

EDUPUB introduction: Melding IMS Education Interop Standards with EPUB3

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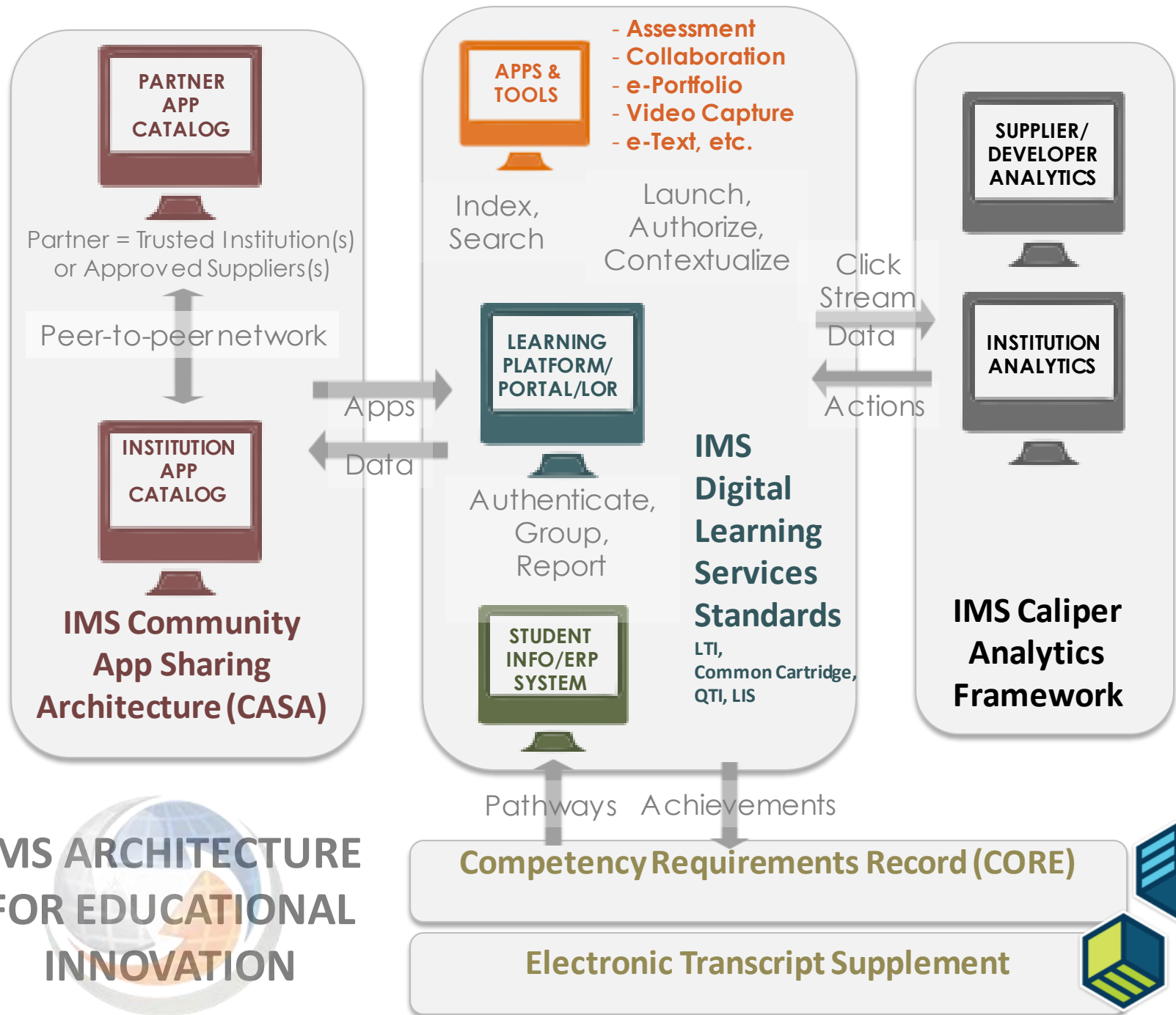
<http://www.imglobal.org/>
<http://www.imglobal.org/edupub/index.html>

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IMS Context



IMS ARCHITECTURE FOR EDUCATIONAL INNOVATION



Learning Platforms that Accept IMS Apps!

<http://imscatalog.org/>

campuscruiser



Blackboard



Sakai



e-med



UniServity



NovoED

SAFARI
MONTAGE™

Google

edX



canvas
BY INSTRUCTURE



OpenClass™



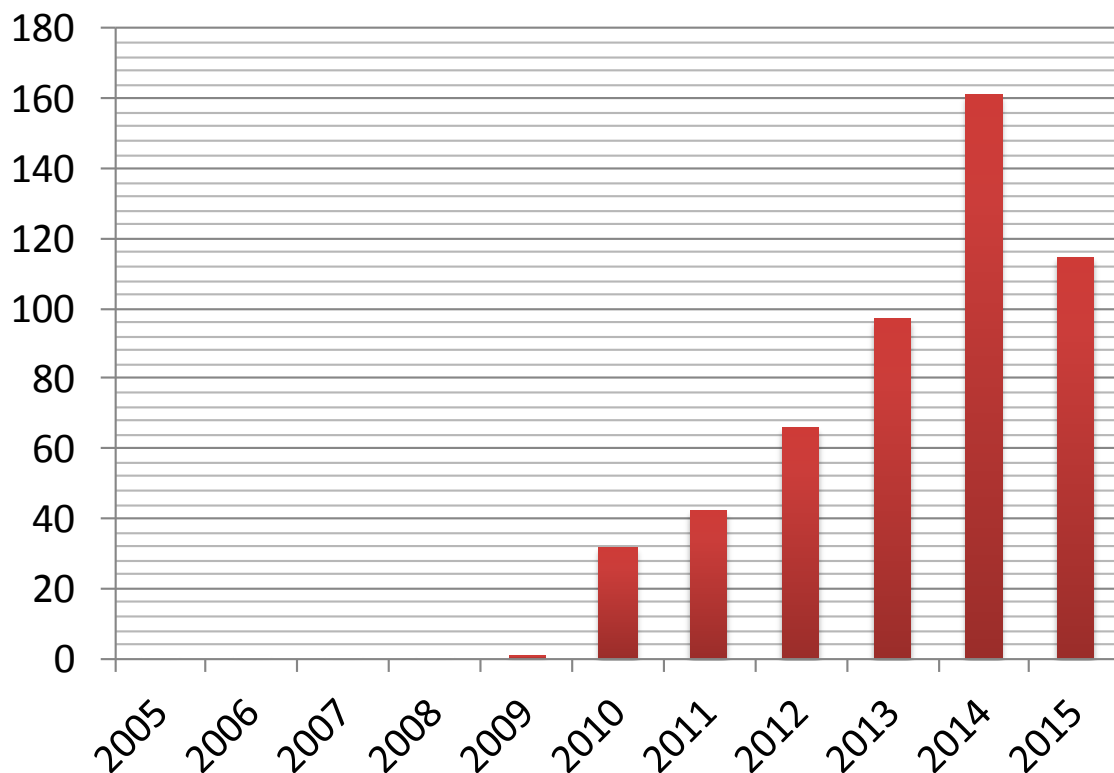
Bisk
BISK EDUCATION

its

EQUELLA®
PEARSON

ATutor

IMS Global Conformance Certification Growth



■ New Conformance
Certifications Granted
During Year

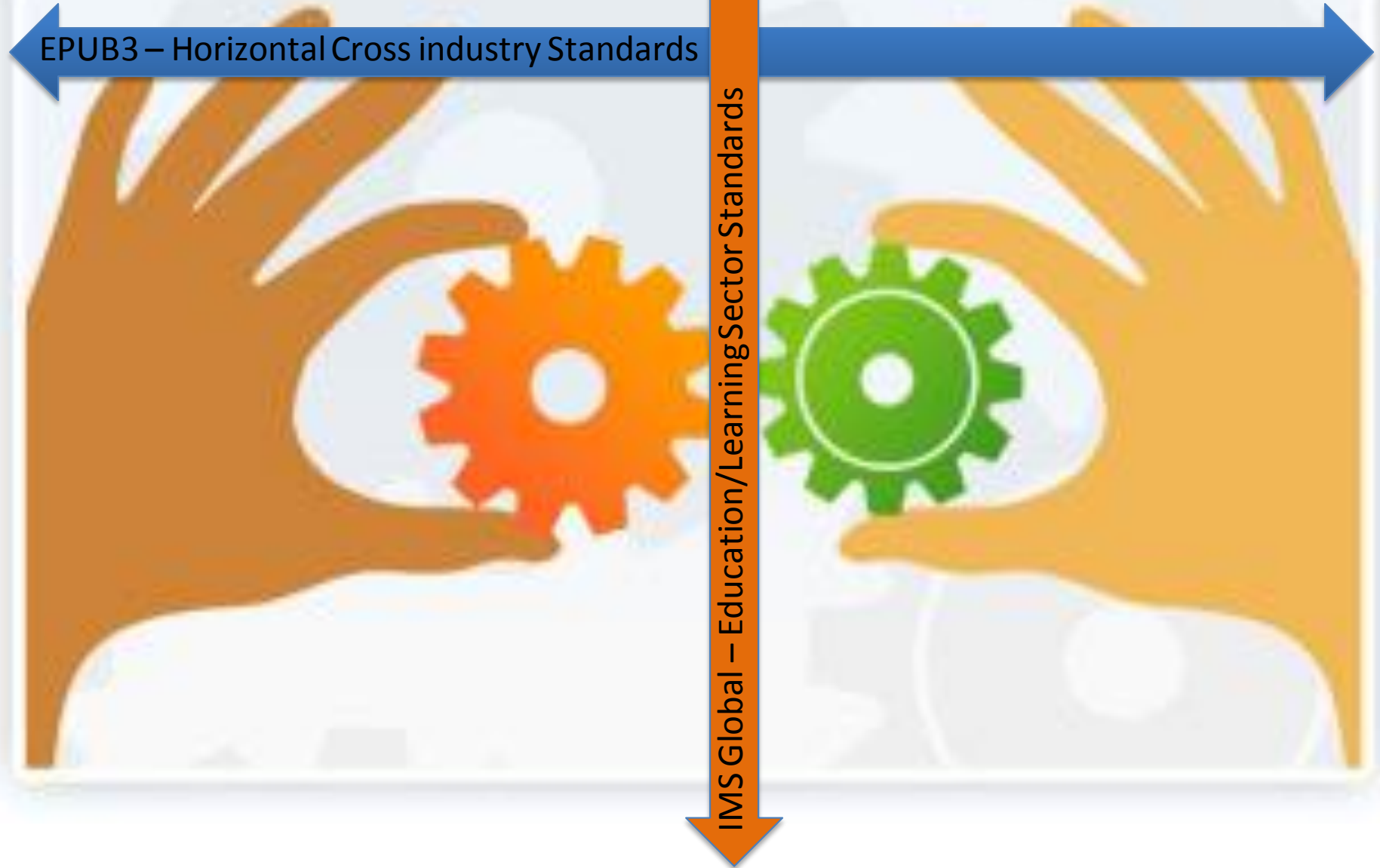
2105 to date only

IMS GLOBAL®



Current Registrations:
imscert.org

High Level Perspective on EDUPUB



EDUPUB IMS Best Practices Doc

TRADEMARK NOTICE
ACKNOWLEDGEMENTS
1 INTRODUCTION
2 ARCHITECTURAL FRAMEWORKS
3 EPUB3 AND LEARNING TOOLS INTEROPERABILITY V1.X
4 EPUB3 AND CALIPER
5 EPUB3 AND QUESTION & TEST INTEROPERABILITY
APPENDIX A – TERMS & DEFINITIONS
APPENDIX B – ANNOTATED LTI/EDUPUB EXAMPLES
APPENDIX C – ANNOTATED CALIPER/EDUPUB EXAMPLES
APPENDIX D – ANNOTATED EMBEDDED QTI/EDUPUB EXAMPLE
APPENDIX E – METADATA IN EDUPUB
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Advancing Learning Impact by Enabling the Open Foundation for
Scalable, Agile and Information-Rich Educational Technology Integration

Using IMS Caliper Analytics™, Question and Test Interoperability™ and Learning Tools Interoperability™ with EPUB3™: EDUPUB Best Practices

Title: Using IMS Caliper, Question & Test Interoperability (QTI) and Learning Tools Interoperability (LTI) with EPUB3: EDUPUB Best Practices

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Summary: This document presents the best practice recommendations for using IMS Learning Tools Interoperability™ (LTI™), IMS Caliper Analytics™ and IMS Question & Test Interoperability™ (QTI™) based content within an EPUB3 context. These form a key part of the EDUPUB standard. Examples of these best practices are presented using the Readium open source EPUB3 reader but are generally applicable to other EPUB3 readers provided they follow the conformance requirements.

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The IMS Global Learning Tools Interoperability (LTI), Accessible Portable Item Protocol (API), Question and Test Interoperability (QTI), Common Cartridge (CC), Access For All (AFA) Caliper Analytics and Sensor API are trademarks of IMS Global Learning Consortium, Inc. in the United States and/or other countries.

EDUPUB IMS Work Summary

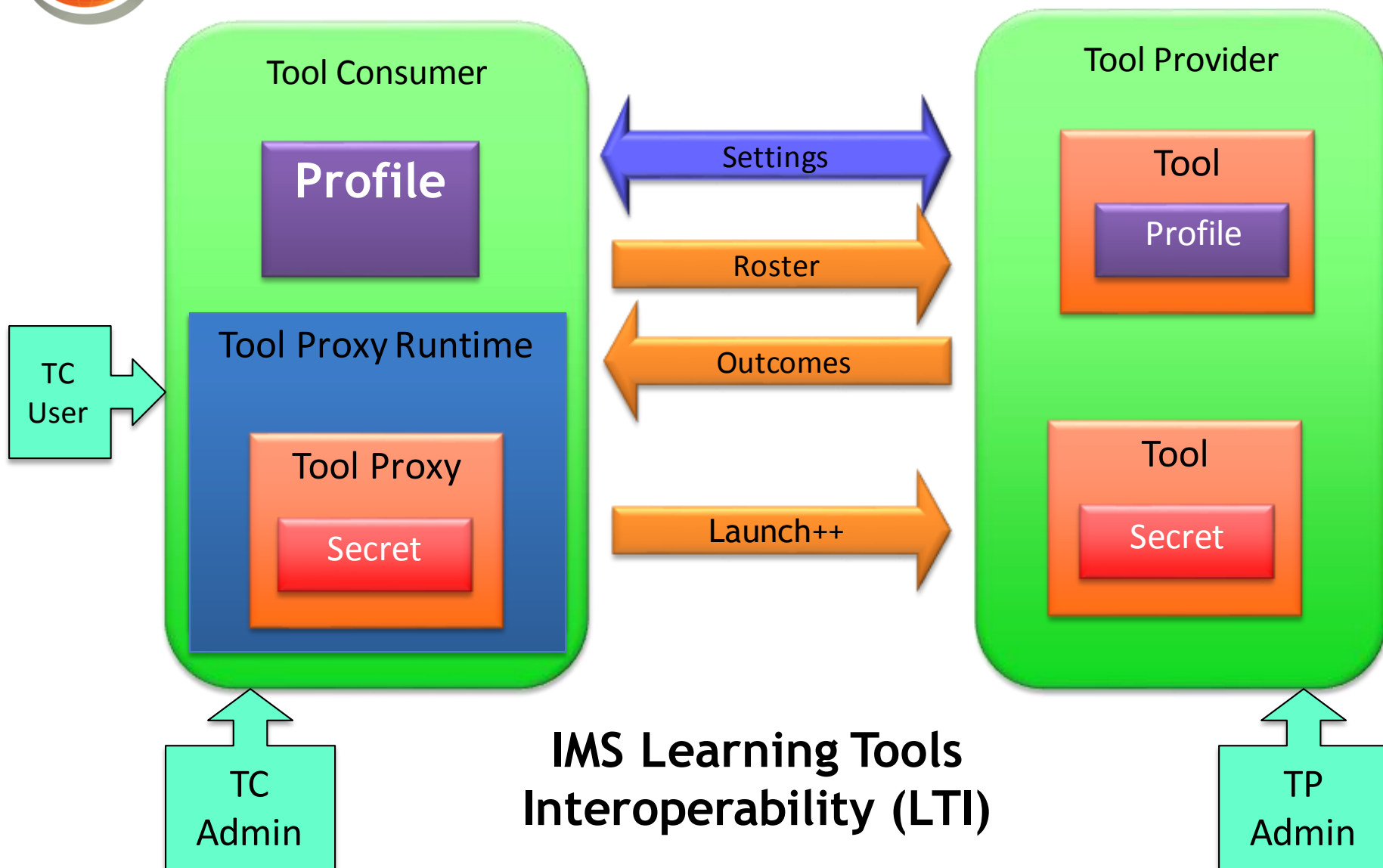
Initial best practices doc and code base (using Radium) published:

<http://www.imsglobal.org/edupub/index.html>

- LTI enablement
- Caliper analytics enablement
- QTI enablement

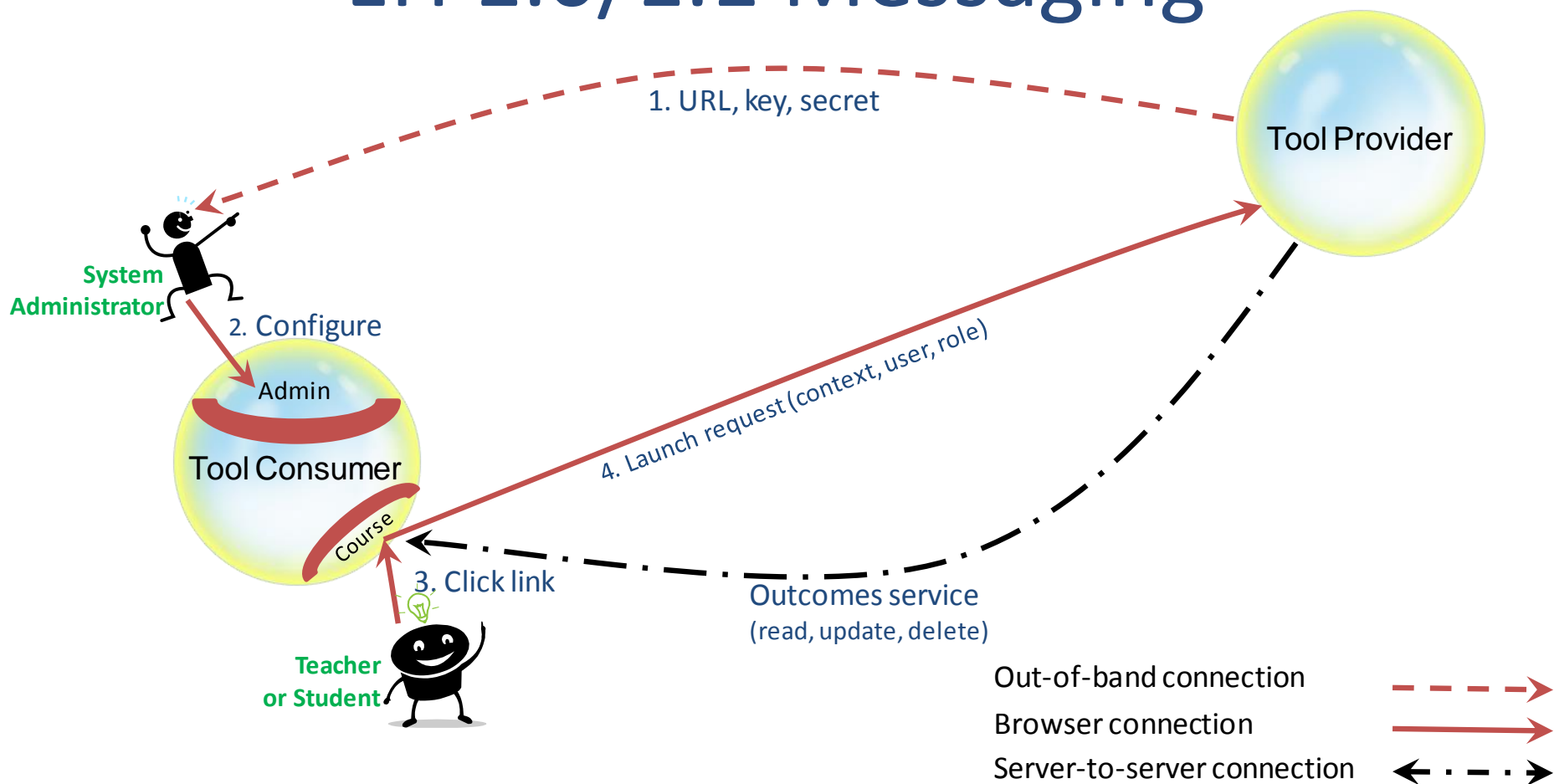
Learning Tools Interoperability

- To enable Remote Tools and Content to be easily integrated into, and accessed from, an LMS (**not limited to LMSs**)
- Several versions now available to support evolving requirements
- Key concepts are the:
 - Tool Provider (TP) and Tool Consumer (TC)



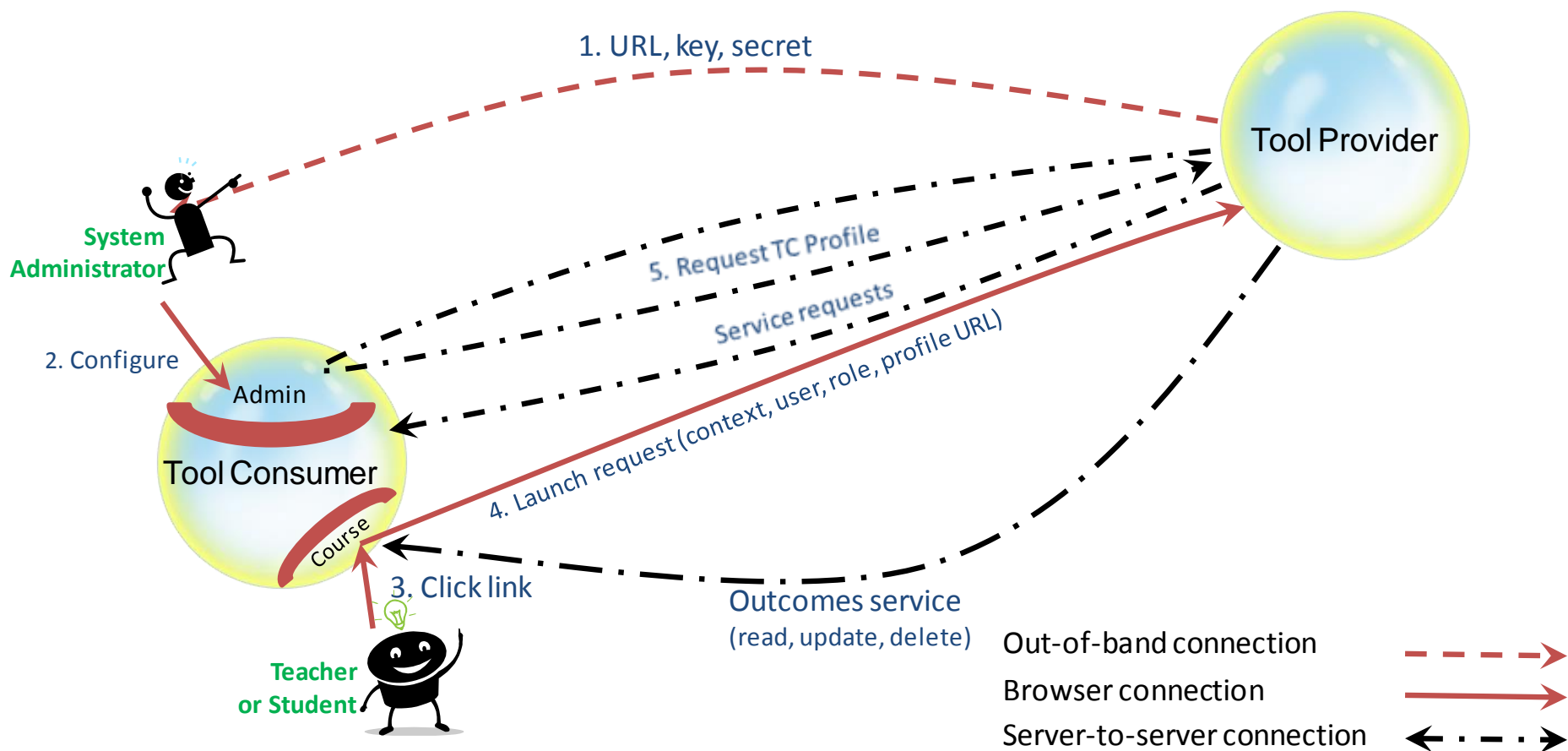


LTI 1.0/1.1 Messaging





LTI 1.2 Messaging

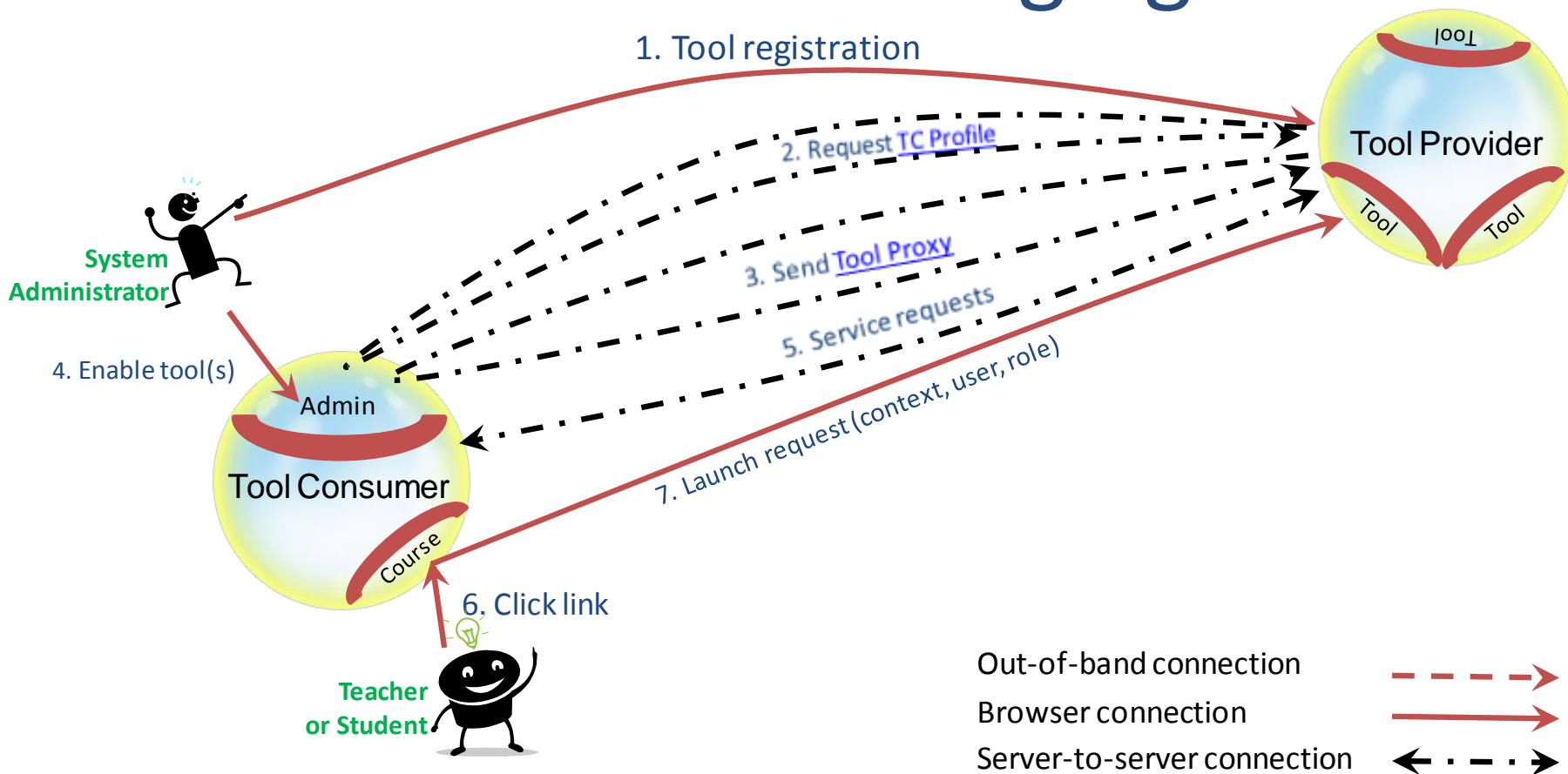


Learning Tools Interoperability v2.0

- LTIv2.0 is LTIv1.0 on steroids!
 - Now a platform for supporting the entire lifecycle of a tool with:
 - Service discovery
 - An extensible service framework (core+custom)
 - Uses REST/JSON-LD as the binding form
- An excellent tutorial is available at
 - <http://developers.imsglobal.org/tutorials.html#lti2>



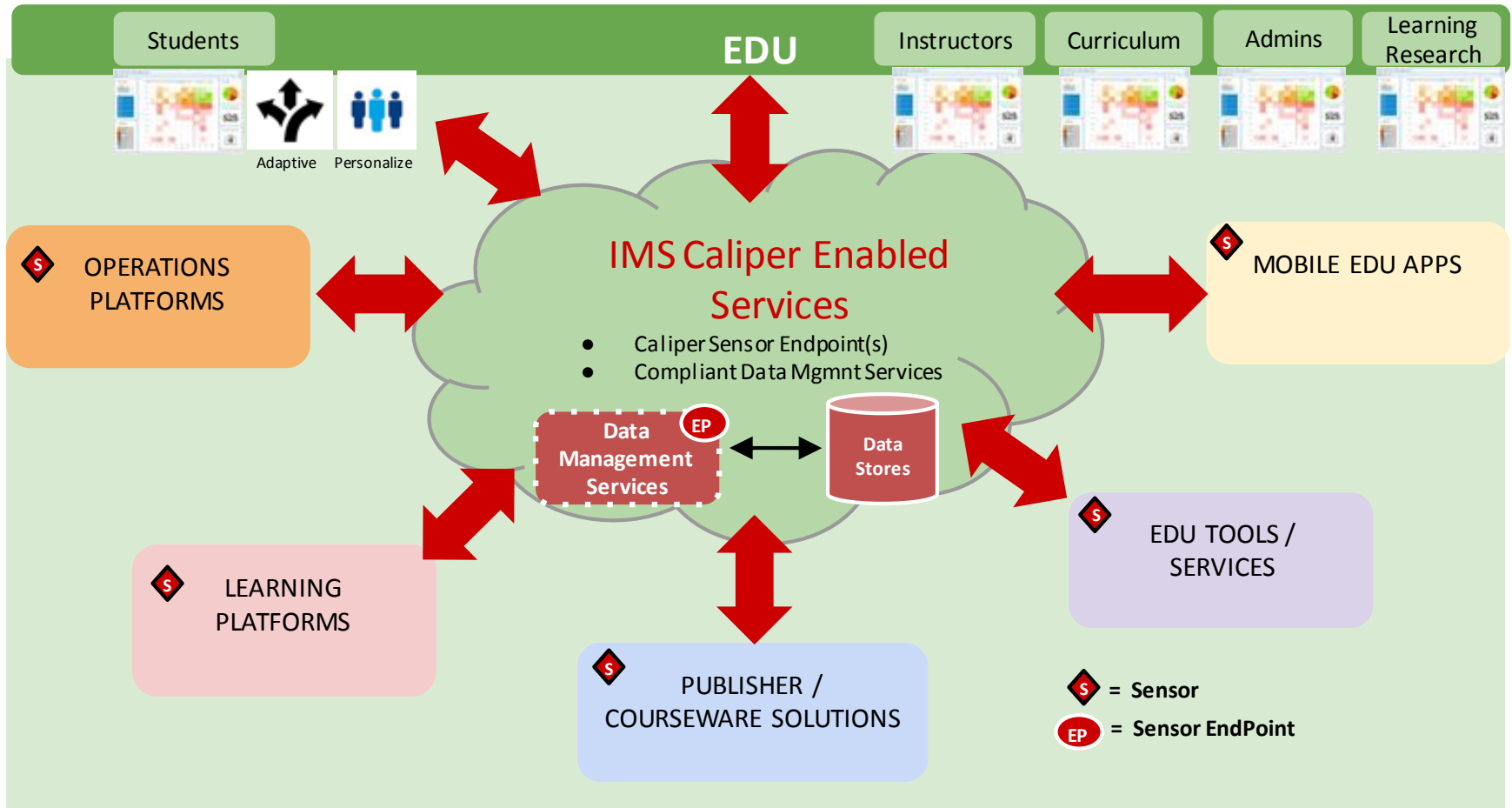
LTI v2.0 Messaging



Comparison of LTI Versions

Feature	LTI 1.0	LTI 1.1	LTI 1.2	LTI 2.0	Comment
Basic Launch	X	X	X	X	LTI2 reduces optional data requirements
Simple Outcomes		X	X	X	Return single numeric value.
TC Profile			X	X	Metadata for the TC's available services.
Tool Proxy				X	Metadata for the TC/TP interface contract.
Credential Management				X	Automatic secure exchange of key/secret.
Registration Flow				X	TC initiated new tool provisioning.
Model-Driven Doc			X	X	Tool generated docs from UML.
REST Services			X	X	LTIv1.2 limits REST to TC only.

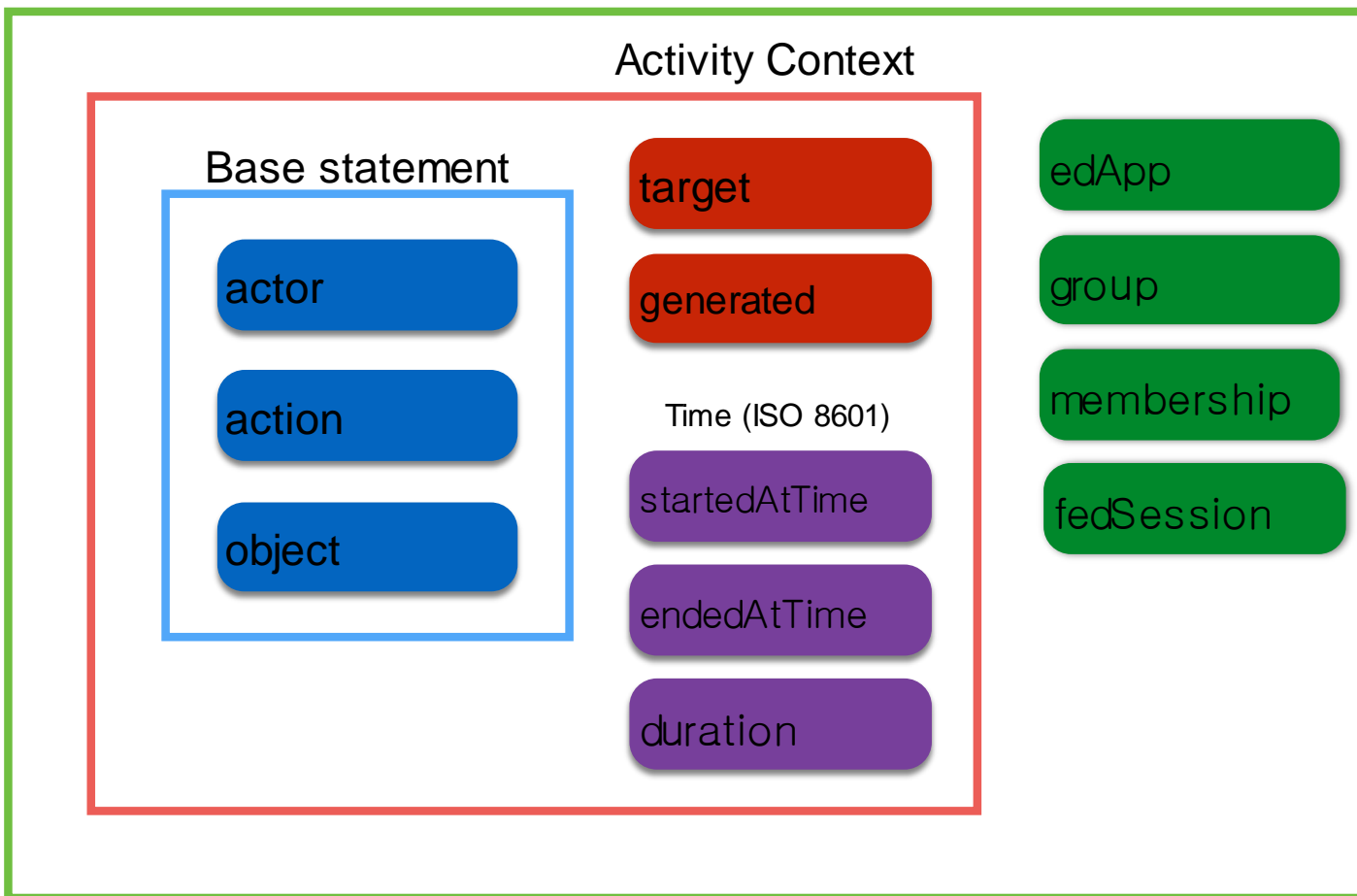
Caliper Learning Analytics Ecosystem



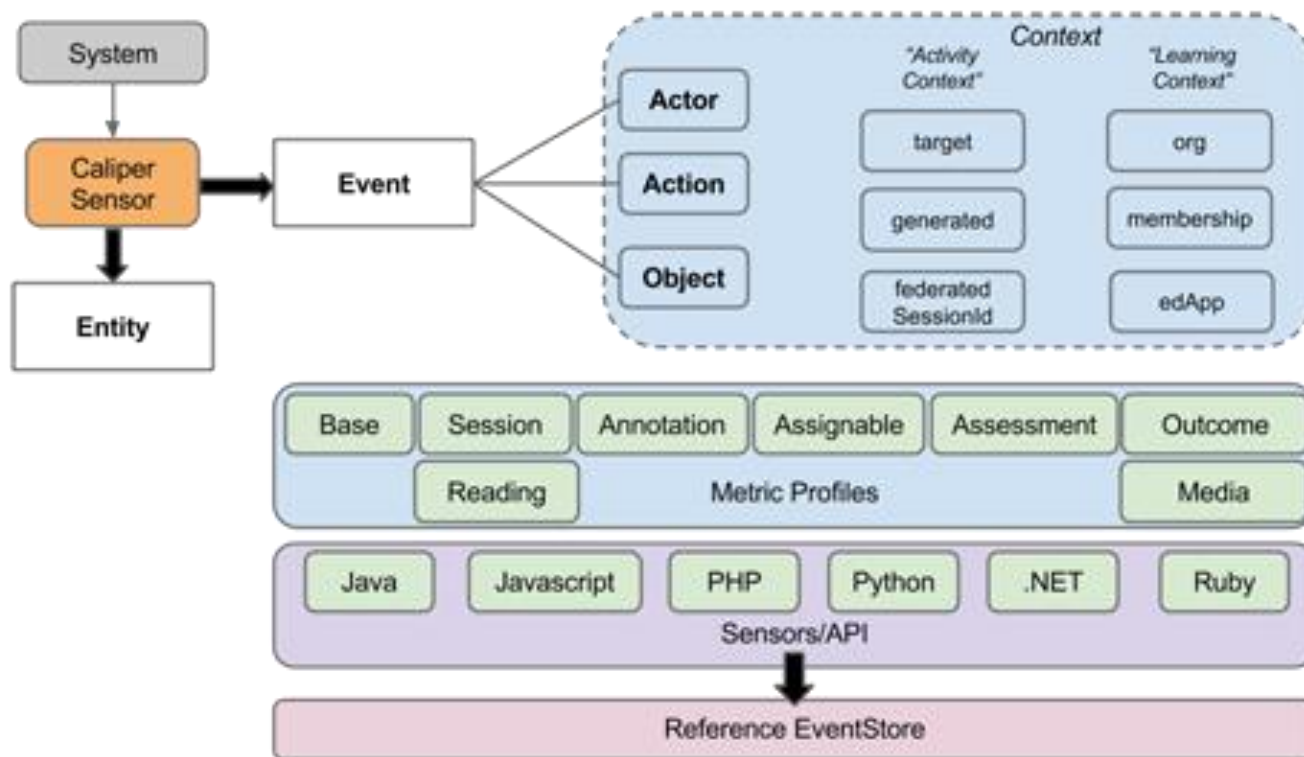


Caliper event

Learning Context



IMS Caliper: Click Stream Data for Learning Analytics



Why Caliper?

Standardization: encourage a common, extensible yet structured approach to describing, collecting and transporting learner interaction data for later consumption by researchers, educators, platforms, apps and services.

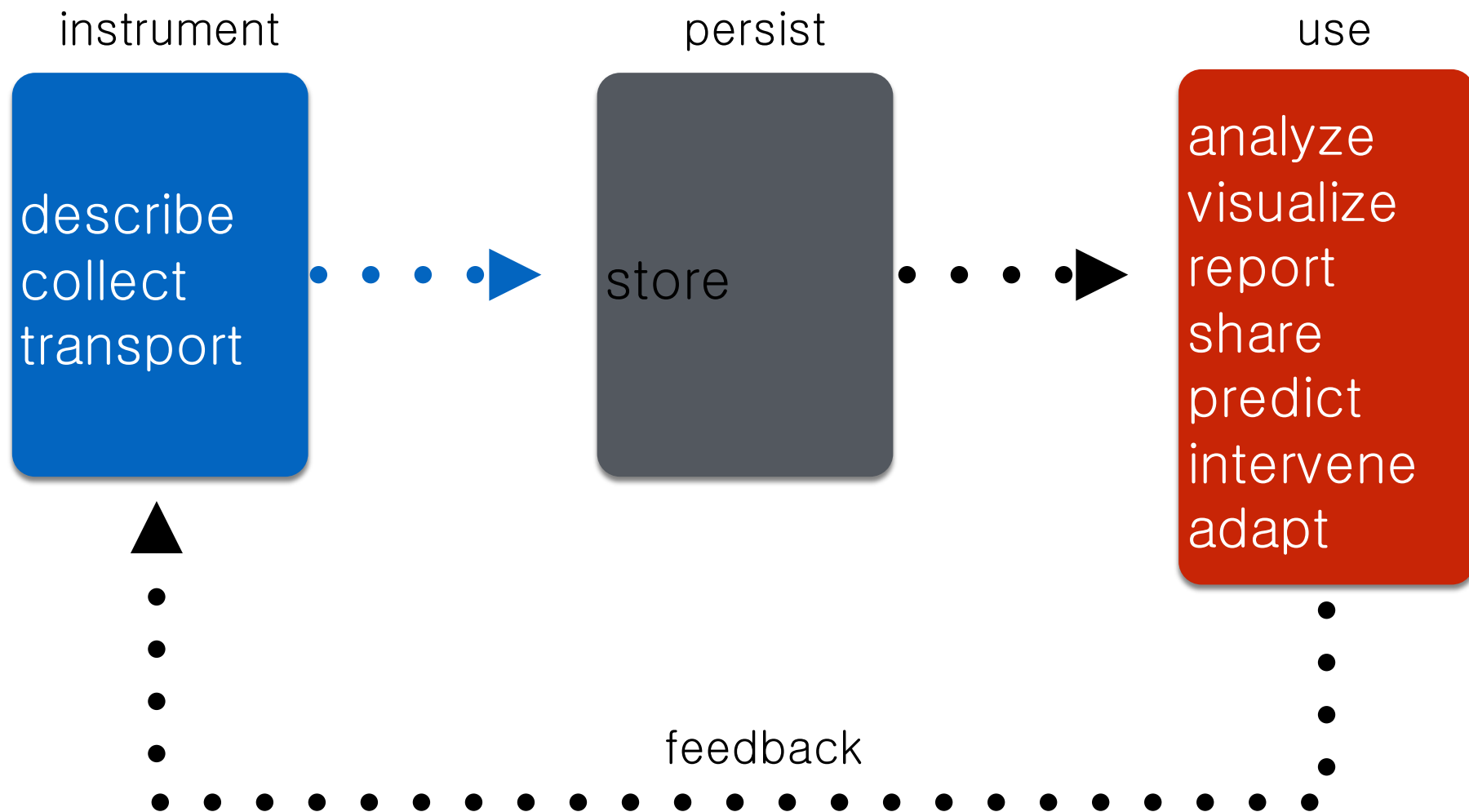
Innovation: provide a extensible data model, controlled vocabularies and an API that enables new uses of learner interaction data.

Interoperability: promote data exchange, sharing, mashups between systems, institutions and people.

Stewardship: evolve an EDU-optimized technical specification under the auspices of IMS Global and its member institutions and organizations.

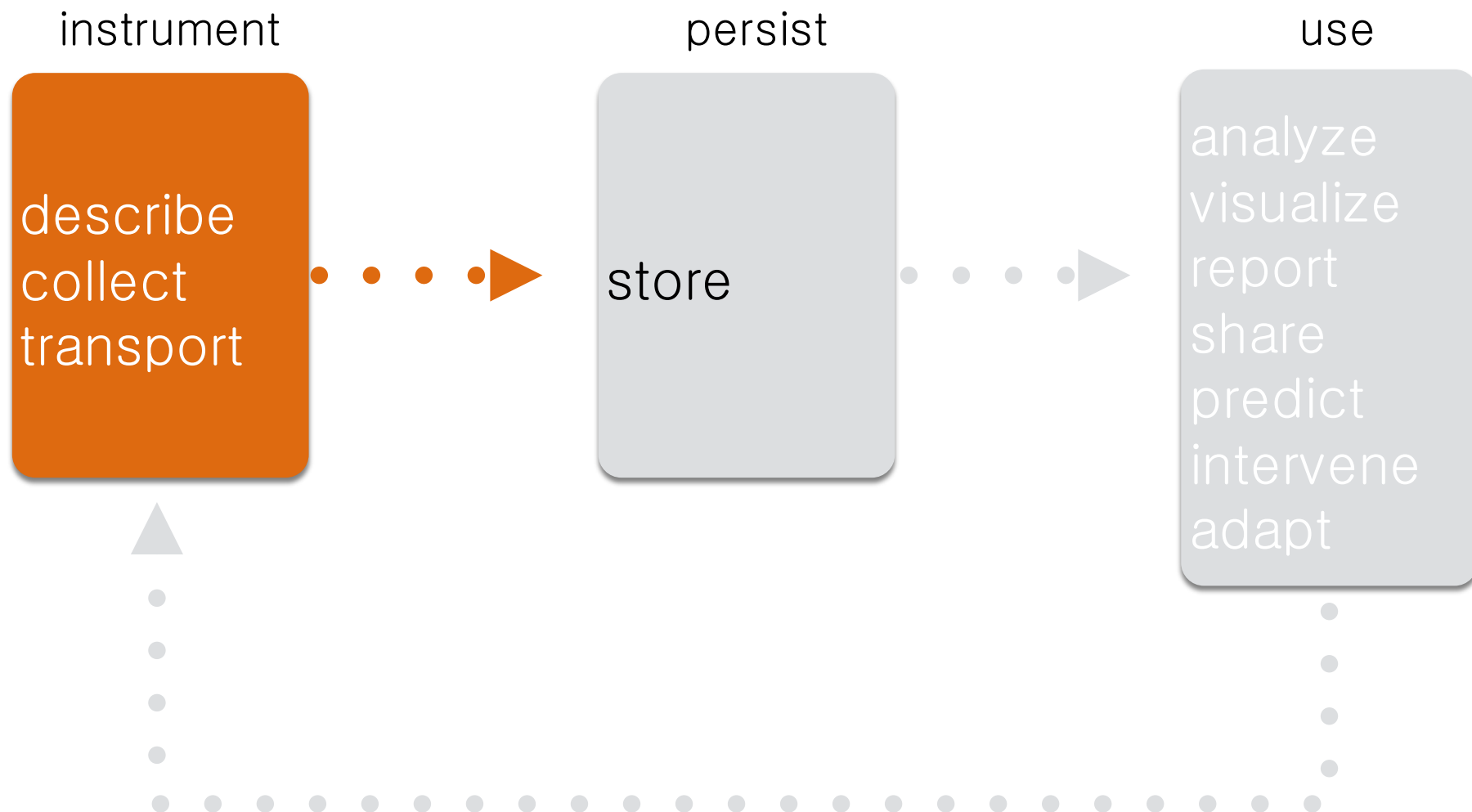


Scope: Caliper





Scope: Caliper 1.0



Caliper fundamentals

Information model: standardized set of learning activity profiles & controlled vocabularies that extend set of foundational metrics.

API: governs the interactions between Caliper, apps, platforms, services, event store(s).

Sensor: code library designed to simplify instrumentation of platforms/apps/services. Multiple bindings: Java, JS, Ruby, Python, PHP, .Net.

Conformance: test suite ensuring implementation compliance.

Dev community: docs, presentations, bootcamps, reference implementations.

The Sensor API

- API Methods
 - initialize () – initialise the API
 - description (id, time, context) – send the learning context information
 - measure (id, time, event) – send the caliper event data
- Technology base
 - REST/JSON-LD

Sensor API & Metric Profiles

- Defining the set of Caliper Events for some MPs
- Current set of MPs being defined are:
 - Reading - reading textual content
 - Assessment - undertaking a test or quiz
 - Annotation - annotating content
 - Performance – grading/scoring of some content
 - Media – interaction with video/audio systems



Caliper code repos (Github)

sensors

caliper-java

caliper-js

caliper-ruby

caliper-python

caliper-php (includes
example)

caliper-net

support

caliper-contexts

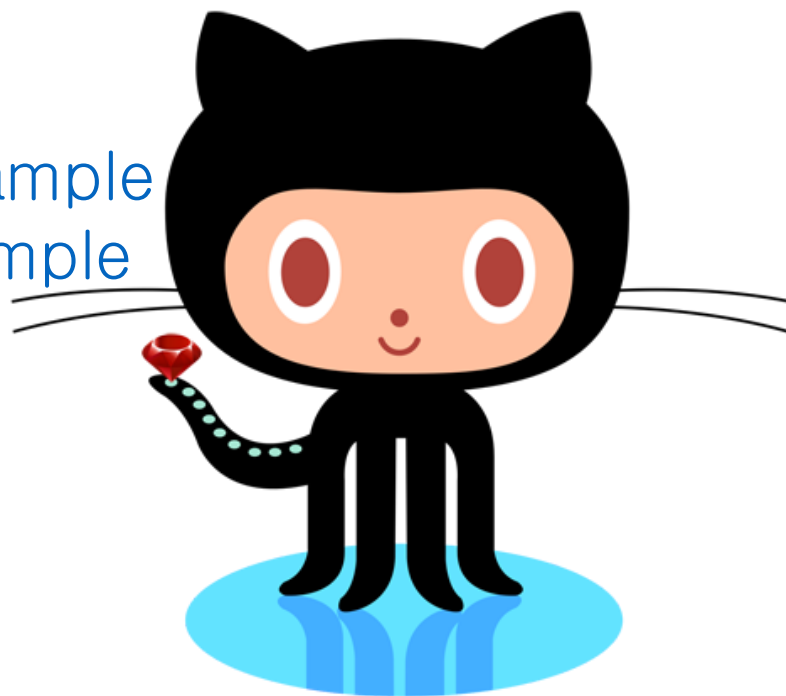
caliper-conformance

caliper-common-fixtures

sample code

caliper-java-example

caliper-net-example

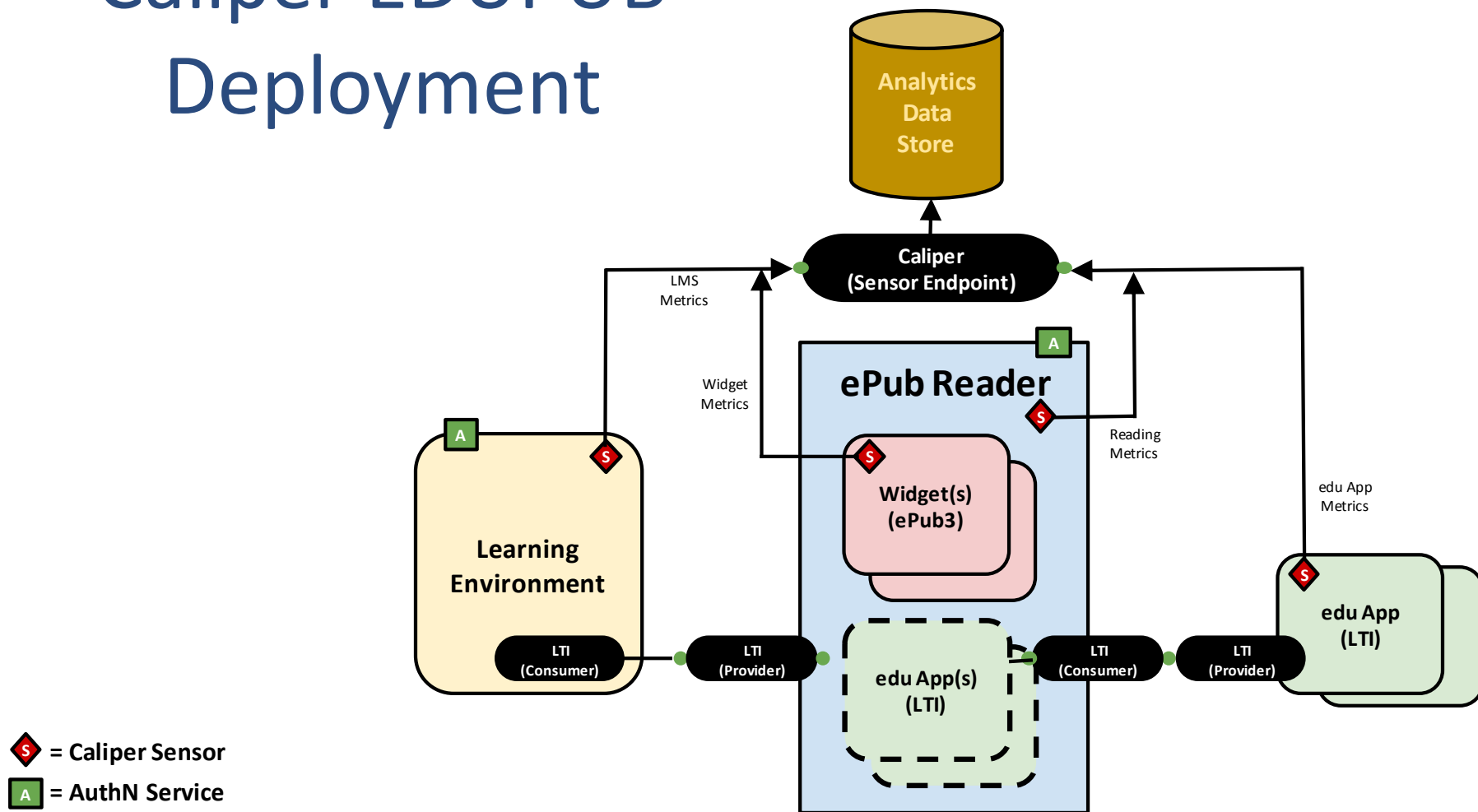


future?

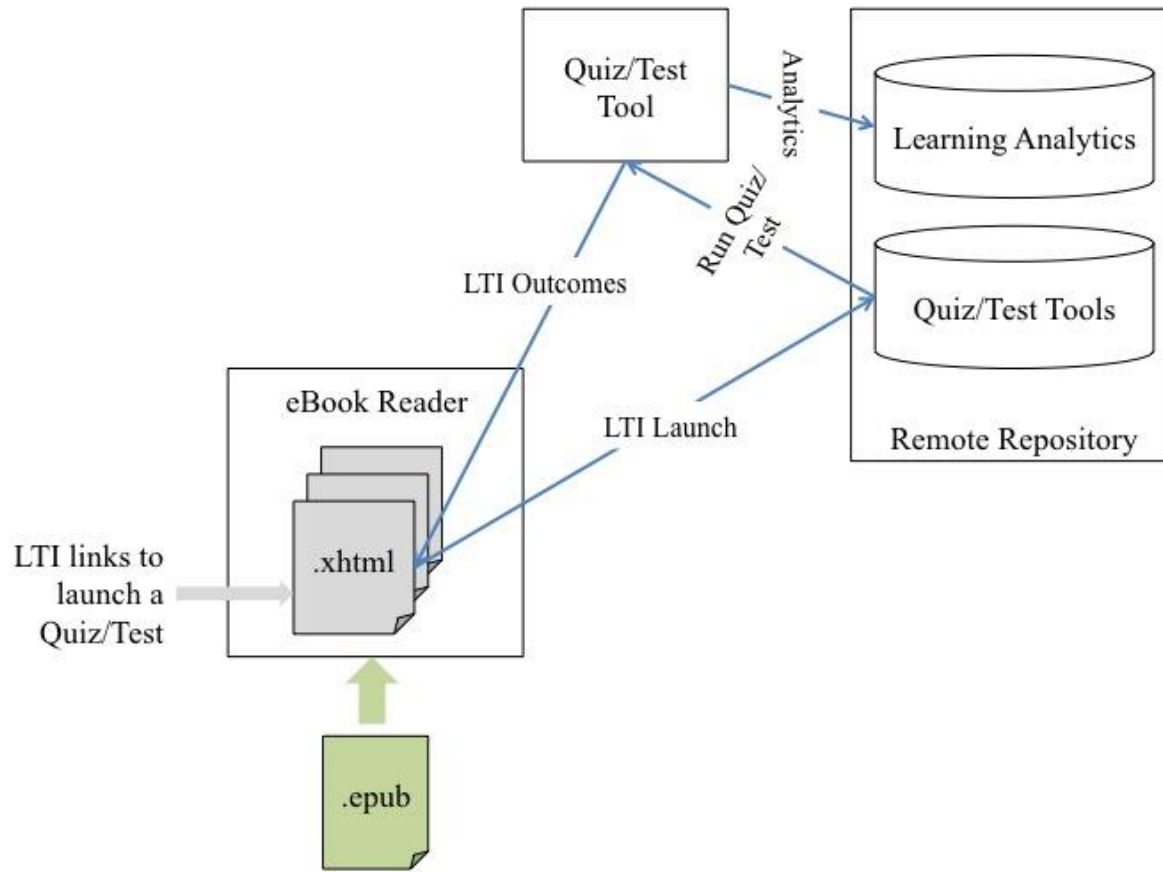
caliper-model/profiles

caliper-docs

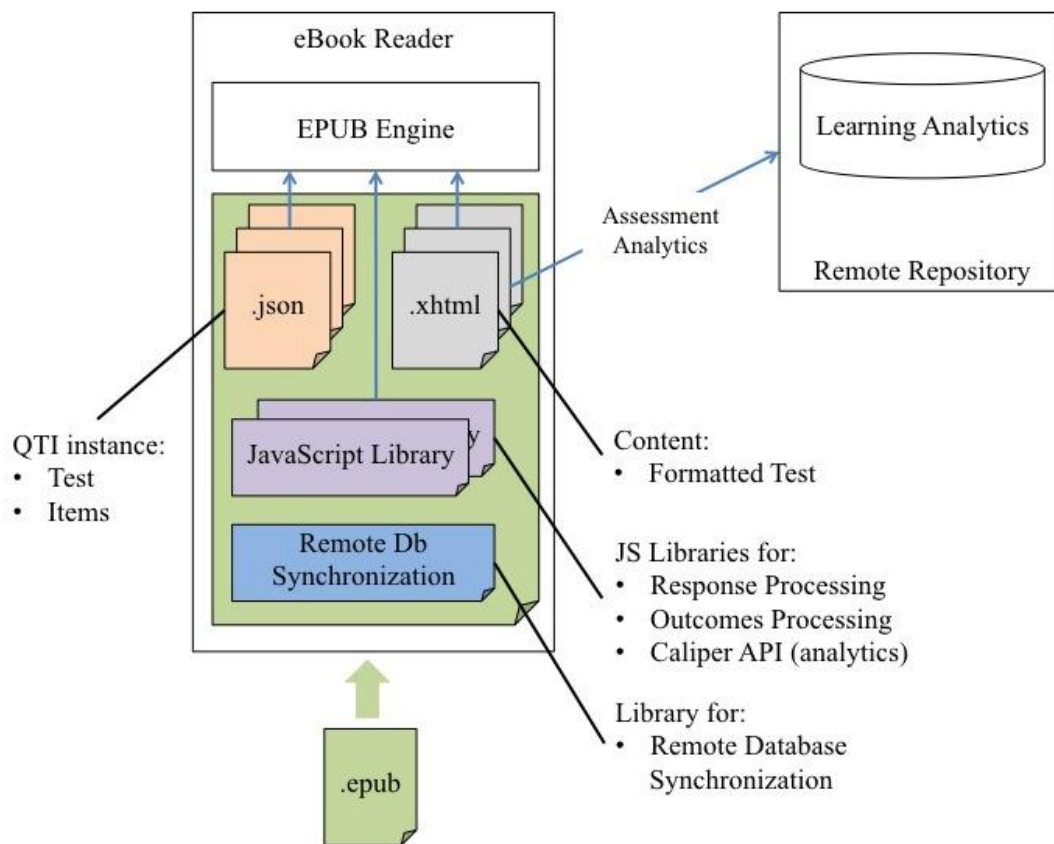
Caliper EDUPUB Deployment



LTI-Enabled QTI Approach



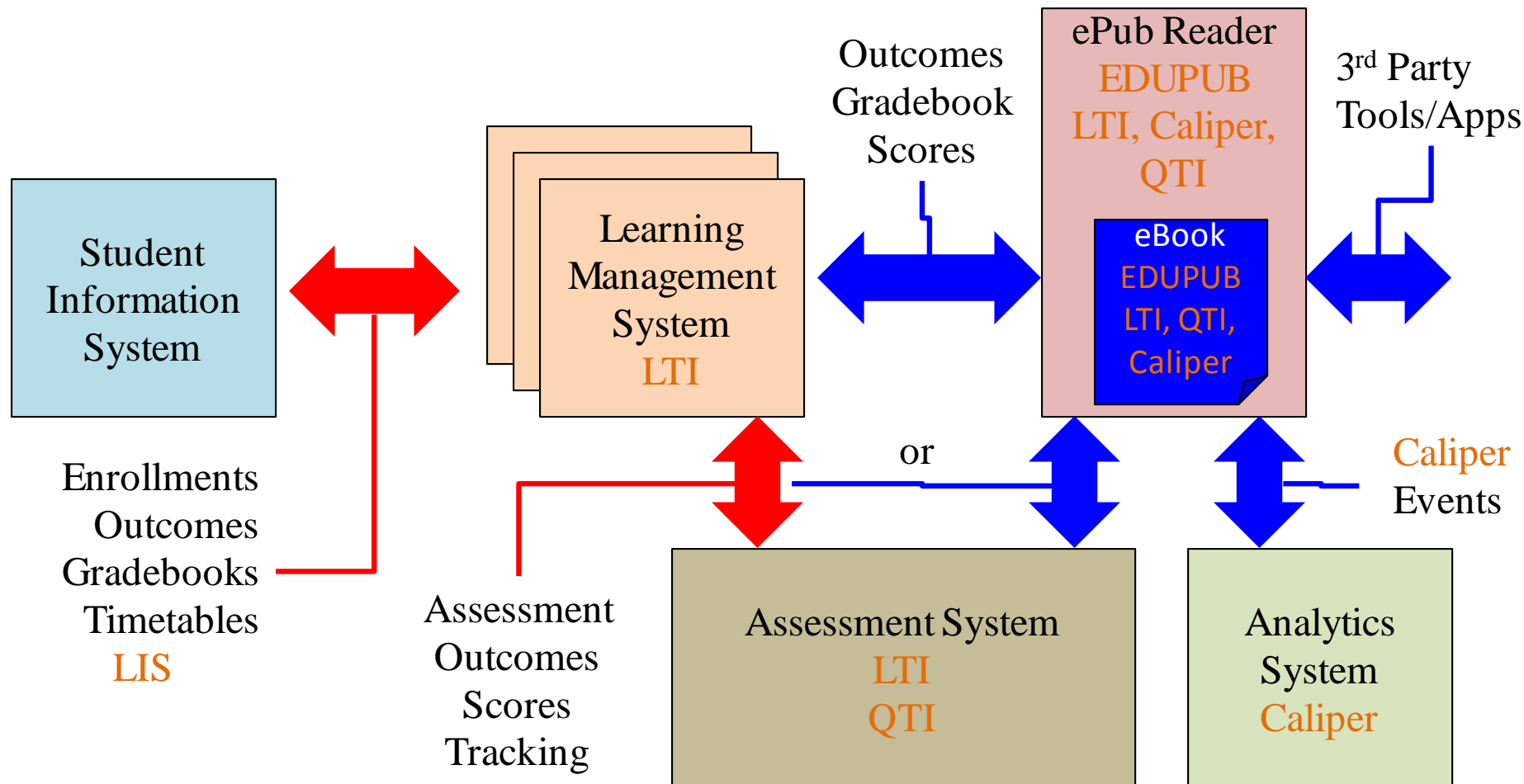
EPUB3-Embedded QTI Approach



IMS EDUPUB Standards Integration

- Required:
 - Application & learning platform interoperability enabled using IMS LTIv1.2: Learning Tools Interoperability with Rich Outcomes
 - Remote-content access/usage enabled
- Optional:
 - Learning analytics reporting enabled using IMS Caliper Analytics Framework
 - Quiz enabled using various forms of IMS QTIv2.1: Question & Test Interoperability

EDUPUB Technology Architecture



IMS EDUPUB Implementation Pathway

- Start with the best practice guide & open source Radium code :
<http://www.imsglobal.org/edupub/index.html>
- IMS EDUPUB workgroup and developers communities are forming
- When available, achieve IMS conformance certification via IMS developer community
- Developers workshop: 24-25 Feb 2016, Adelphi, MD USA
- IMS Korea work focus/activity? EDUPUB + Caliper
- Learning Impact Award for best EDUPUB content?



Thank You!

Questions, Issues & Comments

<http://www.imsglobal.org/>
<http://www.imsglobal.org/edupub/index.html>

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