

The Coming Functionality Mashup

Dr. Charles Severance
University of Michigan
IMS Technical Advisory Board co-Chair

<http://www.dr-chuck.com/>
csev@umich.edu



Outline

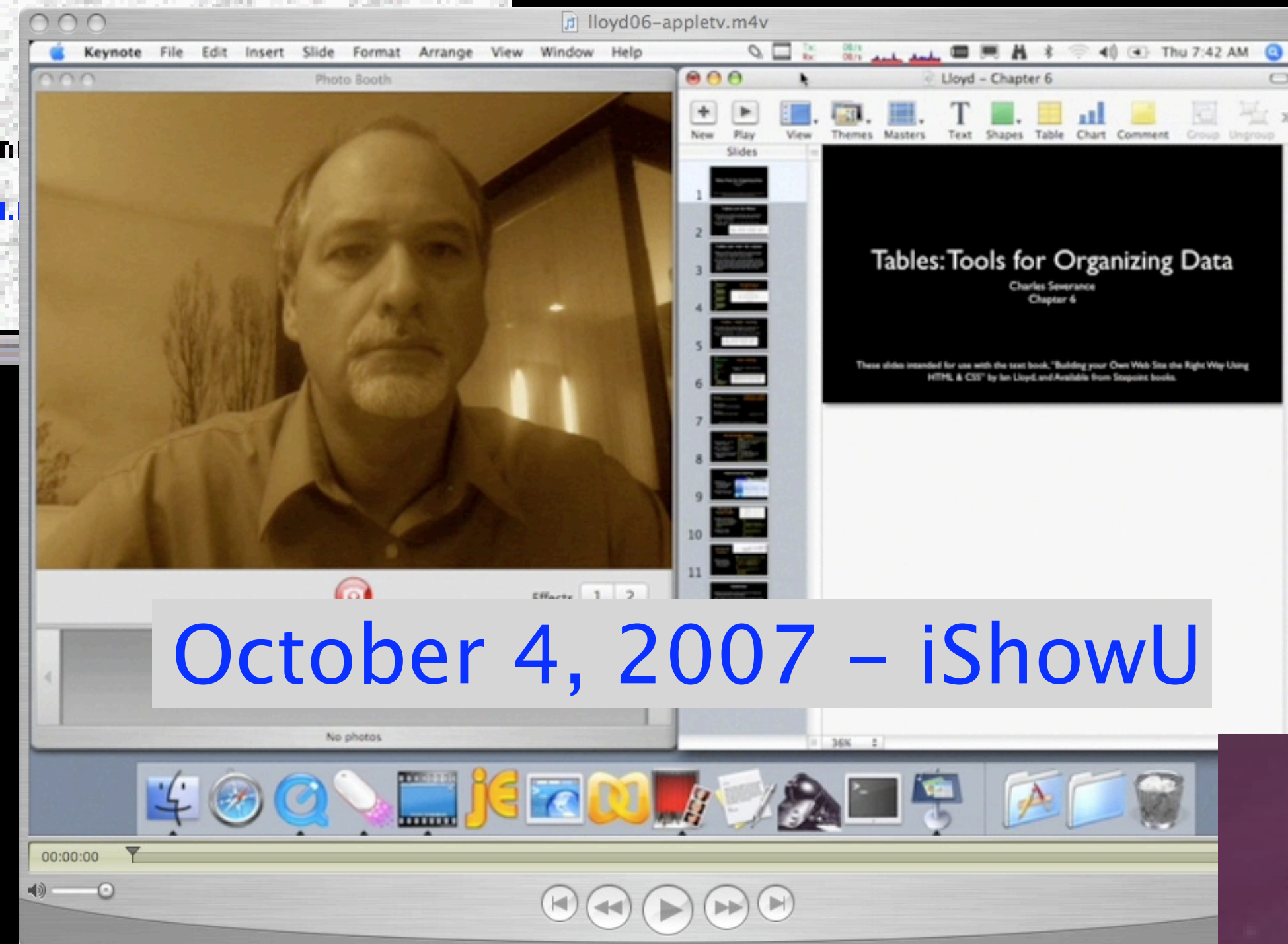
- My guest lecturer for my Ruby class got sick yesterday
- Short Sakai Update
- Content Mashup
- Functionality Mashup
- Standards and Technology for Functionality Mashup
- The Tool Interoperability Project
- Thoughts on University Campus Under Construction
- Summary



1999 - ClipBoard

A Lecture About Food

Dr. Chn
csew@umich



October 4, 2007 - iShowU

Mac OS/X
Leopard



Podcast Capture

Sakai Update (quick)

Sakai Foundation Overview

Collaboration, Teaching, and Learning

FOSS – 100% free to use, modify and contribute

Sakai is 3.5 years old

100+ people developing and testing Sakai releases

Non-profit Sakai Foundation since January 2006

100+ Higher Education and 15 company members

Six paid staff members



Michael Korcuska
Executive Director

www.sakaiproject.org
mkorcuska@sakaifoundation.org

Overview Video: <http://www.dr-chuck.com/media.php?id=64>

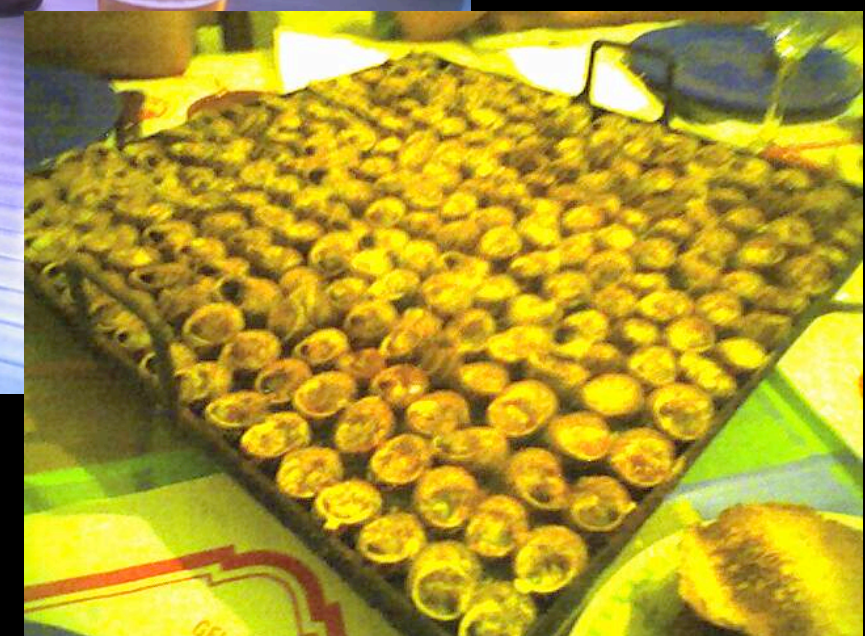
Sakai Copyright

July 20, 2006 – Met in Barcelona with Dr. Valverde and others from OUC and lafarga.cat – discussed UOC concerns about Sakai's ECL 1.0 license

October 19–20, 2006 – Intellectual Property Summit at Indianapolis IN, USA – attended by Malcolm Bain of UOC/lafarga.cat – The meeting produces ECL 2.0 based on Apache 2.0

April 2007 – ECL 2.0 approved by the Open Source Initiative (www.opensource.org)

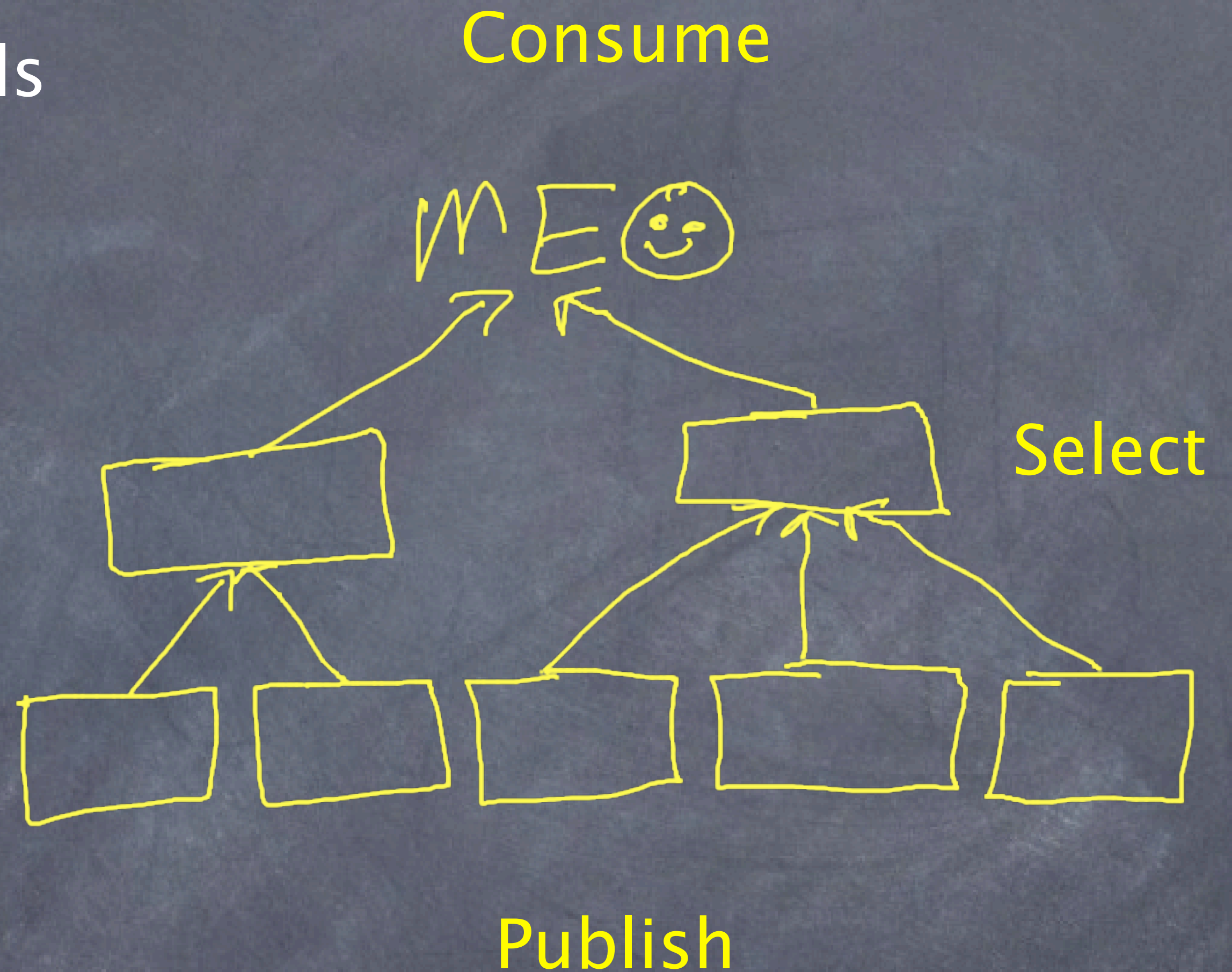
September 2007 – Sakai Foundation Board switches to ECL 2.0 for Sakai version 2.5



Content Mashup

Content Mashup

- Read only – public materials
- Publish / subscribe
- Push content
- A highly personalized “newspaper replacement”





Dr. Chuck's Web Log

MAY 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

SEARCH
Search this site:

Search

ARCHIVES
May 2007
April 2007
March 2007
February 2007
January 2007
December 2006
November 2006

May 14, 2007

Hockey Outcome

If you watch my photo blog - you already know that my team won the Hockey championship and my Thesis advisor did not win the championship.

[A picture of me with the trophy](#)

My finger was fine - it twinged a bit from time to time but it seldom really hurt. Back to the cast so it can heal for the next few months. The next key will be motorcycling - broken finger will put that on hold for 4-6 weeks - Damn!

We won the game 4-2. Rich got his team's first goal which tied the score. Our team was very balanced in scoring with Ray, John, Tom, and Scott each scoring - I got an assist on the fourth goal. I had three outstanding chances to score a goal. Each time I would miss the bench would laugh and suggest that it was my hand that screwed up - but of course I screw up often enough with a good hand - so that is not a good excuse.

RSS

RSS

RSS

planet sakai

May 23, 2007

Dutch Sakai

Sakai 2.4.0 is available

Today, May 22, the latest version of Sakai has become available. There is lots of new stuff in this release, that has been thoroughly tested by the community, as always. There is a new and significantly improved Chat tool, but also some completely new tools are now in the core release: Mailtool, Page Order Helper (in Site info), Polls and User Membership. Furthermore there is new functionality

by Wytze Koopal at May 23, 2007 12:33 AM

May 22, 2007

Matthew Buckett

Upgrading Sakai to 2.4

Ok, I've just upgraded our test sakai instance to the just released 2.4.0. Here are the notes of how I did it, this isn't a recommended pattern:

Subscriptions

- Aaron Zeckoski
- Andreas Wittke
- Anthony Whyte
- Brian Jorgensen
- David Horwitz
- Dr. Chuck
- Dr. Chuck's Videos
- Dutch Sakai
- Harriet Truscott
- Ian Boston
- Josh Holtzman
- Lance Speelman
- Mark Norton
- Matthew Buckett
- Megan May
- Sean Keesler
- Sean Mehan
- Steven Githens
- Zach Thomas

Last updated: May 23, 2007 11:00 AM
All times are UTC.

Powered by: PLANET

Content Mashup

Subscribers

- Latest News **4803**
- Flagged Items
- Favorites **1578**
 - News **2**
 - San Diego news **2**
 - Friends
 - Socioeconomic** **17**
 - Low update rate **12**
 - Watches **47**
 - Lifehacker **2**
 - Boing Boing Blog
 - Male viewpoint
 - Abject fear **276**
 - NOTCOT.ORG **24**
 - Jobs **88**
 - Rick Steves: Blog Gone Europe
 - TV feeds
 - MetaFilter **27**
 - Blackberry
 - Nerdly **506**
 - ranchero.com
 - Slashdot: Apple
 - Think Secret
 - Slashdot **72**
 - Ars Technica **20**
 - The Register **43**
 - iPhone
 - Mac OS Forge
 - TeraGrid Whiteboard **1**
 - Ian Foster

- Socioeconomic - 17 news items
 - Paging Mr. Keynes**
Calculated Risk 5/8/07 12:00 AM by Tanta
 - Supernova News**
The Street Light 5/8/07 12:00 AM by Kash
 - Time for the Credit Card?**
The Street Light 5/8/07 12:00 AM by Kash
 - DrumBeat: May 8, 2007**
The Oil Drum 5/8/07 5:57 AM by Leanan in (drumbeat
 - Is Deficit Spending Ethically Deficient?**
Economist xchg 5/8/07 8:15 AM by Economist.com | M
 - Yahoo! Should Buy Dow Jones**
The Big Picture 5/8/07 8:30 AM by ritholtz in (Media)
 - Eco Worrier Hosts Carnival of the Green**
Treehugger 5/8/07 8:50 AM in (
 - What's Al Gore Have in Common With the Ku Kl**
Freakonomics Blog 5/8/07 8:55 AM by Stephen J. Du
 - University Successfully Leading Neighborhood P**
Planetizen - Urban Planning and Development Network
 - Seattle Greendrinks: New Community-Building**
Treehugger 5/8/07 9:01 AM in (events, events, "green
 - The Contrarian's Guide to Used Car Buying**
The Truth About Cars 5/8/07 9:12 AM by Matthew Dar
 - Seattle Plans Clamp Down On Free Parking**
Planetizen - Urban Planning and Development Network
 - This Blog Apparently Not Worthless After All**
Freakonomics Blog 5/8/07 10:21 AM by Stephen J. Du
 - Air Travel Treehugger Style?**
Treehugger 5/8/07 10:24 AM in ("Travel & Nature", "A
 - The Parable of the Donkey and the Japanese eW**
Treehugger 5/8/07 10:30 AM in (electronics, eWaste, J
 - Most Huggable: Organic Tequila, 8-Speeds of E**
Treehugger 5/8/07 10:32 AM in ("best of hugg.com", "
 - Debt financed death-dealing**
Economist xchg 5/8/07 10:43 AM by Economist.com |

- News Items
- TidBITS: ...
- Dual Mo...
- Hackszin...
- Daring Fi...
- High-tes...
- 10 mista...
- Toodled...
- G2P Beta...
- The Ulti...

Sakai RSS Feed

feed://192.168.1.103:8080/portal/atom/ Google

D Sakai Collab Bugs Confluence S:8080 PDA Portal Mambo Desiderata GVideo

Sakai RSS Feed

2 Total

Gateway Today, 01:41 PM

Server Status, Sakai Administrator, Feb 19, 2007 1:41 pm [Read more...](#)

PDA in Sakai Today, 01:31 PM

This is an Announcement, Sakai Administrator, Feb 19, 2007 1:31 pm [Read more...](#)

PDA in Sakai

feed://192.168.1.103:8080/portal/atom/snork/ Google

D Sakai Collab Bugs Confluence S:8080 PDA Portal Mambo Desiderata GVideo

PDA in Sakai

7 Total

Resources Today, 02:13 PM

[Read more...](#)

Schedule Today, 02:13 PM

[Read more...](#)

Wiki Today, 02:13 PM

[Read more...](#)

NumberGuess Today, 02:13 PM

[Read more...](#)

Discussion Today, 01:33 PM

Topic, Sakai Administrator, Feb 19, 2007 1:33 pm [Read more...](#)

Chat Room Today, 01:31 PM

Yo Fellows, Sakai Administrator, Feb 19, 2007 1:31 pm [Read more...](#)

Search Articles:

Article Length:

= =

Sort By:

[Date](#)

[Title](#)

[Source](#)

[New](#)

Recent Articles:

[All](#)

[Today](#)

[Yesterday](#)

[Last Seven Days](#)

[This Month](#)

[Last Month](#)

Source:

PDA in Sakai

Actions:



[Web](#) [Images](#) [Video](#) [News](#) [Maps](#) [more »](#)

Google Search

I'm Feeling Lucky

[Advanced Search](#)
[Preferences](#)
[Language Tools](#)

[Home](#) [Games](#) [Add a tab](#)

[New! Select theme](#) | [Add stuff »](#)

BBC News | News Front Page | World Edition [Close]

- [+ Football: Fifa to probe Tevez saga](#)
- [+ Tennis: Murray pulls out of match](#)
- [+ EU agrees mobile roaming prices](#)

NYT > Home Page [Close]

- [+ Napa Valley? Bordeaux? No, but Still Wine Country](#)
- [+ Jibek Joly Journal: Central Asians Chase Jobs, and Endure Exploitation](#)
- [+ Inspectors Cite Big Gain by Iran on Nuclear Fuel](#)

Local Gas Prices [Close]

Gas Prices For 48842 :

Station/Brand	Address	Unleaded	Plus	Premium	Dies
KROGER KROGER FUEL #6884 Q	921 W HOLMES RD LANSING, MI 48910	\$2.989	N/A	N/A	
SUNOCO WASHINGTON AVE TOTAL	1600 S WASHINGTON AVE LANSING, MI 48910	\$3.109	\$3.219	N/A	

USATODAY.com News - Top Stories [Close]

- [+ Hundreds questioned over missing GIs in Iraq](#)
- [+ Details of Iraq benchmarks yet to be decided](#)
- [+ Youth gangs contribute to rising crime rates](#)

Weather [Close]

Holt, MI
 72°F
 Clear
 Wind: SW at 10 mph
 Humidity: 43%

Today	Wed	Thu
78° 45°	58° 41°	60° 38°

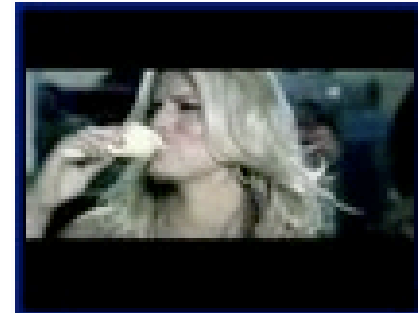
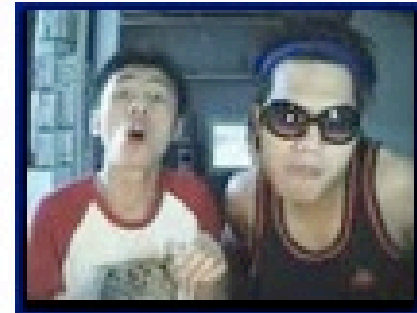
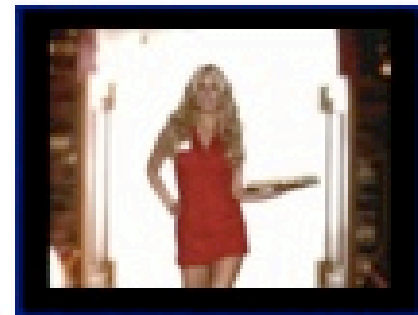
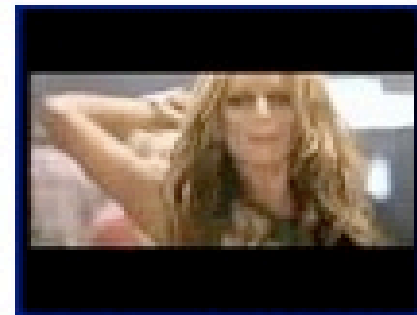
Yahoo! Finance: GOOG News [Close]

- [+ Craigslist's Ongoing Success Story \(at BusinessWeek Online\)](#)
- [+ Microsoft Wants to 'Kill' Open Source \(at BusinessWeek Online\)](#)
- [+ Understated Options Expense at Google: Either Sell it or Short It \(SeekingAlpha\)](#)

Google Videos [Close]

Search [Close]

tag this search powered by Google™

whatshot surfing comedy mtv christina jessica vwgti musicvideos whatsnew f1 mytruck googlepicks nascar ads

[edit tags](#) [upload your own video](#)

My Portfolio [Close]

Symbol	Price	Value	Earned	
GOOG	\$461.78	\$6927	\$12	[?]

Functionality Mashup

Functionality is interactive, functionality usually needs identity, functionality is live software. How do we mash this up?



Sakai Community May 2007

Map Mashup

The screenshot shows the Holiday Inn website interface. At the top, the Holiday Inn logo and tagline "Look again. You're just a click away from a great stay" are visible. Below the navigation bar, the "Reservation Desk" section is active, showing a "Select Hotel" step. The selected hotel is "Holiday Inn CHAMPAIGN/URBANA" located at 1001 KILLARNEY STREET, URBANA, IL 61801. The page includes a "Check Availability" section with date and room selection options, and a "Mapquest" map showing the hotel location in Champaign and Urbana, IL. The map includes street names like N Market St, N Neil St, and E Bradley Ave, and highway markers for I-74, I-180, and I-150. The map interface also features zoom controls and a scale bar.

iChoice
hotels

Proprietary Glue

Mapquest

MIT Simile: Timeline Mashup

Dr. Chuck's Page | [Back to map](#)

Sakai User's Meeting IMS Alt-I-Lab Meeting on usability and
Seth Theriault produces the NCESS eCollaboration Portals and portlets v
University of JA-SIG Meeting OS VLE Next Generation Universitat de
CLLAP: Open Source In TeraGrid 2006 Sakai Site Visit
JISC/CNI Meeting

JISC/CNI Meeting
York, UK ([URL](#))
Thu, 06 Jul 2006 04:00:00 GMT
Fri, 07 Jul 2006 04:00:00 GMT

Timeline © SIMILE

May 28 Jun 4 Jun 11 Jun 18 Jun 25 Jul 23

May Jun Jul Aug Sep

Depending on browser you may or may not be able to drag the timeline around Google-style. The way to navigate that works on all browsers is to double click on some area of the timeline and that will become the new center. If dragging seems not to work (Safari for example) simply double-click and be patient.

Reference: [The Very Cool MIT Simile Timeline Project](#)

Simile

dr-chuck.com



Proprietary Glue

Simile Project



Simile Timeline Mashup Code

```
<script src=  
"http://simile.mit.edu/timeline/api/timeline-api.js"  
type="text/javascript">  
</script>  
<script>  
  var tl;  
  function onLoad() {  
  
var eventSource = new Timeline.DefaultEventSource();  
var bandInfos = [  
  Timeline.createBandInfo({  
    eventSource: eventSource,  
    date: "Jun 28 2006 00:00:00 GMT",  
    width: "80%",  
    intervalUnit: Timeline.DateTime.WEEK,  
    intervalPixels: 100  
  }),  
  Timeline.createBandInfo({  
    eventSource: eventSource,  
showEventText: false,  
trackHeight: 0.5,  
trackGap: 0.2,  
date: "Jun 28 2006 00:00:00 GMT",  
width: "20%",  
intervalUnit: Timeline.DateTime.MONTH,  
intervalPixels: 200  
  })  
bandInfos[1].syncWith = 0;  
bandInfos[1].highlight = true;  
  
  tl = Timeline.create(document.getElementById("my-  
timeline"), bandInfos);  
  Timeline.loadXML("events.php", function(xml, url)  
{ eventSource.loadXML(xml, url); });  
  }  
  var resizeTimerID = null;  
  function onResize() {  
    if (resizeTimerID == null) {  
      resizeTimerID = window.setTimeout(function  
  
0 {  
      resizeTimerID = null;  
      tl.layout();  
    }, 500);  
  }  
}  
</script>
```

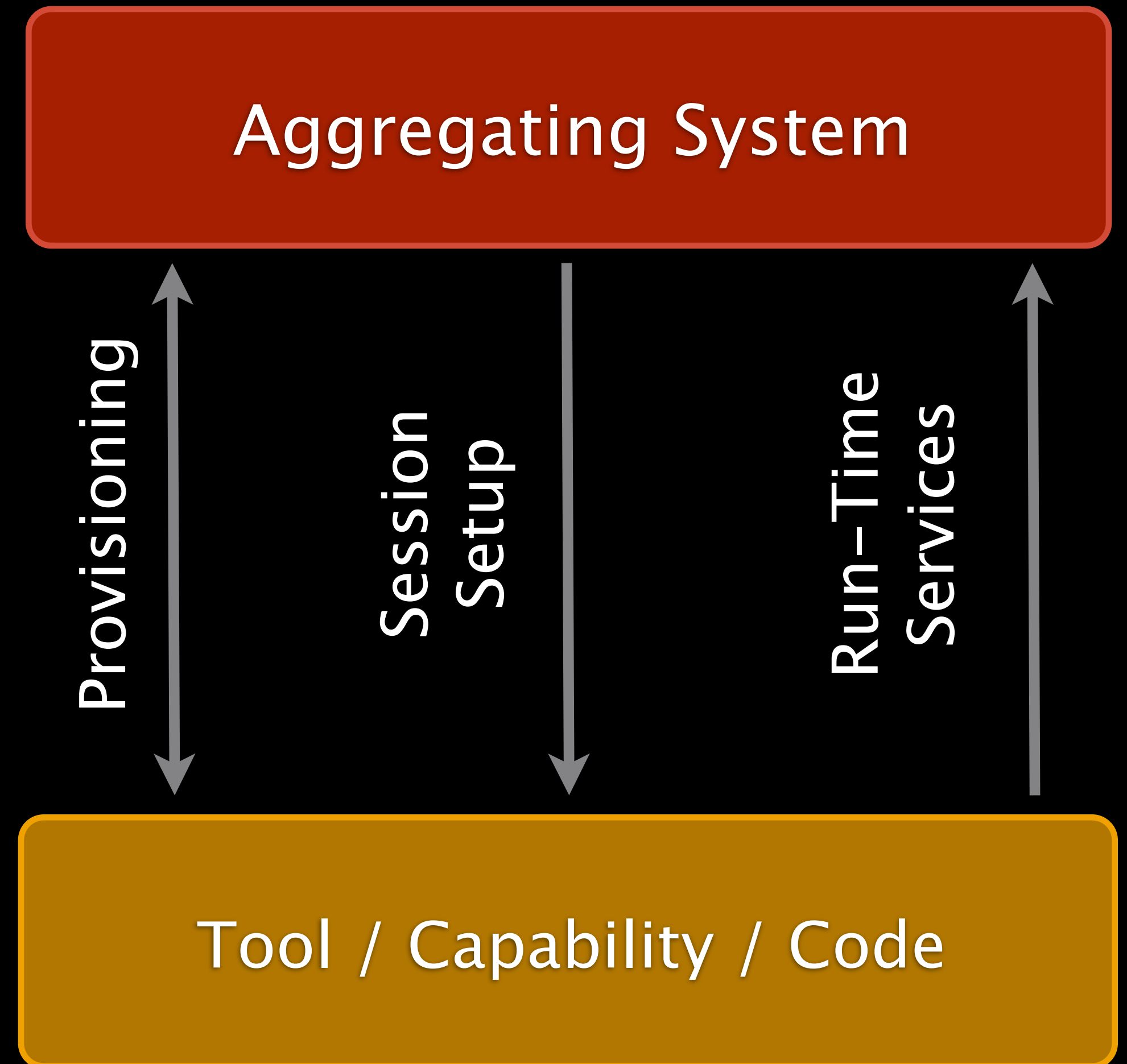
MashUp: Google Analytics

```
<script src="http://www.google-analytics.com/urchin.js"
  type="text/javascript">
</script>
<script type="text/javascript">
_uacct = "UA-423997-1";
urchinTracker();
</script>
```



Beyond Anonymous Functionality Mashup

- Think “portal”, “Eclipse”, even “Windows”
- There are no rich standards in this area so everyone invents their own
- Sakai is an example of a one off functionality mashup with identity and authorization used to select and assemble tools together flexibly to produce an application





Web Images Video News Maps more »

Charles Severance

Search

Advanced Scholar Search
Scholar Preferences
Scholar Help

Scholar All articles Recent articles Results 1 - 10 of about 8,980 for Charles Severance. (0.10 seconds)

All Results

C Severance

K Dowd

M Loukides

L Pearlman

M Halloran

[BOOK] High Performance Computing - group of 2 »
K Dowd, C Severance, M Loukides - 1998 - O'Reilly & Associates, Inc. Sebastopol, CA, USA
Cited by 167 - Related Articles - Web Search - Import into Sakai - Library Search

Distributed Hybrid Earthquake Engineering Experiments: Experiences with a Grid Shaking Grid ... - group of 27 »

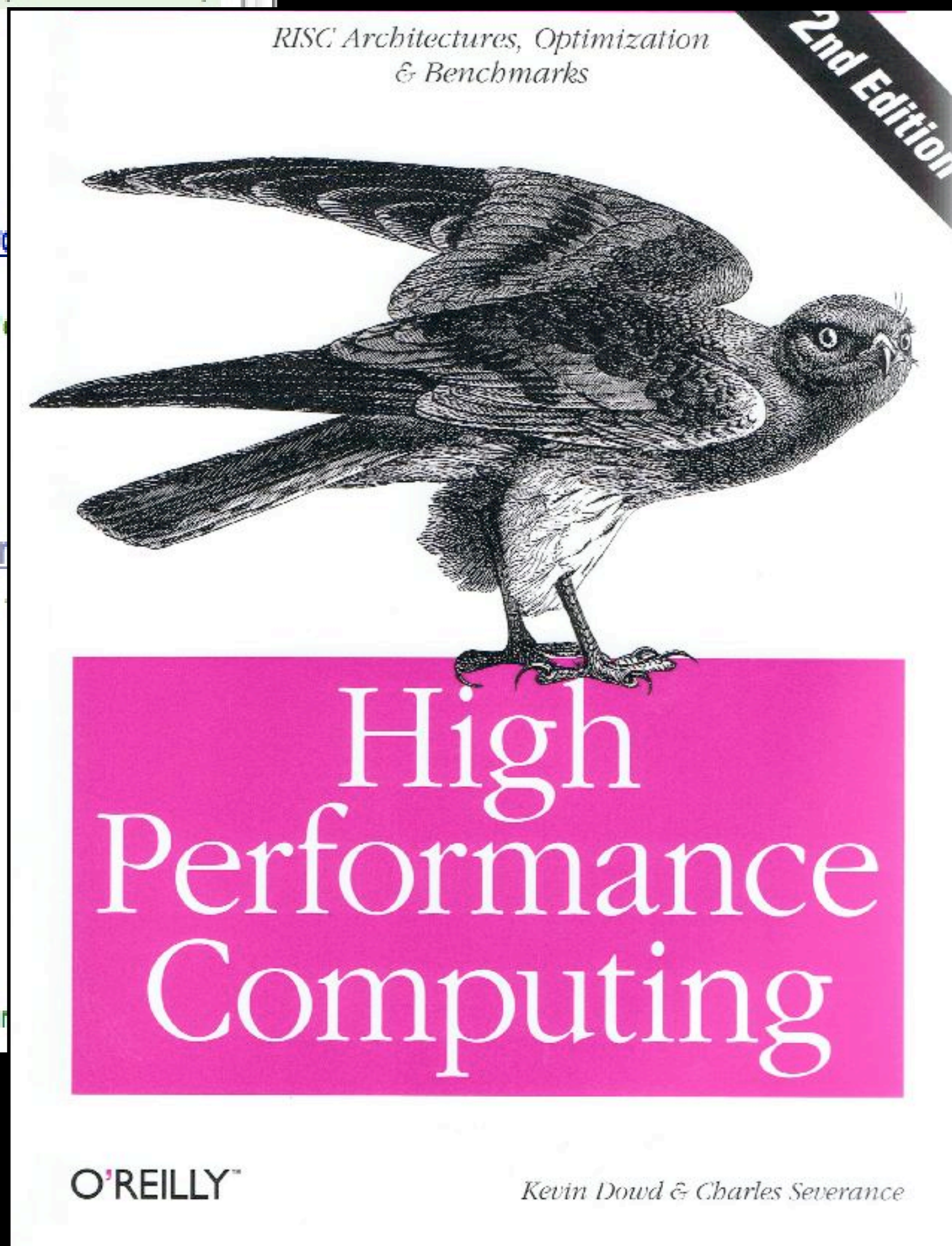
... , K Ricker, I Foster, P Hubbard, C Severance - 13th IEEE International Symposium on High Performance Computing, 2004 - doi.ieeecomputersociety.org
1 USC Information Sciences Institute, University of Southern California, Los Angeles, CA 2 Department of Civil and Environmental Engineering, UIUC, ...
Cited by 26 - Related Articles - Web Search - Import into Sakai

Distributed linear hashing and parallel projection in main memory databases - group of 2 »
C Severance, S Pramanik, P Wolberg - Proceedings of the sixteenth international conference on Database Systems for Applications, 2005 - acm.org

ABSTRACT This paper extends the concepts of the distributed linear hashed main memory file system with the objective of supporting higher level parallel ...
Cited by 21 - Related Articles - View as HTML - Web Search - Import into Sakai

[CITATION] Grid portals: A scientist's access point for grid services (draft 1)
... B Plale, G von Laszewski, C Severance, J Hardin, J ... - Global Grid Forum, 2003
Cited by 10 - Related Articles - Web Search - Import into Sakai

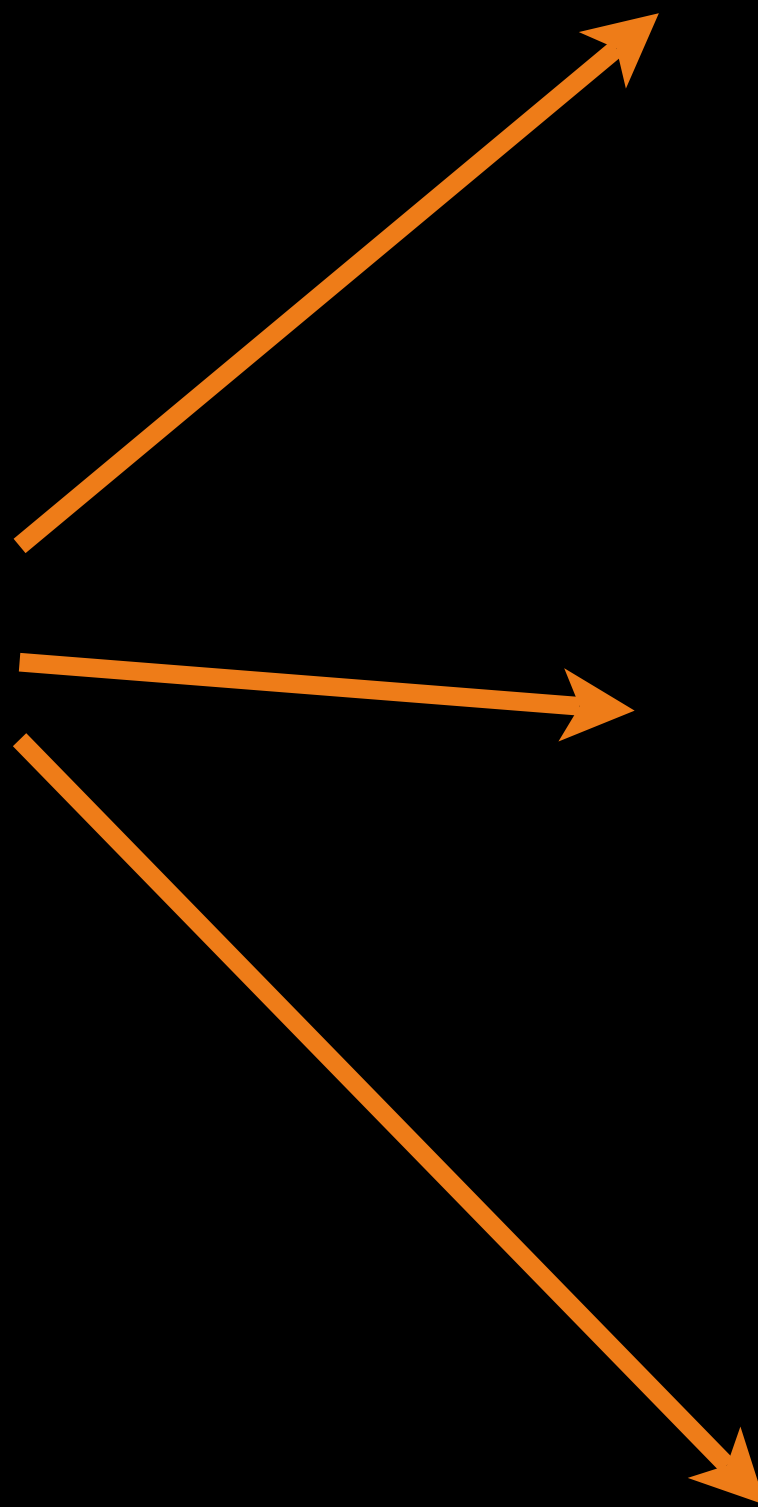
p p. 10-12, 16 Storage Technology Takes Center Stage - group of 3 »
... , PM Marden, EV Munson, C Severance, DJ Reifer, B ... - Computer, 1999 - csdl.computer.org/standards/Free-Requires-Subscription-Buy-pp-126-127-IEEE



Approaching Functionality Mashup Standards and Technologies

Standards are critical to making functionality mashup something we can commonly use to assemble applications.





?

Functionality
Mashup

What is the standards
equivalent of "RSS" for
functionality mashup?

Background in Standards

- Open Software Foundation (OSF) (1989–90)
- UNIX International (1990)
- IEEE POSIX
 - IEEE P1003.0 / ISO BS ISO/IEC TR 14252 (1990–1997) – Guide to an Open System Environment Reference Model
 - Vice Chair POSIX (1992–1996)
- IEEE Standards Advisory Board
- IEEE Computer Magazine – Column Editor 1994–1998
- IEEE LTSC – (2001 – 2002)
- IMS
 - Technical Board coChair 2005–2007
 - IMS Tool Interoperability WG – 2005 – 2007
 - IMS Common Cartridge WG – 2006
- JSR–286 (Portlet V2.0) (2006–2007)



Conflict and Consensus: The Role of Standards

Charles Severance, Michigan State University

Sometime in the future we will all look back at January 1998 and laugh about the current conflicts in the technology industry. A hindsight perspective inevitably generates a few chuckles, but it also allows us to recognize that conflict is essential to innovation. Conflict energizes the entire process. If there were no conflict (over market shares, protocols, pricing structures, formats, programming languages, platforms, or standards) innovation would almost certainly stagnate.

While conflict ensures that technology will continue to change and grow stronger, it also ensures a certain forced honesty. As one organization "invades" the turf of another—especially when it comes to standards activities—we get to see the cards held in the hands of the players. It usually takes a few years, however, before we're able to smile at all the poker faces.

THE PAST

While we certainly need to practice laughing about these conflicts, we must

Editor: Charles Severance, Michigan State University, Department of Computer Science, 1338 Engineering Bldg., East Lansing, MI 48824; voice (517) 353-2268; fax (517) 355-7516; crs@egr.msu.edu; http://www.egr.msu.edu/~crs



As one organization "invades" the turf of another, we get to see the cards held in the hands of the players.

try to remember how serious these conflicts seemed during their time. One of the most serious technology wars began with IBM mainframes reigning supreme over all challengers. In the mid-to-late 80s, Unix systems powered by fast RISC processors began to invade the IBM glass houses. Innovative risk-taking organizations tentatively deployed Unix.

Like all great conflicts, there were a great many fans cheering or booing as each skirmish was played out. And within the Unix field itself there were many battles. Versions of AT&T Unix and BSD Unix waged war for shares of the marketplace. Instead of continuing the battles head to head—a course of action that could have crippled all par-

ties involved—the vendors eventually decided to work together, forming the Open Software Foundation (OSF). While nearly all of the Unix vendors joined OSF, not everyone wanted to join. Those abstaining from OSF formed Unix International.

Instead of reducing the intensity of the battles, however, formalizing the conflicts served to increase it. Instead of small wars between individual companies, there were now two Unix superpowers. The fight for the control of the operating system of the future was on. The major battle of the Unix wars—I call it Unix War I—was the Motif versus Open Look conflict, a multiyear conflict about the shape of some buttons and whether or not the outlines of windows should have a 3D look.

Don't laugh. This was really serious business and kept many software developers on the sidelines for several years, waiting for one or the other of the technologies to win.

At the time, the two combatants were so engrossed in launching press releases at each other that they failed to notice that Microsoft was developing a graphical interface and application suite that ran on the lowly Intel processors. Instead of focusing on the deployment of a low-cost PC-based desktop with good applications, the Unix vendors waged war over the \$40,000 workstation market that was about to become much less significant. By the time they stopped fighting and began to work together, the battle for the desktop operating system was over without a single shot being fired.

Interestingly, though, by the end of the warfare both sides adopted the best features from each other. Standards organizations like IEEE Posix and X/Open continuously produced standards that broadened the "least common denominator" between different Unix versions.

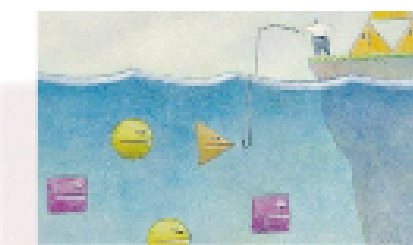
Because of cross-pollination—due to competition and intense standards development—Unix emerged as the most completely specified multivendor computing environment ever produced. The Unix-based standards have had some impact on all remaining viable operating systems, including MVS, VMS, Unix, and NT.

IEEE 754: An Interview with William Kahan

If you were a programmer using floating-point computations in the 1960s and 1970s, you had to cope with a wide variety of configurations, with each computer supporting a different range and accuracy for floating-point numbers. While most of these differences were merely annoying, some were very serious. One computer, for example, might have values that behaved as non-zero for additions but behaved as zero for division. Sometimes a programmer had to multiply all values by 1.0 or execute a statement such as $X = (X + X) - X$ to make a program work reliably. These factors made it extremely difficult to write portable and reliable numerical computations.

In 1976, Intel began to plan for a floating-point coprocessor for the Intel 8086/8 and i432 microprocessors. John Palmer convinced Intel that they needed to develop a thorough standard to specify the arithmetic operations for their coprocessor so that all Intel processors would produce the same results. Because William Kahan had extensive experience with the IBM, Cray, and Control Data Corp. (CDC) floating point, he was one of the few who understood the challenges of writing accurate numerical code. In 1976, Kahan's influence on floating-point processing escalated when Intel

Editor: Charles Severance, Michigan State University, Department of Computer Science, 1338 Engineering Bldg., East Lansing, MI 48824; voice (517) 353-2268; fax (517) 355-7516; crs@egr.msu.edu; http://www.egr.msu.edu/~crs



I think that it is nice to have at least one example—and the floating-point standard is one—where sleaze did not triumph.

hired him as a consultant to help design the arithmetic for the 8087 processor.

As a result, he had a hand in the birth of the IEEE 754 specification for floating-point computations.

—Charles Severance

THE BEGINNING

Charles Severance: When Intel hired you as a consultant in 1976, what did they want you to do?

William Kahan: The folks at Intel decided that they wanted really good arithmetic. The DEC VAX was really not that bad, so my reasoning went: Why not copy the VAX? Intel wanted the best arithmetic, so Palmer and I got together to think about what the best arithmetic should be. One of the things Palmer told me was that Intel anticipated selling these coprocessors in very large numbers. The best arithmetic was what was best for a large market, which subsequently started to frighten Silicon Valley because of

rumors that Intel was building floating point on a single chip, the i8087. And when they heard rumors of what was going to be on that chip, they were aghast.

CS: Out of this thinking grew IEEE 754?

WK: People have said from time to time (as a joke) that the other Silicon Valley companies got worried and joined the IEEE 754 working group. I realized at this first meeting that the members of the committee were very serious. CDC didn't bother to attend that meeting in November 1977 because it was a microprocessor committee—they had no idea that microprocessors would mean anything at all. Cray felt the same way. IBM was only there in an observer capacity—they knew microprocessors were coming but they couldn't say much.

CS: What were the meetings like?

WK: One of my friends said that attending one of these meetings was like a visit to the Grand Canyon: just awesome. In the usual standards meeting everybody wants to grandfather in his own product. I think that it is nice to have at least one example—and the floating-point standard is one—where sleaze did not triumph. Cray, CDC, and IBM could have weighed in, if they wanted to, and destroyed the whole thing. But CDC and Cray must have thought, "Microprocessors. Why worry?"

CS: What happened next?

WK: After the first meeting, I went back to Intel and asked to participate in the standards effort. Then Jerome Kuanan, Harold Stone, and I prepared a draft document of the Intel specification in the format of an IEEE standard and brought it back to an IEEE 754 meeting.

CS: Were there any complications?

WK: I got Palmer's verbal permission to disclose the specifications for the non-transcendental functions on the chip, but not the specifications for the architecture. I could describe the precision, exponent ranges, special values, and storage formats. I could also disclose some of the reasoning behind the decisions. We didn't say a word about the i8087's transcendental functions—I had to bite my tongue. [Commonly used transcendental functions include sine, cosine, loga-

Grab the Chance to Work on the Leading Edge

Charles Severance, Michigan State University

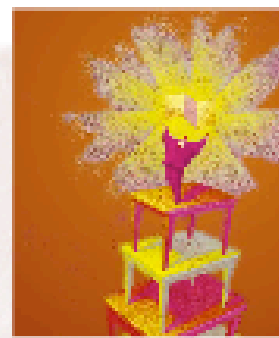
Each year I make a point to impress on my students the importance of standards to their career. I really want to cultivate in these young engineers a strong desire to participate in standards, because I myself have benefited so much from the experience.

Through my standards work, I have had a chance to travel and meet some of the sharpest engineers in the world. So I tell my students that by far the most important reason for an engineer to participate in standards is personal growth. The opportunities for networking and learning are endless.

The classic reason to attend standards meetings is to represent your organization when its technology is directly involved. But standards-setting is not simply about winning battles; it is about building consensus. To thrive in this environment, an engineer must be able to argue for a position on the basis of technical merit alone.

Even if your organization is not involved in the standards at hand, attending and participating in standards meetings is an excellent way to track emerging technologies. When I attended Posix meetings, I would spend a great deal of time outside the meetings talking about technology and future trends.

Editor: Charles Severance, Michigan State University, Department of Computer Science, 1338 Engineering Bldg., East Lansing, MI 48824; voice (517) 353-2268; fax (517) 355-7516; crs@egr.msu.edu; http://www.egr.msu.edu/~crs



The possibilities for career growth through involvement in standards are endless.

With the information I learned at each meeting, I was able to come back to my job with new perspectives on the technical problems I was facing. At times, my staff thought I had a crystal ball on the future, though I always told them I was just a lucky guesser.

Another benefit of participation in standards is achieving a more global perspective. Engineers from all over the world participate in standards-setting. Joining others in the work of forging an international consensus is an excellent way to develop a global awareness. And there may even be a chance to travel internationally.

To be frank, the cost of standards attendance is significant. Michigan State University spent about \$8,000 a year so that I could attend Posix. But the value to my career at MSU has been immeasurable. Without ever having to change jobs, I've been able to maintain career growth.

TO FIND OUT MORE

To find out more about how to get involved, start at the IEEE Web site, <http://www.standards.ieee.org>. Or explore the American National Standards Institute (<http://www.ansi.org>), the Internet Engineering Task Force (<http://www.ietf.org>), and the International Standards Organization (<http://www.iso.org>) sites.

Note that Web pages devoted to a working group are designed for use by the working group, not necessarily for the casual surfer. Poke around for the meeting announcements. If you have a question, don't hesitate to send an e-mail to the chair. Chairs are always glad to have new people attending the meetings. Some larger groups—IEEE 802 and IETF, for example—even offer orientation sessions.

TIPS FOR SUCCESS

Standards meetings are not like conferences. Unless you get involved, you won't learn and you won't meet or interact with anyone. Unless you have some role and some work to do, the meetings will become extremely boring. Here are a few tips to build your interest.

First, volunteer to take notes or minutes. The secretary role is my favorite. You don't have to fully understand what's going on, and taking minutes forces you to learn at least some of the material.

Volunteer to review material, such as draft documents. Even if you are starting out, your input is valuable to these groups. These draft documents are supposed to be written so that an engineer in the field can understand them. If you can't understand them, there is a good chance the material is not written well.

Finally, acquire some understanding in the topic area before you go to the meeting. Don't expect to be offered a tutorial. Conversations at standards meetings are narrowly defined and very deep.

Standards groups often find themselves working close to the edge of known technology. To arrive there, you need to have a strong focus. If the first group you attend is not working on something that interests you, move on.

But if you are willing to get involved, the networking, learning, and mentoring opportunities are endless. And the travel is not bad either. ♦

OSI Retrospect and Prospect

Jerry Foley, Epcom Corporation
Charles Severance, Michigan State University

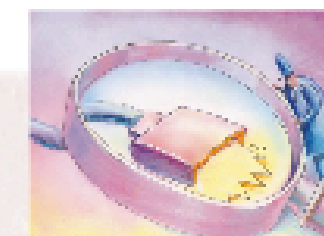
At a recent IEEE meeting, I struck up a conversation about OSI networking with Jerry Foley. As we talked, it occurred to me that enough time may have passed to talk openly about the myths and reality regarding the ISO OSI networking efforts and how they relate to TCP/IP networking as the two technologies evolved over the late 1970s and 1980s. In late 1976, working within the ANSI Information Systems Infrastructure, Foley was authorized to write a study on "standards for distributed information systems." From this study ANSI's Open Systems Interconnect standards committee evolved, and for the next 16 years Foley served on the committee, about 12 of them as chair. Foley was a US delegate to ISO OSI committees and he represented the US State Department to the CCITT work on ISO. He also served as liaison to the Manufacturing Automation Task Force, which implemented OSI, and managed MAP implementations in General Motors plants.

—Charles Severance

How much effort went into developing OSI?

The US OSI committee involved more than 140 people. We met at least six times a year, one to two weeks at a time,

Editor: Charles Severance, Michigan State University, Department of Computer Science, 1338 Engineering Bldg., East Lansing, MI 48824; crs@egr.msu.edu; http://www.egr.msu.edu/~crs



Enough time passed to talk openly about the myths and reality regarding the ISO OSI networking efforts and how they relate to TCP/IP.

and we continued the work in our home offices and labs. The first ISO OSI meeting brought about 40 people to Washington, D.C.; we all fit in one room. Later, meetings were held concurrently in Vienna, Paris, and London to accommodate all the delegates. Representatives of 17 countries eventually made up ISO OSI. Delegates came from industry, government agencies, universities, and consultants under contract to governments. One or more ISO OSI technical groups would be meeting somewhere in the world on more than 40 out of the 52 weeks of the year, frequently with overlapping meetings.

Were OSI committee members aware of ARPANet, SNA, DECNet, and others?

Yes, many US OSI people were also developers of these systems, users, or had continuing liaisons with the respective organizations. They ensured the OSI groups' awareness of these other network technologies.

How did the OSI folks view TCP/IP at the beginning?

We saw a fundamental difference in scope. To us, OSI was an international system of standards to provide complete support for cooperating, interconnected computer systems. TCP/IP was viewed as a data-communications networking system. OSI was predicated on attaining error-free performance using an international mix of underlying transmission services—including some of very low quality. TCP/IP was perceived to be based on the higher quality US transmission capabilities. Most important, TCP/IP was viewed as a US Defense Department system that would therefore not be acceptable in international work.

Why did OSI gain such strong support?

The then-new information systems networking technology was being developed as proprietary systems and so was not interoperable. Coincidentally, there was a demand for standards to facilitate cooperating processes independent of platforms. Large users and computer manufacturers supported the demand with resources. Initially, it was the US, the UK, and European countries that supplied enough highly qualified technical people to give OSI momentum. Participation then snowballed because no company or country that wanted a major role in information processing could stay away.

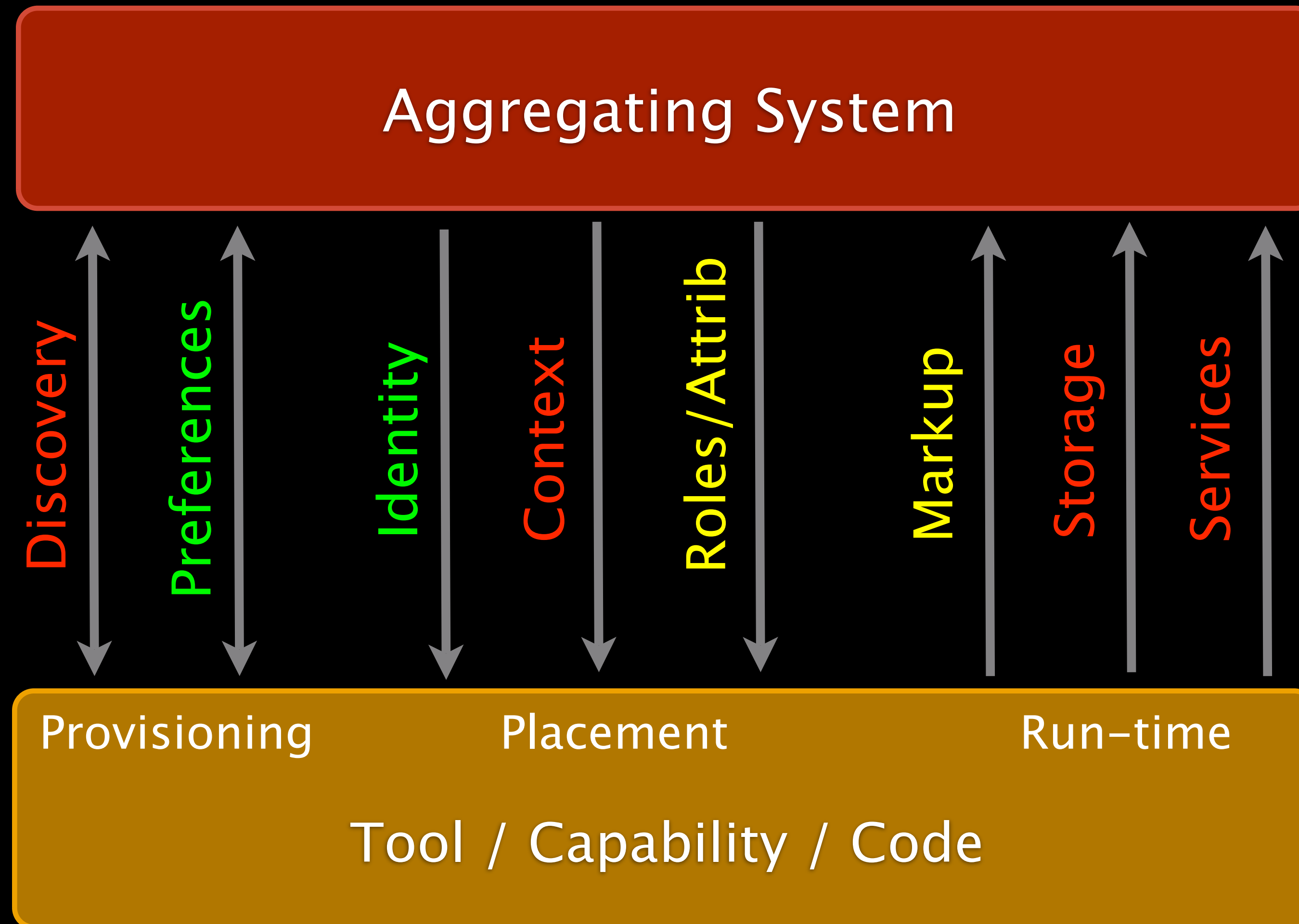
What were the barriers to acceptance?

OSI penetrated too deeply in too many vendors' proprietary interests. This kept the vendors from giving their full support to OSI in the area of delivering OSI to customers on their systems.

While many people think that OSI was too late, this is overemphasized as a barrier. In 1984, full OSI implementations were networked in a demonstration by the multivendor MAP consortium. At that time, the Internet had not yet become the de facto worldwide network.

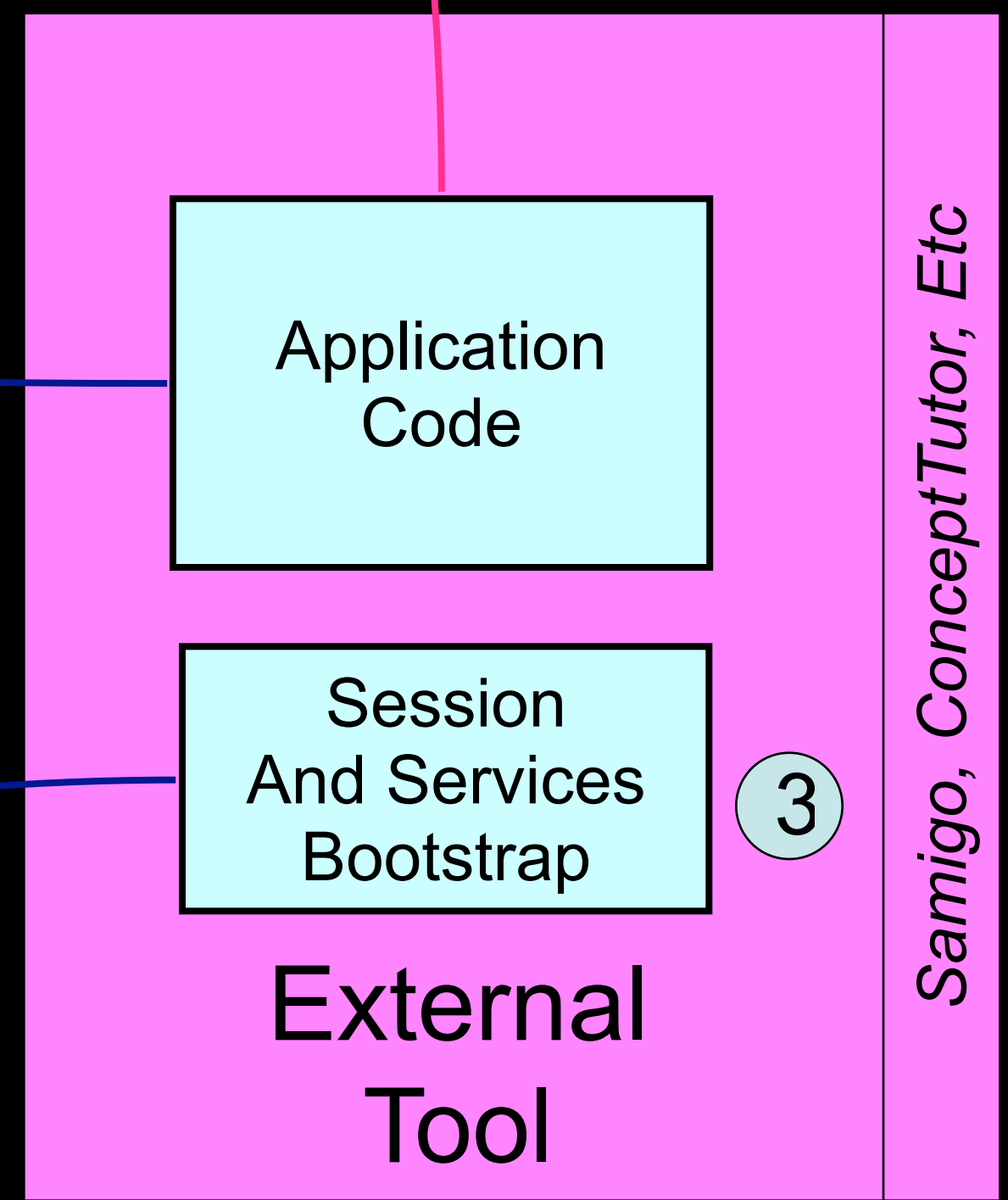
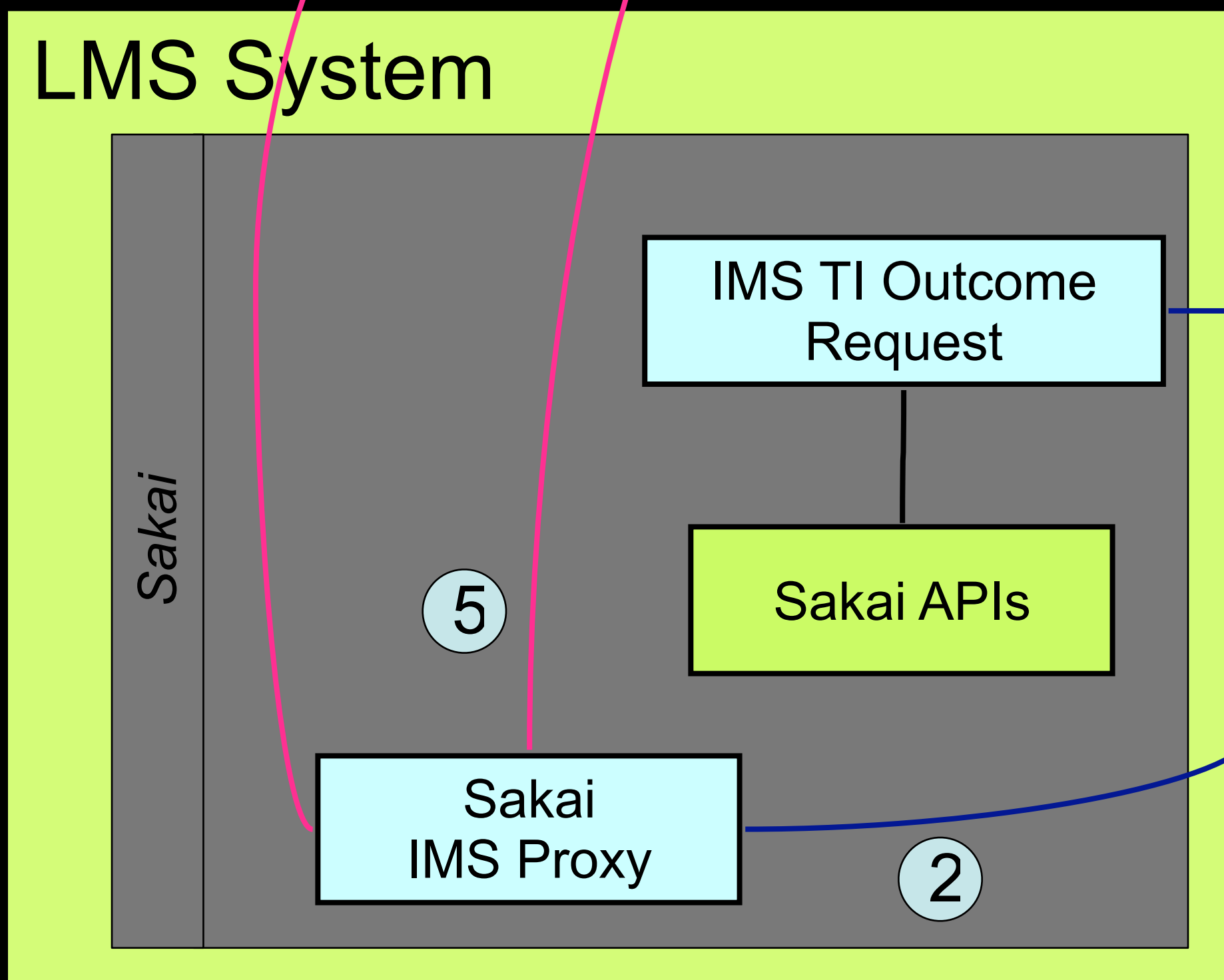
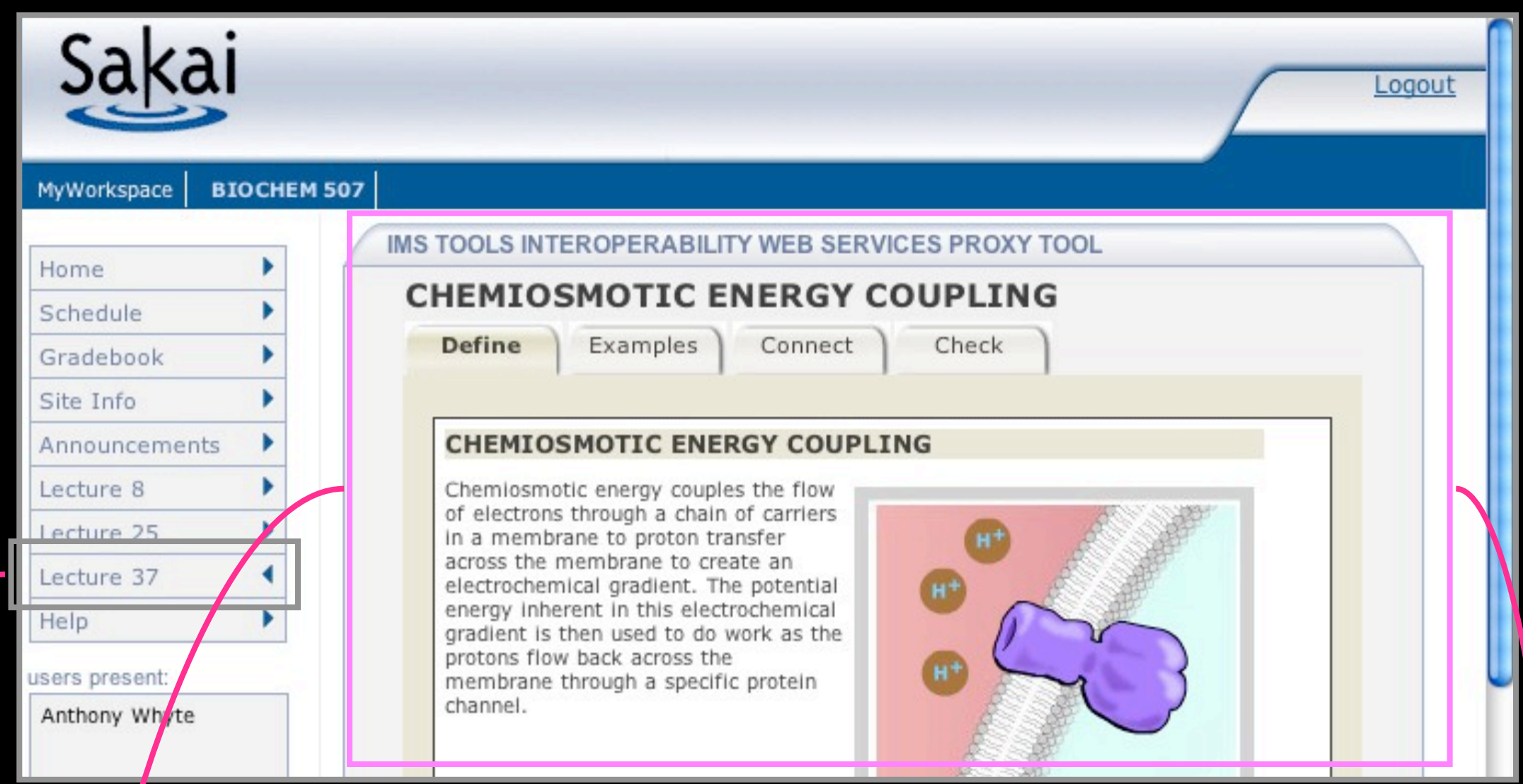
However, this does not mean that the ANSI and ISO administrative structures were particularly quick, either. These groups were organized to produce blue-ribbon standards. Their operating procedures required multiple approval cycles, and most committee communications and balloting had to be done by reg-

Functionality Mashup Technical Needs



How IMS Tool Interoperability 1.0 Works

Sakai
Blackboard
WebCT
Angel



Outcome

Launch

Pluto Portal

http://localhost:8090/pluto/portal//IMS%20Tool%20Interoperability/...pm0x3in

Sakai Collab Source Bugs Confluence Pluto S:8080 PDA uP3 Desiderata GVideo IMSTI DNS Devbox Gmail Band

APACHE PLUTO

Logout

Navigation:

IMS Tool Interoperability (JSR-168)

Add Merge Fields Permissions

Calendar by Week

View Calendar by Week

Apr 15, 2007

< Previous Week

Printable Version

Earlier

	Sun 15	Mon 16	Tue 17	Wed 18	Thu 19	Fri 20
8 AM						
9 AM						
10 AM						
11 AM						
12 PM						
1 PM						
2 PM						

http://localhost:8080/portal/pda/b3ab...69-ed4a-4fbf-00be-b2caeb596370/target

http://localhost:8080/portal/pda/b3abd26c-23cl

Sakai Collab Source Bugs Confluence Pluto up3 S:8080 PDA uP3 Desiderata

Sites > IMS TI Testing > IMSTI (?)

Log Out

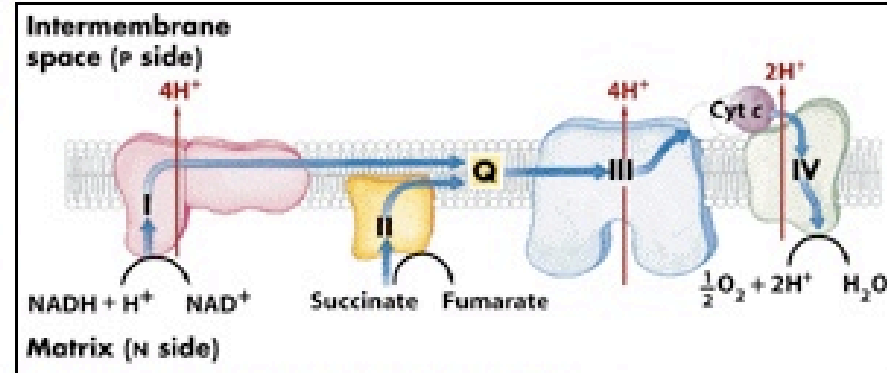
Tool List

OXIDATIVE PHOSPHORYLATION

Define Examples Connect Check

OXIDATIVE PHOSPHORYLATION

The enzymatic phosphorylation of ADP to ATP coupled to electron transfer from a substrate to molecular oxygen. Oxidative phosphorylation has the following attributes:



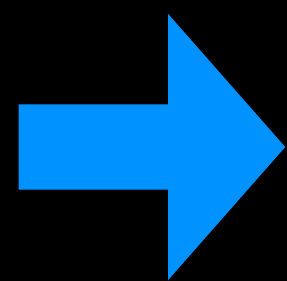
mitochondrial oxidative phosphorylation

- occurs in the mitochondrion (and some other compartments)
- electrons are passed down the electron-transfer chain
- redox reactions of the electron-transfer chain move protons to the intermembrane space
- phosphorylation of ADP is coupled to re-entry of protons into the matrix through the enzyme ATP synthase

Close Window



Sakai can consume IMS TI tools *and* produce / export its tools over IMS Tool Interoperability.



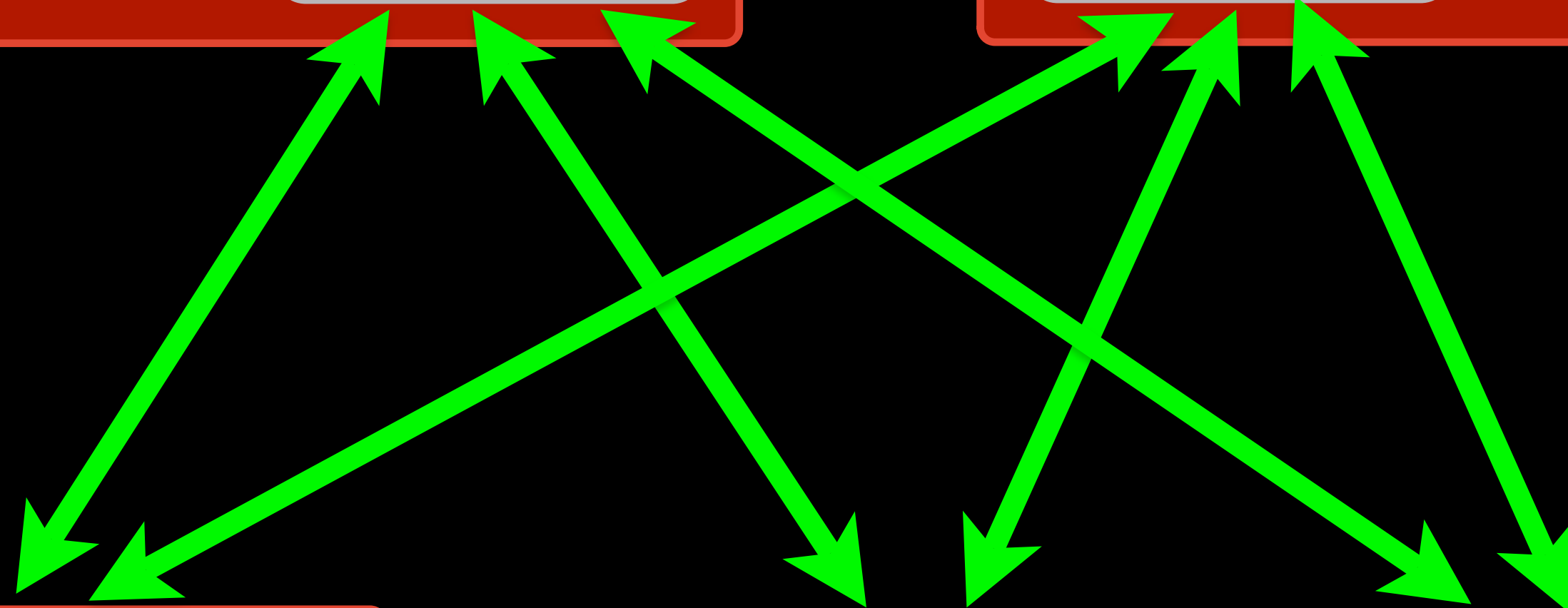
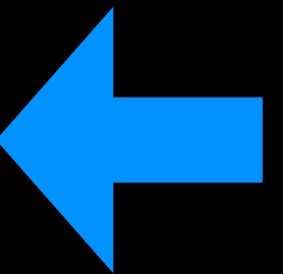
 Sakai Tools

 Concept Tutor

 PHP

 Proxy Portlet (JSR-168)

 Proxy Portlet (JSR-168)



A Sakai calendar can be shown in a portal using this approach.



Pluto Portal

http://localhost:8090/pluto/portal//IMS%20Tool%20Interoperability/_pm0x3in

Sakai Collab Source Bugs Confluence Pluto S:8080 PDA uP3 Desiderata GVideo IMSTI DNS Devbox Gmail Band

APACHE PLUTO

Logout

Navigation:

IMS Tool Interoperability (JSR-168)

Add Merge Fields Permissions

Calendar by Week

View Calendar by Week

Apr 15, 2007

< Previous Week

Printable Version

Earlier

	Sun 15	Mon 16	Tue 17	Wed 18	Thu 19	Fri 20
8 AM						
9 AM						
10 AM						
11 AM						
12 PM						
1 PM						
2 PM						

http://localhost:8080/portal/pda/b3ab...69-ed4a-4fbf-00be-b2caeb596370/target

http://localhost:8080/portal/pda/b3abd26c-23cl

Sakai Collab Source Bugs Confluence Pluto up3 S:8080 PDA uP3 Desiderata

Sites > IMS TI Testing > IMSTI (?)

Log Out

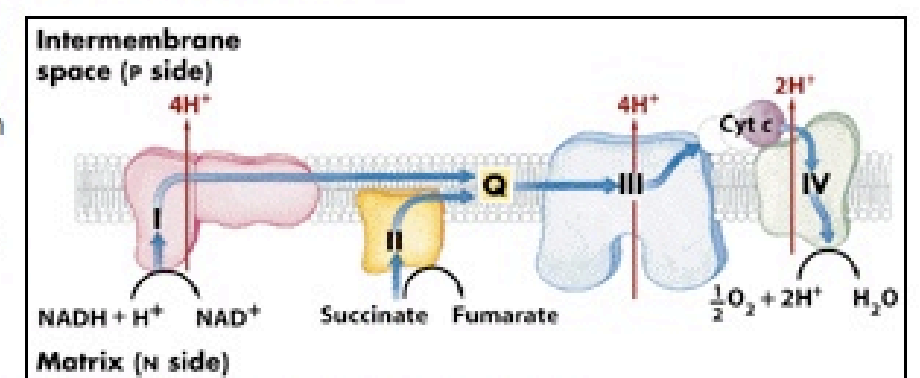
Tool List

OXIDATIVE PHOSPHORYLATION

Define Examples Connect Check

OXIDATIVE PHOSPHORYLATION

The enzymatic phosphorylation of ADP to ATP coupled to electron transfer from a substrate to molecular oxygen. Oxidative phosphorylation has the following attributes:



mitochondrial oxidative phosphorylation

- occurs in the mitochondrion (and some other compartments)
- electrons are passed down the electron-transfer chain
- redox reactions of the electron-transfer chain move protons to the intermembrane space
- phosphorylation of ADP is coupled to re-entry of protons into the matrix through the enzyme ATP synthase

Close Window



Looking Forward IMS Tool Interoperability

- IMS Tool Interoperability 1.0 Extensions based on use
 - REST and SOAP-Lite Bindings
 - Security Function and Configuration Extensions
 - Outcome Request schema – IMS TI 1.1
- IMS Learning Tool Interoperability 2.0
 - Builds on IMS TI 1.0
 - Improves the integration into LMS systems
 - Defines extension points within LMS systems such as “Add New Resource”
 - Modeled on Blackboard Building Blocks
 - Led by: Bruno van Haetsdale of Wimba and Chris Moffat of Microsoft



Tool Interoperability Research

One of the primary goals of the Sakai project was to define a “Tool Portability Profile” which made it possible to build truly portable tools that could be moved between Learning Management Systems.



One of the primary goals of the Sakai project was to define a “Tool Portability Profile” which made it possible to build truly portable tools based on OKI OSIDs that could be moved between Learning Management Systems.



One of the primary goals of the Sakai project was to define a “Tool Portability Profile” which made it possible to build truly portable tools based on OKI OSIDs that could be moved between Learning Management Systems.

While the Sakai project is very successful and achieved many goals, there is work yet to be done to complete this goal..



One of the primary goals of the Sakai project was to define a “Tool Portability Profile” which made it possible to build truly portable tools based on OKI OSIDs that could be moved between Learning Management Systems.

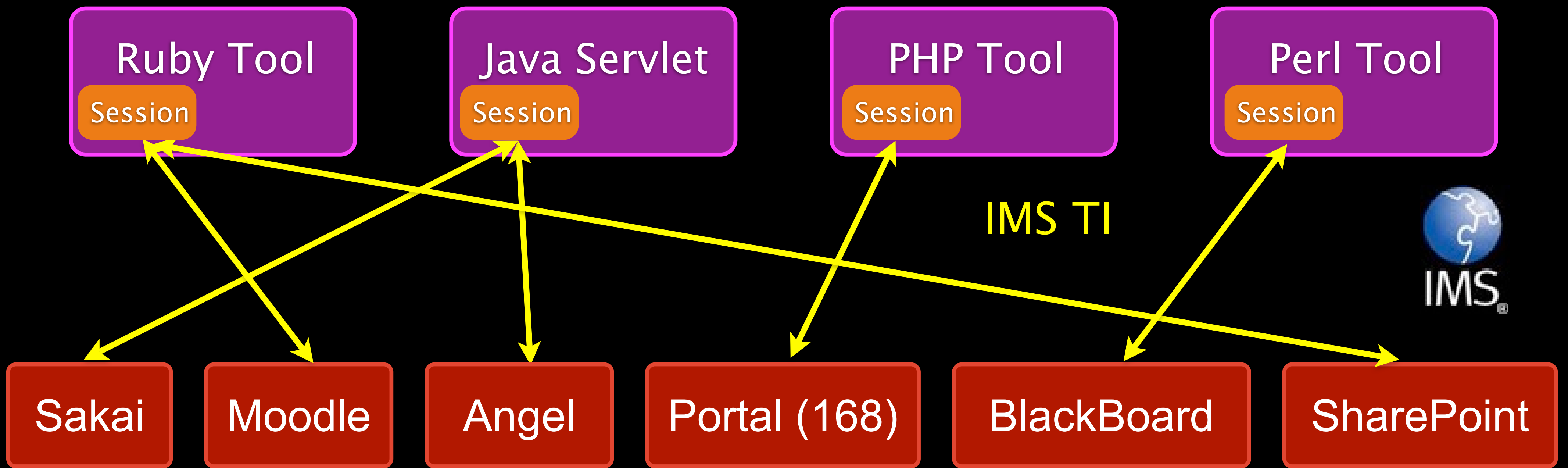
While the Sakai project is very successful and achieved many goals, there is work yet to be done to complete this goal..

This is not just about Sakai – it is about enabling the general purpose mash up of learning functionality.



My tool interoperability research intends to deliver portable and interoperable tools. For me IMS Tool Interoperability was the missing standard to build tools to enable language independence and cross-platform interoperability.

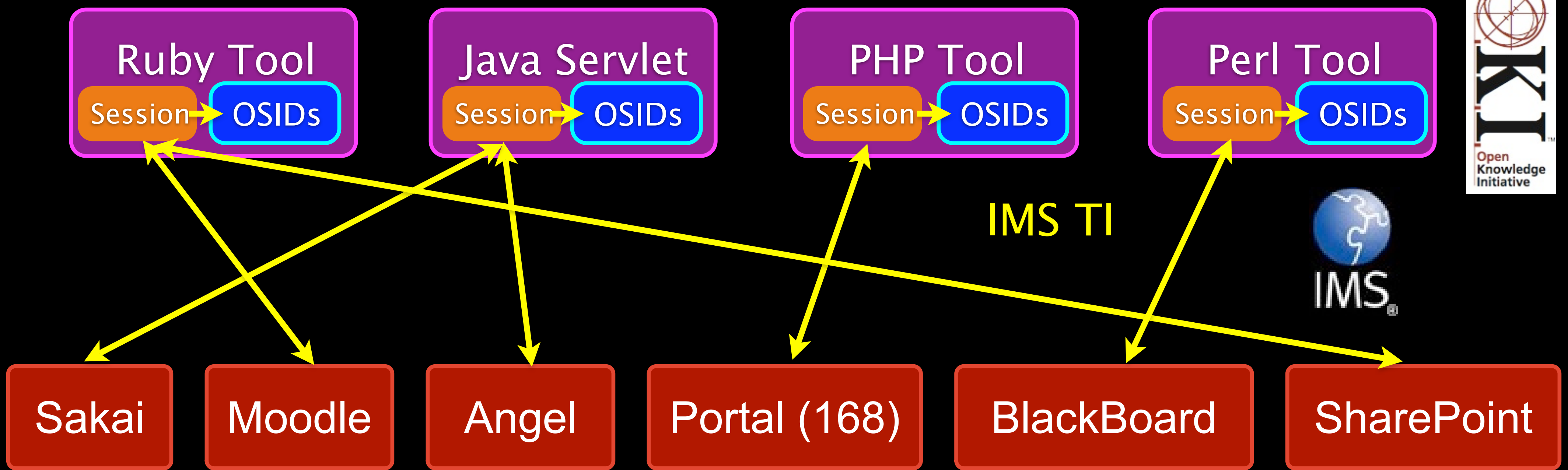
Tool Producers – Tool Functionality



Tool Consumers (LMS Systems)

OKI OSIDs are a set of interoperable APIs that can provide run-time services for these tools. We can use the IMS TI ability to establish a session remotely to partially populate an OSID Context for each user.

Tool Producers – Tool Functionality



Tool Consumers (LMS Systems)

My Spare Time Goals

- Encourage the adoption and use of IMS Tool Interoperability and OKI OSIDs
- Enable learning tools to be built in any programming language or web application framework
- Participate in the IMS and OKI standards activities to evolve and enhance these standards
- Build and distribute reference implementations of the IMS TI producer and consumer modules in many languages



IMS TI Progress To Date

- IMS TI Consumers
 - Sakai Tool
 - JSR-168 Portlet (Pluto, uPortal, Oracle Portal, etc)
- IMS TI Sample Producers
 - Java
 - Ruby
 - PHP
- IMS TI 1.0 Extensions
 - SOAP-Lite and REST Bindings – Makes non-Java producers practical
 - Configuration and Permission functionality



Using OKI OSIDs in Portable Tools

- One of the great challenges in using OKI OSIDs is one of “bootstrapping”
- The OSID Context contains the information that makes the rest of the OSIDs function – it gives them “context”
- But – “Where does the OSID Context come from?”
- A Chicken and Egg Problem – which came first?
- IMS Tool Interoperability provides a mechanism to populate the OSID Context as part of the Launch Request/Response and session setup



OKI Progress to Date

- Proof of concept of IMS TI populating OSID Context
- Started discussions regarding a Ruby Binding for OKI OSIDs



LocalSakaiName : Test IMSTool : IMS TI - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://sheep.udl.net:8080/portal/site/65a75057-09d5-48b8-80e3-c9c56bd6c3 campus projecte

Release Notes Fedora Project Red Hat Free Content

Sakai

Logout

My Workspace | Test IMSTool

Site Info

IMS Tool Interoperability (JSR-168)

IMS Tool Interoperability - Java Test Tool

Help

This is a IMS Tool Interoperability test end point written in Java. It only supports REST profile of the IMS Tool Interoperability Specification. REST supports is currently an extension (i.e. not part of the approved IMS TI standard). It uses the information provided in the IMS Tool Interoperability LaunchRequest to populate and OKI Osid Context

Testing OKI...

```
agent.getDisplayName() = Ballesté Crevillén, Alex
```

At this point the tool is just a prototype to demonstrate feasibility and explore potential extensions to IMS Tool Interoperability 1.0 to better support tools.

Here is the XML from the IMS Tool Interoperability LaunchRequest which created this session. This work is also exploring approaches to develop Java implementations for OKI OSIDs to be used in Campus Project.

```
<?xml version="1.0" encoding="UTF-8"?>
<LaunchRequest>
<DeploymentProfile>
```

Done



Applications Places System sakai 9:09 PM

LocalSakaiName : Test IMSTool : IMS TI - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://sheep.udl.net:8080/portal/site/65a75057-09d5-48b8-80e3-c9c56bd6c37 Google

Release Notes Fedora Project Red Hat Free Content

Sakai [Logout](#)

[My Workspace](#) | [Test IMSTool](#)

[Site Info](#) [IMS TI](#) [Help](#)

IMS Tool Interoperability (JSR-168)

IMS Tool Interoperability - PHP Test Tool

This is an IMS Tool Interoperability test end point written in PHP. It only supports REST profile of the IMS Tool Interoperability Specification. REST support is currently an extension (i.e not part of approved IMS TI standard). It uses the information provided in the IMS Tool Interoperability Launch Request to populate an OSID Context.

```
Testing OKI...
agent.getDisplayName = Alex, Ballesté Crevillén
```

At this point the tool is just a prototype to demonstrate feasibility and explore potential extensions to IMS Tool Interoperability 1.0 to better support tools.

Here is the XML from the IMS Tool Interoperability LaunchRequest which created this session.

```
<?xml version="1.0" encoding="UTF-8"?>
<LaunchRequest>
```

Done

LocalSakaiN... root@localhos... sakai Sakai-Rest-... [root@localho... [INBOX (20 u...]




[Logout](#)
[My Workspace](#) | [TI Test](#)

[Home](#)

[Resources](#)

[Site Info](#)
[IMS TI](#)

[Help](#)

Users present:

p p

[IMS Tool Interoperability \(JSR-168\)](#)

IMS Tool Interoperability - Ruby Test Tool

This is an IMS Tool Interoperability test end point written in Ruby. It only supports the REST profile of the IMS Tool Interoperability Specification. REST support is currently an extension (i.e. not part of the approved IMS TI standard). It uses the information provided in the IMS Tool Interoperability Launch Request to populate and OKI OSID Context.

Testing OKI...

```
agent.getDisplayName() = Charles Severance
```

At this point the tool is just a prototype to demonstrate feasibility and explore potential extensions to IMS Tool Interoperability 1.0 to better support tools. This work is also exploring approaches to develop Ruby bindings and implementations for OKI OSIDs.

Here is the XML from the IMS Tool Interoperability LaunchRequest which created this session:

```
<?xml version="1.0" encoding="UTF-8"?>
<LaunchRequest>
  <DeploymentProfile>
    <CoreSettings>
      <ProxyTool>
        <IMSTIVersion>
          <major>1</major>
          <minor>0</minor>
        </IMSTIVersion>
        <ProxyToolDescription>DO A LOOP</ProxyToolDescription>
        <ProxyToolName>Ruby Loop Back Endpoint</ProxyToolName>
        <ProxyToolVersion>
```



IMS TI 1.0 Function and Security Extensions

```
<TIR>
  <LaunchService/> <!-- Not allowed for this placement -->
  <RestLaunchService>
    <ServiceName>PHP Test End Point</ServiceName>
    <ServiceLocation>
      http://www.dr-chuck.com/imsti-test/launch.php
    </ServiceLocation>
    <Options>
      <option>Width</option>
      <option>Height</option>
      <option>Color</option>
    </Options>
    <Permissions>
      <permission>Read</permission>
      <permission>Update</permission>
      <permission>Write</permission>
    </Permissions>
  </RestLaunchService>
</TIR>
```



The screenshot shows the Sakai interface for configuring tool permissions. The page title is "IMS Tool Interoperability (JSR-168)". The left sidebar contains navigation links: Home, Site Info, IMS TI, and Help. Below these, it shows "Users present: csev". The main content area is titled "Tool Permissions" and contains a table with columns for Role, Read, Update, and Write. The roles listed are Admin, Student, and Instructor. Each role has three checkboxes corresponding to the Read, Update, and Write permissions. At the bottom of the table are "Save" and "Cancel" buttons.

Role	Read	Update	Write
Admin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Instructor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The screenshot shows the Sakai interface for configuring tool options. The page title is "IMS Tool Interoperability (JSR-168)". The left sidebar contains navigation links: Home, Site Info, IMS TI, and Help. Below these, it shows "Users present: csev". The main content area is titled "Tool Options" and contains three input fields: Width, Height, and Color. At the bottom of the form are "Save" and "Cancel" buttons.

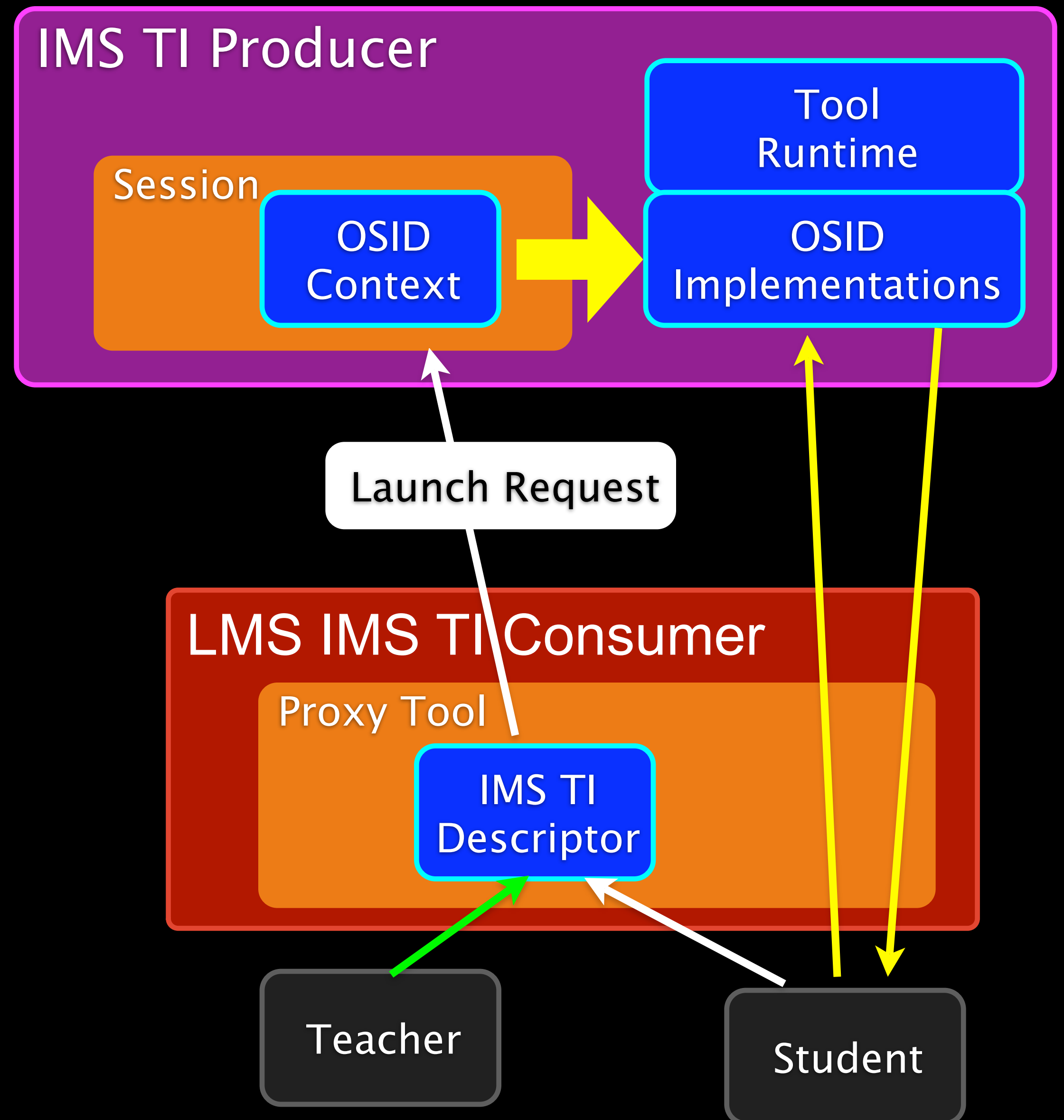
This is the IMS Proxy Portlet developed for Sakai controlling configuration, roles, and functions for a particular tool placement from within the LMS. This information will be passed to the remote tool in the Launch Request.

Process Flow

Teacher sets up and configures LMS Placement using IMS TI Descriptor.

Student selects tool and a Launch Request is sent to the consumer. This contains information to build an OSID Context associated with the user session in the producer.

When the student requests markup in the context of their session, the OSID implementations pull the OSID Context from the session.



Roadmap Forward (in my spare time)

- Develop New Consumers for IMS TI 1.0 (with extensions)
 - Moodle
 - Angel
 - BlackBoard Building Block
 - Microsoft SharePoint
- New IMS TI Producer Reference Implementations
 - Perl



More Spare Time Roadmap

- Work on Ruby/Rails Binding for OKI OSIDs
- Work with targeted application providers to support adoption of IMS TI 1.0
- Eliminate iFrames
 - WSRP – Web Services for Remote Portals
 - Proxy / Bridge Portlet / Web Clipping in the IMS TI Consumer
 - Create REST Binding for WSRP



Resources Available

- So far this is just me and members of the Sakai Community
 - Universitat de Lleida
- Interested in others with resources to help
- Participating in the OKI and IMS formal processes
- There is no rush – this needs to be done right

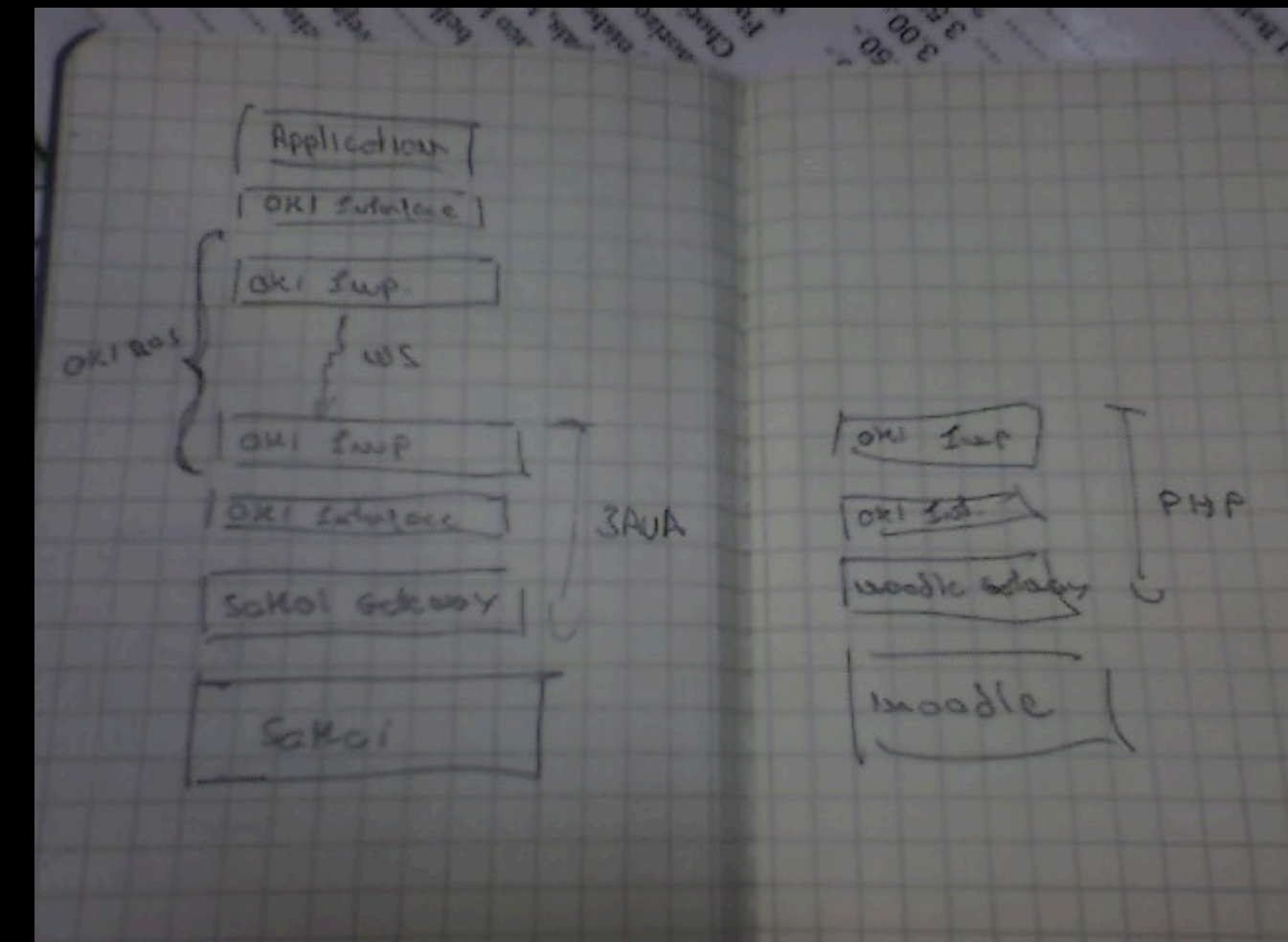


Thoughts on University Campus Under Construction



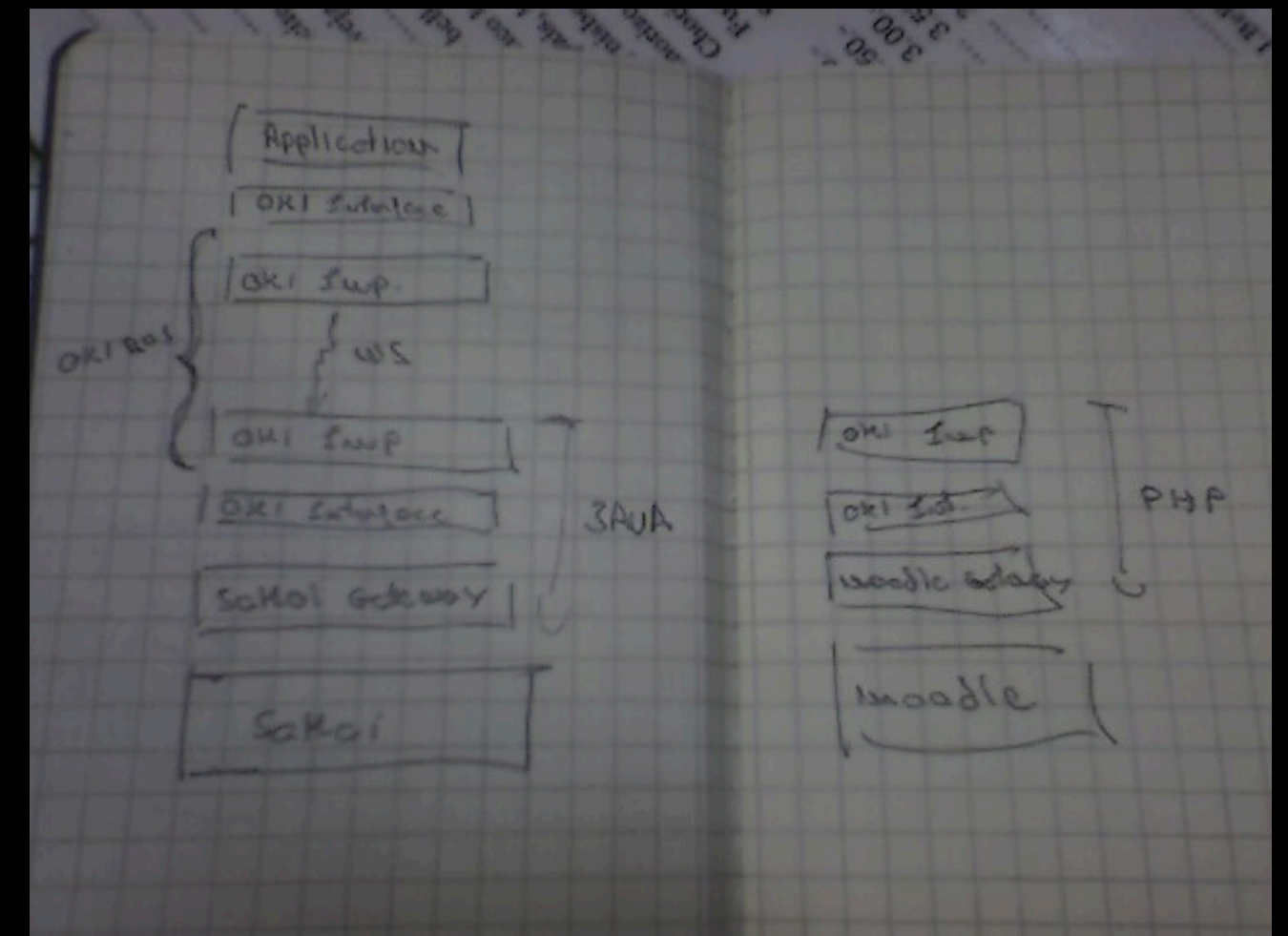
Campus Project – In a Bodega

- Service Oriented Architecture
- Tool Pattern allows deployment in Sakai *or* Moodle
- OKI as Middleware
- Includes cross-deployment and configurations
- Proxy Tool Pattern
- Strong funding by Catalan Government
- www.campusproject.org



My Thoughts

- University Campus – A Bold Choice and Challenge
 - University Campus project chose to support both Moodle and Sakai
 - Developing a new pattern for tools that work in either Sakai or Moodle
 - Interoperability based on OKI OSIDs and an OKI Bus
- Some Ideas *
 - Broaden the impact of the UC work
 - Use and extend IMS Tool Interoperability



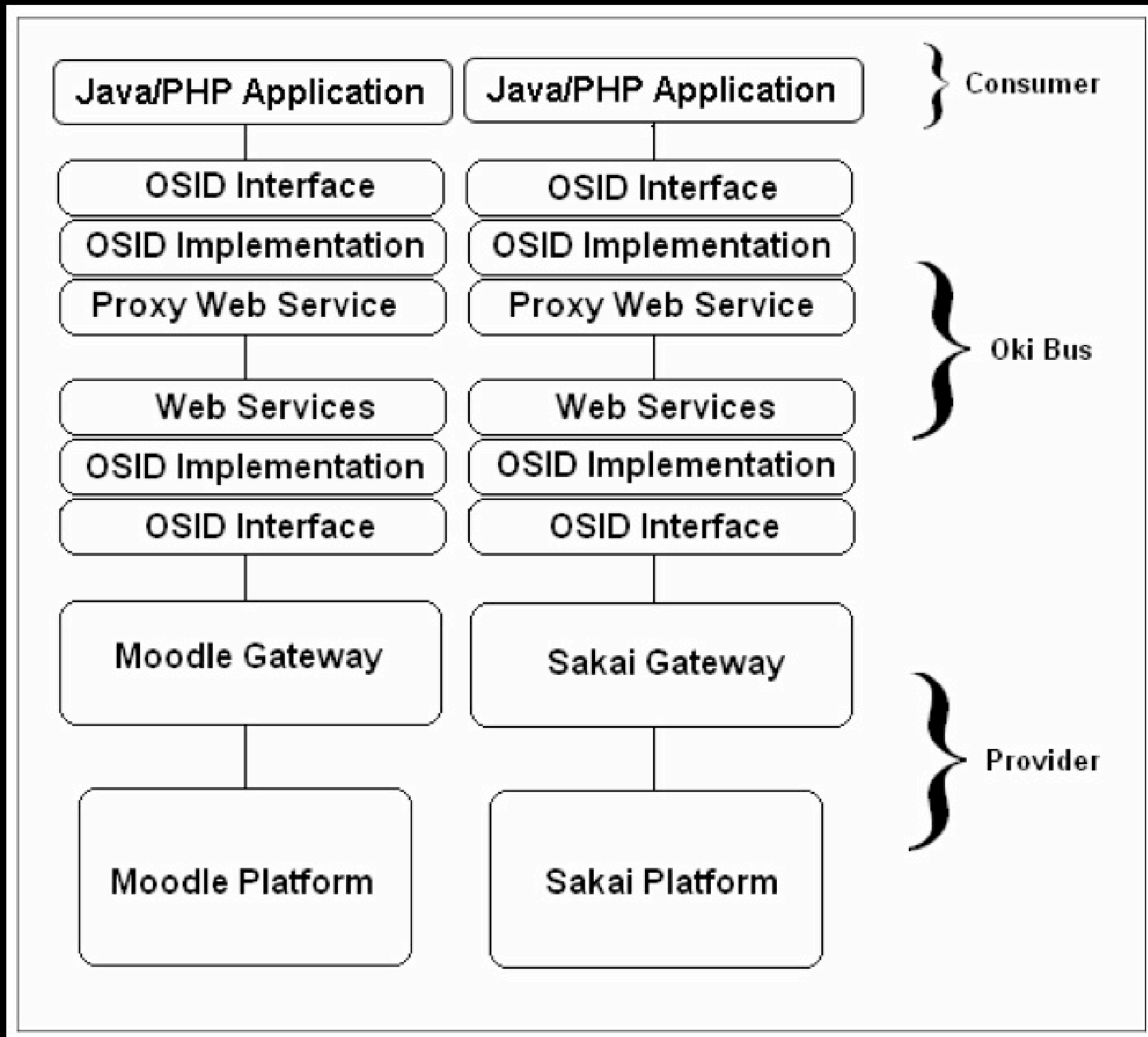
* Since I am an academic, I assume infinite time and infinite resources

Initial Campus OKI OSIDs

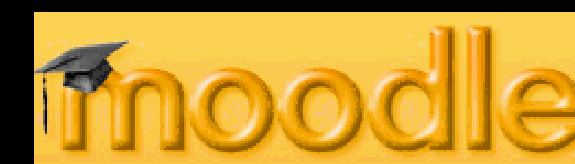
- Authentication
- Authorization
- Configuration
- Locale
- Logging
- Identifier
- Messaging

This set is a good choice because it keeps the project scope feasible. And these OSIDs are used by nearly every learning application ever built.

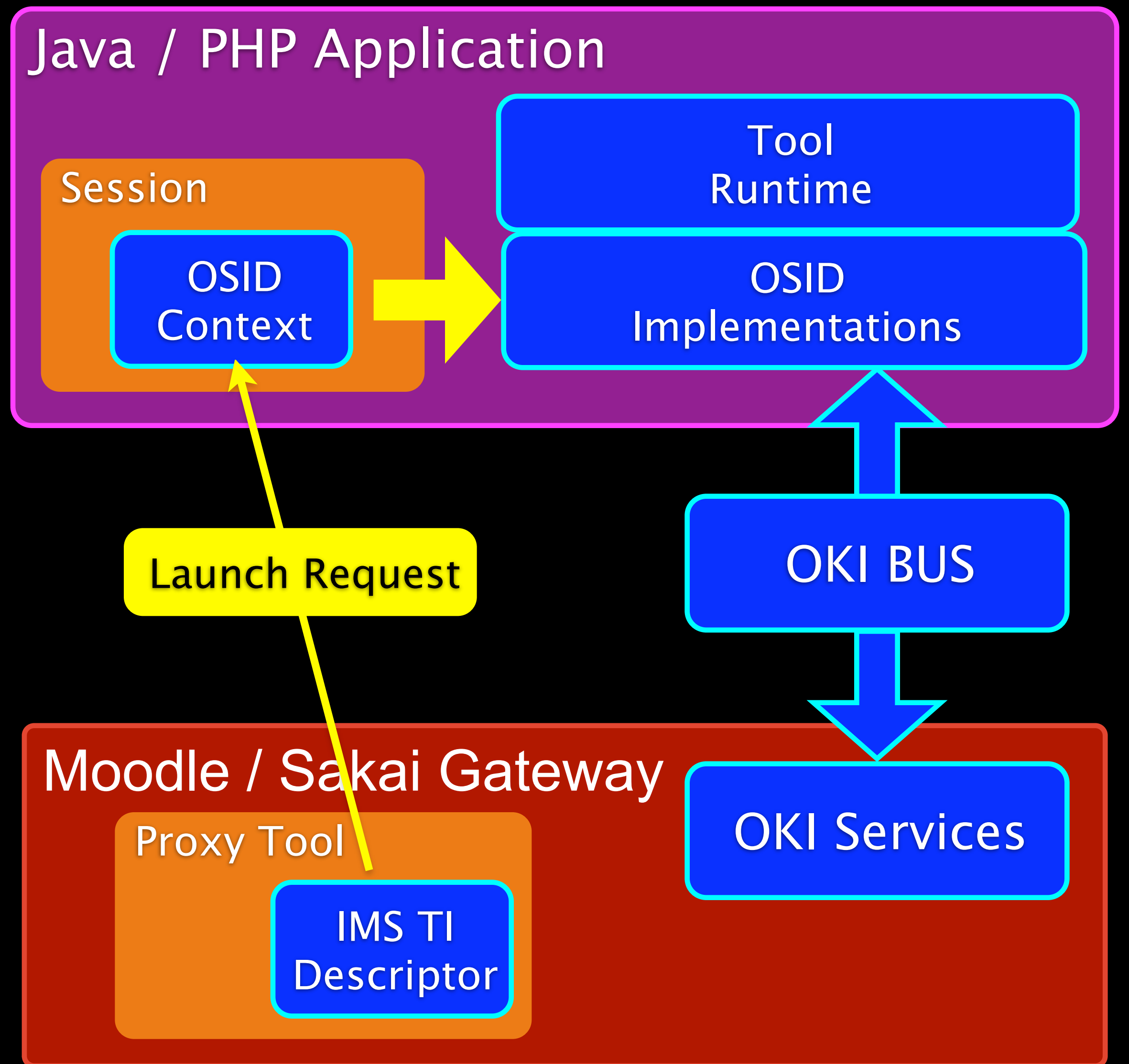
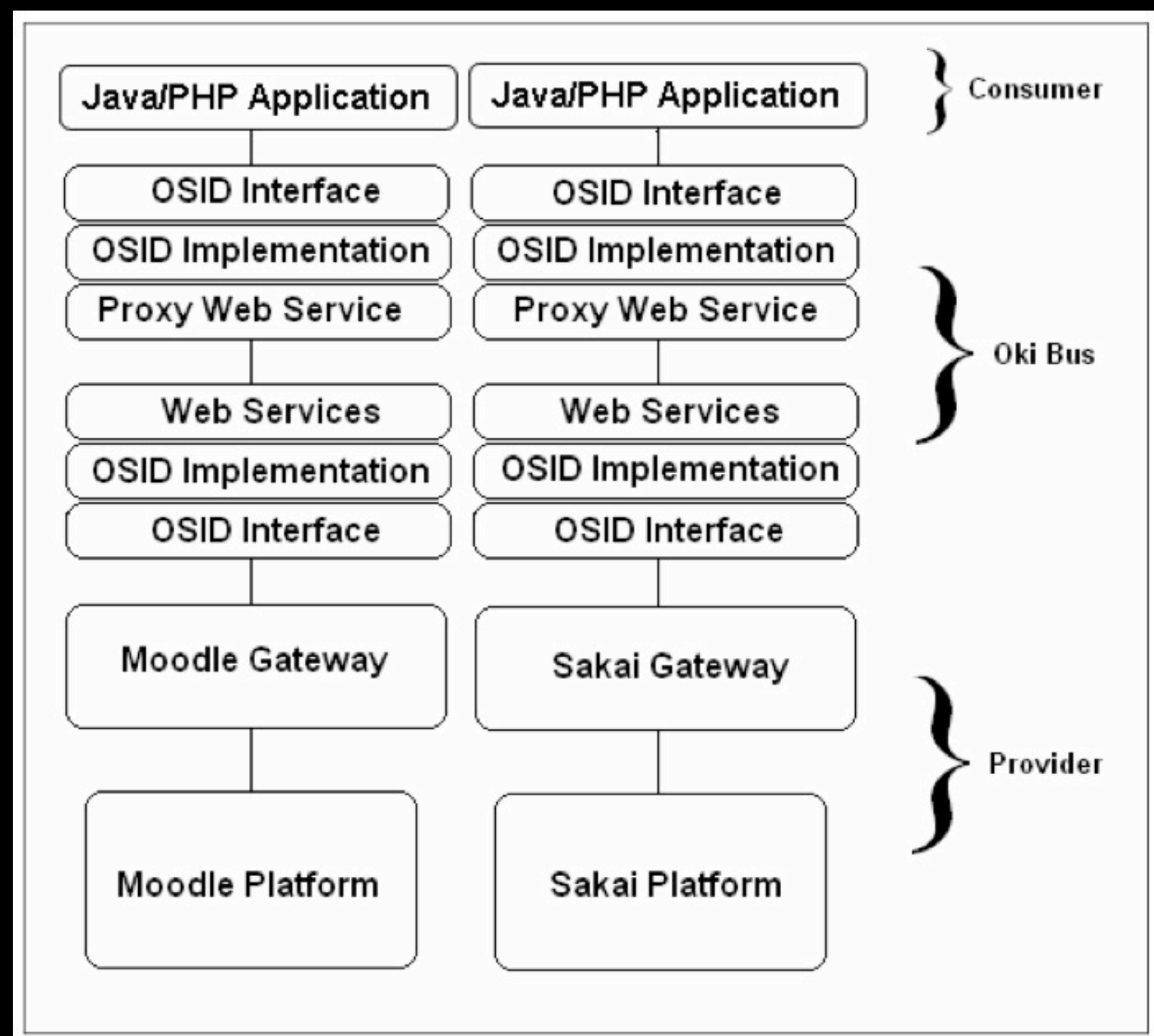
Campus Architecture



Campus Architecture



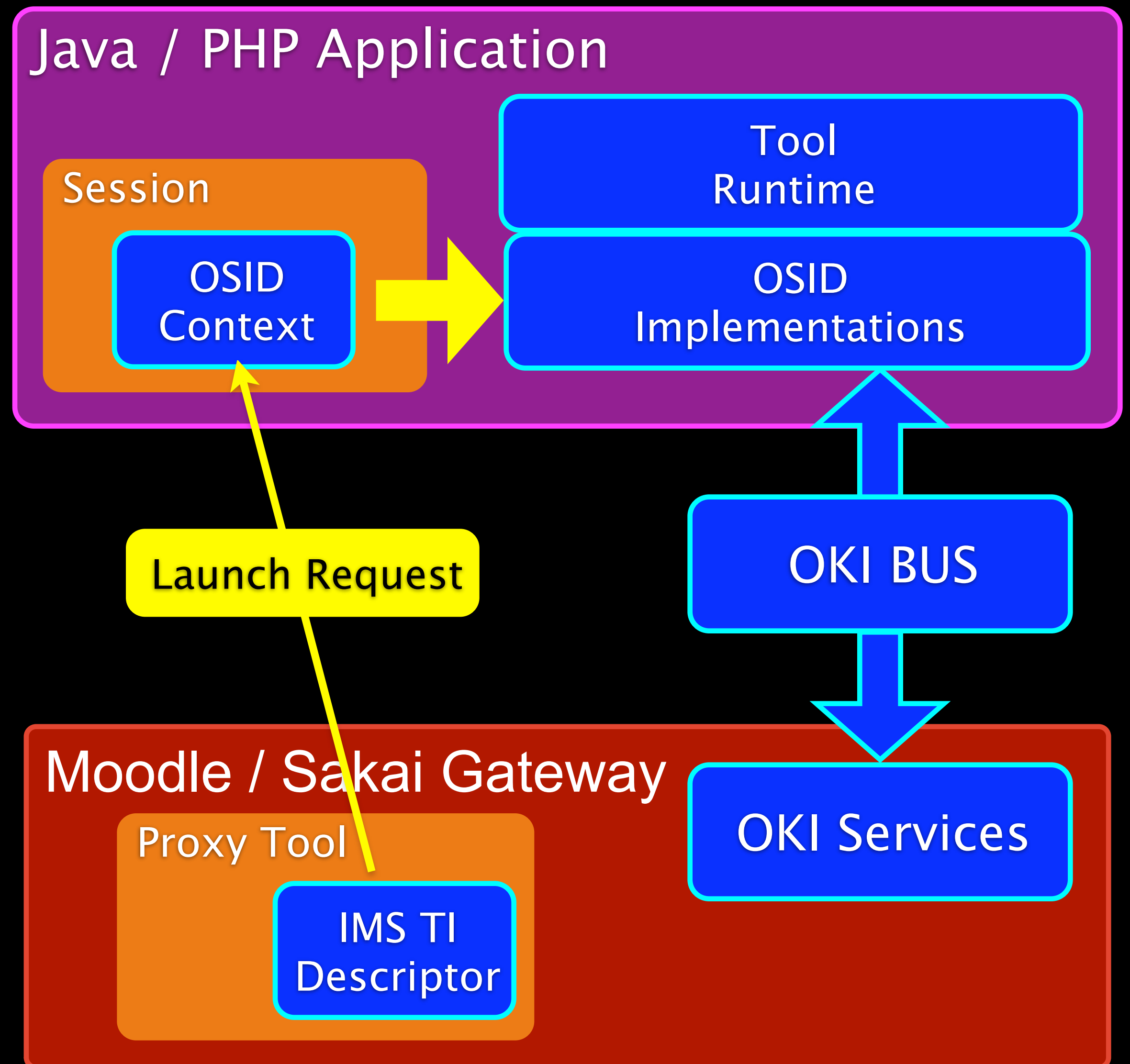
Adding IMS Tool Interoperability to Campus



Adding IMS Tool Interoperability to Campus

The primary value in using IMS Tool Interoperability as part of the Campus Architecture is to provide a standards-based protocol to exchange configuration information between the LMS and the Tool and establish the OSID Context.

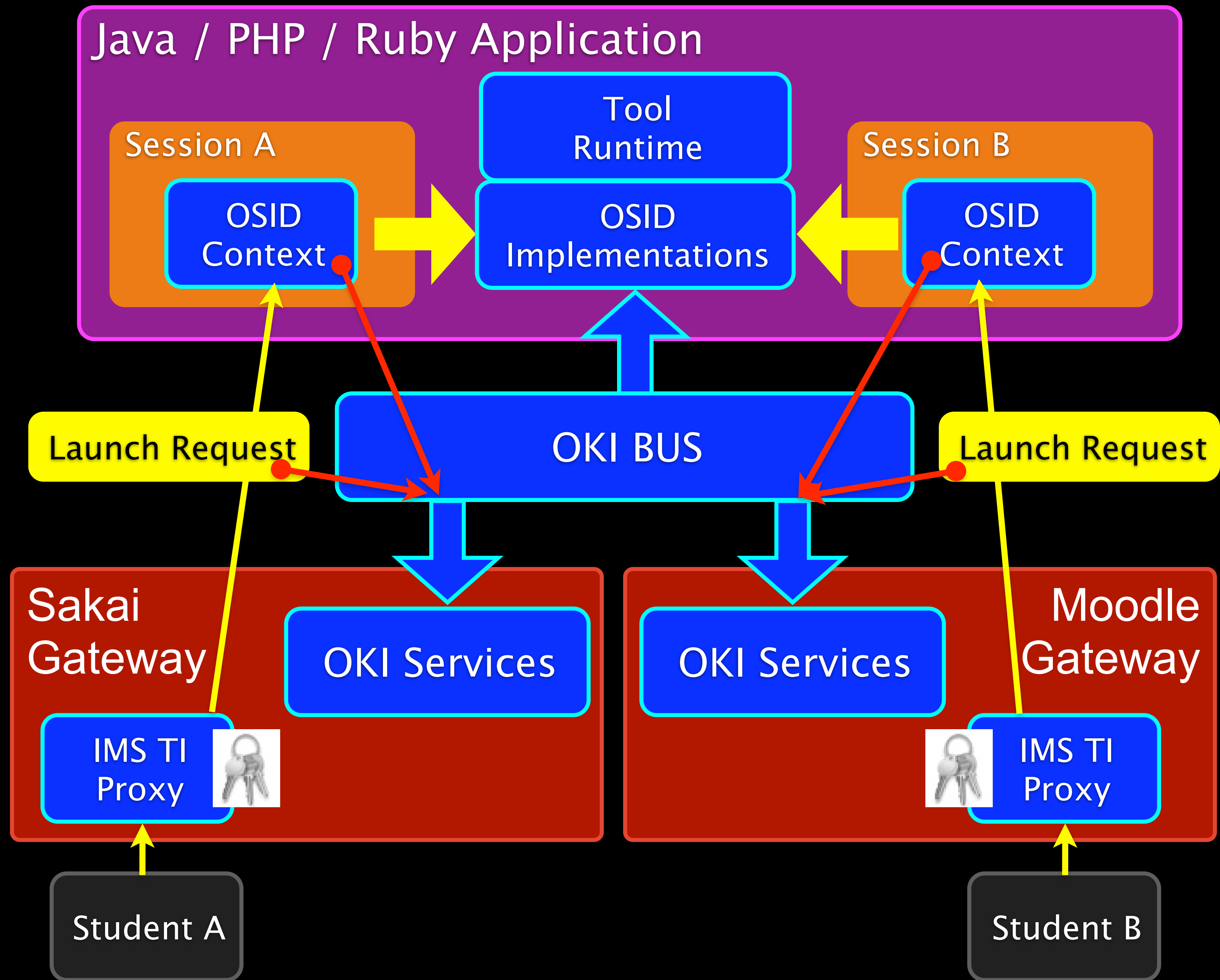
For Campus, this OSID context can also contain information which properly configures the OKI bus so that applications can access other OKI services in the LMS.



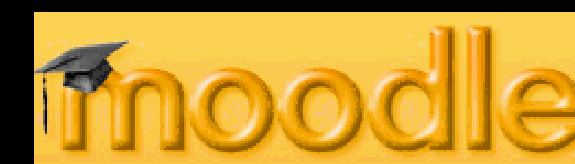
Sharing Tool Context

We can support multiple LMS systems and tools that federate identity by including an appropriate bus end point in each launch request.

Trust is granted when two LMS placements share the IMS TI Descriptor.



Campus Architecture



Summary

Standards are emerging to enable functionality mashup – particularly IMS standards for learning functionality mashup.

Much more work is required. With several strong open source LMS systems in the market place, we can begin to tackle the hard technical issues in real Tool Interoperability.

This will require an iterative process of building reference implementations, extending standards, and then improving standards.

Thank you for your time...

- csev@umich.edu
- <http://www.dr-chuck.com/>