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OSLC Requirements Management Version 2.1. Part 3: Constraints

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This stage:

https://docs.oasis-open-projects.org/oslc-op/rm/v2.1/os/requirements-management-shapes.html (Authoritative)
https://docs.oasis-open-projects.org/oslc-op/rm/v2.1/os/requirements-management-shapes.pdf

Previous stage:

https://docs.oasis-open-projects.org/oslc-op/rm/v2.1/ps02/requirements-management-shapes.html (Authoritative)
https://docs.oasis-open-projects.org/oslc-op/rm/v2.1/ps02/requirements-management-shapes.pdf

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https://docs.oasis-open-projects.org/oslc-op/rm/v2.1/requirements-management-shapes.html (Authoritative)
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Additional components:

This specification is one component of a Work Product that also includes:

- *OSLC Requirements Management Version 2.1. Part 1: Specification*. https://docs.oasis-open-projects.org/oslc-op/rm/v2.1/os/requirements-management-spec.html
- *OSLC Requirements Management Version 2.1. Part 2: Vocabulary*. https://docs.oasis-open-projects.org/oslc-op/rm/v2.1/os/requirements-management-vocab.html
- *OSLC Requirements Management Version 2.1. Part 3: Constraints (this document)*. https://docs.oasis-open-projects.org/oslc-op/rm/v2.1/os/requirements-management-shapes.html
- *OSLC Requirements Management Version 2.1. Machine-readable Vocabulary Terms*. https://docs.oasis-open-projects.org/oslc-op/rm/v2.1/os/requirements-management-vocab.ttl
- *OSLC Requirements Management Version 2.1. Machine-readable Constraints*. https://docs.oasis-open-projects.org/oslc-op/rm/v2.1/os/requirements-management-shapes.ttl

Related work:

This specification is related to:

- *Open Services for Lifecycle Collaboration Requirements Management Specification Version 2.0.* http://open-services.net/bin/view/Main/RmSpecificationV2

RDF Namespaces:

http://open-services.net/ns/rm#

Abstract:

This specification defines resource shapes for the OSLC Requirements Management domain.

Status:

This document was last revised or approved by the membership of OASIS on the above date. The level of approval is also listed above. Check the "Latest stage" location noted above for possible later revisions of this document. Any other numbered Versions and other technical work produced by the Open Project are listed at https://open-services.net/about/.

Comments on this work can be provided by opening issues in the project repository or by sending email to the project's public comment list oslc-op@lists.oasis-open-projects.org.

The English version of this specification is the only normative version. Non-normative translations may also be available. Note that any machine-readable content (Computer Language Definitions) declared Normative for this Work Product is provided in separate plain text files. In the event of a discrepancy between any such plain text file and display content in the Work Product's prose narrative document(s), the content in the separate plain text file prevails.

Citation format:

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Notices

Table of Contents

1. Introduction

This section is non-normative.

This specification defines resource shapes for the OSLC Requirements Management resources. The intent is to define resources needed to support common integration scenarios and not to provide a comprehensive definition of a Requirement. The resource formats may not match exactly the native models supported by requirement management service providers, but are intended to be compatible with them. The approach to supporting these scenarios is to delegate operations, as driven by service provider contributed user interfaces, as much as possible and not require a service provider to expose its complete data model and application logic.

1.1 Terminology

This section is non-normative.

Terminology is based on OSLC Core Overview [OSLCCore3], W3C Linked Data Platform [LDP], W3C's Architecture of the World Wide Web [WEBARCH], Hyper-text Transfer Protocol [HTTP11]. Terminology for this specification is defined in part 1 of the multi-part specification.

1.2 References

1.2.1 Normative references

[HTTP11]

R. Fielding, Ed.; J. Reschke, Ed.. *Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing*. IETF, June 2014. Proposed Standard. URL: https://httpwg.org/specs/rfc7230.html

[LDP]

Steve Speicher; John Arwe; Ashok Malhotra. *Linked Data Platform 1.0*. W3C, 26 February 2015. W3C Recommendation. URL: https://www.w3.org/TR/ldp/

[OSLCCore2]

S. Speicher; D. Johnson. *OSLC Core 2.0*. http://open-services.net. Finalized. URL: http://open-services.net/bin/view/Main/OslcCoreSpecification

[OSLCCore3]

Jim Amsden; S. Speicher. *OSLC Core Version 3.0. Part 1: Overview*. OASIS. Project Specification. URL: https://docs.oasis-open-projects.org/oslc-op/core/v3.0/oslc-core.html

[OSLCCore3LinkGuidance]

Jim Amsden. *OSLC Core 3.0: Link Guidance*. OASIS. Project Note Draft. URL: https://oslc-op.github.io/oslc-specs/notes/link-guidance.html

[RFC2119]

S. Bradner. *Key words for use in RFCs to Indicate Requirement Levels*. IETF, March 1997. Best Current Practice. URL: https://datatracker.ietf.org/doc/html/rfc2119

[RFC8174]

B. Leiba. *Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words*. IETF, May 2017. Best Current Practice. URL: https://datatracker.ietf.org/doc/html/rfc8174

1.2.2 Informative references

[WEBARCH]

Ian Jacobs; Norman Walsh. *Architecture of the World Wide Web, Volume One*. W3C, 15 December 2004. W3C Recommendation. URL: https://www.w3.org/TR/webarch/

1.3 Typographical Conventions and Use of RFC Terms

As well as sections marked as non-normative, all authoring guidelines, diagrams, examples, and notes in this specification are non-normative. Everything else in this specification is normative.

The key words "**MUST**", "**MUST NOT**", "**REQUIRED**", "**SHALL**", "**SHALL NOT**", "**SHOULD**", "**SHOULD NOT**", "**RECOMMENDED**", "**NOT RECOMMENDED**", "**MAY**", and "**OPTIONAL**" in this specification are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

In addition to the namespace URIs and namespace prefixes `oslc`, `rdf`, `dcterms` and `foaf` defined in the OSLC Core specification, OSLC RM defines the namespace URI of `http://open-services.net/ns/rm#` with a namespace prefix of `oslc_rm`

2. Conformance

Requirements Management servers **MUST** use the vocabulary terms defined here where required, and with the meanings defined here. [cc-1]

Requirements Management servers **MAY** augment this vocabulary with additional classes, properties, and individuals. [cc-2]

Clause Number	Requirement
cc-1	Requirements Management servers **MUST** use the vocabulary terms defined here where required, and with the meanings defined here.
cc-2	Requirements Management servers **MAY** augment this vocabulary with additional classes, properties, and individuals.
cc-3	Requirement creation through a Creation Factory resource in the Service Description is **REQUIRED** by this specification.
cc-4	Any **resource** asserted to be of `rdf:type http://open-services.net/ns/rm#Requirement` **MUST** conform to the constraints and meaning of properties defined below.
cc-8	`RequirementCollection` creation through a Creation Factory resource in the Service Description is **OPTIONAL** in this specification.
cc-9	Any **resource** asserted to be of `rdf:type http://open-services.net/ns/rm#RequirementCollection` **MUST** conform to the constraints and meaning of properties defined below.
cc-10	It **SHOULD** include only content that is valid and suitable inside an XHTML <div> element.
cc-13	For compatibility with OSLC Core 2.0 [OSLCCore2], RM servers **MAY** accept relationship properties.
cc-14	It **SHOULD** include only content that is valid inside an XHTML <span> element.
cc-15	To this end, OSLC Servers **MAY** suppport a `dcterms:title` link property in RM resource representations where a relationship property is permitted, using the anchor approach outlined in the OSLC Core Links Guidance.
cc-16	Servers and Clients **SHOULD** be aware that the `dcterms:title` of a link is unrelated to the dcterms:title of the object resource.

3. Requirements Management Resource Constraints

3.1 Resource: RequirementShape

The constraints on the Requirement resource properties are defined in the tables below. Requirement resource properties are not limited to the ones defined in this specification. Service providers may provide additional properties. It is strongly recommended that any additional properties be defined in XML namespaces distinct from those defined by OSLC in these specifications. Requirement creation through a Creation Factory resource in the Service Description is REQUIRED by this specification. [cc-3]

Any **resource** asserted to be of `rdf:type http://open-services.net/ns/rm#Requirement` MUST conform to the constraints and meaning of properties defined below. [cc-4] Notice that partial representations of a requirement resource are admitted by this specification (for example, in query results, or where `oslc.properties` has been used), and such partial representations will in general not conform to these constraints.

- **Describes:** `http://open-services.net/ns/rm#Requirement`
- **Summary:** Statement of need.
- **Description:** A condition or capability needed by a stakeholder, or imposed by a solution component, to address a need, solve a problem, achieve an objective, or to satisfy a contract, standard, specification, or other formally imposed documents.

Requirement Properties

Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
`dcterms:contributor`	Zero-or-many	unspecified	AnyResource	Either	`oslc:AnyResource`	Contributor(s) to resource (reference: Dublin Core). It is likely that the target resource will be a <code>foaf:Person</code> but that is not necessarily the case.
`dcterms:created`	Zero-or-one	true	dateTime	N/A	Unspecified	Timestamp of resource creation (reference: Dublin Core).
`dcterms:creator`	Zero-or-many	unspecified	AnyResource	Either	`oslc:AnyResource`	Creator(s) of resource (reference: Dublin Core). It is likely that the target resource will be an <code>foaf:Person</code> but that is not necessarily the case.
`dcterms:description`	Zero-or-one	unspecified	XMLLiteral	N/A	Unspecified	Descriptive text (reference: Dublin Core) about resource represented as rich text in XHTML content. It SHOULD include only content that is valid and suitable inside an XHTML <div> element. [cc-5]
`dcterms:identifier`	Zero-or-one	true	string	N/A	Unspecified	An identifier for a resource. This identifier may be unique with a scope that is defined by the RM provider. Assigned by the service provider when a resource is created. Not intended for end-user display.
`dcterms:modified`	Zero-or-one	true	dateTime	N/A	Unspecified	Timestamp of last resource modification (reference: Dublin Core).

Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
dcterms:subject	Zero-or-many	false	string	N/A	Unspecified	Tag or keyword for a resource. Each occurrence of a dcterms:subject property denotes an additional tag for the resource.
dcterms:title	Exactly-one	unspecified	XMLLiteral	N/A	Unspecified	Title (reference: Dublin Core) of the resource represented as rich text in XHTML content. It SHOULD include only content that is valid inside an XHTML <span> element. [cc-6]
oslc_rm:affectedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The subject is affected by the object, such as a defect or issue.
oslc_rm:constrainedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The subject is constrained by the object. For example, a functional requirement is constrained by a safety requirement.
oslc_rm:constrains	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The object is constrained by the subject.
oslc_rm:decomposedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The subject is decomposed by the object. For example, a system requirement is decomposed into a collection of system requirements.
oslc_rm:decomposes	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The object is decomposed by the subject.
oslc_rm:elaboratedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The subject is elaborated by the object. For example, a user requirement is elaborated by use case.
oslc_rm:elaborates	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The object is elaborated by the subject.
oslc_rm:implementedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	Resource, such as a change request, which implements this requirement.
oslc_rm:satisfiedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The subject is satisfied by the object. For example, a user requirement is satisfied by a system requirement.
oslc_rm:satisfies	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The object is satisfied by the subject.
oslc_rm:specifiedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The subject is specified by the object. For example, a requirement is elaborated by a model element.

Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
`oslc_rm:specifies`	Zero-or-many	false	Resource	Reference	`oslc:AnyResource`	The object is specified by the subject.
`oslc_rm:trackedBy`	Zero-or-many	false	Resource	Reference	`oslc:AnyResource`	Resource, such as a change request, which tracks this requirement.
`oslc_rm:validatedBy`	Zero-or-many	false	Resource	Reference	`oslc:AnyResource`	Resource, such as a test case, which validates this requirement.
`oslc:instanceShape`	Zero-or-one	unspecified	Resource	Reference	`oslc:ResourceShape`	Resource Shape that provides hints as to resource property value-types and allowed values.
`oslc:serviceProvider`	Zero-or-many	unspecified	Resource	Reference	`oslc:ServiceProvider`	The scope of a resource is a URI for the resource's OSLC Service Provider.
`oslc:shortTitle`	Zero-or-one	unspecified	XMLLiteral	N/A	Unspecified	Short name identifying a resource, often used as an abbreviated identifier for presentation to end-users. It **SHOULD** include only content that is valid inside an XHTML <span> element. [cc-7]
`rdf:type`	Zero-or-many	unspecified	Resource	Reference	Unspecified	The resource type URIs.

3.2 Resource: RequirementCollectionShape

The constraints on the RequirementCollection vocaubluary resource properties are defined in the tables below. RequirementCollection resource properties are not limited to the ones defined in this specification, service providers may provide additional properties. It is strongly recommended that any additional properties be defined in XML namespaces distinct from those defined by OSLC in these specifications. `RequirementCollection` creation through a Creation Factory resource in the Service Description is **OPTIONAL** in this specification. [cc-8]

Any **resource** asserted to be of `rdf:type` `http://open-services.net/ns/rm#RequirementCollection` **MUST** conform to the constraints and meaning of properties defined below. [cc-9] Notice that partial representations of a requirement collection resource are admitted by this specification (for example, in query results, or where `oslc.properties` has been used), and such partial representations will in general not conform to these constraints.

- **Describes:** `http://open-services.net/ns/rm#RequirementCollection`
- **Summary:** A collection of Requirements.
- **Description:** A grouping or collection of related requirements for any purpose.

RequirementCollection Properties

Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
`dcterms:contributor`	Zero-or-many	unspecified	AnyResource	Either	`oslc:AnyResource`	Contributor(s) to resource (reference: Dublin Core). It is likely that the target resource will be a <code>foaf:Person</code> but that is not necessarily the case.
`dcterms:created`	Zero-or-one	true	dateTime	N/A	Unspecified	Timestamp of resource creation (reference: Dublin Core).

Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
dcterms:creator	Zero-or-many	unspecified	AnyResource	Either	oslc:AnyResource	Creator(s) of resource (reference: Dublin Core). It is likely that the target resource will be an <code>foaf:Person</code> but that is not necessarily the case.
dcterms:description	Zero-or-one	unspecified	XMLLiteral	N/A	Unspecified	Descriptive text (reference: Dublin Core) about resource represented as rich text in XHTML content. It SHOULD include only content that is valid and suitable inside an XHTML <div> element. [cc-10]
dcterms:identifier	Zero-or-one	true	string	N/A	Unspecified	An identifier for a resource. This identifier may be unique with a scope that is defined by the RM provider. Assigned by the service provider when a resource is created. Not intended for end-user display.
dcterms:modified	Zero-or-one	true	dateTime	N/A	Unspecified	Timestamp of last resource modification (reference: Dublin Core).
dcterms:subject	Zero-or-many	false	string	N/A	Unspecified	Tag or keyword for a resource. Each occurrence of a dcterms:subject property denotes an additional tag for the resource.
dcterms:title	Exactly-one	unspecified	XMLLiteral	N/A	Unspecified	Title (reference: Dublin Core) of the resource represented as rich text in XHTML content. It SHOULD include only content that is valid inside an XHTML <span> element. [cc-11]
oslc_rm:affectedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The subject is affected by the object, such as a defect or issue.
oslc_rm:constrainedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The subject is constrained by the object. For example, a requirement collection is constrained by a requirement collection.
oslc_rm:constrains	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The object is constrained by the subject.
oslc_rm:decomposedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The subject is decomposed by the object. For example, a collection of business requirements is decomposed by a collection of user requirements.

Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
oslc_rm:decomposes	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The object is decomposed by the subject.
oslc_rm:elaboratedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The subject is elaborated by the object. For example, a collection of user requirements elaborates a business need, or a model elaborates a collection of system requirements.
oslc_rm:elaborates	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The object is elaborated by the subject.
oslc_rm:implementedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	Resource, such as a change request, which implements this requirement collection.
oslc_rm:satisfiedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The subject is satisfied by the object. For example, a collection of user requirements is satisfied by a requirement collection of system requirements.
oslc_rm:satisfies	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The object is satisfied by the subject.
oslc_rm:specifiedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The subject is specified by the object. For example, a model element might make a requirement collection more precise.
oslc_rm:specifies	Zero-or-many	false	Resource	Reference	oslc:AnyResource	The object is specified by the subject.
oslc_rm:trackedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	Resource, such as a change request, which manages this requirement collection.
oslc_rm:uses	Zero-or-many	unspecified	Resource	Reference	oslc:AnyResource	A collection uses a resource - the resource is in the requirement collection.
oslc_rm:validatedBy	Zero-or-many	false	Resource	Reference	oslc:AnyResource	Resource, such as a test plan, which validates this requirement collection.
oslc:instanceShape	Zero-or-one	unspecified	Resource	Reference	oslc:ResourceShape	Resource Shape that provides hints as to resource property value-types and allowed values.
oslc:serviceProvider	Zero-or-many	unspecified	Resource	Reference	oslc:ServiceProvider	The scope of a resource is a URI for the resource's OSLC Service Provider.

Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
`oslc:shortTitle`	Zero-or-one	unspecified	XMLLiteral	N/A	Unspecified	Short name identifying a resource, often used as an abbreviated identifier for presentation to end-users. It SHOULD include only content that is valid inside an XHTML <span> element. [cc-12]
`rdf:type`	Zero-or-many	unspecified	Resource	Reference	Unspecified	The resource type URIs.

4. Relationship Properties

For compatibility with OSLC Core 2.0 [OSLCCore2], RM servers **MAY** accept relationship properties. [cc-13] This is however no longer recommended practice, since the necessary reification of relationship can have entailment and inferencing issues. OSLC Core 3.0 Link Guidance [OSLCCore3LinkGuidance] details an alternative approach, where a separate resource is created to represent the relationship and its properties.

The following relationship properties are defined by this specification:

Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
`dcterms:title`	zero-or-one	unspecified	XMLLiteral	n/a	n/a	Title (reference: Dublin Core) of the link represented as rich text in XHTML content. It **SHOULD** include only content that is valid inside an XHTML <span> element. [cc-14]
`dcterms:creator`	zero-or-many	unspecified	Resource or Local Resource	Either Reference or Inline	`any`	Creator(s) of resource (reference: Dublin Core). It is likely that the target resource will be a `foaf:Person` but that is not necessarily the case.
`dcterms:contributor`	zero-or-many	unspecified	Resource or Local Resource	Either Reference or Inline	`any`	Creator(s) of resource (reference: Dublin Core). It is likely that the target resource will be a `foaf:Person` but that is not necessarily the case.
`dcterms:created`	zero-or-one	True	DateTime	n/a	n/a	Timestamp of link creation (reference: Dublin Core).
`dcterms:modified`	zero-or-one	True	DateTime	n/a	n/a	Timestamp last latest link modification (reference: Dublin Core).

4.1 Relationship labels

When an RM relationship property is to be presented in a user interface, it may be helpful to provide an informative and useful textual label for that relationship instance. (This in addition to the relationship property URI and the object resource URI, which are also candidates for presentation to a user.) To this end, OSLC Servers **MAY** suppport a `dcterms:title` link property in RM resource representations where a relationship property is permitted, using the anchor approach outlined in the OSLC Core Links Guidance. [cc-15]

Servers and Clients **SHOULD** be aware that the `dcterms:title` of a link is unrelated to the dcterms:title of the object resource. [cc-16] Indeed, links may carry other properties with names in common to the object of the link, but there is no specified relationship between these property values.