

# IMS Basic Learning Tools Interoperability

Charles Severance, Ph.D.  
Affiliate Coordinator  
IMS Global Learning Consortium (IMS GLC)

<http://www.imsglobal.org/>  
<http://www.dr-chuck.com/>





# Learning Tools Interoperability

- Problem

- Every CMS has their own very unique "module", "tool" "block", "nugget", "powerlink", etc
- External tools like QuestionMark, Wimba, Elluminate, etc must prioritize which CMS they invest in plugging into
- Tool Providers wait until customers are willing to pay money to start development



# Learning Tools Interoperability

- Solution
  - Build a standard plug-in for all CMS systems
  - Tool and Content Providers can build one integration and use it in any CMS that supports the standard
  - Start simple and basic and then expand feature sets to allow market to adjust over time and insure that engineering due diligence is being done - phased release



# IMS: Digital Learning Standards

*Free the  
content*



IMS Common Cartridge



IMS Learning Tools  
Interoperability (LTI)

*The information  
architecture for  
learning*



IMS Learning Information  
Services (LIS)



# Certified - LMS



- PowerLink for Blackboard WebCT v8
- Building Block for Blackboard Learn v9
- Desire2Learn Learning Environment v8.4.2
- Desire2Learn Learning Environment v9.0
- Jenzabar JICS v7.2
- Learning Objects Campus Pack v4
- Sakai v2.7
- Sakai 3 v0.4
- OLAT 7.0





**Desire2Learn**  
Innovative Learning Technology



**JENZABAR®**

**Sakai**



**WORDPRESS.ORG**

...  
**NING**



PHP  
Java  
App Engine  
Wookie...



My Places | Home | Help | Logout

Bb WebCT The University of Testing

My Institution Courses Content Collection System Admin Scholar

powered by noteflight

Charles Severance (Admin) Learn More Help FAQ Feedback Sign Out

NEW SCORE Browse My Home My Account My Profile SEARCH

Attach to Link 'Untitled'

scores (o) favorites (o) shared (o)

## welcome to noteflight!

release 2.1

Welcome to your home page!

This is where you'll be, every time you log into Noteflight. Once you have scores, they'll show up here.

Here are some things to do next...

Create your first score

To create a new score, simply click the **New Score** button at the top of this page. The Noteflight Score Editor will appear, with a blank score, title and composer. Decide whether your score will be private or shared, and then enter music by selecting and clicking with the mouse, or by typing note names and using the arrow keys.

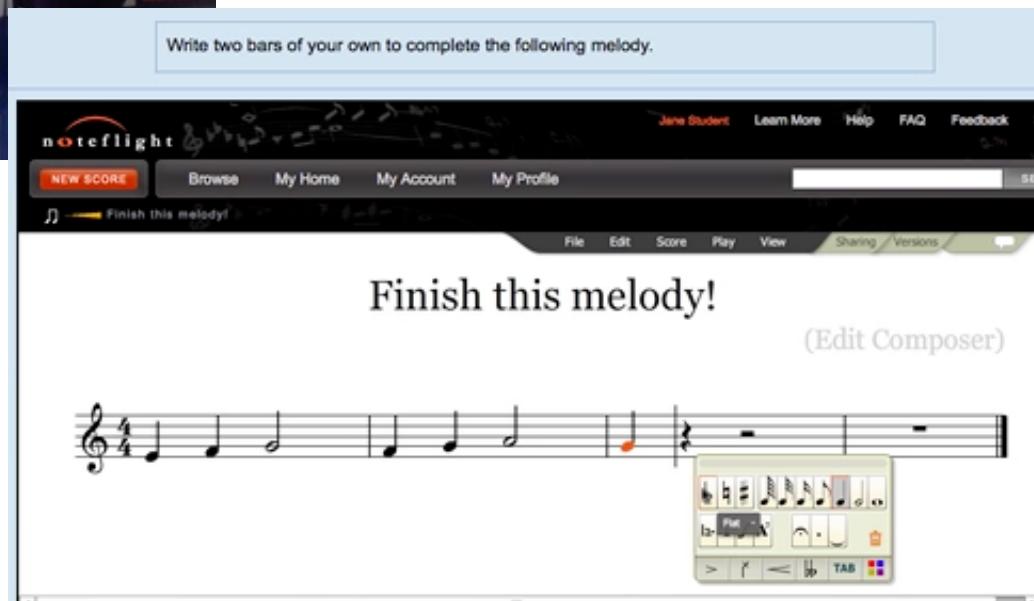
Charles Severance (Admin) (Instructor)  
MEMBER SINCE June 08, 2010  
edit my profile

NEWS

www.noteflight.com



Joseph Berkovitz  
<info@noteflight.com>  
[www.noteflight.com](http://www.noteflight.com)



The screenshot shows the NoteFlight software interface. At the top, there's a header with the NoteFlight logo, user information (Jane Student), and navigation links (Learn More, Help, FAQ, Feedback). Below the header, a main title says "Finish this melody!" with a "(Edit Composer)" link. The central part of the screen is a musical score editor with a staff of four lines. A melody is partially composed with black notes. A red dot is placed on the fourth note of the first measure, indicating where the user should add the next note. To the right of the score is a toolbar with various musical symbols and options like "TAB". The bottom of the interface has a menu bar with File, Edit, Score, Play, View, Sharing, and Versions.

<http://videos.noteflight.com/MoodleBasicLTI.mov>



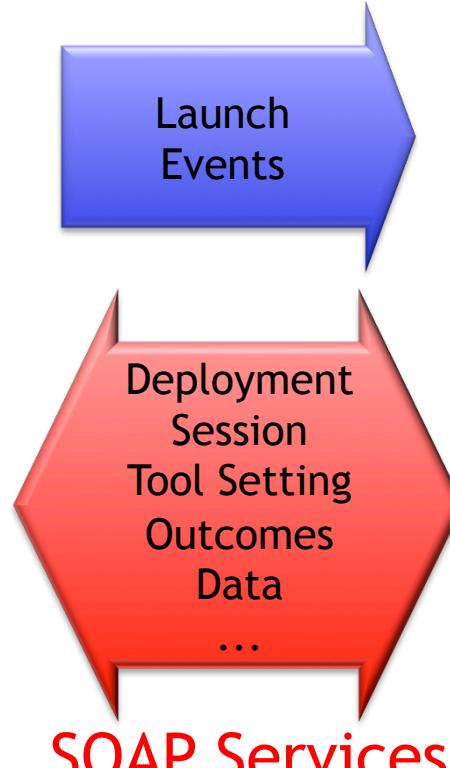
# LTI Terminology

- **Tool Consumer** - The system that "consumes" the tool (i.e. the Learning Management System - e.g. Blackboard, Moodle)
- **Tool Provider** - The system that provides the tool (e.g. Wimba, LearningObjects, etc..)

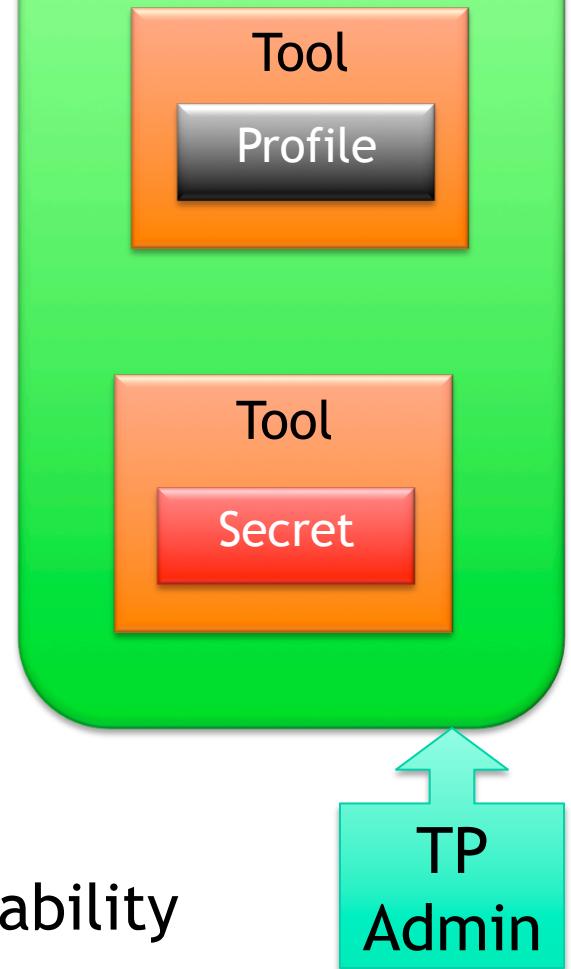
TC  
User



**REST Services**



**Tool Provider**



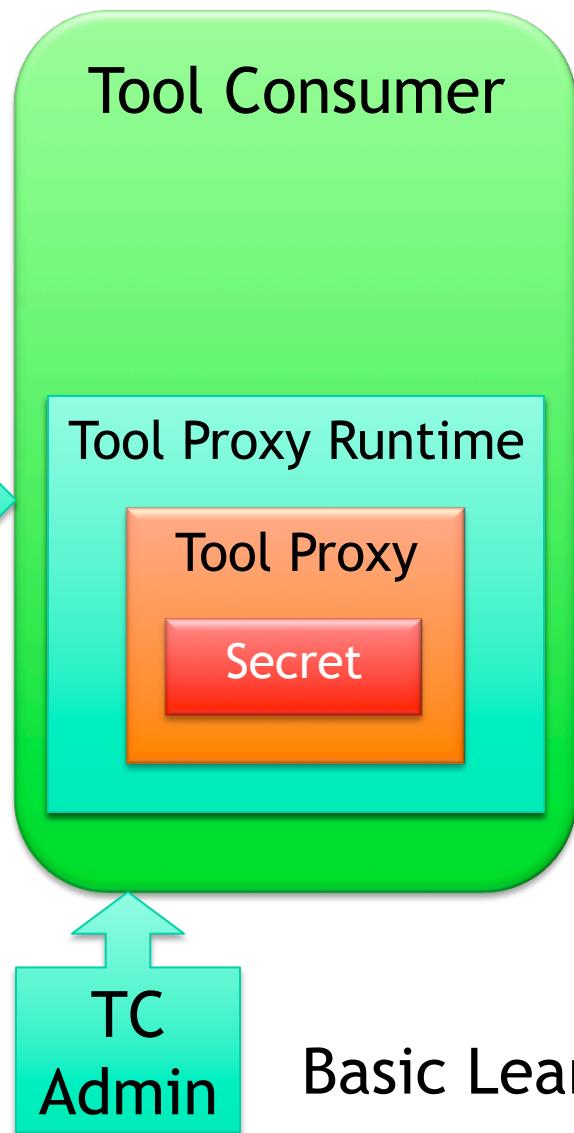
**Learning Tools Interoperability**



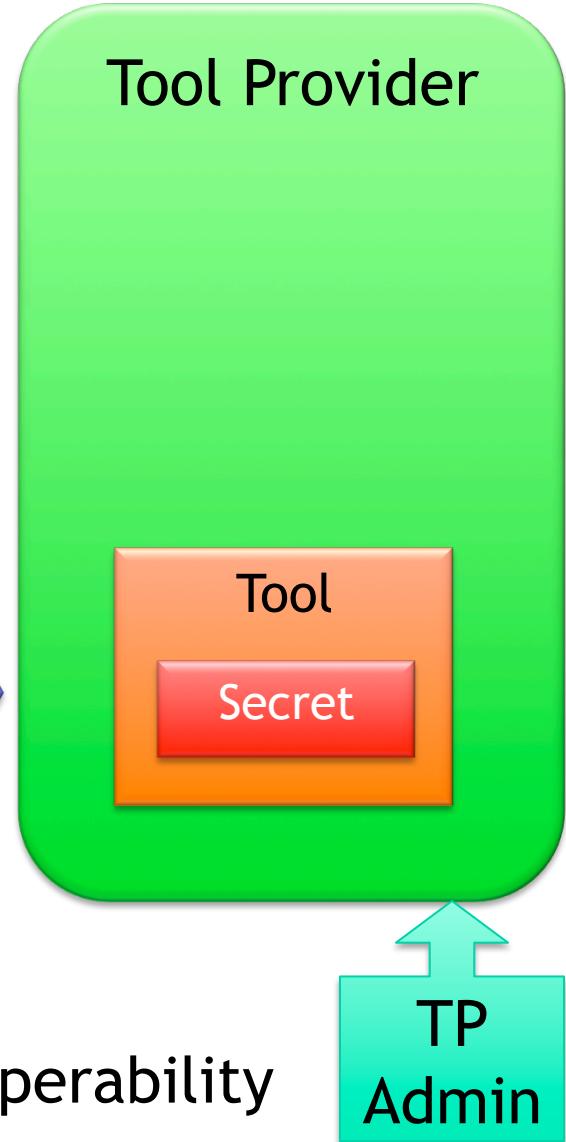
# Basic LTI Goals

- We decided to roll out Learning Tools Interoperability in a phased series of releases
  - These specifications are pretty detailed so we want to get them right
  - We want to engineer reference implementations along the way
- Basic LTI: "The smallest useful subset of LTI"

TC  
User



Launch



**Basic Learning Tools Interoperability**



# Basic LTI Certification

- Assure the end-user/purchaser that products will interoperate
- Any certified Provider (Tool) should be able to interoperate with any certified Consumer (LMS)





# IMS GLOBAL LEARNING CONSORTIUM

STANDARDS THAT ENABLE THE  
DEVELOPMENT AND ADOPTION OF INNOVATIVE TECHNOLOGIES  
TO IMPROVE AND TRANSFORM EDUCATION WORLDWIDE



Join IMS | Innovation | Adoption | Learning Impact | Engage

## Formal Process for Basic LTI Consumer Certification

Quick Link: [Test Setup](#)

To pass certification, you must take the following steps:

- You must be an IMS Common Cartridge Alliance member
- You must pass the tests using certification suite hosted on the Alliance web site.
- You must prepare a report of the results of the test including any necessary explanations of any anomalies in the test.
- The report must be submitted by a designated representative of the alliance member and you must agree that there is no misrepresentation or manipulation of the results in the submitted report.
- You must submit your report via E-Mail to [basiclti-certification-report@imsglobal.org](mailto:basiclti-certification-report@imsglobal.org)
- After IMS reviews your report and notifies you that the report is approved and adds you to the Basic LTI product directory, you can claim certification to IMS Basic LTI and display the certification badge on your web site and in your software.

### MORE INFORMATION

Alliance Home  
Alliance Forum  
Demonstrations  
Sample Cartridges  
Implementer Tools  
Conformance Tests  
Marketing  
Events  
Specification

<http://www.imsglobal.org/developers/alliance/lti/blti-cert/>



# IMS Learning Tools Interoperability Technical Overview



My Places Home Help Logout

Bb WebCT The University of Testing

My Institution Courses Content Collection System Admin Scholar

Charles my talk my watchlist my contributions

category discussion create watch

## Category:Lti demo

There is currently no text in this page. You can search for this page title in other pages, [search the related logs](#), or [edit this page](#).

*This category currently contains no pages or media.*

**navigation**

- [Main Page](#)
- [Recent changes](#)
- [Help](#)

**search**

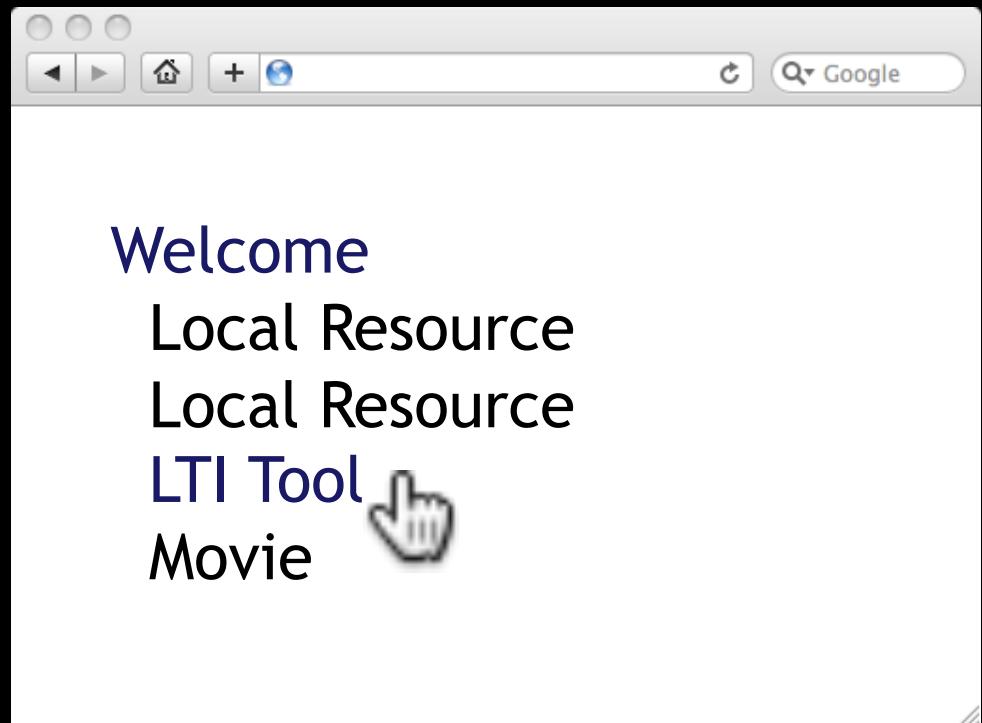
**toolbox**

- [What links here](#)
- [Special pages](#)
- [Printable version](#)

[Privacy policy](#) [About Chuck](#) [Disclaimers](#)

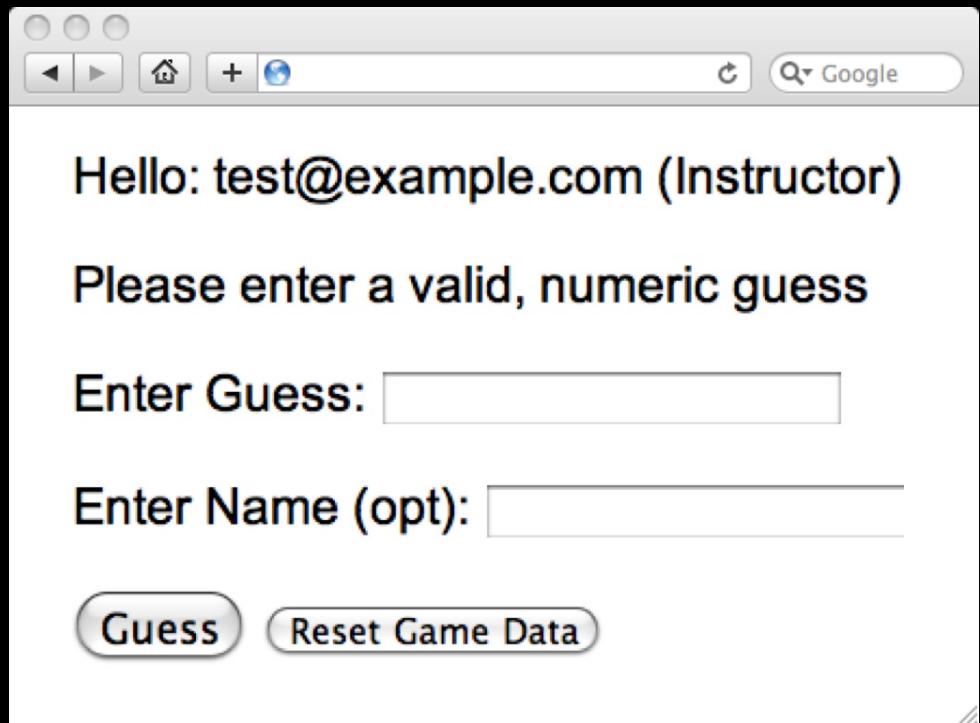
Powered By MediaWiki

# Integrated User Experience



© Copyright 2010 IMS Global Learning Consortium  
All Rights Reserved.

# User Experience



A screenshot of a web browser window. The address bar shows "Google". The main content area displays a user interface for a game:

Hello: test@example.com (Instructor)

Please enter a valid, numeric guess

Enter Guess:

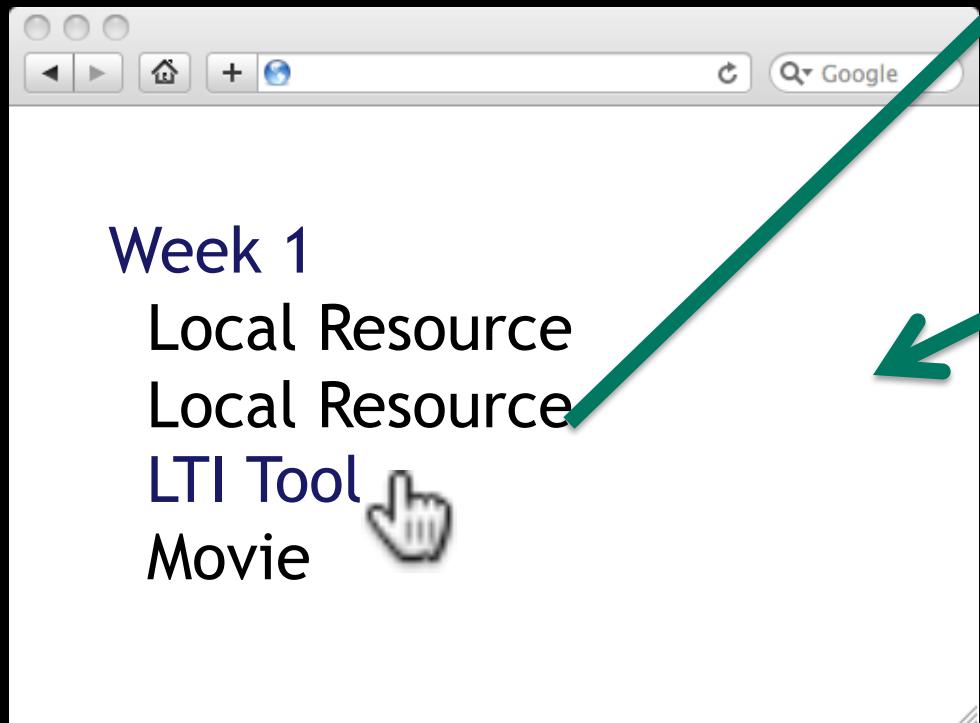
Enter Name (opt):

**Guess** **Reset Game Data**



© Copyright 2010 IMS Global Learning Consortium  
All Rights Reserved.

Again in slow motion...



LMS (LTI Consumer)

LMS Looks up User and Course Information.

Information is signed using  
*secret* and OAuth

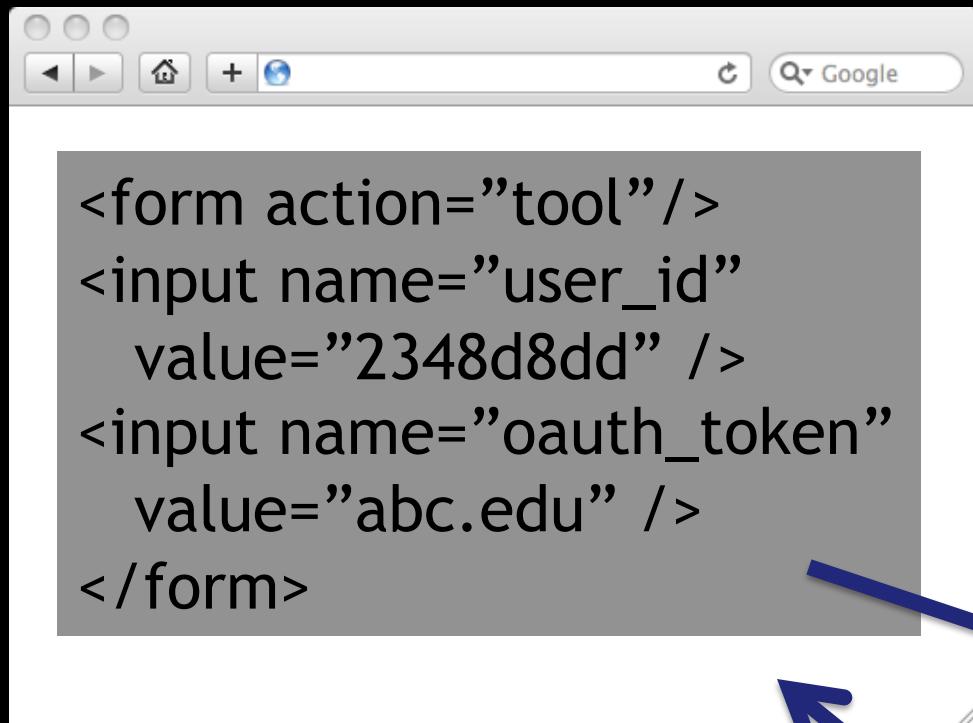
Form data sent to Browser

Tool (LTI Provider)



© Copyright 2010 IMS Global Learning Consortium  
All Rights Reserved.

Form is immediately auto-submitted using JavaScript.



LMS (LTI Consumer)

Tool (LTI Provider)

Tool looks up **secret** and validates signature.

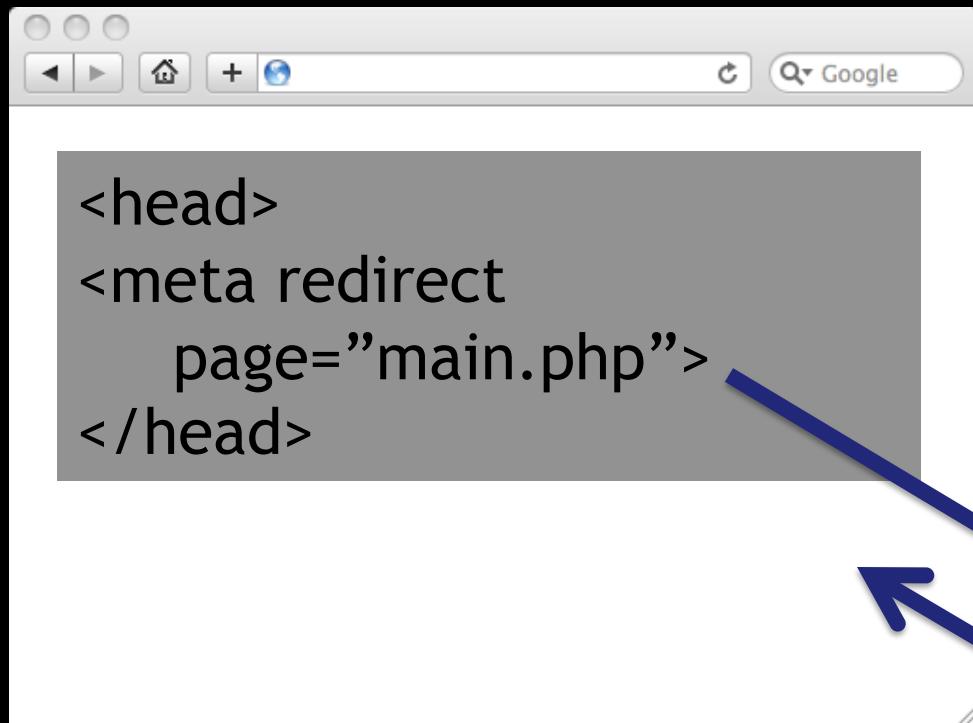
Tool provisions user, course, and session.

Tool sends redirect



Browser follows redirect...

LMS (LTI Consumer)



Tool (LTI Provider)

Tool produces  
first page.



© Copyright 2010 IMS Global Learning Consortium  
All Rights Reserved.

## LMS (LTI Consumer)

Hello: test@example.com (Instructor)

Please enter a valid, numeric guess

Enter Guess:

Enter Name (opt):

**Guess** **Reset Game Data**

## Tool (LTI Provider)



© Copyright 2010 IMS Global Learning Consortium  
All Rights Reserved.



# Basic LTI Sample Launch Data

lti\_version=LTI-1p0

lti\_message\_type=basic-lti-launch-request

oauth\_consumer\_key=lmsng.school.edu

resource\_link\_id=120988f929-274612

user\_id=292832126

roles=Instructor

lis\_person\_name\_full=Charles R. Severance

lis\_person\_contact\_email\_primary = csev@umich.edu

context\_id=456434513

context\_title=SI301 - PHP

tool\_consumer\_instance\_description=University of School



IMS®

Innovation  
Adoption  
Learning

# OAUTH

About   Advisories   Documentation   Code   Blog   Community

An **open protocol** to allow **secure API authorization** in a **simple** and **standard** method from desktop and web applications.

[Read on »](#)

## For Consumer developers...

If you're building...

- desktop applications
- dashboard widgets or gadgets
- Javascript or browser-based apps
- webpage widgets

OAuth is a simple way to publish and interact with protected data. It's also a safer and more secure way for people to give you access. We've kept it simple to save you time.

## For Service Provider developers...

If you're supporting...

- web applications
- server-side APIs
- mashups

If you're storing protected data on your users' behalf, they shouldn't be spreading their passwords around the web to get access to it. Use OAuth to give your users access to their data while protecting their account credentials.



# Basic LTI and IMS Common Cartridge

- Common Cartridge 1.1 will include the ability to define a Basic LTI resource and include that resource in course organizational structures

Welcome  
HTML Resource  
Folder  
LTI Tool  
Discussion  
QTI Pool



**Desire2Learn**  
Innovative Learning Technology



**JENZABAR®**

**Sakai**



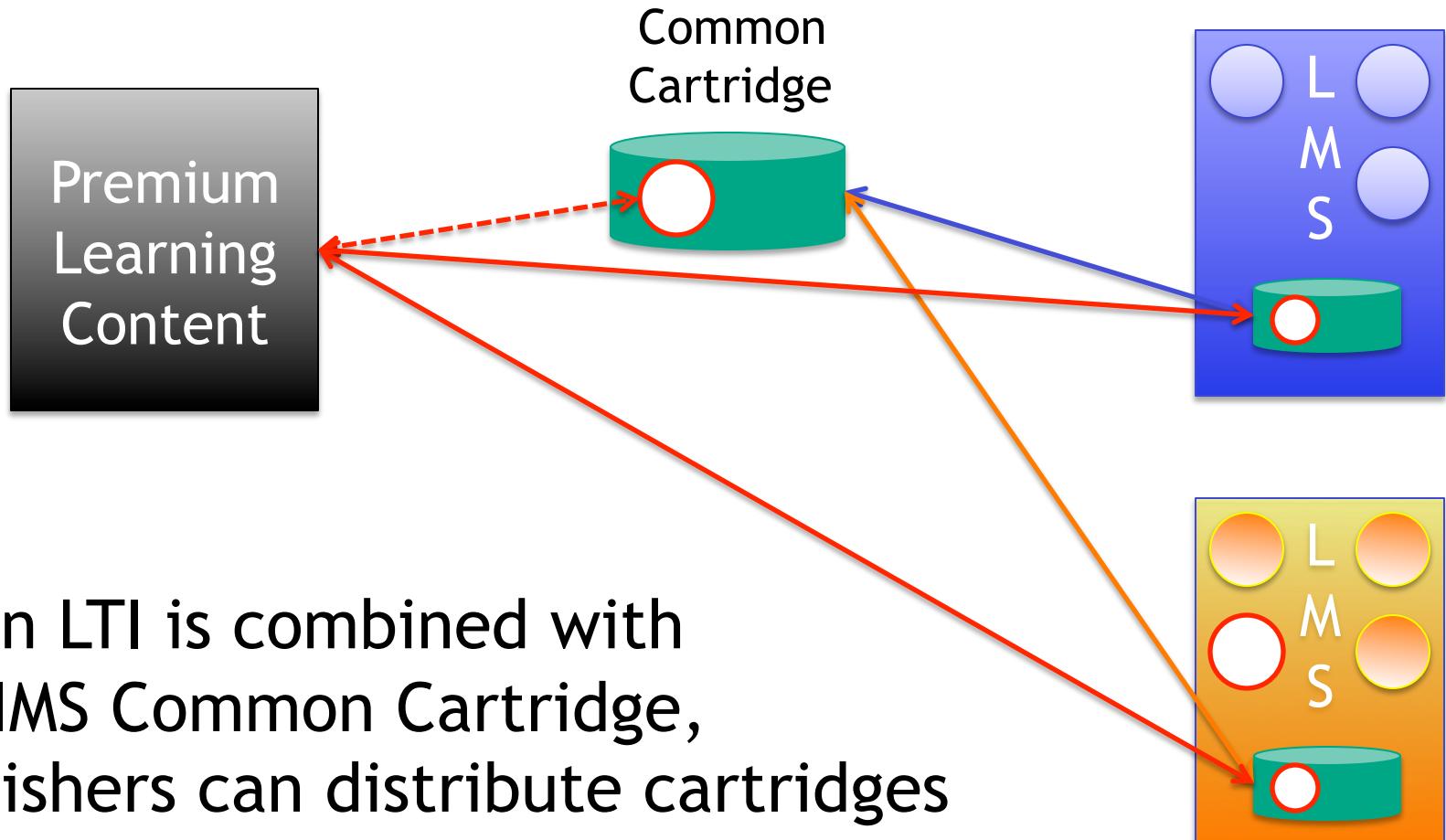
**WORDPRESS.ORG**

**NING**

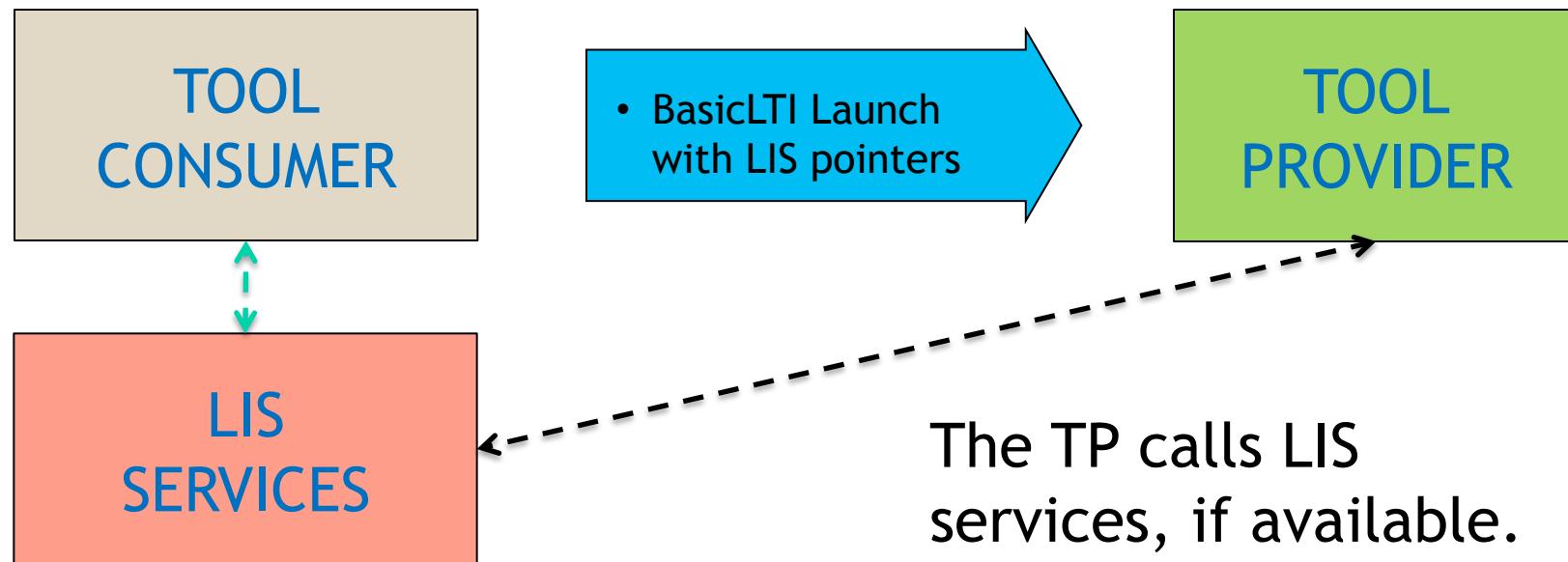
L  
T  
I



**PREMIUM  
LEARNING  
CONTENT**



# Coming: Connecting to Learning Information Services (LIS)



Planned: Educause 2010 Prototype Demo



# SimpleOutcome Launch

- Add fields to launch
  - **lis\_result\_sourcedid** - represents course, resource, gradebook, user in one id - opaque to tool
  - **ext\_ims\_lis\_simple\_outcome\_url** - Service URL
  - **ext\_ims\_lis\_resultvalue\_sourcedids** - a list of types of outcomes accepted (decimal, percentage, passfail ..)



# SimpleOutcome Service

- Service can be called any time (i.e. no session needed)
- Tool sends outcome to service as form-encoded POST data, signed by OAuth shared-secret
- **lis\_result\_sourcedid** is separately signed by the LMS which checks signature upon receipt



# LTI: Enables Innovation

- In the next 5 years, LMS systems will become increasingly enterprise critical systems
- Reliability, scalability, and consistency will rule
- That *\*could\** greatly reduce the pace of innovation
- LTI supports a model of a solid and central LMS and enables *increased* innovation



# IMS Implementation Support

- Materials, sample code, sample application
  - <http://www.imsglobal.org/developers/BLTI/>
- Additional support and certification
  - <http://www.imsglobal.org/joinims.html>



# Questions

- IMS - [www.imsglobal.org](http://www.imsglobal.org)
- cseverance@imsglobal.org

*Seamlessly  
connect  
to learning*



IMS Learning Tools  
Interoperability (LTI)

<http://www.imsglobal.org/developers/BLTI/>