



IMS GLOBALTM
Learning Consortium

IMS Learning Tools Interoperability



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IMS Global Learning Consortium (IMS GLC)

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

Thanks to John Tibbetts for the use of his LTI 2.0 slides

What is IMS LTI?

- A simple REST launch protocol that allows an externally hosted tool to be integrated into an LMS and receive course, user, and roster information as well as send grades back to the LMS.
- It gives users a seamless integration between learning tools from multiple sources



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Desire2Learn
Innovative Learning Technology



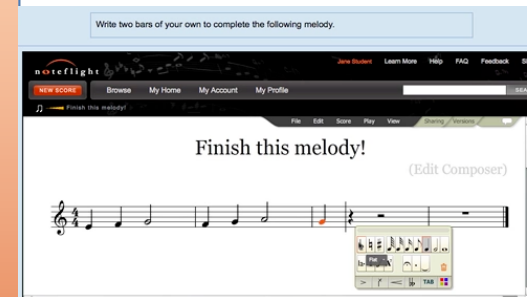
Blackboard



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PHP
Java
C#



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Everything here is IMS LTI Certified!

learning tools interoperability catalog

Use LTI tools inside these
platforms- [See what they
support](#)

click icon for more info



Blackboard



ebook tools



CourseSmart

Find and access eTextbooks
and digital course materials



CourseLoad

Delivers course materials
through any web-enabled
device



vitalsource

VitalSource

Integrated online,
downloadable and mobile
access for your e-textbooks



Barnes and Noble

Use Nook Study to read your
ebooks and texts

assessment tools



Learning.com

Web delivered curriculum and
assessments

eportfolio tools



Chalk & Wire

ePortfolio authoring,
assessment system, and data
analysis tools for students,
faculty and professional staff
in higher education and K-12



Mahara

Open source eportfolios where
you can collect, reflect on and
share your achievements
success.



Pathbrite

ePortfolios help students
collect, track and showcase a
lifetime of learning and
achievement, and
recommend pathways for continuous success.



PebblePad

Users create records of
learning, achievement, and
aspiration

specialty course tools



ChemVantage

An Open Education Resource
for General Chemistry

collaboration tools



Learning Objects

Social software for learning



LTI Plugin for Vanilla 2

Provides forum capability via a
LTI connection



Elgg

Create your own fully-featured
social networks and
applications

classroom capture/lecture tools



McGraw-Hill Tegrity

Records class time and course
content for students to watch



ALEKS

Use artificial intelligence for your assessment system



BadgeStack

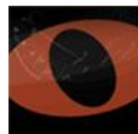
Uses a game-like approach that assesses skills, recognizes learner achievement



WebPA

Online peer assessment tool that enables every team member to recognise individual contributions to

group work



Noteflight

Online music writing application that lets you create, view, print and hear music notation



SpACE

Spatial Activities in Course Environments provides map data and related content



Toolwire

Special purpose learning content and learning environments



MyOpenMath

Online algorithmically generated math homework with auto grading of algebraic and numerical answers, with content tied to open texts.



UCertify

Online IT certification test preparation



Mediasite

Lecture capture, academic webcasting and video management for education

grading tools



Compass Learning

Gradebook and content management for K12

content creation and delivery tools



UCompass.com

Allows content publishers to enhance and modernize their existing or new content.

course help tools



Piazza

Helping students and instructors ask for and provide course help online


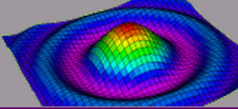


- David Lippman, Mathematics Faculty, Pierce College, Lakewood, WA
- Open Text Books, Free online problem sets
- Grants / state initiatives

MyOpenMath provided by OpenTextBookStore

Welcome	Self Study	Classroom	About Us
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About Us



MyOpenMath runs on the free, open source, [IMathAS](#) platform, providing free hosted use of this platform in support of free, open textbooks. The intent is to provide classroom use of the platform, without any added cost to students, for schools unable to host their own install of the IMathAS platform, and to provide students self-study opportunities.

Be aware that this site is community managed and provides no direct technical support to faculty or students.

MyOpenMath began with wild dream back in 2005 that it would be great to provide free online math



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forum

extensions

alliance

ims global's learning tools interoperability

righteous!

what is learning tools interoperability?

Learning Tools Interoperability (LTI) is a specification developed by [IMS Global Learning Consortium](#). The principal concept of LTI is to establish a standard way of integrating rich learning applications (often remotely hosted and provided through third-party services) with platforms like learning management systems, portals, or other educational environments. In LTI these learning applications are called Tools (delivered by Tool Providers) and the LMS, or platforms, are called Tool Consumers.

The basic use case behind the development of the LTI specification is to allow the seamless connection of web-based, externally hosted applications and content, or Tools (from simple communication applications like chat, to domain-specific learning environments for complex subjects like math or science) to platforms that present them to users. In other words, if you have an interactive assessment application or virtual chemistry lab, it can be securely connected to an educational platform in a standard way without having to develop and maintain custom integrations for each platform.

How can [Learning Tools Interoperability \(LTI\)](#) benefit me?

The IMS [LTI](#) specification provides significant benefits for all parties involved in [developing](#), [deploying](#) and [utilising](#) learning applications. It provides a standard mechanism for [launching](#) external tools which is supported by all major [virtual learning environments](#) (VLEs) as well as other educational systems. [LTI 1.1](#) adds the ability to pass [grades](#) back to the [VLE](#) and the IMS is continuing to develop the specification further. In the meantime some unofficial extensions have been widely adopted to give tools access to an [enrolment list](#) and a simple [data store](#).

Hey, this is great,

This is way better;
no more separate logins.

what's going on here?

IMS Global created this website to give developers and end-users the opportunity to learn more about Learning Tools Interoperability. Our goal is to create a public LTI community where users can learn, share information and help spread the word about LTI's righteousness!

want even more?

Join the [IMS Common Cartridge/ Learning Tools Interoperability Alliance](#) to stay ahead of the curve. You will get access to the latest drafts and updates, tools, sample code, the ability to apply for conformance certification, and personalized support.

show me the tools



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Technical Overview of LTI 1.1



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Advancing Learning Impact by Enabling the Open Foundation for
Seamless, Agile and Information-Rich Educational Technology Integration

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Learning Tools Interoperability

IMS is developing [Learning Tools Interoperability \(LTI\)](#) to allow remote tools and content to be integrated into a Learning Management System (LMS). **Note that Basic LTI and LTI have been combined into just Learning Tools Interoperability.**

Version 1.1.1 - Final Specification (revised 29 August 2012)

The 29 August 2012 revision corrects the Appendix section B.5 sample launch code. Version 1.1.1 of LTI adds support for the role_scope_mentor launch parameter.

IMS Learning Tools Interoperability Specification - Version 1.1.1 Final Specification - HTML

[Learning Tools Interoperability v1.1.1 Final Implementation Guide](#)

IMS LTI Specification - Version 1.1.1 Final Specification - PDF

[Download all the pdf and other support documents](#)

More Information

[Common Cartridge & Learning Tools Interoperability Alliance Website Login](#)

[LTI v1.0 Conformance Testing](#) (For Members, Affiliates and Alliance Participants)

[LTI v1.1 and LTI v1.1.1 Conformance Testing](#) (For Members, Affiliates and Alliance Participants)

[Join the Common Cartridge & Learning Tools Interoperability Alliance Online](#)

[Learning Tools Interoperability](#)

[Check out the LTI Developers Website](#)

[Common Cartridge & Basic LTI Implementation Chart](#)



LTI 1.0 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



OAUTH

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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.



LTI 1.1 Additional Launch Data

lti_version=LTI-1p0

lti_message_type=basic-lti-launch-request

oauth_consumer_key=lmsng.school.edu

resource_link_id=120988f929-274612

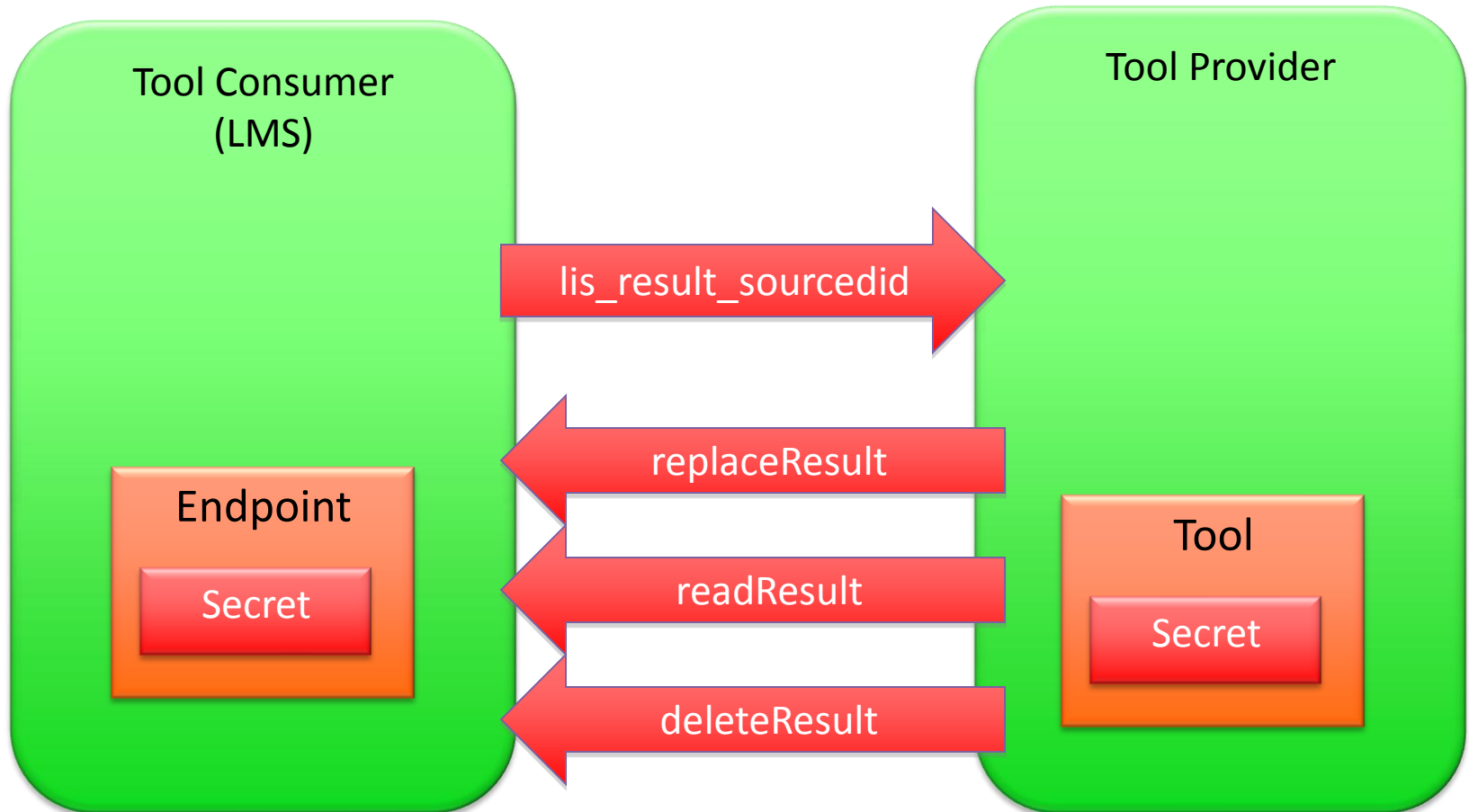
user_id=292832126

roles=Instructor

context_id=456434513

lis_result_sourcedid=8387364783687634

lis_outcome_service_url=http://localhost/outcome.php



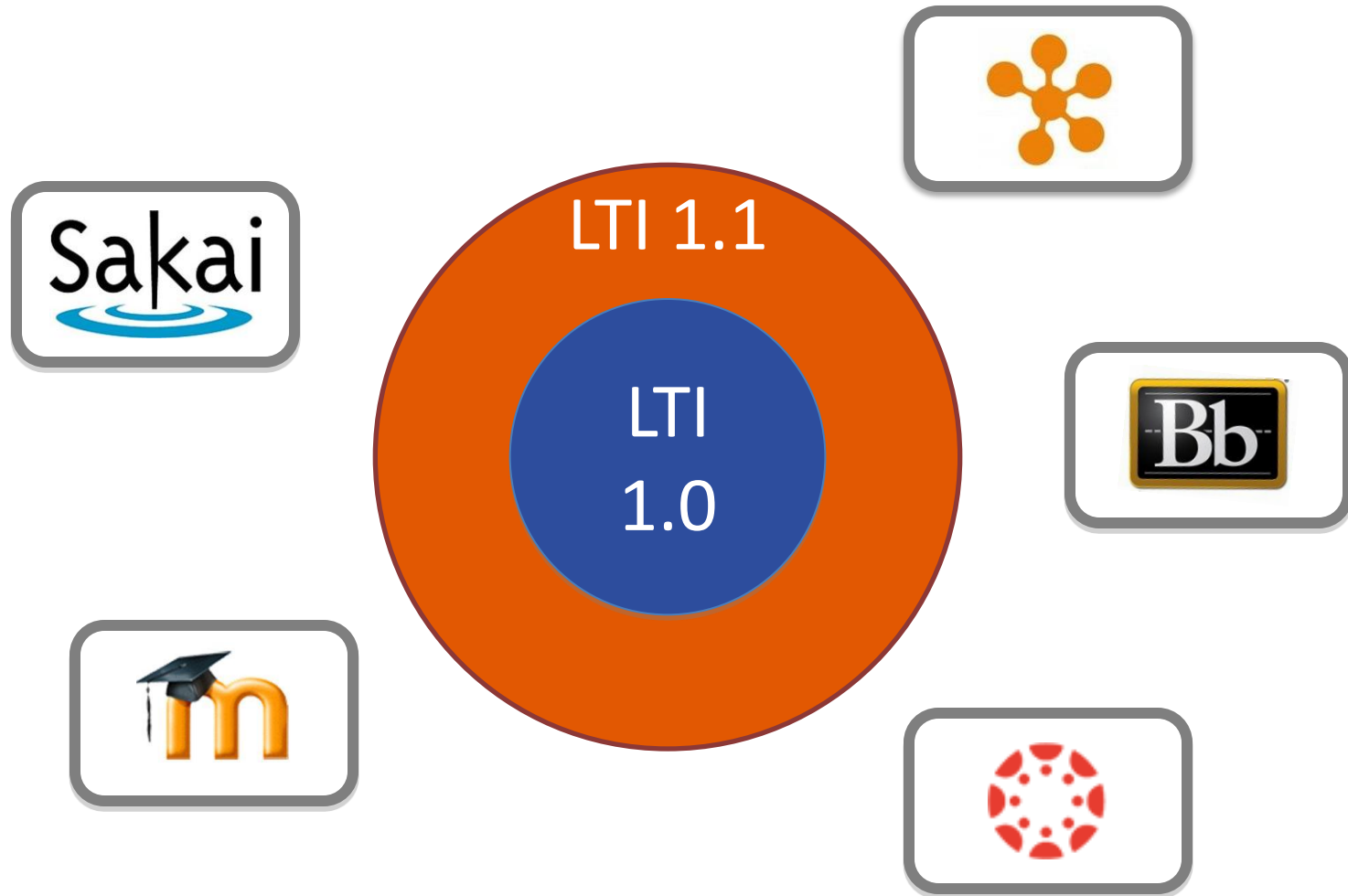


LTI 1.1 Summary

- Implemented and shipped in all the major LMS out of the box
- Many extensions growing up around LTI 1.1
- New LMS Efforts simply assume LTI
 - Canvas
 - Stanford's Class2Go



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Learning Tools Interoperability 2.0

New Architecture for New Needs

LTI 2.0—Driven by Need

- LTI 1x accepted in marketplace and widely adopted.
- But many LTI adopters need increased functionality.
- Market forces driving requirements:
 - Smarter tools
 - Dynamic messages and updates
 - Much richer outcome support
 - Smoother user and administrator experience: auto-registration

Especially: **Easier and quicker to extend and improve**

Richer Service Model

- Need more than a simple “Launch + Grade”
 - Need true “Function” service model
 - True interoperability of launched object
 - Need two way communication: TC < -- > TP
 - Need event streams in either direction



Next Round Functionality

- Need simpler even automated deployment
 - Minimize out-of-band communication to set up new partner
- Richer outcome support
 - Need many outcomes per request
 - Need richer outcome data structure, not just number
- Other extended core features
 - Tool settings
 - Menu items



Architecture for Expansion

- LTI needs architecture to support ‘incremental evolution’
 - Currently LTI 1x feature expansion requires changing the whole adapter
 - Imagine a pluggable architecture for LTI
 - New functionality can be added without changing the core
 - Extensions can be created and tested in a earlier version
 - Tactical, version-specific extensions can be accommodated

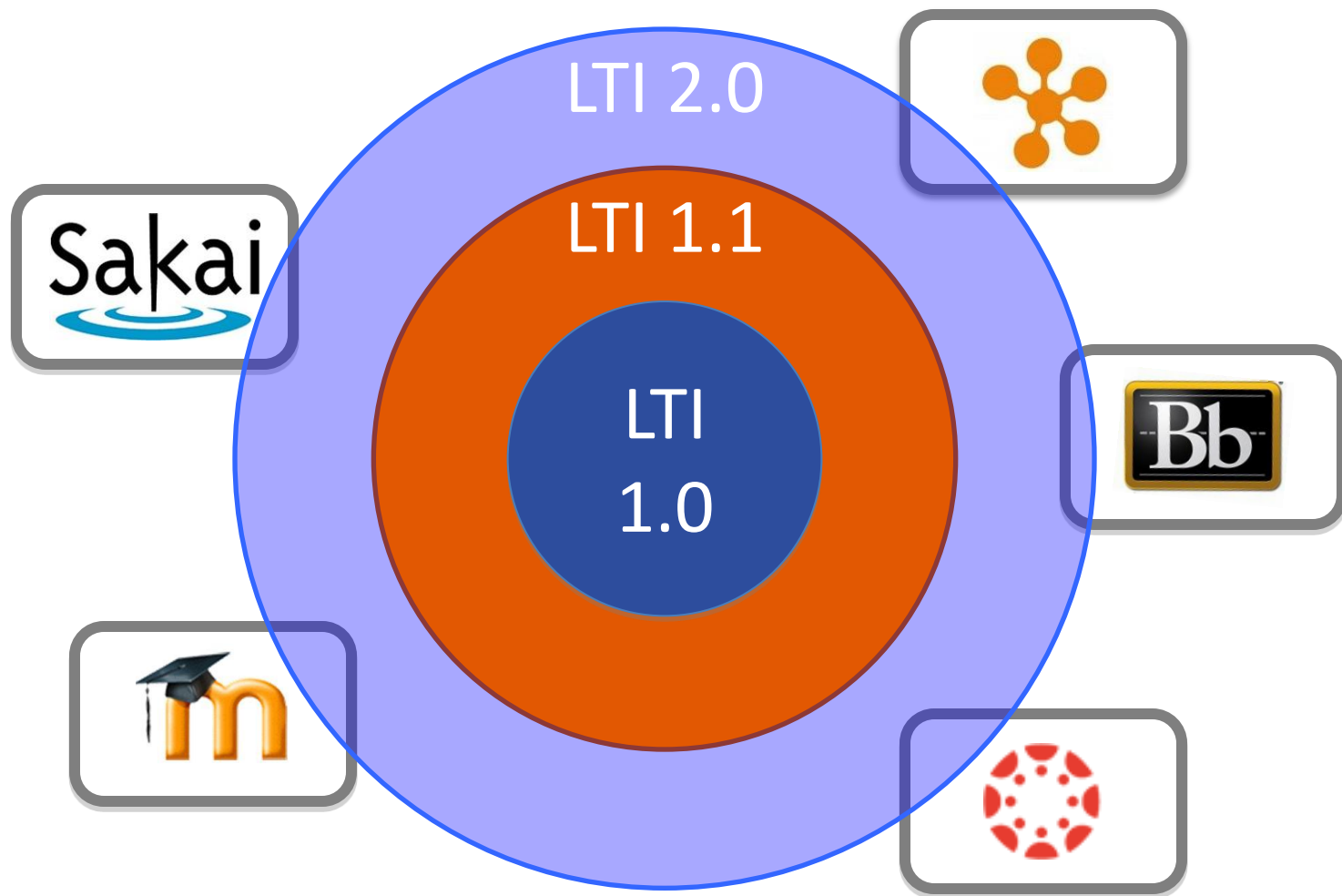


LTI 2 Architectural Elements

- Develops general approach for REST interface
- Resource definitions from REST level 3
- JSON for Data Interchange
- Mechanisms to discover and configure services dynamically
- Smooth path from proprietary extension to standard extension

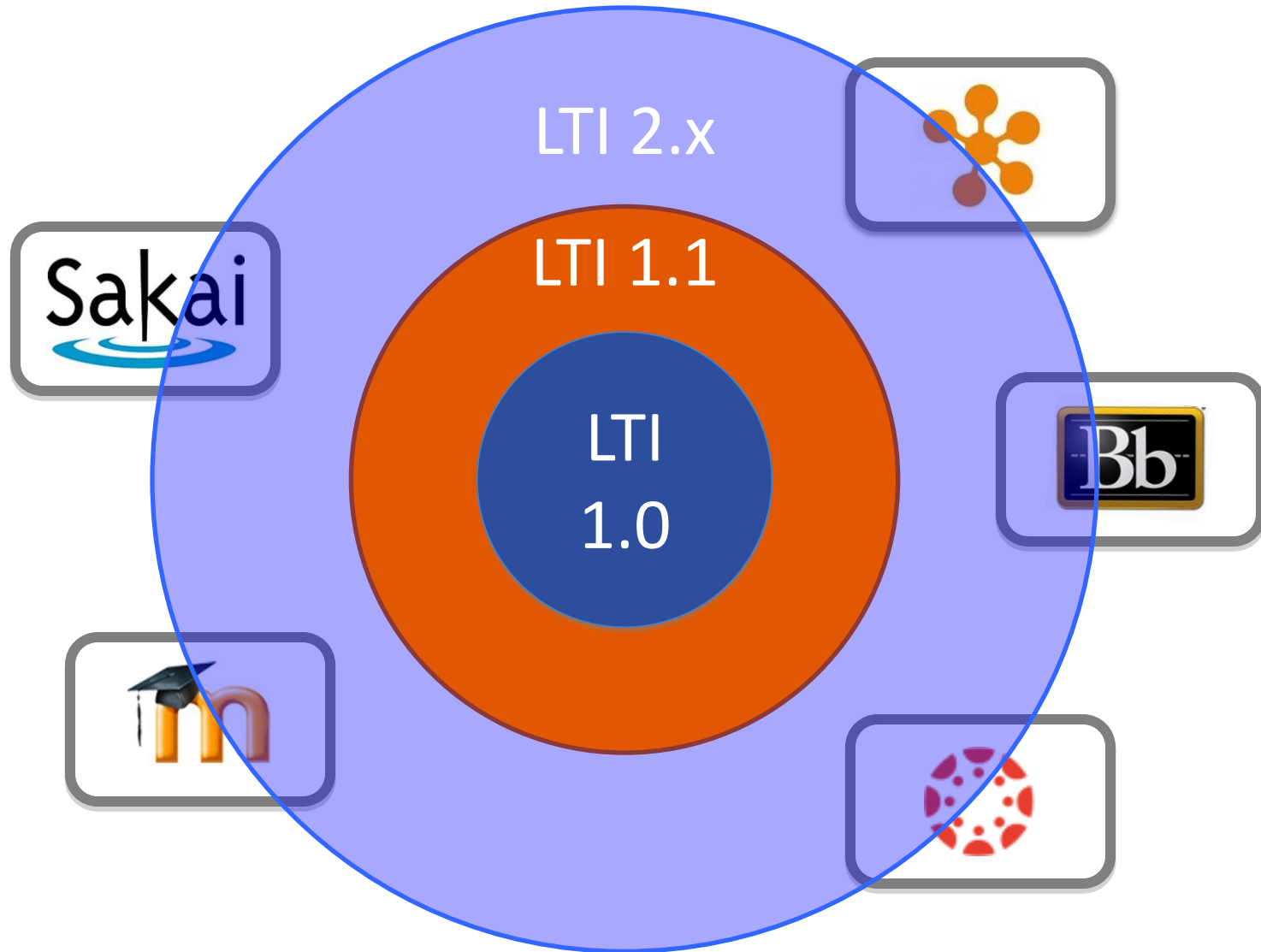


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Looking Forward

- As LTI 2.x moves forward a number of richer use cases are enabled
 - Application Store for Education
 - Deep publisher integration – searching / resources
 - Learning Object Repositories
 - Rich and expandable outcomes
- We can do this together as an industry