North East Regional Computing Program

NERCOMP Workshop
Sakai Special Interest Group

September 23, 2004

College of the Holy Cross

Worcester, Massachusetts, USA

Publisher's Note

Because of limited time, the speakers discussed only part of the slides in their NERCOMP SIG presentations. The complete presentations are included here to both provide additional information for those who attended and a more complete record of the discussions for those who did not attend.

Jim Farmer, Editor

NERCOMP Workshop: Sakai

College of the Holy Cross, Worcester, Massachusetts
Thursday, September 23, 2004

This SIG (Special Interest Group) was organized by Babi Mitra of the Massachusettts Institute of Technology

The Sakai SIG meeting is a preliminary discussion of the role of NERCOMP and its member schools in relation to the community source Sakai collaboration and learning environment software project. Participants in the Sakai SIG meeting will learn the current direction of the Sakai community source development project, its motivation, goals, and vendor support. This discussion will explore possible engagements and communication NERCOMP might facilitate in this emerging open source courseware community, more so as there are several Sakai Educational partners who are members of NERCOMP.

Additional information on this project is available at www.sakaiproject.org.

Program

8:00am – 9:00am Registration and Coffee

9:00am - 10:30am TheSakai Poject: Vision, Goals, Architectural Approach
Amitava "Babi" Mitra, Executive Director, Academic Media Production Services, MIT

The Sakai Educational Partners Program, Mark Norton, SEPP

Open Knowledge Initiative Jeff Merriman, MIT

10:30 to 10:45 Break

10:45 to 12:00 SEPP, Community Building, Commercial Affiliates

SEPP; The Partners Perspective, Jim Farmer, SEPP

Sakai Architecture and Framework, Mark Norton, SEPP

12:00 Lunch

1:00 to 3:15

Group Discussions and Report

3:15 Everyone goes home!

NERCOMP Sakai Special Interest Group
September 23, 2004 College of the Holy Cross, Worcester, Massachusetts

	First Name	Last Name	Title	Institution	SEPP member
1	Jennifer	Banks	Head, Collection Management Service	Massachusetts Institute of Technology	Yes
2	Trent	Batson	Dir., Informational & Instructional Tech. Svcs.	University of Rhode Island	No
3	Stephen	Battisti	Principle Software Engineer	University of Massachusetts - Amherst	No
4	Don	Bell	Web Learning Consultant	Rensselaer Polytechnic Institute	No
5	Paul	Bergen	Senior Manager, Instructional Computing Group	Harvard University	No
6	Alex	Chapin	Educational Technologist	Middlebury College	No
7	Elizabeth	Clark	Associate Director, Instructional Technology Services	Boston College	No
8	Doug	Cotton	Web Programmer	Hampshire College	No
9	Diane	Creede	Instructional Designer/Developer	Connecticut College	No
10	Kuljit	Dharni	Director, Architecture & Development	Babson College	No
11	Brian	Douglas	UMassOnline Director of Technology and Operations	University of Massachusetts System Office - Hadley	No
12	Jim	Farmer	Sakai Community Liaison	Sakai Educational Partners Program	
13	Clay	Fenlason	Associate Director for Academic Computing	Boston University	Yes
14	Robert	Ferrara	Director, FSILG Alumni Relations	Massachusetts Institute of Technology	Yes
15	Adam	Franco	Educational Technologist	Middlebury College	No
16	Ted	Gaiser	Director, Academic & Research Services	Boston College	No
17	Scott	Hamlin	Faculty Liaison in Academic Computing	Wheaton College	No
18	David	Hart	Executive Director	University of Massachusetts - Amherst	No
19	Pamela	Harvey	Educational Technology Consultant	University of Rochester	No
20	Arnaldo	Hernandez	Academic Windows System Administrator	Mass. College of Art	No
21	Hubert	Hohn	Director - Computer Arts Center	Mass. College of Art	No
22	Janel	Jorda	Manager of Web Development	Hampshire College	No
23	Ben	Kennedy	Programmer	Boston University	Yes
24	Patrick	Laverty	WebCT Program Manager	Brown University	Yes
25	Eric	LePage	Technical Support Specialist	Bridgewater State College	No
26	Aaron	Long	College Web Manager	Bridgewater State College	No
27	Andy	Lymburner	Manager - Software Services, ITSD	Babson College	No
28	Tad	Macy	Director of Computing and Research	Bowdoin College	No
29	Tim	Mentzer	Team Leader, Web Development	College of the Holy Cross	No
30	Jeffrey	Merriman	Sr Strategist, Academic Computing Enterprise	Massachusetts Institute of Technology	Yes
31	Mark	Miller	Associate Director, Academic and Research Computing	Rensselaer Polytechnic Institute	No
32	Amitava Babi	Mitra	Executive Director, Academic Media Production Srvcs	Massachusetts Institute of Technology	Yes
33	Adrianne	Mora	Instructional Support Associate	SUNY New Paltz	No
34	Ellen Marie	Murphy	Director of Technology Integration	The Sage Colleges	No
35	Mark	Norton	Senior Technical Consultant	Sakai Educational Partners Program	
36	Eileen	Palenchar	Associate Director, Computing & Information Svcs	Brown University	Yes
37	Enoch	Park	Instructional Technology Specialist	Bryant College	No
38	Patty	Patria	Manager, Technology Deployment & Integration	Bentley College	No
39	Jeanne	Po	Instructional Designer, Academic Technology Services	Boston College	No
40	Alan	Powell	Senior Systems Programmer	Rensselaer Polytechnic Institute	No

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41	Renwick	Quesada	IT Programmer	College of Westchester	No
42	William	Reilly	Technical Analyst	Massachusetts Institute of Technology	Yes
43	Jon	Rifkin	Sys Admin	University of Connecticut - Storrs Campus	No
44	Jennifer	Ruggiero	Assistant Director, Instructional Computing & User Services	College of the Holy Cross	No
45	Howard	Silver	Associate Head, Science Library	Massachusetts Institute of Technology	Yes
46	Linda	Smith	Instructional Support Specialist	SUNY New Paltz	No
47	Steve	Taylor	Director, Academic Consulting Svcs	Vassar College	No
48	Laura	Walters	Head of Reference and Collections	Tufts University	Yes
49	Michael	Weaver	Instructional Technologis	Bucknell University	No
50	Margaret	Young	Associate Director - Computer Arts Center	Mass. College of Art	No

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NERCOMP SIG Workshop: Sakai
September 23, 2004
College of the Holy Cross, Worcester,MA

- Vision and Goals : Amitava 'Babi' Mitra, Executive Director, Academic Media, MIT
- Architecture : Jeff Merriman, Senior Strategist, Academic Computing, MIT
- Sakai Educational Partners Program(SEPP) : Mark Norton, Senior Technical Consultant, SEPP

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 *pre-integrated collection of open source tools* termed Collaboration & Learning Environment(CLE)."

Sakai

Converging Trends…why now…?

Data Standards
- IMS Global

Technical Standards
- OKI, JSR-168

Institutional Mobilization
- Economics, control of destiny

Foundation $$ Investments

Institutional Partnering

Open Source Applications for Education

Sakai

Sakai Project Deliverables

1. Tool Portability Profile
   - Specifications for writing portable software to achieve application 'code mobility' among institutions
2. Pooled intellectual property/experiences…best of
   - JSR-168 portal (uPortal 3.x)
   - Course management system
     - Quizzing and assessment tools, [ePortfolio from OSPI], etc
   - Research collaboration system
   - Workflow engine
   - Modular tools, but also pre-integrated to inter-operate
3. Synchronized adoptions at Michigan, Indiana, MIT, Stanford
4. Based on "open-open" licensing –

   [no restriction on commercialization]

Sakai

Sakai Project Core Universities

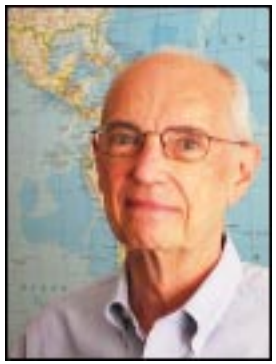
- Each Core University Commits
  - 5+ developers/architects, etc. under Sakai Board project direction for 2 years
  - Public commitment to implement Sakai
  - Open/Open licensing
- Project
  - $4.4M in institutional staff (27 FTE)
  - $2.4M Mellon Foundation
  - Additional investment through partners

Sakai Educational Partner's Program(SEPP)

Membership Fee: US$10K per year, 3 years

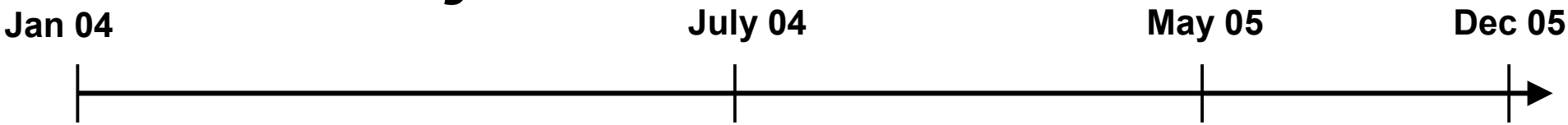
- Access to SEPP staff
  - Community development manager
  - SEPP developers, documentation writers
- Knowledgebase
- Developer training for the TPP
- Exchange for partner-developed tools
- Strategy and implementation workshops
- Early access to pre-release code

From the Sakai and SEPP teams



Sakai

Sakai Project Timeline



***Activity*: Maintenance & Transition from a project to a community**

Michigan
- CHEF Framework
- CourseTools
- WorkTools

Indiana
- Navigo Assessment
- Eden Workflow
- OneStart
- Oncourse

MIT
- Stellar

Stanford
- CourseWork
- Assessment

OKI
- OSIDs

uPortal

"Best of" Refactoring

SAKAI 1.0 Release
- Tool Portability Profile
- Framework
- Services-based Portal
- Refined OSIDs & implementations

SAKAI Tools
- Complete CMS
- Assessment

SAKAI 2.0 Release
- Tool Portability Profile
- Framework
- Services-based Portal

SAKAI Tools
- Complete CMS
- Assessment
- Workflow
- Research Tools
- Authoring Tools

***Activity*: Ongoing implementation work at local institution…**

Primary SAKAI Activity
Architecting for JSR-168 Portlets,
Re-factoring "best of" features for tools
Conforming tools to Tool Portability Profile

Primary SAKAI Activity
Refining SAKAI Framework,
Tuning and conforming additional tools
Intensive community building/training

Sakai

www.sakaiproject.org

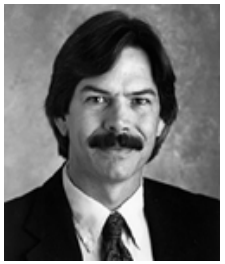
Sakai: Progress so far

- Sep 03: University of Michigan, Indiana University, MIT and Stanford University decide to go ahead
- Dec 03: Mellon grants $2.4M
- Jan 04: Sakai project kicks off
- Feb 04: SEPP launched with $300K grant from Hewlett
- May 04: Foothill-De Anza Community College District awarded $ 600K by Hewlett to adopt and extend Sakai
- Jun 04: Sakai CLE 1.0 Beta released to SEPP partners during first SEPP conference at Denver
- Jul 04: SEPP members join Sakai Board
- Jul 04: Sakai CLE 1.0 RC1 released to public
- Aug 04: Sakai CLE 1.0 RC2 released
- Sep 04: SEPP members number 43

Sakai

The Sakai Board









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- Jeff Merriman
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- Vivian Sinou
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- Mara Hancock
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- SEPP
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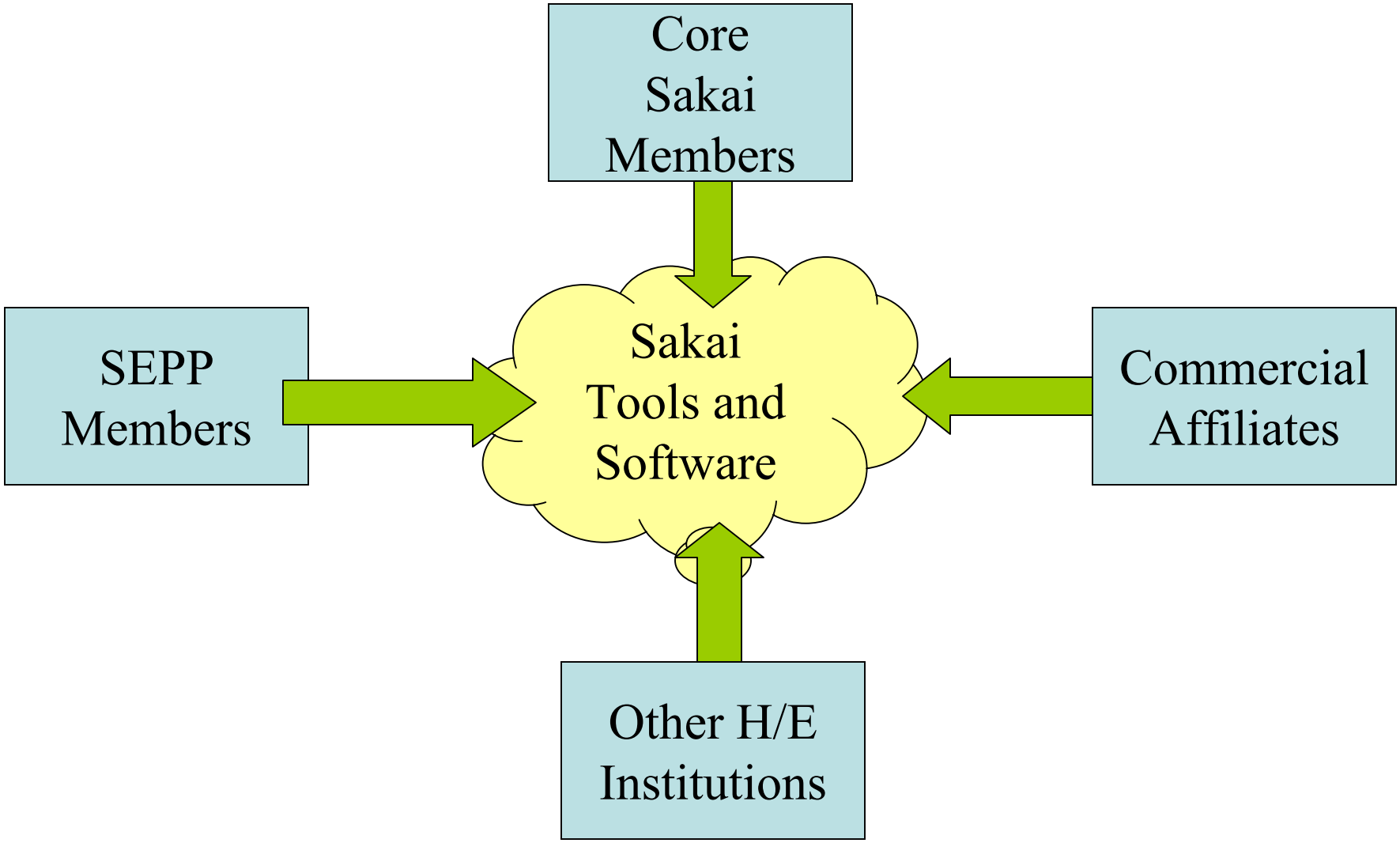
  - Jim Farmer jxf@immagic.com

The Sakai Educational Partnership Program

Mark J. Norton
Senior Technical Consultant

Sakai Contributors



Core Sakai Members

- University of Michigan
- Indiana University
- Massachusetts Institute of Technology
- Stanford University
- OKI: Open Knowledge Initiative
- uPortal

Sakai Educational Partner Program

The SEPP was created in Feb. of 2004 by the Sakai Board of Directors with support from a grant by the Mellon Foundation. It is intended to enable interested institutions to closely track Sakai development and create a forum of additional software development.

Core Sakai Activities

- Creation of a stable Collaboration Learning Environment.
- Scalability, Performance, and Enterprise enhancements.
- Support environments:
  - Discussion group sites, demo site, nightly builds, releases, testing, bug reporting, etc.
- Architecture and Framework

SEPP Benefits

- Access to SEPP staff
  - Community development manager
  - SEPP technical expertise
- Program communication
- Developer training – Sakai Framework
- Early access to code – Sakai CVS Tree
- Exchange for partner-developed tools
- Strategy and implementation workshops
- Representation to core Sakai activities

SEPP Newsletter

- Update Newsletter by Email
  - A weekly electronic newsletter sent directly to all members
  - Latest Sakai news including up coming releases
  - Reports from discussion groups
  - Upcoming events
  - References to papers and documentation
  - External developments relevant to Sakai

SEPP White Papers

- Recent White Papers include:
  - Writing Sakai Tools
  - Interoperability and Portability
  - Abstract Sakai Architecture
  - Sakai Java Framework
  - Using Hibernate for Object/Relation Mapping
  - Sakai API Plugins and the IMS Enterprise Specification

Event Reports

- Summaries of Sakai and Sakai-related events are prepared and made available to SEPP members. Recent reports include:
  - First SEPP Conference, June 2004
  - JA-SIG Conference, June 2004
  - ePortfolio Conference, July 2004
  - uPortal Developers Meeting, Aug. 2004

Bi-Annual SEPP Meeting

- The first SEPP Meeting was held in June of 2004 in Denver. Close to 80 people from 35 organizations were present.
- The second SEPP Meeting will be held Dec. 7, 2004 in New Orleans. It will include a developer's workshop, progress reports, BOF sessions, etc.

SEPP Discussion Groups

- Requirements – Mara Hancock, UC Berkeley
- Migration – Robert Catalano, Columbia
- Cross Language Support – Tom Lewis, Wash.
- Content & Authoring – Dirk Herr-Hoyman, Wisc.
- Libraries – Bill Parod, Northwestern
- User Support – Jim Martino, Johns Hopkins
- Sakai Advocacy – Chuck Powell, Yale
- Developers – Mark Norton, SEPP

Development Support

- Sakai now has a public CVS repository at cvs.sakaiproject.org.
- SEPP has three workgroups focused on software development: architecture, development, and user interface.
- Developer workshops give detailed information how to write tools and services for the Sakai framework.

Sakai Commercial Affiliates

- Contributory and support companies
- Separate from SEPP, but overlapping
- Access to Sakai newsletters
- No solicitation of educational partners
- Will have their own staff and communications in the future

Initial SCA Members

- Embanet
- R-smart Group
- Sunguard SCT
- Unicon

Call to Action

- Join the Sakai Educational Partner Program
- Participate in the discussion groups
- Develop in-house Sakai expertise
- Install and review Sakai alpha (etc)
- Develop or port tools to Sakai
- Share lessons learned
- Be an active voice in how SEPP is run

O.K.I. Overview

Motivation:
from Extensible, Web based LMS…

- Interoperable with campus infrastructures and other educational software
- Flexible to meet a variety of Educational Needs
- Scalable and Maintainable

to…

...Architecture for Sustainable Ecology

Open specifications that

- **describe how the components of a learning technology environment communicate with each other and with other campus systems.**

- **clearly define points of interoperability to allow the components of a complex learning environment to be developed and updated independently of each other**

leading to…

Architectural Specification Benefits

- **Ability of learning technologies to be integrated together into an educational infrastructure.**
- **Easier sharing of applications and educational services among institutions that can be a catalyst for cooperative and commercial development.**
- **Lower long term cost of software ownership and development, as well as increased stability and reliability because discrete components, rather than entire systems, can be replaced or upgraded.**

O.K.I. is:

- Service based architecture specifications
- Open Service Interface Definitions (OSIDs)
- Open source implementations
- Open source exemplar applications
- Educational Development Community

Funded by Andrew W. Mellon Foundation, CMI, MIT

The O.K.I. Solution

- Focus on *Service Based* architecture specifications (data/metadata specifications are "doing fine")
- Identify software infrastructure services critical to eLearning applications
- Define interfaces to them. Don't define how to implement them!
- Open Service Interface Definitions (OSIDs)

OSID development funded by Mellon Foundation

Common Services

- **Authentication**
- **Authorization**
- **SQL**
- **Logging**
- **Filing**
- **Dictionary**
- **Hierarchy**
- **Agent**
- **Shared**
- **ID**
- **User Messaging**
- **Scheduling**
- **Workflow**

“Educational Services”

- **Course Management**
- **Repository**
- **Assessment**
- **Grading**
- **…**

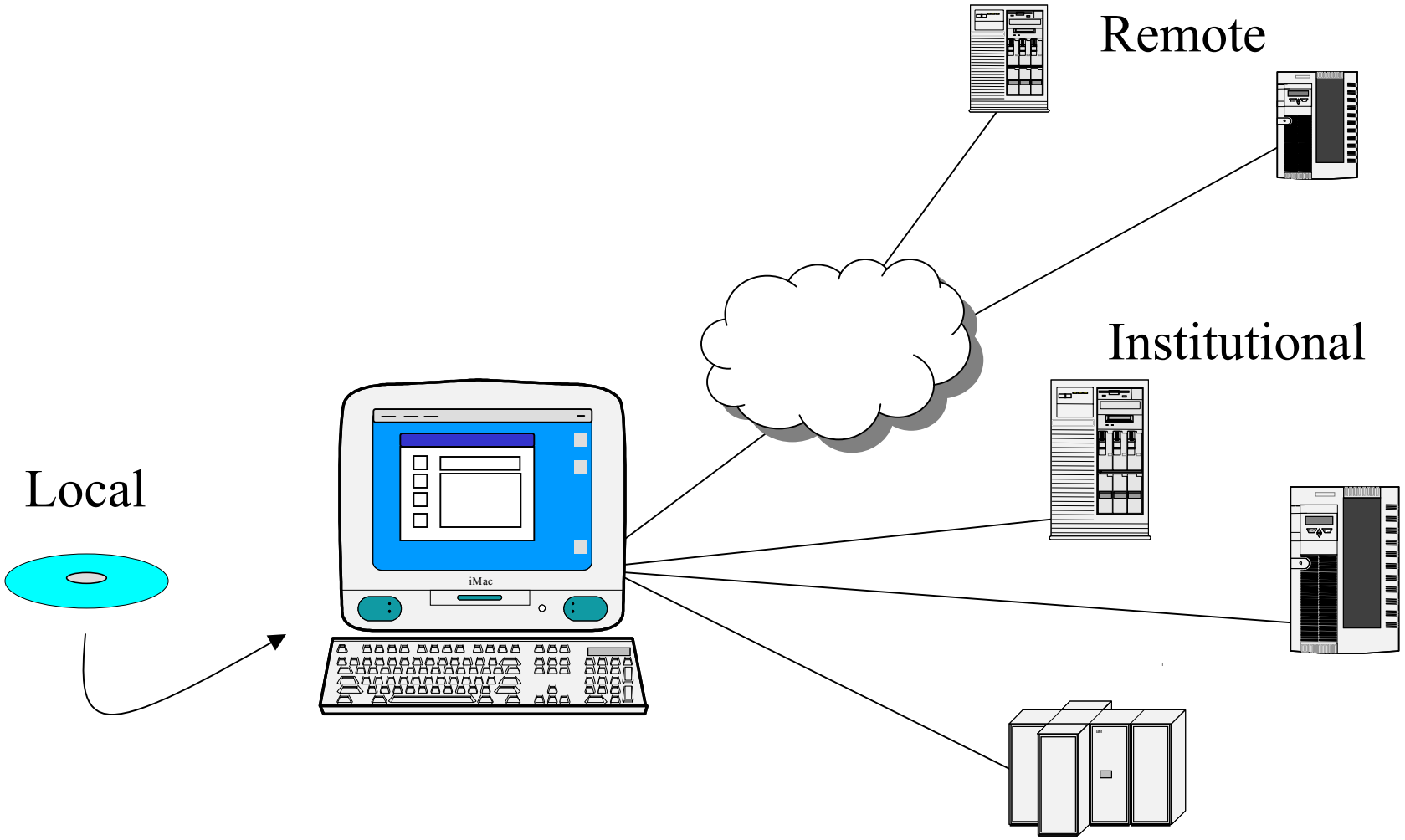
http://sourceforge.net/projects/okiproject

OSIDs…

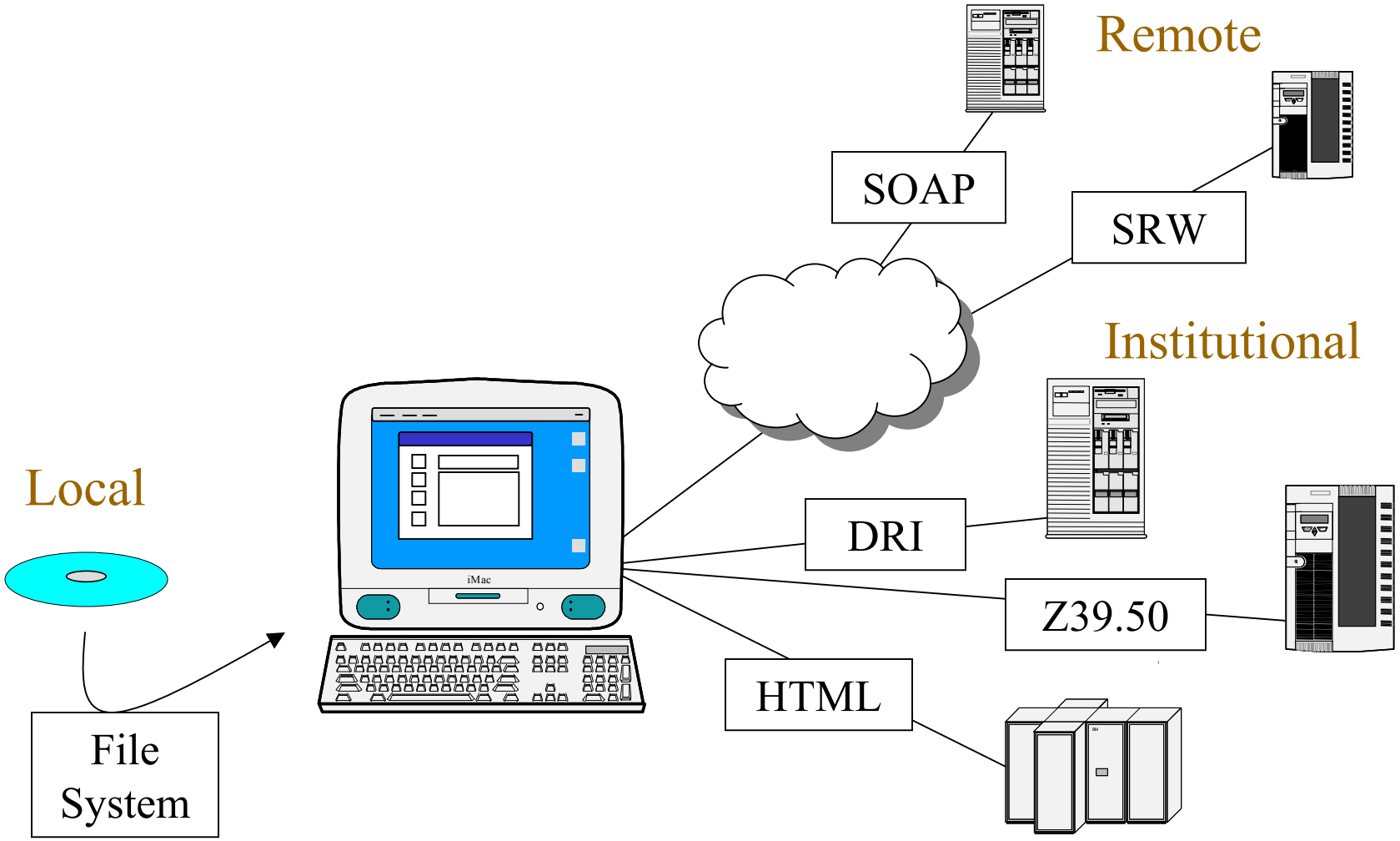
- Provide Architectural Model for software interoperability
- Allow for easy mobility of application tools among enterprise infrastructures
- Provide software developers with common, yet flexible, specifications for collaboration
- Define boundaries between “user facing” applications and critical services (“MiddleWare”)
- Help to “Future Proof” against changing technologies
- Enable “marketplace” of software components
- Are about Architecture, NOT Technology

Example: Digital Repositories of Educational Content

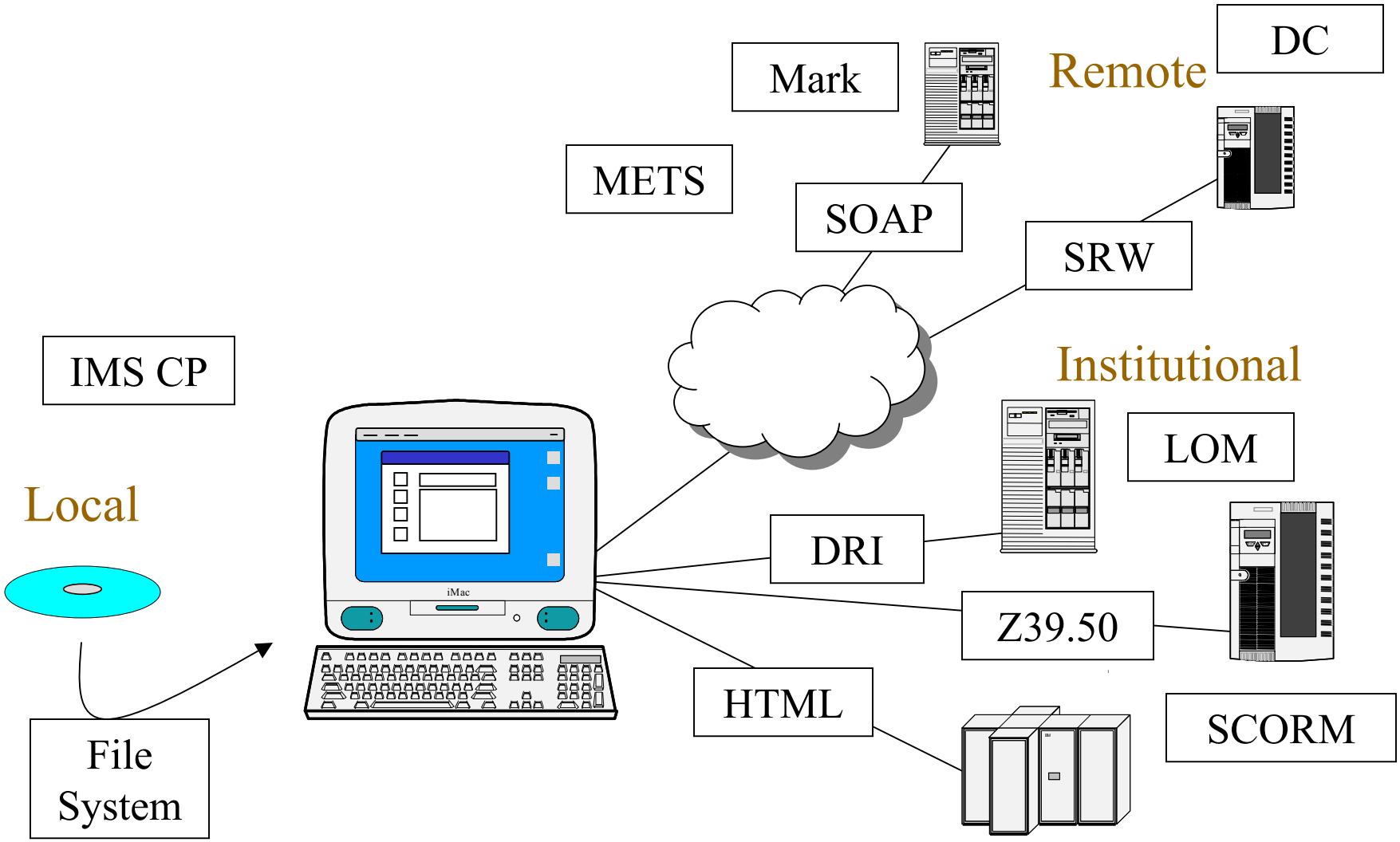
Many Repositories…



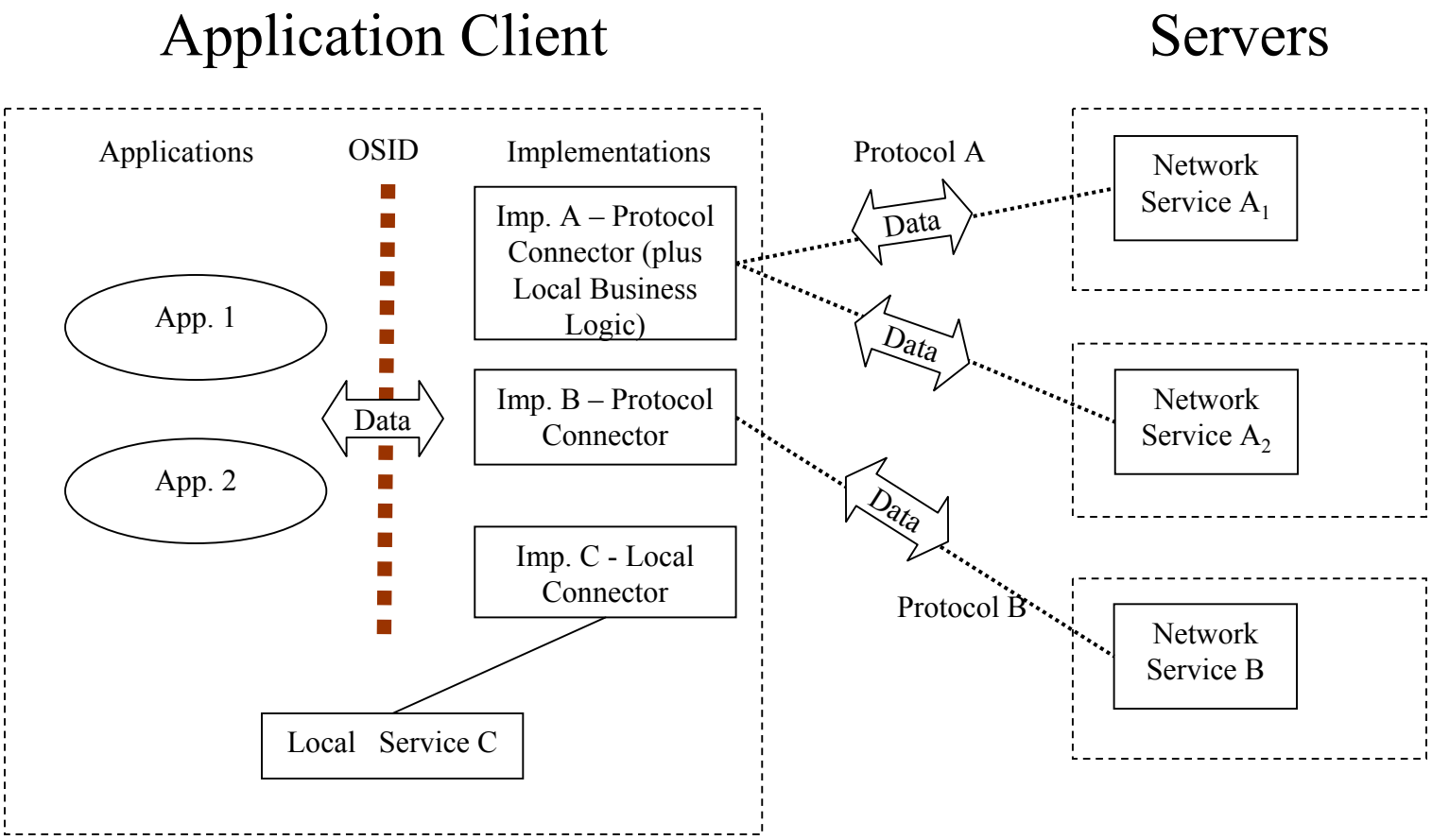
Many Repository Related Protocols…



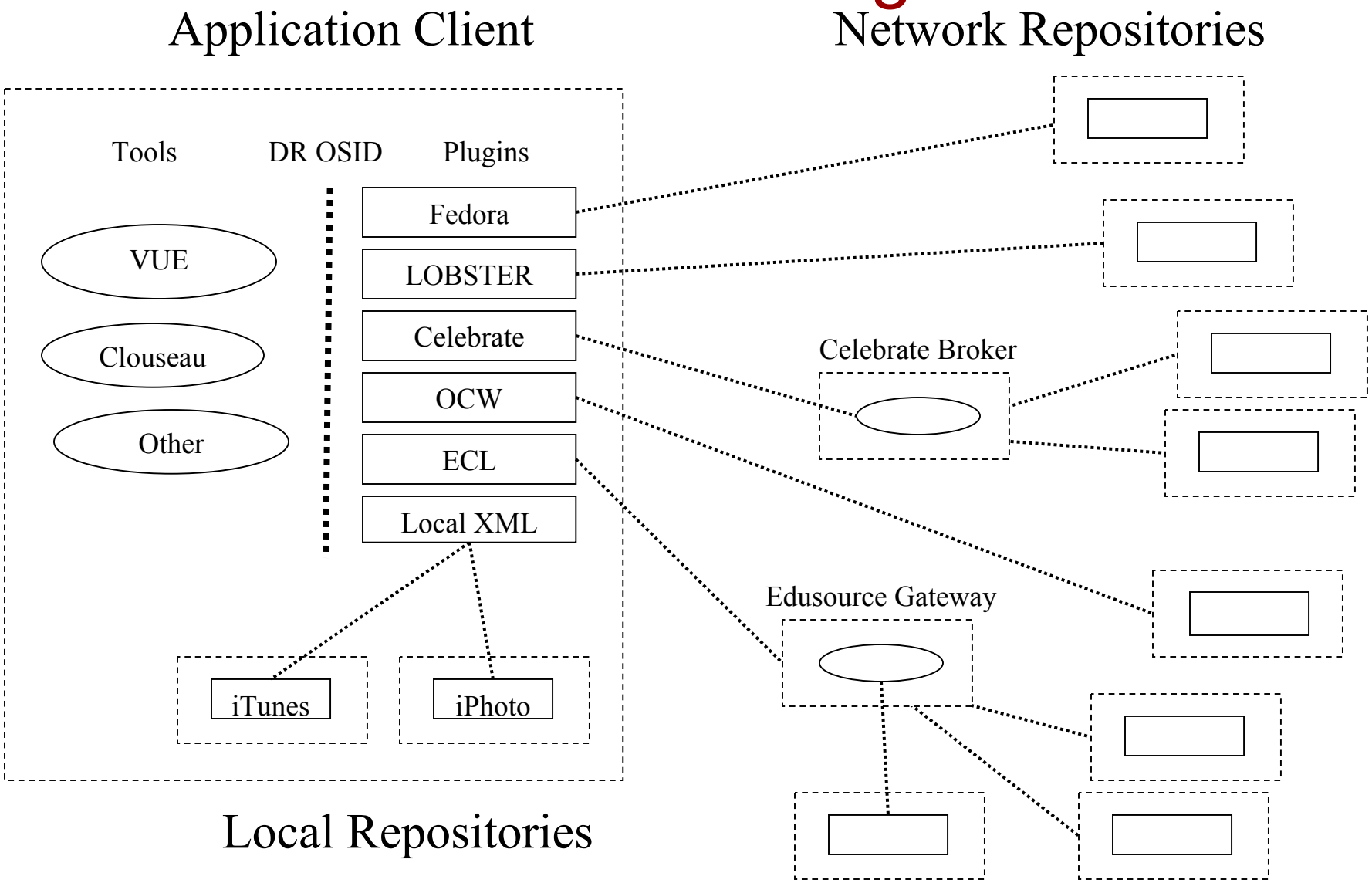
Many Data Specs/Standards…



Service Abstraction for Interoperability



Federating Repositories with OSID Plug-ins



O.K.I. Community

- Original Institutional Partners
  - MIT, Stanford University, Dartmouth College, North Carolina State University, University of Michigan, Indiana University, University of Pennsylvania, University of Wisconsin-Madison, University of Cambridge
- IMS Global Learning Consortium Members
- Assorted Institutional Projects

OSID Based “LMS” Projects

Stanford University

MIT

Indiana University

University of Michigan

The Sakai Partners

Other OSID Based Projects

Sakai – Umich, Indiana, Stanford, MIT

VUE -- Tufts University

Navigo/SAM -- Stanford, Indiana

Lionshare - Penn State University

Segue/Harmoni - Middlebury College

Digital Library Systems -- Fedora, EduSource (CA), DSpace, Celebrate (EU)

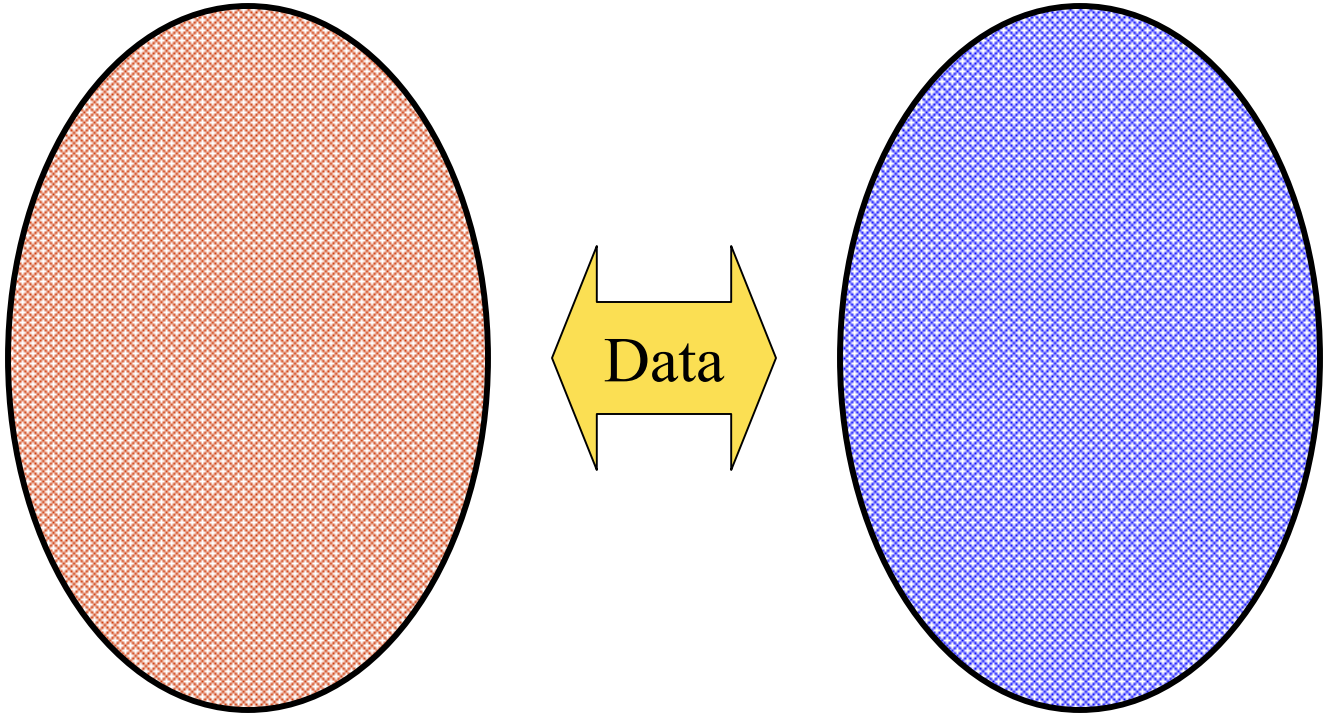
Vendor Engagement

- Through IMS Global Learning Consortium
  - Blackboard
  - Cisco Learning Systems
  - Giunti Labs
  - Learning Objects Network
  - Microsoft Corp
  - Sun Microsystems
  - WebCT

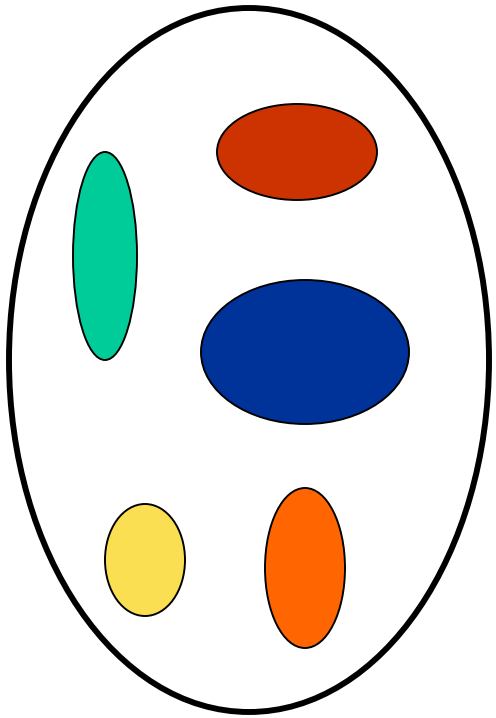
Ed-Tech Architectural Requirements

- Make it easy for software developers to utilize enterprise infrastructure, otherwise they won't.
- Make it possible for institutions to share and collaborate on educational software
- Provide ability for integration requirement to be more clearly specified in RFPs
- Mitigate technology change
- Support both Web and Client based applications
- Driven by sustainability concerns NOT research (Pioneers not Trailblazers)

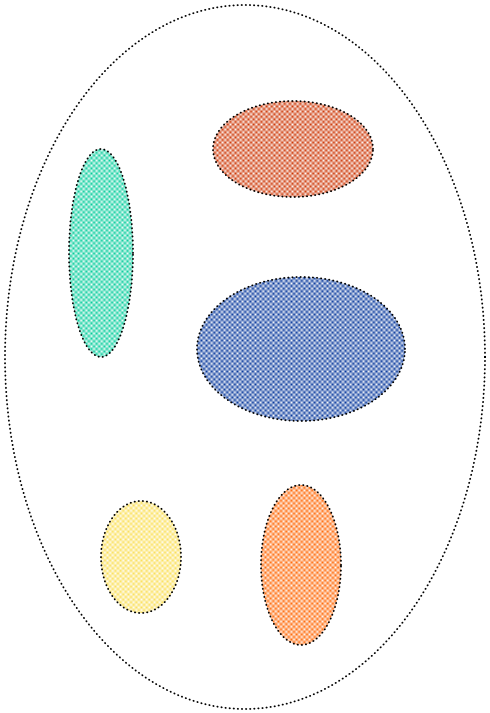
Data Specifications – IMS/SCORM

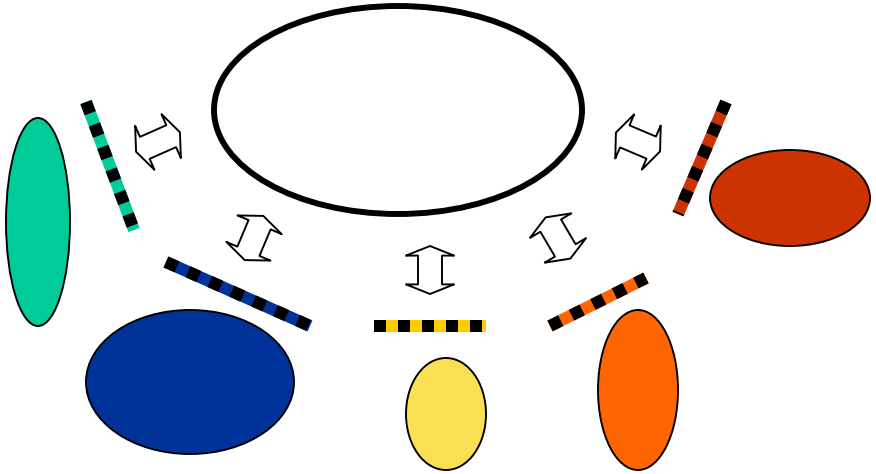


Enterprise Applications - Monolithic



Enterprise Applications - Factored

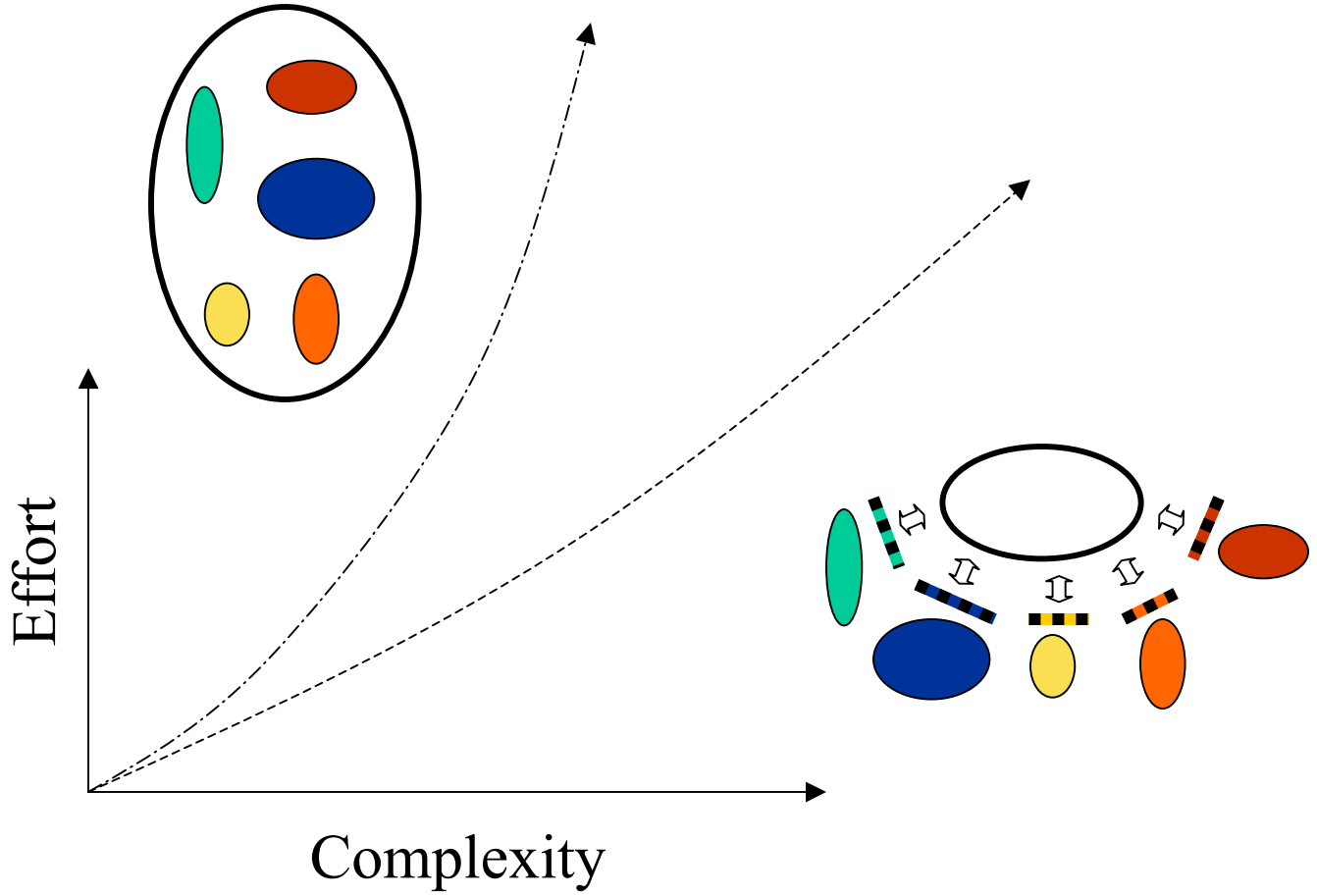




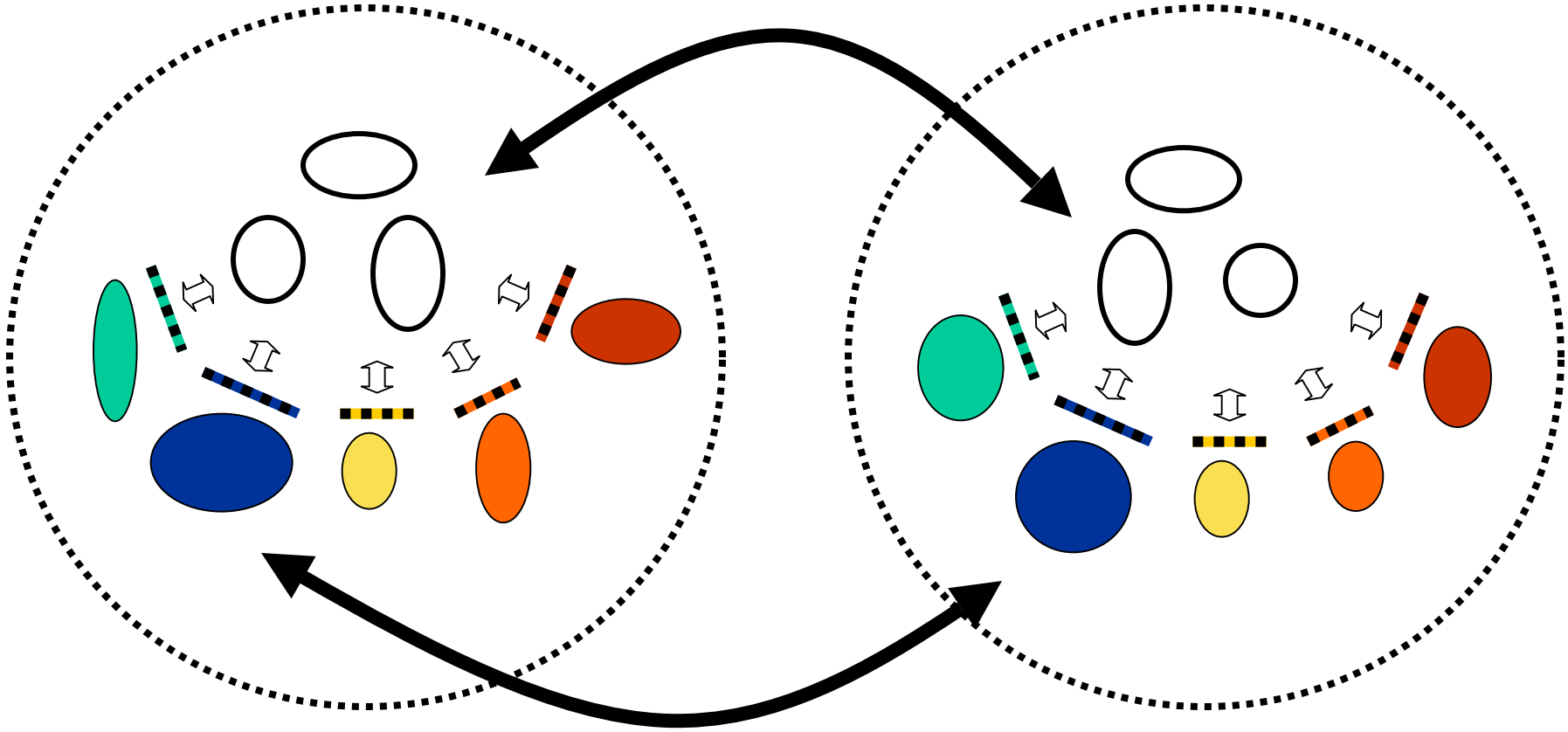
Core OKI Deliverables

- Open Service Interface Definition (OSID)
  - "Common Services"
    - Infrastructure systems critical to most enterprise applications
    - (AuthN; AuthZ……Logging, Messaging….Workflow)
  - "Educational Services"
    - (Course Management; Assessment; Digital Repositories, Grading)
- Reference Implementations
  - Direct value to ed apps
- Exemplar Applications
- Sustainability Strategies

Integration Effort as a Function of System Complexity



Ease of Application Portability and Infrastructure Transition



Time to Integration with OSIDs Today

Creating a new OSID Plug-in for an existing exposed Repository	2 Weeks
Getting it to work with your first O.K.I. App	2 Hours
Getting it to work with the next O.K.I. App	2 Minutes

Assumptions

- Things Change
  - New Services & Functions
  - Method of Accessing Services
  - More Central Software Services
    - Authorization, Calendaring, etc.
  - Evolving Systems
    - Definition

More Assumptions

- All Enterprises won't have the same Technologies
- All Enterprise Systems won't use the same Technology
- The need for sharing will grow
- Differing "connectedness"
- Not Web only

Goals

- Better Integration
  - Allow data to be exchanged
  - Allow software to be integrated
- Predictable Evolution
  - Allow for changing functionality
  - Minimize the negative impacts
- Expanding Market Possibilities

Possible Integration Goals

- Allow enterprise systems to exchange & synchronize information
- Allow different organizations to exchange & synchronize information
- Allow systems to use enterprise services
- Allow for modular software which plugs into a known framework
- Single system responsible for information

Data and Functional Specification

- Data standards serve two goals
  - Data exchange inter/intra enterprise
- Both Data & Function needed for all Goals
- Data duplication and propagation
  - data specifications can’t address all issues
- Both Needed for Interoperability
  - And more!

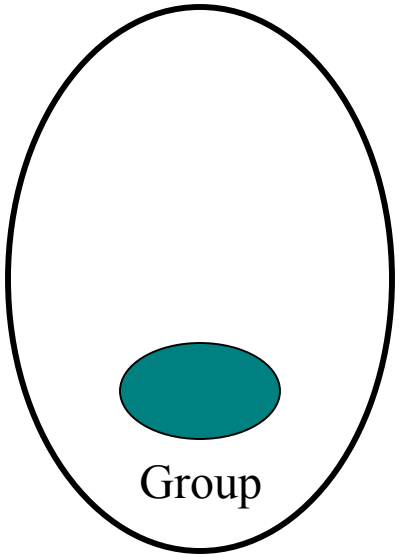
Interface and Protocol Specifications

- Interface specifications make life easier for the Application Beveloper
- Protocol Specifications make life easier for the Service Provider
- Both are required, and both make life easier for the Systems Integrator

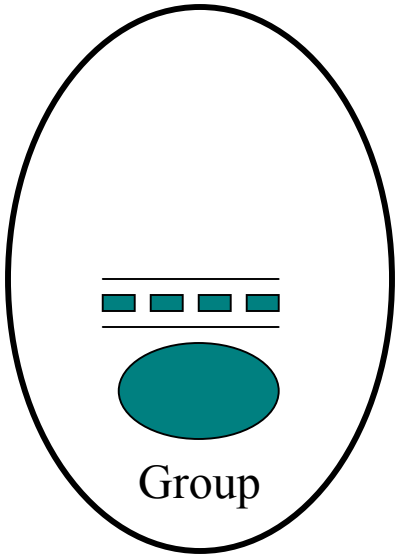
The OSID Approach

- OSID are Interfaces only, not Implementations
- Code Reuse
- Can Achieve Real-time Integration
- Clean Separation or Boundaries
- Minimizes Impacts of Changes

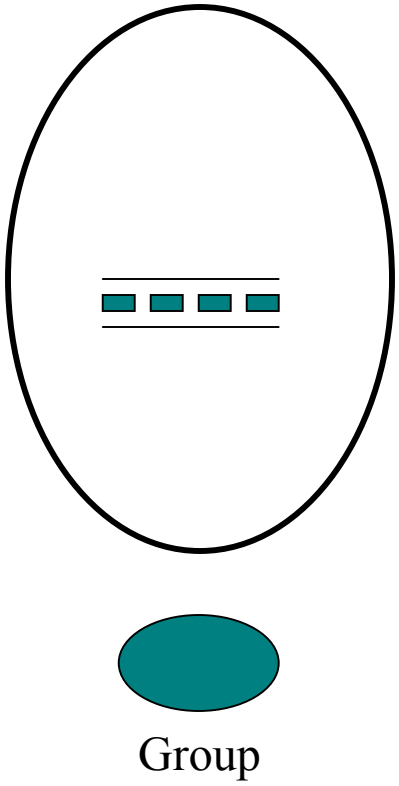
A single application with a module of functionality



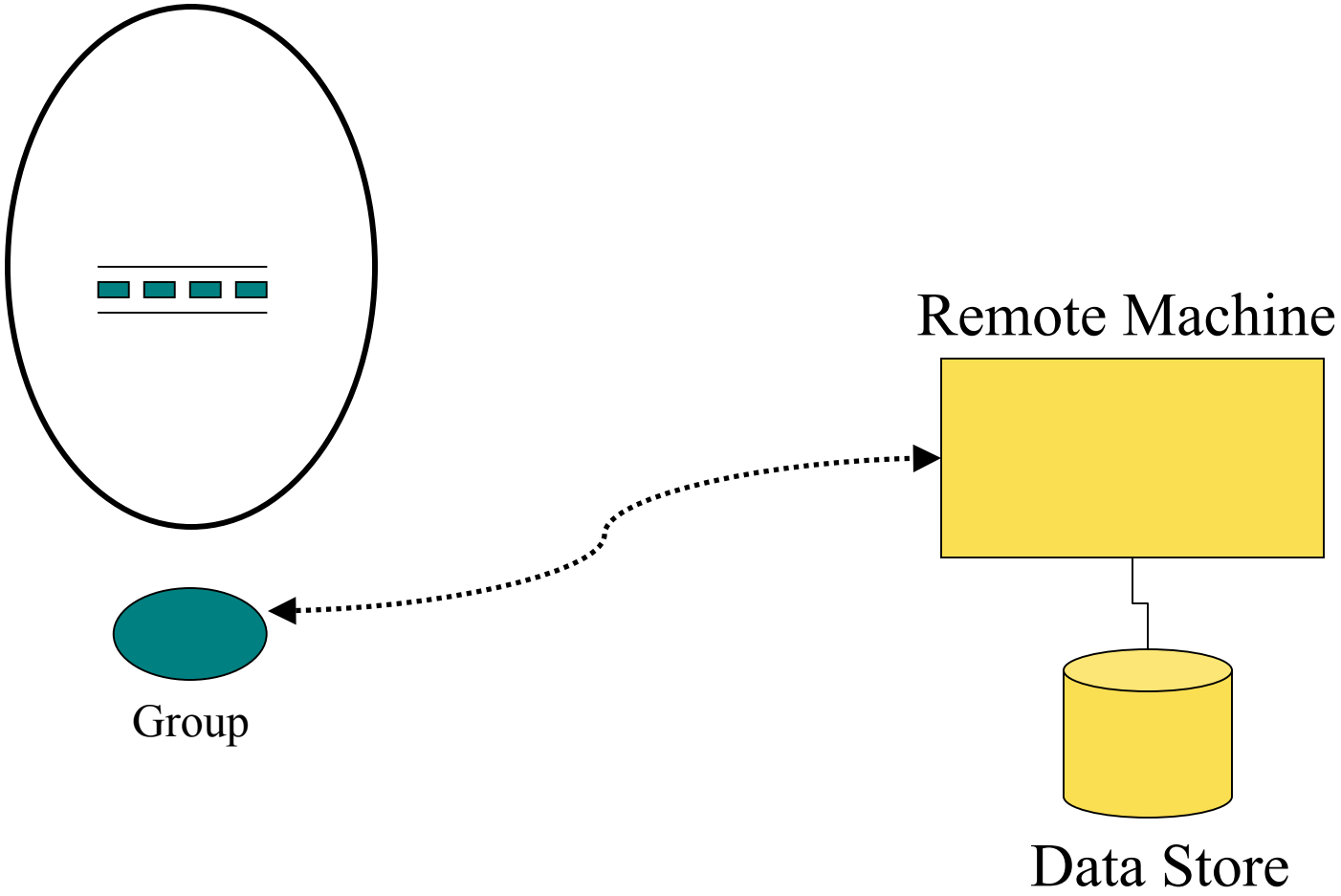
An application using an OSID internally, but with no real benefit



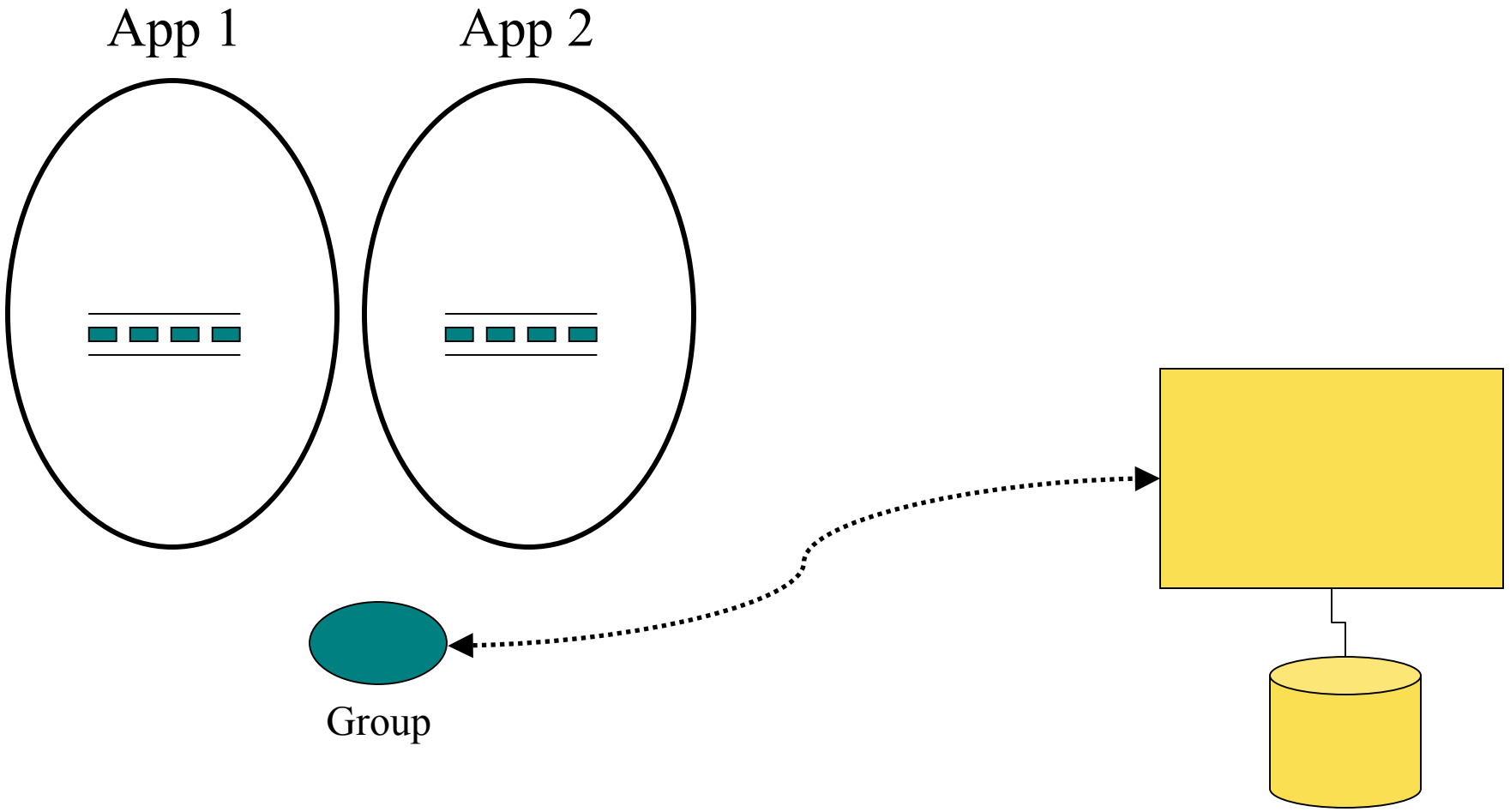
The module is outside the application, but still local



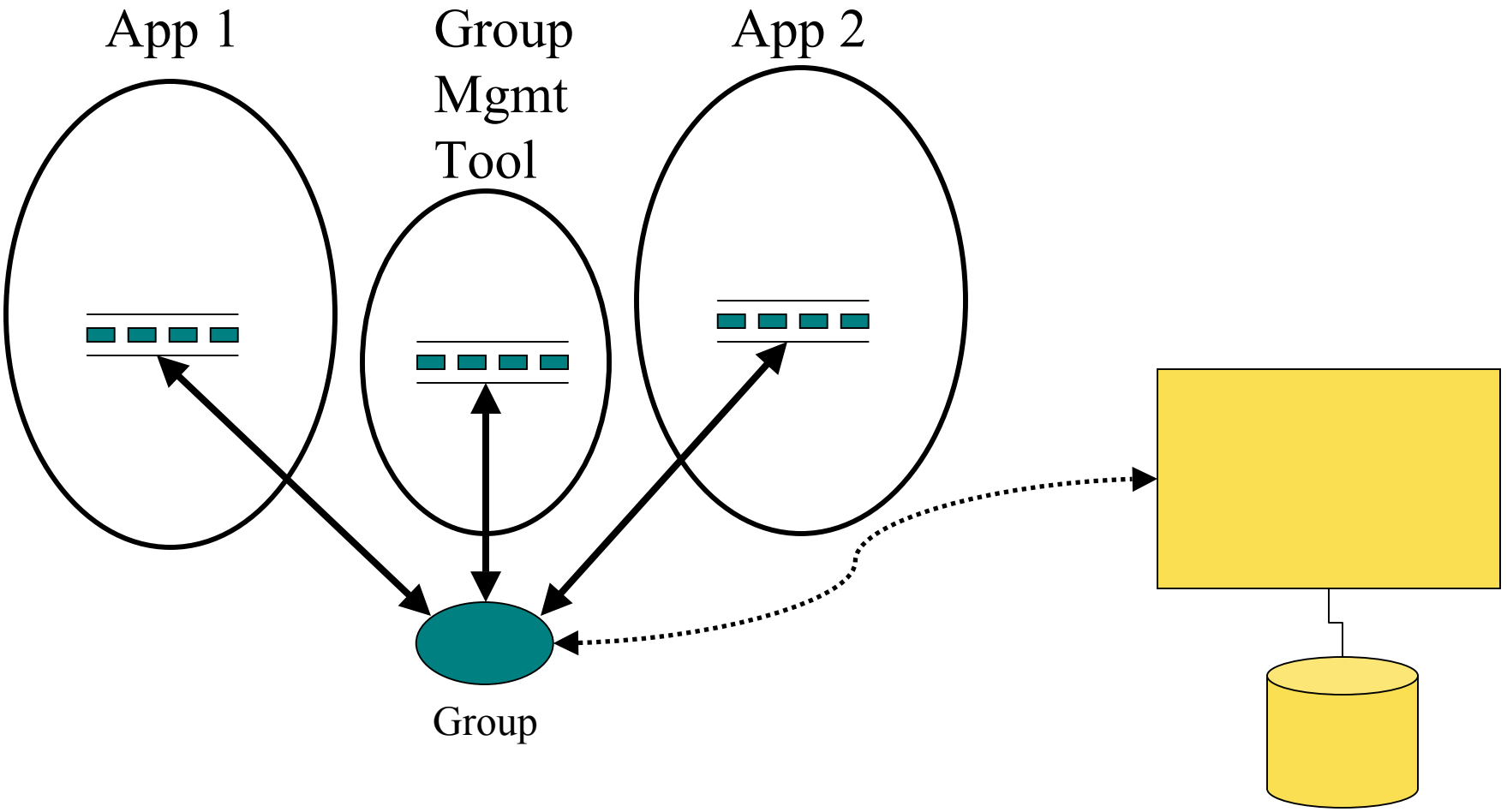
A client-side OSID and a remote service



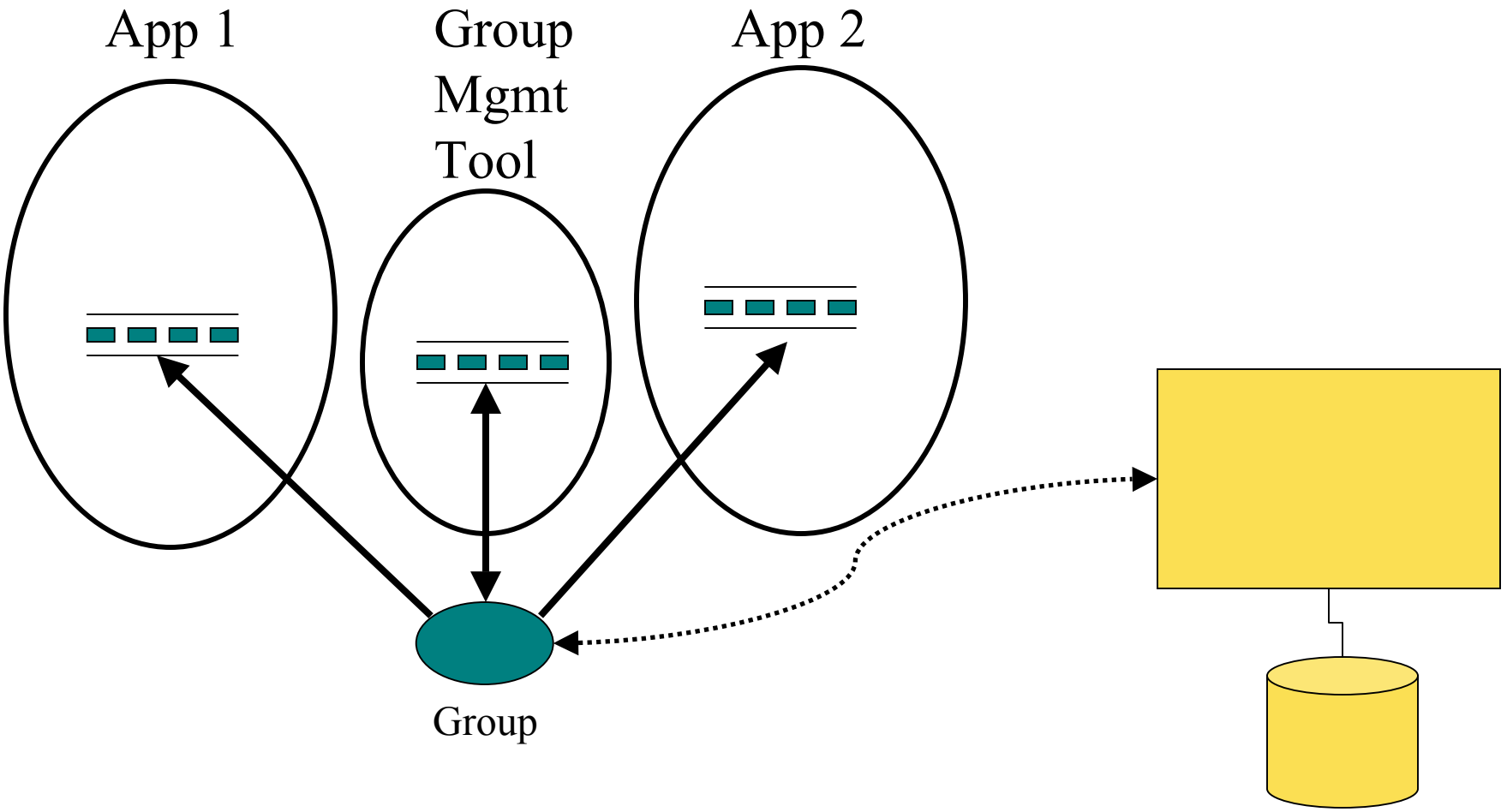
Integration of two applications with a single service



Introduction of a common tool for Group management



Group maintenance can be removed from applications



Goals of Interoperability

Enterprise Information Systems

- Data Exchange/Synchronization
- Enterprise Integration
- Application Portability
- Tool/UI Integration
- Language Integration
- Inter-Enterprise Resource Sharing
- Etc…

Goals of Interoperability

Enterprise Information Systems

- Data Exchange/Synchronization
- Enterprise Integration
- Application Portability
- Tool/UI Integration
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- Inter-Enterprise Resource Sharing
- Etc…

O.K.I. OSIDs

The Partners' Perspective on Teaching and Learning Technologies

Jim Farmer

Sakai Community Liaison

NERCOMP Workshop: Sakai

College of the Holy Cross, Worcester, Massachusetts
September 23, 2004

Sakai is

- A concept
- An architecture
- A six-university software development effort
- A contributing community

  and more important, an emerging vision for higher education focused on improving teaching and learning, and research.

Sakai

The Sakai Vision

"We will create an open-source Collaboration and Learning management system which is competitive with best offerings,

BUT at the same time create a framework, market, clearinghouse, cadre of skilled programmers, documentation and set of community practices necessary to enable many organizations to focus their energy in developing capabilities/tools which advance the pedagogy and effectiveness of technology-enhanced teaching, learning, research and collaboration

...rather than each just building another threaded discussion tool as an LMS."

Sakai Board, June 23, 2004

Sakai

The broader goal

"Integrating these disparate efforts will also merge their associated communities of use and practice towards a *critical mass to have a real economic and innovation effect* for educational institutions."

Brad Wheeler, Indiana University

Sakai

Limitations of the presentation

This perspective comes from discussions in the Sakai Educational Partners Program, interviews at Columbia University, University of California at Los Angles, New York University, Georgetown University, Foothill College, Coastline Community College, University of Wisconsin, Madison and the University of Oklahoma, and recent presentations and publications of Sakai participants.

It may not be representative of Sakai as a whole.

Sakai

The Sakai Education Partners Program

Funded by the William and Flora Hewlett Foundation and the partners

Sakai

Partner Priorities

- Architecture
- Specialized “tools”
- Improved pedagogy
- Complete, **stable**, and scalable learning management system **option.**

The typical planning horizon extends to 2006 and 2007 for Sakai CLE implementation.

Sakai

1. Architecture

An architecture than can be used

- To integrate the learning management system with the student and library systems

or

- As an enterprise [information technology] architecture.

The February/March 2004 Tool Portability Profile is cited as the needed initial reference model.

Sakai

1. Architecture: standards

- Open standards so that software components or “tools” can be added.
- Open standards for learning materials so any material can be used in any learning management system without loss of content or function and without the need technical expertise.

Sakai

1. Architecture: capabilities

- Presentations that are based upon student and/or faculty preferences, role, accessibility needs, and level of experience, and pedagogical effectiveness.
- Designs supporting multiple languages and responding to user language preferences.

Sakai

2. Specialized “tools”

- Software that provides a needed function not available in their current learning management system.
  - An “easy to use” equations editor
  - Editors for modern languages (Greek and Arabic were cited)
  - Search of an individual user’s stored documents; a personal “Google”
  - Support for the use of multimedia, especially audio and video, in the context of a learning object.
  - Business simulations—”game like”

Sakai

2. “Tools” – an observation

- In every case, partners cited a “tool” developed by a faculty member, sometimes with IT support, that illustrated the need and usefulness. All were specific to a discipline.
- These tools could be “redeveloped” using an architectural framework to ensure interoperability and maintainability.

  The Campus EAI “standardization process” was cited as a possible approach to generalize faculty-developed software.

Sakai

3. Improved pedagogies

- The Partners want to use pedagogies that improve student learning, reduce “unrelated” faculty workload, and increase college or university effectiveness.
- The Partners want delivery systems that extends a student’s knowledge, adapts to the student learning style and availability, and facilitates faculty teaching.

Sakai

3. Improved pedagogies

The learning management system should facilitate the teaching role of faculty, provide "tools" to monitor student progress, and actively adapt and guide the learning process.

This implies "learning process management" functions not yet available in any learning management system.

Sakai

3. Improved pedagogies

- Faculty research must be supported to ensure current knowledge. The learning system must facilitate the availability of new content in the learning management system.
- The learning management system must provide data on the effectiveness of pedagogies so faculty can improve their teaching.

  This need implies improved assessments and records of student activities.

Sakai

4. The “Sakai” software

- From the Sakai Project, a collaborative learning environment (CLE) that, in the future, will meet all of the functional requirements and be scalable and stable.
- This “Sakai” becomes a desired *option* available to all colleges and universities.
- “Tools” will also emerge from the Sakai Educational Partners Program.

Sakai

4. The "Sakai" software

- Working with other organizations a fully-developed reference implementation of "open standards" and a new generation of "service oriented software."
- An opportunity, with broad implementation, to standardize learning content and to fully utilize "open content."

Sakai

4. Implementing Sakai Software

Partners expect to implement the Sakai Collaborative Learning Environment if:

- It provides the functions of the current learning management system with either improved effectiveness or reduced costs,
- It proves more stable and scalable that currently used learning management systems,

or

- It provides some critically need function not available in the current system.

Sakai

Value of collaboration

The Sakai Partners all share the belief that working together is the best way to improve teaching and learning in their colleges and universities.

The “community” needs an effective way to collaborate, to share knowledge including software and learning objects, and to learn from the collective experience.

And the Partners Program seeks to provide this

Sakai

The emerging vision

"Transforming education will transform educational technology. And the transformation of education depends upon the transformation of current technologies."

Justin E. Tilton, September 2004

Sakai

The Future?

If enthusiasm and the willingness to share and to contribute are an indicator, the “transformation” has begun. And the Sakai partners are making a commitment to *their* emerging vision.

Sakai

The end

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Sakai

Publisher's Note

- uPortal is a project of the JA-SIG Collaborative led by Carl Jacobson at the University of Delaware and funded, in part, from the Sakai Project.
- The author is Chairman of the Board of im+m and Sigma Systems Inc., contracted by the University of Michigan for the Sakai Educational Partners Program, and volunteers as uPortal Project Administrator.
- im+m has contributed to uPortal, and the Meteor and California Electronic Transcript Project prototypes referenced in some of these presentations.

Sakai

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Sakai

The Sakai Architecture

Mark J. Norton

Senior Technical Consultant

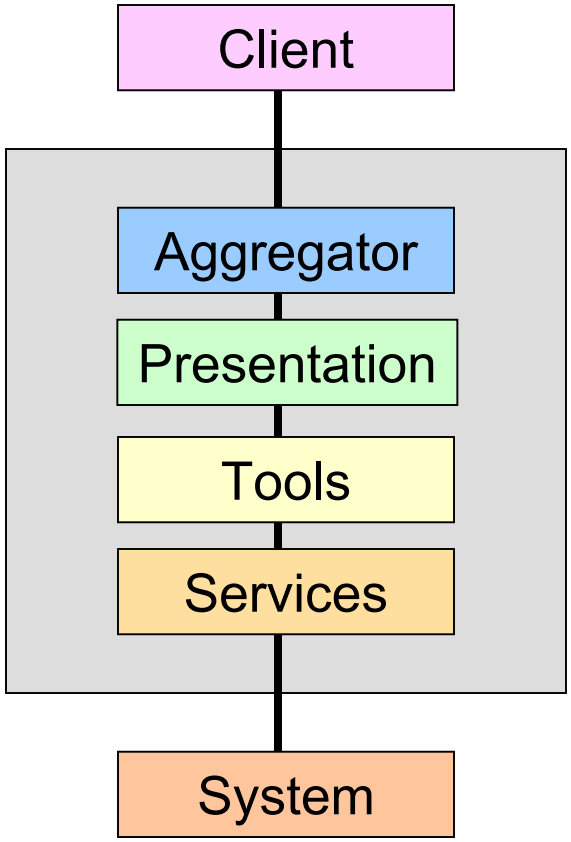
Overview

- The Abstract Sakai Architecture
- The Sakai Framework
- Framework Requirements
- The Java Framework
- Sakai Features
- Project Timeline
- Future Development

High Level Sakai Goals

- Produce a full featured Collaborative Learning Environment to replace existing ones on core member campuses.
- Develop a framework which will enable the creation of new tools and services which will be portable to other Sakai environments.
- Leverage standards such as IMS and OKI for data interoperability.
- Create a modular system that can aggregate content from a variety of sources, not just those created by Sakai.

Abstract Sakai Architecture



Sakai will work with a variety clients, including browsers

Aggregators typically mean portals.

Presentation is separated from the tool for better control.

Tools act as the glue between the UI and services.

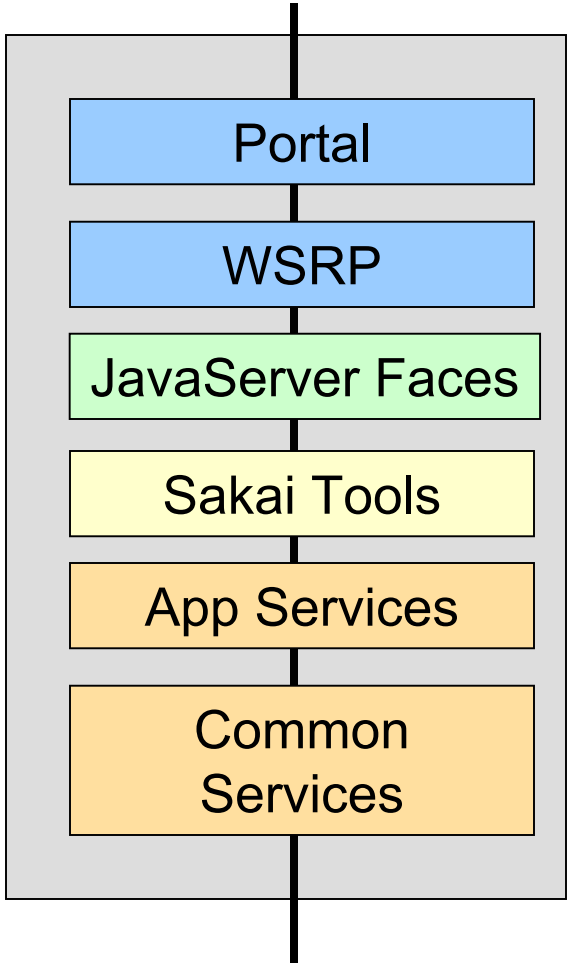
Services provide abstract, re-usable functionality.

The system in most cases is a server or system cluster.

Framework Requirements

- Tool and Service Portability
- Data migration using industry standards
- Enterprise service interface capability
- Self contained out of the box experience
- Support for small, medium, large systems
- Separation of UI from the tools
- Content aggregation
- Built in support for accessibility
- Skinning and Customization
- Consistent user experience and single sign on

The Sakai Framework



The goal is support any portal that supports standards.

WSRP will be the primary output from Sakai tools.

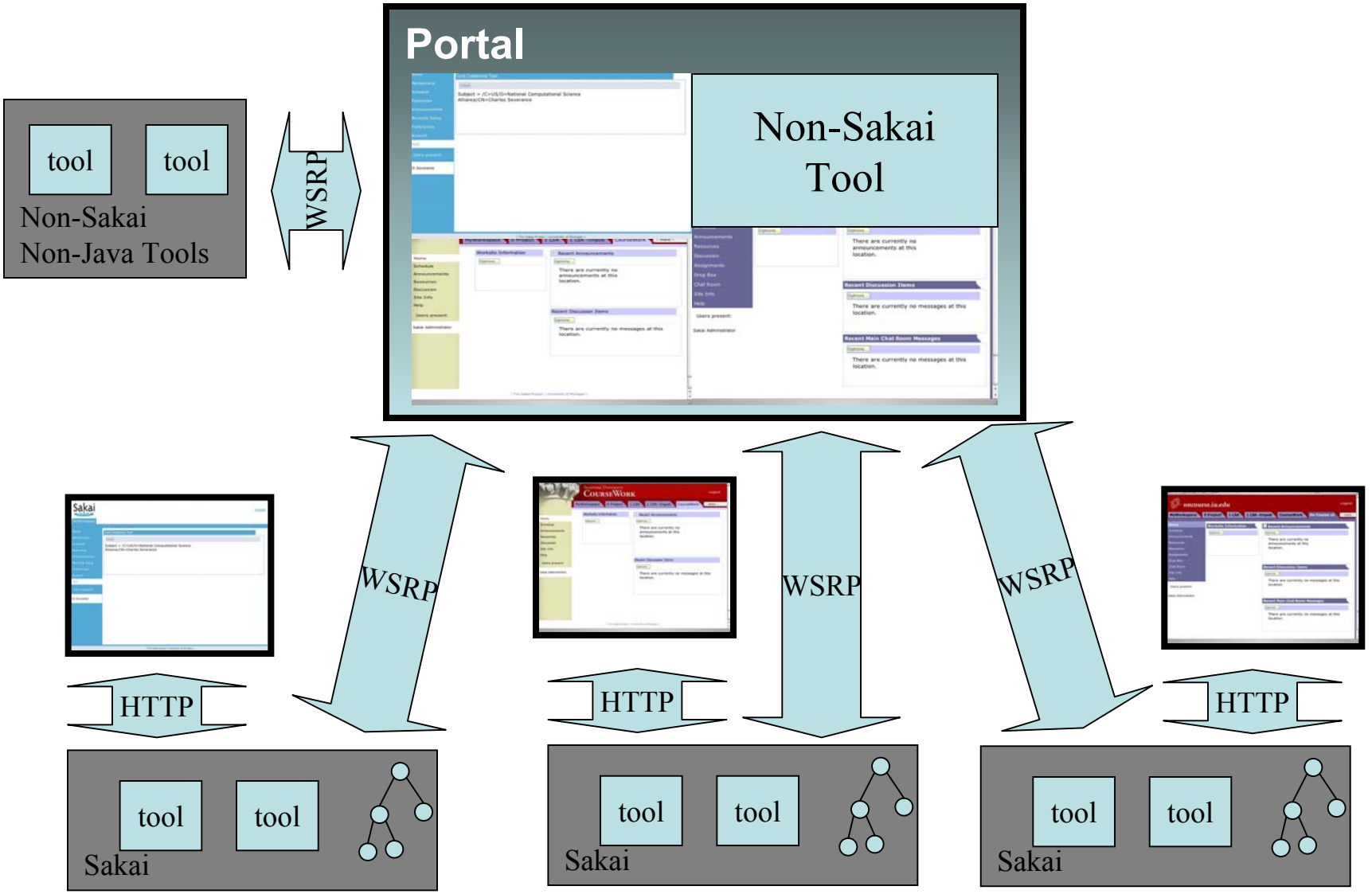
JavaSever faces allow UI descriptions using XML.

Sakai tools manage JSF events using services.

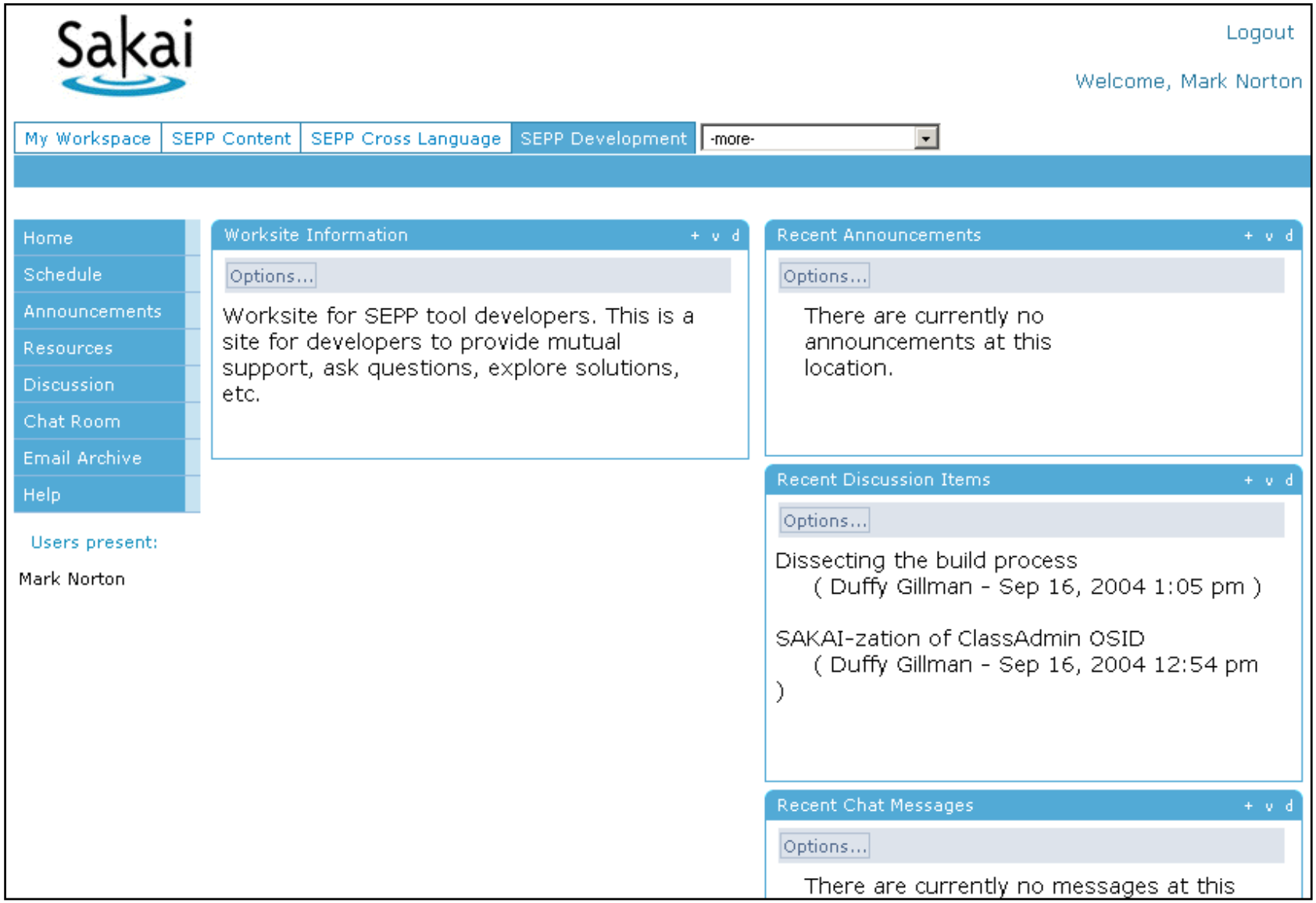
Sakai services are revealed via Sakai API's.

Common services will be based on OKI models.

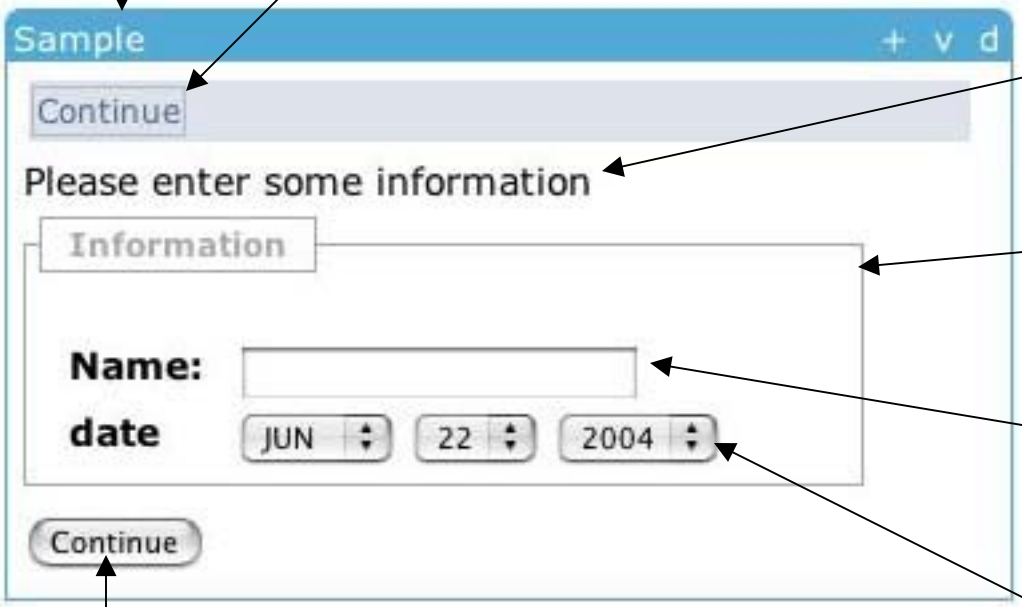
Web Services for Remote Portals



The Sakai User Interface



JavaServer Faces – XML based UI




```
<sakai:view_container title="#{msgs.sample_title}">
```

```
<sakai:tool_bar>  <sakai:tool_bar_item/>  </sakai:tool_bar>
```

```
<sakai:instruction_message
value="#{msgs.sample_one_instructions}" />
```

```
<sakai:group_box
title="#{msgs.sample_one_groupbox}">
```

```
<h:inputText
value="#{MyTool.userName}" />
```

```
<sakai:date_input
value="#{MyTool.date}" />
```

```
<sakai:button_bar>
        <sakai:button_bar_item
        action="#{MyTool.processActionDoIt}
        value="#{msgs.sample_one_cmd_go}" />
</sakai:button_bar>
```

Sakai

Sakai Common Services

- Authentication
- Authorization
- Id Manager
- Type Manager
- Agents and Groups
- Hierarchy

Design Patterns

- Separate of presentation and application logic
- Inversion of Control: Dependency Insertion
- Model / View / Controller
- Hibernate for ORM

Sakai Features 1

- Course Management Capabilities
  - Sites for individual course offerings
  - Roster control with input from SIS
  - Sub-groups for study, projects, discussion, etc.
  - Drop box for assignments
  - Course content, access control.
  - Email lists per class.
  - Based on best-in-class features from CTools, OnCourse, Stellar, and others.

Sakai Features 2

- Assessment
  - Broad support for tests, quizzes, problem sets.
  - Based on IMS QTI 1.0.
  - Item banks for random test generation.
  - Rubrics for scoring.
- Gradebook
  - Student, group, class data.
  - Curving, weighting, adjustments, editing.
  - Graphs and statistics.

Sakai Features 3

- Collaboration
  - Support for on-line research and work groups.
  - Forum, threaded discussions, chat.
  - Announcements, calendar.
  - Resource management, document control.
  - Web content references.
  - Archived email lists.

Sakai Features 4

- Enterprise Integration
  - Student information systems
  - Registration systems
  - Digital Libraries
  - Repositories
  - Single sign on and authentication
  - Remote authorization
- Scalability and Performance
  - Small and larger databases
  - Clustering, load balancing
  - Caching

Project Timeline

Sakai 1.0	Sept. 2004
SEPP Meeting	Dec. 2004
Sakai 1.5	Dec. 2004
Sakai 2.0	Mar. 2005
SEPP Meeting	June 2005

Future Development

- The Sakai Partners have started work on collecting requirements and desires for Sakai 3.0 with a target release timeframe of Dec. 2005.
- The SEPP Content DG is working on a Content Manager proposal.
- There is interest in a JSR-170 compatible repository, perhaps based on Slide.
- What would you like in Sakai?

Useful Developer Skills

- Java Beans (dependency insertion)
- Understanding of Servlets
- Interface design and implementation
- OKI OSIDs and Sakai APIs
- Maven deployment techniques
- JavaServer Faces and Sakai GUI elements
- Hibernate is useful if developing new APIs

Questions?