



The Power of Global Collaboration
Defense | Government | Industry | Academia

Introduction to SCORM

Wayne Gafford
Advanced Distributed Learning (ADL)
U.S. Department of Defense

S1000D User Forum 2010
Moscow, Russia
Sept 27-30

Presentation Objectives

- Understand basic ADL purpose
- Understand basic Sharable Content Object Reference Model (SCORM Specification)
 - Concepts
 - Terminology
- Understand S1000D to SCORM Connection
 - Similarities
 - Differences
 - Why use S1000D for “technical training content”?

ADL Overview



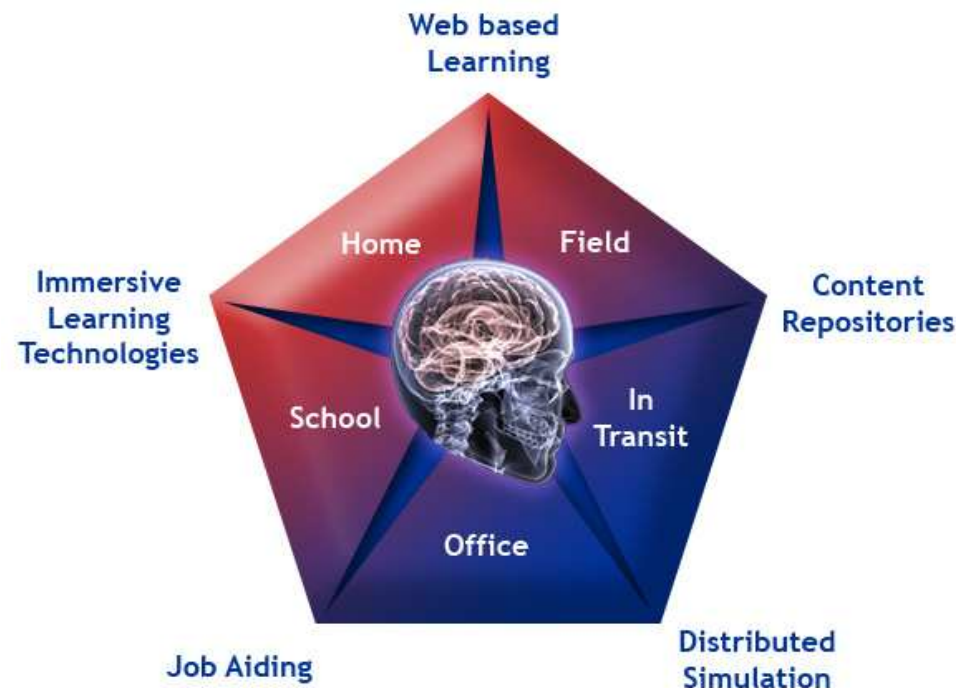
Advanced Distributed Learning Initiative (ADL)

- Founded in 1997: standardize and modernize training delivery for U.S. Department of Defense (DoD)
 - Develop and implement learning technologies for DoD and the federal government
 - Collaborate with government, industry, and academia to promote international specifications and standards for designing and delivering learning content
 - Operate under the direction of the DoD Office of the Under Secretary of Defense for Personnel and Readiness (OUSD P&R)

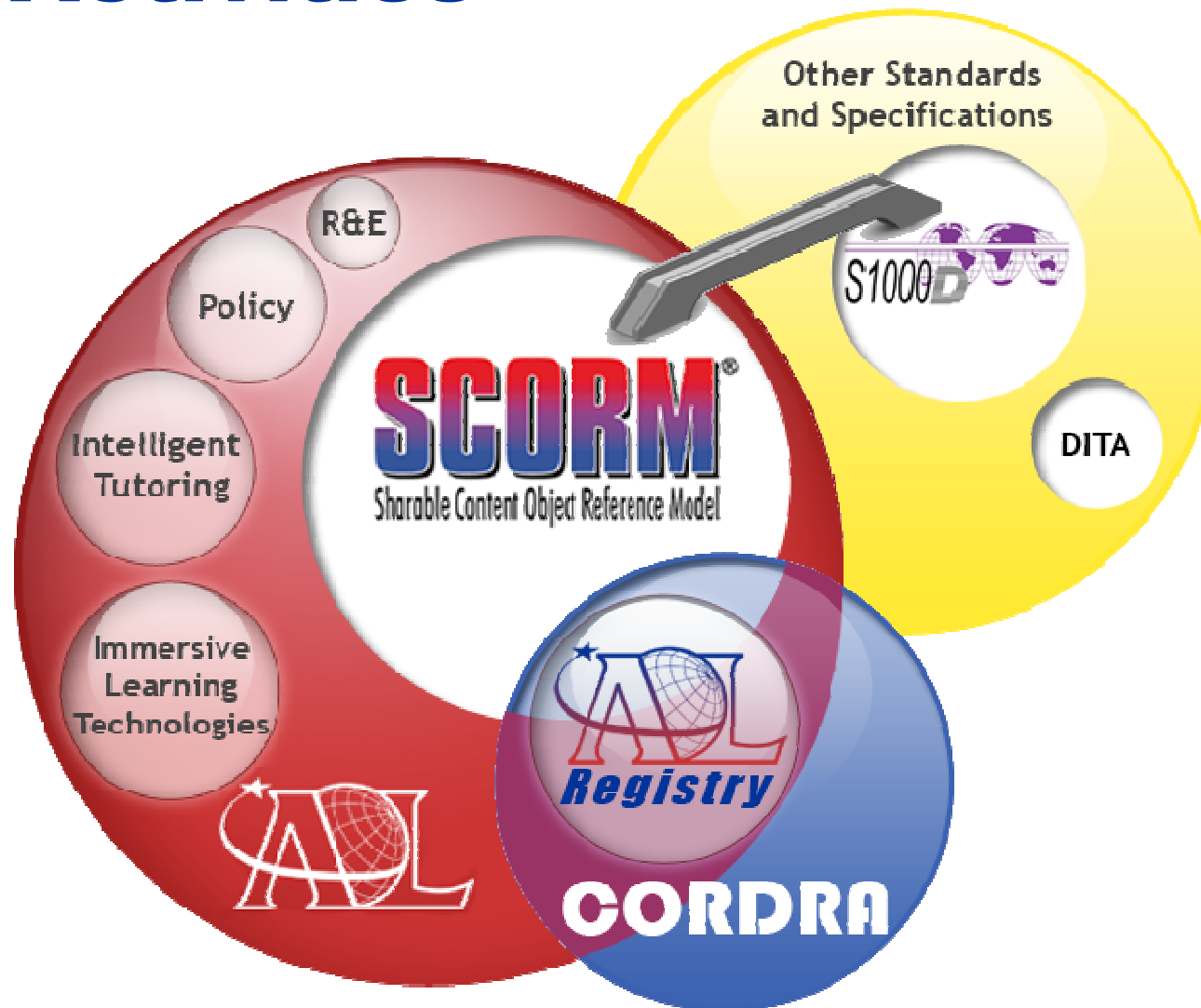


ADL Vision

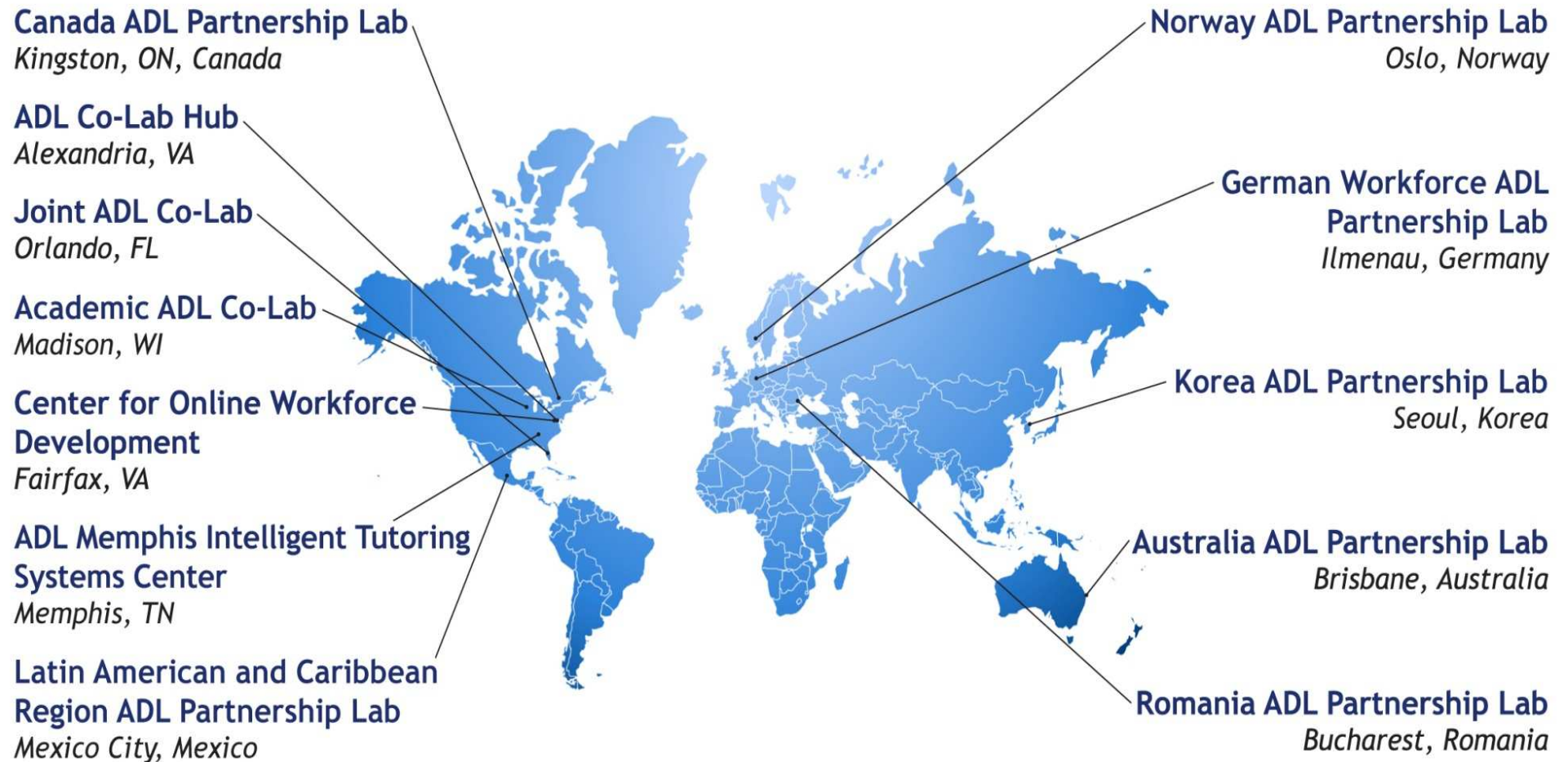
Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectively, anywhere and anytime.



ADL Activities



ADL Network



ADL Principles for Content

- Accessib*ility*...
 - Locate and access instructional components from multiple locations and deliver them to other locations
- Interoperab*ility*...
 - Take instructional components developed for one system and use them in another system
- Durab*ility*...
 - Withstand technology changes over time without costly redesign, reconfiguration, or recoding
- Reusab*ility*...
 - Use instructional components in multiple applications, courses, and contexts

Sharable Content Object Reference Model Specification: Concepts



SCORM Content: Basics

- Is rendered in a **browser** via a system for managed learning
 - Typically Web-based
- Is displayed as html
 - Requires **javascript** that communicates with the systems that manage learning
- Accepts plug-ins and 3rd party tools
 - For example: Flash Player, QuickTime, and others



SCORM Functions: Basics

Sharable Content Object Reference Model (SCORM)

- Exchange courses between Learning Management Systems
- Reuse content pieces across different courses
- Track a learner's progress through computer-based instruction
- Sequenced content tailored to the learner

SCORM Benefits: Basics

- Provides an object-based approach for developing and delivering instructional content
- Allows interoperability of these objects across multiple delivery environments
- Enables sophisticated learning strategies based on the learner's mastery and progress (individualized learning)

***Sharable Content Object
Reference Model Specification:
Terminology***



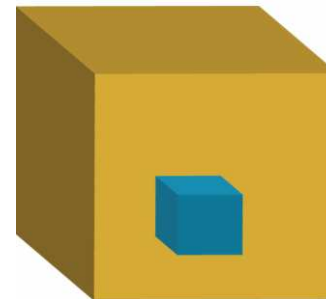
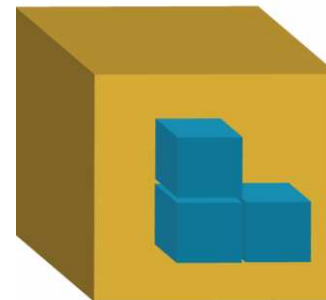
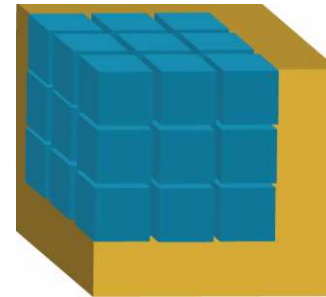
Asset

- Electronic representations of media such as text, images, sound, or any other piece of data a web client can deliver (simply...an asset is an electronic file).
 - A data module would be an asset.
- The most basic building block of content
- Can be reused in many different contexts and applications



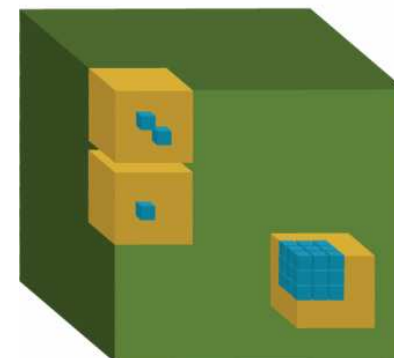
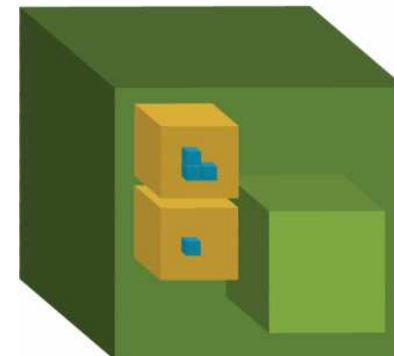
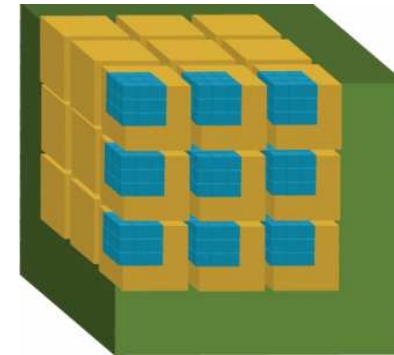
Sharable Content Object (SCO)

- SCO: one or more collected assets that become an independent, defined piece of instructional material
- The smallest logical unit of information you can deliver to your learners via an LMS
 - In technical terms, a SCO is defined as the only piece of information that uses the SCORM Application Programming Interface (API) for communication with an LMS.



Aggregation

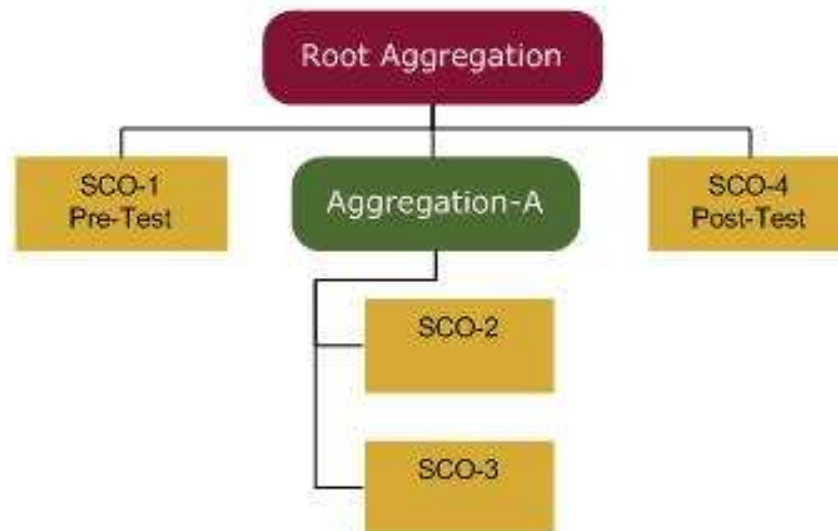
- Referenced collection of related content into SCOs
- Used to group related content for sequencing so that it can be delivered to learners in the manner you prescribe



Sequencing

- Ability to prescribe the way learners receive content in an interoperable manner

TEMPLATE 7: Pre- and Post-Test Sequencing (2)

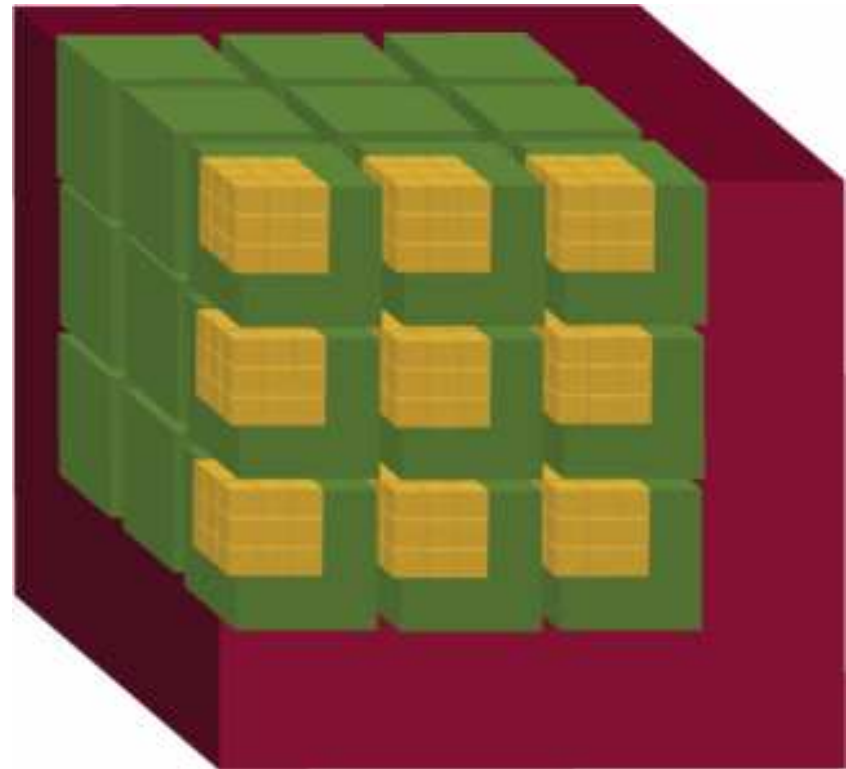


© Copyright 2004, Learning Systems Architecture Lab, Some Rights Reserved (CC: by-nc-sa/3.0)
Updated 2009, Advanced Distributed Learning Initiative



Organization

- The part of a content package where SCO's are ordered into a tree structure and sequencing behaviors are assigned to them
 - Also known as a root aggregation
- Outlines the entire structure you created for the content that will be delivered as a single content package



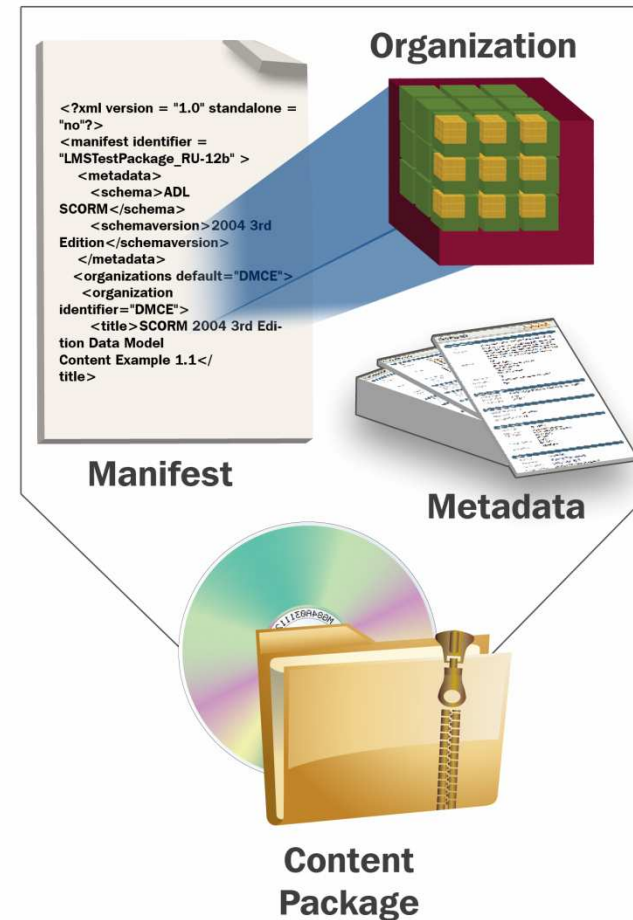
Content Package – 1

- A standardized, interoperable way to upload content to a SCORM-conformant LMS



Content Package – 2

- Contains two principal parts
 - XML manifest file listing
 - All resources or assets in package
 - Content structure diagram (organization)
 - Sequencing rules
 - Metadata for SCOs, aggregations, and package itself
 - All physical SCO and asset files for content package



API

- SCORM Application Programming Interface
 - Standardized method for a sharable content object (SCO) to communicate with the learning management system (LMS) when a learner is interacting with a SCO
 - SCOs can set or retrieve a specific set of information, for example a
 - Learner name
 - Set values, such as a score



SCORM Bookshelf

(The Specification)



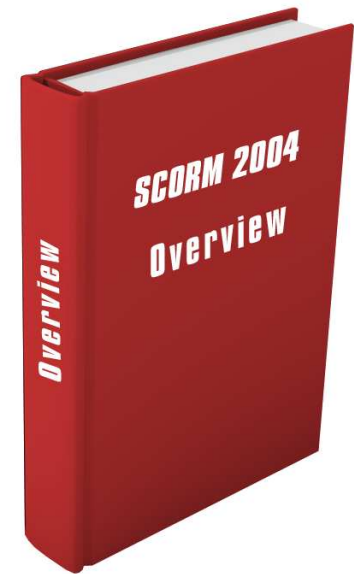
The SCORM Bookshelf

- Sharable Content Object Reference Model (SCORM) is a collection of specifications and guidelines that might be thought of as books in a library
- Nearly all of the specifications and guidelines come from other organizations



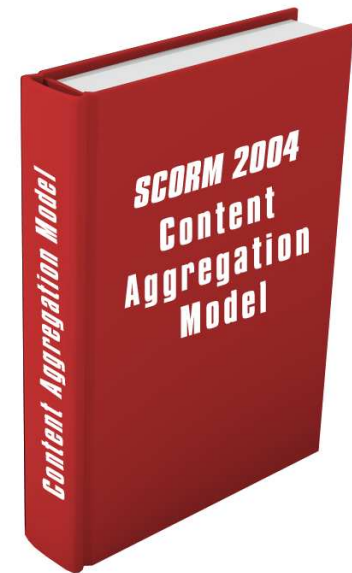
Overview

- Overview of SCORM 2004
 - History
 - Current status
 - Future direction of ADL and SCORM
 - Introduction to ADL's high-level functional requirements



Content Aggregation Model

- Defines how to
 - Package content to enable exchange between and among systems
 - Describe content for search and discovery
 - Encode sequencing in your manifest
- Includes
 - Content structure (AICC)
 - LOM Metadata (IEEE)
 - Content packaging (IMS Global Learning Consortium)
 - Sequencing information (IMS Global Learning Consortium)



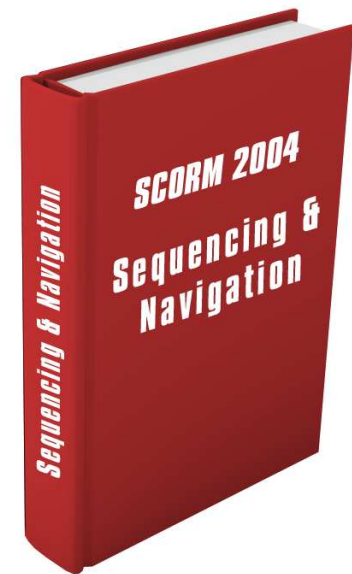
Run-Time Environment

- Provides
 - More information about the SCORM Data Model Elements that enable the collection and storage of data about learners' performance in, and interaction with, instructional content
- Includes
 - IEEE Application Programming Interface (1484.11.2)
 - IEEE Data Model (1484.11.1)



Sequencing and Navigation

- Defines
 - How sequencing can be applied to content to prescribe the manner in which learners receive content from the LMS interoperably
- Includes
 - Sequencing Information and Behavior
 - From IMS Global Learning Consortium
 - Navigation Behavior
 - Created by ADL



API

- SCORM Application Programming Interface
 - Standardized method for a sharable content object (SCO) to communicate with the learning management system (LMS) when a learner is interacting with a SCO
 - SCOs can set or retrieve a specific set of information, for example a
 - Learner name
 - Set values, such as a score



S1000D to SCORM Connection:

***Why Use S1000D for Technical
Training Content?***



SCORM Standardization Facts

- No asset (file) naming convention
 - No equivalent “SNS”
 - SCORM is used for *any content*
- No XML markup for content
 - Content is used in any format of choice
- No defined way to “chunk” information
 - No business rules to define what is “re-usable”

These facts are “*intentional*”



Facts about Technical Learning Content

- Technical learning content is based on “authoritative sources” (technical publications)
- Technical learning content must be “maintained” as the product and the technical data change
- Technical learning content is out date quickly if links to authoritative sources are not “maintained”
- Costs go up when “all related technical content” are not maintained by a common specification

Why Use S1000D for Technical Training Content?

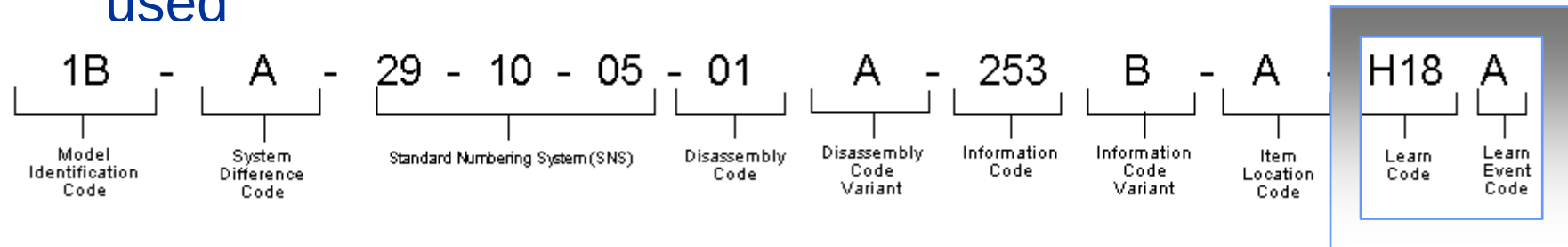
- Technical training must be configured to systems and technical data
- DMC file naming rules promotes content management for technical learning
- IndentAndStatus provides system-specific meta data

***Let S1000D be the regulating format for
technical learning content
AND
authoritative source technical publications***



S1000D and the Learning Data Module (LDM) Code

- Apply a “Learn Code” and “Learn Event Code” at the end of the data module code
 - “Learn Code” describes the “instructional purpose” of the training content.
 - “Learn Event Code” describes the branch of the LDM used



- DMC keeps authoritative source and training content “synchronized” in the CSDB.

Comparing SCORM to S1000D

Function	S1000D	SCORM 2004
Aggregation	S1000D - PubModule, scormContentPackage, SCO DM	IMS Manifest
Sequencing	S1000D - Process Data Module	IMS Simple Sequencing
Granularization and Reuse	S1000D - Data Modules	Sharable Content Objects
Meta Data	S1000D - <idStatus>, <pmStatus>, <scormContentPackageStatus>	Learning Object Metadata (Institute for Electronics and Electrical Engineers, LOM)
Content	S1000D- Learning Data Modules	No reference to content and format
Reporting and Interfacing	S1000D- Data and communication protocol not specified	IEEE ECMA Script API for Content-to-Runtime Services Communication

Communications

- Bookmark

www.ADLNet.gov

- Topic sections with regularly updated feature stories
- More resources for designers and developers



- Subscribe to *ADL Insights Newsletter* on www.ADLNet.gov

- Follow @ADL_Initiative on **twitter**
- Join Advanced Distributed Learning Group on **LinkedIn**



Advanced Distributed Learning



The Power of Global Collaboration
Defense | Government | Industry | Academia

Thank you - Questions?

Wayne Gafford
Wayne.gafford@adlnet.gov
703 283 3372

www.ADLNet.gov
helpdesk@adlnet.gov