OASIS OPEN PROJECTS

OSLC Systems Modeling Language Version 2.0. Part 1: Specification

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Additional components:

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

- *OSLC SysML Version 2.0. Part 1: Specification (this document)*. sysml-spec.html
- *OSLC SysML Version 2.0. Part 2: Vocabulary*. sysml-vocab.html
- *OSLC SysML Version 2.0. Part 3: Constraints*. sysml-shapes.html
- *OSLC SysML Version 2.0. Part 4: Machine Readable Vocabulary Terms*. sysml-vocab.ttl
- *OSLC SysML Version 2.0. Part 5: Machine Readable Constraints*. sysml-shapes.ttl

Related work:

This specification is related to:

- *OMG Systems Modeling Language*. https://www.omg.org/spec/SysML/
- *Systems Modeling Application Programming Interface (API) and Services*. https://www.omg.org/spec/SystemsModelingAPI/1.0/Beta1/PDF

RDF Namespaces:

http://open-services.net/ns/sysmlv2#

Abstract:

This specification defines the OSLC SysML domain, a RESTful web services interface for the SysML v2 resources and relationships between those and related resources such as product change requests, activities, tasks, requirements or test cases. To support these scenarios, this specification defines a set of HTTP-based RESTful interfaces in terms of HTTP methods: GET, POST, PUT and DELETE, as well as HTTP response codes, content type handling and resource formats.

Status:

This document was last revised or approved by the OASIS Open Services for Lifecycle Collaboration (OSLC) OP 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.

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.

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Notices

All capitalized terms in the following text have the meanings assigned to them in the OASIS Intellectual Property Rights Policy (the "OASIS IPR Policy"). The full Policy may be found at the OASIS website.

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1. Introduction

This section is non-normative.

Object Management group (https://www.omg.org) defines the OMG Systems Modeling Language Version 2.0 commonly referred to as SysML v2 [SysML]. From OMG: "SysML is a general-purpose modeling language for modeling systems that is intended to facilitate a model-based systems engineering (MBSE) approach to engineer systems. It provides the capability to create and visualize models that represent many different aspects of a system.This includes representing the requirements, structure, and behavior of the system, and the specification of analysis cases and verification cases used to analyze and verify the system. The language is intended to support multiple systems engineering methods and practices. The specific methods and practices may impose additional constraints on how the language is used."

SysML v2 plays a key role in Model-Based Systems and Software Engineering which is a major part of lifecycle management by defining a representation of the resources whose lifecycles are to be managed. It is therefore highly desirable to be able to integrate and link SysML resources with OSLC resources such as Requirements, Change Requests, Architecture Resources and test cases. This is accomplished by two OSLC-OP initiatives:

- Contributing an OSLC PIM to PSM mapping to the OMG Systems Modeling API and Services specification [SYSTEMSMODELINGAPI] and
- This OASIS specification, which defines the OSLC RDF representation of SysML v2 models, and is used by [SYSTEMSMODELINGAPI].

This specification defines the RESTful web services interface for the SysML OSLC domain that is used in the PIM to PSM mapping. This domain addresses the management of Model-Based Systems Engineering (MBSE) artifacts such as models, and relationships with other resources such as requirements, testing resources and change requests, as well as relationships between reusable SysML model elements in a supply chain. To support these scenarios, this specification defines a set of HTTP-based RESTful interfaces in terms of HTTP methods: GET, POST, PUT and DELETE, HTTP response codes, content type handling and resource formats.

The intent of this specification is to define the capabilities needed to support integration scenarios used in typical MBSE methods using SysML v2, and to enable linking SysML model artifacts with other OSLC lifecyle artifacts. This is accomplished by generating the OSLC SysML v2 vocabulary terms and constraints from the SysML Abstract Syntax (XMI), and having http://open-services.net/ns/kerml#Element subclass http://open-services.net/ns/am#Resource [OSLCAM].

This specification is a [OSLCCore3] compliant specification, and as such most of its content are references to [OSLCCore3].

1.1 Terminology

SysML Client

An implementation of the OSLC SysML specifications as a client. OSLC SysML Clients consume services provided by SysML servers.

SysML Server

A server implementing the OSLC SysML domain specifications. OSLC SysML clients consume services provided by SysML Servers. The use of the terms Client and Server are intended to distinguish typical consumers and providers of OSLC resources in a distributed environment based on REST. A particular application component could be a client for some OSLC domain services and a server for the same or another domain.

1.2 References

1.2.1 Normative references

[OSLCAM]

Jim Amsden; Andrii Berezovskyi. *OSLC Architecture Management Version 3.0. Part 1: Specification*. OASIS. OASIS Standard. URL: https://docs.oasis-open-projects.org/oslc-op/am/v3.0/os/architecture-management-spec.html

[OSLCCore2]

Dave Johnson; S. Speicher. *OSLC Core Specification 2.0*. https://open-services.net/. Finalized. URL: https://archive.open-services.net/bin/view/Main/OslcCoreSpecification

[OSLCCore3]

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

[OSLCPreview]

OSLC Core Version 3.0. Part 3: Resource Preview0. OASIS. OASIS Standard. URL: https://docs.oasis-open-projects.org/oslc-op/core/v3.0/resource-preview.html

[OSLCShapes]

Arthur Ryman; Jim Amsden. *OSLC Core Version 3.0. Part 6: Resource Shape*. OASIS. OASIS Standard. URL: https://docs.oasis-open-projects.org/oslc-op/core/v3.0/resource-shape.html

[RFC2119]

S. Bradner. *Key words for use in RFCs to Indicate Requirement Levels*. IETF, March 1997. Best Current Practice. URL: https://www.rfc-editor.org/rfc/rfc2119

[RFC8174]

B. Leiba. *Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words*. IETF, May 2017. Best Current Practice. URL: https://www.rfc-editor.org/rfc/rfc8174

[SysML]

OMG ADTF. *OMG Systems Modeling Language Version 2.0*. OMG. Beta1. URL: https://www.omg.org/spec/SysML/

1.2.2 Informative references

[LDPPatch]

Linked Data Patch Format. http://www.w3.org/. Working Group Note. URL: http://www.w3.org/TR/ldpatch/

[SYSTEMSMODELINGAPI]

OMG ADTF. *Systems Modeling API and Services*. OMG. 1.0 Beta. URL: https://www.omg.org/spec/SystemsModelingAPI/1.0/Beta1/About-SystemsModelingAPI

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.

2. Base Requirements

The following sub-sections define the mandatory and optional requirements for an OSLC SysML (OSLC SysML) server.

2.1 Base Compliance

This specification is based on [OSLCCore3]. OSLC SysML servers **MUST** be compliant with both the core specification, **MUST** follow all the mandatory requirements in the normative sections of this specification, and **SHOULD** follow all the guidelines and recommendations in both these specifications. [sml-1]

An OSLC SysML server **MUST** implement the domain vocabulary defined in OSLC SysML Version 2.1. Part 2: Vocabulary [sml-2]

The following table summarizes the requirements from OSLC Core Specification as well as some additional requirements specific to the SysML domain. Note that this specification further restricts some of the requirements from the OSLC Core Specification. See the previous sections in this specification or the OSLC Core Specification to get further details on each of these requirements.

Requirement	Meaning
Absolute URIs	SysML Servers **MUST** use absolute URIs for all references to resources by properties [sml-3]
Unknown properties and content	SysML Servers **MAY** ignore unknown content and SysML clients **MUST** preserve unknown content. SysML Servers **MAY** discard such properties and continue the POST or PUT operation without warning to the client. [sml-4]
Resource Operations	SysML Servers **MUST** support resource operations via standard HTTP operations [sml-5]
Update and Delete	SysML Servers **SHOULD** support resource modifications with standard HTTP PUT and DELETE methods. SysML Servers **MAY** limit modifications [sml-6]
HTTP If-Match use	SysML Servers supporting update and delete of resources **MUST** support the standard HTTP If-Match header in PUT and DELETE for concurrency protection of resources. [sml-7]
Resource Paging	SysML Servers **MAY** provide paging for resources but only when specifically requested by clients [sml-8]
Partial Resource Representations	SysML Servers **MAY** support requests for a subset of a resource's properties via the oslc.properties URL parameter retrieval via HTTP GET [sml-9]
Partial Update	SysML Servers **MAY** support partial update of resources via the oslc.properties URL parameter retrieval via HTTP PUT and or using [LDPPatch]. [sml-10]
Discovery	SysML Servers **MAY** provide a Service Provider Catalog, **MUST** provide a Service Provider resource, and **MAY** provide other forms of discovery described in [OSLCCore3]. [sml-11]
Creation Factories	SysML Servers **MAY** provide creation factories for resource formats that it supports. SysML Servers **MAY** support creation factories for OSLC SysML defined resources formatted as application/rdf+xml. SysML Servers **MAY** support creation factories for other formats, and indicate such creation factories with a non-default identifier in the oslc:usage property of the creation factory definition in the service provider document [sml-12]

Requirement	Meaning
Query Capabilities	SysML Servers **MUST** provide query capabilities on oslc_am:Resource resources to enable clients to query for resources. SysML Servers **SHOULD** support a query interface for oslc_am:LinkType resources that support a GET for all LinkType resources. Such a GET does not require any simple query syntax parameters. SysML Servers **MAY** support the full query syntax for LinkType resources. [sml-13]
Query Syntax	OSLC query capabilities **MUST** support the OSLC Core Query Syntax [sml-14]
Delegated Dialogs	SysML Services **SHOULD** offer selection delegated dialogs and **MAY** offer creation delegated dialogs specified via service provider resource [sml-15]
Resource Preview	SysML Services **SHOULD** offer resource previews for resources that may be referenced by other resources [sml-16]
Authentication	SysML Services **SHOULD** follow the recommendations for Authentication specified in [OSLCCore3] [sml-17]
Error Responses	SysML Servers **SHOULD** provide error responses using OSLC Core defined error formats [sml-18]
RDF/XML Representations	SysML Servers **MUST** support RDF/XML representations for OSLC Defined Resources [sml-19]
XML Representations	SysML Servers **MUST** support XML representations that conform to the OSLC Core Guidelines for XML [sml-20]
JSON Representations	SysML Servers **MAY** support JSON representations; those which do **MUST** conform to the OSLC Core Guidelines for JSON [sml-21]
HTML Representations	SysML Servers **MAY** provide HTML representations for GET requests [sml-22]

2.2 Specification Versioning

This specification follows the specification version guidelines given in [OSLCCore3].

2.3 Namespaces

In addition to the namespace URIs and namespace prefixes `oslc`, `rdf`, `dcterms` and `foaf` defined in [OSLCCore3], OSLC SysML defines the namespace URI of `http://open-services.net/ns/sysmlv2#` with a preferred namespace prefix of `oslc_am`.

2.4 Resource Formats

In addition to the requirements for resource representations in [OSLCCore3], this section outlines further refinements and restrictions.

For HTTP GET/PUT/POST requests on all OSLC SysML and OSLC Core defined resource types,

- SysML Servers **MUST** support RDF/XML representations with media-type `application/rdf+xml`. SysML Clients **SHOULD** be prepared to deal with any valid RDF/XML document. [sml-23]
- SysML Servers **MUST** support XML representations with media-type `application/xml`. The XML representations **MUST** follow the guidelines outlined in the OSLC Core Representations Guidance to maintain compatibility with [OSLCCore2]. [sml-24]
- SysML Servers **MAY** support JSON representations with media-type `application/json`. The JSON representations **MUST** follow the guidelines outlined in the OSLC Core Representations Guidance to maintain compatibility with [OSLCCore2]. [sml-25]

2.5 Resource Operations

For compatibility with OSLC 2.0, OSLC SysML Servers **MAY** accept the OSLC Core Version header (OSLC-Core-Version: 2.0) in any HTTP request as specified in [OSLCCore3], and return an OSLC SysML 2.0 representation (including the OSLC-Core-Version: 2.0 header). If the OSLC Core Version header is absent on a request, or has some undefined value, the OSLC SysML Server **MUST** return an SysML 2.0 representation. [sml-26]

OSLC SysML Servers **MUST** support HTTP GET requests on SysML Resources, with an Accept header of `application/rdf+xml`, and return the RDF/XML representation of the resource. [sml-27]

OSLC SysML Servers **SHOULD** support HTTP GET requests on SysML Resources, with an Accept header of an HTML type (`application/html`, `application/xhtml`), and return either an HTML/XHTML representation of the resource or redirect the client to another URL that can (i.e. 302 Redirect). [sml-28]

OSLC SysML Servers **SHOULD** support HTTP GET requests for user interface (UI) preview of SysML Resources as defined by [OSLCPreview]. [sml-29]

OSLC SysML Servers **SHOULD** support resource modifications on SysML Resources with standard HTTP PUT and DELETE methods. SysML Servers **MAY** limit modifications in any way they want. For example a service provider may limit updates to resources to simple link properties of link types already defined in the provider. Modification methods **MUST** use the If-Match header for concurrency management. Providers **MAY** discard such properties and continue a PUT operation without warning to the client. [sml-30]

OSLC SysML Servers **SHOULD** support resource modifications on LinkType Resources (LTR) with standard HTTP PUT and DELETE methods. SysML Servers **MAY** limit modifications in any way they want. For example a service provider may not support additional properties. Modification methods **SHOULD** use the If-Match header for concurrency management. [sml-31]

2.6 Authentication

See [OSLCCore3], OSLC SysML puts no additional constraints on authentication.

2.7 Error Responses

See [OSLCCore3], OSLC SysML puts no additional constraints on error responses

2.8 Pagination

OSLC SysML Servers **SHOULD** support pagination of query results and **MAY** support pagination of a single resource's properties as defined by [OSLCCore3]. [sml-32]

2.9 Requesting and Updating Properties

2.9.1 Requesting a Subset of Properties

An OSLC SysML server **MAY** support the `oslc.properties` URL query parameter on an HTTP GET request on individual resource request or a collection of resources by query. If the `oslc.properties` query parameter is omitted on the request, then all resource properties **MUST** be provided in the response. [sml-33]

2.9.2 Updating a Subset of Properties

An OSLC SysML client **MAY** request that a subset of a resource's properties be updated by identifying those properties to be modified using the `oslc.properties` URL parameter on a HTTP PUT request. [sml-34]

2.9.3 Updating Multi-Valued Properties

An OSLC SysML Server **MAY** support updating a subset of a resource's properties by using the [LDPPatch] `PATCH` method. [sml-35]

For compatibility with [OSLCCore2], an SysML Server **MAY** also support partial update by identifying those properties to be modified using the `oslc.properties` URL parameter on a HTTP PUT request. [sml-36]

If the parameter `oslc.properties` contains a valid resource property on the request that is not provided in the content, the server **MUST** set the resource's property to a null or empty value. If the parameter `oslc.properties` contains an invalid resource property, then a `409 Conflict` **MUST** be returned. [sml-37]

3. Vocabulary Terms and Constraints

OSLC SysML Resources 2.1 Defines the vocabulary terms and constraints for OSLC Change Management resources. These terms and constraints are specified according to [OSLCCore3].

4. Vocabulary Subsets

SysML OSLC servers **MAY** choose to limit the types of SysML resources that can be accessed directly with a URL, or are accessible for resource preview or selection and creation dialogs. This allows servers to simplify the OSLC REST API to those SysML elements that are necessary for their particular purpose. SysML Servers **MUST** allow direct access to at least Element and Relationship. [sml-38]

5. SysML Server Capabilities

5.1 Resource Shapes

OSLC SysML servers **SHOULD** support Resource Shapes as defined in [OSLCShapes]. [sml-39]

5.2 Service Provider Resources

OSLC SysML Servers **MUST** provide a ServiceProvider Resource that can be retrieved at a implementation dependent URI. [sml-40]

OSLC SysML Servers **MUST** provide a ServiceProviderCatalog Resource that can be retrieved at a implementation dependent URI. [sml-41]

OSLC SysML Servers **MUST** provide an `oslc:serviceProvider` property for their defined resources that will be the URI to a ServiceProvider Resource. This does not prevent SysML Servers from providing multiple servie provider properties with different values, if the service provider supports multiple OSLC domain specifications, and the resource is applicable to multiple domains. [sml-42]

OSLC SysML Servers **MUST** supply a value of `http://open-services.net/ns/am#` for the property `oslc:domain` on either `oslc:ServiceProvider` or `oslc:ServiceProviderCatalog` resources. [sml-43]

5.3 Creation Factories

OSLC SysML Servers **MAY** support CreationFactories as defined by [OSLCCore3]. [sml-44]

OSLC SysML Servers **MAY** discard properties it does not recognize and continue the POST operation without warning to the client. The returned resource will contain the accepted properties (and server generated properties like the dcterms:identifer) so clients will be able to confirm if required what was accepted. [sml-45]

If OSLC SysML Servers support the creation of resources from the OSLC defined `oslc_am:Resource` format, there **MUST** be at least one Creation Factory entry in the Services definition, and its `oslc:usage` property **MUST** be set to `http://open-services/ns/core#default`. The `oslc:resourceType` **MUST** be set to `http://open-services.net/ns/am#Resource`. [sml-46]

If OSLC SysML Servers support the creation of resources from a resource other than `oslc_am:Resource`, there **MUST** be a separate creation services definition whose `oslc:usage` property **MUST NOT** be set to `http://open-services/ns/core#default`. [sml-47]

5.4 Query Capabilities

OSLC SysML Servers **SHOULD** support the Query Capabilities as defined by [OSLCCore3] for both `oslc_am:Resource` and `oslc_am:LinkType` resources. [sml-48]

If the service provider supports query capability for `oslc_am:Resource` resources, it **MUST** support the following query parameters: [sml-49]

- `oslc.where`
- `oslc.searchTerms`

OSLC SysML Servers **SHOULD** support query capability for `oslc_am:LinkType` resources. If supported then SysML Servers **MUST** support a simple GET without any query parameters that returns all link type resources. SysML Servers **SHOULD** support the full OSLC query syntax. [sml-50]

5.5 Delegated UIs

OSLC SysML Servers **SHOULD** support the selection of resources by delegated selection dialogs as defined by [OSLCCore3]. [sml-51]

OSLC SysML Servers **MAY** support the creation of resources by delegated creation dialogs as defined by [OSLCCore3]. [sml-52]

In `oslc:Dialog` elements, the two optional child elements; `oslc:hintWidth` and `oslc:hintHeight` specify the suggested size of the dialog or frame to render the HTML content in. Expected size values are defined by CSS length units. [sml-53]

6. Conformance

Implementations of this specification need to satisfy the following conformance clauses.

Clause Number	Requirement
sml-1	This specification is based on [OSLCCore3]. OSLC SysML servers **MUST** be compliant with both the core specification, **MUST** follow all the mandatory requirements in the normative sections of this specification, and **SHOULD** follow all the guidelines and recommendations in both these specifications.
sml-2	An OSLC SysML server **MUST** implement the domain vocabulary defined in OSLC SysML Version 2.1. Part 2: Vocabulary
sml-3	SysML Servers **MUST** use absolute URIs for all references to resources by properties
sml-4	SysML Servers **MAY** ignore unknown content and SysML clients **MUST** preserve unknown content. SysML Servers **MAY** discard such properties and continue the POST or PUT operation without warning to the client.
sml-5	SysML Servers **MUST** support resource operations via standard HTTP operations
sml-6	SysML Servers **SHOULD** support resource modifications with standard HTTP PUT and DELETE methods. SysML Servers **MAY** limit modifications
sml-7	SysML Servers supporting update and delete of resources **MUST** support the standard HTTP If-Match header in PUT and DELETE for concurrency protection of resources.
sml-8	SysML Servers **MAY** provide paging for resources but only when specifically requested by clients
sml-9	SysML Servers **MAY** support requests for a subset of a resource's properties via the oslc.properties URL parameter retrieval via HTTP GET
sml-10	SysML Servers **MAY** support partial update of resources via the oslc.properties URL parameter retrieval via HTTP PUT and or using [LDPPatch].
sml-11	SysML Servers **MAY** provide a Service Provider Catalog, **MUST** provide a Service Provider resource, and **MAY** provide other forms of discovery described in [OSLCCore3].
sml-12	SysML Servers **MAY** provide creation factories for resource formats that it supports. SysML Servers **MAY** support creation factories for OSLC SysML defined resources formatted as application/rdf+xml. SysML Servers **MAY** support creation factories for other formats, and indicate such creation factories with a non-default identifier in the oslc:usage property of the creation factory definition in the service provider document
sml-13	SysML Servers **MUST** provide query capabilities on oslc_am:Resource resources to enable clients to query for resources. SysML Servers **SHOULD** support a query interface for oslc_am:LinkType resources that support a GET for all LinkType resources. Such a GET does not require any simple query syntax parameters. SysML Servers **MAY** support the full query syntax for LinkType resources.
sml-14	OSLC query capabilities **MUST** support the OSLC Core Query Syntax
sml-15	SysML Services **SHOULD** offer selection delegated dialogs and **MAY** offer creation delegated dialogs specified via service provider resource
sml-16	SysML Services **SHOULD** offer resource previews for resources that may be referenced by other resources
sml-17	SysML Services **SHOULD** follow the recommendations for Authentication specified in [OSLCCore3]
sml-18	SysML Servers **SHOULD** provide error responses using OSLC Core defined error formats
sml-19	SysML Servers **MUST** support RDF/XML representations for OSLC Defined Resources
sml-20	SysML Servers **MUST** support XML representations that conform to the OSLC Core Guidelines for XML
sml-21	SysML Servers **MAY** support JSON representations; those which do **MUST** conform to the OSLC Core Guidelines for JSON
sml-22	SysML Servers **MAY** provide HTML representations for GET requests

Clause Number	Requirement
sml-23	SysML Servers **MUST** support RDF/XML representations with media-type `application/rdf+xml`. SysML Clients **SHOULD** be prepared to deal with any valid RDF/XML document.
sml-24	SysML Servers **MUST** support XML representations with media-type `application/xml`. The XML representations **MUST** follow the guidelines outlined in the OSLC Core Representations Guidance to maintain compatibility with [OSLCCore2].
sml-25	SysML Servers **MAY** support JSON representations with media-type `application/json`. The JSON representations **MUST** follow the guidelines outlined in the OSLC Core Representations Guidance to maintain compatibility with [OSLCCore2].
sml-26	For compatibility with OSLC 2.0, OSLC SysML Servers **MAY** accept the OSLC Core Version header (OSLC-Core-Version: 2.0) in any HTTP request as specified in [OSLCCore3], and return an OSLC SysML 2.0 representation (including the OSLC-Core-Version: 2.0 header). If the OSLC Core Version header is absent on a request, or has some undefined value, the OSLC SysML Server **MUST** return an SysML 2.0 representation.
sml-27	OSLC SysML Servers **MUST** support HTTP GET requests on SysML Resources, with an Accept header of `application/rdf+xml`, and return the RDF/XML representation of the resource.
sml-28	OSLC SysML Servers **SHOULD** support HTTP GET requests on SysML Resources, with an Accept header of an HTML type (`application/html`, `application/xhtml`), and return either an HTML/XHTML representation of the resource or redirect the client to another URL that can (i.e. 302 Redirect).
sml-29	OSLC SysML Servers **SHOULD** support HTTP GET requests for user interface (UI) preview of SysML Resources as defined by [OSLCPreview].
sml-30	OSLC SysML Servers **SHOULD** support resource modifications on SysML Resources with standard HTTP PUT and DELETE methods. SysML Servers **MAY** limit modifications in any way they want. For example a service provider may limit updates to resources to simple link properties of link types already defined in the provider. Modification methods **MUST** use the If-Match header for concurrency management. Providers **MAY** discard such properties and continue a PUT operation without warning to the client.
sml-31	OSLC SysML Servers **SHOULD** support resource modifications on LinkType Resources (LTR) with standard HTTP PUT and DELETE methods. SysML Servers **MAY** limit modifications in any way they want. For example a service provider may not support additional properties. Modification methods **SHOULD** use the If-Match header for concurrency management.
sml-32	OSLC SysML Servers **SHOULD** support pagination of query results and **MAY** support pagination of a single resource's properties as defined by [OSLCCore3].
sml-33	An OSLC SysML server **MAY** support the `oslc.properties` URL query parameter on an HTTP GET request on individual resource request or a collection of resources by query. If the `oslc.properties` query parameter is omitted on the request, then all resource properties **MUST** be provided in the response.
sml-34	An OSLC SysML client **MAY** request that a subset of a resource's properties be updated by identifying those properties to be modified using the `oslc.properties` URL parameter on a HTTP PUT request.
sml-35	An OSLC SysML Server **MAY** support updating a subset of a resource's properties by using the [LDPPatch] `PATCH` method.
sml-36	For compatibility with [OSLCCore2], an SysML Server **MAY** also support partial update by identifying those properties to be modified using the `oslc.properties` URL parameter on a HTTP PUT request.
sml-37	If the parameter `oslc.properties` contains a valid resource property on the request that is not provided in the content, the server **MUST** set the resource's property to a null or empty value. If the parameter `oslc.properties` contains an invalid resource property, then a `409 Conflict` **MUST** be returned.
sml-38	SysML OSLC servers **MAY** choose to limit the types of SysML resources that can be accessed directly with a URL, or are accessible for resource preview or selection and creation dialogs. This allows servers to simplify the OSLC REST API to those SysML elements that are necessary for their particular purpose. SysML Servers **MUST** allow direct access to at least Element and Relationship.
sml-39	OSLC SysML servers **SHOULD** support Resource Shapes as defined in [OSLCShapes].
sml-40	OSLC SysML Servers **MUST** provide a ServiceProvider Resource that can be retrieved at a implementation dependent URI.

Clause Number	Requirement
sml-41	OSLC SysML Servers **MUST** provide a ServiceProviderCatalog Resource that can be retrieved at a implementation dependent URI.
sml-42	OSLC SysML Servers **MUST** provide an `oslc:serviceProvider` property for their defined resources that will be the URI to a ServiceProvider Resource. This does not prevent SysML Servers from providing multiple servie provider properties with different values, if the service provider supports multiple OSLC domain specifications, and the resource is applicable to multiple domains.
sml-43	OSLC SysML Servers **MUST** supply a value of `http://open-services.net/ns/am#` for the property `oslc:domain` on either `oslc:ServiceProvider` or `oslc:ServiceProviderCatalog` resources.
sml-44	OSLC SysML Servers **MAY** support CreationFactories as defined by [OSLCCore3].
sml-45	OSLC SysML Servers **MAY** discard properties it does not recognize and continue the POST operation without warning to the client. The returned resource will contain the accepted properties (and server generated properties like the dcterms:identifer) so clients will be able to confirm if required what was accepted.
sml-46	If OSLC SysML Servers support the creation of resources from the OSLC defined `oslc_am:Resource` format, there **MUST** be at least one Creation Factory entry in the Services definition, and its `oslc:usage` property **MUST** be set to `http://open-services/ns/core#default`. The `oslc:resourceType` **MUST** be set to `http://open-services.net/ns/am#Resource`.
sml-47	If OSLC SysML Servers support the creation of resources from a resource other than `oslc_am:Resource`, there **MUST** be a separate creation services definition whose `oslc:usage` property **MUST NOT** be set to `http://open-services/ns/core#default`.
sml-48	OSLC SysML Servers **SHOULD** support the Query Capabilities as defined by [OSLCCore3] for both `oslc_am:Resource` and `oslc_am:LinkType` resources.
sml-49	If the service provider supports query capability for `oslc_am:Resource` resources, it **MUST** support the following query parameters:
sml-50	OSLC SysML Servers **SHOULD** support query capability for `oslc_am:LinkType` resources. If supported then SysML Servers **MUST** support a simple GET without any query parameters that returns all link type resources. SysML Servers **SHOULD** support the full OSLC query syntax.
sml-51	OSLC SysML Servers **SHOULD** support the selection of resources by delegated selection dialogs as defined by [OSLCCore3].
sml-52	OSLC SysML Servers **MAY** support the creation of resources by delegated creation dialogs as defined by [OSLCCore3].
sml-53	In `oslc:Dialog` elements, the two optional child elements; `oslc:hintWidth` and `oslc:hintHeight` specify the suggested size of the dialog or frame to render the HTML content in. Expected size values are defined by CSS length units.

Appendix A. Acknowledgements

This section is non-normative.

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Participants:

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