

IMS Standards Update: A Technical Perspective



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Content

- IMS Specifications Context
- Technical Highlights 2018-2019
- Technical Objectives 2019-2020
- Technical Considerations for IMS Japan

Colin Smythe (IMS Chief Architect)

- Role
 - Developing the top-level architectural perspective and understanding
 - Making sure the IMS specifications fit the IMS ECOSYSTEM
 - Overseeing the range of technologies we adopt and adapt to create IMS specifications
 - Facilitating the completion of various specifications
 - Supporting the adoption of the IMS specifications
- Current Specification Responsibilities
 - Question & Test Interoperability
 - OneRoster
 - OpenVideo Metadata















- **IMS Specifications Context**
- Technical Highlights 2018-2019
- Technical Objectives 2019-2020
- Technical Considerations for IMS Japan

- [Accessibility](#)
- [Accessible Portable Item Protocol®](#)
- [Caliper Analytics®](#)
- [Competency Definitions](#)
- [Content Packaging](#)
- [Common Cartridge®](#)
- [Competencies and Academic Standards Exchange™](#)
- [Course Planning and Scheduling](#)
- [Digital Repositories](#)
- [Enterprise](#)
- [Enterprise Services](#)
- [ePortfolio](#)
- [General Web Services](#)
- [Interactive WhiteBoard/ Common File Format](#)
- [Learner Information](#)
- [Learning Design](#)
- [Learning Information Services](#)
- [Learning Object Discovery and Exchange](#)
- [Learning Tools Interoperability®](#)
- [LTI Resource Search](#)
- [Meta-data](#)
- [OneRoster®](#)
- [Open Badges](#)
- [Question and Test Interoperability](#)
- [Resource List Interoperability](#)
- [Shareable State Persistence](#)
- [Simple Sequencing](#)
- [Tools Interoperability](#)
- [Vocabulary Definition Exchange](#)

A wide range of specifications published since 1999.

We have an extensive legacy responsibility.

Technical Activity Summary

	Accessibility	Accessibility, inclusive design, and personalization of online learning resources to meet the needs of all users/learners
	App Sharing & Integration Protocol	Peer-to-peer educational app sharing catalogs and storefronts
	App Vetting	Vetting educational applications, to ensure that a minimum standard of privacy and security is met, provides assurance that the information gathered by these educational applications is being used responsibly.
	Caliper Analytics	Consistently capturing and presenting measures of learning activity and defining a common language for labeling learning data, with a standard way of measuring learning activities and effectiveness enabling designers and providers of curriculum to measure, compare and improve quality
	Common Cartridge	Organization, publishing, distribution, delivery, and search of a wide variety of collections of digital learning content, applications used as the basis for or in support of online learning of any type.
	Competencies & Academic Standards Exchange®	Exchange and management of information about learning standards and/or competencies in a consistent and referenceable way including machine-readable statements of what the learner will know and be able to do, explanations of relationships between standard sets and/or among individual standards or courses where applicable, and guides listing specific criteria for grading or scoring academic papers, projects, or tests.
	Comprehensive Learner Record	A comprehensive digital learner record that supports competency-based education, co-curricular and extra-curricular skills and achievements, employer-based learning, and other learning experiences in a verifiable, portable, and interoperable format.
	Digital Credentials and Badges	Capturing learner achievements that are verifiable, portable, and interoperable through Open Badges and in the future, learning pathways and Blockchain extensions.
	EPUB for Education	Establishing a globally interoperable, accessible, open ecosystem for e-Textbooks and other Digital Learning Materials via EPUB3, Educational Sector Standards and the Open Web Platform
	Learning Tools Interoperability	Integrating rich learning applications (often remotely hosted and provided through third-party services) with platforms like learning management systems, portals, learning object repositories, or other educational environments.
	OneRoster and Learning Information Services	Exchange and synchronization of roster information and grades which focuses on people, memberships, courses and outcomes.
	OpenVideo	Creation of video capture metadata to enable information from any video to be shared and searched
	Privacy and Security	Development of a Privacy Service which will carry privacy preferences across systems and tools
	Question and Test Interoperability/Accessible Portable Item Protocol	Exchange of item, test and results data between authoring tools, item banks, test construction tools, learning systems and assessment delivery systems, including accessible assessments.

Current Specification Activity

New Specification

- Comprehensive Learner Record
- Open Video
- Computer Adaptive Testing

New Version

- OneRoster 1.2
- QTI 3.0
- Badge Connect 2.1
- Thin CC 1.4
- Caliper 1.2 + MPs

Profile

- Proctoring
- SBAC of QTI
- Japanese OneRoster Profile
- European OneRoster 1.2 Profile

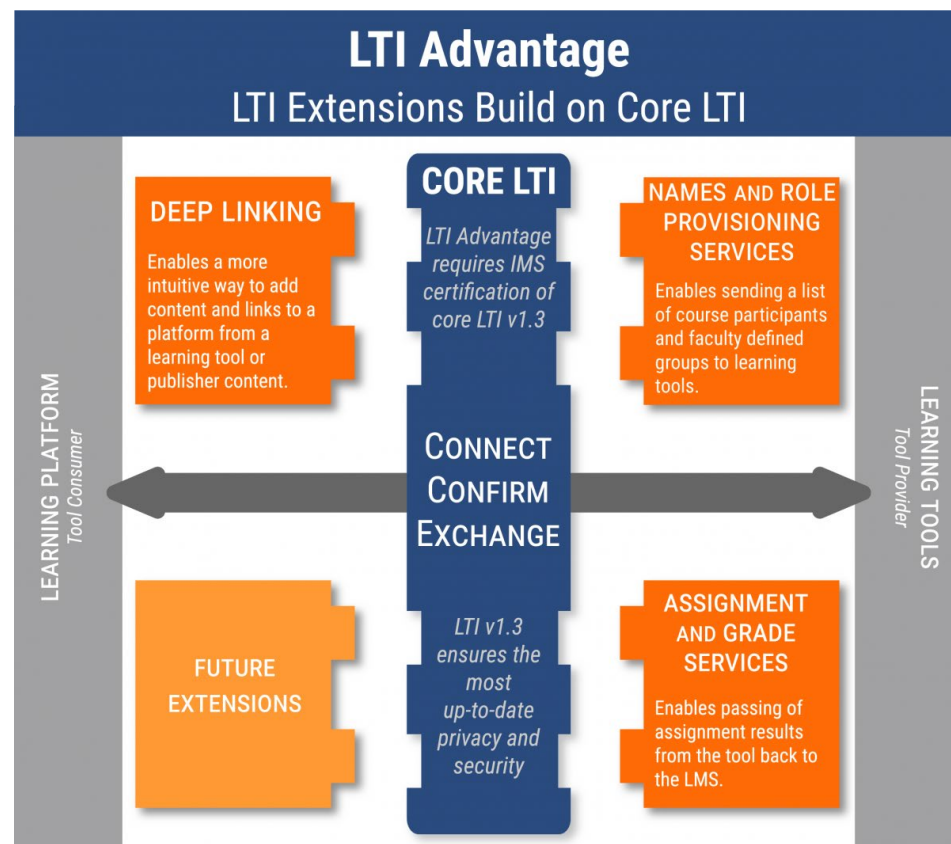
Evaluation

- CASE
- Results Management
- Caliper Metric Profiles
- EDU APIs

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Learning Tools Interoperability Advantage

- LTI 1.3 Core
 - IMS Security Framework
- LTI Extensions
 - LTI Deep Linking
 - LTI Names & Role Service
 - LTI Assignment and Grade Service
- Reference Implementation



IMS Security Framework

Trusted Exchange of Student Data

CIOs, CSSOs, and Data Protection Officers have critical security-related concerns about sensitive and personally identifiable information (PII) passing between platforms and tools. Older security frameworks have demonstrated vulnerabilities. IMS Global members are leading the drive to improve student privacy and security by adopting the IMS Security Framework across its standards.

IMS Global creates service-oriented and message-exchange interoperability specifications. These service-based specifications recommend or require many different security patterns: for example, the use of OAuth 1.0 based message signing, OAuth 2.0 based authentication and authorization, and so forth. The IMS Security Framework defines a set of patterns for security that all IMS specifications should use (only in special circumstances will IMS consider exceptions). These security patterns are premised on the appropriate standards and specifications published by other organizations such as the Internet Engineering Task Force (IETF) and its Requests For Comments (RFCs). The core standards used are:

- OAuth 2.0 - RFCs 6749 and 6750 from the IETF
- JSON Web Tokens - RFCs 7515, 7516, 7517, 7518, 7519 and 7523
- Open ID Connect Core - an identity layer, from OpenID Foundation, on top of OAuth 2.0

The use of the IMS Security Framework promotes consistent and compatible implementation requirements and simplifies adoption when more than one IMS specification is being implemented.

In the case where IMS has defined a web services-based standard, such as OneRoster, the specification will describe the set of web service calls that can occur between a service consumer (or Client) and a service provider (Platform). Typical service calls include when a Client 'pulls' the data from the Platform and when the Platform 'Pushes' the data to the Client. In many cases, these service calls must occur within an appropriate security framework. For IMS specifications using a web services approach, the Figure on the right shows a schematic representation of this security framework

The IMS specification will define how the Client and Platform will exchange information. This document defines how to achieve the "Authentication" and "Authorization" using a separate set of message exchanges and how the actual corresponding set of IMS service calls will use this authorization and authentication information. The authorization and authentication uses an "Authorization Server" which may be a system independent of the Platform or may be endpoints hosted by the Platform.

In the case where IMS has defined a non-web services based standard, such as Learning Tools Interoperability (LTI), the specification will describe the set of messages that can occur between a Platform and a Client. In scenarios where the message exchange is vulnerable (for example, when launching from a web browser), the messages will be signed. This signing MAY include data derived from the identity-based authentication. The IMS specification defines how a Client can transform the messages exchanged between the Platform and the Client (including a user's browser-based interaction) into a Client-based experience. This document defines how to achieve Authentication and Authorization using a separate set of message exchanges between Platform and Client and how to encode the authorization and authentication information in JWT-based message signing of these message exchanges. The authorization and authentication process uses an authorization server which may be a system independent of the Platform or may be endpoints hosted by the Platform.

The IMS Security Framework was published as Final Release to the public in May 2019. It is upon this framework that all IMS service-based specifications should make reference, including the [LTI v1.3](#) and [LTI Advantage](#) services.

Public Resource

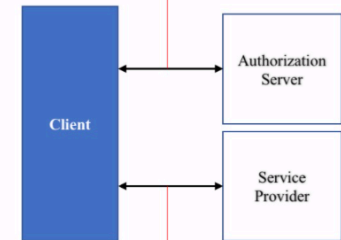
Security Framework

- [IMS Security Framework v1.0 - Final Release \(15 May 2019\)](#)

LTI Security Update

- [IMS Security Bulletin - Announcement \(22 July 2019\)](#)
- [IMS LTI Security Update v1.0 - Final Release \(22 July 2019\)](#) addresses a potential Cross-Site Request Forgery threat in earlier versions of LTI (v1.0 and v1.1.1).

Authentication and authorization based upon OAuth 2.



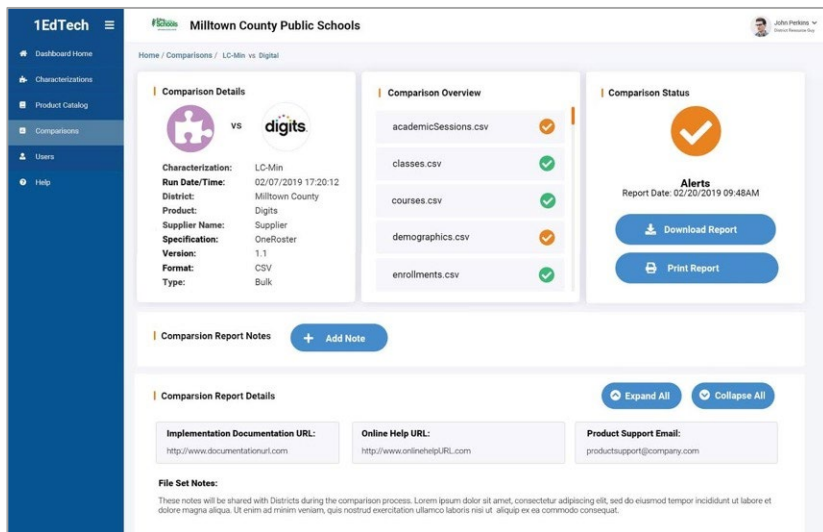
Data exchange as defined by the IMS service specification.

Security Framework

www.imsglobal.org/ims-security-framework

1EdTech Data Comparison Report

This report is generated for every comparison and is available to both Districts and Suppliers helping them and the 1EdTech team identify areas that require additional testing on implementation



1EdTech | Milltown County Public Schools

Home / Comparisons / LC-Min vs. Digital

Comparison Details

LC-Min vs. digits

Characterization: LC-Min
Run Date/Time: 02/07/2019 17:20:12
District: Milltown County
Product: Digits
Supplier Name: Supplier
Specification: OneRoster
Version: 1.1
Format: CSV
Type: Bulk

Comparison Overview

academicSessions.csv ✓
classes.csv ✓
courses.csv ✓
demographics.csv ✓
enrollments.csv ✓

Comparison Status

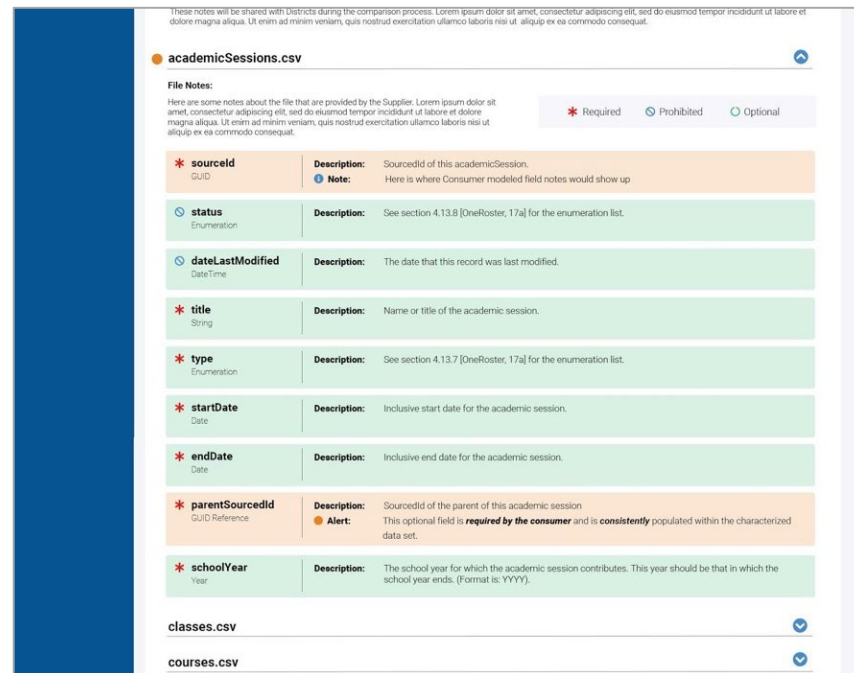
Alerts
Report Date: 02/20/2019 09:48AM
Download Report
Print Report

Comparison Report Notes + Add Note

Comparison Report Details Expand All Collapse All

Implementation Documentation URL: <http://www.documentationurl.com>
Online Help URL: <http://www.onlinehelpurl.com>
Product Support Email: productsupport@company.com

File Set Notes:
These notes will be shared with Districts during the comparison process. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.



academicSessions.csv

File Notes:
Here are some notes about the file that are provided by the Supplier. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Required Prohibited Optional

* sourcedid GUID	Description: Sourcedid of this academicSession. Note: Here is where Consumer modeled field notes would show up
status Enumeration	Description: See section 4.13.8 [OneRoster, 17a] for the enumeration list.
dateLastModified DateTime	Description: The date that this record was last modified.
* title String	Description: Name or title of the academic session.
* type Enumeration	Description: See section 4.13.7 [OneRoster, 17a] for the enumeration list.
* startDate Date	Description: Inclusive start date for the academic session.
* endDate Date	Description: Inclusive end date for the academic session.
* parentSourcedid GUID Reference	Description: Sourcedid of the parent of this academic session. Alert: This optional field is required by the consumer and is consistently populated within the characterized data set.
* schoolYear Year	Description: The school year for which the academic session contributes. This year should be that in which the school year ends. (Format is: YYYY).

classes.csv
courses.csv

CASE® Network of
Academic Standards &
Workforce Competencies
is live!

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New Specifications Final Release

- Badge Connect 1.0
- Competency Learner Record (CLR) 1.0
- Computer Adaptive Testing (CAT) 1.0
- OpenVideo Metadata 1.0
- Proctoring 1.0
 - Profile of LTI Advantage
- Assessment Result Profile 1.0
 - Profile of OneRoster 1.2 Gradebook Service

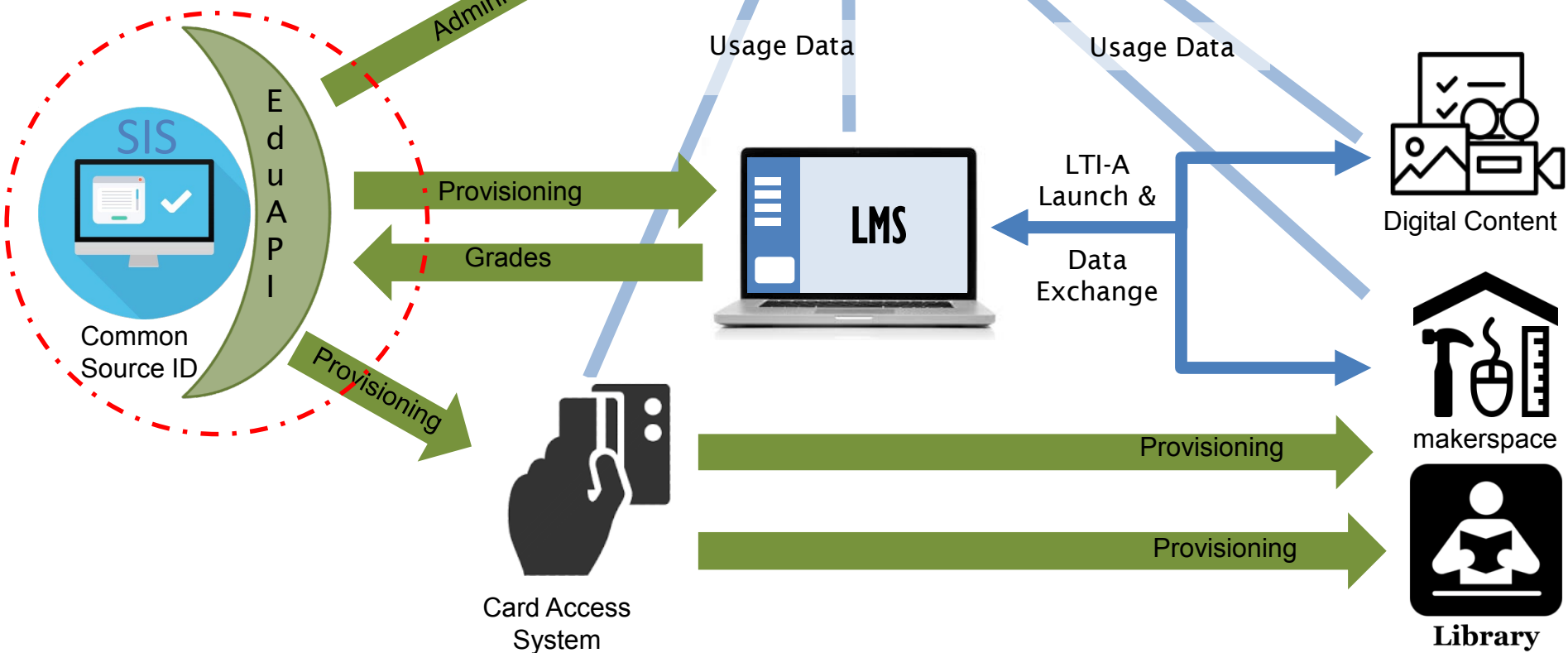
New Versions Final Release

- Caliper 1.2
 - Several new Metric Profiles
- Common Cartridge (CC) / Thin CC 1.4
- OneRoster 1.2
- Question & Test Interoperability 3.0

New Technical Activities

- LTI Advantage / Assessment Results Profile integration
- Security Committee
- IMS Extensions Framework
- Next Generation Metadata
- Unified Model

EduAPI is a set of industry standard extensible APIs to support user provisioning, common source ID and administrative data exchange



Defining, describing, explaining
and clarifying how the IMS
specifications can be combined to
support richer learning and
teaching processes

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OneRoster 1.2 Profiles

- IMS Japan Society / IMS Europe knowledge transfer
 - Profiling approach
 - Detailed solution awareness

Caliper Metric Profiles

- What new Metric Profiles need to be created to support the specific needs for the IMS ECOSYSTEM in Japan?

Other Areas?

Future APAC Technical Briefings

- December 5th, 2019
 - November IMS Quarterly Review
 - Open Badges & Comprehensive Learner Record
- March 5th, 2020
 - February IMS Quarterly Review
 - OneRoster
- June, 2020
 - IMS LILI 2020 Review

Questions & Comments