



Federated Search for Learning

Learning 2009

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ADL Initiative

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Session Goals

- Describe basic concepts about digital object registries and Content Object Repository Discovery and Registration/Resolution Architecture (CORDRA)
- Understand how the ADL Registry, a digital object registry, implements CORDRA
- See an example of multi-national federated search for learning content



A Registry Is

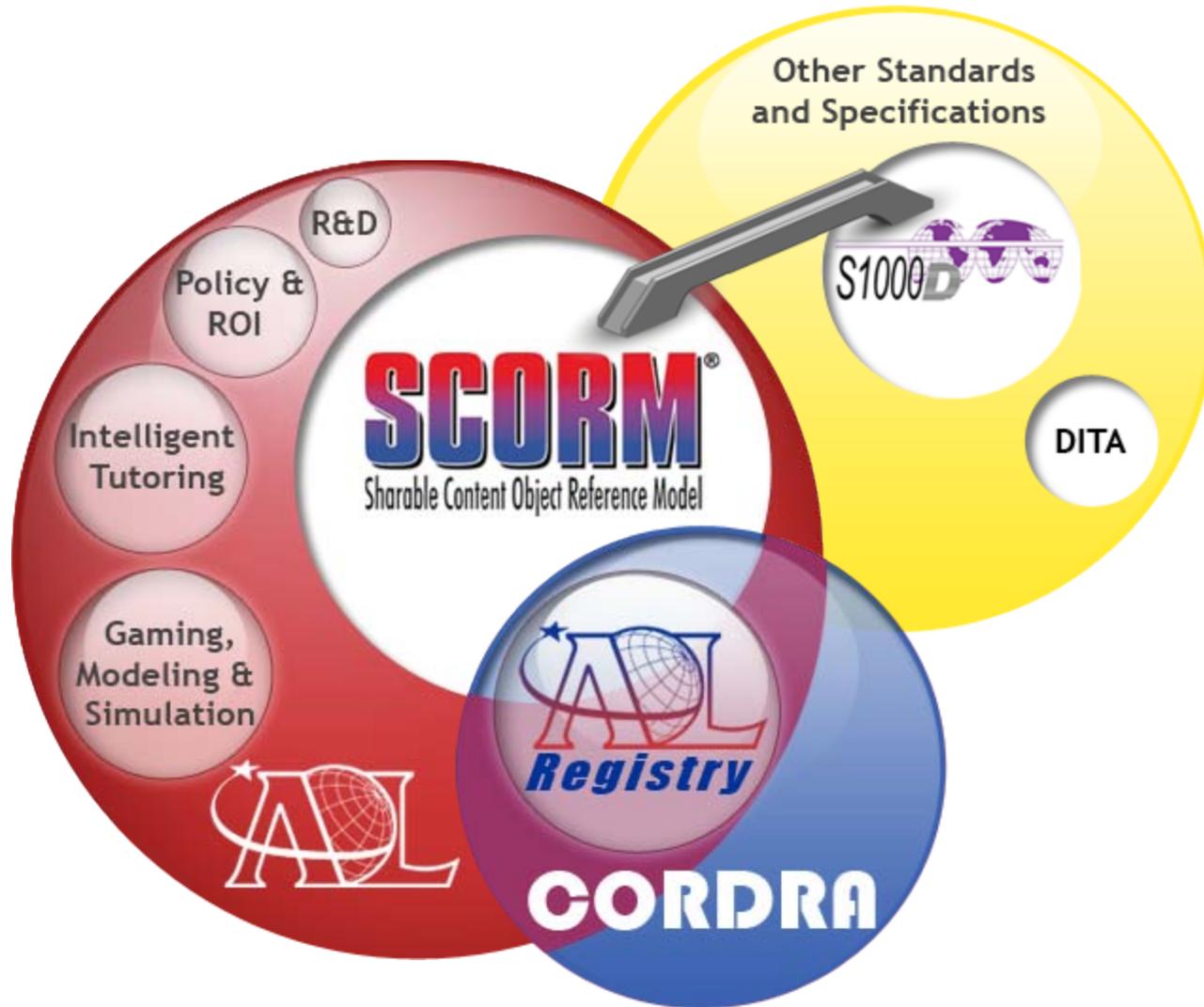
- A central search point for content objects
- The digital equivalent of a library card catalog
 - Contains all of the cards (**registered entries**) that contain a standard set of information (**metadata**) about all of the books (**learning-related content**) in the library (**repository**)



ADL and CORDRA



ADL Activities



Key CORDRA Concepts

- **C**ontent **O**bject **R**epository **D**iscovery and **R**egistration/**R**esolution **A**rchitecture
 - Register a content object in the *content catalog* for later search and retrieval
 - Search the *content catalog*; return content objects (via their IDs) and metadata
 - Register a content repository in the *repository registry* by specifying descriptive data and rules
 - Query the *repository registry* for the operational, policy, and business rules

CORDRA Architecture



-  - Content Repository
-  - Registry
-  - Comunity





Digital Object Registries



Digital Object Registry Goals – 1

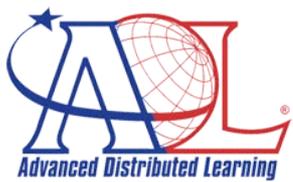
- Federate (make discoverable) disparate collections (repositories) of digital objects when those repositories
 - Exist in different locations
 - Are operated by different organizations
 - Are governed by varied policies
- Go beyond generic browsing of web harvests
 - Active registration of objects that may not be “crawl-able”
 - Not generally exposed
 - Do not enable indexing

Digital Object Registry Goals – 2

- Enable precise and domain specific description
- Provide a controlled environment for development of reliable applications
- Develop a scalable solution that can grow and evolve
 - Aggregate small metadata records instead of large content objects
 - Allow local repository variations by defining minimal registry interface requirements
 - Design multiple registries that can be aggregated (CORDRA), so any registry is one instance of many

Digital Object Registry Goals – 3

- Develop a scalable solution that can grow and evolve (continued)
 - Introduce persistent identifiers (Handle System) to further stabilize the learning object ecology
 - Design a highly modular architecture adaptable to varied configurations and new technologies
- Encourage a broad community of use that will add tools, services, etc.
 - Open Architecture
 - Make the technology widely available
 - Design a generic registry that can be configured and reused for specific domains



Digital Object Registry – Summary

- Objects have a unique, persistent identifier
- Objects are registered with metadata
- Metadata is indexed and searchable
- Current downloadable version is oriented towards learning objects
- Open-source downloadable software for use
 - Hardware requirements
 - Roadmap
 - <http://www.doregistry.org>





ADL's DOR Implementation

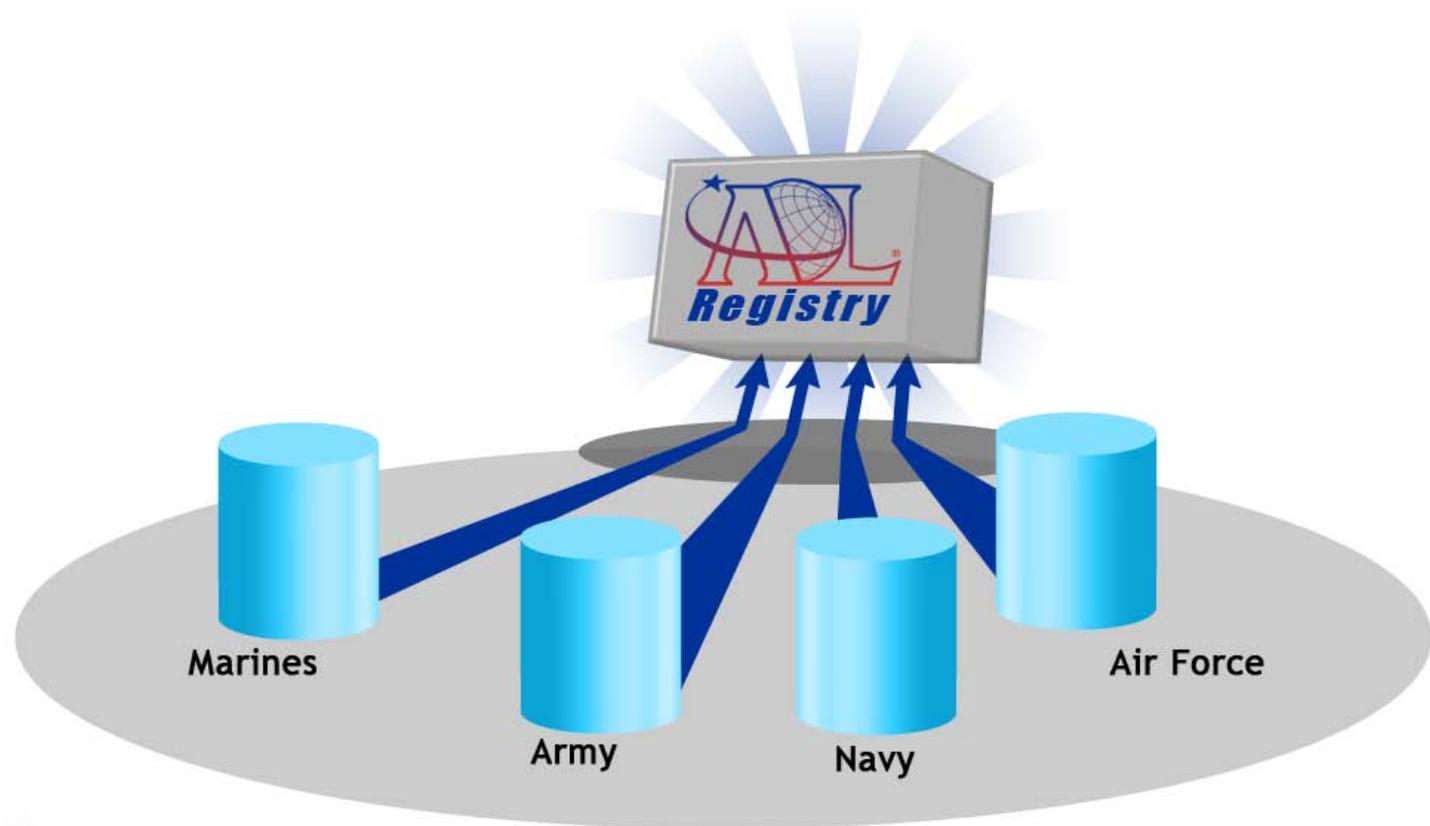


ADL Registry Implementation

- Technological and organizational infrastructure
 - Processes and procedures to register existence and access conditions for objects relevant to DoD
 - Interfaces for users to search registry and obtain objects
- Integrates existing technologies
 - Handle System for identification and access
 - eXtensible Markup Language (XML) for object description and submission
 - Learning Object Metadata (LOM)
 - Repository for metadata object storage and access
 - Lucene search engine
- Initial operational version deployed 12/05



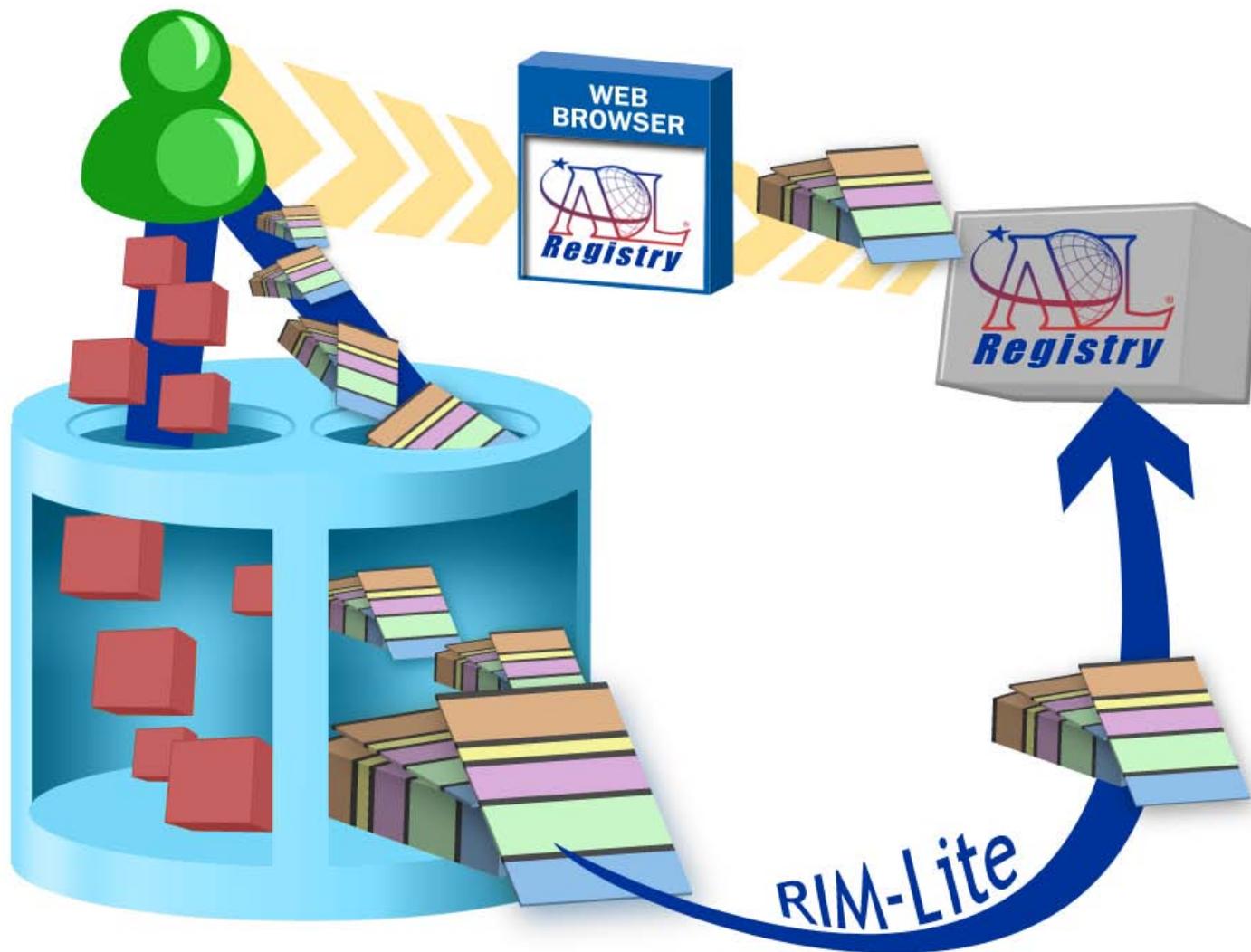
ADL Registry and Repositories



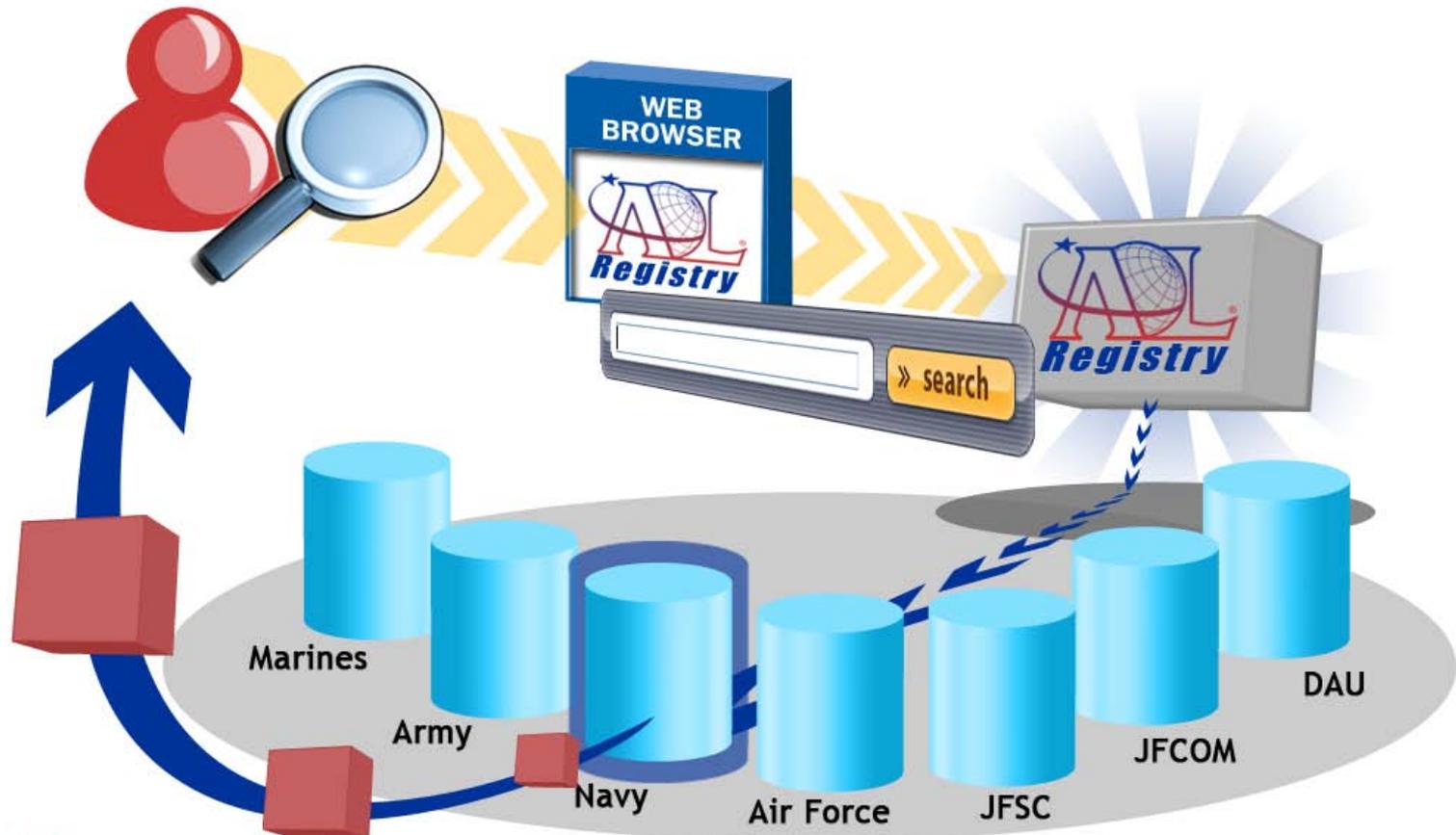
-  - Content Repository
-  - Registry
-  - Community



Repository Manager Functions



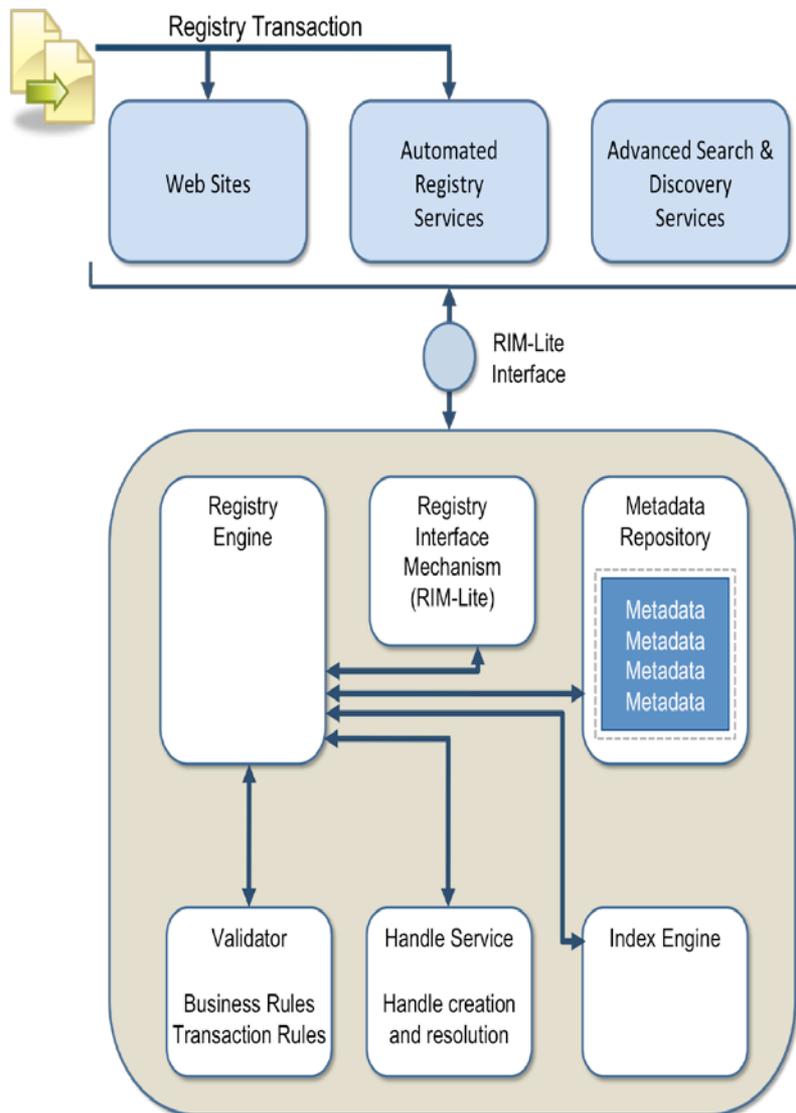
Searching the ADL Registry



-  - Content Repository
-  - Registry
-  - Comunity



Internal Architectures in ADL-R





[Home](#) ▶ [Search](#) ▶ [Basic Search](#)

▼ Search

- [Basic Search](#)
- [Advanced Search](#)
- [Search by ID](#)
- [Resolve Search Receipt](#)

- ▶ Contribute
- ▶ Practice Registry
- ▶ Help

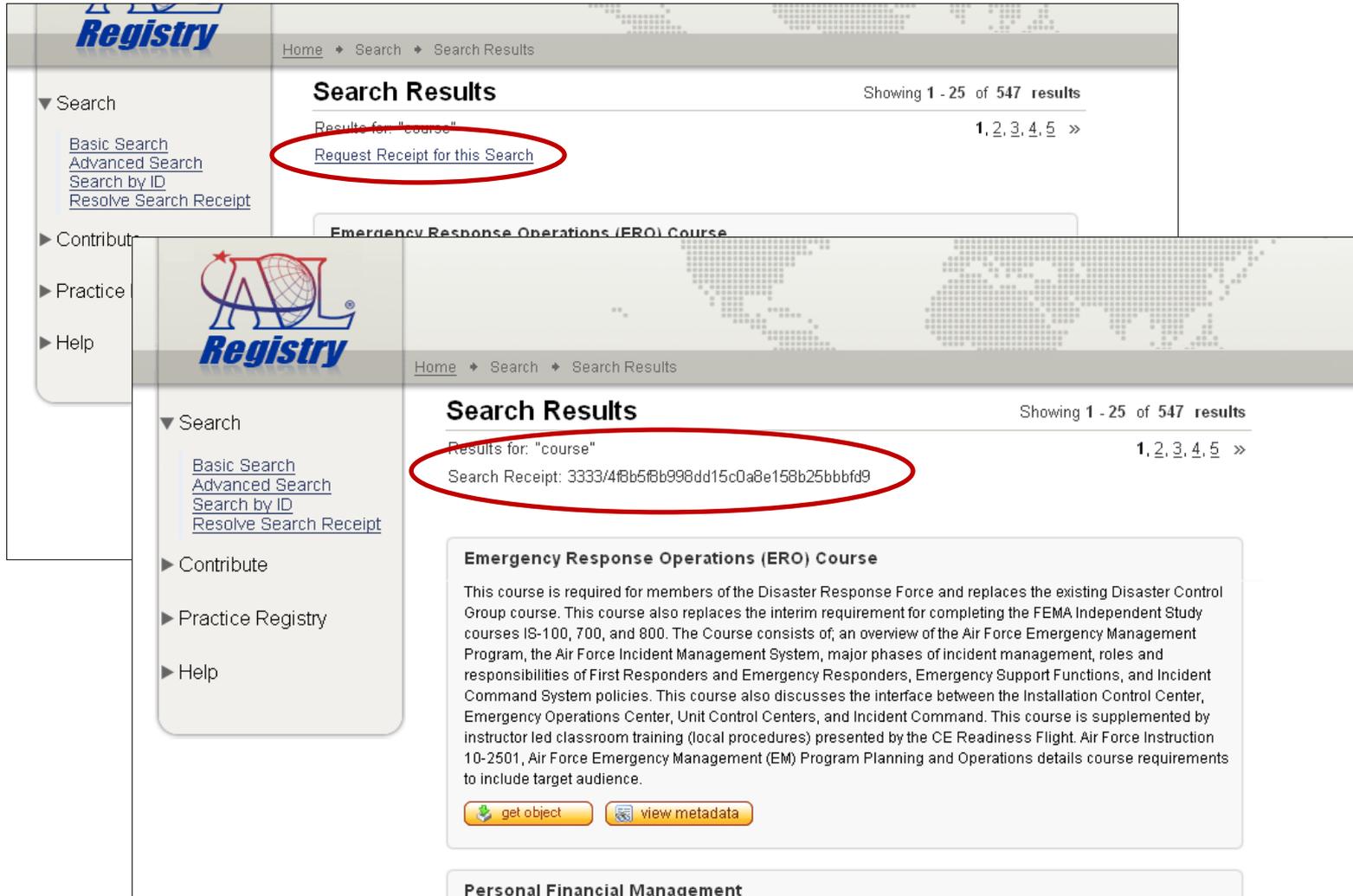
Search

Enter your search criteria, then click search.

Request Receipt

Sponsored by the Office of the Under Secretary of Defense for Personnel and Readiness (OUSD P&R)
This is an official web site of the U.S. Government. © 2009 Advanced Distributed Learning (ADL).





The screenshot shows the search results page for the term "course". The page is divided into two main sections, with the top section partially obscured by a larger, more detailed view of the same page below.

Top Section (Partial View):

- Registry logo and navigation: Home → Search → Search Results
- Search Results: Showing 1 - 25 of 547 results
- Results for: "course" (circled in red)
- Request Receipt for this Search (circled in red)
- Emergency Response Operations (ERO) Course

Bottom Section (Detailed View):

- Registry logo and navigation: Home → Search → Search Results
- Search Results: Showing 1 - 25 of 547 results
- Results for: "course" (circled in red)
- Search Receipt: 3333/4f8b5f8b998dd15c0a8e158b25bbbf9 (circled in red)
- Emergency Response Operations (ERO) Course**

This course is required for members of the Disaster Response Force and replaces the existing Disaster Control Group course. This course also replaces the interim requirement for completing the FEMA Independent Study courses IS-100, 700, and 800. The Course consists of, an overview of the Air Force Emergency Management Program, the Air Force Incident Management System, major phases of incident management, roles and responsibilities of First Responders and Emergency Responders, Emergency Support Functions, and Incident Command System policies. This course also discusses the interface between the Installation Control Center, Emergency Operations Center, Unit Control Centers, and Incident Command. This course is supplemented by instructor led classroom training (local procedures) presented by the CE Readiness Flight. Air Force Instruction 10-2501, Air Force Emergency Management (EM) Program Planning and Operations details course requirements to include target audience.

[get object](#) [view metadata](#)
- Personal Financial Management

Search Receipt

Search Identifier: 3333/4f8b5f8b998dd15c0a8e158b25bbbf9
Registry: 3333/registry
Query: course
Timestamp: Mon Apr 13 16:34:49 EDT 2009

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Personal Financial Management

**Used to verify a Front-End Analysis (FEA)
in accordance with DoDI 1322.26**

- Short Term (early 2009)
 - Released Version 1.7 on 04/09/2009
 - Typed uniform resource locators (URLs)
 - Improved user registration facilities
 - Business validation to address new LOM elements
 - Move to .mil address
 - Increased registrations
- Longer Term (2009 +)
 - ADL Registry (ADL-R) as a configuration option on Generic Registry
 - Generic Registries used in additional projects
 - Deploy Registry of Registries



Multinational Federated ADL Search and Retrieval



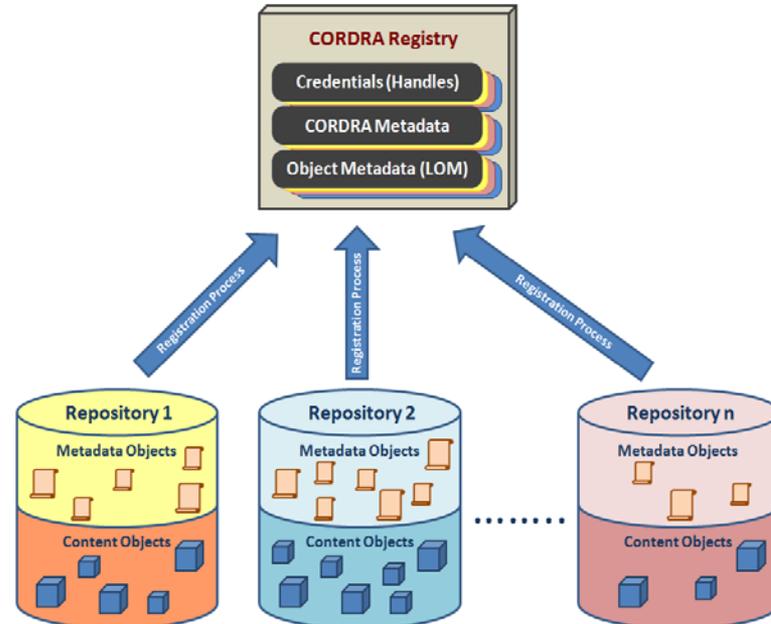
■ Participants

- ADL Co-Lab of US DoD
- Norwegian Defence Education Command (NoDEC)
- Canadian Defence Academy (CDA)
- USJFCOM

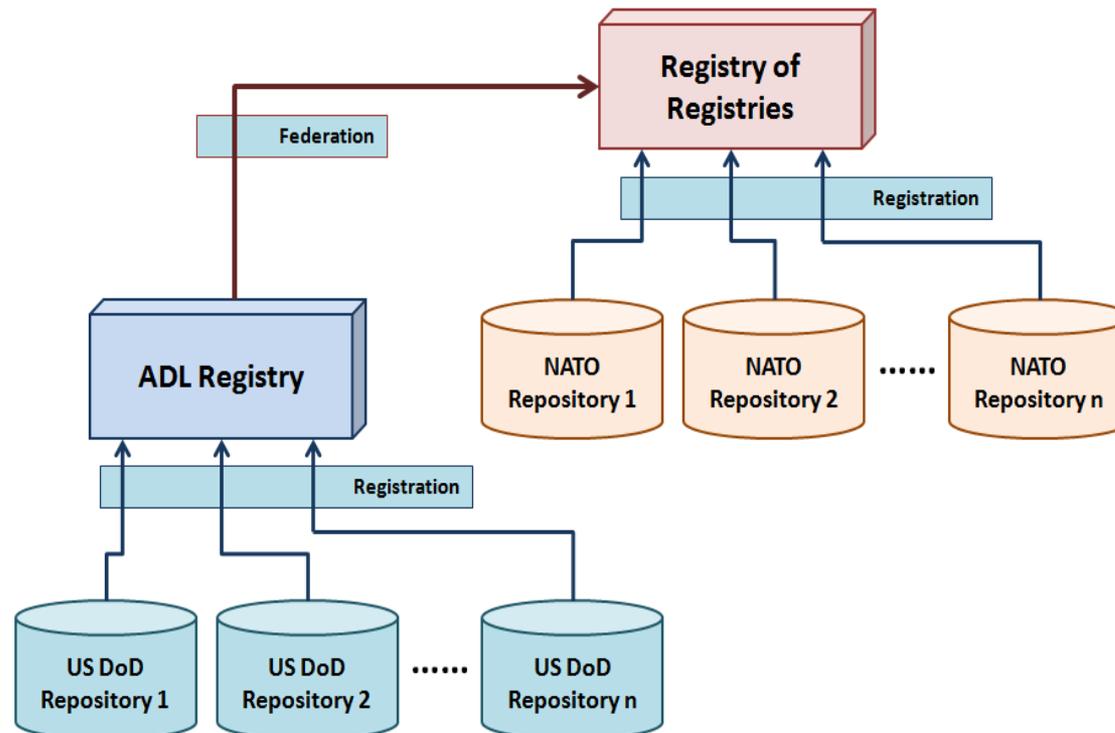
■ Purpose

- To develop an infrastructure to allow multiple NATO nations to search, discover, view, and share technical and instructional content.

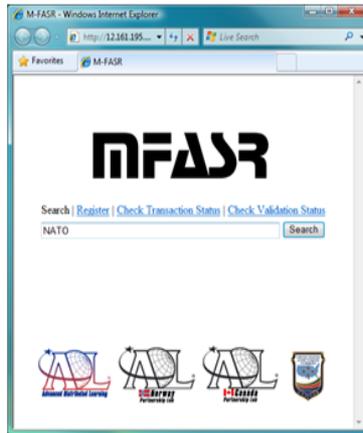
The architecture adheres to the principles of the Content Object Repository Discovery and Registration/Resolution Architecture (CORDRA)



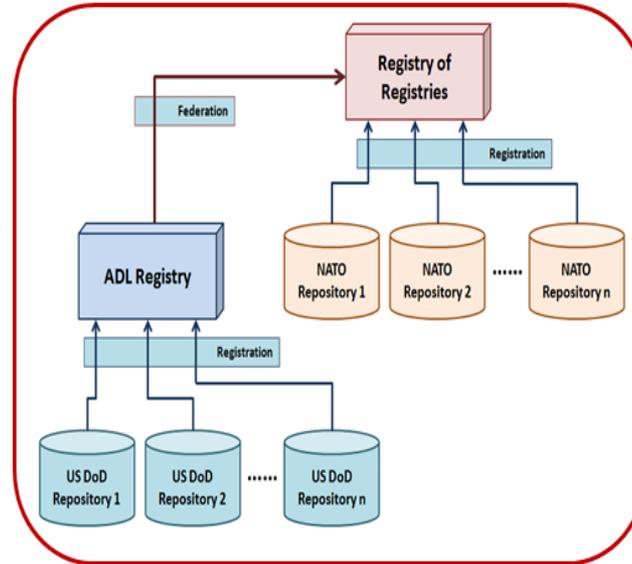
The basic design principle is the federation of heterogeneous repositories through a system of registries



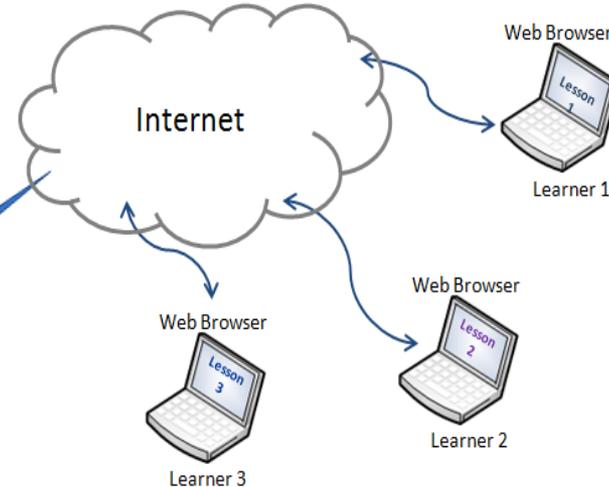
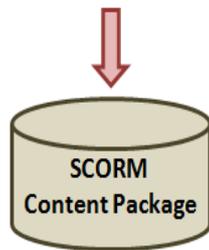
Search and Retrieval

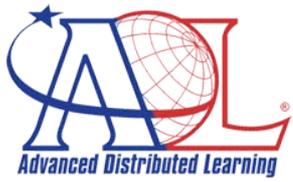


Search
Registry-of-Registries
Discover



Retrieve from
Repositories
Reuse





MFASR Demonstration Video



When selecting a repository or a content management system, consider

- Metadata. Must meet the LOM requirements (ADL-Registry version 1.7).
- Versioning. Capable of tracking changes.
- Complex content object types.
- Web interface. For content access and distribution.
- User roles and privileges.
- Automated registration.

M-FASR Benefits

- Every content object is uniquely identified.
- Content objects can be discovered across various types of repository systems.
- Managers maintain total control over the content objects.
- All types of content objects are discoverable.
- The architecture is highly scalable.
- The federation of registries is scalable.
- Searches for content objects are highly scalable.
- The user interface is easy to use and integrate.

Future Considerations

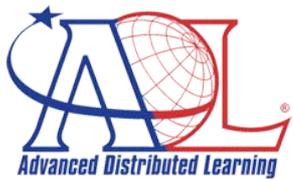
- Most repository systems do not have the ability to automatically register a content object in a registry when the object is put into the repository system.
- Repository managers must register content with correct, meaningful, and consistent metadata to produce usable search results.
- Without automated registration, any change to any already registered content object requires a manual update in the registry.

- Demonstrated a technical solution that enables content sharing and reuse across heterogeneous repository systems.
- Architecture provides a flexible, scalable, and efficient platform.
- This architecture can serve as the foundation for developing a content sharing and reuse infrastructure throughout NATO.

References and Resources



- *ADL Guide to Creating Reusable Content with SCORM 2004*
 - www.ADLNet.gov
- *The ADL Registry and CORDRA, Volume 2: ADL Registry Overview and User Guide*
 - <http://adlregistry.ADLNet.gov/>
- *DOD Instruction 1322.26, Development, Management, and Delivery of Distributed Learning, June 2006*
 - <http://www.dtic.mil/whs/directives/corres/pdf/132226p.pdf>



Learning Opportunities

- Webinars: 1-hour sessions each week
 - Current topics
 - Introduction to SCORM
 - SCORM 2004 4th Edition Overview
 - Creating Reusable Content with SCORM 2004
 - Sequencing SCORM 2004 Content (2-part series)
 - Contributing to the ADL Registry Version 1.7
 - Federated Registry Architectures
 - Choosing Authoring Tools
 - Visual Design Principles for Reusable Learning Content
 - For details, visit www.ADLNet.gov

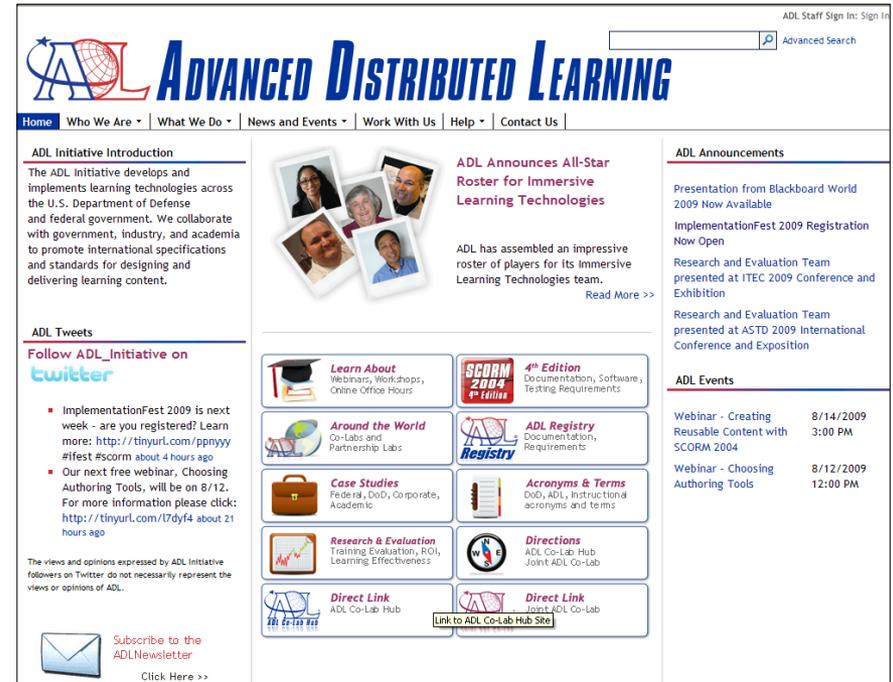


- Online Office Hours
 - Every Thursday from 1:00 - 3:00 PM Eastern
 - Instructional Systems Designer (ISD) and technical expert support
 - For details, visit www.ADLENet.gov



- Bookmark ADLNet.gov
 - Topic sections with new feature stories each month
 - More resources for designers and developers
- *ADL Insights* Monthly Newsletter
 - Subscribe at www.ADLNet.gov

- Follow ADL on  @ADL_Initiative



The screenshot shows the ADL website homepage. At the top left is the ADL logo and the text 'Advanced Distributed Learning'. To the right is a search bar with the text 'Advanced Search'. Below the logo is a navigation menu with links: Home, Who We Are, What We Do, News and Events, Work With Us, Help, and Contact Us.

The main content area is divided into several sections:

- ADL Initiative Introduction:** A paragraph describing the ADL Initiative's mission to develop and implement learning technologies across the U.S. Department of Defense and federal government, collaborating with government, industry, and academia.
- ADL Announces All-Star Roster for Immersive Learning Technologies:** A section featuring a group photo of team members and a short announcement that ADL has assembled an impressive roster of players for its Immersive Learning Technologies team. A 'Read More >>' link is provided.
- ADL Announcements:** A section listing recent events, including 'Presentation from Blackboard World 2009 Now Available' and 'ImplementationFest 2009 Registration Now Open'.
- ADL Events:** A table listing upcoming webinars:

Event	Date	Time
Webinar - Creating Reusable Content with SCORM 2004	8/14/2009	3:00 PM
Webinar - Choosing Authoring Tools	8/12/2009	12:00 PM
- ADL Tweets:** A section titled 'Follow ADL_initiative on twitter' containing three tweets:
 - ImplementationFest 2009 is next week - are you registered? Learn more: <http://tinyurl.com/ppnyyy>
 - Our next free webinar, Choosing Authoring Tools, will be on 8/12. For more information please click: <http://tinyurl.com/Udyf4> about 21 hours ago
 - The views and opinions expressed by ADL Initiative followers on Twitter do not necessarily represent the views or opinions of ADL.
- Learn About:** A grid of links to various resources:
 - Learn About: Webinars, Workshops, Online Office Hours
 - SCORM 2004 4th Edition: Documentation, Software, Testing Requirements
 - Around the World: Co-Labs and Partnership Labs
 - ADL Registry: Documentation, Requirements
 - Case Studies: Federal, DoD, Corporate, Academic
 - Acronyms & Terms: DoD, ADL, Instructional acronyms and terms
 - Research & Evaluation: Training Evaluation, ROI, Learning Effectiveness
 - Directions: ADL Co-Lab Hub, Joint ADL Co-Lab
 - Direct Link: ADL Co-Lab Hub
 - Direct Link: Joint ADL Co-Lab
- Subscribe to the ADL Newsletter:** A link with an envelope icon and the text 'Click Here >>'.

- Vendor-neutral Evaluation Environment
 - Hosted at ADL Co-Lab Hub in Alexandria, VA
 - Expert support to help resolve interoperability concerns
 - Unbiased facilitation for dispute resolution
- Will host a variety of LMS, LCMS, and authoring tools
 - Support test and evaluation of content across platforms
Showcase exemplar content and tools
 - Enable rapid troubleshooting to quickly identify problem areas





Questions or Comments?

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