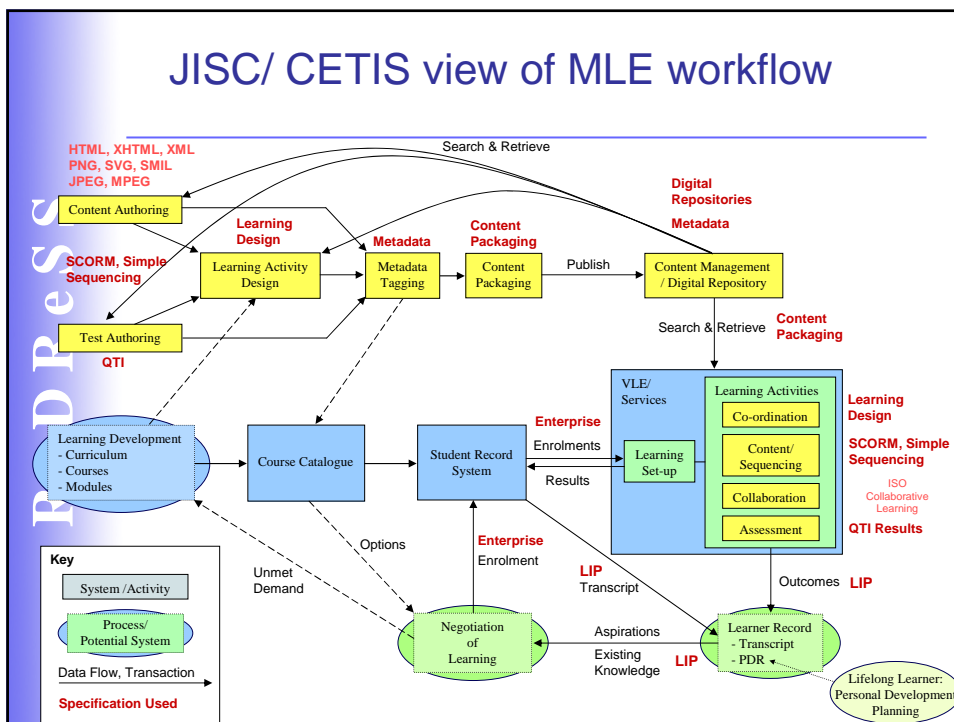
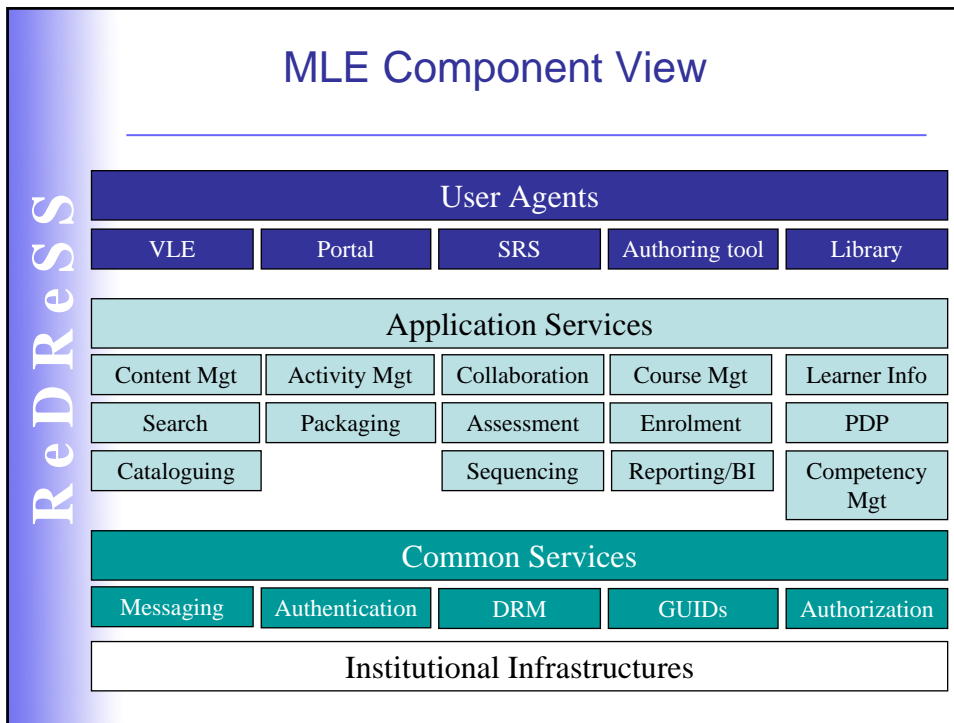


## What is a MLE

### *Managed Learning Environment*

ReDRESS

- An MLE is the full range of information systems and processes of an institution that contributes directly or indirectly to learning and the management of learning;
- A Virtual Learning Environment VLE is the subset of MLE components that provide online learning interactions for learners and teachers;
- MLE Components include enrollment, security, portal, digital library functions on learning resources, access to administrative material, payment, attendance tracking, authoring curriculum, learning planners, quizzes, homework, grading, assessment, distance teaching, computer-aided instruction, collaboration tools;
- ReDRESS is training and awareness environment - it does not need MLE assessment and grading tools;
- BUT - it *does* need Grid tools to access demonstrators.



## ReDRESS Portal Content

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- Introductory material from roadshows;
- Specific material from the Agenda Setting Workshops;
- On-line demonstrators;
- Course timetables/ notes;
- Video/ audio material;
- Associated reference material and FAQs;
- Links to JISC national collections;
- Links to partner institutions in Social Science;
- World wide links;
- E-mail for students/ staff;
- Additional help for self learners;
- Examination and monitoring results.

Note: some of this will be done by NCeSS

## Content List (ongoing)

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- What is the Grid?
- Numerical Libraries for High Performance Computing
- Overview of e-Science - Methods and Directions
- Principles of Parallel Programming
- An Introduction to Web Services
- Video-based research of conduct and interaction
- Material - Awareness
- Exemplars of interdisciplinary research
- The Role of Visualisation
- Database Management on the Grid
- R Commander
- Java Online
- Qualitative data analysis online
- Modelling and simulation in the social sciences

## Example 1: Multimedia Demonstration



## Example 2: Cross search Tool from SPP

R-D-N Subject Portal Demonstrator Hello | Login

Home Search News What's new Events

Welcome

The subject portal demonstrator brings together a range of information to illustrate the possibilities of subject-based portals. A range of subject-based services will be prototyped by the RDN Hubs.

**What does the Subject Portal offer?**

**Cross search**

Search a range of diverse information sources through a single search box; brings together reports, articles, book references, Internet sites and more

**Customisation**

Tailor the subject portal to your own requirements; save searches, email search results, see new information based around your subject interests, etc.

**News feeds**

Scan daily updated news from a number of publications in your subject area.

Login

**CUSTOMISE**

Have an **Athens** account? Login in [here](#) ([why Athens?](#)) or you can **create** an RDN account to customise the content and layout of this site.

Username:

Password:

[Login](#) | [Help](#)

[Login via Athens](#) | [Create an RDN account](#)

**Portal Bug Reporting**

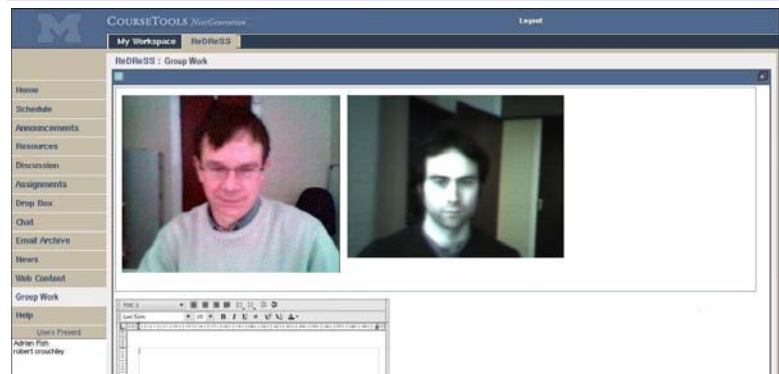
Please report any problems, suggestions or bugs to this address: [spp-bugs@dev.portal.ac.uk](mailto:spp-bugs@dev.portal.ac.uk)

Please include **{DZ00}** in your subject line and, if you are reporting a bug, try to provide as much information as possible about when the problem occurred. This makes it easier for us to replicate it.

The Subject Portals Project is a JISC funded initiative which is being run by UKOLN at the University of Bath. This site is meant to demonstrate the deliverables of the project and is not a public service.

R-D-N ILRT

### Example 3: Audio/ video Collaboration



- Collaboration with Universities of Lancaster and Michigan;
- We are adding video conferencing for joint working on the same document;
- Students-tutors or peers?
- Will link into AGN and other portlets (collaboration with Geoffrey Fox, Indiana).

### Portal Technology

- ReDReSS identified CHEF/ Sakai as appropriate 2<sup>nd</sup> generation portal technology (Technology Survey by Adrian Fish);
- CHEF, *Comprehensive Collaborative Framework*, was developed by Charles Severance, U. Michigan and the Grid Computing Environments GGF research group;
- Supports Managed Learning activities;
- Additional JISC funding to evaluate Sakai for a Virtual Research Environment;
- Collaborators attended Sakai Educational Partners' Programme conferences, Denver, 23-25<sup>th</sup> June;
- Based on uPortal 3.0 which supports JSR-168 and WSRP standards;
- Sakai 1.0 beta released on 22<sup>nd</sup> June, so following slides show work in previous CHEF framework.

## Sakai/ CHEF/ OGCE

ReDRess

### Background:

- Sakai/ Chef already adopted as the open source framework/ workbench of choice for VLE(MLE)/ VRE development in the USA and used already in some UK e-Science projects;
- Big new investments from Mellon and Hewlett Foundations and leading American Universities (\$6.8M Sakai + \$2M estimated for OGCE);
- We need to add JSR-168 and WSRP compliant portlets to Sakai/ Chef. This will require generic portlets to access Web services via the registry and link to core services;
- The Sakai/ OGCE projects have critical mass and a lot of momentum. Chief architect Charles Severance presented on Sakai at the JISC *Awareness Raising Days*.

<http://www.sakaiproject.org>

ReDRess

The screenshot shows the Sakai Project website homepage. At the top left is the Sakai logo. Below it is a search bar with a 'go' button. The main content area is titled 'The Sakai Project' and contains a paragraph about the consortium and a 'Project Notes' section with a news item dated Feb. 9, 2004. On the right side, there are sections for 'Partners Program (SEPP)' and 'Sakai Headlines'. The website has a blue and white color scheme.

**Sakai**

[About Sakai](#) | [Sakai Board](#) | [Code](#) | [FAQs](#) | [License](#) | [Partners Program](#) | [Presentations](#) | [Request info.](#)

sakaiproject.org

Search  go

**Sakai Core Institutions**

- University of Michigan - CourseTools
- Indiana University - OnCourse
- MIT - Stellar
- Stanford University - CourseWork
- JA-SIG - uPortal

**Related Projects**

- CHEF
- O.K.I.
- uPortal
- O.S.P.I.
- Navigo

**Foundation Support**

- Mellon Foundation
- Hewlett Foundation

**The Sakai Project**

The University of Michigan, Indiana University, MIT, Stanford, the uPortal Consortium, and the Open Knowledge Initiative (OKI) are joining forces to integrate and synchronize their considerable educational software into a modular, pre-integrated collection of open source tools.

**Project Notes**

**NEWS: Sakai Educational Partners Program Launched**

**Feb. 9, 2004**  
Ann Arbor, Michigan – The Sakai Project announces the launch of the Sakai Educational Partner's Program (SEPP) with a \$300,000 grant from the William and Flora Hewlett Foundation. The role of SEPP is to further the development and adoption of open source Sakai Project software in higher education.

**Partners Program Notes**

**Sakai Project moves toward further definition**

Two meetings will bring further definition to the Sakai project and products. Sakai developers meet February 19-20 at Stanford University and functional specialists meet February 26-27 at Indiana University.

Questions about architecture and features and functions from Sakai presentations have

**Partners Program (SEPP)**

[Become a Partner](#)

**NEW: Partner Login:**

SEPP News

**Sakai Headlines**

[All Articles...](#)

**NEW: Sakai Educational Partner's Program -Press Release**

4 Colleges Collaborate on Open-Source Courseware

Sakai Project launches groundbreaking open source collaboration

More Sakai details revealed and partner programme presented

## Hiroyuki Sakai



### Iron Chef French – Fusion Cuisine

Iron Chef is a Japanese produced show that pits the "Iron Chefs", master chefs in various culinary styles, against challengers who try to prove their culinary prowess and skill.



## Hiroyuki Sakai

Sakai is the current French Iron Chef who wears a red outfit and holds a pear. Sakai is the second French chef and started at the beginning of 1994 after Ishinabe retired. He cooks at the French restaurant, [La Rochelle](#), which offers a great view of Tokyo from its 32nd floor location. The restaurant's name is from a city in France where Sakai spent some time (as revealed in the France Showdown special).

When he was a young boy, Iron Chef French Hiroyuki Sakai wanted to become a chef so that he would never go hungry. Born in Kagoshima, he began learning his craft in Osaka at a restaurant in the Shin Osaka Hotel when he was 17.

But Sakai began to rebel against the culinary world's feudalistic system of apprenticeship. At 19, he traveled alone to Perth, Australia, to build his skills at the Hotel Oriental. After a year and a half in Australia he returned to Japan, spending three years studying at Ginza Shiki with the late Fujio Shito, his predecessor as the leader of French cooking in Japan. He later worked as a chef at the restaurants Coco Palms in Aoyama and John Kanaya in Roppongi. When he was 38, Sakai opened his own restaurant--La Rochelle--in Aoyama. The restaurant's name is from a city in France where Sakai spent some time (as revealed in the France Showdown special). Several years later he moved the restaurant to Shibuya, where it remains today.

## 境

KYOU / sakai

Boundary, Situation

逆境 Gyakkyou – adversity, adverse circumstances

边境 Henkyou – frontier, remote area

心境 Shinkyou – frame of mind, mental state

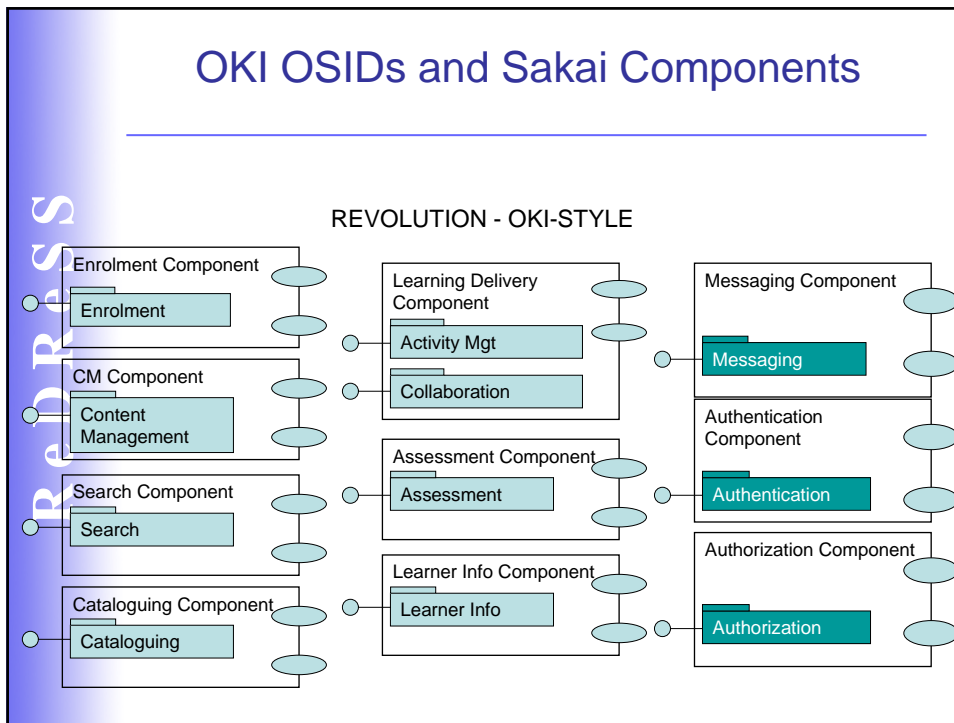
So why name a portal after him? SAKAI originally stood for: *Synchronous Architecture for Knowledge Access and Integration*. Not good! According to Dr. Chuck, above definitions fit well, since we are embarking on a difficult project that will cross important frontiers, taking us into remote areas, and that will require determination and clarity in our thinking.

## Further notes on CHEF/ Sakai

CHEF is a "content management framework" using portlets;

- Provides a mechanism for software development which allows organizations to share and re-use each other's work;
- Utilizes existing technologies wherever possible and adds value rather than invent all new;
- Enables code reuse across multiple organizations;
- Lead to portal technology - previously Jetspeed, now uPortal;
- Sakai is enhancing CHEF;
  - U Michigan, Indiana U, MIT, Stanford all sharing tools;
  - uPortal is a member;
  - Mellon Foundation provides funding.
- Sakai builds on OKI, Open Knowledge Initiative, interfaces
- OSIDs were developed outside the Grid process but appear to have overlaps with many Web service and Grid standards

# OKI OSIDs and Sakai Components



<http://redress.lancs.ac.uk/chef/portal>

ReDRess

**LANCASTER UNIVERSITY**  **The ReDRess Project**

**CHEF Logon**

Email:  Password:

[Top ^]

CHEF has been installed at Lancaster, and has already proven itself as a useful collaboration tool for the developers

Work sites for:

- Developers
- Collaborators
- ReDRess
- Lancaster

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## Portals and Frameworks

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A portal is a framework to deploy tools in "windows" and focus on how the user wants to arrange their own windows;

- Each project can customise the look and feel for its own partners;
- While CHEF technically is a portal, the goal is for the tools to work together closely and seem to really be parts of a larger "toolset";
- CHEF has a lot of features, (services, presence, notification, etc.) which bridge the gap between portal and application framework;

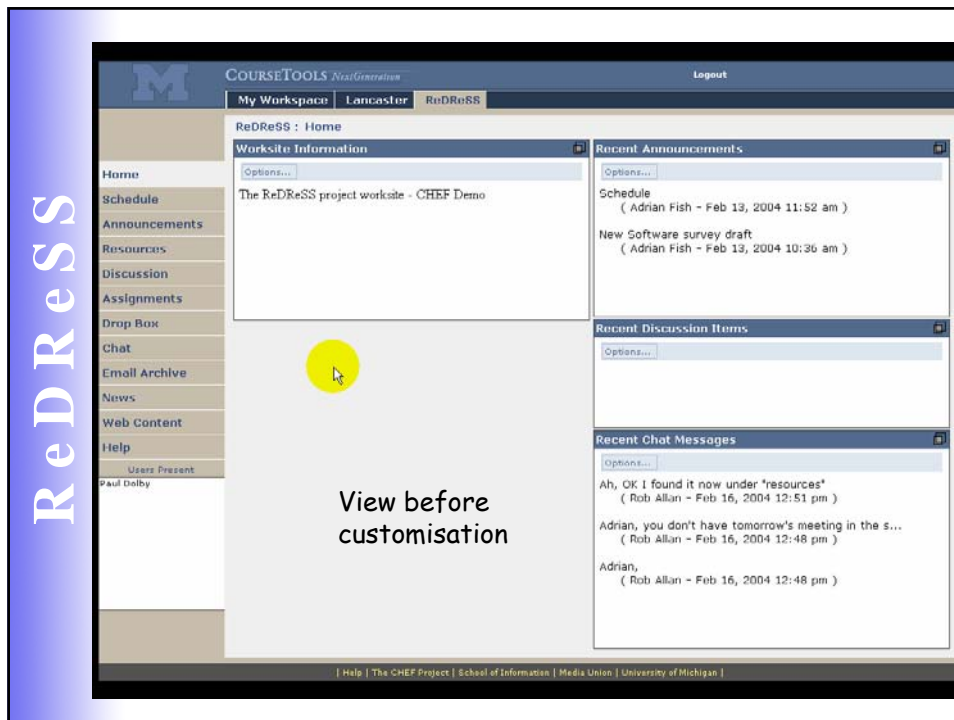
Why not coordinate this work, do the work once, and share each others solutions?

- Integrate across projects at multiple institutions and adopt relevant standards;
- Collaboration at the next frontier - implementation.

## Second Generation Grid Portals

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- Running inside a portlet container, portlets can be added into, or removed from a portal, thus providing users with the ability to customize Grid services at a portal level;
- Grid Portlets are independent components that are based on existing Grid services;
- A Grid portal built from Grid Portlets can provide users with the ability to integrate services provided by different Grid enabling technologies;
- Building on Standard Technologies
  - Portlet Design (JSR-168) IBM, Oracle, Sun, BEA, Apache
  - Grid standards: Java CoG, Web/ Grid Services, others
  - Web server: JetSpeed, uPortal (open source)
- User configurable, Service Oriented
  - Philosophy: The Portal is a gateway to distributed Grid and Web Services
- Second-generation Grid portals with portlets have important benefits as compared to first-generation Grid portals.



ReDReSS

## 2<sup>nd</sup> Generation Features

### Portal Customization

- A user instead of a Grid system developer can construct their personalized portals with the available portlets to meet their specific needs. Portlets can be easily added or removed from a portal.

### Extensible Grid Services

- Portals built from portlets are loosely coupled with Grid middleware technologies since Grid services can be exposed as standard portlets. A portal constructed from portlets provides users the ability to integrate services from different Grid system providers.

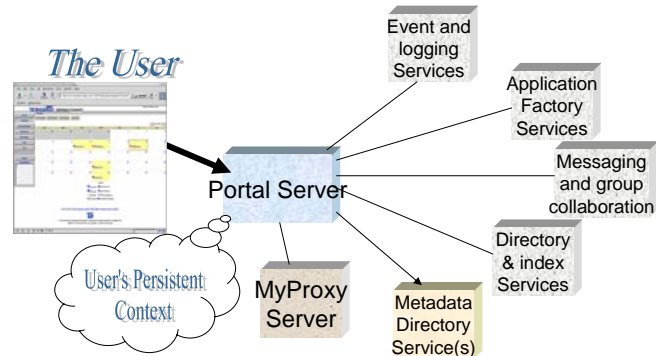
### Dynamic Grid Services

- New services and components are being developed for the Grid. A Grid portal should be able to provide users the ability to access dynamic Grid services in a Grid environment. To this end, a mechanism can be provided to expose Grid services as individual portlets that can be published and accessed via a portal.

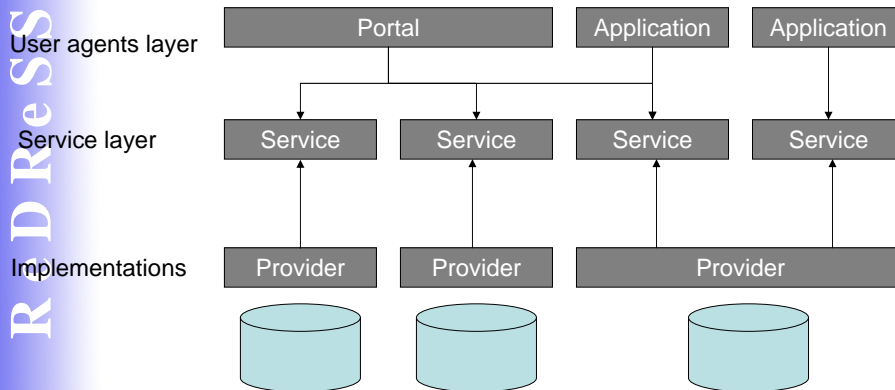
ReDReSS

## Portal Services

- Second-generation Grid portals will be produced from pluggable Grid Portlets;
- With common API, portlets can be exchanged, interoperate
- Need to work to APIs of underlying services

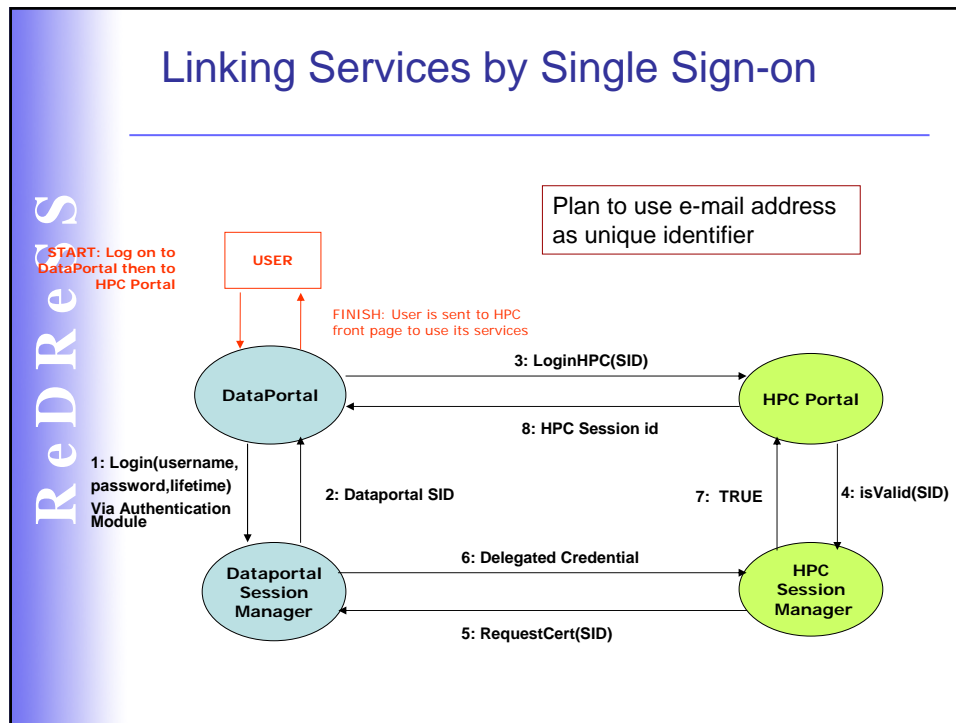


## Service Oriented Architecture



This is the .Net model, and the most common web services pattern. Event mediated services may be better!

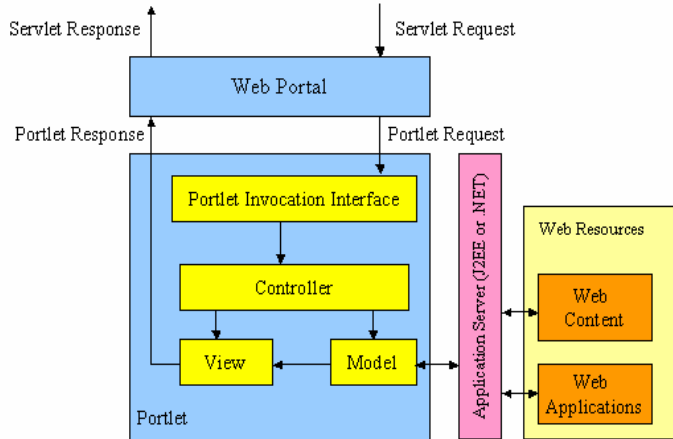
## Linking Services by Single Sign-on



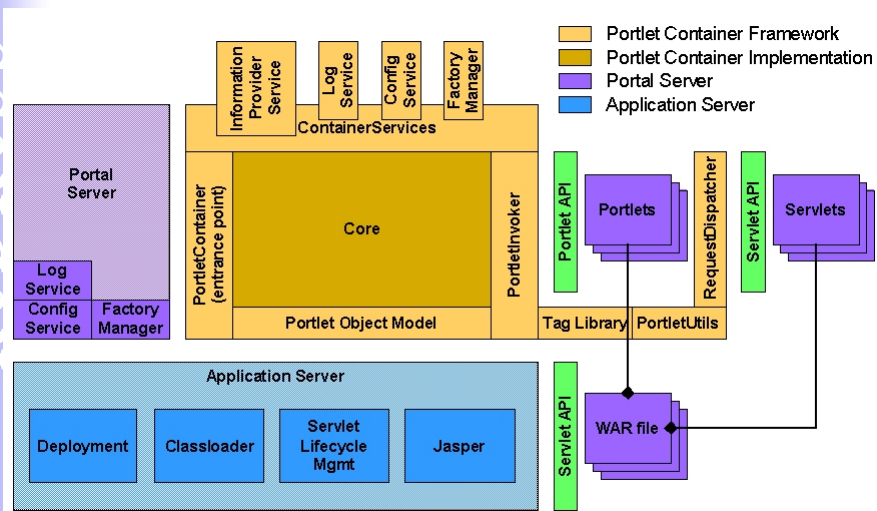
## Nuts and Bolts 1: Portlet standard JSR-168

- ReDRess**
- CHEF/ Sakai are 100% Java portals using portlets and the JSR-168 interface standard
  - Enables the "plug and pay" of tools developed by a large distributed community
  - From a user's perspective, a portlet is a "window" in a portal that provides a specific service, for example, a calendar or news feed;
  - From an application development perspective, a portlet is a software component written in Java, managed by a portlet container, which processes requests and generates dynamic contents;
  - Portlets, as pluggable user interface components, can provide a presentation layer to portal systems. The content generated by a portlet is also called a fragment. A fragment is a chunk of markup language (e.g., HTML, XHTML) adhering to certain rules and can be aggregated with other fragments to form a complete document;
  - The content of a portlet is normally aggregated with the content of other portlets to form the portal page. A portlet container manages the lifecycle of portlets in a portal.

## Accessing Web Services from a Portlet



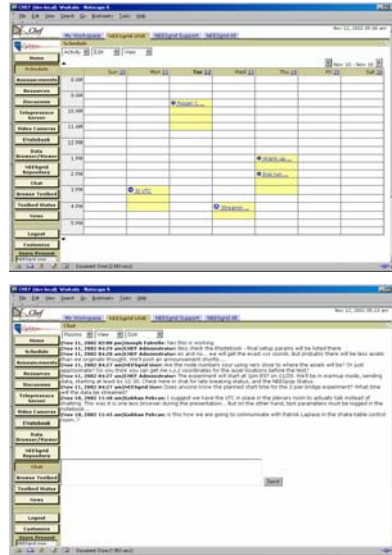
## Portlet Container Architecture



## Existing Collaboration Tools

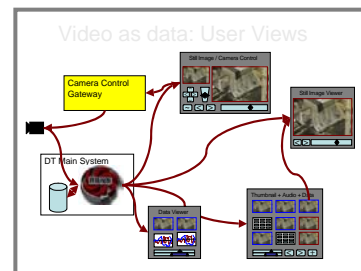
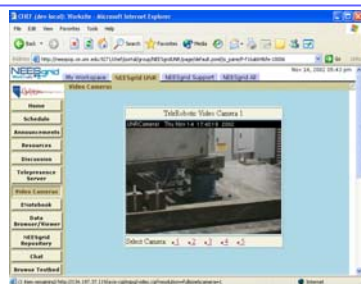
Many tools for collaboration and e-Learning already exist in the Sakai framework:

- Announcements
- Chat
- Threaded Discussion
- Calendar
- Schedule
- E-Mail Archive
- Resources (including WebDav)
- Web-Frame
- Worksite Setup
- Profile
- Notifications/Subscriptions
- Public View
- Anonymous Comment



## Sakai - more Tools

- Course Management
  - Assignments
  - Drop Box
- Worktools
  - Data Viewers (Live/Stored)
  - Telepresence
  - Video as Data
  - Electronic Notebook
- Grid Technologies
  - Grid sign on using myproxy
  - Grid computational portal
  - GridFTP
  - ..Many more



## Existing e-Learning Tools

ReDReSS

Sakai has e-Learning tools from U. Michigan, MIT, Stanford

- CTNG, Course Tools Next Generation
  - WTNG, Work Tools Next Generation
  - SAMIGO, Sakai Assessment Management tool
  - Stellar
  - + others
- We are working on a CopperCore interface for content replay.

Over 5000 users at the end of 2003

<http://coursetools.ummu.umich.edu/>



## Contributions from other Projects

CHEF is also being used and enhanced by other consortia, e.g. Collaboratory for Multi-scale Chemical Science lead by Pacific Northwest National Laboratory. Adding meta-data management tools.

Collaboratory for Multi-Scale Chemical Science

Address: [http://cmcs-lepton.ca.sandia.gov/10080/News/projects/data\\_pedigree](http://cmcs-lepton.ca.sandia.gov/10080/News/projects/data_pedigree)

Metadata Properties

- Standard Pedigree
- Issue Date: 2002-10-29
- Output File: Output: [data\\_files/reactedFlow/flamemaster\\_output/45.xml](#)
- Project: Project Information: Project: [/slide/files/projects/orimech/...](#)
- References: COMBUSTION AND FLAME, v. 93(4)
- Resource Name: data.xml

Data is linked to projects, references, inputs, and outputs

The Browser enables metadata editing.

## New Portal Tools

In the ReDRess and Sakai Evaluation projects we are adding additional tools to the Sakai framework:

- Authorisation via Shibboleth;
- Context-based information retrieval;
- CoppeCore learning content sequencing;
- Creation of application usage documentation;
- Distributed whiteboard;
- Distributed flowchart/ workflow editor;
- Distributed presentation/ authoring tool;
- Distributed display;
- JSF-based Web service interface generator;
- Learning design authoring tool;
- Link to existing UK Grid tools;
- OGSA-DAI portlet;
- Personal and project notebook;
- Personal information management;
- Project bibliography;
- Project specification grammar;
- Research scheduling;
- Scholarly resource cross-searching portlet;
- Semantic common services;
- Service identification and verification;
- Statistical computing Web service interface;
- Video conference and AGN participation;
- Visualisation;
- Wiki

## Nuts and Bolts 2: Content Aggregation and WSRP

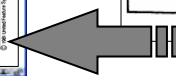
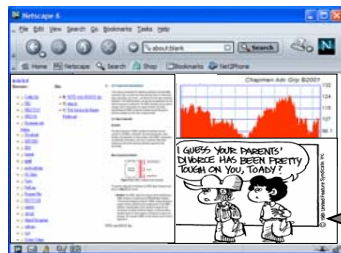
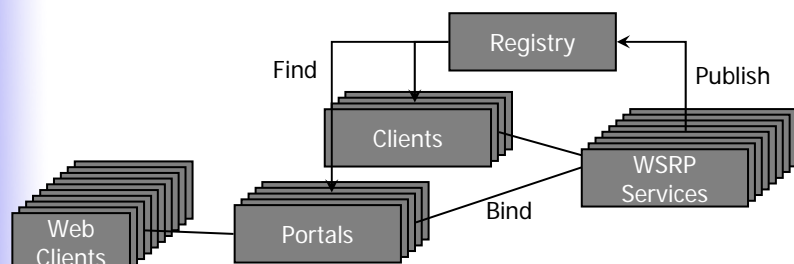
uPortal 3.0 supports the WSRP, *Web Services for Remote Portlets*, standard;

- WSRP was developed to allow one portal to export its portlet content to another portal;
- Key technology to allow a large distributed community, like ReDReSS, to develop and combine content.

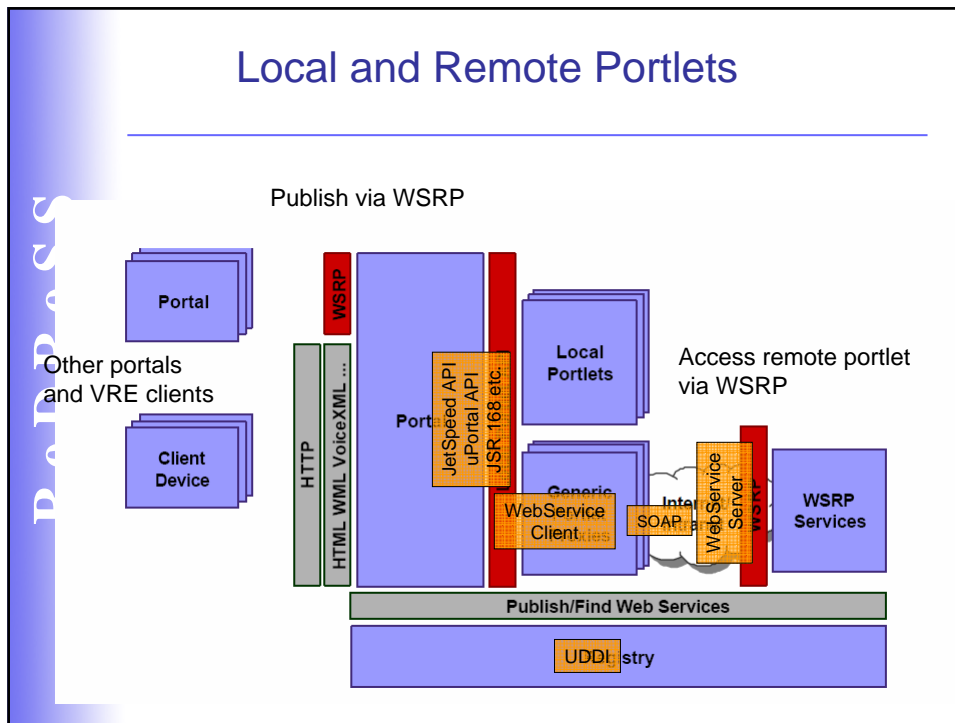
Aggregate content and provide services for:

- ReDReSS - Lancaster host site and developers
- CQeSS - Lancaster node and SABRE-R project
- NCeSS - Manchester hub
- NGS - National Grid Service
- HPCPortal - Daresbury other e-Science projects

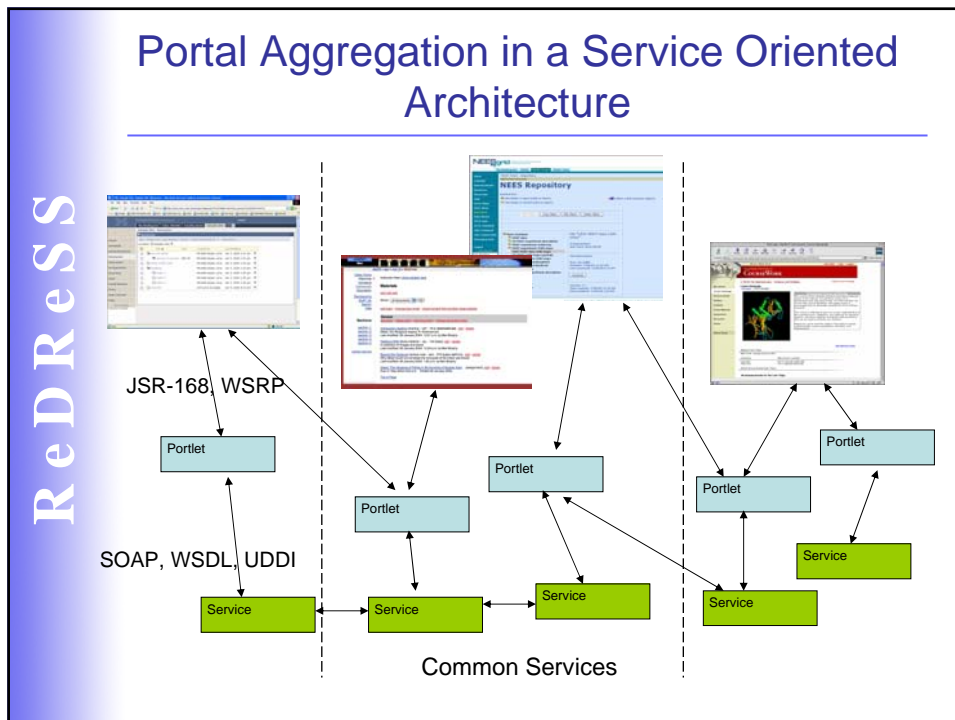
## WSRP Services Plug and Play with Portals

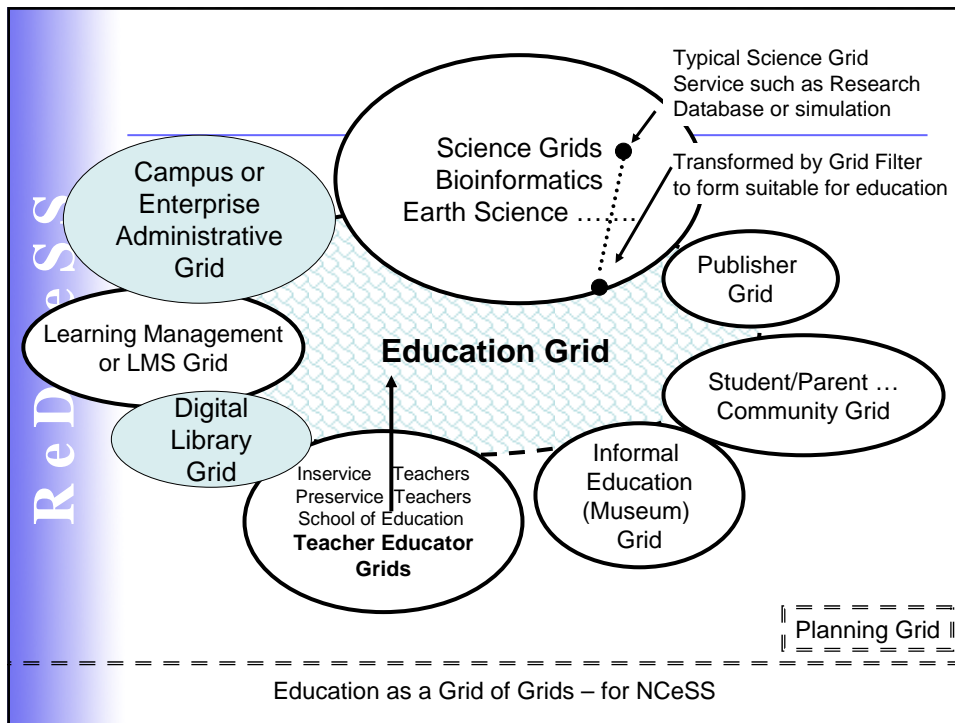


## Local and Remote Portlets



## Portal Aggregation in a Service Oriented Architecture

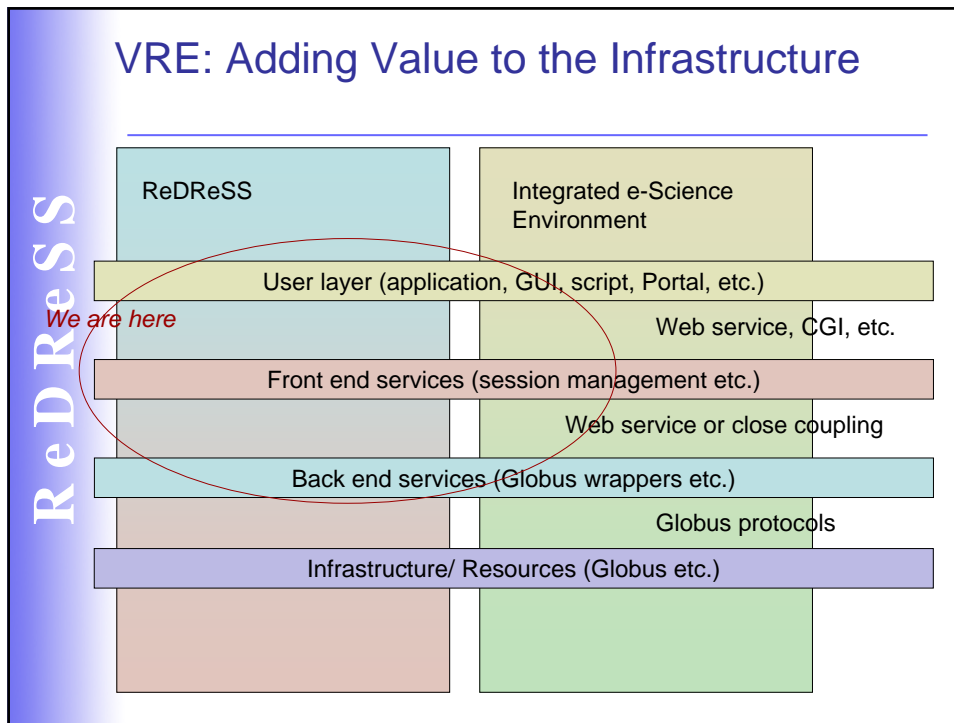




## A Virtual Research Environment ?

- Is Sakai an appropriate tool to host a Virtual Research Environment?
- Dunno!

## VRE: Adding Value to the Infrastructure



## Open Grid Computing Environments (OGCE) VRE Consortium

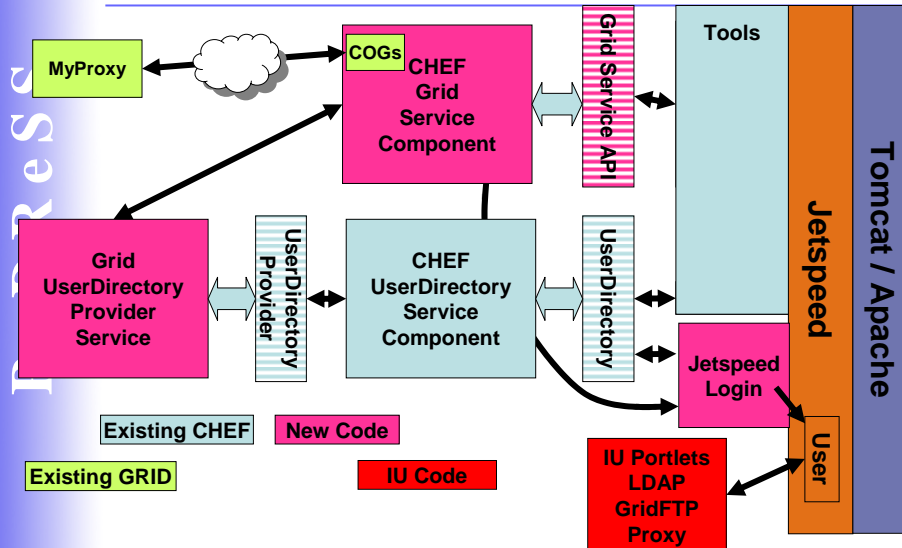
- ReDReSS
- Established in Fall 2003 and already building many components of a VRE;
  - Involves the aggregation of tools for collaboration in portal frameworks;
  - It has evolved from GGF Grid Computing Environments research group. Background:
    - Uses the new technologies and standards;
      - Grid/ Web services, ubiquitous database use, XML
    - Uses the lessons learnt from GCE-RG and other projects (GridPort/ HotPage/ HPCPortal, Alliance Portal, DOE Components, NEESGrid, Gateway, GRaDS, others);
    - Stops multiple projects repeating similar tasks, work and development;
  - EU GridLab project is pursuing similar goals.

## The OGCE VRE

ReDRess

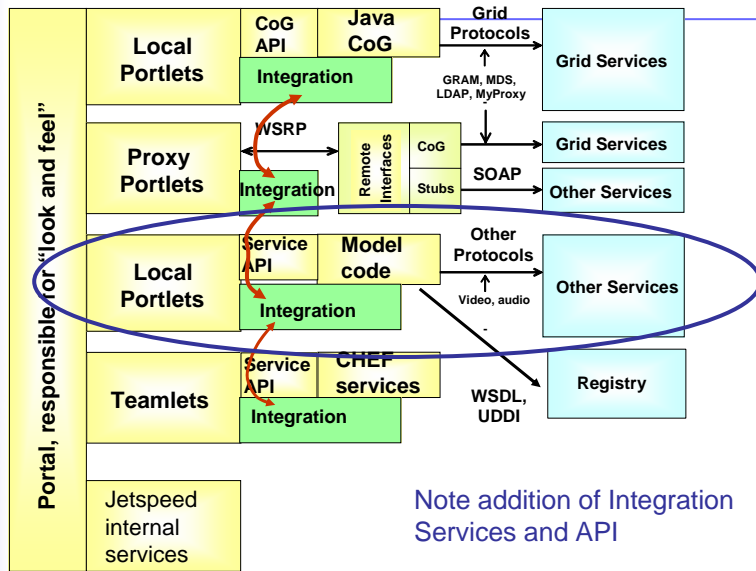
- Funded by:
  - NSF Middleware Initiative: software releases will be part of NMI and synchronized with GRIDS releases. Also: NCSA Alliance, NPACI, DoE, NASA, others
- Release Schedule:
  - First Release: 15/11/03
  - Second Release: April, 2004
- Website: <http://www.ogce.org>
- OGCE will continue to use Sakai/ CHEF as its framework/ workbench

## Adding Grid Infrastructure to CHEF

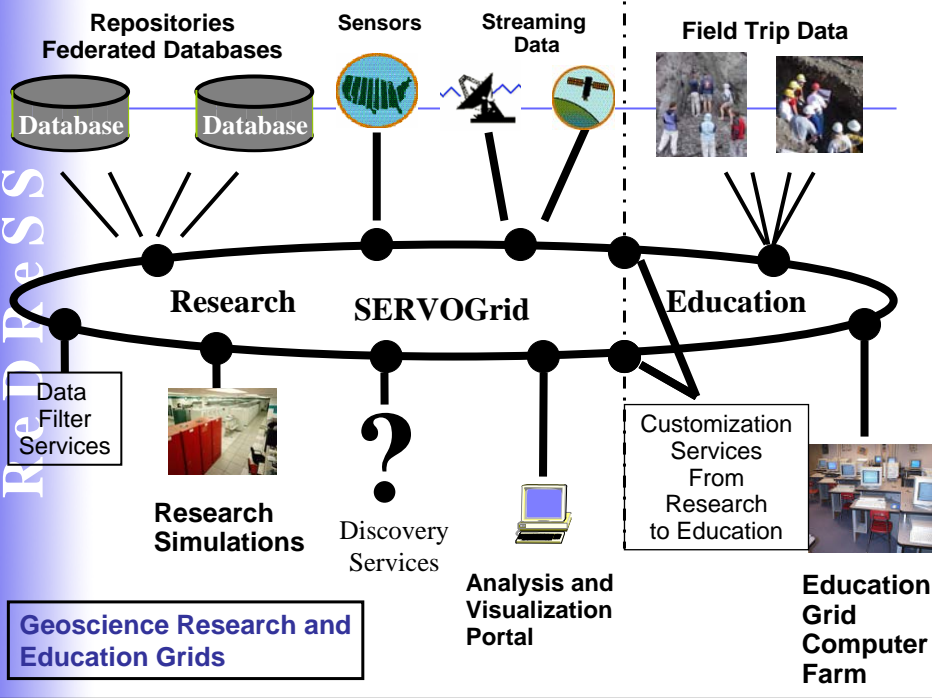


# Proposed Service Oriented Architecture

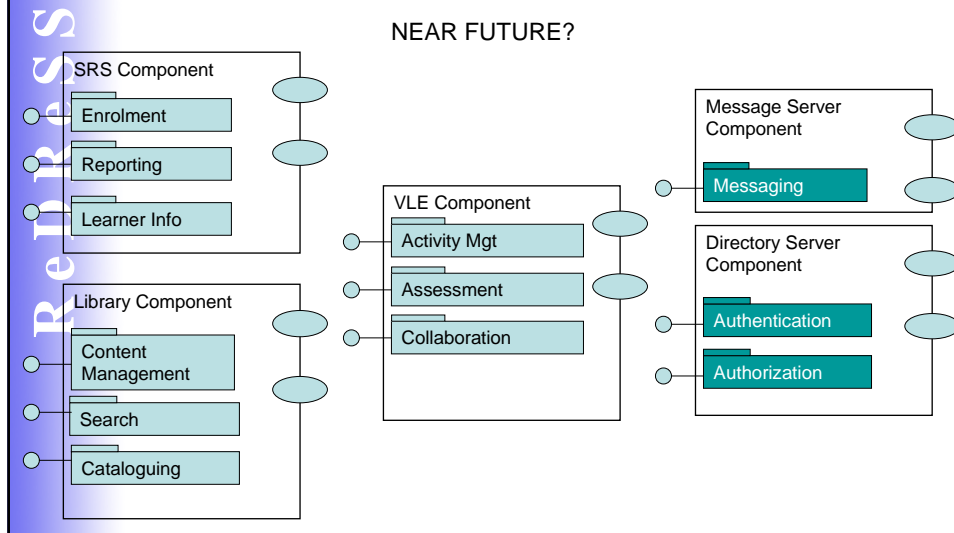
ReDRess



ReDRess



## A different View of Components



## Features of New Portal Species

- ReDRess
- *Generic portlets to support different APIs/ specifications/ protocols*
    - similar to mime types in plug and play
  - *Generic APIs link to model code (MVC paradigm) - can be remote services (WSDL/ UDDI) or portlets (WSRP) or Grid, etc.*
    - Uses a registry and associated semantics
  - *Integration API provided for cross-portlet state/ session/ coordination/ aggregation activities (see next slide)*
  - *Can implement communication between "active" portlets*
    - Portlets should have an identify, e.g. a unique key, and be self describing - e.g. contain service data via their integration method
    - Portlets should have state
  - *Keeps code base minimal and allows extensibility*
  - *Integration services can also handle complex issues of security, authorisation, etc.*

## Final Sakai/ CHEF/ OGCE Comments

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- With current approach all the tools are added directly to the CHEF code tree;
- This lacks flexibility, its all or nothing, (even though CHEF is, so far, a lightweight tool);
- This is an old approach that will be out dated by developments in WSRP (starting now!);
- We really want a plug and play approach that gives us the flexibility to dynamically use just those tools we want, when we want them;
- We think that with our limited budget we should start by adding this flexibility to Sakai, establish proof of concept before we decouple our tools using the proposed SOA scheme;

ReDReSS is taking this approach for its content management and Grid demonstrators.

## Thanks!

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To our developers:

- Adrian Fish
- Dharmesh Chohan
- Audrienne Cutajar-Bezzina

ESRC and JISC

The Sakai Developers, in particular Charles Severance

Slides from Mary Thomas, Goeffrey Fox, Charles Severance, Mark Norton, Scott Wilson and others

And the ReDReSS Steering Group