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English version

Interoperability of Registries

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Foreword

This CEN Workshop Agreement (Learning Technologies (WS/LT))has been drafted and approved by a Workshop of representatives of interested parties on 10 October 2011, the constitution of which was supported by CEN following the public call for participation made on 10 August 2011.

A list of the individuals and organizations which supported the technical consensus represented by the CEN Workshop Agreement is available to purchasers from the CEN-CENELEC Management Centre. These organizations were drawn from the following:

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Comments or suggestions from the users of the CEN Workshop Agreement are welcome and should be addressed to the CEN-CENELEC Management Centre.

Introduction

Over the last 15 years, considerable effort has been spent on the development of standards and specifications for learning object repositories, with significant results, including:

- IEEE 1484.12.1-2002 Standard for Learning Object Metadata (LOM) specifies how to describe learning content [IEEELOM 2002],
- CWA 15555 Guidelines and Support for Building Application Profiles in e-Learning (delivered under SA/CEN/2004/25) specifies how application profiles can be derived from IEEE LOM [CWA15555 2006],
- CWA 14645 Availability of alternative language versions of a learning resource in IEEE LOM (delivered under SA/CEN/2000/42) specifies how the availability of alternative language versions of a learning resource can be described in IEEE LOM [CWA14645 2003],
- CWA 15454 A Simple Query Interface Specification for Learning Repositories (delivered under SA/CEN/2003-13) defines SQI (Simple Query Interface)—a query interface to access content in learning repositories [CWA15454 2005]. Alternatives to SQI include SRU/SRW [SRU 2007],
- The ProLearn Query Language defines a query language for searching learning object repositories [PLQL 2008]. Alternatives include CQL [CQL 2008] and XQuery [XQuery 2007],
- Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) defines how metadata can be harvested from learning object repositories [OAIPMH 2002]. Alternatives include publishing a sitemap for a web crawler to harvest [Sitemap 2008],
- The Simple Publishing Interface (SPI) (delivered under SA/CEN/2007-24A) in the CEN Workshop on Learning Technologies defines how metadata and content can be inserted into learning object repositories [CWA16097 2010]. Alternatives include the Atom Publishing Protocol [ATOM 2005], PENS [PENS 2006], and SWORD [SWORD 2008].

This work resulted in global infrastructures that are interconnected worldwide. As a result, we have moved from the earlier problem of a scarcity of learning resources with a new problem of abundance. In the ICT PSP Digital Content¹ (under eContentplus), the standards and specifications mentioned above were the core of the technical backbone for EU-funded projects including:

- MELT [<http://info.melt-project.eu/>]
- MACE [<http://www.mace-project.eu/>]
- ICOPER [<http://www.icoper.org/>]
- ASPECT [<http://aspect-project.org/>]
- ORGANIC.EDUNET [<http://www.organic-edunet.eu/>]

This standardization work goes one step further and attempts to standardize ways for federations such as the EUN Learning Resource Exchange (LRE) [<http://lreforschools.eun.org/>], ARIADNE [<http://www.ariadne-eu.org/>], GLOBE [<http://www.globe-info.org/>], and others to automatically discover new repositories for inclusion in their federation.

¹ http://ec.europa.eu/information_society/activities/econtentplus/about/index_en.htm

1 Scope

Typically, a federation of repositories consists of a number of participating Learning Object Repositories. The locations of those repositories and the description of the protocols they support for exposing their learning resources to the federation are maintained and managed at the federation level. This can either be managed:

- By tools such as harvesters or federated search engines that connect the repositories to the federation, or
- In a separate registry that manages this information for all the repositories on behalf of these tools.

These registries are generally not available outside of the individual federation in which they operate. The obvious problem is that this leads to a duplication of effort because repository descriptions must be entered in the registry of each federation where they are a member. As the result, there are difficulties to keep the information up-to-date across all the registry instances in all the federations. For example, if the Open Learn (OU-UK) repository changes the location of their OAI-PMH target, the location should be changed in the registries of ARIADNE, ASPECT, ICOPER, etc.

The present document gives guidance to enable the connection of learning object repositories, in order to further increase their impact in making relevant content available to teachers, trainers and (life-long) learners, by specifying how a network of registries can be set such that changes in the description of a repository only needs to be made once. This document does not build new specifications but rather profiles existing specifications.

Therefore, this CWA will focus on the following topics:

- Overview of the data model that can be used to describe collection registries (Clause 5),
- Specify protocols and APIs that can be used to provide access to these registries (Clause 6),
- A Collection Registry Specification (Clause 7),
- Registry reference implementations that can be used to validate the specifications (Clauses 8 and 9),
- Case studies (Clause 10).

The data model and APIs facilitate the use of registries by external tools that can manage, query or update the information that the registries contain. They make it possible to share registries between federations, thus enabling the automatic discovery of repositories and the automatic federation to new repositories into a federation.

2. Normative References

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CWA 15454 2005 *A Simple Query Interface Specification for Learning Repositories*

NOTE CEN Workshop Agreement 15454:2005 (E), European Committee for Standardization, November 2005.
Available at: <ftp://ftp.cenorm.be/PUBLIC/CWAs/e-Europe/WS-LT/CWA15454-00-2005-Nov.pdf>

CWA 16097 2010, *The Simple Publishing Interface (SPI) Specification*,

NOTE CEN Workshop Agreement 16097:2010 (E), European Committee for Standardization, February 2010.
Available at: <ftp://ftp.cenorm.be/CEN/Sectors/TCandWorkshops/Workshops/CWA16097.pdf>

[LODE 2010] D. Massart, N. Nicholas, and N. Ward, IMS GLC Learning Object Discovery and Exchange Base Document, v1.0, IMS Global Learning Consortium, March 2010.

NOTE Available at <http://imglobal.org/LODE/spec/imsLODEv1p0bd.html>

[OAIPMH 2002] The Open Archives Initiative Protocol for Metadata Harvesting, Open Archives Initiative, V2.0, June 2002.

NOTE Available at: <http://www.openarchives.org/OAI/openarchivesprotocol.html>

ISO 2146 2010 *Information and documentation - Registry services for libraries and related organizations*

NOTE Available at: http://www.iso.org/iso/catalogue_detail.htm?csnumber=44936

[IEEELOM 2002] IEEE Standard for Learning Object Metadata, IEEE Std 1484.12.1™-2002, IEEE Computer Society, September 2002