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OSLC Automation Version 2.1 Part 3: Constraints

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

- *OSLC Automation Version 2.1 Part 1: Specification*. automation-spec.html
- *OSLC Automation Version 2.1 Part 2: Vocabulary*. automation-vocab.html
- *OSLC Automation Version 2.1 Part 3: Constraints (this document)*. automation-shapes.html
- *OSLC Automation Version 2.1 Machine Readable Vocabulary Terms*. automation-vocab.ttl
- *OSLC Automation Version 2.1 Machine Readable Vocabulary Constraints*. automation-shapes.ttl

Related work:

This specification is related to:

- *Open Services for Lifecycle Collaboration Automation Specification Version 2.1*. http://open-services.net/wiki/automation/OSLC-Automation-Specification-Version-2.1/

RDF Namespaces:

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

Abstract:

OSLC Automation Version 2.1 Part 3: Constraints defines constraints on the OSLC Automation RDF vocabulary terms and resources using OSLC ResourceShapes.

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://github.com/oslc-op/oslc-specs.

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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1. Introduction

This section is non-normative.

RDF vocabularies define the terms and resources for a domain of interest, life-cycle management in the case of OSLC Automation. These vocabularies are often specified in an open manner, without providing information such as property domain and range assertions, cardinalities, etc. This helps keep the vocabulary applicable for a wide range of uses and furthering integration with other vocabularies.

However, it is often desirable to closed down a vocabulary with specific constraints to facilitate using the vocabulary for a specific purpose. This document specifies the constraints for using the OSLC Automation vocabulary in OSLC. Different sets of constraints may be applied to a vocabulary in order to tailor its use, without overly constraining the vocabulary for other usages.

These constraints apply to the core vocabulary defined in OSLC Automation Version 2.1. Part 2: Vocabulary.

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; J. Gettis; J. Morgul. *Hyper-text Transfer Protocol (HTTP/1.1)*. STD 1. URL: https://tools.ietf.org/html/rfc2616

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

[OSLCCore2]
S. Speicher; D. Johnson. *OSLC Core Specification 2.0*. Finalized. URL: http://open-services.net/bin/view/Main/OslcCoreSpecification

[OSLCCore3]
Steve Speicher; Jim Amsden. *OSLC Core Overviewv3.0*. Project Specification. URL: https://docs.oasis-open-projects.org/oslc-op/core/v3.0/oslc-core.html

[RFC2119]
S. Bradner. *Key words for use in RFCs to Indicate Requirement Levels*. March 1997. Best Current Practice. URL: https://tools.ietf.org/html/rfc2119

[RFC8174]
B. Leiba. *Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words*. May 2017. Best Current Practice. URL: https://tools.ietf.org/html/rfc8174

1.2.2 Informative references

[OSLCQM]
Paul McMahan; Jim Amsden; Gray Bachelor. *OSLC Quality Management 2.1. Part 1: Specification*. Project Specification Draft. URL: https://open-services.net/spec/qm/latest

[OSLCRM]
Ian Green; Jad El-khoury. *OSLC Requirements Management Version 2.1. Part 1: Specification*. Project Specification Draft. URL: https://open-services.net/spec/rm/latest

[WEBARCH]
Ian Jacobs; Norman Walsh. *Architecture of the World Wide Web, Volume One*. 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 AM defines the namespace URI of `http://open-services.net/ns/am#` with a namespace prefix of `oslc_am`

This specification also uses these namespace prefix definitions:

- oslc_rm : `http://open-services.net/ns/rm#` [OSLCRM]
- oslc_qm : `http://open-services.net/ns/qm#` [OSLCQM]

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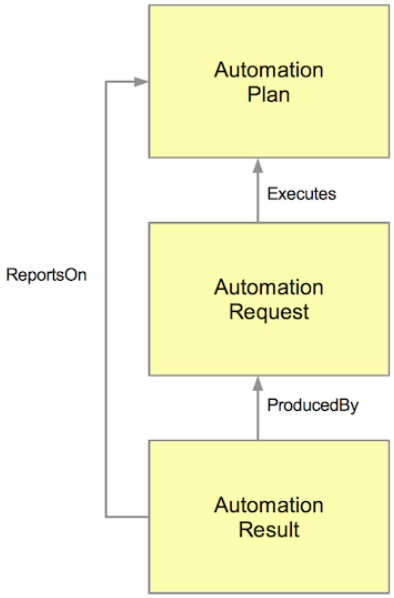
2. Automation Resource Definitions

The Automation resource properties are not limited to the ones defined in this specification; service providers may provide additional properties. It is recommended that any additional properties exist in their own unique namespace and not use the namespaces defined in this specification.

A list of properties is defined for each type of resource. Most of these properties are identified in [OSLCCore3] Any exceptions are noted. Relationship properties refer to other resources. These resources may be in any OSLC domain (including Automation).

The diagram below shows the relationships between Automation Resources.



For all resource types defined in this specification, all required properties (those defined with an occurrence of exactly-one or one-or-many) **MUST** exist for each resource and must be provided when requested. All other properties are optional, and might not exist on some or any resources; those that do not exist will not be present in the returned representation even if requested, while those that do exist **MUST** be provided if requested. Providers **MAY** define additional provider-specific properties; providers **SHOULD** use their own namespaces for such properties, or use standard Dublin Core or RDF namespaces and properties where appropriate.

If no specific set of properties is requested, all properties are returned - both those defined in this specification as well as any provider-specific ones. See [OSLCCore2] Selective Property Values in OSLC Core Specification.

Consumers of OSLC Automation services should note that some resources may have a very large number of related resources, and that some resources may be very large and/or expensive to compute. For this reason, consumers are strongly encouraged to use the `oslc.properties` parameter to limit the properties returned from a request to the subset required. See [OSLCCore2] Selective Property Values in OSLC Core Specification.

2.1 Resource: AutomationPlan

- **Describes:** `http://open-services.net/ns/auto#AutomationPlan`
- **Summary:** Statement of need.
- **Description:** A resource representing the unit of automation which is available for execution.

AutomationPlan Properties

Prefixed Name	*Occurs*	*Read-only*	*Value-type*	*Representation*	*Range*	*Description*
`dcterms:contributor`	Zero-or-many	unspecified	AnyResource	Either	`oslc:Any`	Contributor or contributors to resource. It is likely that the target resource will be an foaf:Person but that is not necessarily the case. When the service provider or its agents is the contributor to the resource, a foaf:Agent could be used.
`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:Any`	Creator or creators of resource. It is likely that the target resource will be an foaf:Person but that is not necessarily the case.
`dcterms:description`	Zero-or-one	unspecified	XMLLiteral	N/A	Unspecified	Descriptive text about resource represented as rich text in XHTML content.
`dcterms:identifier`	Exactly-one	true	string	N/A	Unspecified	A unique identifier for a resource. Assigned by the service provider when a resource is created. Not intended for end-user display.

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Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
dcterms:modified	Zero-or-one	true	dateTime	N/A	Unspecified	Timestamp of latest resource modification (reference: Dublin Core).
dcterms:subject	Zero-or-many	unspecified	string	N/A	Unspecified	Tag or keyword for a resource. Each occurrence of a dc: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.
oslc_auto:parameterDefinition	Zero-or-many	unspecified	AnyResource	Either	oslc:Property	The definition of a parameter for this Automation Plan. parameterDefinitions are either a local (inline) or referenced resource and use the attributes (the range) of the oslc:Property resource with one exception. When used in the context of an oslc_auto:parameterDefinition, the cardinality of oslc:propertyDefinition becomes zero-or-one instead of exactly-one. Automation consumers creating Automation Requests **MUST** use the oslc:occurs attribute of the parameterDefinition, if present, to determine if a given parameter is required when creating the Automation Request. If the oslc:occurs attribute indicates the parameter is required (exactly-one or one-or-more), the service provider must guarantee the named parameter will be present in the Automation Result either as an oslc_auto:inputParmeter when unmodified during execution, or as an oslc_auto:outputParameter when modified during execution.
oslc_auto:usesExecutionEnvironment	Zero-or-many	unspecified	Resource	Reference	oslc:Any	A resource representing the environment(s) which this Automation Plan can be executed in. The execution environment resource could represent a grouping of environmental details such as operating system, database, browser, compiler, etc. See also the execution environments section.
oslc:futureAction	Zero-or-many	unspecified	Resource	Reference	oslc:Any	A resource representing actions that will become available on Automation Results that result from execution of this Plan. The resource is likely to be of type oslc:Action, but it can be of any type. Automation defines oslc_auto:TeardownAction as one kind of future action.
oslc:instanceShape	Zero-or-one	true	Resource	Reference	oslc:ResourceShape	Resource Shape that provides hints as to resource property value-types and allowed values.
oslc:serviceProvider	Zero-or-many	true	Resource	Reference	oslc:serviceProvider	The scope of a resource is a link to the resource's OSLC Service Provider.
rdf:type	Zero-or-many	unspecified	Resource	Reference	Unspecified	The resource type URIs.

2.2 Resource: AutomationRequest

- **Describes:** http://open-services.net/ns/auto#AutomationRequest
- **Summary:** AutomationRequest
- **Description:** A resource representing the intention to execute an Automation Plan. The Automation Request contains the information required to request that the provider execute an Automation Plan.

AutomationRequest Properties

Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
dcterms:contributor	Zero-or-many	unspecified	AnyResource	Either	oslc:Any	Contributor or contributors to resource. It is likely that the target resource will be an foaf:Person but that is not necessarily the case. When the service provider or its agents is the contributor to the resource, a foaf:Agent could be used.
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:Any	Creator or creators of resource. It is likely that the target resource will be an foaf:Person but that is not necessarily the case.
dcterms:description	Zero-or-one	unspecified	XMLLiteral	N/A	Unspecified	Descriptive text about resource represented as rich text in XHTML content.
dcterms:identifier	Exactly-one	true	string	N/A	Unspecified	A unique identifier for a resource. 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 latest resource modification (reference: Dublin Core).
dcterms:title	Exactly-one	unspecified	XMLLiteral	N/A	Unspecified	Title (reference: Dublin Core) of the resource represented as rich text in XHTML content.

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Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
oslc_auto:desiredState	Zero-or-one	false	AnyResource	Either	Unspecified	Used to indicate the desired state of the Automation Request based on values defined by the service provider. It is expected that this will be a resource reference to a definition of a valid automation request state on the service provider.
oslc_auto:executesAutomationPlan	Exactly-one	false	Resource	Reference	oslc:Any	Automation Plan run by the Automation Request. It is likely that the target resource will be an oslc_auto:AutomationPlan but that is not necessarily the case.
oslc_auto:inputParameter	Zero-or-many	true	AnyResource	Either	oslc_auto:ParameterInstance	A copy of the parameters provided during creation of the Automation Request which produced this Automation Result (see oslc_auto:producedByAutomationRequest). The oslc_auto:inputParameter resources on an Automation Result should be considered a point-in-time copy of the parameter at the time the Automation Request was created.
oslc_auto:state	One-or-many	true	AnyResource	Either	Unspecified	Used to indicate the state of the automation request based on values defined by the service provider. Most often a read-only property. It is expected that this will be a resource reference to a definition of a valid automation request state on the service provider.
oslc:instanceShape	Zero-or-one	true	Resource	Reference	oslc:ResourceShape	Resource Shape that provides hints as to resource property value-types and allowed values.
oslc:serviceProvider	Zero-or-many	true	Resource	Reference	oslc:serviceProvider	The scope of a resource is a link to the resource's OSLC Service Provider.
rdf:type	Zero-or-many	unspecified	Resource	Reference	Unspecified	The resource type URIs.

2.3 Resource: AutomationResult

- **Describes:** http://open-services.net/ns/auto#AutomationResult
- **Summary:** AutomationResult
- **Description:** A resource representing the intermediate and final execution state of an Automation Request, along with contributions to the result.

AutomationResult Properties

Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
dcterms:contributor	Zero-or-many	unspecified	AnyResource	Either	oslc:Any	Contributor or contributors to resource. It is likely that the target resource will be an foaf:Person but that is not necessarily the case. When the service provider or its agents is the contributor to the resource, a foaf:Agent could be used.
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:Any	Creator or creators of resource. It is likely that the target resource will be an foaf:Person but that is not necessarily the case.
dcterms:identifier	Exactly-one	true	string	N/A	Unspecified	A unique identifier for a resource. 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 latest resource modification (reference: Dublin Core).
dcterms:subject	Zero-or-many	unspecified	string	N/A	Unspecified	Tag or keyword for a resource. Each occurrence of a dc: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.
oslc_auto:contribution	Zero-or-many	unspecified	AnyResource	Either	Unspecified	A result contribution associated with this automation result. It is recommended that the contribution be an inline resource which can be retrieved with the automation result. The recommended attributes beyond the contribution itself are dcterms:title, dcterms:description and dcterms:type to provide a description of the contribution which would be appropriate for display in a simple UI for an automation result.

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Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
oslc_auto:desiredState	Zero-or-one	false	AnyResource	Either	Unspecified	Used to indicate the desired state of the Automation Request based on values defined by the service provider. It is expected that this will be a resource reference to a definition of a valid automation request state on the service provider.
oslc_auto:inputParameter	Zero-or-many	true	AnyResource	Either	oslc_auto:ParameterInstance	A copy of the parameters provided during creation of the Automation Request which produced this Automation Result (see oslc_auto:producedByAutomationRequest). The oslc_auto:inputParameter resources on an Automation Result should be considered a point-in-time copy of the parameter at the time the Automation Request was created.
oslc_auto:outputParameter	Zero-or-many	unspecified	AnyResource	Either	oslc_auto:ParameterInstance	Automation Result output parameters are parameters associated with the automation execution which produced this Result. This includes the final value of all parameters used to initiate the execution and any additional parameters which may have been created during automation execution by the service provider or external agents. The value of a given oslc_auto:outputParameter **MAY** change as the execution proceeds. Point-in-time accuracy of the values of output parameters is not covered by this specification. Once the Automation Result is in a final state (oslc_auto:complete or oslc_auto:canceled), the oslc_auto:outputParameter values **MUST NOT** change.
oslc_auto:producedByAutomationRequest	Zero-or-one	false	Resource	Reference	oslc:Any	Automation Request which produced the Automation Result. It is likely that the target resource will be an oslc_auto:AutomationRequest but that is not necessarily the case.
oslc_auto:progress	Zero-or-one	true	integer	N/A	Unspecified	The percentage (0-100) of completion, if known.
oslc_auto:reportsOnAutomationPlan	Exactly-one	false	Resource	Reference	oslc:Any	Automation Plan which the Automation Result reports on. It is likely that the target resource will be an oslc_auto:AutomationPlan but that is not necessarily the case.
oslc_auto:state	One-or-many	true	AnyResource	Either	Unspecified	Used to indicate the state of the automation request based on values defined by the service provider. Most often a read-only property. It is expected that this will be a resource reference to a definition of a valid automation request state on the service provider.
oslc_auto:verdict	One-or-many	unspecified	AnyResource	Either	Unspecified	Used to indicate the verdict of the automation result based on values defined by the service provider. Most often a read-only property. It is expected that this will be a resource reference to a definition of a valid automation result verdict on the service provider.
oslc:instanceShape	Zero-or-one	true	Resource	Reference	oslc:ResourceShape	Resource Shape that provides hints as to resource property value-types and allowed values.
oslc:serviceProvider	Zero-or-many	true	Resource	Reference	oslc:serviceProvider	The scope of a resource is a link to the resource's OSLC Service Provider.
rdf:type	Zero-or-many	unspecified	Resource	Reference	Unspecified	The resource type URIs.

2.4 Resource: ParameterInstance

- **Describes:** http://open-services.net/ns/auto#ParameterInstance
- **Summary:** ParameterInstance
- **Description:** A resource representing an individual input or output parameter instance for an automation request or result. Automation requests or results may have zero or more parameter instances.

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ParameterInstance Properties

Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
dcterms:description	Zero-or-one	unspecified	XMLLiteral	N/A	Unspecified	Descriptive text about resource represented as rich text in XHTML content.
oslc:instanceShape	Zero-or-one	true	Resource	Reference	oslc:ResourceShape	Resource Shape that provides hints as to resource property value-types and allowed values.
oslc:name	Exactly-one	unspecified	string	N/A	Unspecified	The name of the parameter instance.
oslc:serviceProvider	Zero-or-many	true	Resource	Reference	oslc:serviceProvider	The scope of a resource is a link to the resource's OSLC Service Provider.
rdf:type	Zero-or-many	unspecified	Resource	Reference	Unspecified	The resource type URIs.
rdf:value	Zero-or-one	unspecified	unspecified	Either	Unspecified	The value of the parameter. The value may be an RDF literal or a resource. If the value is an RDF literal, then it **SHOULD** be an RDF typed literal.

2.5 Resource: Dialog

- **Describes:** http://open-services.net/ns/core#dialog
- **Summary:** Dialog
- **Description:** Dialogs in general are defined by OSLC Core 2.0, and this specification defines two specific types of dialogs: the immediate-execution creation dialog, which can be used to allow a user to interactively create a new Automation request which is immediately available for execution, and the deferred-execution creation dialog, which creates a new Automation Request that is not immediately available for execution, but which requires further work on the part of the consumer.

dialog Properties

Prefixed Name	Occurs	Read-only	Value-type	Representation	Range	Description
dcterms:title	Exactly-one	unspecified	XMLLiteral	N/A	Unspecified	Title (reference: Dublin Core) of the resource represented as rich text in XHTML content.
oslc_auto:binding	One-or-many	true	Resource	Reference	oslc:Any	A resource providing instructions that a client can follow to immediately execute the action, when the client is ready to do so. In this context (a deferred execution creation dialog), each binding is likely to be an immediate-execution binding, used during the execution phase of the deferred execution dialog interaction pattern first defined in OSLC Automation 2.1. It is likely that the target resource will be one of the following, but that is not necessarily the case: http:Request , oslc:CreationFactory , oslc:Dialog. This property is only used by the deferred-execution creation dialog. This is new for 2.1: END.
oslc:dialog	Exactly-one	true	Resource	Reference	oslc:Any	The URI of the dialog.
oslc:hintHeight	Zero-or-one	true	string	N/A	Unspecified	Values **MUST** be expressed as described in OSLC Core 2.0.
oslc:hintWidth	Zero-or-one	true	string	N/A	Unspecified	Values **MUST** be expressed as described in OSLC Core 2.0.
oslc:label	Zero-or-one	true	string	N/A	Unspecified	Very short label for use in menu items.
oslc:resourceType	Zero-or-many	true	Resource	Reference	oslc:Any	The expected resource type URI(s) for the resources that will be returned when using this dialog. These would be the URIs found in the result resource's rdf:type property. In a deferred execution creation dialog, clients will expect at least one of these types to be oslc_auto:AutomationRequest.
oslc:usage	One-or-many	true	Resource	Reference	oslc:Any	An identifier URI for the domain specified usage of this dialog. For example, for a deferred execution creation dialog this will be oslc_auto:DeferredExecution.

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3. Relationship labels

This section is non-normative.

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.

Servers and Clients should be aware that the `dcterms:title` of a link is unrelated to the dcterms:title of the object resource. 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.

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4. Conformance

Architecture Management servers **MUST** follow the constraints defined here where required, and with the meanings defined here.

Architecture Management servers **MAY** provide additional constraints for specific purposes.

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