Collaborative eScience: Evolving Approaches

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Executive Director, Sakai Foundation

Shaping Collaboration 2006
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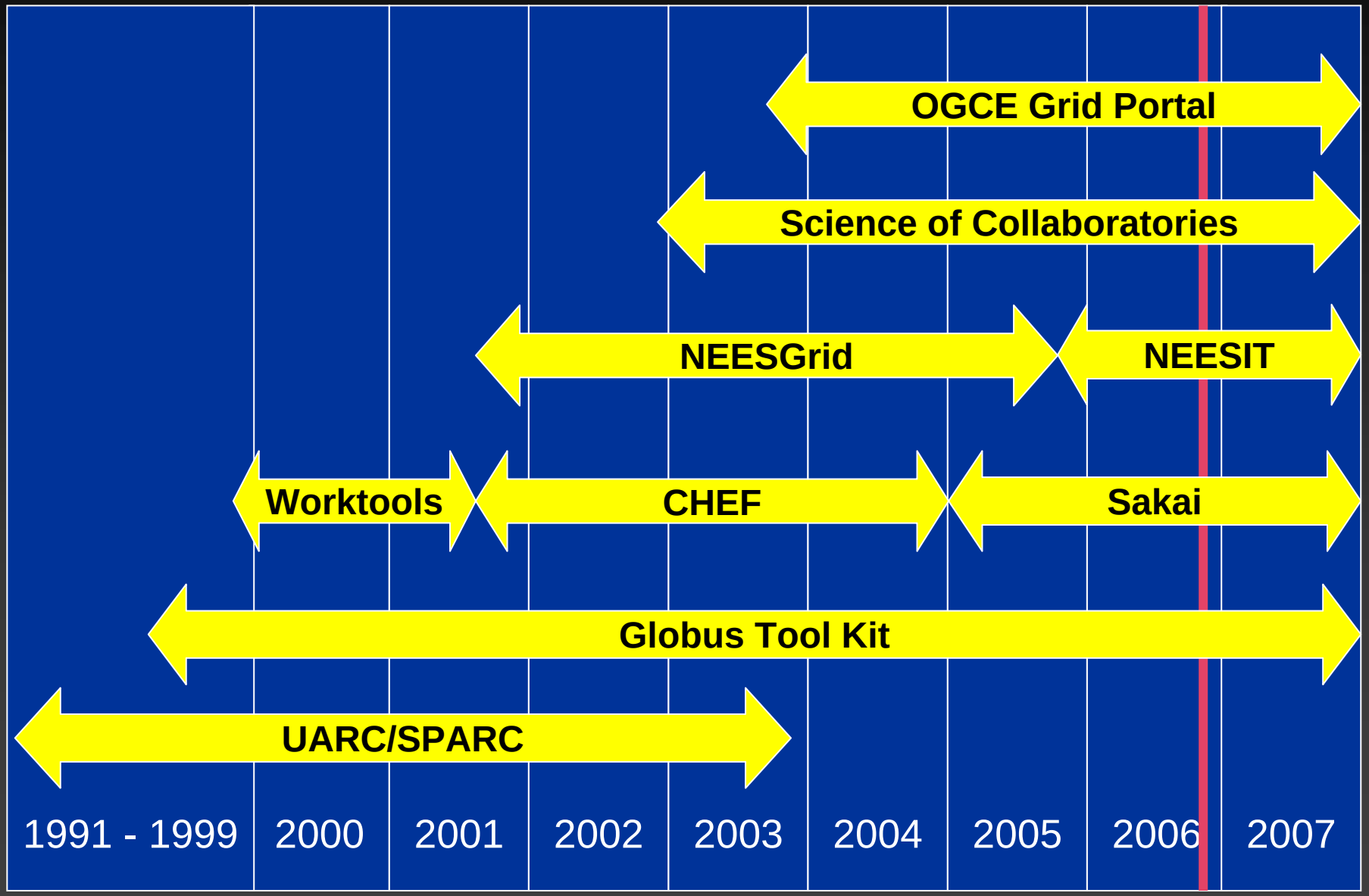
Outline

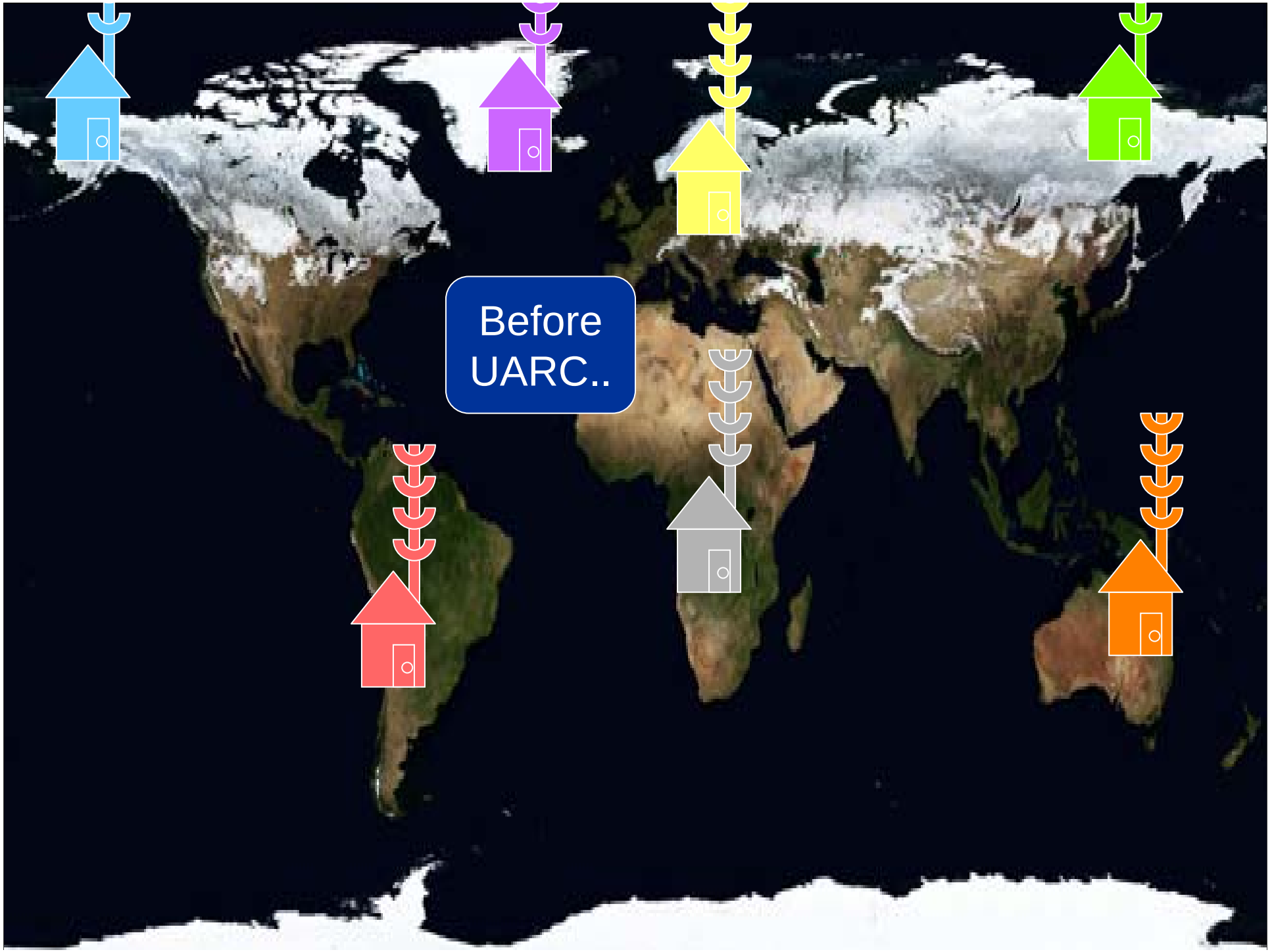
- My perspective on collaborative eScience history
  - Space Aronomy Research Collaboration (SPARC)
  - Network for Earthquake Engineering Simulation (NEES)
- Collaborative CI Software - Building the UI
  - Worktools / CHEF / Sakai
  - Open Grid Computing Environment
- Ecology of eScience (hidden slides)
- Sakai Research Edition
  - Sakai as Portal (JSR-168)
  - Sakai WorkGroup Portal (hidden slides)
  - Sakai Repository Approach
- My eScience fantasy scenario
- The Tricorder, Tivo and the Matrix

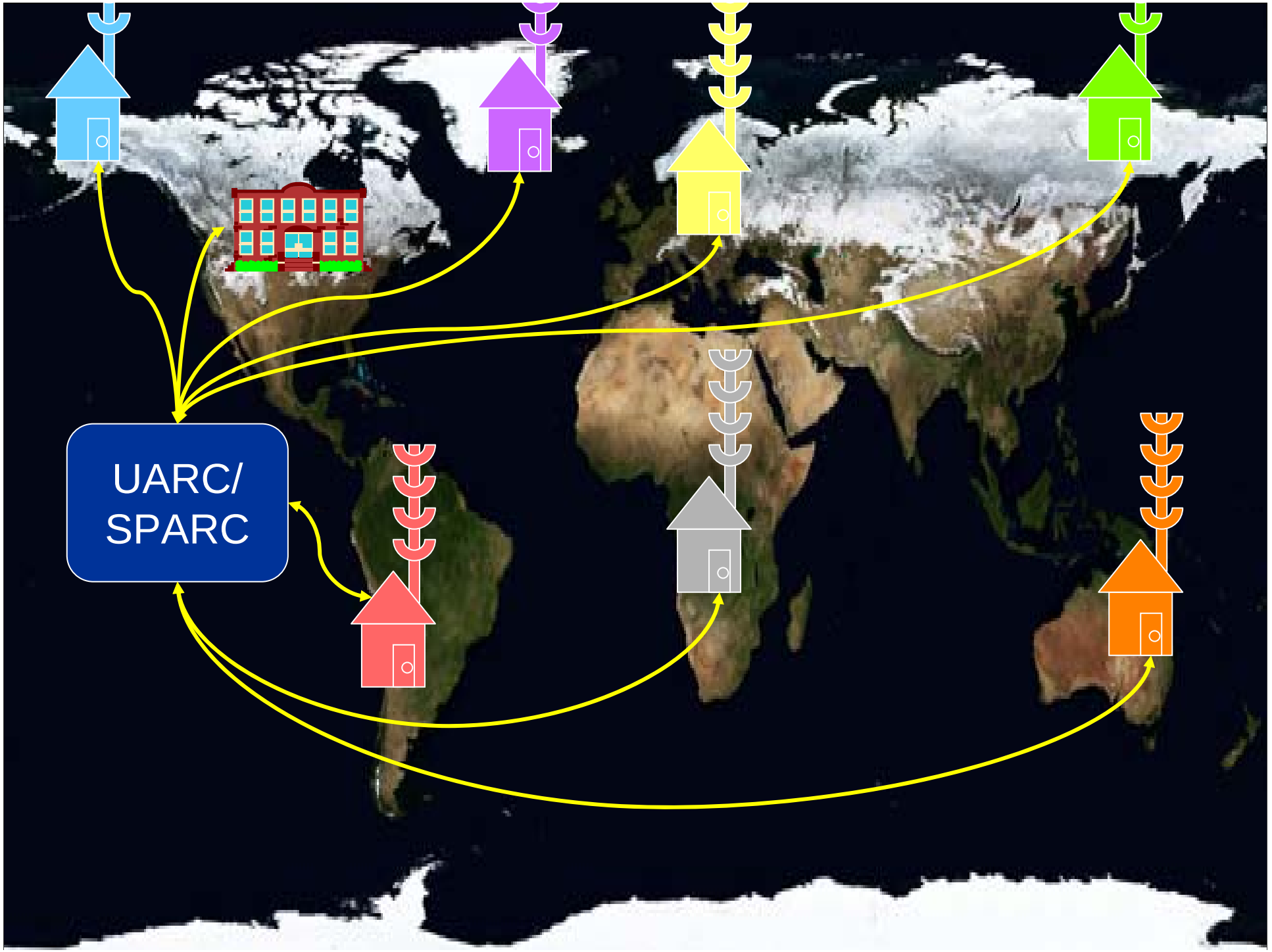
The Founding Concepts

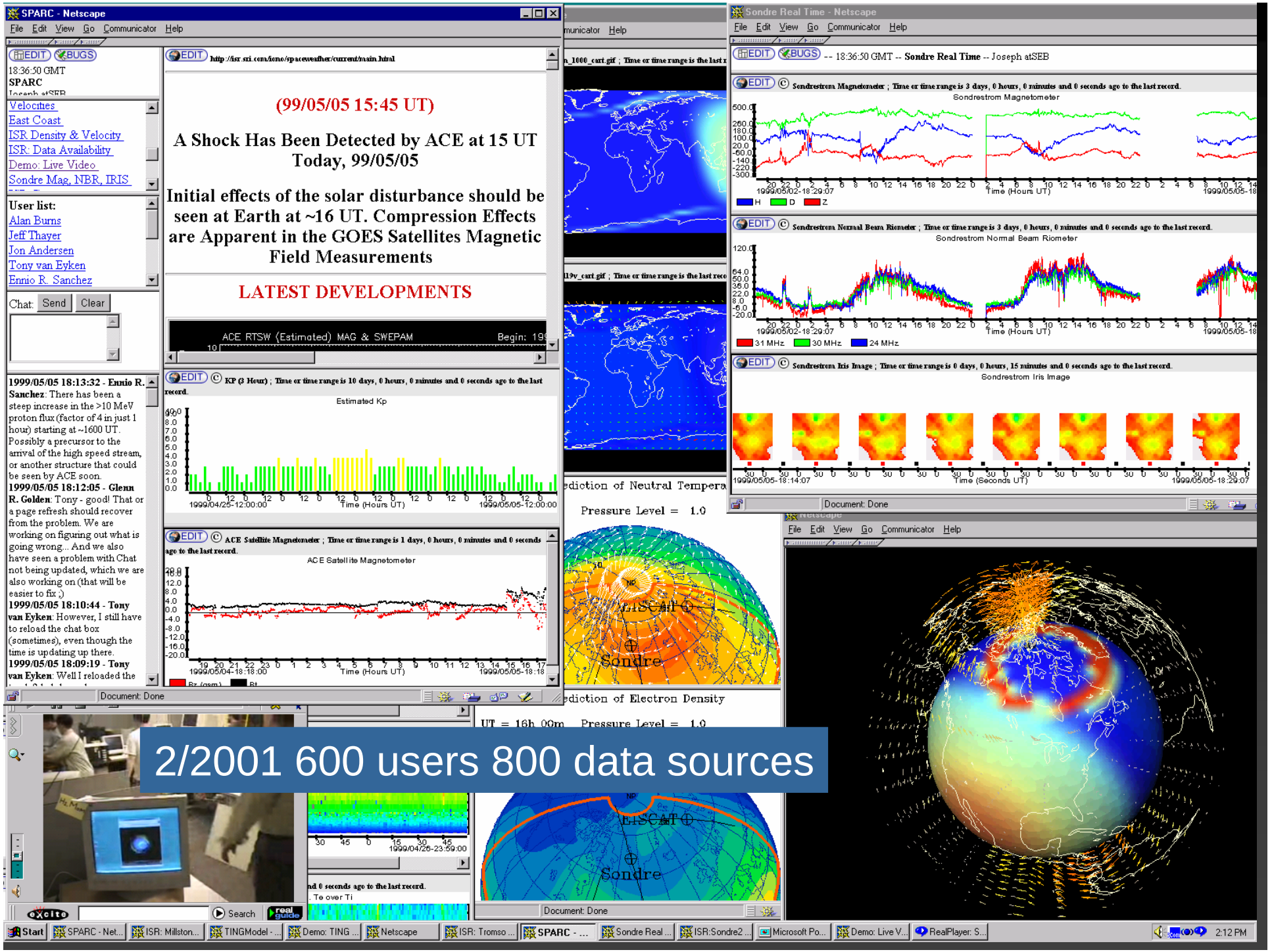
- Scientific Domain
- Groups of People
- Common User Interface
- Data Sharing
  - In the moment
  - Long-term
- Experimental Equipment
- Compute
- Visualization

Over 15 Years of Collaborative eScience




Before
UARC..


UARC/
SPARC


SPARC - Netscape
(99/05/05 15:45 UT)
A Shock Has Been Detected by ACE at 15 UT Today, 99/05/05
Initial effects of the solar disturbance should be seen at Earth at ~16 UT. Compression Effects are Apparent in the GOES Satellites Magnetic Field Measurements
LATEST DEVELOPMENTS
Sondre Real Time - Netscape
Sondrestrom Magnetometer
Sondrestrom Normal Beam Riometer
Sondrestrom Iris Image
Estimated Kp
ACE Satellite Magnetometer
Pressure Level = 1.0
Sondre
2/2001 600 users 800 data sources

SPARC Software

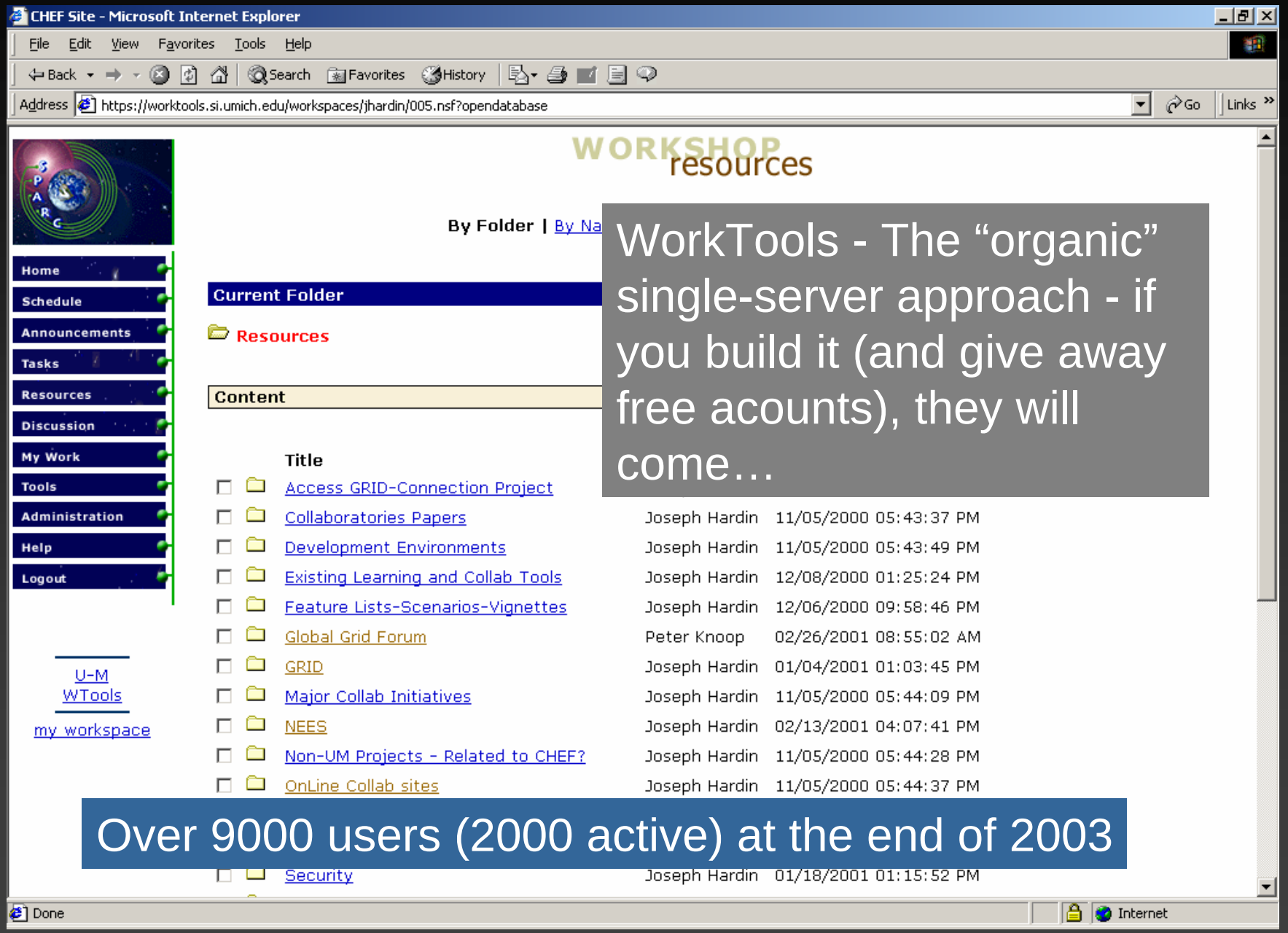
- Written from scratch
  - No Middleware
  - No Portal Technology
- Three rewrites over 10 years
  - NextStep
  - Java Applets with server support
  - Browser based - kind of like a portal
- At the end, in 2001 - it was ready for **another** rewrite

Keys to SPARC Success

- Ten years of solid funding
  - Team consistency
  - Long enough to learn from “mistakes”
- Long term relationship between IT folks and scientists - evolved over time - relationship was “grey”
- Software rewritten several times over life of project based on evolving user needs and experience with each version of the program
- Portion of effort was invested in evaluation of usability - feedback to developers

After SPARC: Now What?

- Getting people together is an important part of collaborative eScience
  - WorkTools - Based on Lotus Notes
  - CHEF - Collaborative framework - Based on Java and Jetspeed
  - Sakai - Collaboration and Learning Environment - Java
- Critical point: Collaborative software is only one component of eScience
- Lets explore this: Building reusable user interface technologies for the people part of collaborative eScience



WorkTools - The “organic” single-server approach - if you build it (and give away free acounts), they will come…

Over 9000 users (2000 active) at the end of 2003

CompreHensive collaborativE Framework (CHEF)

- Fall 2001: CHEF Development begins
  - Generalized extensible framework for building collaboratories
- Funded internally at UM
- All JAVA - Open Source
  - Jakarta Jetspeed Portal
  - Jakarta Tomcat Servlet Container
  - Jakarta Turbine Service Container
- Build community of developers through workshops and outreach

CHEF Applications

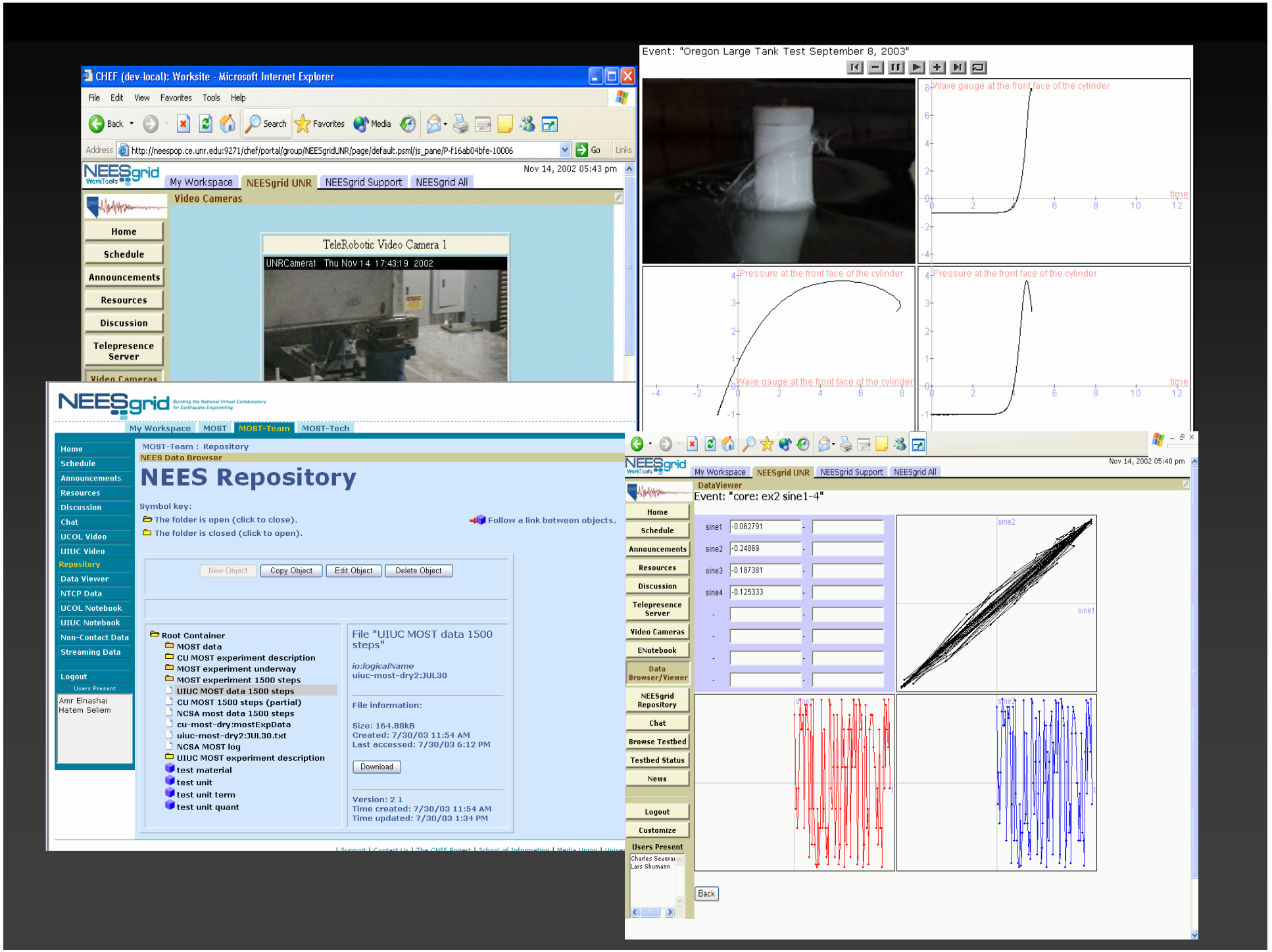
- CourseTools Next Generation
- WorkTools Next Generation
- NEESGrid
- NSF National Middleware Grid Portal

NEESgrid

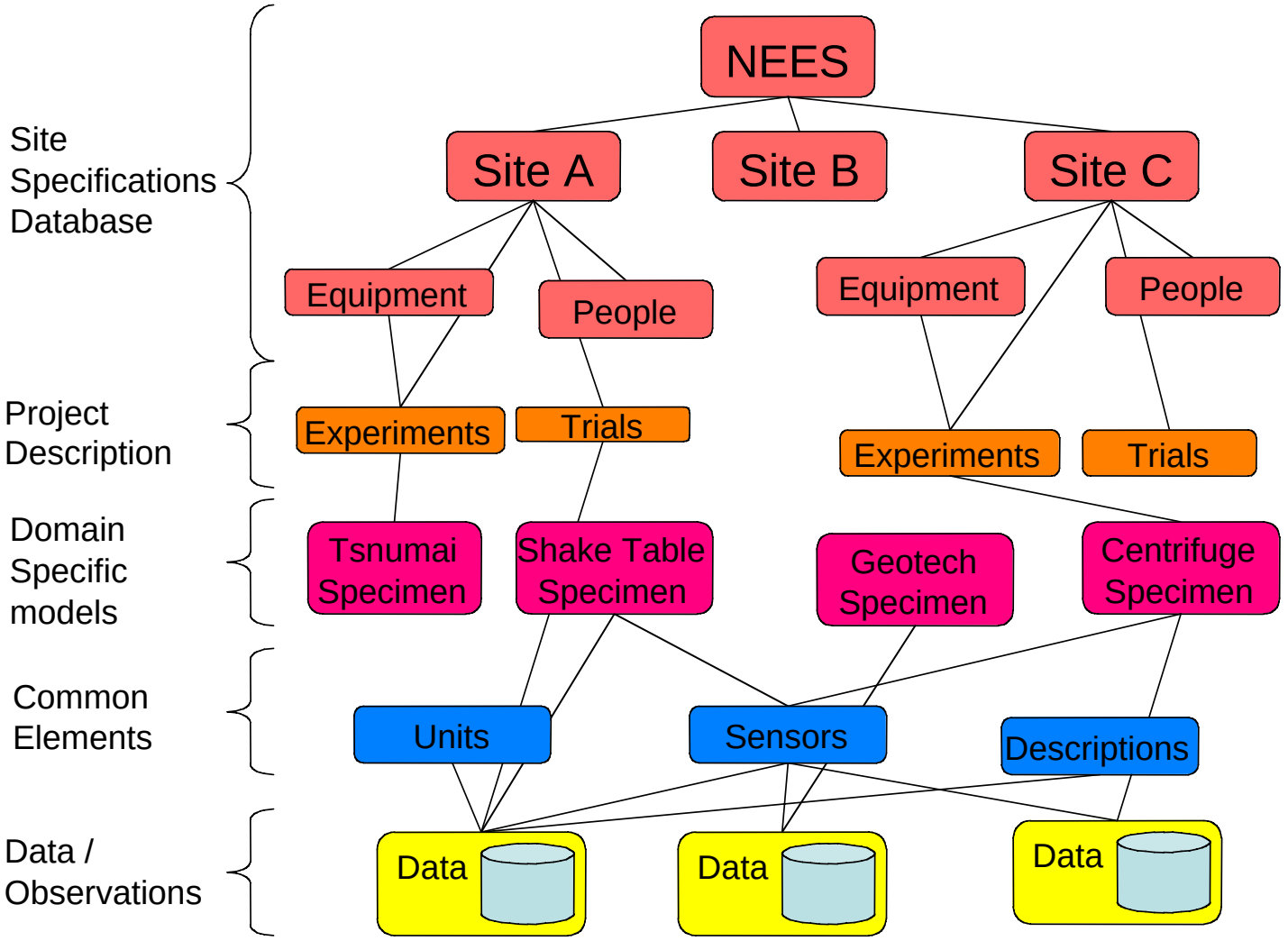
Network for Earthquake Engineering Simulation

NSF Funded.
NCSA, ANL, USC/ISI, UM, USC, Berkeley, MSU

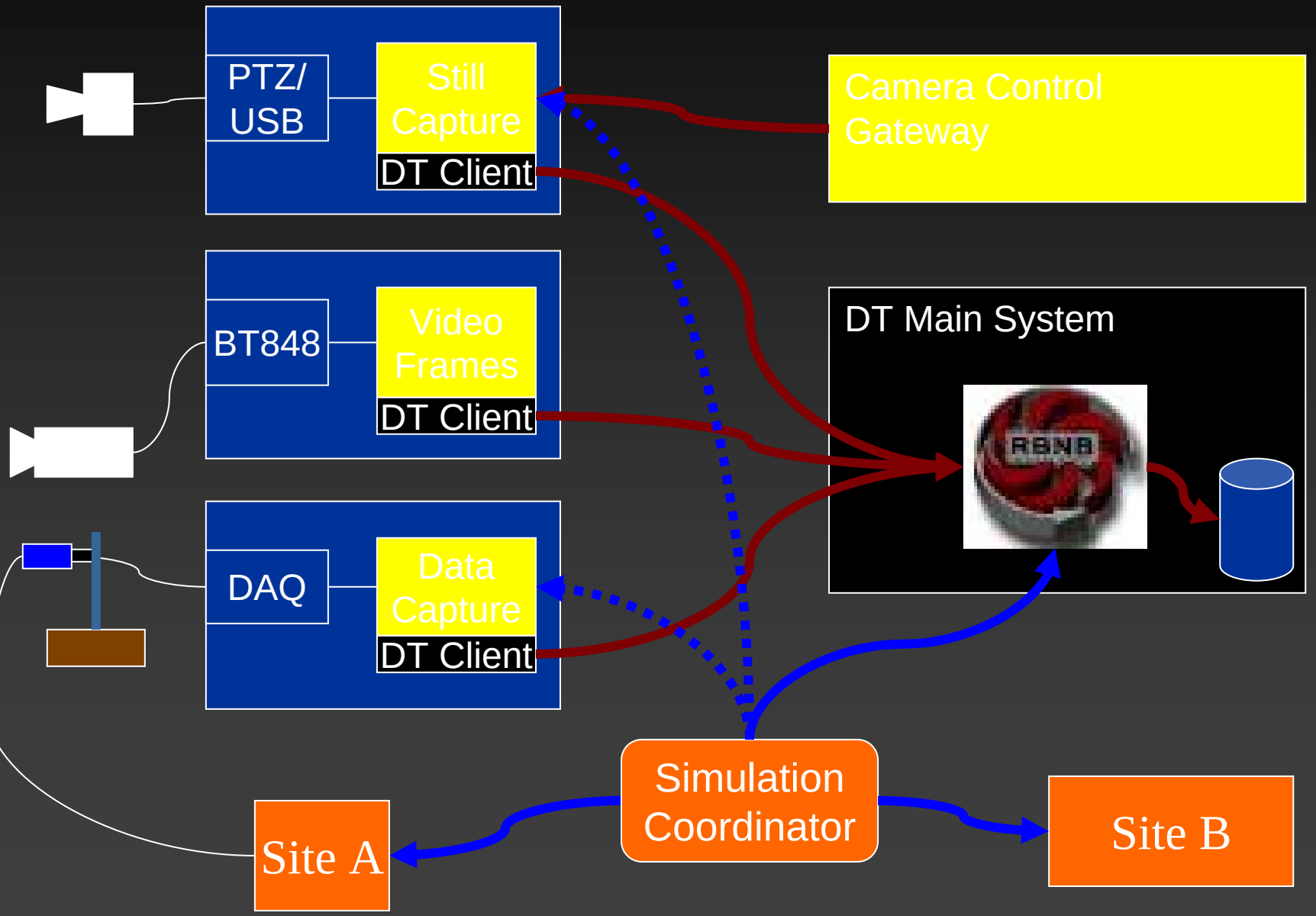
Sakai


CHEF (dev-local): Worksite - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://neespop.ce.unr.edu:9271/chef/portal/group/NEESgridUNR/page/default.psml/js_pane/P-f16ab04bfe-10006
Go Links
NEESgrid WorkTools
Nov 14, 2002 05:43 pm
My Workspace
NEESgrid UNR
NEESgrid Support
NEESgrid All
Video Cameras
Home
Schedule
Announcements
Resources
Discussion
Telepresence Server
Video Cameras
TeleRobotic Video Camera 1
UNRCamera1 Thu Nov 14 17:43:19 2002
Event: "Oregon Large Tank Test September 8, 2003"
Wave gauge at the front face of the cylinder
time
Pressure at the front face of the cylinder
Wave gauge at the front face of the cylinder
Pressure at the front face of the cylinder
time
NEESgrid
Building the National Virtual Collaboratory for Earthquake Engineering
My Workspace
MOST
MOST-Team
MOST-Tech
Home
Schedule
Announcements
Resources
Discussion
Chat
UCOL Video
UIUC Video
Repository
Data Viewer
NTCP Data
UCOL Notebook
UIUC Notebook
Non-Contact Data
Streaming Data
Logout
Users Present
Amr Elnashai
Hatem Seliem
MOST-Team : Repository
NEES Data Browser
NEES Repository
Symbol key:
The folder is open (click to close).
The folder is closed (click to open).
Follow a link between objects.
New Object
Copy Object
Edit Object
Delete Object
Root Container
MOST data
CU MOST experiment description
MOST experiment underway
MOST experiment 1500 steps
UIUC MOST data 1500 steps
CU MOST 1500 steps (partial)
NCSA most data 1500 steps
cu-most-dry:mostExpData
uiuc-most-dry2:JUL30.txt
NCSA MOST log
UIUC MOST experiment description
test material
test unit
test unit term
test unit quant
File "UIUC MOST data 1500 steps"
io:logicalName
uiuc-most-dry2:JUL30
File information:
Size: 164.88kB
Created: 7/30/03 11:54 AM
Last accessed: 7/30/03 6:12 PM
Download
Version: 2 1
Time created: 7/30/03 11:54 AM
Time updated: 7/30/03 1:34 PM
NEESgrid WorkTools
Nov 14, 2002 05:40 pm
My Workspace
NEESgrid UNR
NEESgrid Support
NEESgrid All
DataViewer
Event: "core: ex2 sine1-4"
Home
Schedule
Announcements
Resources
Discussion
Telepresence Server
Video Cameras
ENotebook
Data Browser/Viewer
NEESgrid Repository
Chat
Browse Testbed
Testbed Status
News
Logout
Customize
Users Present
Charles Severance
Lars Shumann
sine1 -0.062791
sine2 -0.24869
sine3 -0.187381
sine4 -0.125333
sine2
sine1
Back

Overall Data Modeling Efforts

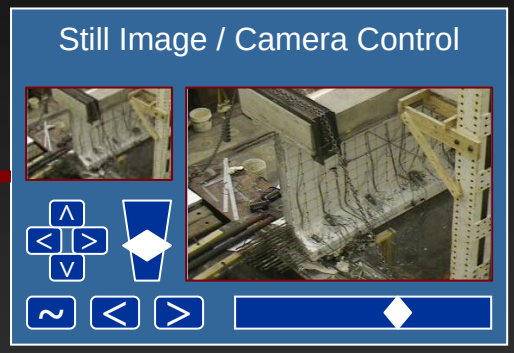


Capturing Video and Data



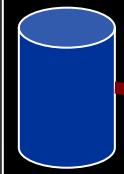
Data Monitoring Tools

Camera Control Gateway

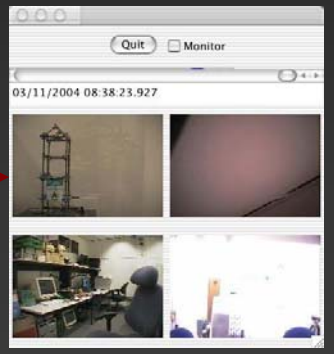


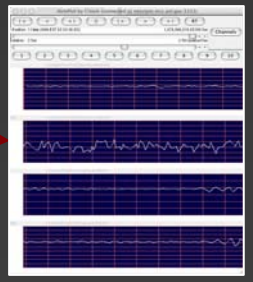
Still image camera control

DT Main System



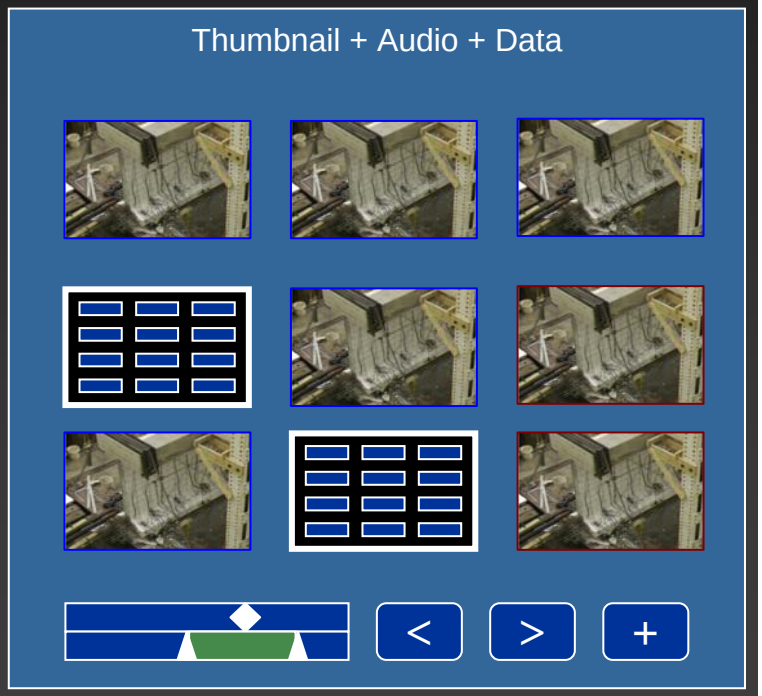
Thumb-nail

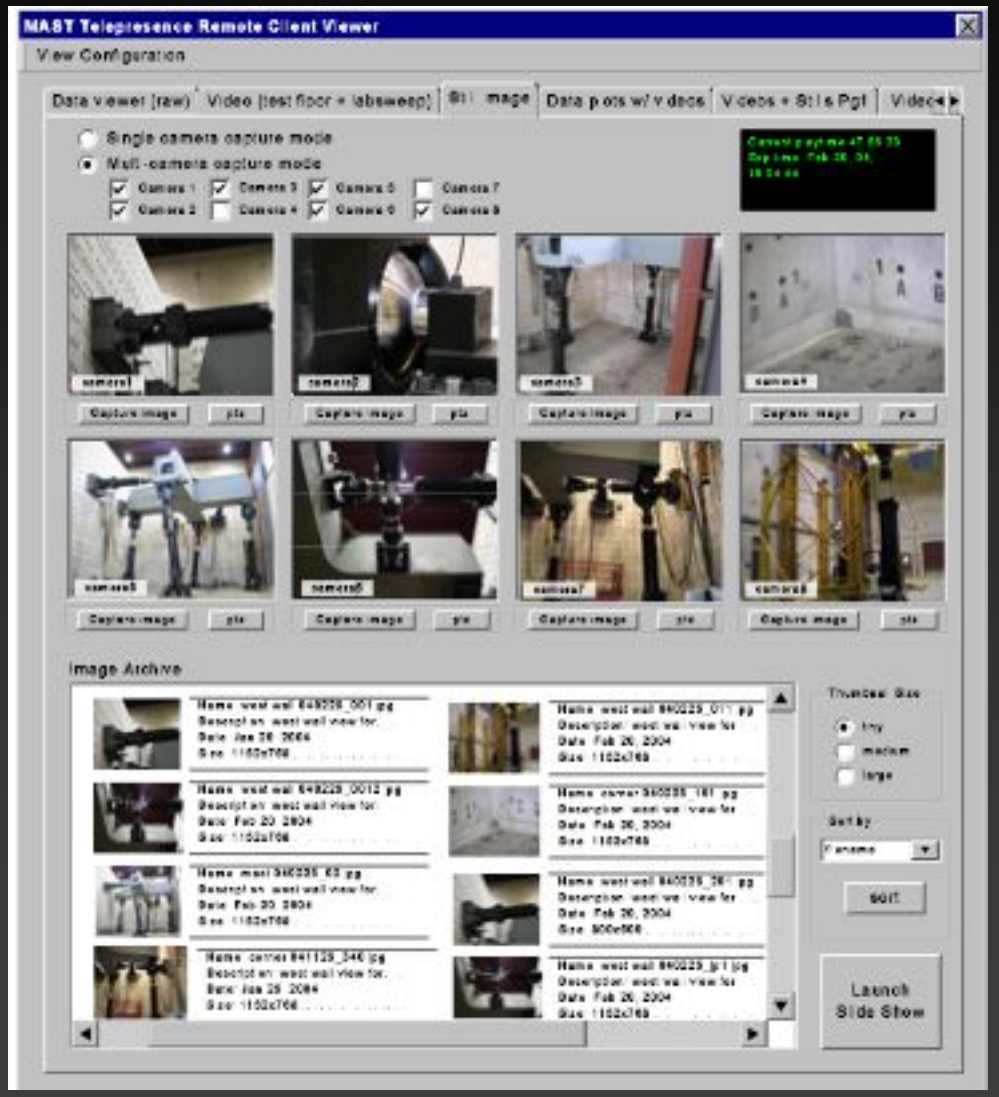




Creare viewers

Video and Data Tivo





Lessons Learned in NEESGrid (Chuck's views)

- This takes a long time - *after* trust is built up
- Scientists know a lot about Computer Science - listen to them and involve them
- The real work begins after software is "delivered" - Version 1.0 is usually just a conversation starter - but a very important step
- There are some things that are useful across fields - but the most valuable elements are field-unique
- Data models, data repositories, and long-term curation are difficult!

HENP/Civil Similarities

HENP/Civil: Differences

- Willingness to collaborate
  - CE: Not too keen on the idea - NSF forcing the issue using “carrot and stick”
  - HENP: It is part of the fabric of the field (at least within LHC)
- Technology Savvy
  - CE: It is all about the “within lab” electronics
  - HENP: In lab electronics is difficult, important and different. The Internet is a tool to be used both for human communication and data manipulation - have tried everything - use simple reliable stuff because the work cannot wait.

Sakai as a Collaborative Portal

Overview Slide

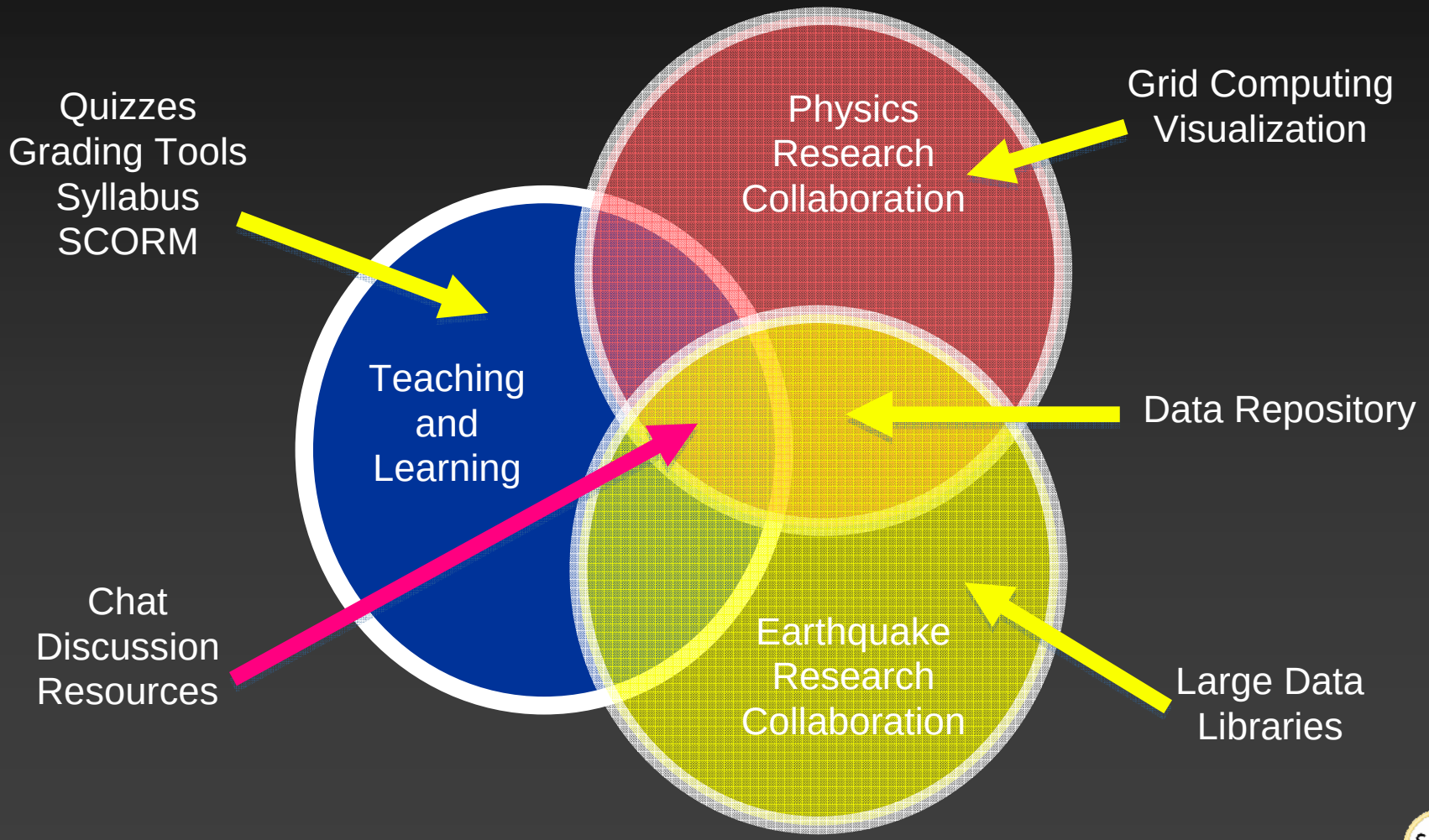
- Sakai is used for Collaboration, Teaching, and Learning
- Sakai Project started January 2004 (2.5 years old)
- Non-profit Sakai Foundation January 2006
- Open Source - 100% free - Apache License
- Voluntary financial support from 100+ Higher Education, 15 companies, each paying $10,000 / year = $ 1M revenue
- Executive Director for the Foundation and six paid staff members
- Worldwide community with 100+ people active in developing and testing Sakai releases
- Nifty Web site www.sakaiproject.org
  - Sakai Community Google Map Mashup
  - Very cool “Sakai Overview” Video (10 minutes)


Show All | Production | Sakai Partner Server | Sakai Partner | Commercial Affiliate | Foundation Server | Sakai Server
Map
Satellite
Hybrid
Greenland
Iceland
Canada
Russia
Finland
Sweden
Norway
Poland
Germany
Ukraine
Kazakhstan
Mongolia
France
Spain
Turkey
China
Japan
North Atlantic Ocean
Algeria
Libya
Egypt
Iraq
Iran
Afghanistan
Pakistan
Saudi Arabia
India
Myanmar
Thailand
Mexico
Cuba
Mauritania
Mali
Niger
Chad
Sudan
Nigeria
Ethiopia
Venezuela
Colombia
DR Congo
Kenya
Tanzania
Angola
Namibia
Madagascar
Indonesia
Papua New Guinea
Peru
Brazil
Bolivia
Chile
Argentina
South Pacific Ocean
South Atlantic Ocean
Indian Ocean
Australia
New Zealand
Africa
Southern
POWERED BY Google
Terms of Use

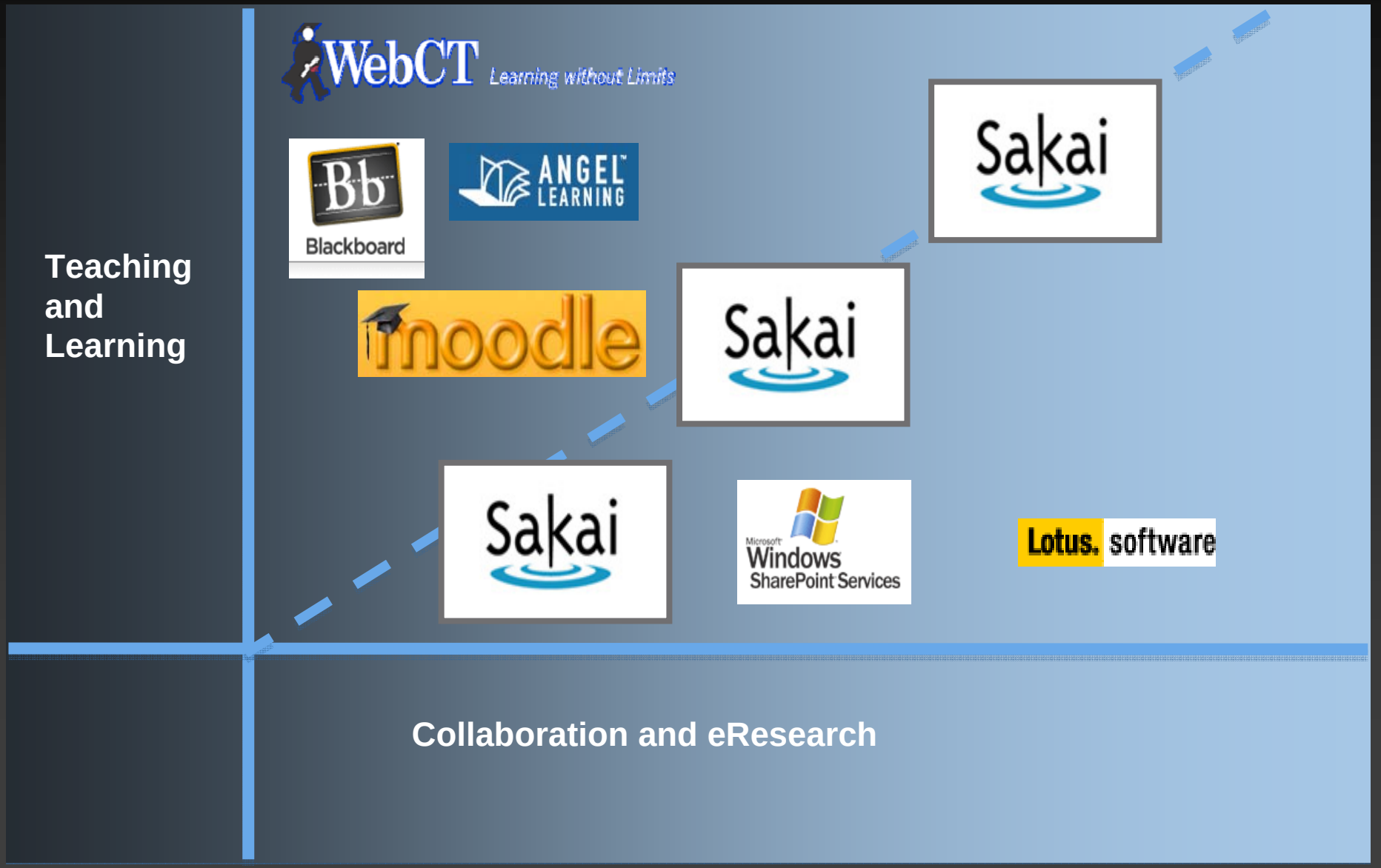
What’s in a name?

Sakai is named after **Hiroyuki Sakai** of the Food Channel Television program “Iron Chef”. Hiroyuki is renowned for his fusion of French and Japanese cuisine.

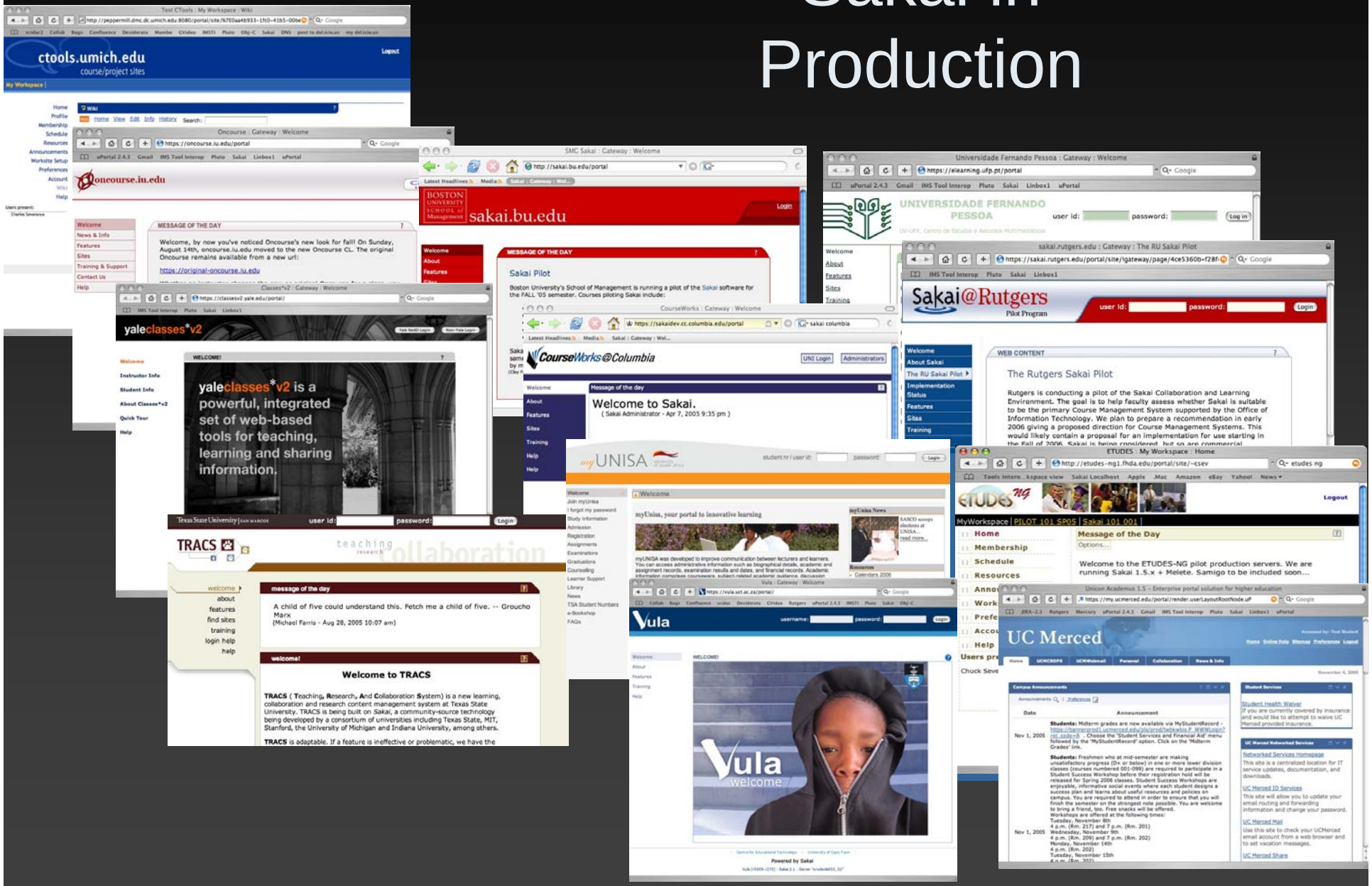
Requirements Overlap



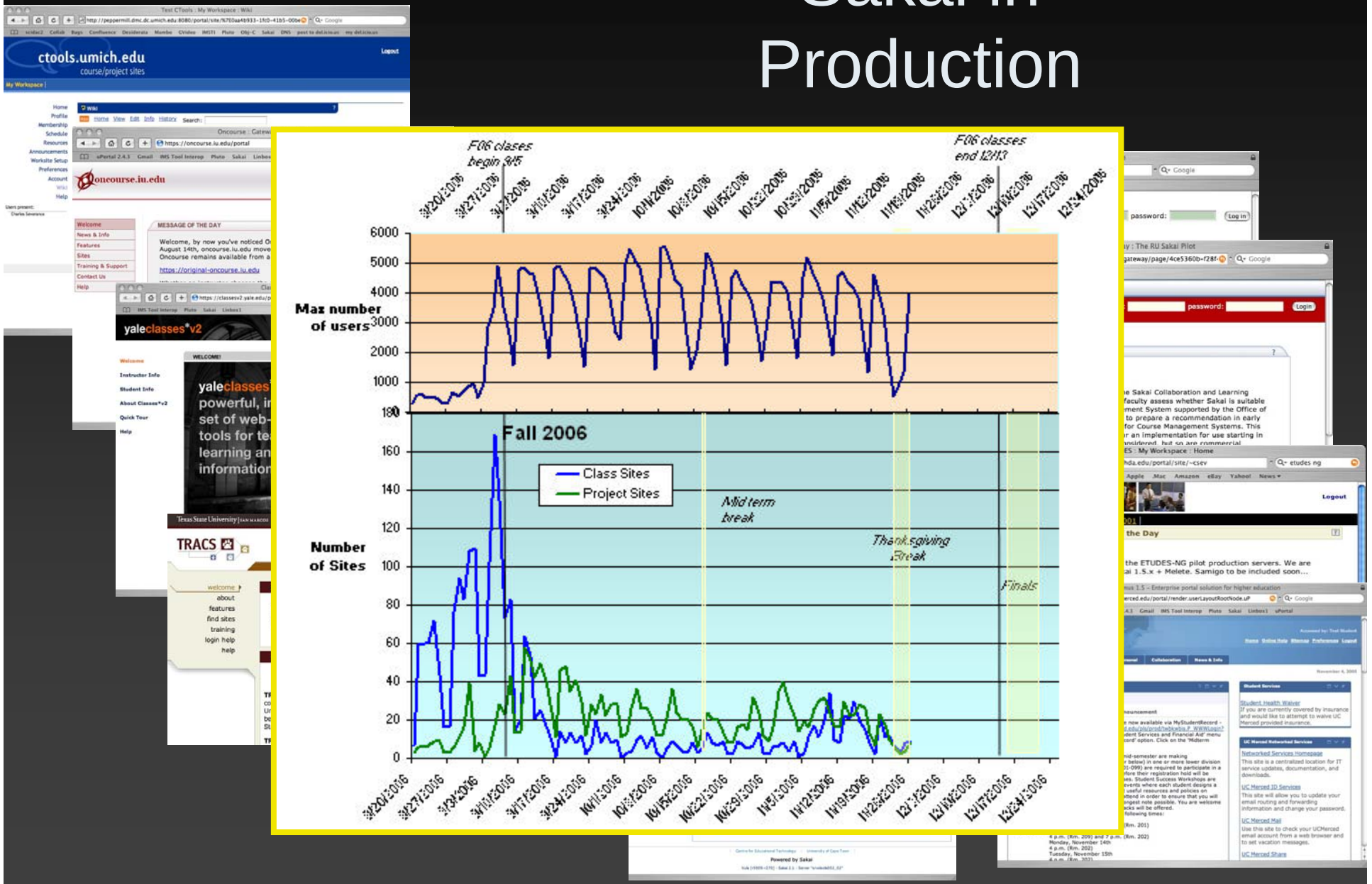
Sakai: Product Placement



Sakai in Production



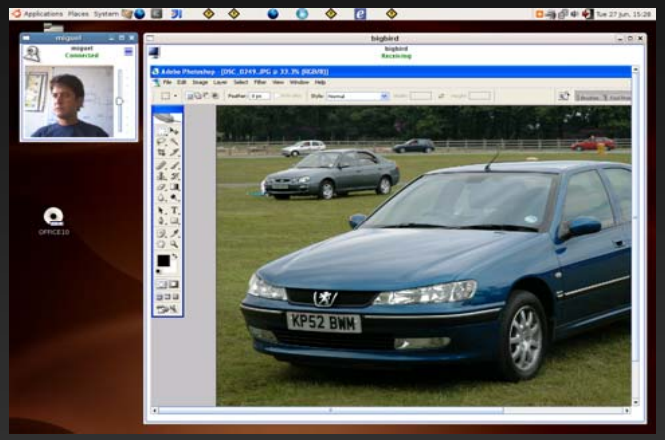
Sakai in Production

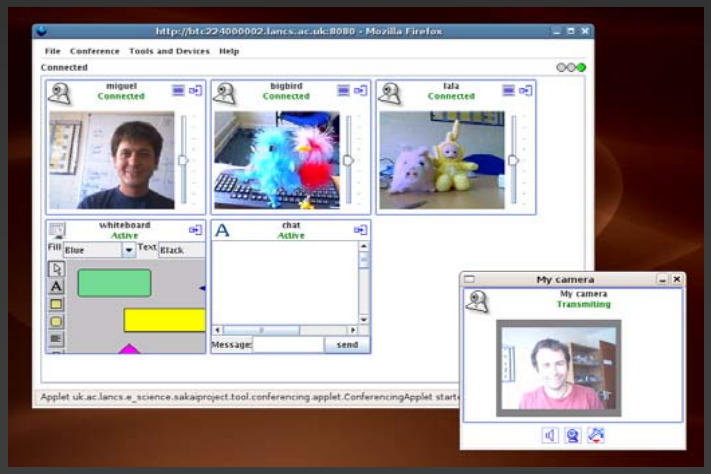


Sakai General Collaborative Tools

- Announcements
- Blog
- Chat Room
- Threaded Discussion
- Drop Box
- Email Archive
- Message Of The Day
- News/RSS
- Podcast
- Resources
- Roster
- Schedule
- Web Content
- Wiki
- WebDAV

Tools Under Development





- Lancaster Collaboration Suite
  - Shared Display
  - Shared Whiteboard
  - Multicast Audio
  - Multicast Video
- Horizon/Wimba Integration
- Marratech Integration
- Adobe Connect (Breeze)
- Paper Review Tool
- Repository Search (SakaiBrary)
- Clicker
- Poll Tool
- User Tracking

These are works-in-progress by members of the Sakai community. There are no dates for release.

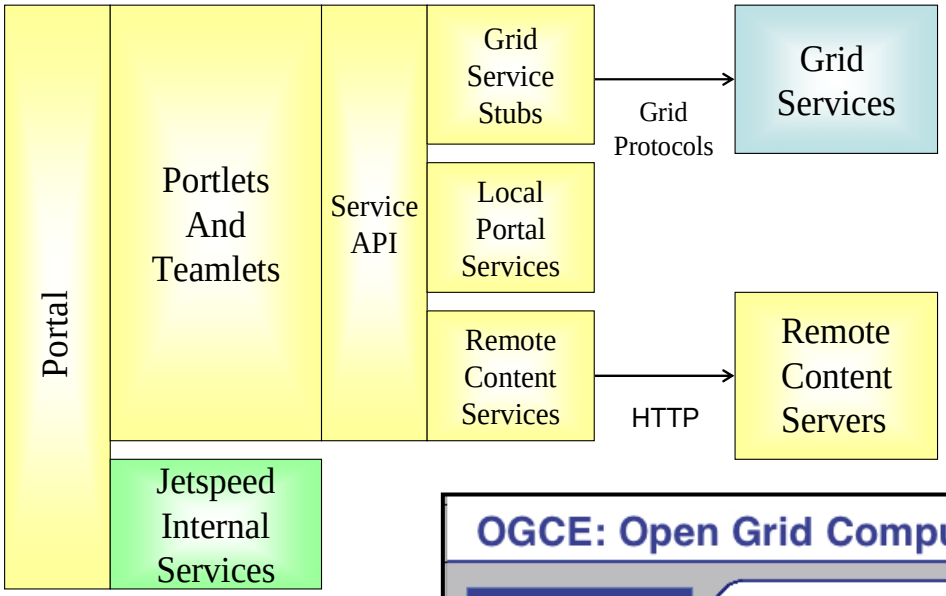
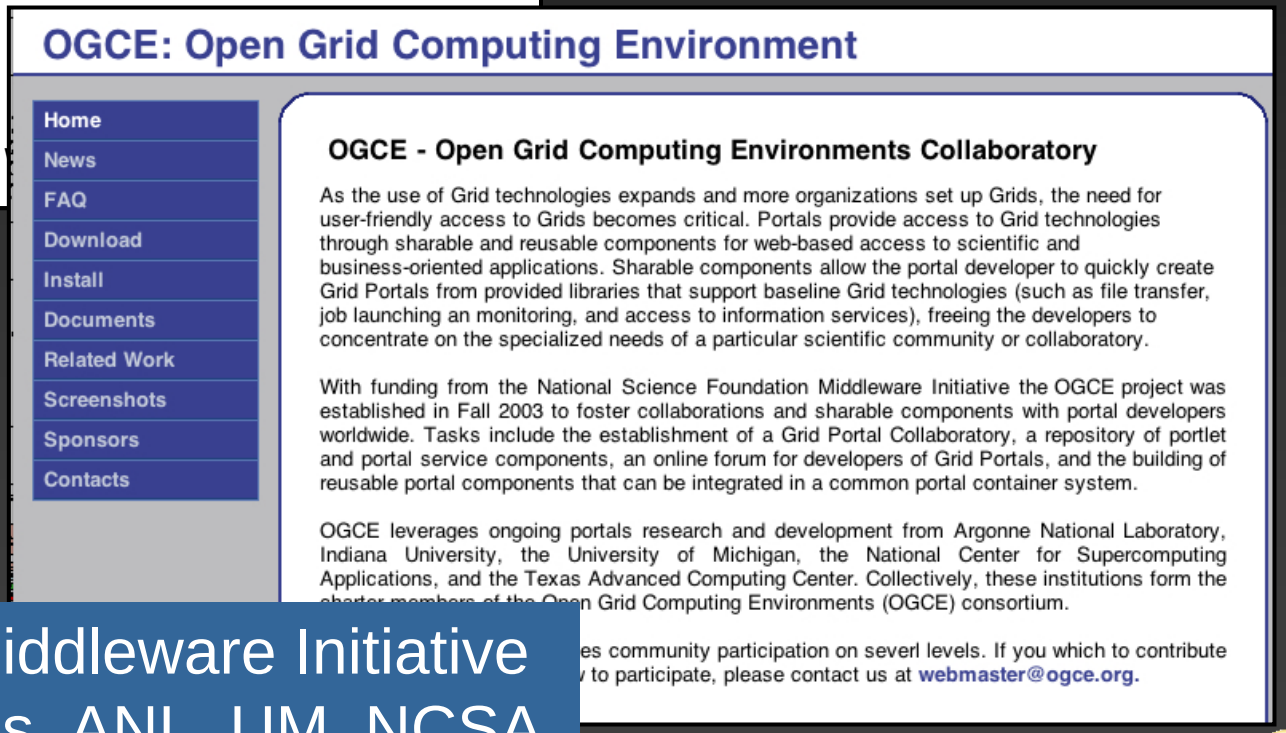


Figure 4: The revised portal architecture portal services.

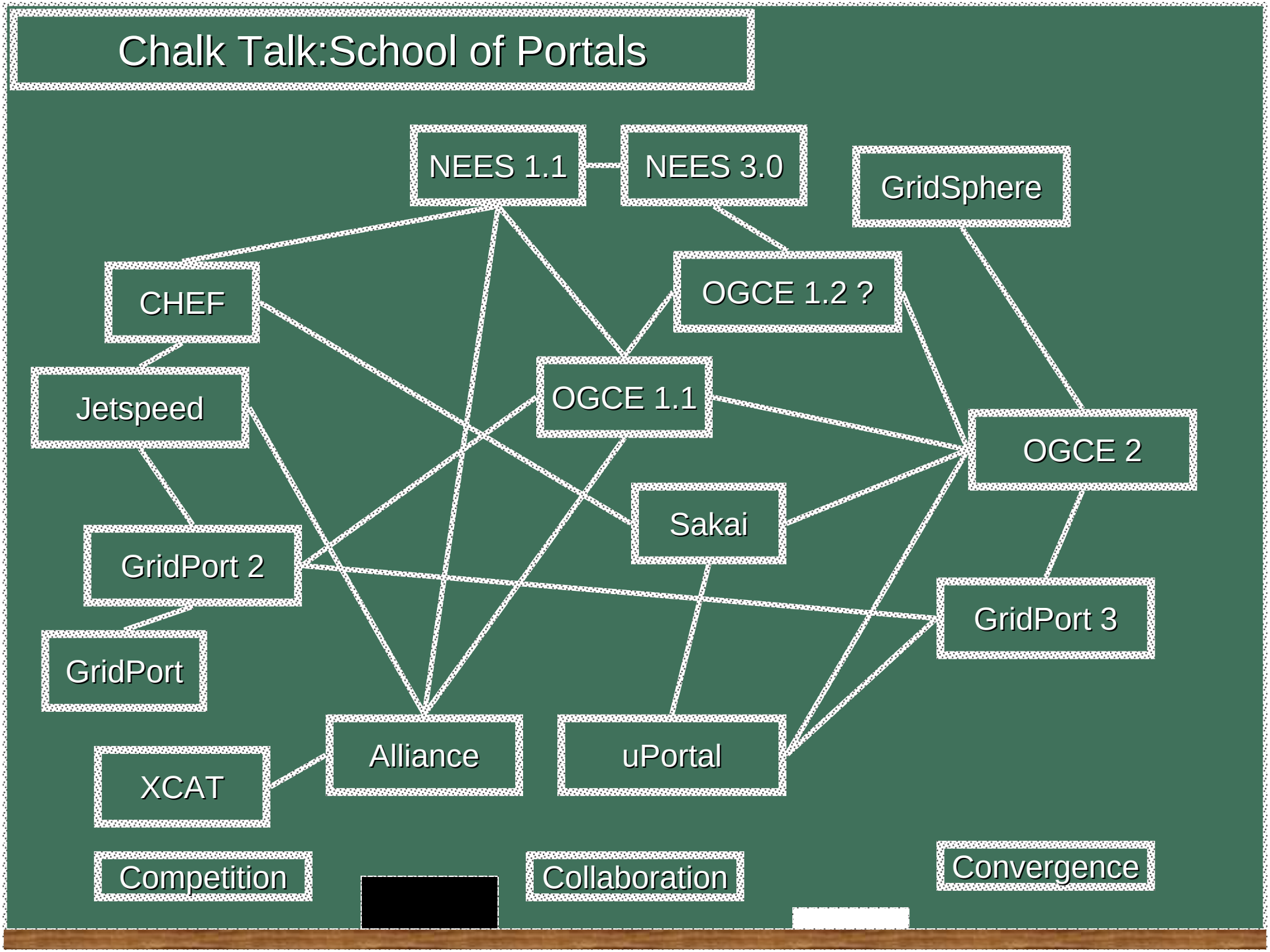
www.ogce.org

Out of the box science gateway



NSF National Middleware Initiative
Indiana, UTexas, ANL, UM, NCSA

Sakai


Chalk Talk:School of Portals
NEES 1.1
NEES 3.0
GridSphere
CHEF
OGCE 1.2 ?
Jetspeed
OGCE 1.1
OGCE 2
Sakai
GridPort 2
GridPort 3
GridPort
Alliance
uPortal
XCAT
Competition
Collaboration
Convergence

Science Gateway Barriers to Adoption

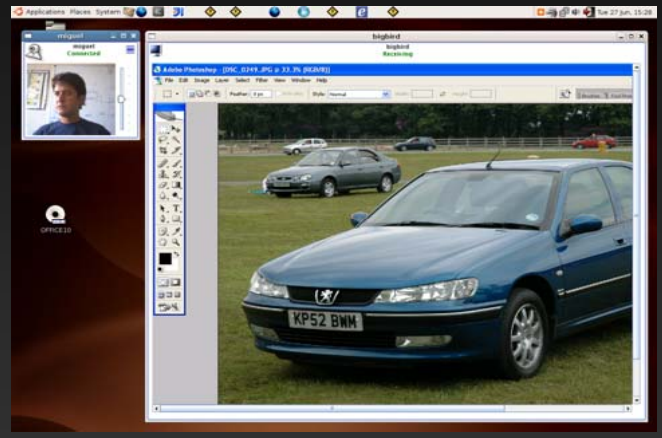
- Had to choose between JSR-168 and collaborative environment or do both and integrate
- Need something that “just installs” and works out of the box
  - Some assembly required
- Barriers lead to teams reinventing the wheel.

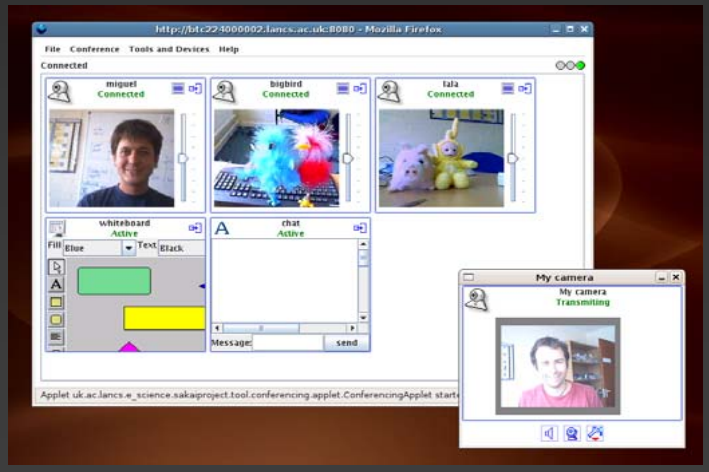
Sakai Research Edition

- Defaults set to appeal to research deployments
  - Teaching tools will be included but hidden
  - Include popular extension components
- F2F collaborative suite integration
- Shibboleth / Guan Xi Support
- MyProxy / GridShib support
- JSR-168 (portlet) support
- Sakai WorkGroup Portal
- JSR-170 (repository) support
- OGCE Grid Portlets
- Target - Summer 2007

Lancaster Collaboration Suite

- Built for Sakai
- Extremely simple setup
- Shared video, audio
- Whiteboard
- Screen Sharing
- Recording
- Software multicast
- Java Web Start auto-install
- Apache License

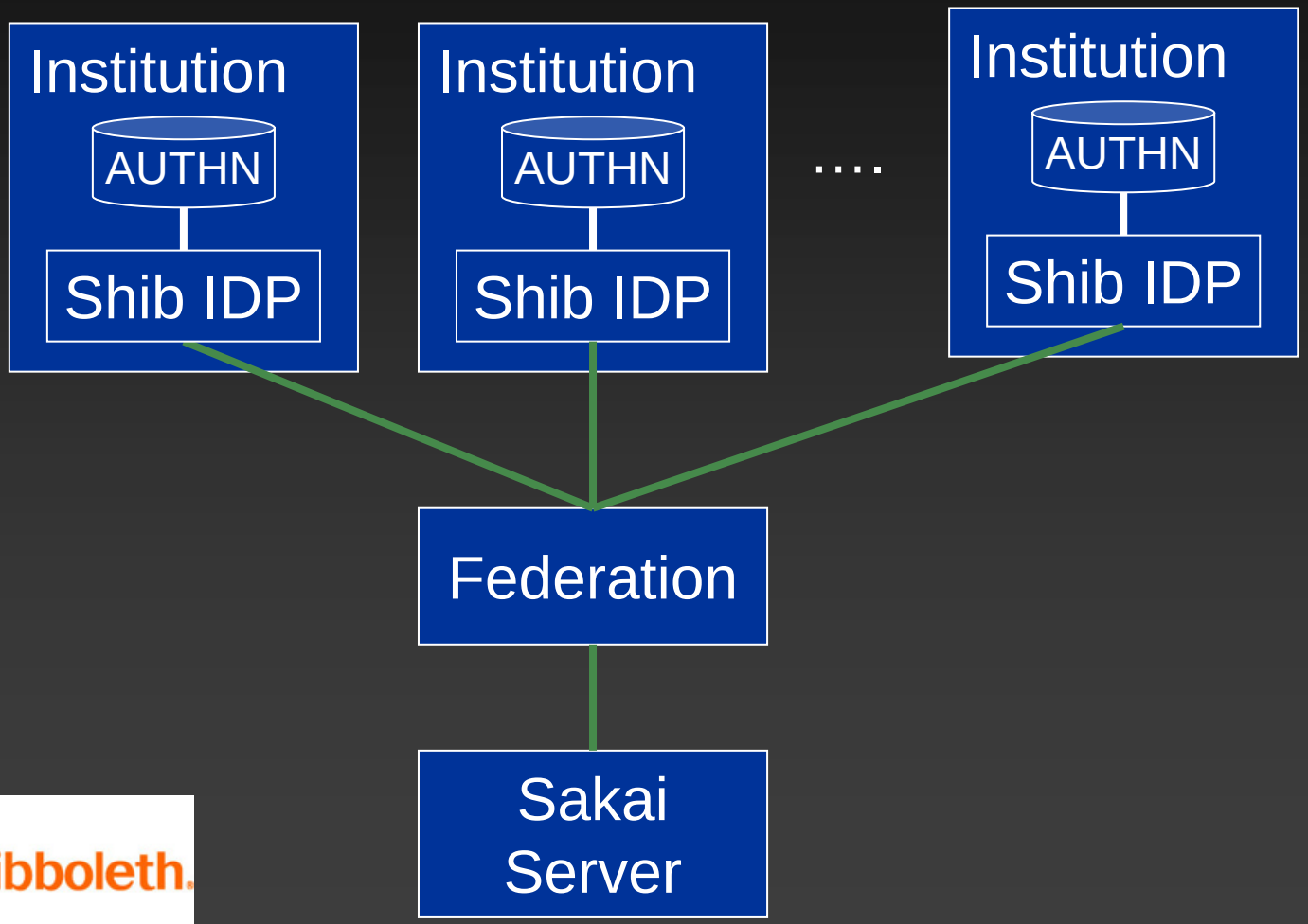




Federated Identity in Sakai

- SAML profiles - Shibboleth and GuanXi
- Shibboleth - Oxford
  - Federated identity for large groups to use a Sakai server with support for distributed AUTHN/AUTHZ
- GuanXi - University of the Highlands and Islands
  - Allows inclusion of Shib-enabled resources into a Sakai Collaborative Environment
  - Allows elements of Sakai to be used/included in another environment

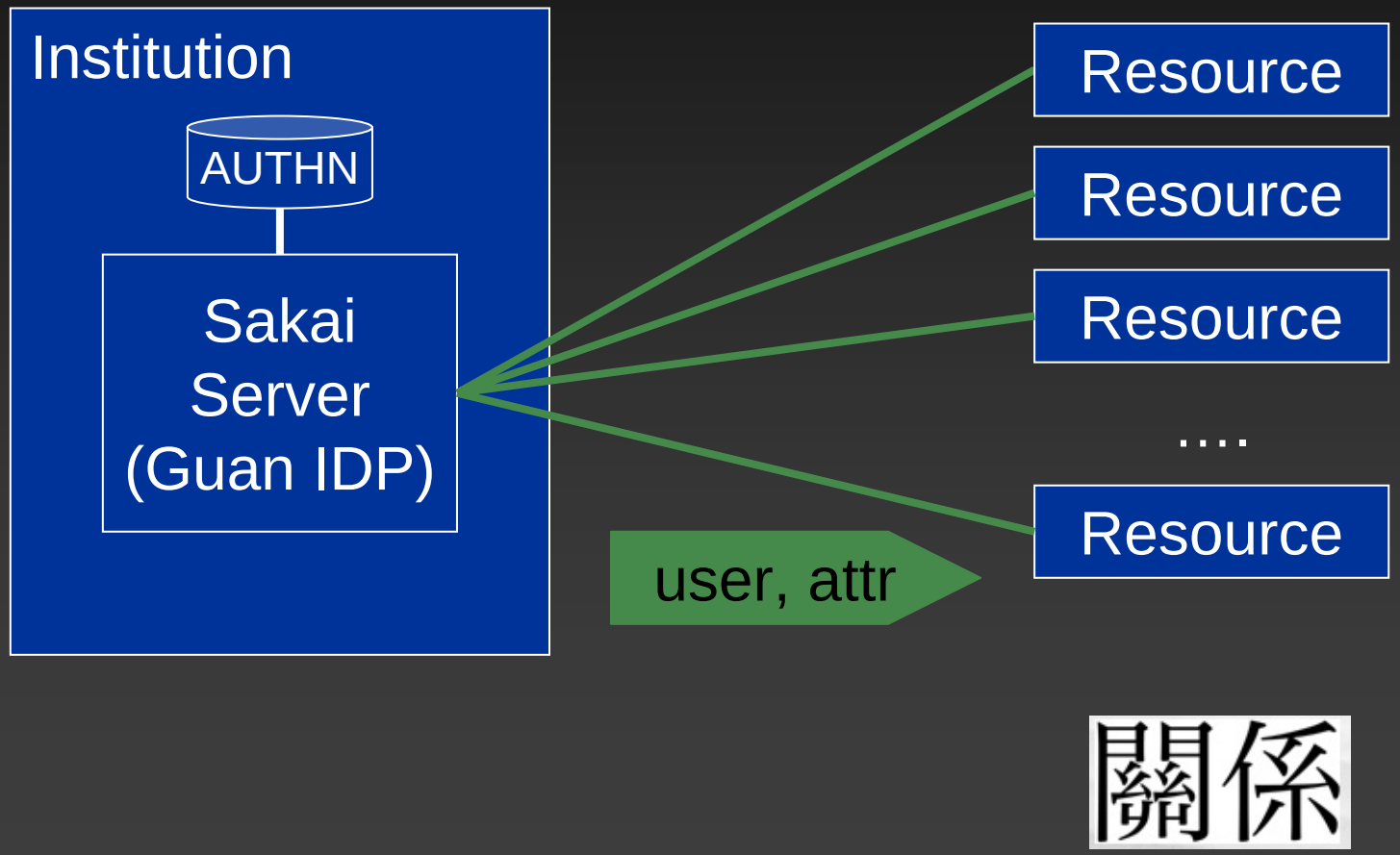
Shibboleth Use Case



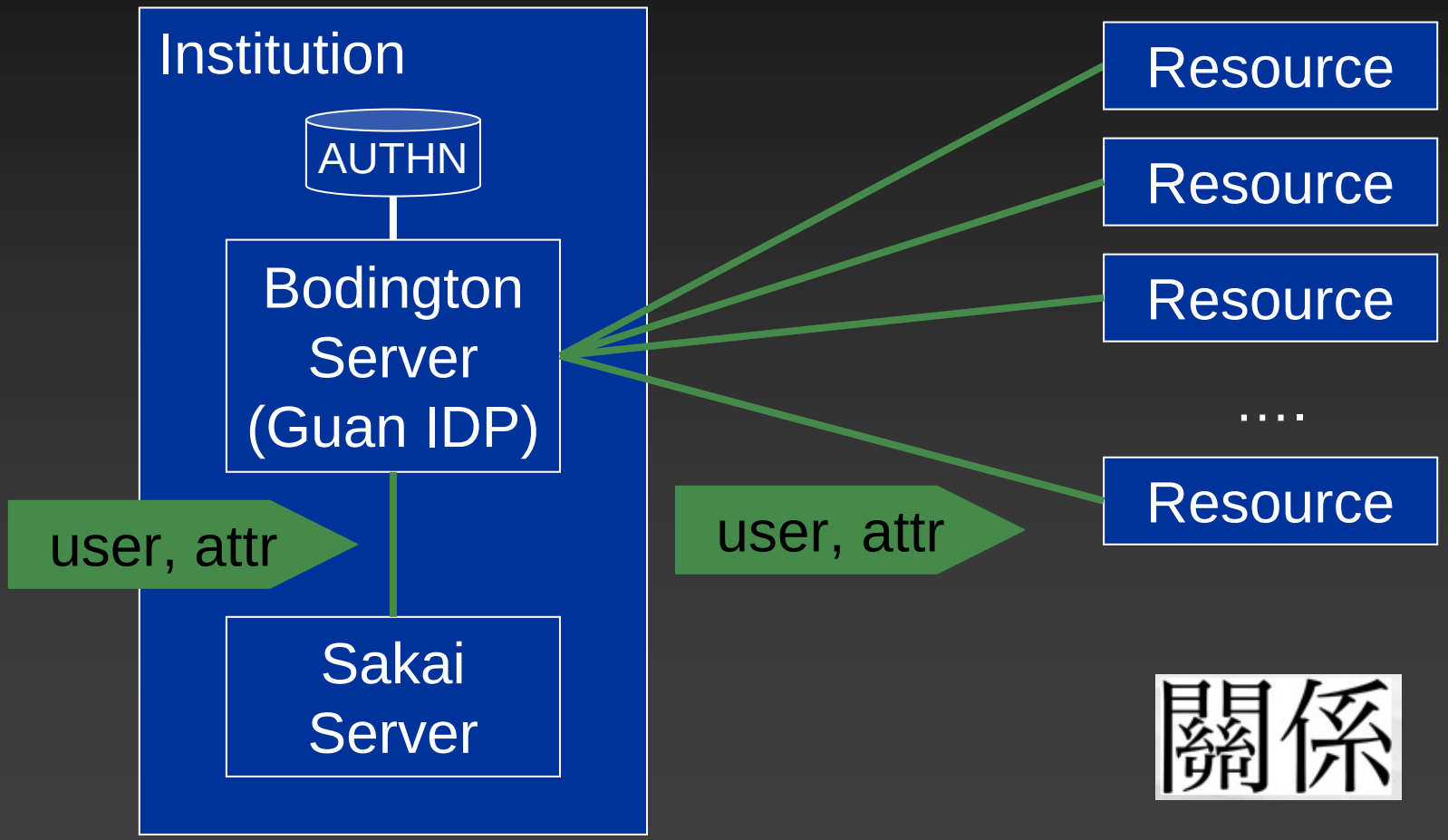
Shibboleth.

Sakai

GuanXi Use Case I



GuanXi Use Case II



GuanXi in Sakai

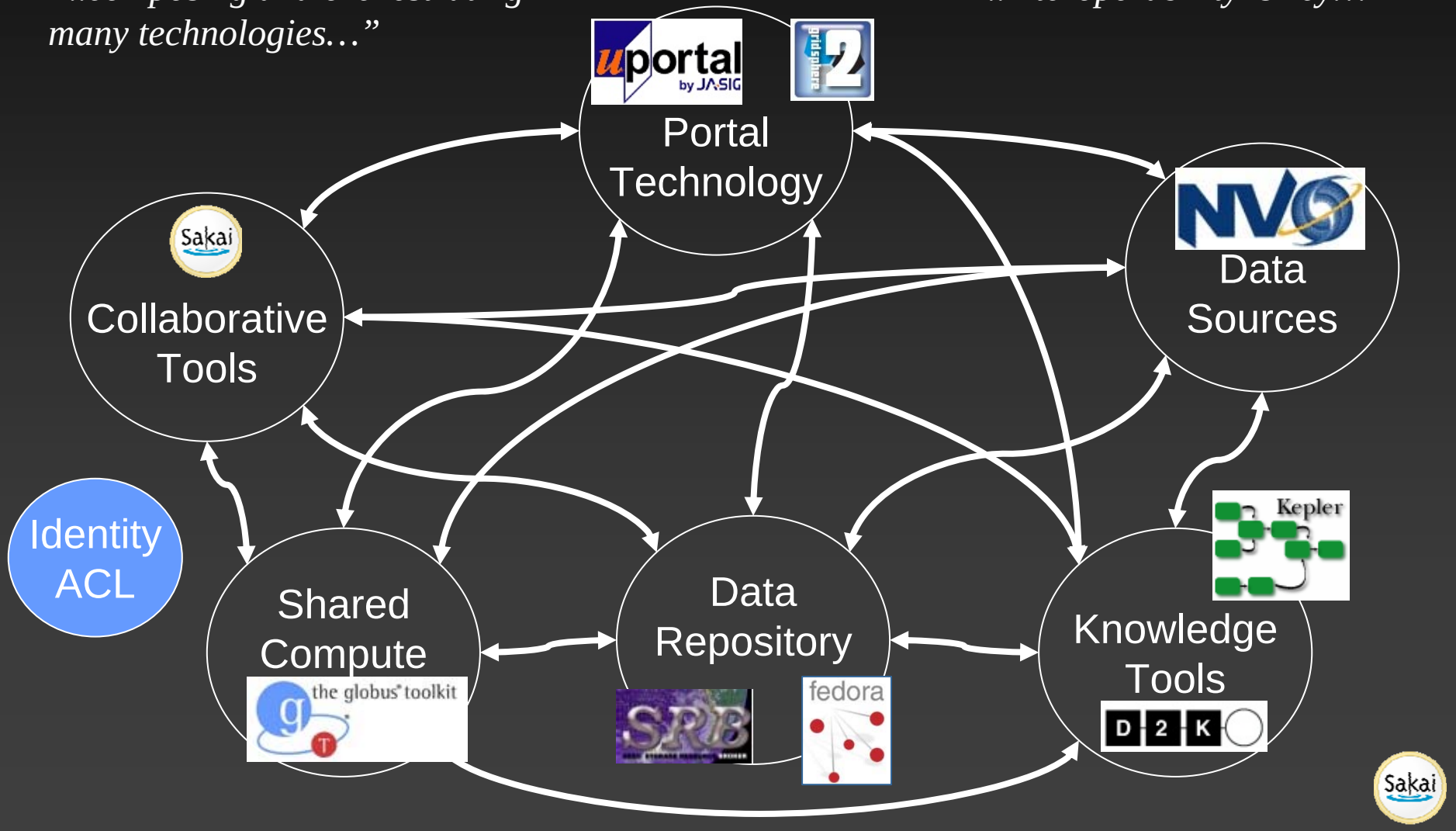
關係

The Ecology of Collaborative eScience

Scope of Collaborative E-Science

"..composing and orchestrating many technologies…"

"..interoperability is key…"



User Interface for Collaborative E-Science

Portals are an excellent technology for building a federated user interface across these disparate components using standards like JSR-168.

Portal Technology

Collaborative Tools

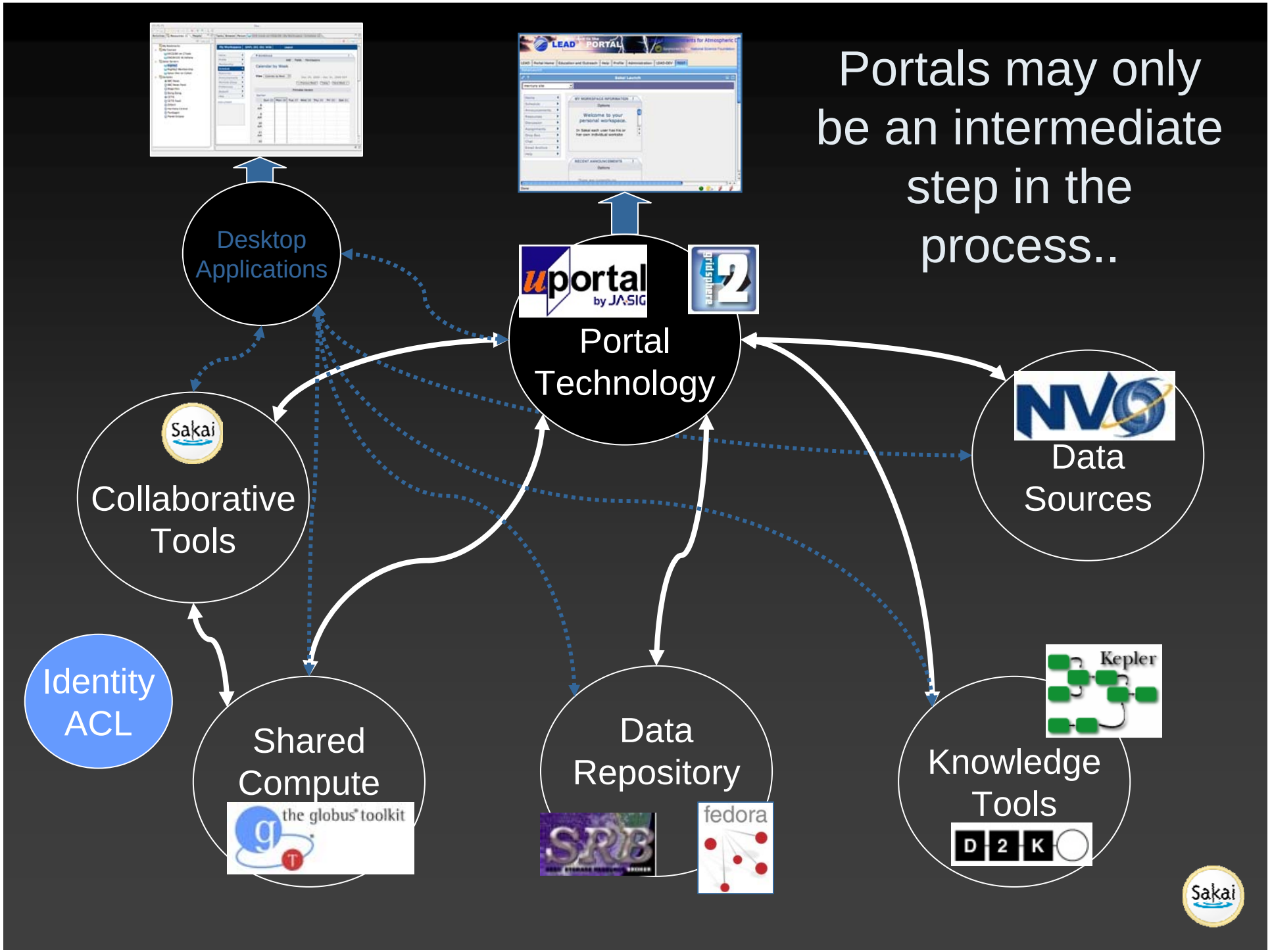
Data Sources

Identity ACL

Shared Compute

Data Repository

Knowledge Tools


Portals may only be an intermediate step in the process..
Desktop Applications
uportal by JASIG
gridsphere 2
Portal Technology
Sakai
Collaborative Tools
NVO
Data Sources
Identity ACL
Shared Compute
the globus toolkit
Data Repository
SRB
fedora
Kepler
Knowledge Tools
D 2 K
Sakai

Focus of Sakai Activity in eScience

Sakai is focused primarily on integration with portals and working closely with data repositories.

Bring Closer

Portal Technology

Collaborative Tools

Data Sources

Identity ACL

Shared Compute

Data Repository

Knowledge Tools

JSR-168 in Sakai

Sakai JSR-168 Roadmap

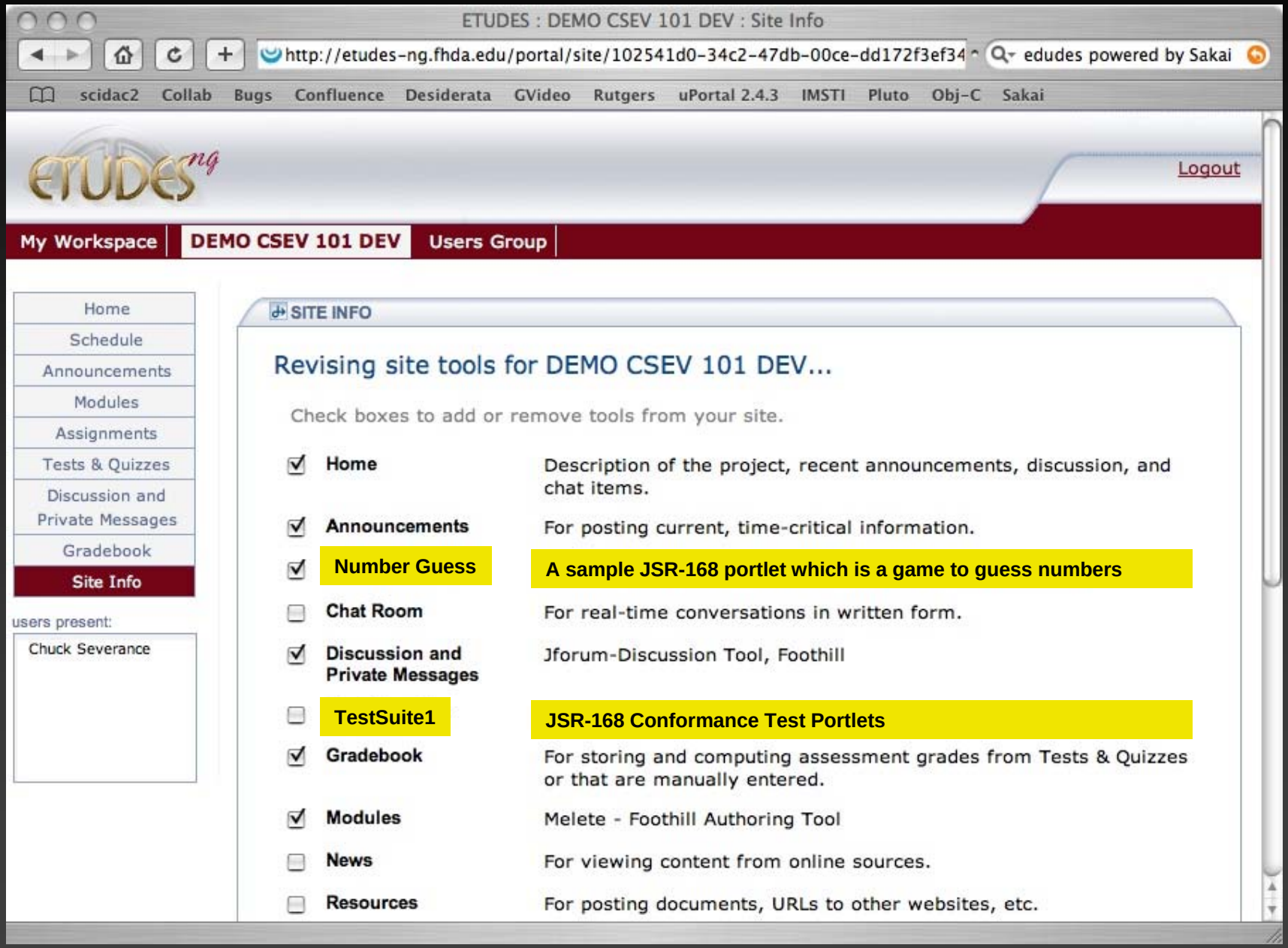
- Build support in Sakai for JSR-168 using Pluto 1.1 - expected in Sakai 2.4 2Q07
- Enable the use of existing *truly portable* JSR-168 portlets within Sakai
- Enable new Sakai tools to be written as JSR-168 portlets
  - This will only be suitable for the class of tools that simply need a unique placement.
  - Will lead to a set of simple and very reusable collaborative tools

JSR-168 In Sakai

- Took some NSF and JISC funding and retained David DeWolf - lead committer for Pluto and JSR-286 EG member to put Pluto 1.1 into Sakai
- Coordination / Sakai Architecture work is being handled by Ian Boston of Cambridge
- Expect initial version for Daresbury, UK to test early December 2006

Use Cases for Sakai-168

- Prepare a Pluto-style portlet war file and drop it into Sakai as a webapp - auto register
- Users simply use Sakai's Site Info tool to place portlets like any other Sakai tool
- It will be possible to use any Sakai API within a JSR-168 Portlet
- Sakai will provide a JSR-168 complaint classes so that portlets have the same look and feel as Sakai tools


ETUDES : DEMO CSEV 101 DEV : Site Info
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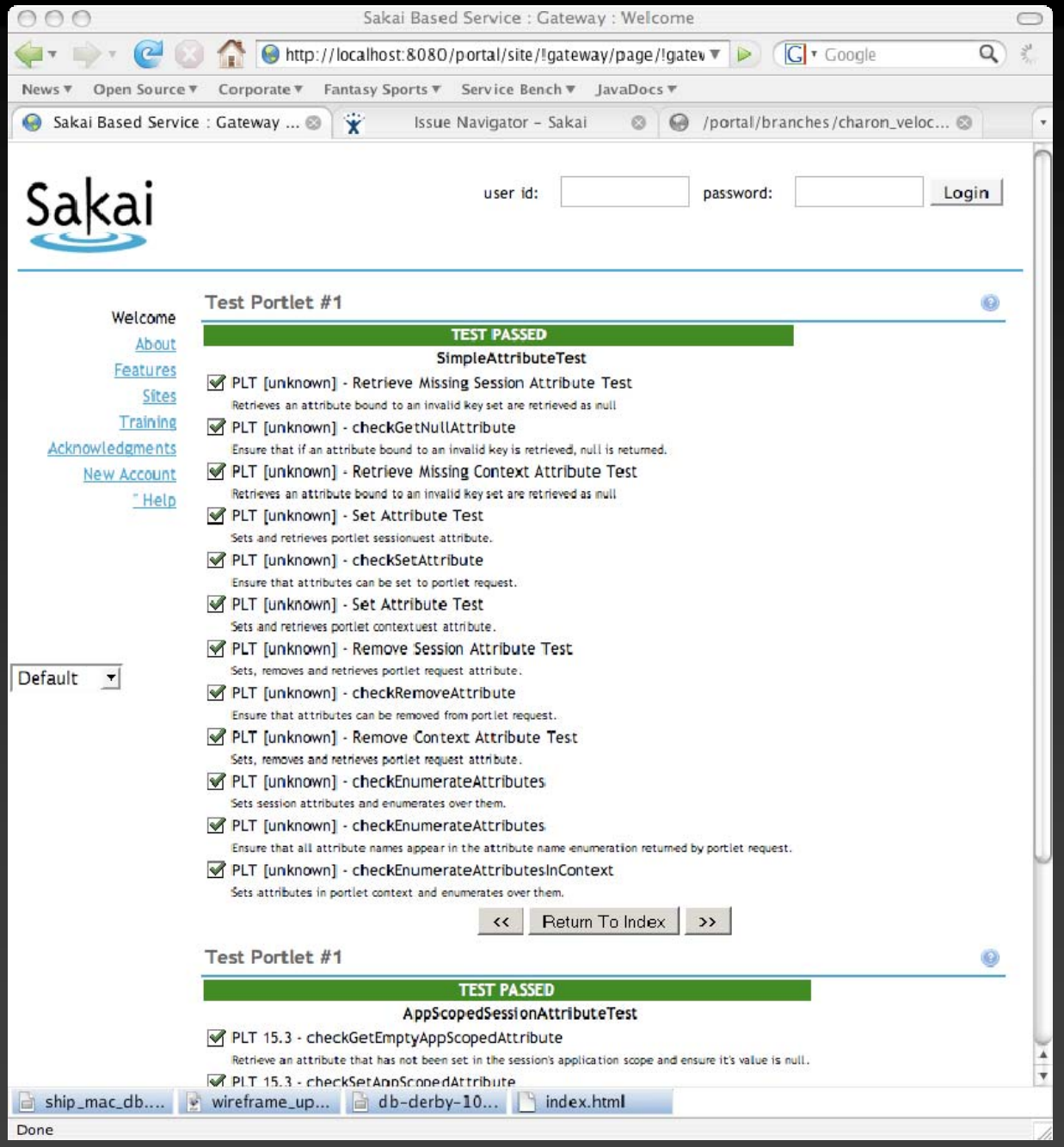
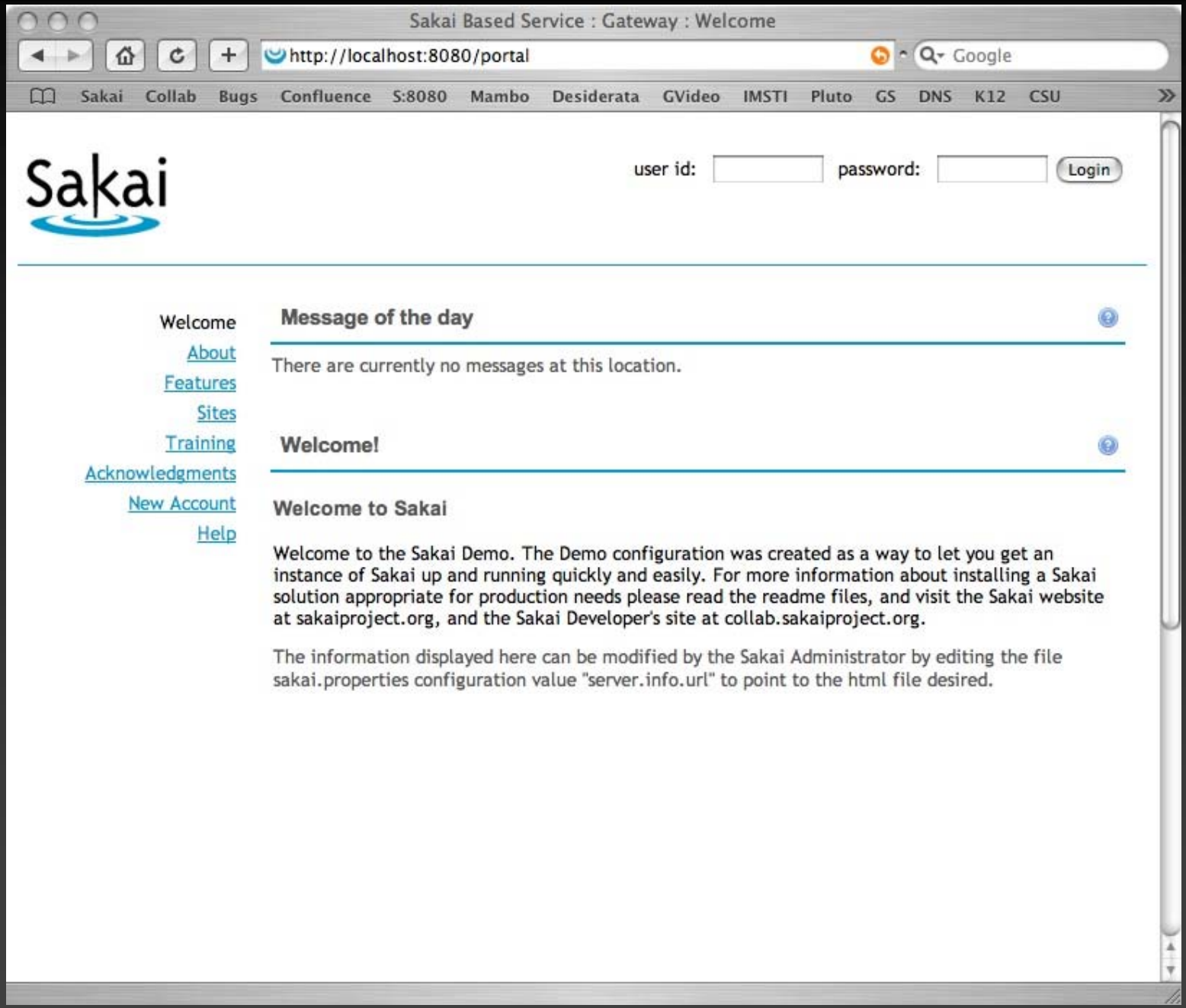
edudes powered by Sakai
scidac2 Collab Bugs Confluence Desiderata GVideo Rutgers uPortal 2.4.3 IMSTI Pluto Obj-C Sakai
Logout
My Workspace
DEMO CSEV 101 DEV
Users Group
Home
Schedule
Announcements
Modules
Assignments
Tests & Quizzes
Discussion and Private Messages
Gradebook
Site Info
users present:
Chuck Severance
SITE INFO
Revising site tools for DEMO CSEV 101 DEV...
Check boxes to add or remove tools from your site.
Home
Description of the project, recent announcements, discussion, and chat items.
Announcements
For posting current, time-critical information.
Number Guess
A sample JSR-168 portlet which is a game to guess numbers
Chat Room
For real-time conversations in written form.
Discussion and Private Messages
Jforum-Discussion Tool, Foothill
TestSuite1
JSR-168 Conformance Test Portlets
Gradebook
For storing and computing assessment grades from Tests & Quizzes or that are manually entered.
Modules
Melete - Foothill Authoring Tool
News
For viewing content from online sources.
Resources
For posting documents, URLs to other websites, etc.

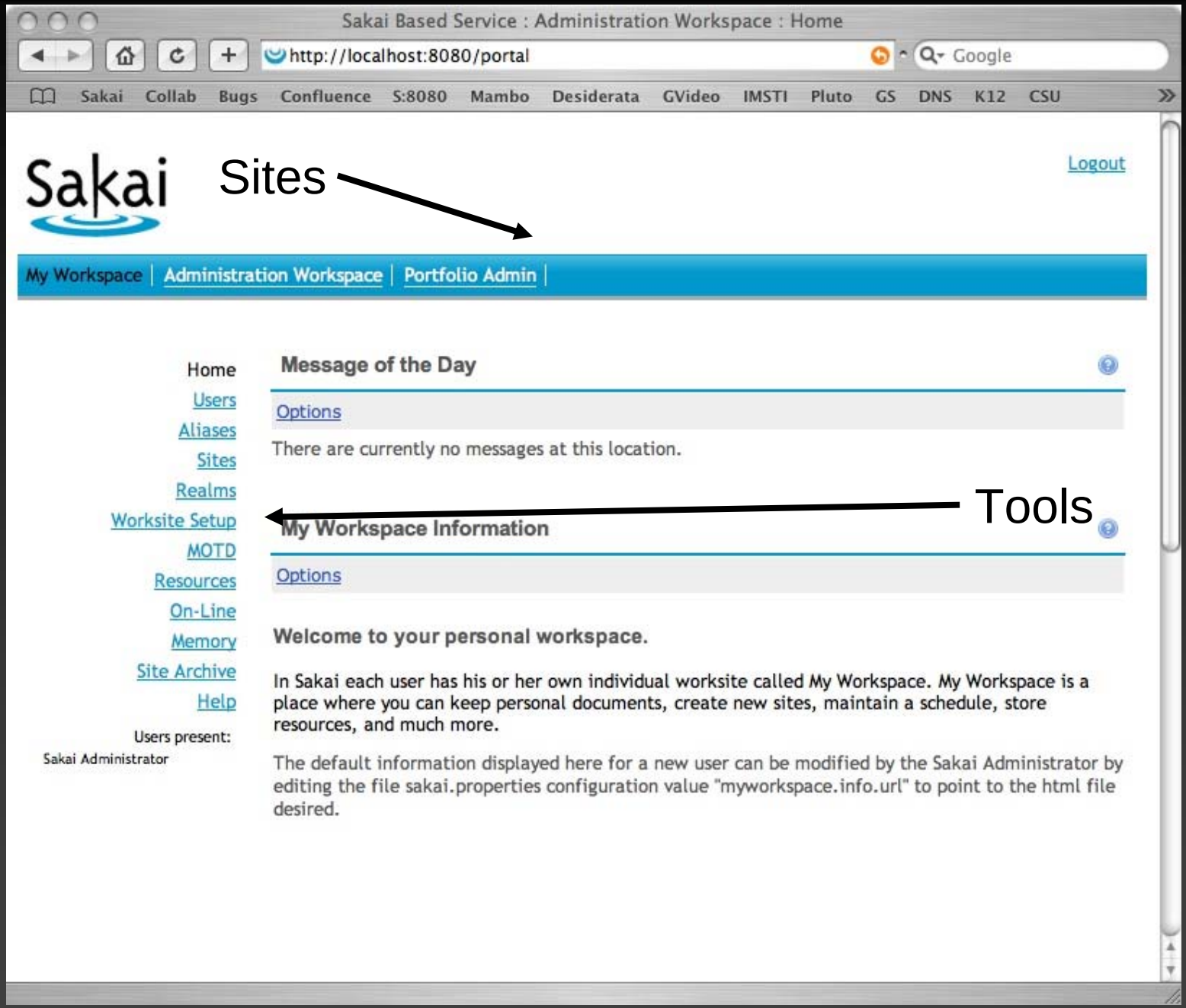

Sakai Based Service : Gateway : Welcome
http://localhost:8080/portal/site/!gateway/page/!gatew
Google
News
Open Source
Corporate
Fantasy Sports
Service Bench
JavaDocs
Sakai Based Service : Gateway ...
Issue Navigator - Sakai
/portal/branches/charon_veloc...
Sakai
user id:
password:
Login
Welcome
About
Features
Sites
Training
Acknowledgments
New Account
Help
Default
Test Portlet #1
TEST PASSED
SimpleAttributeTest
PLT [unknown] - Retrieve Missing Session Attribute Test
Retrieves an attribute bound to an invalid key set are retrieved as null
PLT [unknown] - checkGetNullAttribute
Ensure that if an attribute bound to an invalid key is retrieved, null is returned.
PLT [unknown] - Retrieve Missing Context Attribute Test
Retrieves an attribute bound to an invalid key set are retrieved as null
PLT [unknown] - Set Attribute Test
Sets and retrieves portlet sessionuest attribute.
PLT [unknown] - checkSetAttribute
Ensure that attributes can be set to portlet request.
PLT [unknown] - Set Attribute Test
Sets and retrieves portlet contextuest attribute.
PLT [unknown] - Remove Session Attribute Test
Sets, removes and retrieves portlet request attribute.
PLT [unknown] - checkRemoveAttribute
Ensure that attributes can be removed from portlet request.
PLT [unknown] - Remove Context Attribute Test
Sets, removes and retrieves portlet request attribute.
PLT [unknown] - checkEnumerateAttributes
Sets session attributes and enumerates over them.
PLT [unknown] - checkEnumerateAttributes
Ensure that all attribute names appear in the attribute name enumeration returned by portlet request.
PLT [unknown] - checkEnumerateAttributesInContext
Sets attributes in portlet context and enumerates over them.
<< Return To Index >>
Test Portlet #1
TEST PASSED
AppScopedSessionAttributeTest
PLT 15.3 - checkGetEmptyAppScopedAttribute
Retrieve an attribute that has not been set in the session's application scope and ensure it's value is null.
PLT 15.3 - checkSetAppScopedAttribute
ship_mac_db....
wireframe_up...
db-derby-10...
index.html
Done

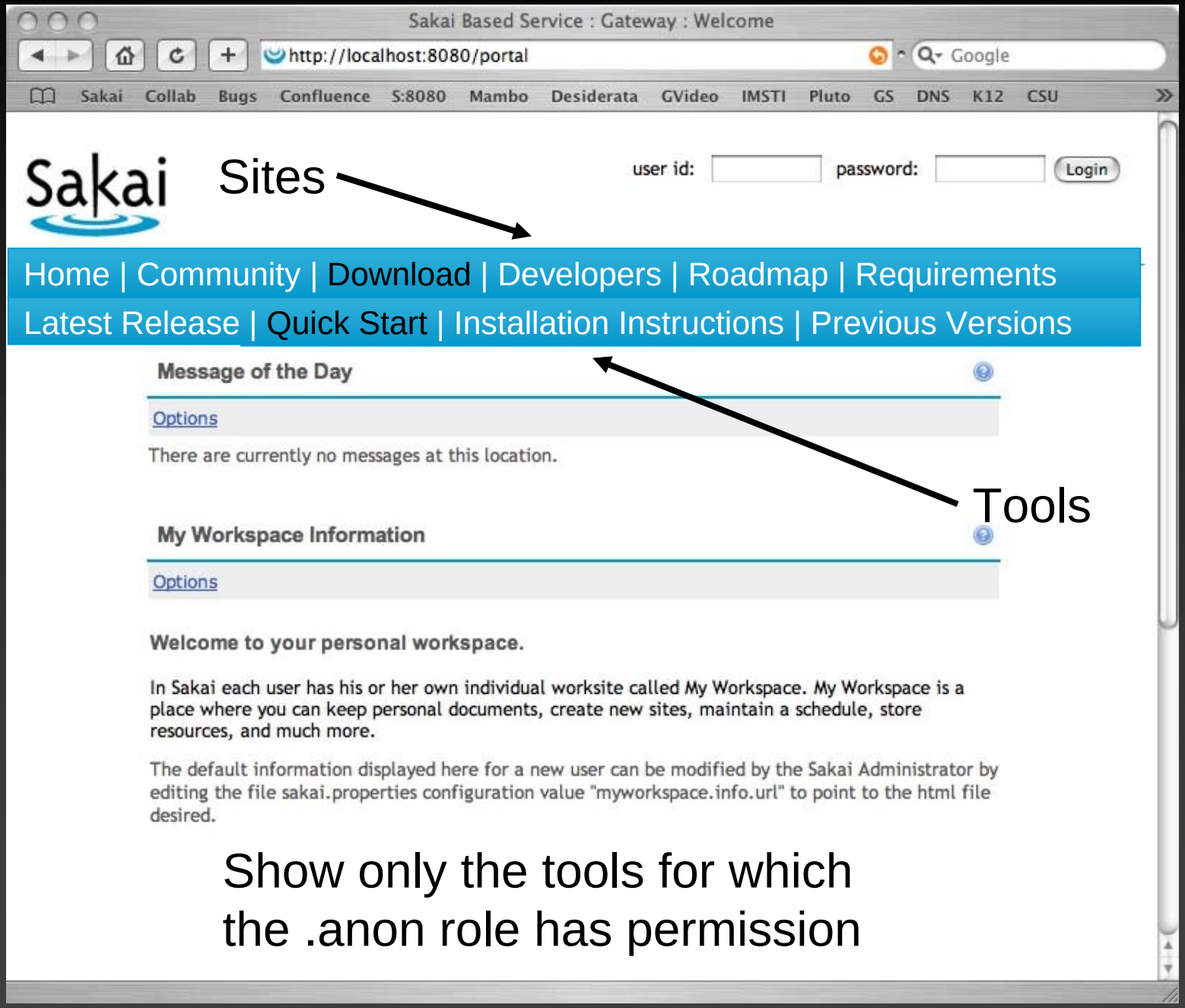
Sakai WorkGroup Portal

Sakai WorkGroup Portal

- Allows Sakai to be used as a simple Content Management System like Mambo or Plone
- Display any site which grants the anonymous user permission
- Site buttons are controlled by which permissions are granted to the anonymous user.
- Sakai Workgroup portal is expected in Sakai 2.4


Sakai Based Service : Gateway : Welcome
http://localhost:8080/portal
Google
Sakai Collab Bugs Confluence S:8080 Mambo Desiderata GVideo IMSTI Pluto GS DNS K12 CSU
Sakai
user id:
password:
Login
Welcome
About
Features
Sites
Training
Acknowledgments
New Account
Help
Message of the day
There are currently no messages at this location.
Welcome!
Welcome to Sakai
Welcome to the Sakai Demo. The Demo configuration was created as a way to let you get an instance of Sakai up and running quickly and easily. For more information about installing a Sakai solution appropriate for production needs please read the readme files, and visit the Sakai website at sakaiproject.org, and the Sakai Developer's site at collab.sakaiproject.org.
The information displayed here can be modified by the Sakai Administrator by editing the file sakai.properties configuration value "server.info.url" to point to the html file desired.


Sakai Based Service : Administration Workspace : Home
http://localhost:8080/portal
Google
Sakai Collab Bugs Confluence S:8080 Mambo Desiderata GVideo IMSTI Pluto GS DNS K12 CSU
Sakai
Sites
Logout
My Workspace | Administration Workspace | Portfolio Admin |
Home
Users
Aliases
Sites
Realms
Worksite Setup
MOTD
Resources
On-Line
Memory
Site Archive
Help
Users present:
Sakai Administrator
Message of the Day
Options
There are currently no messages at this location.
Tools
My Workspace Information
Options
Welcome to your personal workspace.
In Sakai each user has his or her own individual worksite called My Workspace. My Workspace is a place where you can keep personal documents, create new sites, maintain a schedule, store resources, and much more.
The default information displayed here for a new user can be modified by the Sakai Administrator by editing the file sakai.properties configuration value "myworkspace.info.url" to point to the html file desired.


Sakai Based Service : Gateway : Welcome
http://localhost:8080/portal
Google
Sakai Collab Bugs Confluence S:8080 Mambo Desiderata GVideo IMSTI Pluto GS DNS K12 CSU
Sakai
Sites
user id:
password:
Login
Home | Community | Download | Developers | Roadmap | Requirements
Latest Release | Quick Start | Installation Instructions | Previous Versions
Message of the Day
Options
There are currently no messages at this location.
Tools
My Workspace Information
Options
Welcome to your personal workspace.
In Sakai each user has his or her own individual worksite called My Workspace. My Workspace is a place where you can keep personal documents, create new sites, maintain a schedule, store resources, and much more.
The default information displayed here for a new user can be modified by the Sakai Administrator by editing the file sakai.properties configuration value "myworkspace.info.url" to point to the html file desired.
Show only the tools for which the .anon role has permission

Sakai Repository Integration Approach

Focus of Sakai Activity in eScience

Sakai is focused primarily on integration with portals and working closely with data repositories.

Portal Technology

Collaborative Tools

Data Sources

Discuss Now

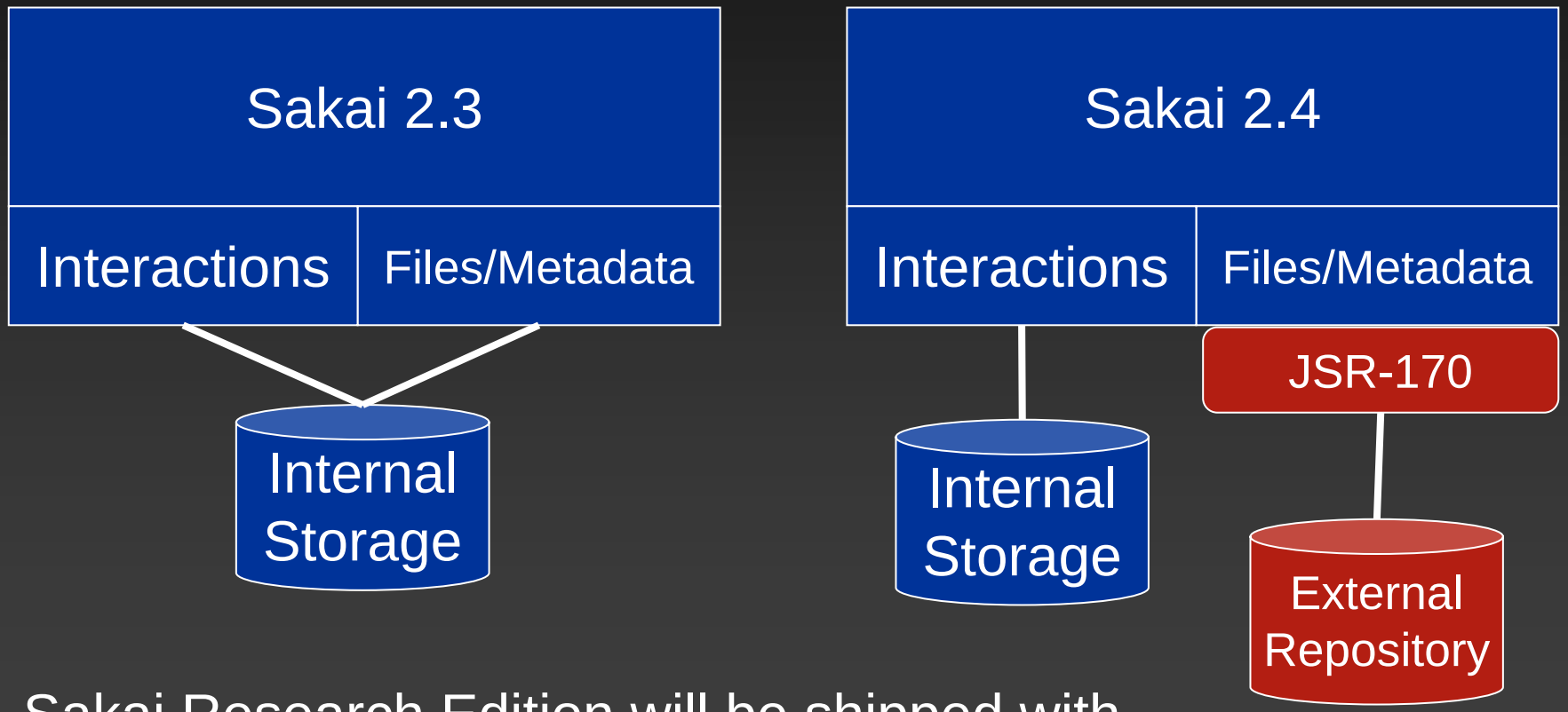
Identity ACL

Shared Compute

Data Repository

Knowledge Tools

Sakai and Data Repositories

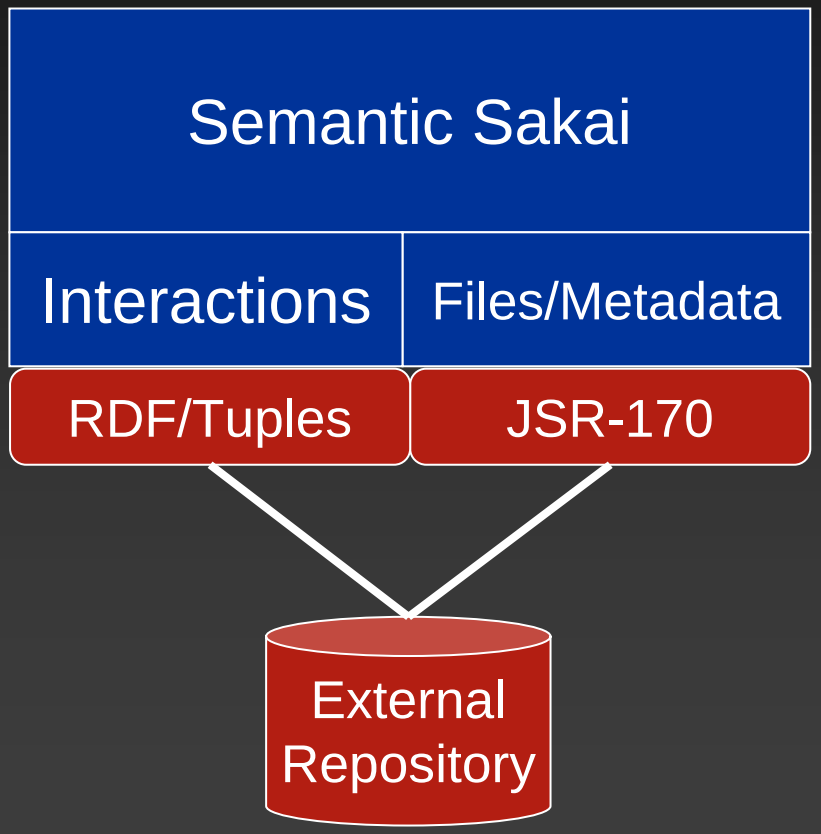


Sakai Research Edition will be shipped with the Jakarta Jack-Rabbit JSR-170 implementation.

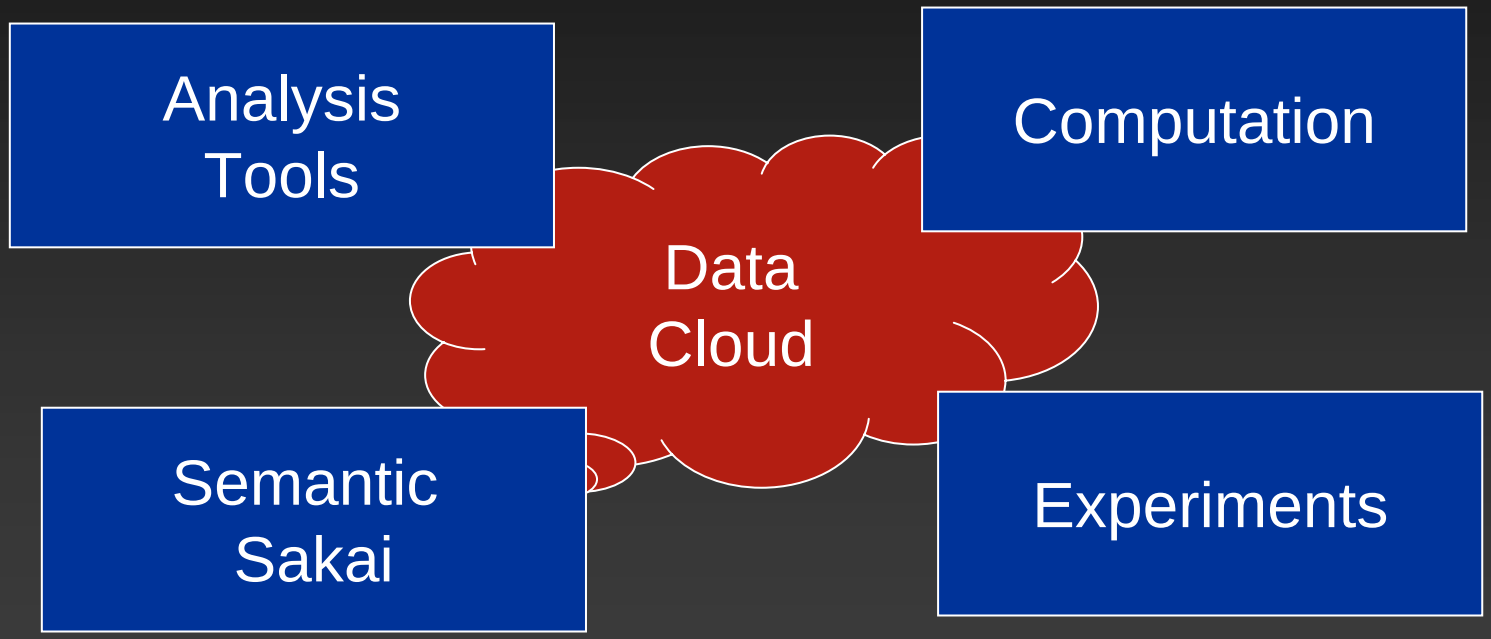
Semantic Sakai

The goal is to also store all of the interaction information in an external repository with complete cross-linking between interaction data and file data as well as data from other sources.

Working on funding and a partner community for this activity.



Adding Collaboration to the Data Cloud



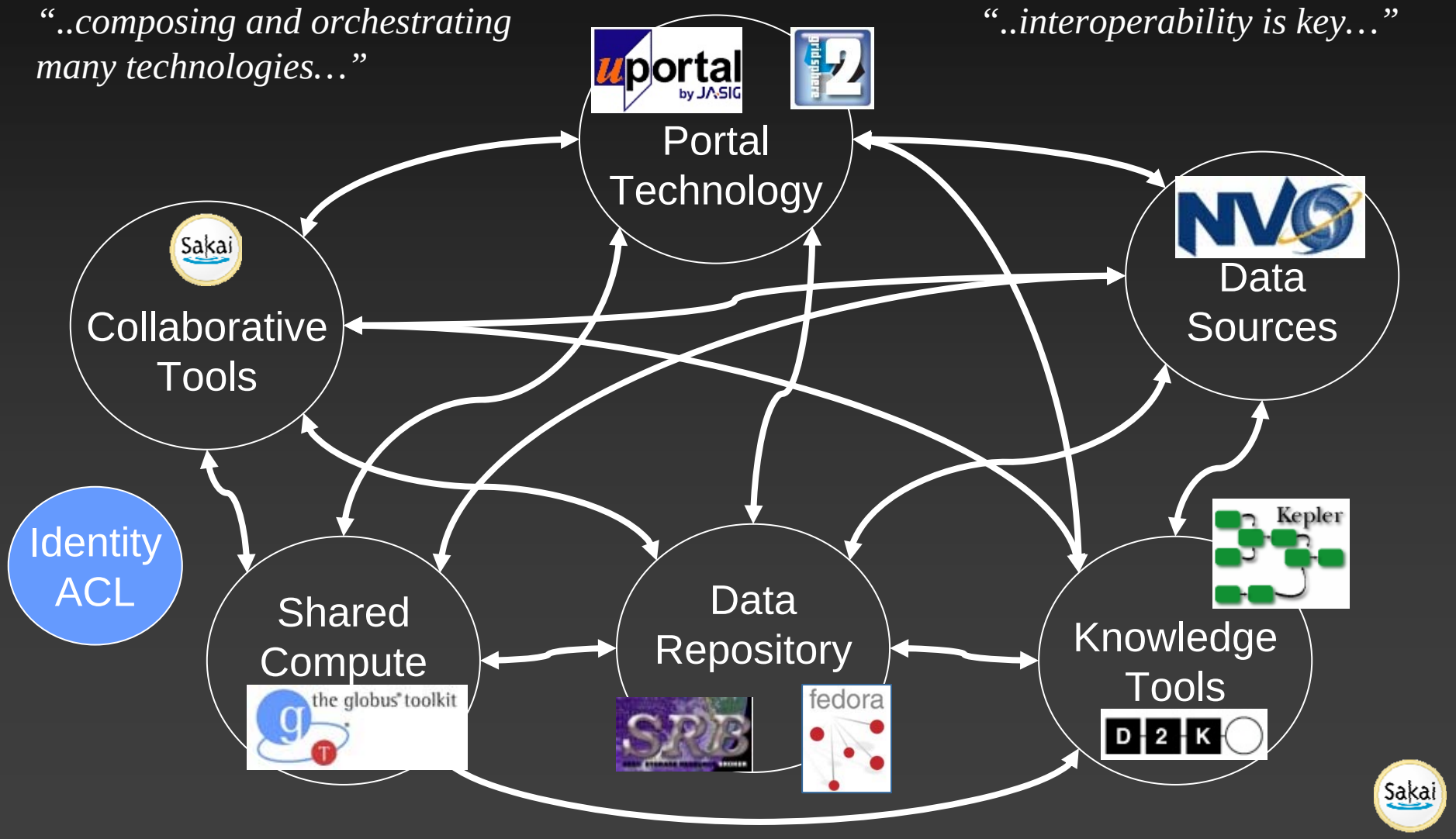
Semantic Sakai is future deliverable with the goal of storing all collaborative activity in semantically rich formats in an external repository.

Issues in Middleware

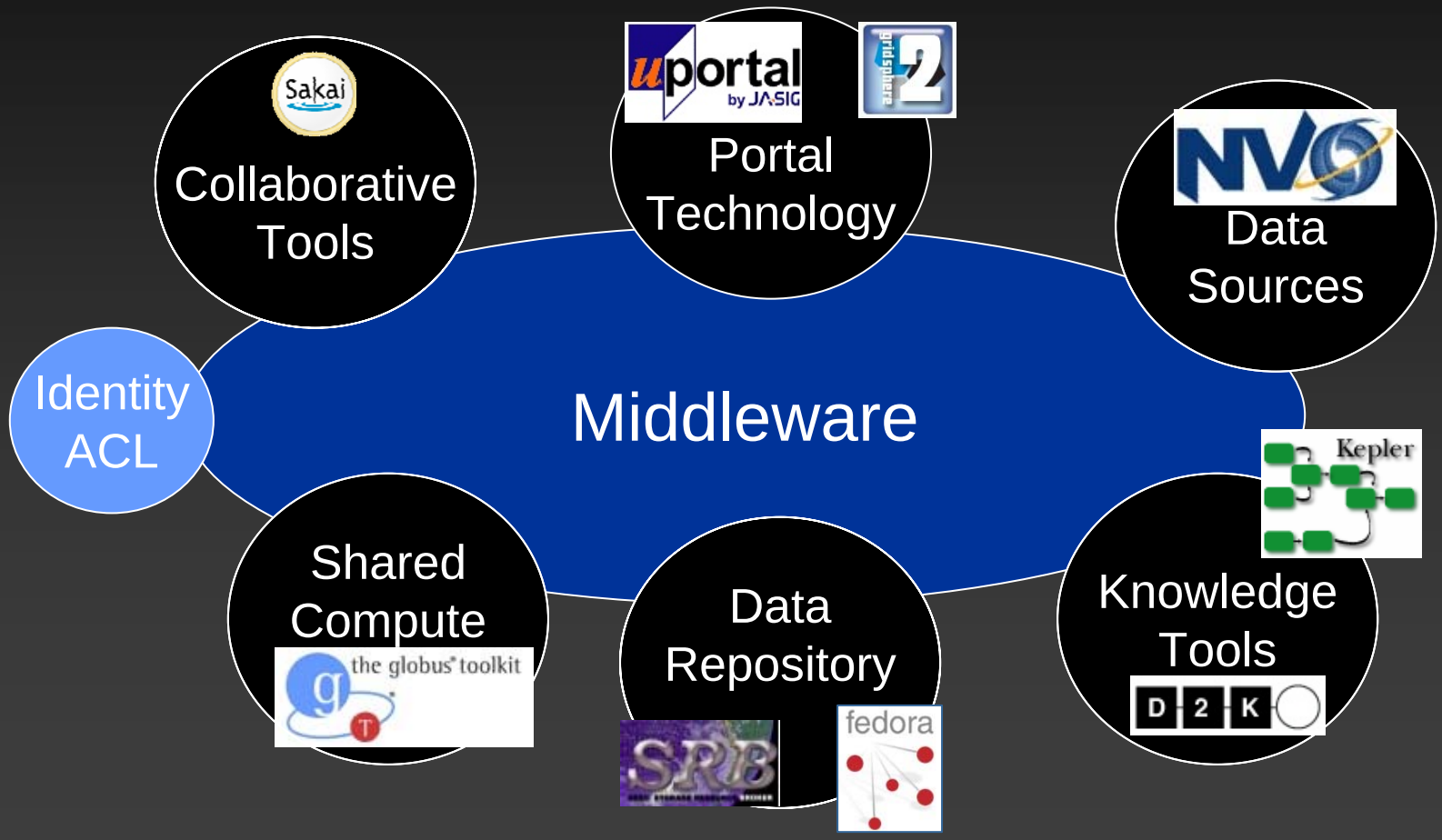
Where is the Middleware?

"..composing and orchestrating many technologies…"

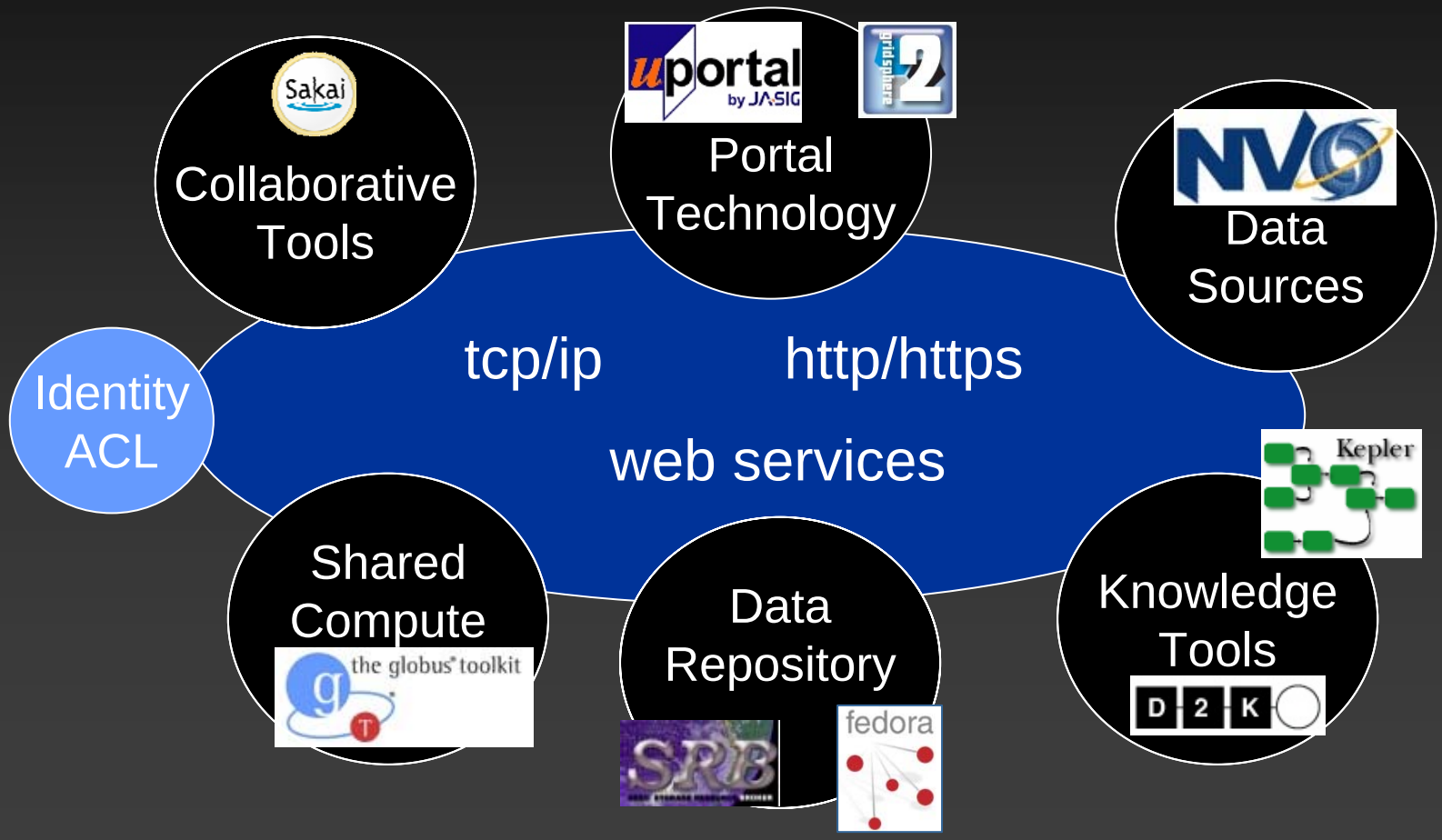
"..interoperability is key…"



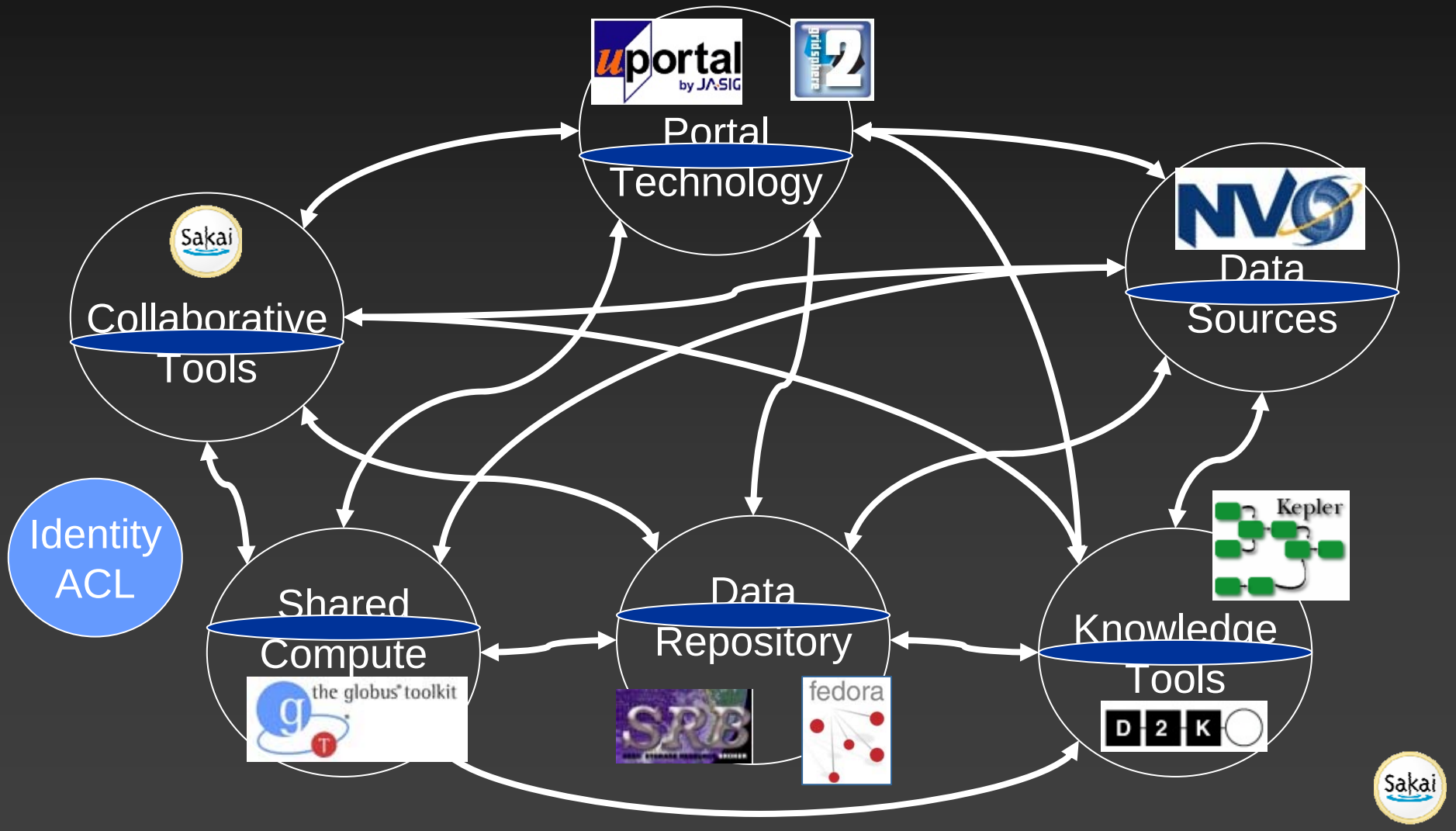
Is Middleware The Universal Connector?



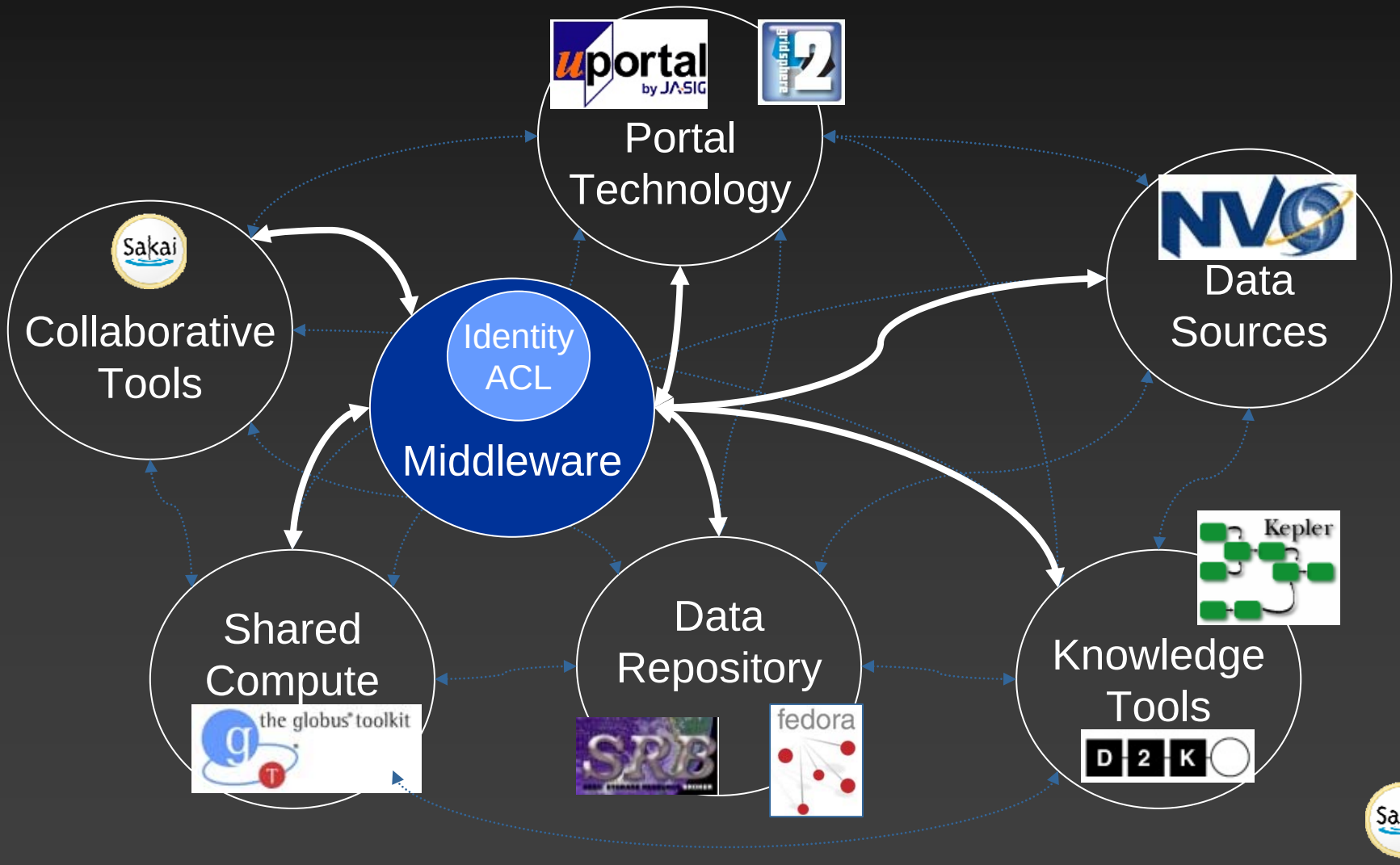
The Universal Connectors



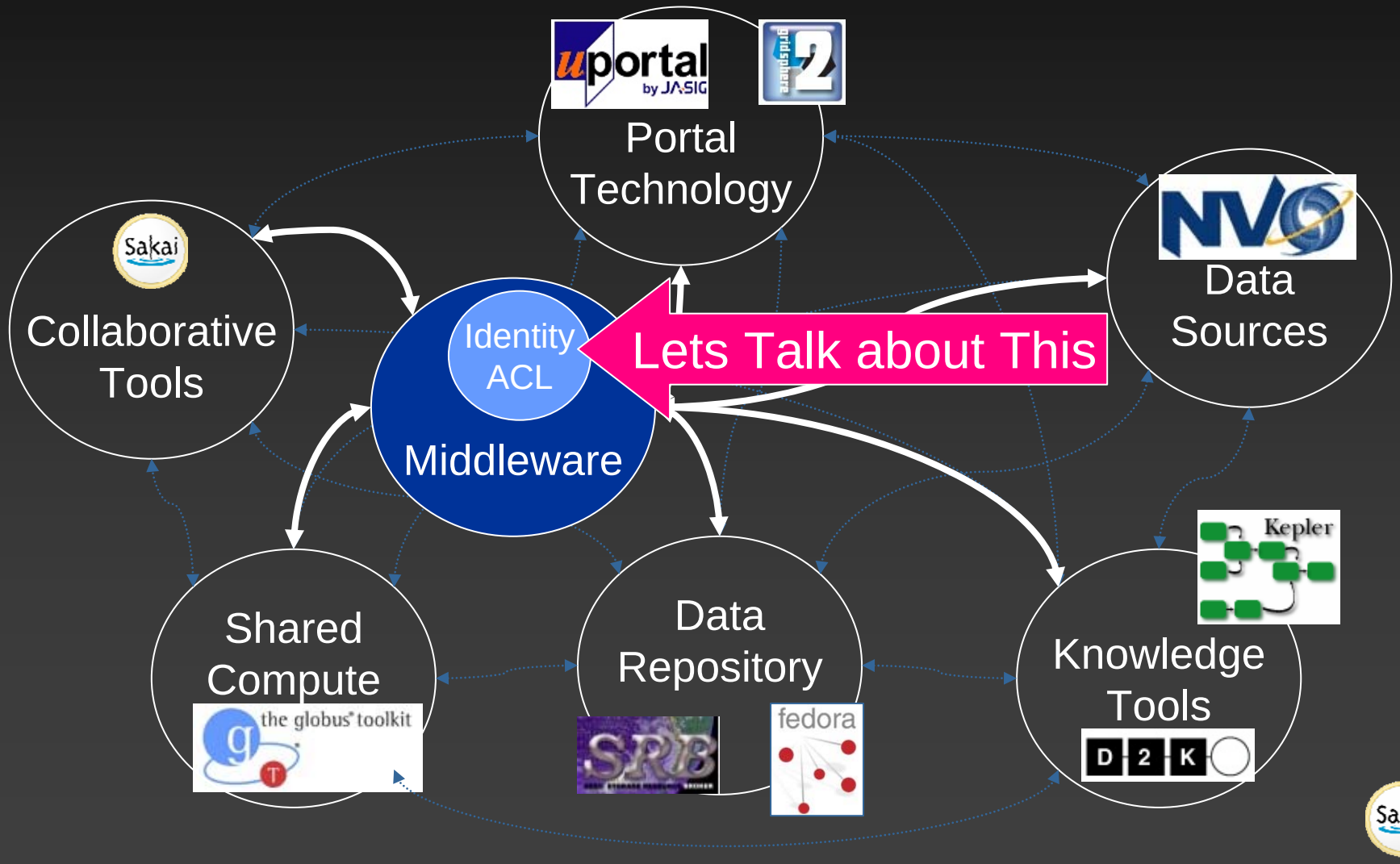
Is Middleware “inside” each application?

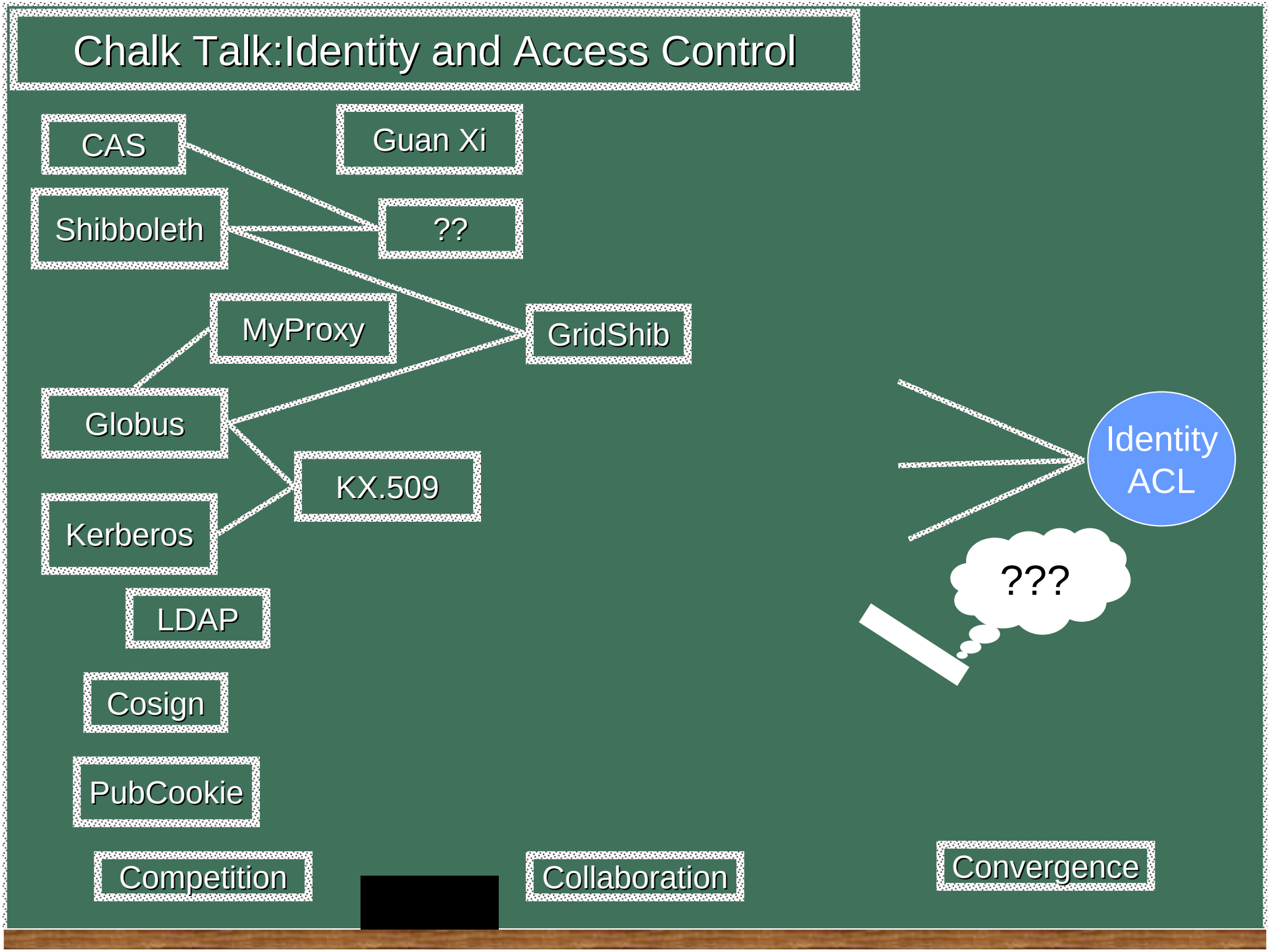


Middleware is simply another component - used as needed



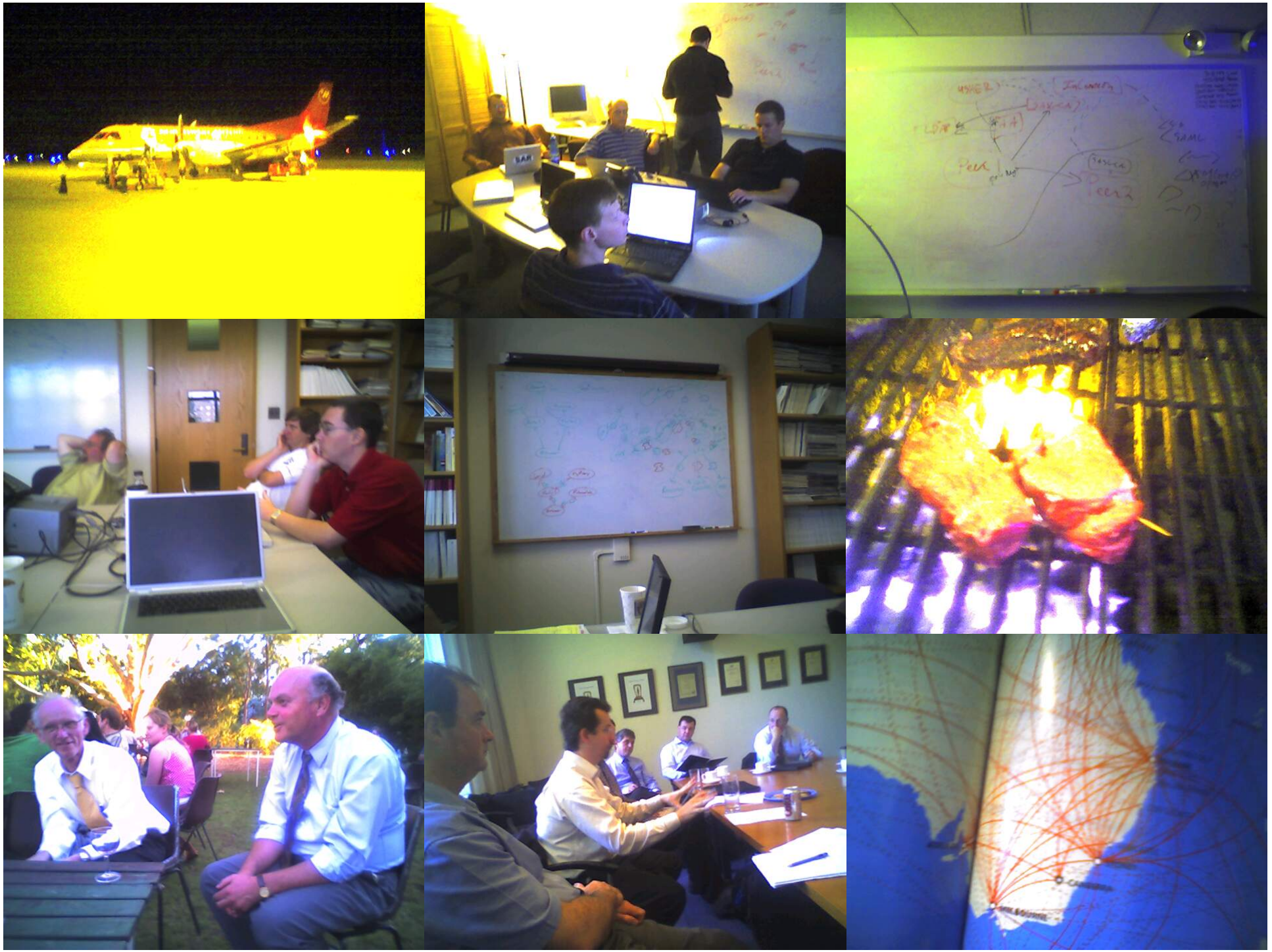
Identity and Access Control: A very important function of Middleware




Chalk Talk:Identity and Access Control
CAS
Guan Xi
Shibboleth
??
MyProxy
GridShib
Globus
KX.509
Kerberos
LDAP
Cosign
PubCookie
Identity
ACL
???
Competition
Collaboration
Convergence

Identity and ACL: Goal State

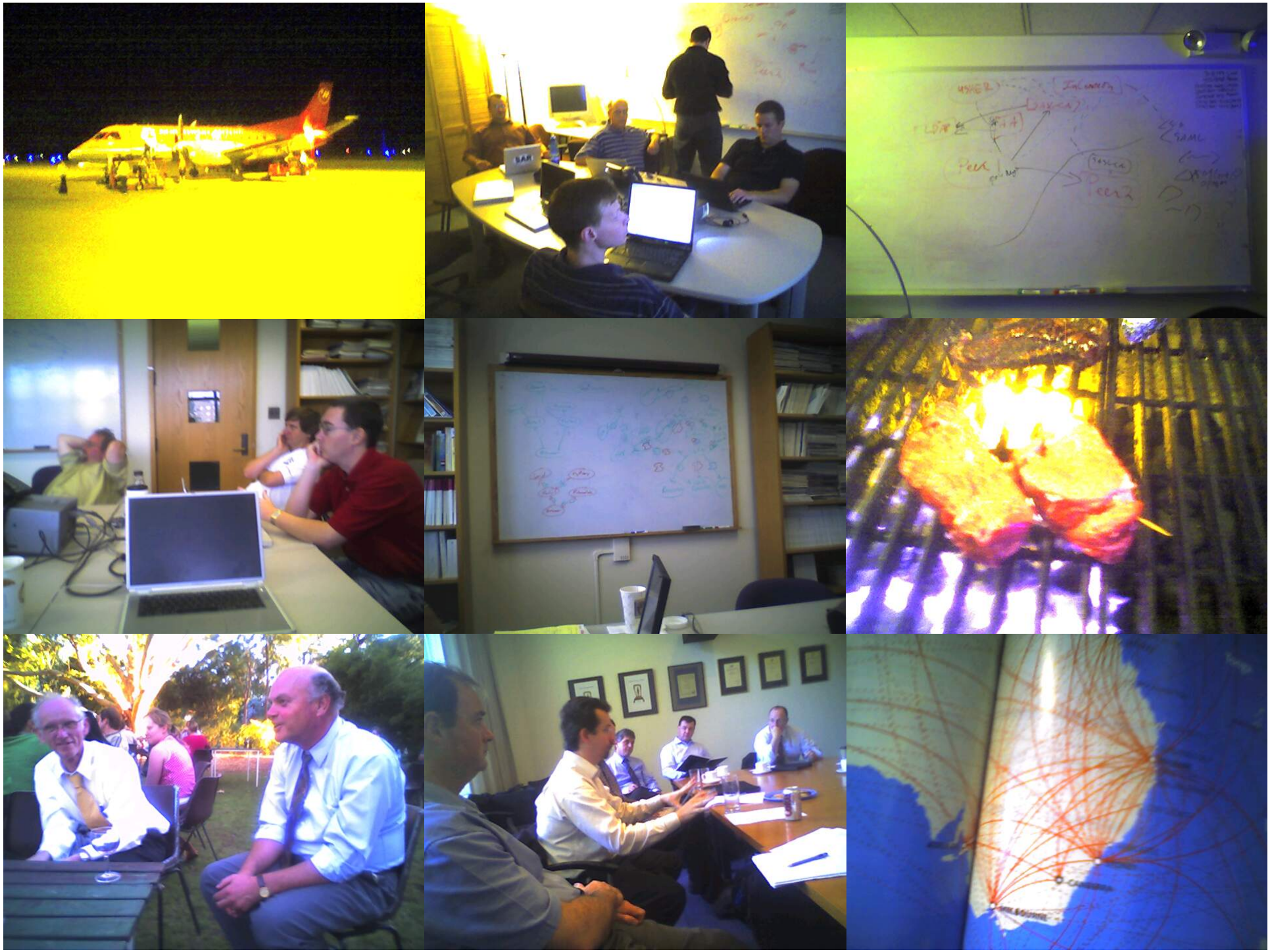
- One server - one software distribution
- Virtual Organization Software
- Supports all protocols
  - Globus Certificate Authority
  - Shibboleth
  - LDAP
  - MyProxy
  - Kerberos
- Who will do this? Who will fund this? Who can get these competitors to cooperate?

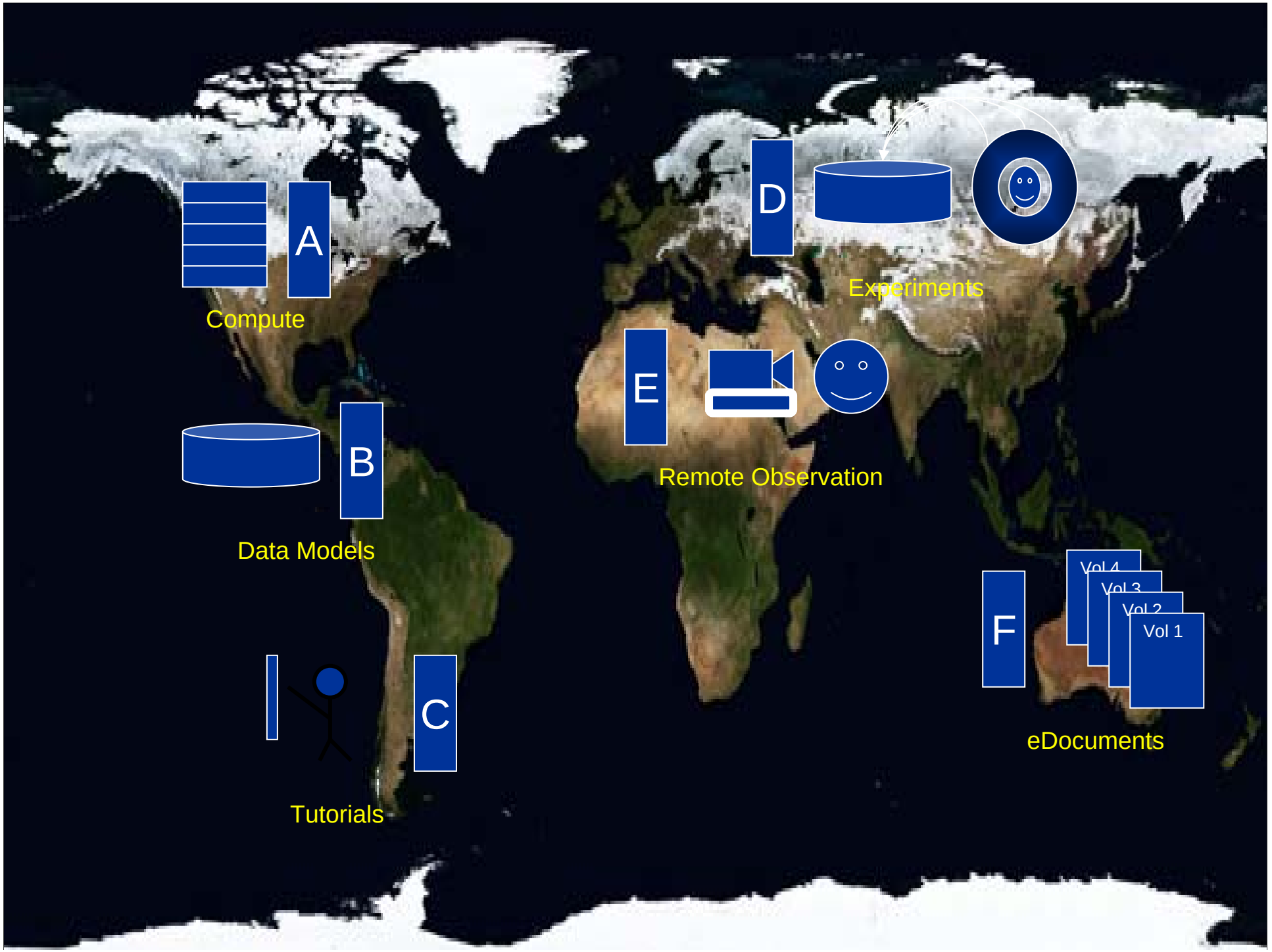


My eScience Fantasy

The pre-requisites

- My net worth is $5B (I give myself grants)
- I encounter some tech-savvy scientists in a field who are using technology to do world-class research…
- They have never been visited by any other computer scientist…
- They are working in groups of 1-30 geographically distributed around the world
- They all work on a beach with Internet2 connections and wide-open wireless and favourable exchange rates



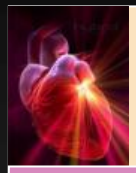

A
Compute
D
Experiments
E
Remote Observation
B
Data Models
C
Tutorials
F
Vol 1
eDocuments

Step 1: Visit The Scientists

- Understand what they are doing and how they are doing it?
- Ask them how they would like to improve it.
- Show each application to other scientists. Ask the other scientists how they would improve it.
- Help each group improve their work - help them using whatever technology they are currently using

Step 2: Add some technology

- Install the super-multi-protocol Virtual Organization software and provide a team supporting the VO software - identity and simple attributes
- Install Sakai - point it at the VO software for identity add icon at the top of Sakai
- Give each scientist an account in the VO
- Give each effort in the field a site within Sakai

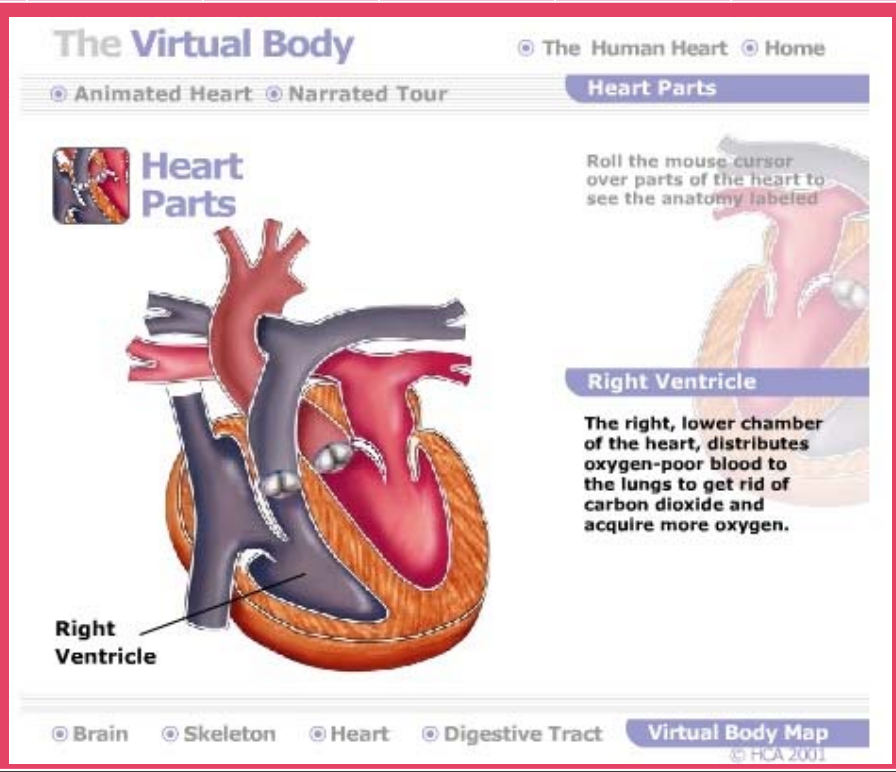


Heart Study Collaboratory

Login

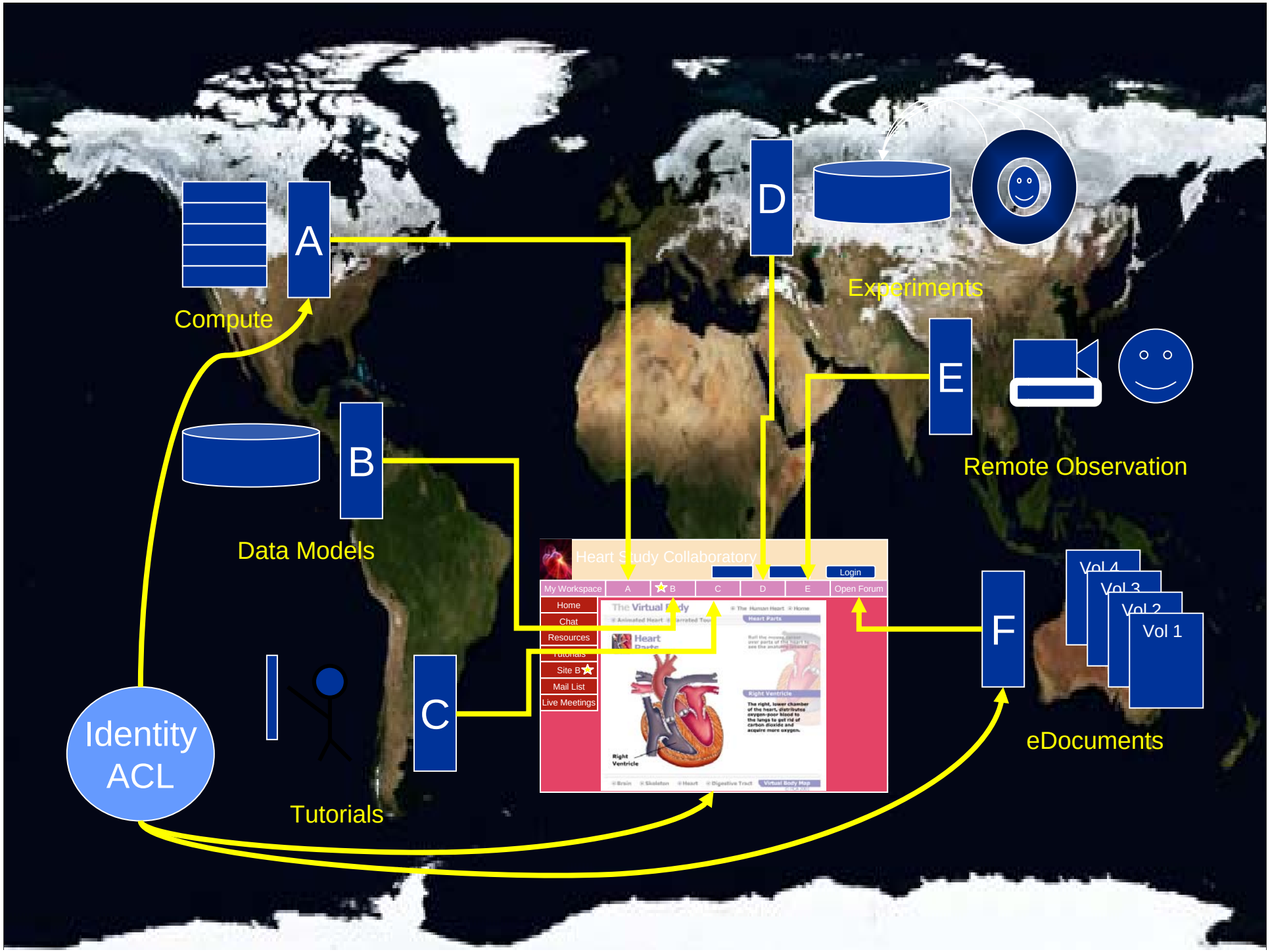
My Workspace | A | ★ B | C | D | E | Open Forum

- Home
- Chat
- Resources
- Tutorials
- Site B ★
- Mail List
- Live Meetings



Step 2: Use the VO

- For those who want to protect their information, help them add SSO to their sites, backed by the VO service
- Since it is multi-protocol - likely there will be no modification of the underlying science code - only a server configuration change


A
Compute
D
Experiments
E
Remote Observation
B
Data Models
C
Tutorials
Identity
ACL
F
eDocuments
Vol 1
Heart Study Collaboratory
Login
My Workspace
A
B
C
D
E
Open Forum
Home
Chat
Resources
Site B
Mail List
Live Meetings
Heart Parts
Right Ventricle

Step 4: Unique Identifier Service

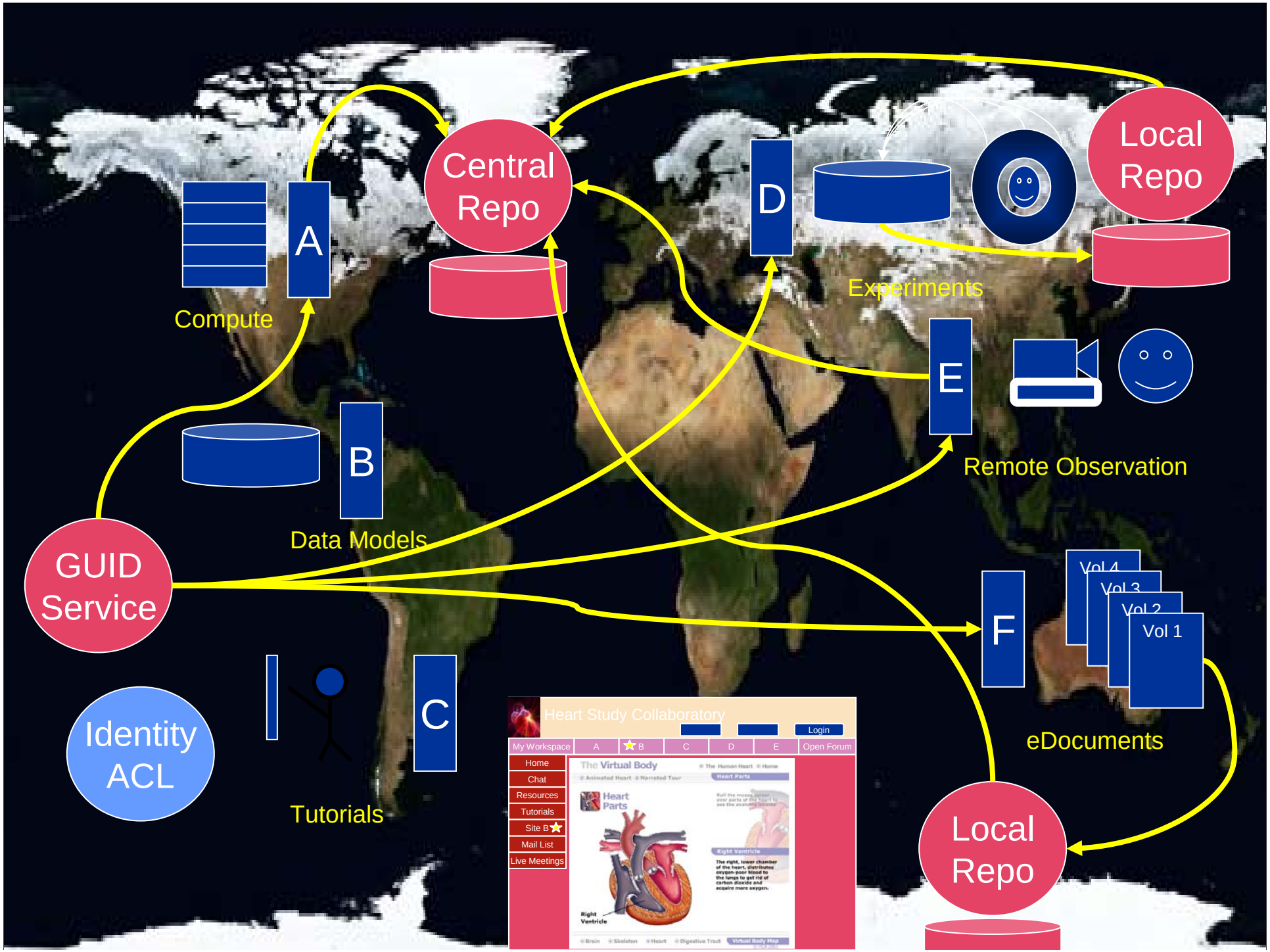
- Come up with a way for any member of the VO to “get” a unique identifier
- Demand some information (build a little data model)
  - Person’s name and organization (implicit from request)
  - What kind of thing this will represent (experiment, document, image series)
  - Simple description
  - Keyword/value extensions
- Build an simple way request and retrieve these through a simple web service - capture implicit metadata from request (when, IP address, etc). Make sure it works from perl!
- Encourage community to start marking “stuff” with these identifiers in their stovepipes
- Connect human communication to data elements to the extent possible

Step 5: Data Models

- Begin to work with subsets of the field to try to find common data models across stovepipes
- Start simple - use very simple RDF - human readable
- Broaden / deepen model slowly - explore variations
- Define simple file-system pattern for storing metadata associated with a file and/or a directory

Step 6: A Backup-Style Repo

- Build a data repository which will function as a backup
- Basic idea - each time you get identifier - this enables backup space - any data and/or metadata can be uploaded under that particular identifier and left in the repository
- Make the repo multi-protocol, FTP, DAV, Web-Service with attachments, GridFTP, etc.
- Make it so there can be a network of cooperating repositories

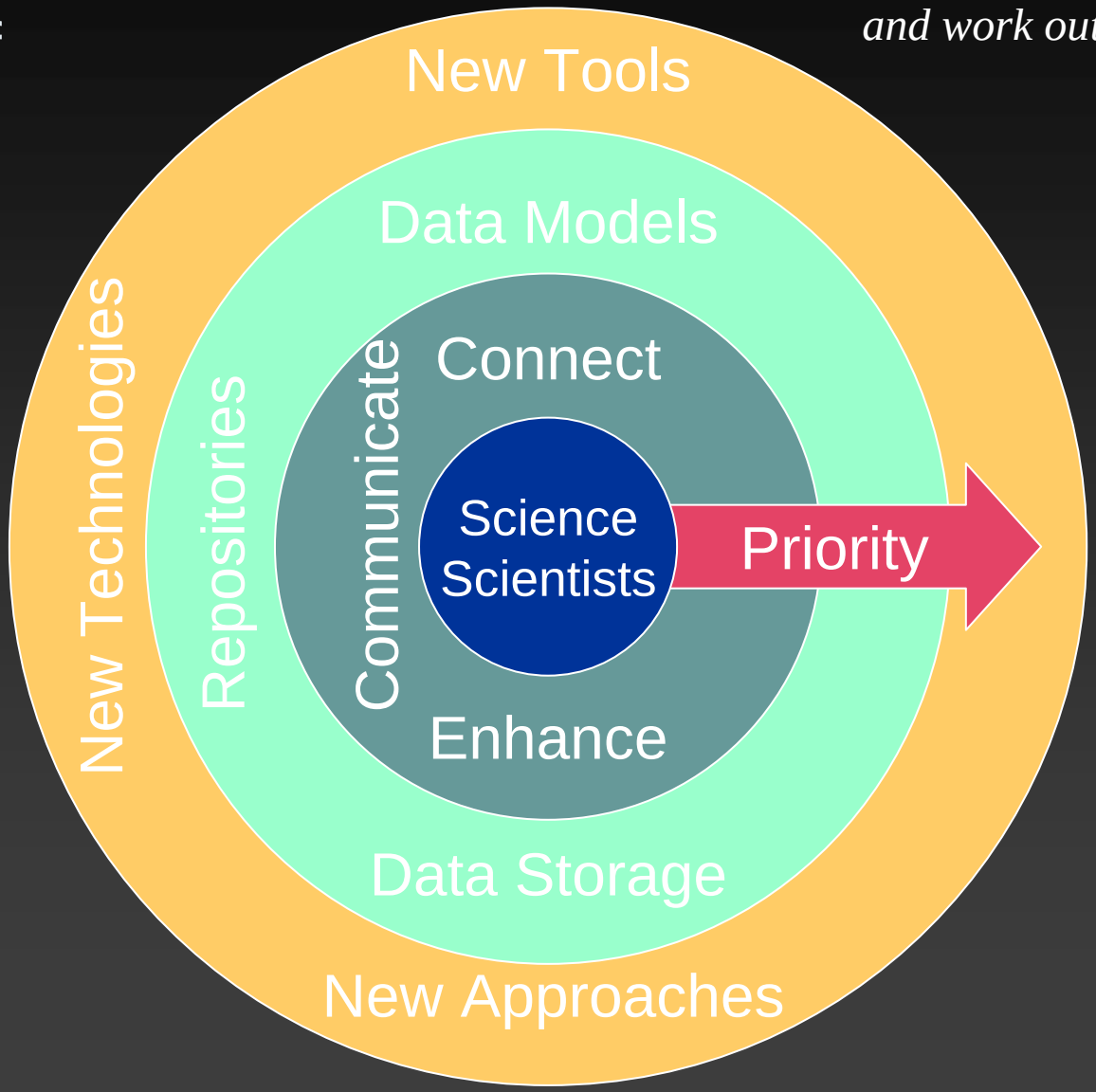

Central Repo
Local Repo
A
D
Compute
Experiments
E
B
Remote Observation
Data Models
GUID Service
F
Vol 4
Vol 3
Vol 2
Vol 1
Identity ACL
C
Tutorials
eDocuments
Local Repo
Heart Study Collaboratory
Login
My Workspace
A
B
C
D
E
Open Forum
Home
Chat
Resources
Tutorials
Site B
Mail List
Live Meetings
The Virtual Body
Heart Parts
Right Ventricle

Year 4 and on…

- Once the basic stovepipes have been “brought in from the cold” and made part of a community with no harm, the next steps are to begin to work “cross-stovepipe”
  - Evolve data models to be far richer with many variants
  - Build value added tools that are aware of the data models and are usable across stovepipes
- Teach the community to build and share tools - gently encourage development standards - Java / JSR-168 perhaps
- Most important: Always listen to the users

Science at the center of eScience

… start at the center and work outwards…

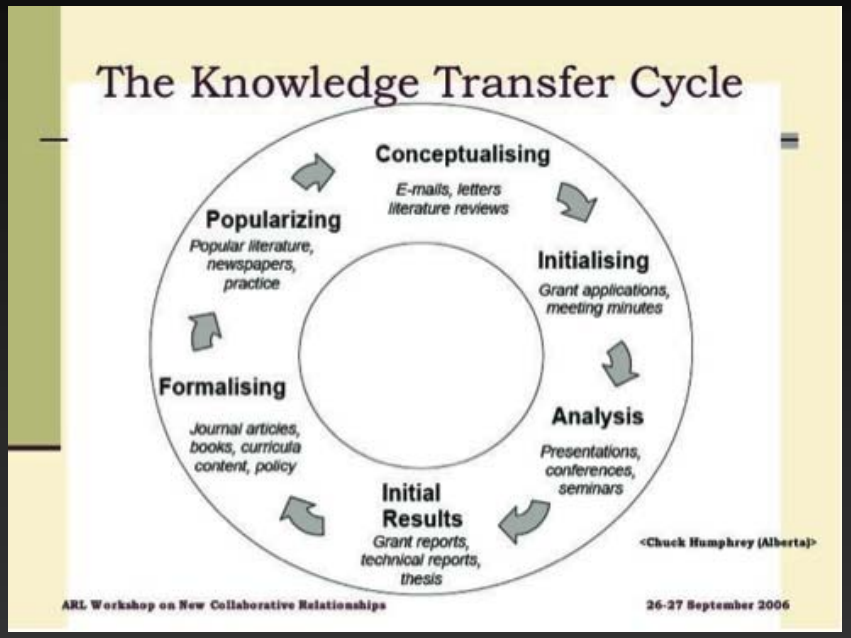


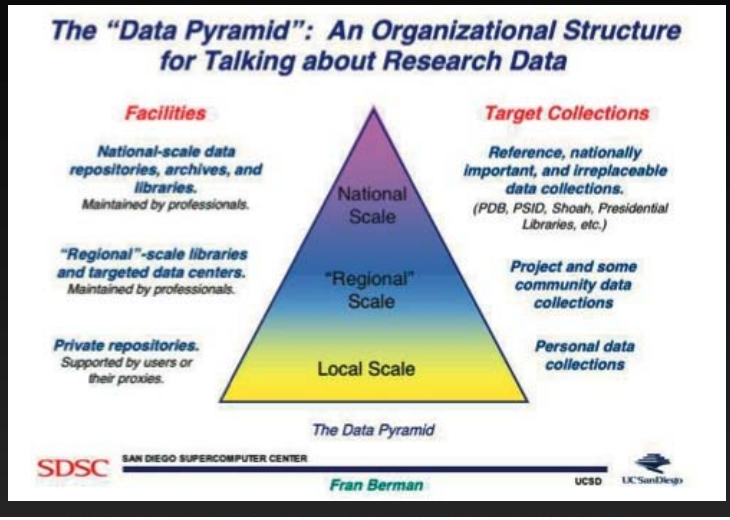
… apply technology when the users will see it as a "win" …

Overall Themes

- Minimize “impact” to the scientists
  - Understand
  - Assist
  - Expand capabilities
- Collaboration software extends / wraps current activity without rewrite

Thinking Ahead
Recording Human Activity and Associating it with eScience Data





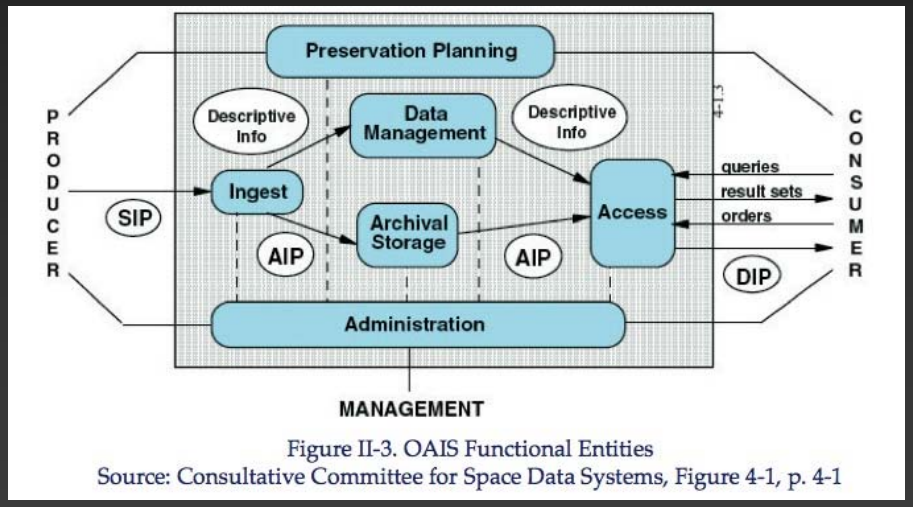
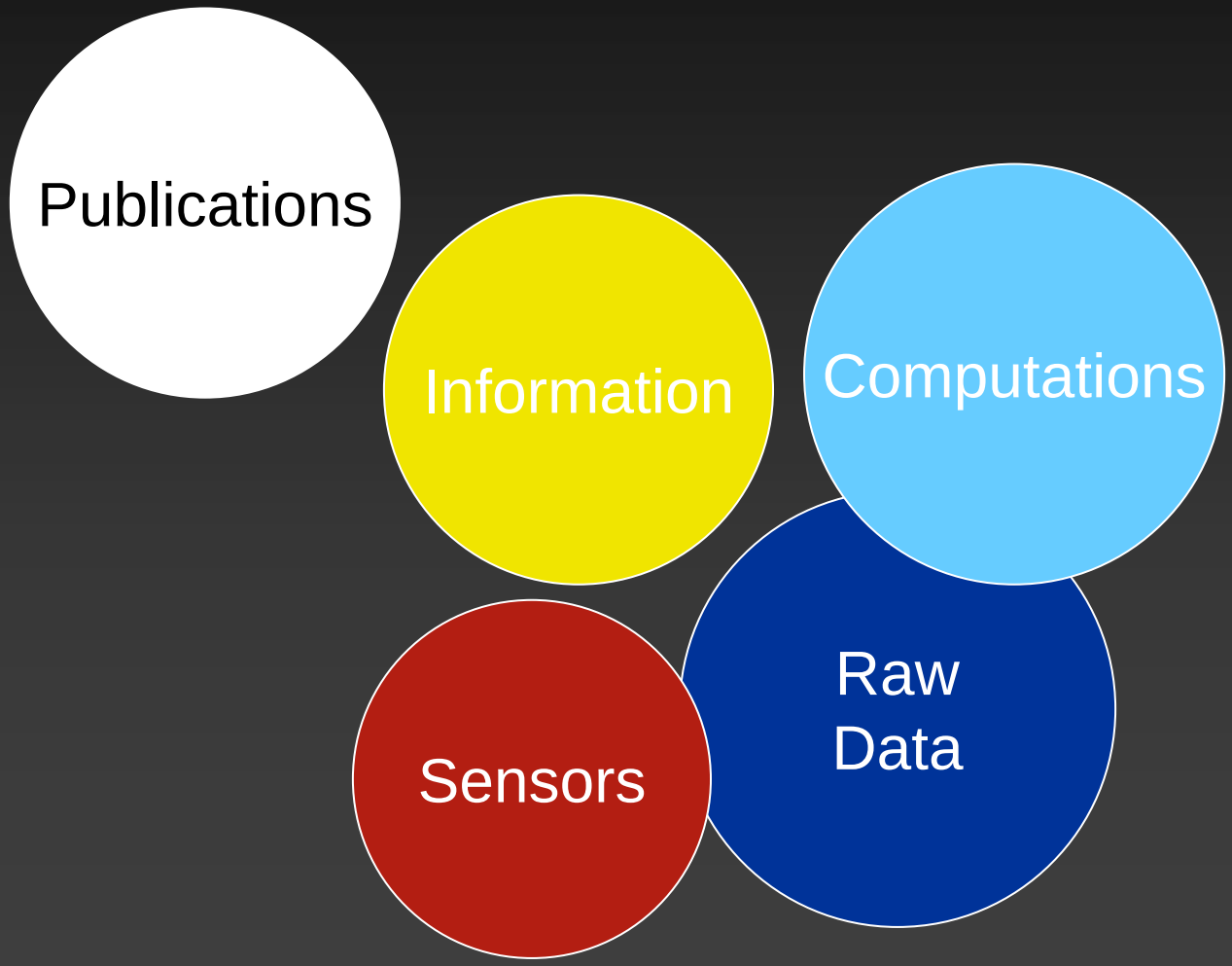
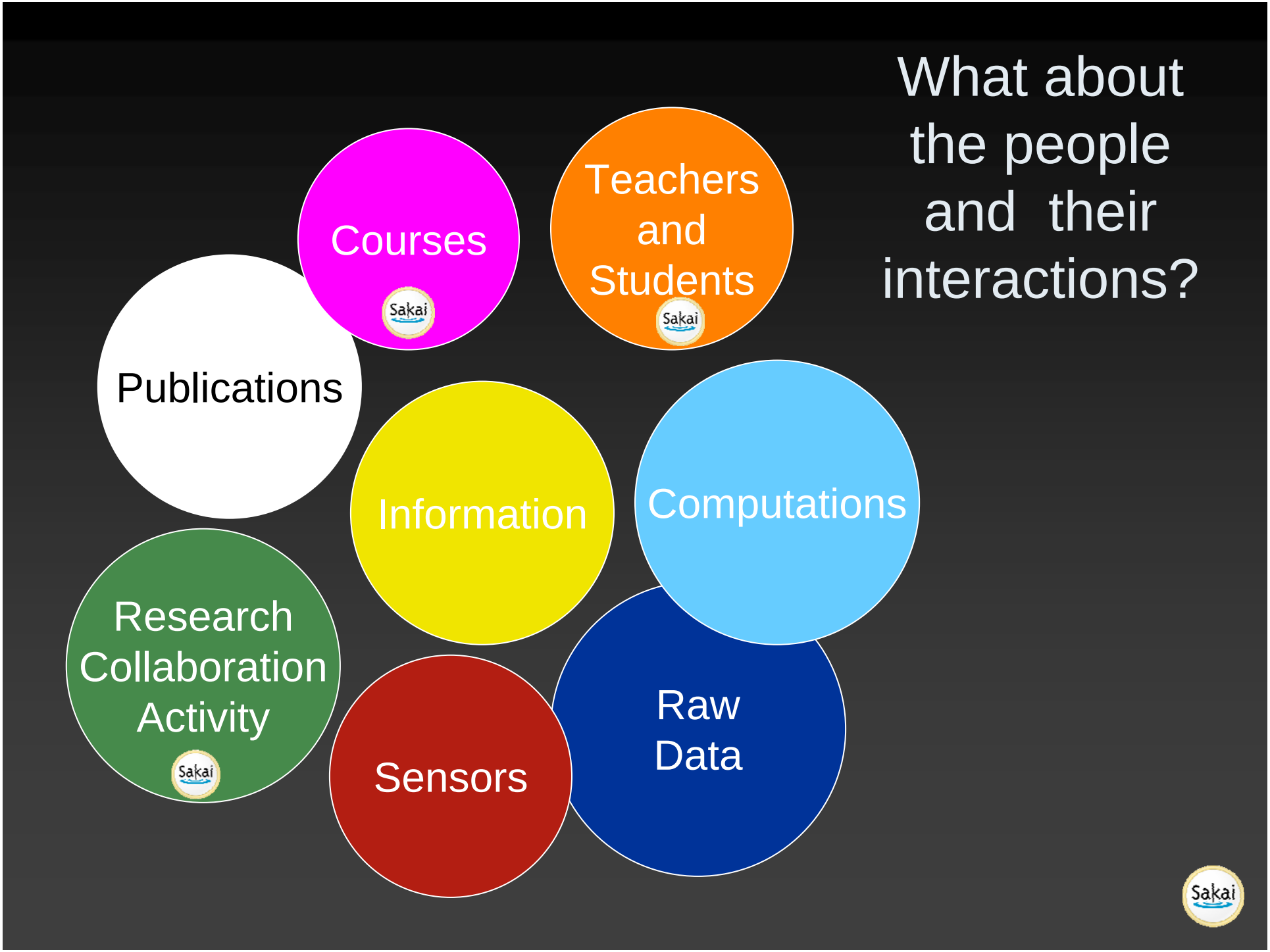


Figure II-3. OAIS Functional Entities
Source: Consultative Committee for Space Data Systems, Figure 4-1, p. 4-1

Long-term Stewardship of Digital Data Sets in Science and Engineering
http://www.arl.org/info/frn/other/ottoc.html

Connecting Everything




What about the people and their interactions?
Courses
Teachers and Students
Publications
Information
Computations
Research Collaboration Activity
Sensors
Raw Data

We are approaching the Tricorder… http://en.wikipedia.org/wiki/Tricorder

Three primary variants of the tricorder are issued by Starfleet: the standard tricorder is a general use device used primarily to scout unfamiliar areas. The medical tricorder is used specifically by doctors to help diagnose diseases […] The engineering tricorder is a variation on the device fine-tuned for starship engineering purposes. There are also many other lesser-used varieties of special use tricorders.

Commercial Tricorder

The Mark 1 TR-107 tricorder from Vital Technologies (top) was unveiled in 1996 as a real scientific device. It could monitor electromagnetic fields, weather, color and light. The company apparently made 10,000 of them before going out of business.

Some ”Tricorder” Exercises

- Recording all of Reality - The ultimate “Blog”
  - CyborLogs
  - EyeTap
  - MyLifeBits
- A quick flight of fancy / motivating example of managing a lot of continuously collected and fully connected information using my own life as a silly example…
- My personal example of linked “human activity” data


Dr. Chuck | Show All | 2004 | 2005 | 2006 | Upcoming/Recent | Experimental Travel Timeline
Map
Satellite
Hybrid
Greenland
Iceland
Suomi Finland
Sverige
Norge
Россия
Canada
United States
Polska
Ukraine
Kazakhstan
Mongolia
China
India
Myanmar
Thailand
Pakistan
Afghanistan
Iran
Iraq
Türkiye
España
Algeria
Libya
Egypt
Saudi Arabia
Mauritania
Mali
Niger
Chad
Sudan
Nigeria
Ethiopia
Kenya
DR Congo
Tanzania
Angola
Namibia
Botswana
Madagascar
South Africa
Mexico
Cuba
Venezuela
Colombia
Peru
Brazil
Bolivia
Chile
Argentina
North Atlantic Ocean
South Atlantic Ocean
South Pacific Ocean
Indian Ocean
Indonesia
Papua New Guinea
Australia
New Zealand
Japan
www.dr-chuck.com
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Dr. Chuck | Show All | 2004 | 2005 | 2006 | Upcoming/Recent | Experimental Travel Timeline
Map
Presentation: Collaborative technologies
CERN Atlas Project
Geneva, Switzerland
http://www.cern.ch/
July 26, 2004
Photos Video Presentation
Vesegnin
Vireloup
Valavran
Le Gobé
Colovrex
Ferney-Voltaire
Les Tuileries
Bellev
D35a
D78a
N5
D35
A1
A1a
E62
E25
1
Rhône-Alpes
Genève
France
Suisse
Rue de Genève
D984
Route de Meyrin
Les Vernes
Aéroport International de Genève
Le Grand-Saconnex
Pregny-Chambésy
Bourdigny-Dessus
Meyrin
Route du Mandement
Route de Ferney
Le Pommier
Parc de l'Ariana
Jardin botanique
Cointrin
Le Petit-Saconnex
Bourdigny
Route du Nant d'Avril
Les Avanchets
Moillebeau
Montfleury
Vernier
Parc Mon Repos


Dr. Chuck | Show All | 2004 | 2005 | 2006 | Upcoming/Recent | Experimental Travel Timeline
Map
Route Niels Bohr
Chemin de la Ca
Presentation: Collaborative technologies
CERN Atlas Project
Geneva, Switzerland
http://www.cern.ch/
July 26, 2004
Photos Video Presentation
Chemin de Franchevaux

20-07-04_0853003.jpg

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Dr. Chuck | Show All | 2004 | 2005 | 2006 | Upcoming/Recent | Experimental Travel Timeline
Map
Route Niels Bohr
Chemin de la Ca
Chemin de Franchevaux
Presentation: Collaborative technologies
CERN Atlas Project
Geneva, Switzerland
http://www.cern.ch/
July 26, 2004
Photos Video Presentation

Sakai Video Report: Robert Caillliau
Produced: September 30, 2006

Robert Caillliau is the co-Inventor of the World-Wide-Web. Robert works at the CERN High Energy Physics laboratory. Robert talks anout the early days of the web and Gopher, the design of HTML, and talks about how the web changed when many new kinds of browsers such as Mosaic were introduced for the PC and Mac. He also talks about how the first web browser and server were developed. This interview was taped July 1999. Details: Flash Video 9 minutes.

View other Sakai videos on Google Video

Note: If you are having problems viewing the file with a plug-in, you can download the media and play it locally.

YouTube | Quicktime (1440) | Google Video

www.dr-chuck.com Complete Media Index


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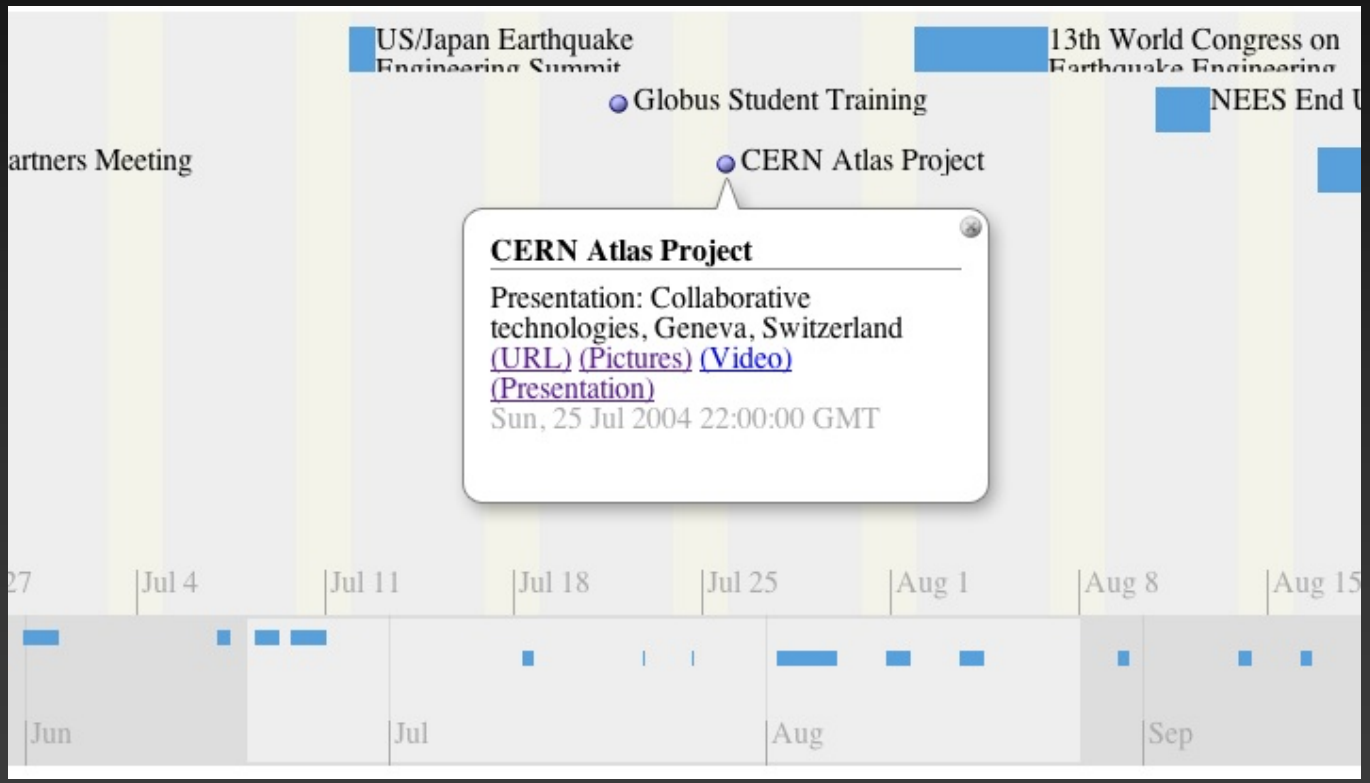
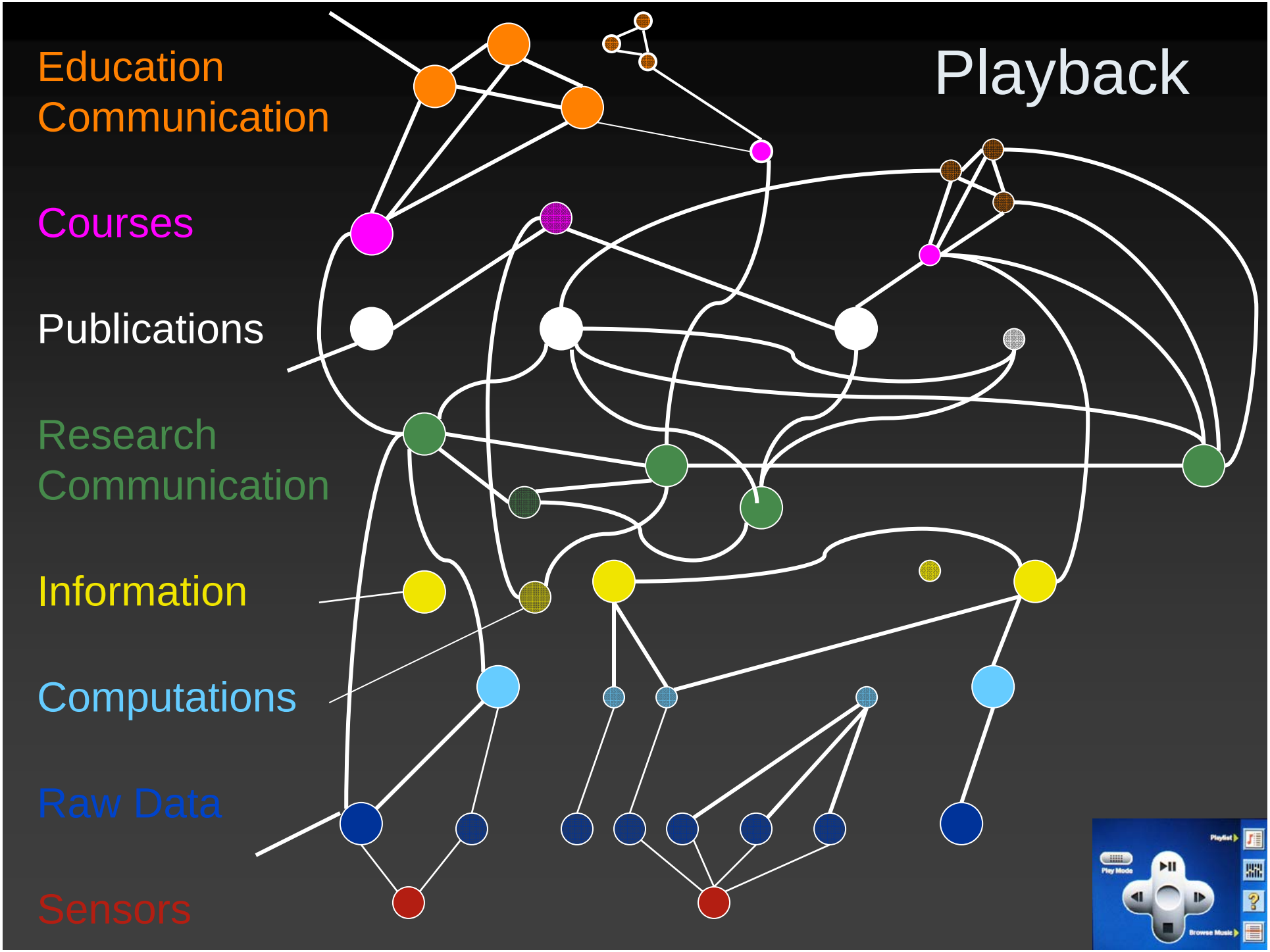

US/Japan Earthquake
13th World Congress on
Globus Student Training
NEES End U
artners Meeting
CERN Atlas Project
CERN Atlas Project
Presentation: Collaborative technologies, Geneva, Switzerland
(URL) (Pictures) (Video)
(Presentation)
Sun, 25 Jul 2004 22:00:00 GMT
27
Jul 4
Jul 11
Jul 18
Jul 25
Aug 1
Aug 8
Aug 15
Jun
Jul
Aug
Sep

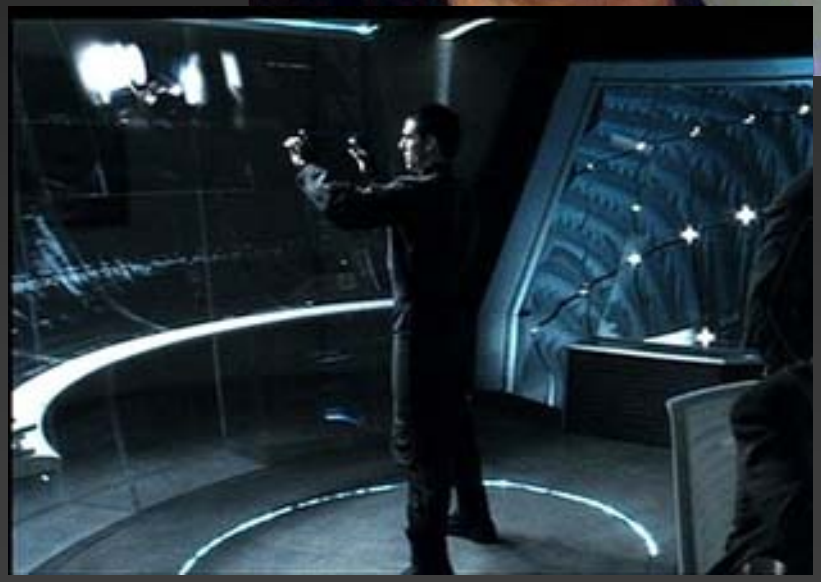

Education
Communication
Courses
Publications
Research
Communication
Information
Computations
Raw Data
Sensors
Playback

Many Useful Views

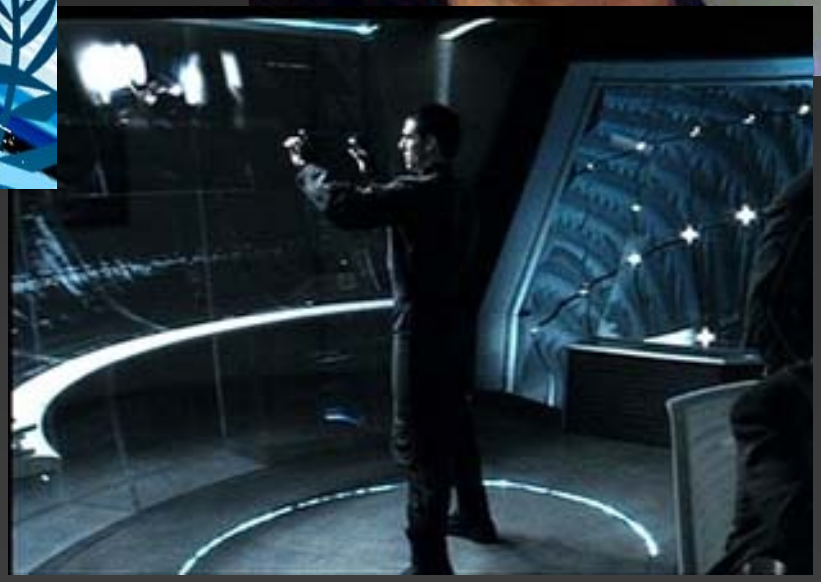
- Time
- Geographical
- Concept
- People
- Groups
- Search
- Tags
- Physical Structures - BIRN Brain Morphology

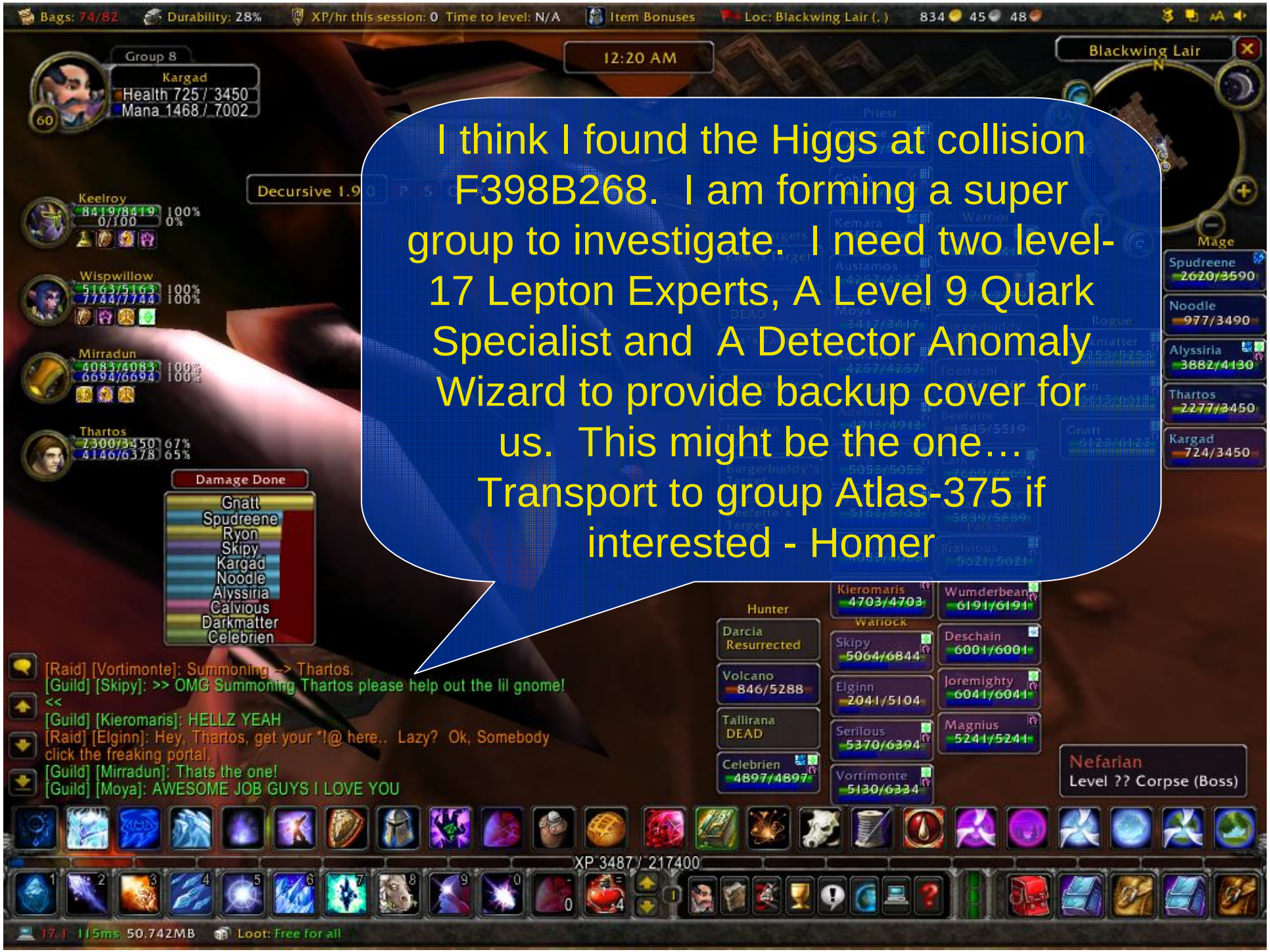
How to work with this much data?

- We need something like what we saw in the Movie “Minority Report”
  - Large Screen
  - Gesture Interface



How to work with this much data?




I think I found the Higgs at collision F398B268. I am forming a super group to investigate. I need two level-17 Lepton Experts, A Level 9 Quark Specialist and A Detector Anomaly Wizard to provide backup cover for us. This might be the one… Transport to group Atlas-375 if interested - Homer
Bags: 74/82
Durability: 28%
XP/hr this session: 0 Time to level: N/A
Item Bonuses
Loc: Blackwing Lair (,)
12:20 AM
Blackwing Lair
Group 8
Kargad
Health 725 / 3450
Mana 1468 / 7002
Keelroy
Wispwillow
Mirradun
Thartos
Damage Done
Gnatt
Spudreene
Ryon
Skipy
Kargad
Noodle
Alyssiria
Calvious
Darkmatter
Celebrien
[Raid] [Vortimonte]: Summoning --> Thartos.
[Guild] [Skipy]: >> OMG Summoning Thartos please help out the lil gnome! <<
[Guild] [Kieromaris]: HELLZ YEAH
[Raid] [Elginn]: Hey, Thartos, get your *!@ here.. Lazy? Ok, Somebody click the freaking portal.
[Guild] [Mirradun]: Thats the one!
[Guild] [Moya]: AWESOME JOB GUYS I LOVE YOU
Hunter
Darcia Resurrected
Volcano 846/5288
Tallirana DEAD
Celebrien 4897/4897
Warlock
Kieromaris 4703/4703
Skipy 5064/6844
Elginn 2041/5104
Serilous 5370/6394
Vortimonte 5130/6334
Wumderbean 6191/6191
Deschain 6001/6001
Joremighty 6041/6041
Magnius 5241/5241
Mage
Spudreene 2620/3590
Noodle 977/3490
Alyssiria 3882/4130
Thartos 2277/3450
Kargad 724/3450
Nefarian
Level ?? Corpse (Boss)
XP 3487 / 217400
Loot: Free for all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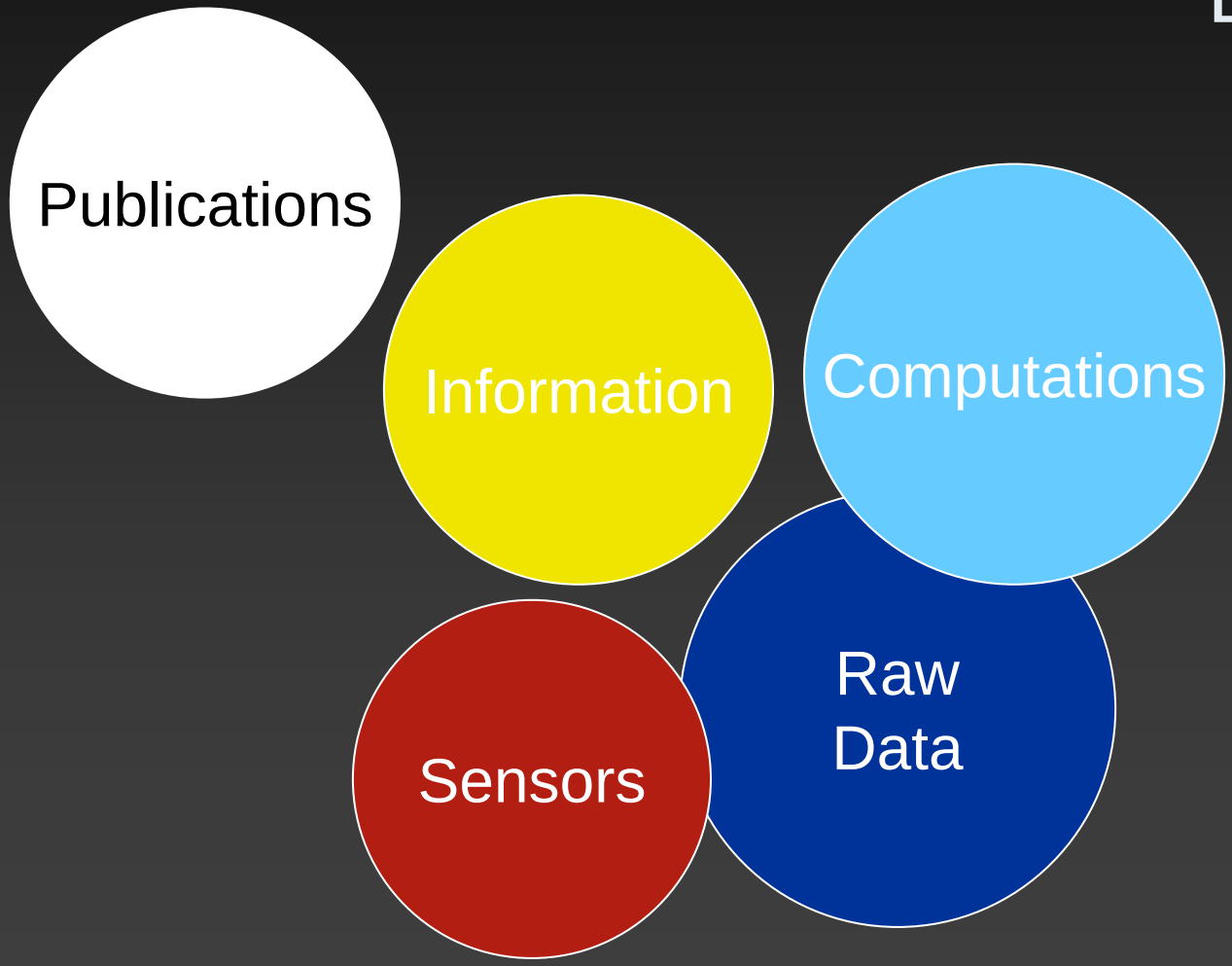
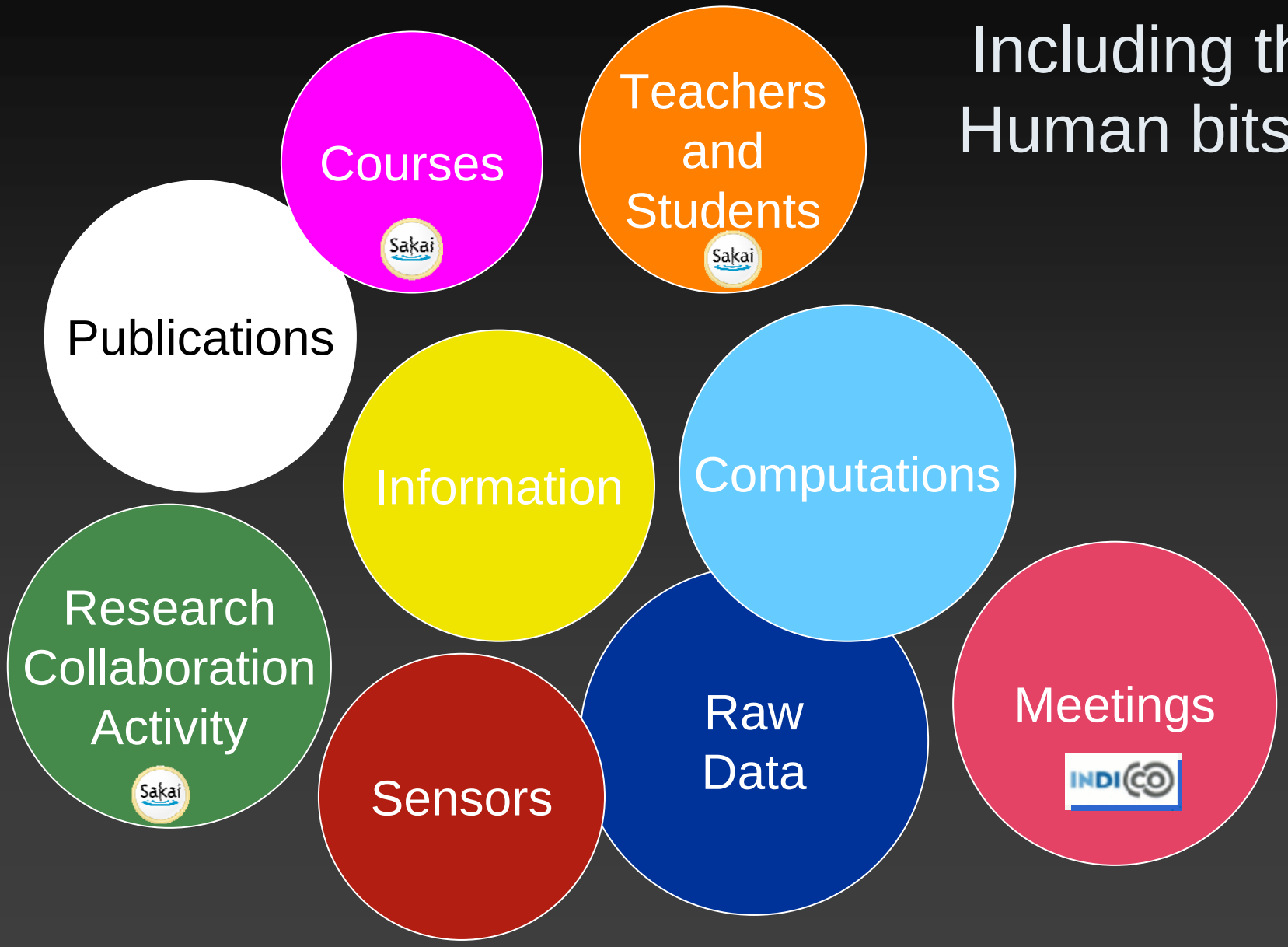


Including the Human bits…



Conclusion

- Many years ago, eScience had science as its main focus
- Custom approaches resulted in too many unique solutions
- Computer scientists began a search for the “magic bullet” - each group found a different magic bullet
- Each group now competes for mind share (and funding) to be the “one true” magic bullet

Conclusion (cont)

- One way to solve the “many competing technologies” solution is to form “super groups” which unify the technologies
- No single technology gets to claim “they are the one” (Middleware is not “in the middle”)
- Each technology needs to become a drop-in service/component which is available for use only when appropriate
- Once we can get past looking at the technologies as the main focus, we get back to science as the main focus

Lets remember why we started this whole field in the first place…

- Scientific Domain
- Groups of People
- Common User Interface
- Data Sharing
  - In the moment
  - Long-term
- Experimental Equipment
- Compute
- Visualization

Questions

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“Chuck’s Talks”