



Overview of Sakai Technology for Eidgenössische Technische Hochschule Zürich

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The Sakai Project

Overview

- Architectural Overview
 - The Sakai Framework
- Developing New Applications
 - Development Languages & Tools
 - Tool Development
- Integrating Sakai
 - Approaches
 - Examples



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What is Sakai?

- Sakai is a Collaboration Learning Environment.
- A platform for modular tools.
- Support for:
 - Course management
 - Learning delivery
 - Collaboration, work, and administration



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A Support Framework

- Sakai is separated into two main parts:

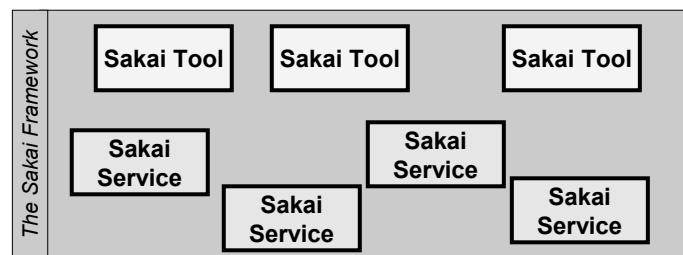


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What is a Framework?

- A “framework” is like a “hosting environment”
- It is the stuff that “surrounds” the user-programmable parts “inside”
- This framework includes common services that can be used to build more complex services.

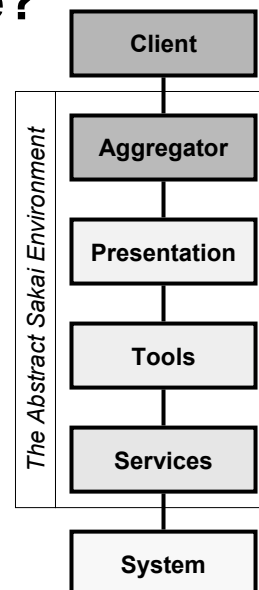


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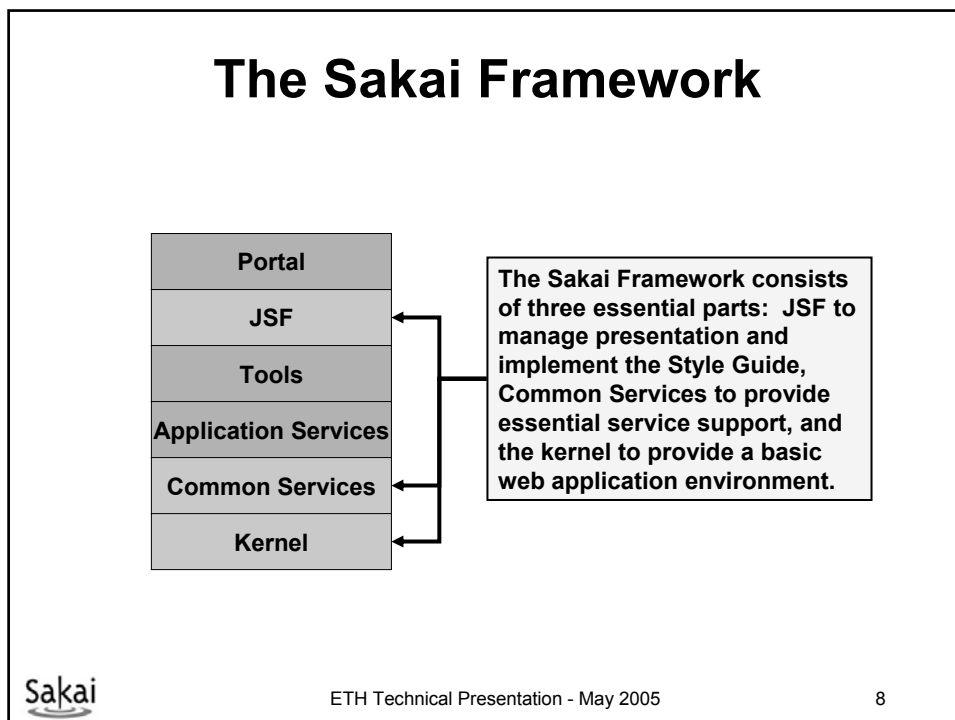
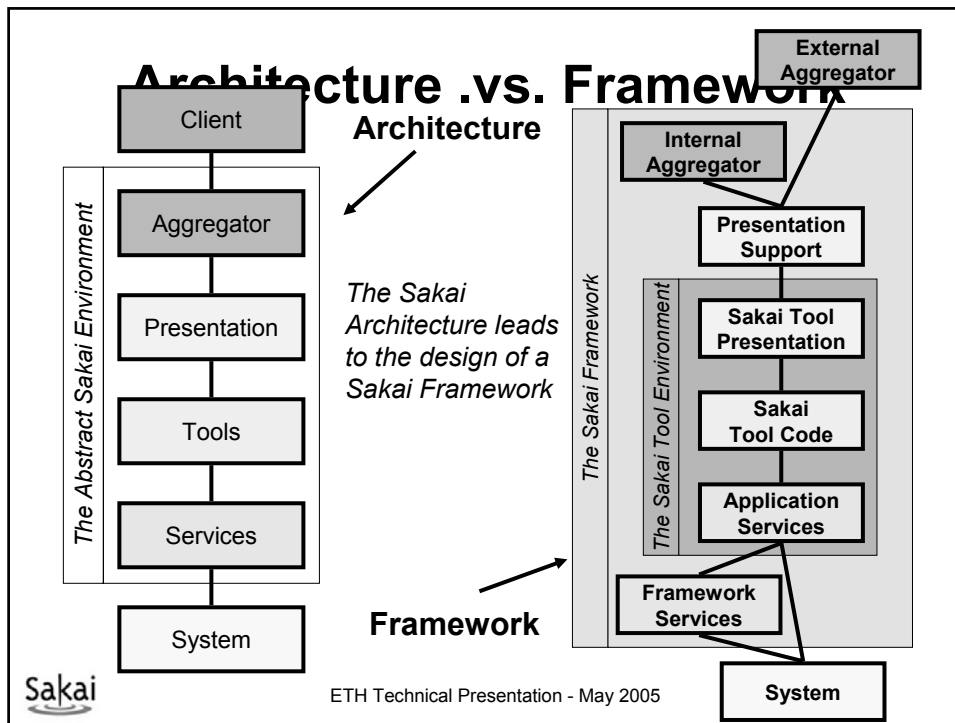
What is an Architecture?

- Very abstract
- The part that doesn't change
- Defines common terminology
- Usually not heavily debated
- Is not the implementation detail at all

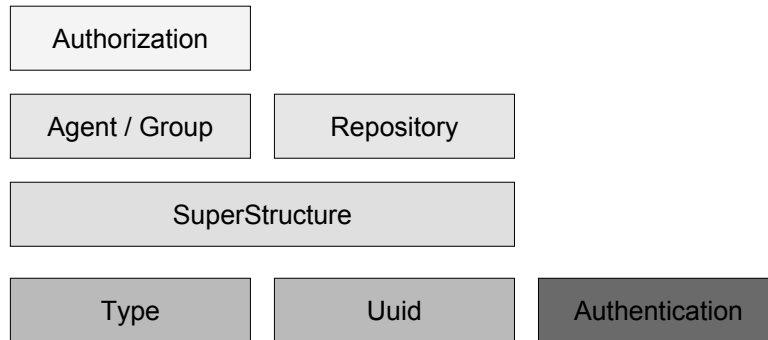


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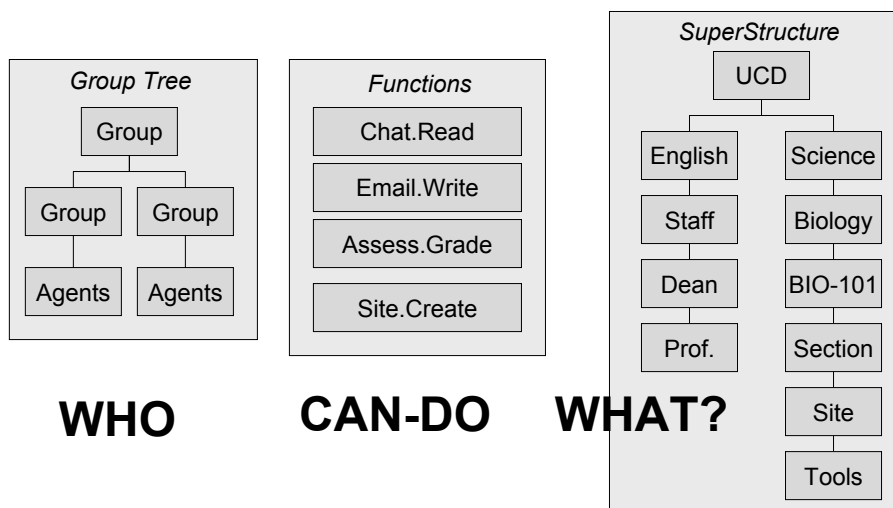
The Sakai Common Services



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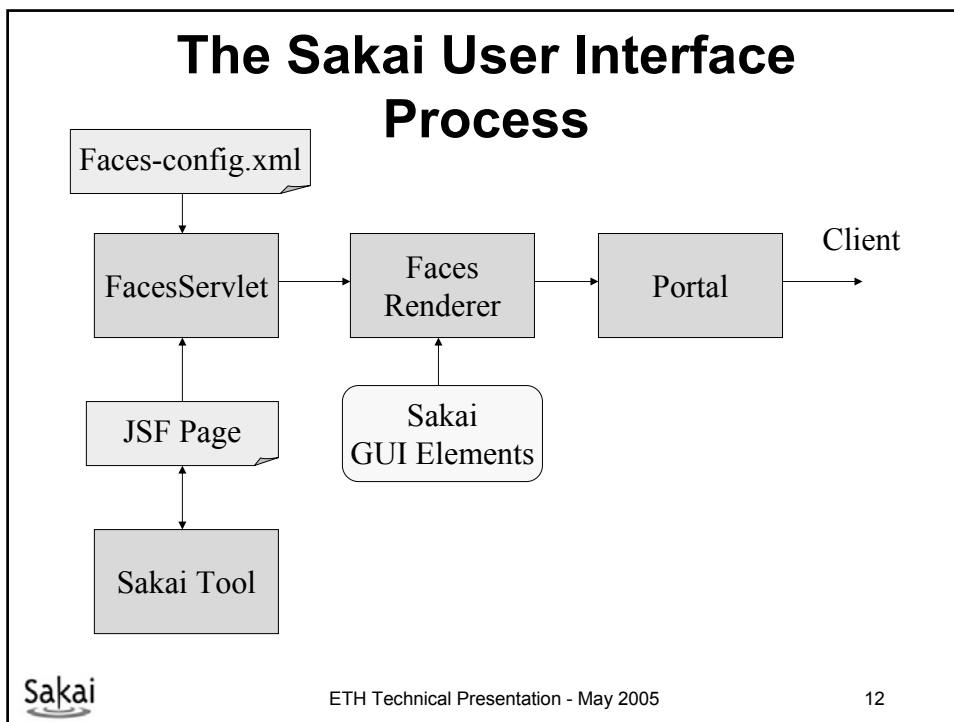
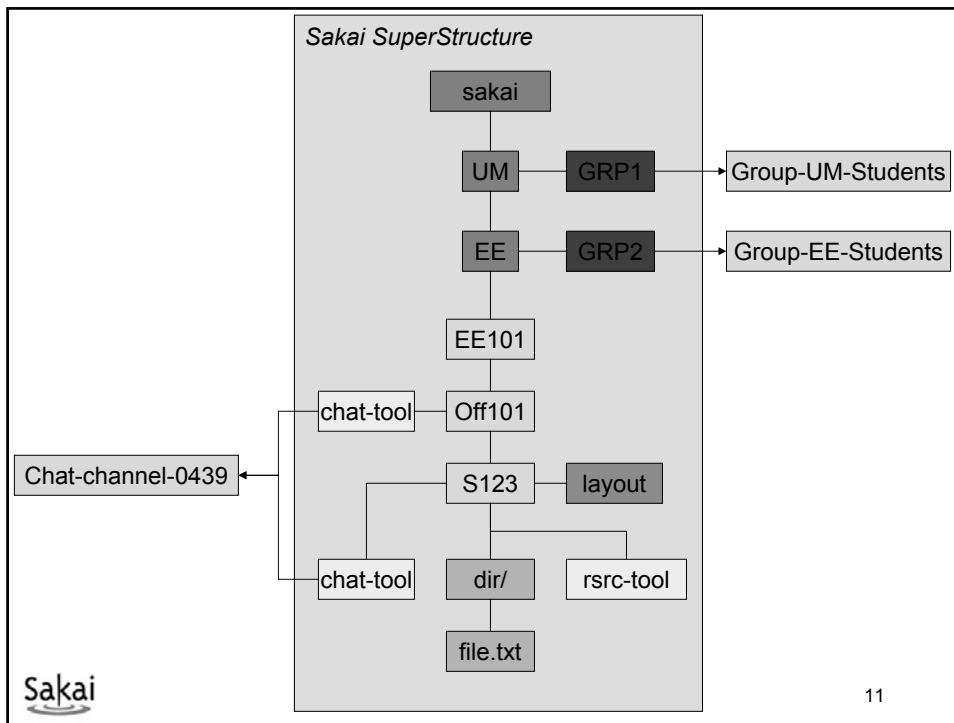
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The AuthZ Structures



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Legacy Services

- alias
- announcement
- archive
- assignment
- calendar
- chat
- content
- coursemanagement
- digest
- discussion
- dissertation
- email
- event
- id
- message
- news
- notification
- preference
- presence
- realm
- resource
- security
- site
- time
- user
- CVS
- cluster
- component
- config
- courier
- current
- email
- log
- memory
- portal
- session
- sql



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Developing Sakai Code

- Development Tools
- Kinds of Development
- Design Patterns
- Languages
- Development Details



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Development Tools

- Sakai developers use a number of tools to build services and applications:
 - Maven: a build tool based on dependencies.
 - Eclipse: an integrated development environment.
 - JUnit: a unit testing support system
 - Jira: bug tracking and management
 - Sakai: projects, design, documentation



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Kinds of Sakai Development

- Framework development – core
- Service development - specialists
- Tool development - general
- User interface design – HCI specialists
- Skins and style sheets - designers



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Design Patterns

- Layered service architecture
- Code to interfaces
- Separation of presentation from application logic
- Beans and DAOs
- ORM based on Hibernate
- Database and OS independence



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Languages

- Sakai is predominantly written in Java intended to run in Tomcat under Apache.
- It is Operating System independent.
- It supports three kinds of databases:
 - Oracle
 - MySQL
 - Hypersonic (HSQL)



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Limited Support for Other Languages

- Key Sakai services are being revealed using WSRP and WSDL.
- This enables tools to be written in languages other than Java.
- Examples include Perl, PHP, Objective C, etc.



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Development Details

- Bug Tracking
- Build Processes
- CVS
- Release Process

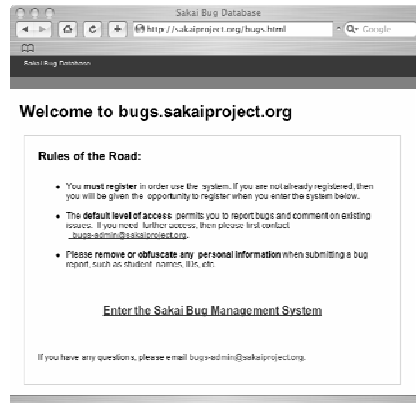


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Bug Tracking

- Full-time bug manager (Peter Knoop)
- bugs-admin@sakaiproject.org
- bugs@sakaiproject.org
- bugs.sakaiproject.org
- Open to the public to view and submit
- Will increasingly be the focus of new work assignments



CVS Process

- Server: cvs.sakaiproject.org
- CVS Structure
 - Sakai module - Should always be a “workable Sakai”
 - Samigo module
 - Gradebook module
 - Scratch module - emerging code (e.g. fw2)
 - UM / IU - etc modules - local configuration stuff
- CVS Head
 - Someone “has the pumpkin” for the “Sakai” module

CVS (cont)

- Tagging
 - Allows production at sites to stabilize while head moves forward
- Permission - wide open - within team trust
- Future
 - Re-factor the Sakai directory so as to produce a more pure framework
 - Move “optional” parts into modules
 - Move toward mechanism to assemble the “basic Sakai release” from multiple modules - probably Maven

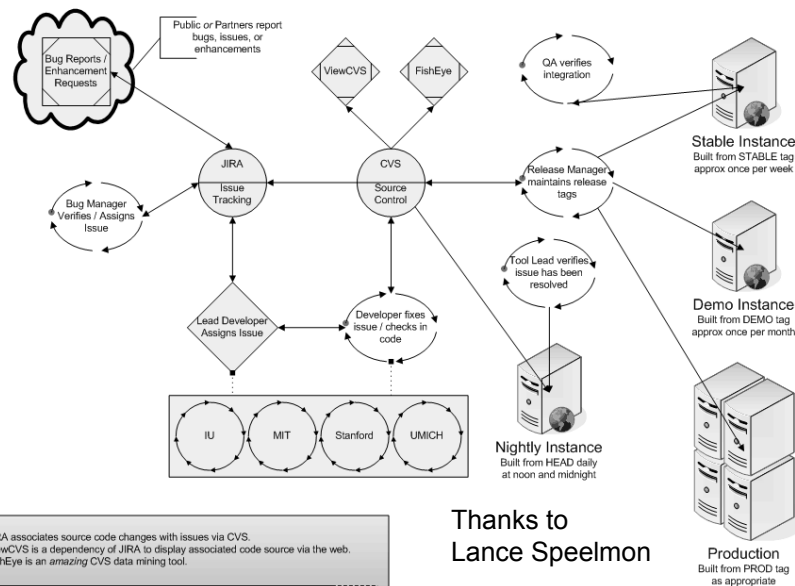


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Sakai Build Process

Wednesday, November 03, 2004



Thanks to
Lance Speelmon

Documentation

- Collab.sakaiproject.org
 - This is where most projects are organized.
- Sakaipedia
 - A collaborative documentation effort similar to Wikipedia.
- Formal documents
 - The kernel and key services are formally documented.



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Enterprise Integration

- Sakai offers several approaches to campus integration:
 - Service replacement
 - Legacy plug-ins
 - Providers – federation, remote service access.
 - Database intermediaries (a provider using published schemas)



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Service Replacement

- Service replace means creating a whole new implementation of a service based on it's published API.
- While this gives you the most amount of control, it is also the most amount of work.
- Service dependencies may require multiple implementations.



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Legacy Plugins

- The Sakai Legacy services include a plug-in architecture that enables extensions to be made.
- They are coded to the same interface as the service.
- These are being replaced by providers as we migrate older services to the new common services.



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Providers

- Providers are a way to “look someplace else” for data.
- These other place can be a service or a database.
- Sakai is working on well known database schemas to allow data to be moved in via intermediate databases.



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Integration Examples

- There are several versions of LDAP integration for Sakai. Schools have been using it for Authentication since 1.0.
- Work is underway at MIT to integrate Sakai to MIT services via the OKI OSIDs. Initial work is focused on the SuperStructure/Hierarchy service.



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Migration and Tool Portability

- Data Migration
 - Migration Tools
- Tool Portability
 - Sakai portability
 - TPP portability



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Data Migration

- Zachary Thomas of Texas State U. has developed a migration tool that currently allows content from Blackboard to be migrated into Sakai.
- This will also serve as the basis for a WebCT migration tool.



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IMS Tool Portability Project

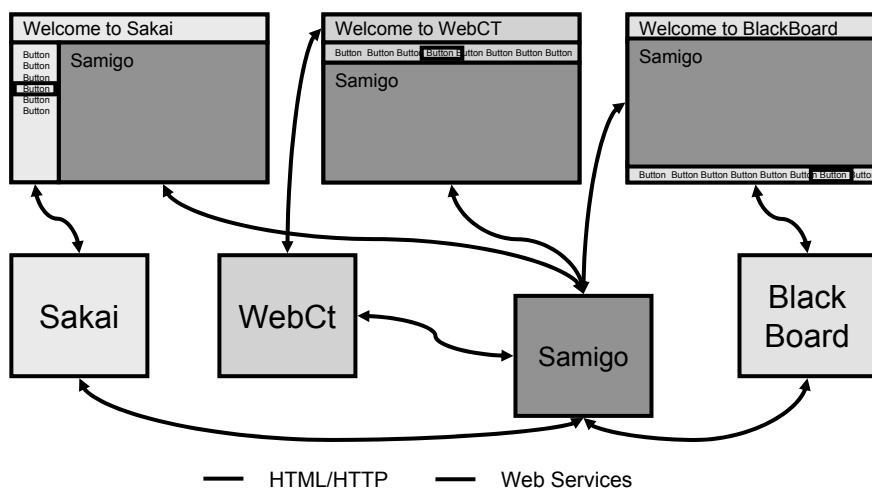
- Started as an IMS SIG for Sakai to interact with commercial LMS companies
- Approved by IMS 11/2004
- Blackboard, CETIS, MIT, Sun, Indiana, WebCT, University of Michigan ...
- Goal: By Alt-I-lab in July 2005 to have demonstrated a single application working in Blackboard, WebCT, and Sakai.



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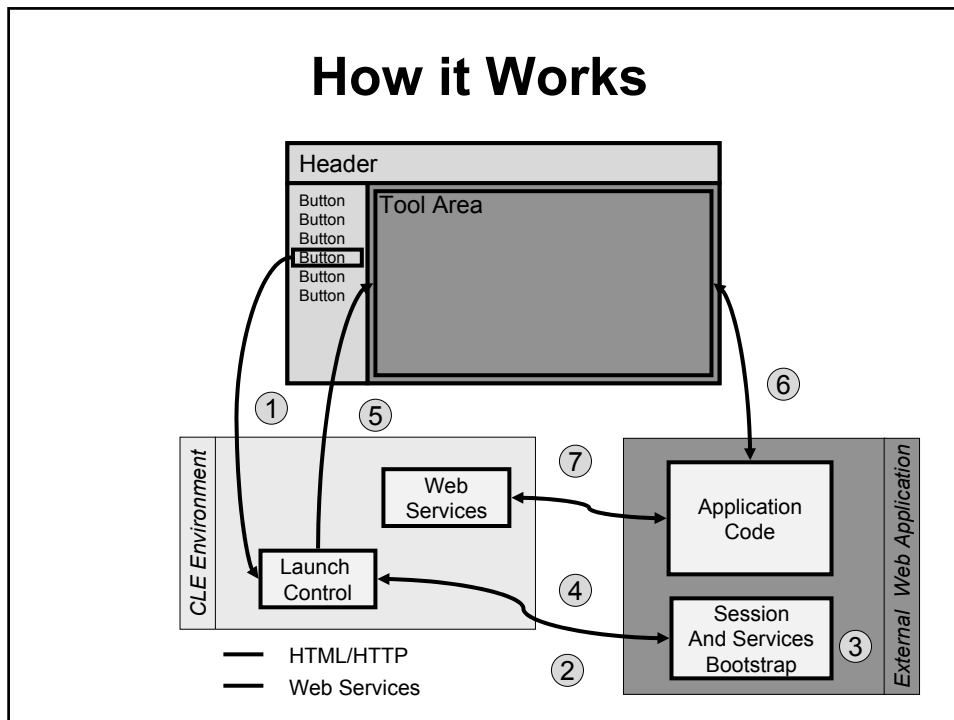
By July 2005 - Demonstrate



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How it Works



Interoperability and Standards

- Sakai provides support for both interoperability and portability.
- Standard data interchange formats are being added to Sakai services.
- Tools are portable between Sakai environments.
- Tools can be ported to TPP-enabled environments.

The SCORM Runtime Engine

- UC Davis is porting the SCORM runtime engine to Sakai.
- This will enable delivery of SCORM modules and organized content.
- Support for sequencing will be included.



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Leveraging other Open Source Projects

- Sakai uses a wide variety of other open source software:
 - Apache, Tomcat, Jakarta Commons
 - JavaServer Faces, myFaces, JSP
 - Hibernate, MySQL
 - Maven, Eclipse
 - XWiki, XML, WSRP, Velocity
 - Etc.



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Questions?



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