

Service Genre: Validate XML

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LSAL

Information Architecture & Design, Learning Technologies, Training

Introduction

The Introduction provides a brief, standalone overview of the Service Genre. It is for a non technical reader. It may duplicate other material in the Service Genre Description.

The validate XML service genre provides an abstract service end point for validating the structure of content objects and content object metadata (e.g., IMS Content Packaging XML documents, LOM metadata XML documents). The validator takes the XML document and validates it against defined document schemata.

Service Genre Description

The Service Genre Description is the complete, formal documentation of the Service Genre.

The validate XML service genre defines how to validate an object—a metadata object, a content package, a knowledge object, a competency definition, etc.—encoded in an XML document. The object SHALL conform to an identified XML encoding standard (defined by an XML schema) which is augmented by business rules and used as the basis for validation.

This is a general description of a validate XML service genre, independent of application end point, resource, data object, or underlying communications protocols and service models. The service genre includes the notion of validating different types of objects in different file formats; it is not otherwise dependent on a data model. The service genre includes a mechanism to authenticate clients. The service genre does not include authorization methods to control the return and filtering of results.

Service Genre Metadata

The Service Genre Metadata contains basic labeling, classification and a version history for the Service Genre.

Name

- Service Genre Name: validate XML
- LSAL ID: hdl:1870/CB160B6A2B3D42839D4D220802F100CA
- ADL Name: validate {collection object}, validate {CSDB content object}, validate {competency object}, validate {content object}, validate {knowledge object}, validate {metadata object}, validate {content package}, validate {rights license}, validate {task list object}, validate {training catalog object}, validate {TSDB content object}
- JADL IPA ID: hdl:JADL-IPA-NA/26A5E8CE9DCD45CC8C717163576CA75F (source for derivative)

Classification

Classification Facets:

- Service Genre Status: Unapproved
- Domains: Repository, Content Authoring
- Domain Coverage: Multiple
- Deployment Status: Developmental
- Deployment Scale: Isolated
- Maturity: Immature
- Composition: Individual
- Purpose: Exemplar, Application

Technical Facets:

- State Behavior: Stateless
- Transactional Behavior: Non Transactional
- Batch Behavior: Individual
- Time Constraint Behavior: None



- Service End Point: Provider
- Authentication / Authorization: Auth'ed
- Exposure: Public

Version

- LSAL Version: 1.0.0 [hdl:1870/CB160B6A2B3D42839D4D220802F100CA]
- JADL IPA Version: 1.0.0 [hdl:JADL-IPA-NA/26A5E8CE9DCD45CC8C717163576CA75F]

Version History			
Version	Date	Author	Description
0.50	2007-09-04	DR	Initial D ³ UI version. hdl:JADL-IPA-NA/26A5E8CE9DCD45CC8C717163576CA75F
0.51	2007-09-25	DR	Editorial review, consistency.
0.70	2007-10-07	DR	Draft for review.
0.90	2007-10-14	DR	Final editorial.
1.0.0	2007-10-21	DR	Final D ³ UI V 1.0.0.
1.0.0	2008-06-18	DR	LSAL V 1.0.0. Derivative from D ³ UI version.

Notation

The Notation element includes conventions used to describe the Service Genre.

The words MUST, MUST NOT, REQUIRED, SHALL, SHALL NOT, SHOULD, SHOULD NOT, RECOMMENDED, MAY, and OPTIONAL in this document are to be interpreted as described in [RFC 2119].

Notational conventions follow those given in the LSAL *Service Notation and Document Conventions*.

The identification and versioning scheme follows those given in the LSAL *Service Component Identification Scheme*.

The service classification scheme follows those given in the LSAL *Service Classification Scheme*.

The Service Genre Description follows those given in the LSAL *Service Genre Description Guidelines*.

Description

The Description element is an informal, standalone, non technical narrative description of the Service Genre (problem, process, business-level capabilities and workflow).

The validate XML service genre is used to examine an encoding of an object, e.g., a content object, metadata object, content package, and determine if it is structurally and semantically valid. Validation insures that the document is correct and meaningful before being processed or stored.

Validation includes checking if the object encoding conforms to the document type XML schema. Validation also applies business rules and semantic checking that cannot be represented directly in the document type XML schema. The validation process is specific to the type of object being validated.

The validate XML service genre defines the minimum expected behavior of an XML document validation service and outlines common design issues involved in implementing such a service. The validate XML service genre defines the interfaces to the validation service. It does not describe the processes used internally by the service to validate the document structure and semantics.



The service genre is specialized in service expressions to validate specific types of content and specific XML formats corresponding to the object type. The service expressions also specify details of transport and communication when passing data to and from the service end point.

The validate XML service genre is authentication controlled. A client request will include necessary authentication credentials such that the service end point can permit or deny access to the service. The source of the authentication credentials is not defined by the service genre. The service end point does not apply filtering to responses according to authorization-based access control constraints.

Note, as with other service genres, there is no expectation that all service implementations will be interoperable. Different service expressions MAY take different approaches to defining interfaces and data models.

Usage Scenarios

The Usage Scenarios element is an informal, non technical description of how the Service Genre is used. An illustration of process or problem workflows, expressed using services, is included. An illustration of an application using the components of the Service Genre may be included (but not a description of the design of the application). No critical or essential information required to understand the Service Genre should be included.

The basic usage scenario for the validate XML service genre is to embed the validator in another tool, e.g., within the *Reload* editor, as demonstrated in the (D³UI) Content Authoring service usage model. The tool invokes the validator, specifying the object to be validated. The validator returns a report describing the validation results. All of the interactions with the validation service are hidden from the end user (the end user may not know which service end point was used) and the validation workflow is fully automated. Alternatively, a simple GUI tool could be created as a wrapper to use the validator as part of a manual content management workflow process.

Applicability

The Applicability element details when the Service Genre is used or not used. It represents specific constraints and assumptions on the use of the Service Genre. It is more specific and normative than the informal Usage Scenarios. No critical or essential information required to understand the Service Genre should be included.

As defined, the validator service genre is applicable for validating any supported object type in any supported XML encoding.

Any subsequent processing of the validation results is out of scope for this service genre.

The service genre is defined for validating a single XML document. Batch behavior is not defined.

The service genre is defined to require authentication to use the service end point. Authentication credentials are included in the service request.

Behavior of the service genre is not defined when the service end point requires its own authentication processes to permit retrieval.

The service genre does not define how to obtain the object to be validated.

Behavior of the service genre is not defined when access to the object requires authorization or access controls.

Behavior of the service genre is not defined when the validator service end point filters results that are returned based on authorization policies or rules that need to be communicated through the service control interface.

Behavior of the service genre is not defined if communications need to be secure.



Functionality

The Functionality element details and illustrates the behaviors provided by the Service Genre, in terms of services, workflows, messages, resources, and data objects. It is not a technical description of the Service Genre, but it must provide sufficient information to develop the Requests & Behaviors of the Service Genre and to evaluate conformance of the Service Genre to the stated behaviors. It should not include implementation-specific information.

The validate XML service genre supports two functions:

Validate Inspection Function: The inspect request is used to determine the capabilities of the validator. This information enables a client to successfully communicate with the service end point of the validator. Data gathered MAY include:

- Descriptions (machine processible) of the types of objects that may be validated.
- Descriptions (machine processible) of the XML document formats for an object type that may be validated.
- Descriptions (machine processible) of the document formats that may be returned for containing the validation results.
- Descriptions (machine processible) of the supported communications and transport protocols.

Validation Function: The validation function is used to validate an XML document.

A request SHALL specify:

- Type data describing the object that is to be validated:
 - The object type [REQUIRED].
 - The governing XML document schema [REQUIRED].
- The object that is to be validated [REQUIRED].
- Authentication credentials to use the service end point [REQUIRED].

A request MAY specify:

- The desired output format including:
 - Requested validation output format [OPTIONAL]. Representations SHOULD refer to existing standards and SHOULD include version numbers or version information.
 - Requested validation output encoding [OPTIONAL]. Representations SHOULD refer to existing standards and SHOULD include version numbers or version information.

No other functionality is defined. The functionality that is defined MAY be extended. Major new or additional functionality SHOULD NOT be included; extended capabilities SHOULD be included in other service genres.

Requests & Behaviors

The Requests & Behaviors element details all of the behaviors exposed by the Service Genre. It lists functionality that can be used by applications or Service Implementations. The information must be sufficient to specialize the Service Genre to one or more Service Expressions.

The format and definitions for requests and responses SHALL be defined by the service expressions that specialize the service genre. Requests and behaviors SHALL meet the following conditions:

- One *Validation Function* SHALL be defined:
 - The function SHALL be capable of validating all supported object types and all supported encodings for the defined object types.
 - The request SHALL include authentication credentials used to control access to the service end point.
 - The request SHOULD include control information to specify the requested result format and encoding.
 - A normal (non error) response SHALL include the validation results.
 - The response SHOULD include summary information.
- One *Validation Inspection Function* SHOULD be defined:
 - The request SHOULD include authentication data.
 - The response SHOULD include information about all supported object types, XML formats and encodings for objects being validated.



- The response SHOULD include information about available XML encodings for validation results.
- Responses SHALL include error indicators or other needed control information.

Use & Interactions

The Use & Interactions element details how the how the Requests & Behaviors are combined to provide the stated functionality of the Service Genre. This is a precise technical description of how the Service Genre provides its capabilities.

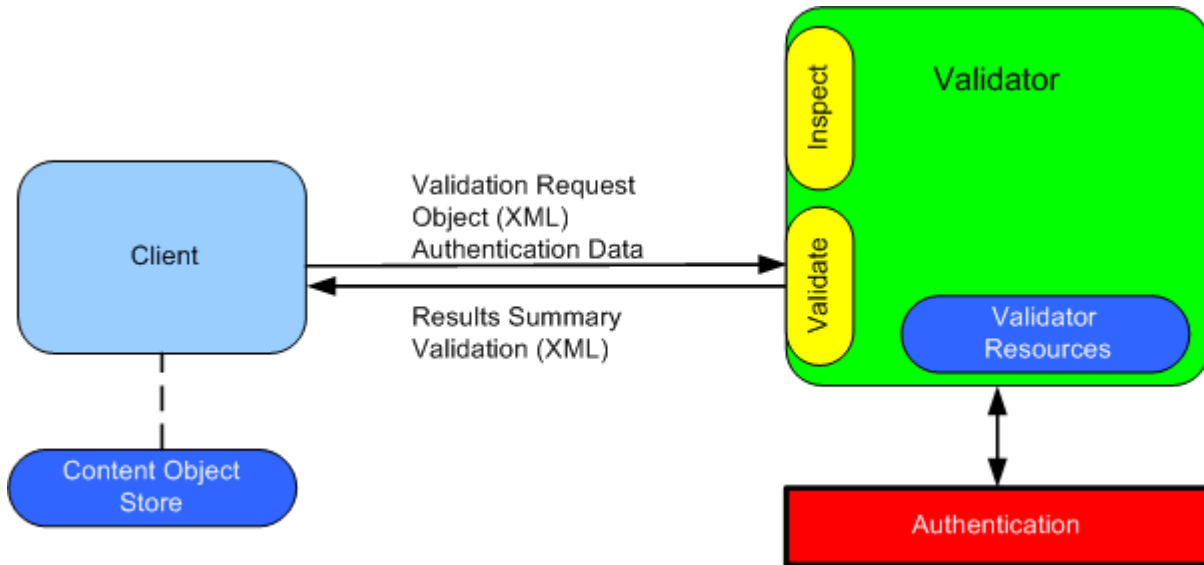
The model for a client to interact with a service implementation SHALL be defined by the service expressions that specialize the service genre.

Structure

The Structure element provides a conceptual model of how the Service Genre manipulates data and state to provide results in response to requests. An illustration of the structure should be included. The structure information is used to specialize the Service Genre to one or more Service Expressions, but is not needed to understand how to use or interact with the Service Genre.

The structure of the service genre SHALL be defined by the service expressions that specialize the service genre.

The overall flow of interactions with the service is illustrated in the diagram.



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Figure 1: Validate XML Service Genre [© Copyright 2007, Learning Systems Architecture Lab, All Rights Reserved.]



Design Decisions & Tradeoffs

The Design Decisions & Tradeoffs element documents overall choices, tradeoffs and their implications on the design of the Service Genre. It does not address the issues related to the internal details of a Service Implementation used to implement the Service Expression based on the Service Genre. No critical or essential information required to understand the Service Genre should be included.

The design assumes that the validation process of are sufficiently similar for different types of XML-encoded documents or objects such that a single service genre may be defined for all XML document types. The design MAY NOT be applicable in validating non XML document; these MAY require other service genres.

The process to validate an XML document is not defined; the service genre only defines interfaces and observable behaviors, not internal models, algorithms or structure.

Validation algorithms MAY be defined in the service expressions that specialize the service genre (resulting in many different service expressions) or they MAY be deferred to the resulting service implementation design. In the later case, the single service expression MAY act as a router to per-object service implementations.

The service genre supports only individual requests, not batch processing. The service genre may be extended to support batch requests or a separate service genre may be defined. Batch processing may take significant time; appropriate messaging is required to address delays and time outs, e.g., request-response may not be an appropriate messaging model. The overall requests and behaviors would remain the same.

The service genre assumes that the XML document will be passed in the request for validation. A locator for the document could be passed instead, but such an approach would require an additional service to obtain the XML document from the locator. This obtain service would also require authentication and possibly authorization data be passed. Such an approach would complicate the overall service design and workflow. Such an approach could be modeled in an alternative service genre or as an extension to the functionality of this service genre.

The service genre uses request-response messaging. This assumes that metadata generation will be sufficiently fast to support this type of interaction. An alternative, if generating the metadata requires significant time, would be to use a call-back messaging model. Additional interactions would be required, but the overall requests and behaviors would remain the same.

Implementation Guide & Dependencies

The Implementation Guide & Dependencies element describes issues of concern in specializing the Service Genre to one or more Service Expressions and their corresponding Service Implementations. Resolution of issues discussed is deferred to the actual Service Implementation design. No critical or essential information required to understand the Service Genre should be included.

The following design decisions apply to the service expressions that specialize the service genre.

Structure and Design:

- A service implementation MAY use internal resources for validation. The provisioning of these resources is not defined but MUST be considered in the implementation design.
- The service expression MAY include the specification of the communications protocol as part of its definition or it MAY layer the functions on top of another communications protocol.

Communications and Messaging:

- The service genre assumes a request-response messaging model. The functionality does not require request-response messaging, and a call-back or polling messaging model may be used as an alternative.
- The service expressions that specialize the service genre SHALL specify the messaging model.

Performance:



- A service implementation SHALL be capable of handling simultaneous requests from different clients.
- A service expression should consider the time required to validate an XML document in the design of the messaging model and behavior interfaces. The resulting service implementation SHOULD consider the implication of long response times.

Security and Privacy Considerations:

- Service implementations may be subject to denial-of-service attacks.
- Care should be taken to maintain privacy of any personal data or other records that may disclose usage or that may be embedded within the XML document.

Applicable Standards

The Applicable Standards element lists domain-specific standards applicable to the Service Genre as a whole. Standards are described in terms of name, version and citation link. Conformance requirements and extensions should be noted. Standards used to implement applications are excluded. No critical or essential information required to understand the Service Genre should be included.

None. No standards are directly applicable to the service genre as a whole.

The service expressions that specialize the service genre SHALL be defined in terms of standards:

- Service expressions SHALL specify applicable standards for describing objects that can be validated.
- Service expressions SHALL specify applicable standards for XML document types for the object to be validated.
- Service expressions SHALL specify applicable standards for representing and encoding validation results.
- Service expressions SHALL specify applicable communications, encoding and transport protocols standards.
- Service expressions SHALL specify applicable standards-based authentication models.

Known Uses

The Known Uses element documents actual uses of the Service Genre in applications and systems, including how used, extensions, limits.

Actual: The service genre is used in the D³UI development-to-deposit prototype using *Reload* to validate ADL-R metadata for registration with the ADL-R and validate content packages for deposit in a repository.

Potential: The service genre could be used in any content management or creation process to validate the created content object. A typical implementation would use a specialized service expression, selecting specific types of documents to be validated and specific validation procedures.

Potential: The service genre could be used in a service usage model for a repository federation. Metadata objects for registration would be validated as part of the ingest/registration process.

Service Genre Dependencies

The Service Genre Dependencies lists other Service Genres that this Service Genre is dependent upon. Dependent Service Genres are identified by name and version.

authenticate: Vx.xx.

[\[link to service genre\]](#)

The service genre requires authentication for use. The authenticate service genre is part of the identity service usage model [\[link to service usage model\]](#). The identity service usage model is an integrated set of service genres that provides the operational user identity infrastructure that includes the creation of user rights and roles, user authentication and user authorization.



Related Service Usage Models

The Related Service Usage Models element documents and illustrates how the Service Genre is used in Service Usage Models. Related Service Usage Models are identified by name and version. No critical or essential information required to understand the Service Genre should be included.

(D³UI) content authoring: V1.0.0.

[[D³UI content-authoring-sum-v100 / hdl:1870/3FD212C661F1464AA79DBB22D3DE00FF](http://hdl:1870/3FD212C661F1464AA79DBB22D3DE00FF)]

Validate (genre) is part of the (D³UI) content authoring service usage model (genre based) and is used within an authoring and content deposit workflow to validate content packages before they are deposited in a repository and to validate metadata before it is registered in the ADL-R.

(FRED) repository federation: V1.0.0.

[[link to service usage model](#)]

Content validation (genre) is a part of the repository federation service usage model (genre based) and is used to validate submissions to the repositories and collections that participate in the federation to build the registry data used for discovery. The repository federation service usage model provides an integrated set of service genres used to populate and use the metadata registry that supports a repository federation. Functionality includes content management (creation and management of metadata objects within a repository federation), content discovery (discovery of content objects from a repository federation) and content delivery (retrieval of and access to content objects discovered through a repository federation).

(ADL-R) repository federation: V1.0.0.

[[ADL-R repository-federation-sum-v100 / hdl:1870/E2FE4AD428A1468FA284E270245F72D7](http://hdl:1870/E2FE4AD428A1468FA284E270245F72D7)]

The (ADL-R) repository federation service usage model is a derivative subset of the (FRED) repository federation service usage model. For the purposes of this service genre they are interchangeable.

Related Service Patterns

The Related Service Patterns element documents and illustrates how the Service Genre is used in Service Patterns. Related Service Patterns are identified by name and version.

None.

References

The References element includes references and bibliographic citations to works needed to understand the Service Genre.

None.

Glossary & Terminology

The Glossary & Terminology element defines domain-specific terms used in documenting the Service Genre.

Terms in the LSAL *Service Glossary* are applicable to this Service Genre.

Working Notes / Things To Do

The Working Notes element documents open issues in the development of the Service Genre and is for internal project use only. It should be deleted before the Service Genre is submitted for publication.

None.

