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OSLC Automation Specification Version 2.0

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This Version

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- [OSLC Automation Specification Version 2.1](http://open-services.net/wiki/automation/OSLC-Automation-Specification-Version-2.1) (<http://open-services.net/wiki/automation/OSLC-Automation-Specification-Version-2.1>)

Previous Version

- This specification is the initial version of an OSLC Automation specification.

Authors

- [MichaelFiedler](http://open-services.net/bin/view/Main/MichaelFiedler) (<http://open-services.net/bin/view/Main/MichaelFiedler>)
- [JohnArwe](http://open-services.net/bin/view/Main/JohnArwe) (<http://open-services.net/bin/view/Main/JohnArwe>)
- [CharlesRankin](http://open-services.net/bin/view/Main/CharlesRankin) (<http://open-services.net/bin/view/Main/CharlesRankin>)
- [PaulMcMahan](http://open-services.net/bin/view/Main/PaulMcMahan) (<http://open-services.net/bin/view/Main/PaulMcMahan>)

Contributors

- See [Contributors section](#) below.

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Notation and Conventions

The key 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 [RFC2119 \(http://www.ietf.org/rfc/rfc2119.txt\)](http://www.ietf.org/rfc/rfc2119.txt). Domain name examples use [RFC2606 \(http://tools.ietf.org/html/rfc2606\)](http://tools.ietf.org/html/rfc2606).

Introduction

(this section is informative)

This specification builds on the [OSLC Core Specification \(http://open-services.net/bin/view/Main/OslcCoreSpecification\)](http://open-services.net/bin/view/Main/OslcCoreSpecification) to define the resources and operations supported by an Open Services for Lifecycle Collaboration (OSLC) Automation provider.

Automation resources define automation plans, automation requests and automation results of the software development, test and deployment lifecycle. They represent individual resources as well as their relationships to other automation resources and to other linked resources outside of the automation domain. The intent of this specification is to define the set of HTTP-based RESTful interfaces in terms of HTTP methods: GET, POST, PUT and DELETE, HTTP response codes, mime type handling and resource formats. The capabilities of the interface definitions are driven by key integration scenarios and therefore don’t represent a complete setup of operations on resources or resource types. The resource formats and operations may not match exactly the native models supported by automation service providers but are intended to be compatible with them.

Automation, as referenced in this specification, refers to the use of IT systems such as servers, workstations and smart hand-held devices to improve efficiency and reduce the need for manual human interactions in the software development, test and deployment lifecycle. See the [Automation Scenarios \(http://open-services.net/wiki/automation/Automation-Scenarios\)](http://open-services.net/wiki/automation/Automation-Scenarios) page for examples from the build, test and deployment disciplines.

Terminology

Service Provider - an implementation of the OSLC Automation specification as a server. OSLC Automation clients consume these services

Automation Resource - A resource managed by the Automation service provider. The types of resources defined by this specification are Automation Plan, Automation Request and Automation Result.

Automation Plan - Defines the unit of automation which is available for execution.

Automation Request - Defines the submission of the information required to execute an Automation Plan and indicates the desired execution state.

Automation Result - Defines intermediate and final execution status of an Automation Request, along with contributions to the result.

Automation Parameter Definition - Defines an individual input parameter of an Automation Plan. Parameter Definitions provide an indication of the type of the parameter and range of allowed values.

Automation Parameter Instance - Defines an individual input or output parameter instance for an Automation Request or Result.

Base Requirements

Compliance

This specification is based on [OSLC Core Specification \(http://open-services.net/bin/view/Main/OslcCoreSpecification\)](http://open-services.net/bin/view/Main/OslcCoreSpecification). OSLC Automation consumers and service providers **MUST** be compliant with both the core specification and this Automation specification, and **SHOULD** follow all the guidelines and recommendations in both these specifications.

The following table summarizes the requirements from OSLC Core Specification as well as some (but not all) additional requirements specific to Automation. See the full content of the Automation specification for all requirements. Note that this specification further restricts some of the requirements for OSLC Core Specification as noted in the Origin column of the compliance table. See further sections in this specification or the OSLC Core Specification to get further details on each of these requirements.

Any consumer or service provider behaviors are allowed unless explicitly prohibited by this or dependent specifications; conditional permissive requirements, especially those qualified with “MAY”, are implicitly covered by the preceding clause. While technically redundant in light of that broad permission, OSLC specifications do still make explicit MAY-qualified statements in cases where the editors believe doing so is likely to add clarity.

Requirements on OSLC Consumers

<i>Requirement</i>	<i>Level</i>	<i>Origin(s)</i>	<i>Meaning</i>
Unknown properties and content	MUST	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Unknown_properties_and_content)	OSLC clients MUST preserve unknown content
Unknown properties and content	SHOULD	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Unknown_properties_and_content)	OSLC clients SHOULD assume an OSLC service will discard unknown property values.

Requirements on OSLC Service Providers

<i>Requirement</i>	<i>Level</i>	<i>Origin(s)</i>	<i>Meaning</i>
Unknown properties and content	MUST	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Unknown_properties_and_content)	OSLC service providers MUST return an error code if recognized content is invalid.
Unknown properties and content	SHOULD	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Unknown_properties_and_content)	OSLC service providers SHOULD NOT return an error code for unrecognized content.
Unknown properties and content	MAY	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Unknown_properties_and_content)	OSLC service providers MAY ignore unknown content
Resource Operations	MUST	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Resource_Operations)	OSLC service providers MUST support resource operations via standard HTTP operations
Resource Paging	MAY	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Resource_Paging)	OSLC services MAY provide paging for resources
Partial Resource Representations	SHOULD	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Selective_Property_Values)	OSLC service providers SHOULD support HTTP GET requests for retrieval of a subset of a resource’s properties via the oslc.properties URL parameter
Partial Resource Representations	MAY	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Selective_Property_Values)	OSLC service providers MAY support HTTP PUT requests for updating a subset of a resource’s properties via the oslc.properties URL parameter
Service Provider Resources	MAY	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Service_Provider_Resources)	OSLC service providers MAY provide a Service Provider Catalog resource
Service Provider Resources	MUST	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Service_Provider_Resources)	OSLC service providers MUST provide a Service Provider resource
Creation Factories	MAY	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Creation_Factories)	OSLC service providers MAY provide creation factories to enable resource creation via HTTP POST
Query Capabilities	SHOULD	Automation, Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Query_Capabilities)	OSLC service providers SHOULD provide query capabilities to enable clients to query for resources

Query Syntax	MUST ²	Automation, Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Query_Syntax)	If a service provider supports a OSLC query capabilities, the query capabilities MUST support the OSLC Core Query Syntax
Query Syntax	MAY	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Query_Syntax)	OSLC query capabilities MAY support other query syntax
Delegated UI Dialogs	SHOULD	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Delegated_User_Interface_Dialogs)	OSLC service providers SHOULD allow clients to discover, via their service provider resources, any Delegated UI Dialogs they offer.
Delegated UI Dialogs	SHOULD	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Delegated_User_Interface_Dialogs)	OSLC service providers SHOULD offer delegated UI dialogs for resource creation
Delegated UI Dialogs	SHOULD	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Delegated_User_Interface_Dialogs)	OSLC service providers SHOULD offer delegated UI dialogs for resource selection
UI Preview	SHOULD	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#User_Interface_Previews)	OSLC Services SHOULD offer UI previews for resources that may be referenced by other resources
HTTP Basic Authentication	MAY	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#HTTP_Basic_Authentication)	OSLC Services MAY support Basic Auth
HTTP Basic Authentication	SHOULD	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#HTTP_Basic_Authentication)	OSLC Services SHOULD support Basic Auth only over HTTPS
OAuth Authentication	MAY	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#OAuth_Authentication)	OSLC service providers MAY support OAuth
OAuth Authentication	SHOULD	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#OAuth_Authentication)	OSLC service providers that support OAuth SHOULD allow clients to discover the required OAuth URLs via their service provider resource
Error Responses	MAY	Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#Error_Responses)	OSLC service providers MAY provide error responses using Core-defined error formats
RDF/XML Representations	MUST ³	Automation, Core (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations#Guidelines_for_application_rdf_x)	OSLC service providers MUST offer an RDF/XML representation for HTTP GET responses
RDF/XML Representations	MUST ³	Automation, Core (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations#Guidelines_for_application_rdf_x)	OSLC service providers MUST accept RDF/XML representations on PUT requests.
RDF/XML Representations	MUST ³	Automation, Core (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations#Guidelines_for_application_rdf_x)	RDF/XML representations on POST requests whose semantic intent is to create a new resource instance.
XML Representations	MAY ³	Automation, Core (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations#Guidelines_for_application_xml)	OSLC service providers MAY provide a XML representation for HTTP GET, POST and PUT requests that conform to the Core Guidelines for XML.
JSON Representations	MAY ³	Automation, Core (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations#Guidelines_for_JSON)	OSLC service providers MAY provide JSON representations for HTTP GET, POST and PUT requests that conform to the Core Guidelines for JSON
HTML Representations	SHOULD ³	Automation, Core (http://open-services.net/bin/view/Main/OslcCoreSpecification#OSLC_Defined_Resource_Representa)	OSLC service providers SHOULD provide HTML representations for HTTP GET requests

- ¹The OSLC Core Specifications indicates service providers MAY provide Query Capabilities. This specification for OSLC Automation makes Query Capability support a SHOULD requirement.
- ²The OSLC Core Specifications indicates service providers MAY support the OSLC Query Syntax. This specification for OSLC Automation makes OSLC Query Syntax support a MUST requirement for service providers providing query capabilities.
- ³For V2 of the OSLC Automation specification, support for all HTTP methods for all automation resources is not required. See the [HTTP Method support table](#) for details.

Specification Versioning

See [OSLC Core Specification Versioning section \(http://open-services.net/bin/view/Main/OslcCoreSpecification#Specification_Versioning\)](http://open-services.net/bin/view/Main/OslcCoreSpecification#Specification_Versioning).

Namespaces

In addition to the namespace URIs and namespace prefixes defined in the [OSLC Core specification \(http://open-services.net/bin/view/Main/OslcCoreSpecification\)](http://open-services.net/bin/view/Main/OslcCoreSpecification), OSLC Automation defines the namespace URI of `http://open-services.net/ns/auto#` with a namespace prefix of `oslc_auto`. This namespace URI and prefix are used to designate the resources defined in this specification and their properties.

Resource Formats

In addition to the requirements for [OSLC Defined Resource Representations \(http://open-services.net/bin/view/Main/OslcCoreSpecification#OSLC_Defined_Resource_Representa\)](http://open-services.net/bin/view/Main/OslcCoreSpecification#OSLC_Defined_Resource_Representa), this section outlines further refinements and restrictions.

See [HTTP Method support table](#) for further clarification on support for HTTP methods and media types for each OSLC Automation resource.

For HTTP GET requests on all OSLC Automation and OSLC Core defined resource types,

- Automation Providers **MUST** provide RDF/XML representations. The RDF/XML representation **SHOULD** follow the guidelines outlined in the [OSLC Core Representations Guidance for RDF/XML \(http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations#Guidelines_for_application_rdf_x\)](http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations#Guidelines_for_application_rdf_x).
- Automation Providers **MAY** provide XML and JSON representations. If provided, the XML and JSON representations **SHOULD** follow the guidelines outlined in the [OSLC Core Representations Guidance \(http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations\)](http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations).
- Automation Consumers requesting RDF/XML **SHOULD** be prepared for any valid RDF/XML document. Automation Consumers requesting XML **SHOULD** be prepared for representations that follow the guidelines outlined in the [OSLC Core Representations Guidance \(http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations\)](http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations).
- Automation Providers **SHOULD** support an [X]HTML representation and a user interface (UI) preview as defined by [UI Preview Guidance \(http://open-services.net/bin/view/Main/OslcCoreUiPreview\)](http://open-services.net/bin/view/Main/OslcCoreUiPreview)

For HTTP PUT/POST request formats for Automation resources,

- Automation Providers **MUST** accept RDF/XML representations and **MAY** accept XML representations. Automation Providers accepting RDF/XML **SHOULD** be prepared for any valid RDF/XML document. If XML is accepted, Automation Providers **SHOULD** be prepared for representations that follow the guidelines outlined in the [OSLC Core Representations Guidance \(http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations\)](http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations).
- Automation Providers **MAY** accept XML and JSON representations. Automation Providers accepting XML or JSON **SHOULD** be prepared for representations that follow the guidelines outlined in the [OSLC Core Representations Guidance \(http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations\)](http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations).

For HTTP GET response formats for Query requests,

Automation Providers **MUST** provide RDF/XML and **MAY** provide JSON, XML, and Atom Syndication Format XML.

When Automation Consumers request:

- `application/rdf+xml` Automation Providers **MUST** respond with RDF/XML representation without restrictions.
- `application/xml` Automation Providers **SHOULD** respond with OSLC-defined abbreviated XML representation as defined in the [OSLC Core Representations Guidance \(http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations\)](http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations)
- `application/atom+xml` Automation Providers **SHOULD** respond with Atom Syndication Format XML representation as defined in the [OSLC Core Representations Guidance \(http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations\)](http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixRepresentations)
- If supported, the Atom Syndication Format XML representation **SHOULD** use RDF/XML representation without restrictions for the atom:content entries representing the resource representations.

Authentication

See [OSLC Core Authentication section \(http://open-services.net/bin/view/Main/OslcCoreSpecification#Authentication\)](http://open-services.net/bin/view/Main/OslcCoreSpecification#Authentication). OSLC Automation puts no additional constraints on authentication.

Error Responses

See [OSLC Core Error Responses section \(http://open-services.net/bin/view/Main/OslcCoreSpecification#Error_Responses\)](http://open-services.net/bin/view/Main/OslcCoreSpecification#Error_Responses). OSLC Automation puts no additional constraints on error responses.

Pagination

OSLC Automation service providers **SHOULD** support pagination of query results and **MAY** support pagination of a single resource's properties as defined by the OSLC Core Specification.

Labels for Relationships

Automation relationships to other resources are represented as properties whose values are the URI of the object or target resource. When an Automation 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 providers **MAY** support a `dcterms:title` link property in Automation resource representations, using the anchor approach outlined in the [OSLC Core Links Guidance \(http://open-services.net/bin/view/Main/OslcCoreSpecAppendixLinks\)](http://open-services.net/bin/view/Main/OslcCoreSpecAppendixLinks).

RDF/XML and XML example using reified statement:

```

<rdf:RDF
  xmlns:dcterms="http://purl.org/dc/terms/"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:oslc_auto="http://open-services.net/ns/auto#">
  <oslc_auto:AutomationResult rdf:about="http://example.com/results/4321">
    <oslc_auto:reportsOnAutomationPlan rdf:ID="link1"
      rdf:resource="http://example.com/plans/123" />
  </oslc_auto:AutomationResult>

  <rdf:Description rdf:about="#link1">
    <dcterms:title>Build Definition 123: Pet Shop App production build</dcterms:title>
  </rdf:Description>
</rdf:RDF>

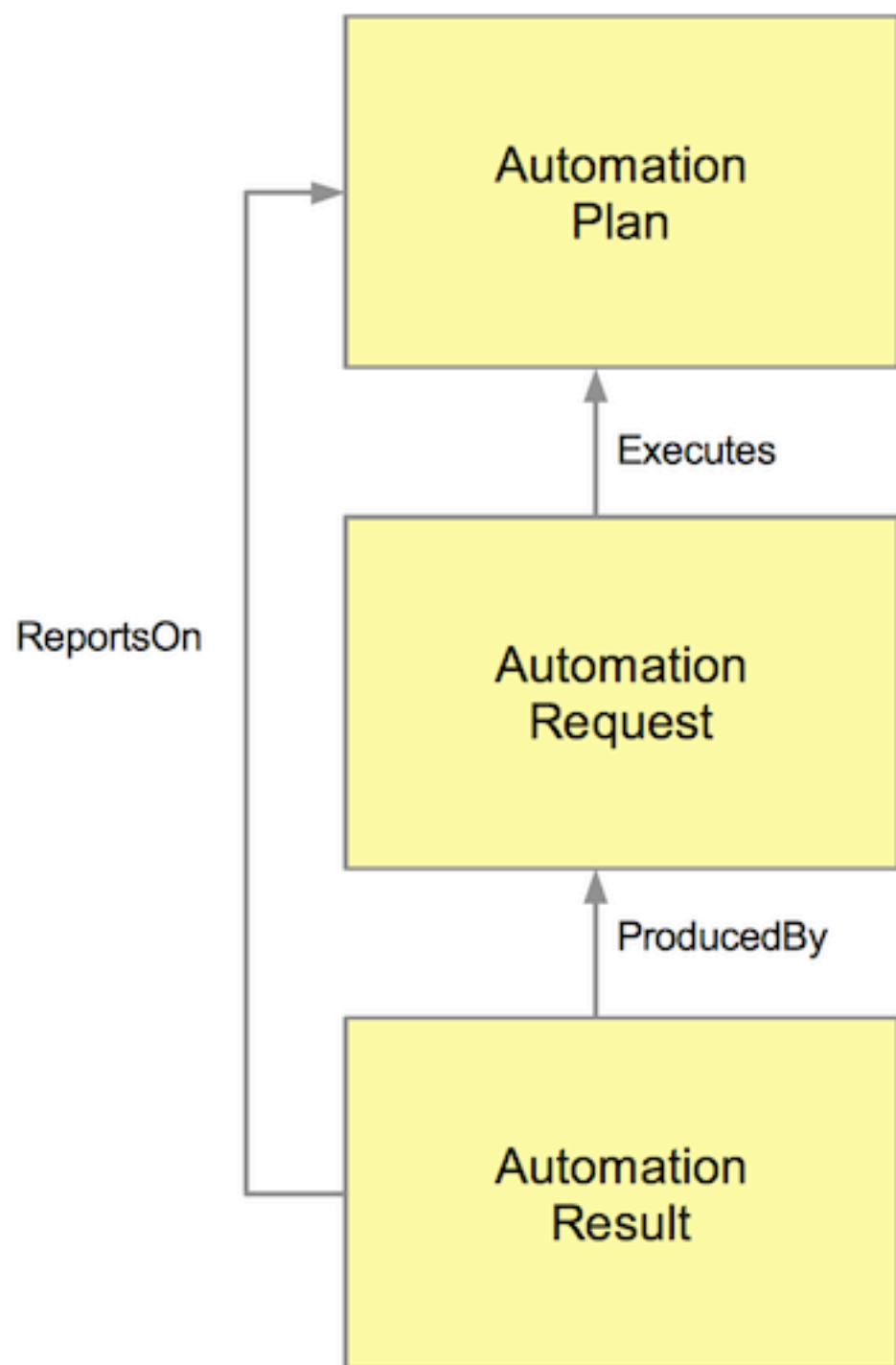
```

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 [OSLC Core Appendix A: Common Properties \(http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA\)](http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA). 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 [Selective Property Values \(http://open-services.net/bin/view/Main/OslcCoreSpecification#Selective_Property_Values\)](http://open-services.net/bin/view/Main/OslcCoreSpecification#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 [Selective Property Values \(http://open-services.net/bin/view/Main/OslcCoreSpecification#Selective_Property_Values\)](http://open-services.net/bin/view/Main/OslcCoreSpecification#Selective_Property_Values) in OSLC Core Specification.

Resource: AutomationPlan

- **Name:** AutomationPlan
- **Description:** A resource representing the unit of automation which is available for execution.
- **Type URI** <http://open-services.net/ns/auto#AutomationPlan>

AutomationPlan Properties

Prefix Name	Occurs	Read-only	Value-type	Representation	Range	Description
<i>OSLC Core: Common Properties</i>						
dcterms:contributor	zero-or-many	unspecified	!AnyResource	Either	any	Contributor or contributors to resource (reference: Dublin Core). It is likely that the target resource will be an <code>foaf:Person</code> (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA#foaf_Person_Resource) but that is not necessarily the case.
dcterms:created	zero-or-one	True	DateTime	n/a	n/a	Timestamp of resource creation (reference: Dublin Core)
dcterms:creator	zero-or-many	unspecified	AnyResource	Either	any	Creator or creators of resource (reference: Dublin Core). It is likely that the target resource will be an <code>foaf:Person</code> (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA#foaf_Person_Resource) but that is not necessarily the case.

Resource: AutomationResult

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

AutomationResult Properties

Prefix Name	Occurs	Read-only	Value-type	Representation	Range	Description
<i>OSLC Core:</i> Common Properties						
dcterms:contributor	zero-or-many	unspecified	AnyResource	Either	any	Contributor or contributors to resource (reference: Dublin Core). It is likely that the target resource will be an <code>foaf:Person</code> (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA#foaf_Person_Resource) but that is not necessarily the case. When the service provider or its agents is the contributor to the resource, a <code>foaf:Agent</code> (http://xmlns.com/foaf/spec/#term_Agent) could be used.
dcterms:created	zero-or-one	True	DateTime	n/a	n/a	Timestamp of resource creation (reference: Dublin Core)
dcterms:creator	zero-or-many	unspecified	AnyResource	Either	any	Creator or creators of the resource (reference: Dublin Core). It is likely that the target resource will be a foaf:Person, but that is not necessarily the case. The resource should represent the entity on whose behalf the automation is being created. When the provider itself or its agent is the initiator of the automation (perhaps in the case of a scheduled automation), an additional foaf:Agent resource could be used.
dcterms:identifier	exactly-one	True	String	n/a	n/a	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	n/a	Timestamp of latest resource modification (reference: Dublin Core)
rdf:type	zero-or-many	unspecified	Resource	Reference	n/a	The resource type URIs.
dcterms:subject	zero-or-many	unspecified	String	n/a	n/a	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	n/a	Title (reference: Dublin Core) of the resource represented as rich text in XHTML content.
oslc:instanceShape	zero-or-one	True	Resource	Reference	oslc: ResourceShape (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA#oslc_ResourceShape_Resource)	Resource Shape that provides hints as to resource property value-types and allowed values.
oslc:serviceProvider	zero-or-many	True	Resource	Reference	oslc: ServiceProvider (http://open-services.net/bin/view/Main/OslcCoreSpecification#Service_Provider_Resources)	The scope of a resource is a link to the resource's OSLC Service Provider.

Prefix Name	Occurs	Read-only	Value-type	Representation	Range	Description
<i>OSLC Automation:</i> Start of additional properties						
oslc_auto:state	one-or-many	True	AnyResource	Either	n/a	Used to indicate the state 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 state on the service provider.
oslc_auto:desiredState	zero-or-one	False	AnyResource	n/a	n/a	Used to indicate the desired state of the Automation Result 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:verdict	one-or-many	unspecified	AnyResource	Either	n/a	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_auto:contribution	zero-or-many	unspecified	AnyResource	Either	n/a	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 rdf:type to provide a description of the contribution which would be appropriate for display in a simple UI for an automation result.
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 <code>oslc_auto:producedByAutomationRequest</code>). The <code>oslc_auto:inputParameter</code> 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 <code>oslc_auto:outputParameter</code> 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 (<code>oslc_auto:complete</code> or <code>oslc_auto:canceled</code>), the <code>oslc_auto:outputParameter</code> values MUST NOT change.

Prefix Name	Occurs	Read-only	Value-type	Representation	Range	Description
<i>Relationship properties:</i> This grouping of properties is used to identify relationships between resources managed by OSLC Service Providers						
oslc_auto:producedByAutomationRequest	zero-to-one	False	Resource	Reference	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:reportsOnAutomationPlan	exactly-one	False	Resource	Reference	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.

Resource: ParameterInstance

- **Name:** ParameterInstance
- **Description:** A resource representing an individual input or output parameter instance for an Automation Request or Result. Automation Requests and Results may have 0 or more parameter instances.
- **Type URI** <http://open-services.net/ns/auto#ParameterInstance>

ParameterInstance Properties

Prefix Name	Occurs	Read-only	Value-type	Representation	Range	Description
<i>OSLC Core:</i> Common Properties						
oslc:name	exactly-one	unspecified	String	n/a	n/a	The name of the parameter instance.
rdf:value	zero-or-one	unspecified	unspecified	n/a	n/a	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.
dcterms:description	zero-or-one	unspecified	XMLLiteral	n/a	n/a	Descriptive text (reference: Dublin Core) about resource represented as rich text in XHTML content. SHOULD include only content that is valid and suitable inside an XHTML <div> element.
rdf:type	zero-or-many	unspecified	Resource	Reference	n/a	The resource type URIs.
oslc	zero-or-				oslc: ResourceShape (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA#oslc_ResourceShape_Resource)	Resource Shape that provides hints as to resource property value-types and allowed values.

`:instanceShape` one True Resource Reference [oslc: ServiceProvider](http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA#oslc_ResourceShape_Resource) (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA#oslc_ResourceShape_Resource) allowed values. The scope of a resource is a link to the resource's OSLC Service Provider.

Automation Service Provider Capabilities

Asynchronous and Synchronous Automation Execution

An OSLC Automation service provider is generally assumed to implement automation requests asynchronously. In this model, a client creates an automation request and then later queries a collection of automation results for the particular result(s) related to its request. For generality, it is also assumed that results may be contributed asynchronously by a set of distributed processes, where each contributor adds its contribution(s) to the result via HTTP PUT. When a provider creates an automation request, it can also include an automation result, which might or might not yet be finished at the point in time when the provider responds to the create request. Providers can persist automation results for as long as they deem reasonable. Consumers are assumed to poll for updates to automation results until they have finished. Once a request has finished, the provider may remove it at any time. An automation result is "finished" when it has an `oslc_auto:state` predicate with an object of `oslc_auto:complete` or `oslc_auto:canceled` or an `oslc_auto:verdict` property with a value other than `oslc_auto:unavailable`.

Automation Provider Sub-Domains

An instance of an OSLC Automation service provider might provide services for one or more particular automation sub-domains (e.g. test or build automation). Automation service providers MAY declare sub-domain information in the Service Provider document by specifying a sub-domain value in the `oslc:usage` attribute on the `oslc:Service` resource in the Service Provider document. Valid sub-domain values are:

- **http://open-services.net/ns/auto#Build**: Indicates that the related service provider or services provide build automation capabilities - the process of converting source code artifacts into software artifacts such as executables, libraries and documentation.
- **http://open-services.net/ns/auto#Test**: Indicates that the related service provider or services provide test automation capabilities - the process of executing tests on a system under test and comparing the results of the tests to pass/fail conditions.
- **http://open-services.net/ns/auto#Deploy**: Indicates that the related service provider or services provide deployment capabilities - the process of executing processes and procedures to ready systems and software for use.

An automation service provider which is a general-purpose automation provider, or a provider not wanting to provide a sub-domain should provide an `oslc:usage` value of **http://open-services.net/ns/auto**. If no `oslc:usage` attribute indicating a sub-domain is present, the default is assumed to be **http://open-services.net/ns/auto**.

Sub-domain Example

Example of a service provider document fragment with a 2 Services which are identified as related to the Test and Deploy sub-domains:

```
<oslc:serviceProvider>
  <oslc:ServiceProvider>
    <oslc:service>
      <oslc:Service>
        <oslc:usage rdf:resource="http://open-services.net/ns/auto#Test">
          <oslc:queryCapability>
            ...
          </oslc:queryCapability>
          <oslc:creatonFactory>
            ...
          </oslc:creationFactory>
          ...
        </oslc:Service>
      </oslc:service>
    <oslc:service>
      <oslc:Service>
        <oslc:usage rdf:resource="http://open-services.net/ns/auto#Deploy">
          ...
        </oslc:Service>
      </oslc:service>
    </oslc:ServiceProvider>
  </oslc:serviceProvider>
```

Resource Shapes

OSLC Automation service providers **MAY** support [Resource Shapes](http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA#oslc_ResourceShape_Resource) (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA#oslc_ResourceShape_Resource) as defined in [OSLC Core Specification Appendix A](http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA) (http://open-services.net/bin/view/Main/OSLCCoreSpecAppendixA).

Service Provider Resource

OSLC Automation service providers **MUST** provide a [Service Provider Resource](http://open-services.net/bin/view/Main/OSlcCoreSpecification#Service_Provider_Resources) (http://open-services.net/bin/view/Main/OSlcCoreSpecification#Service_Provider_Resources) that can be retrieved at a implementation dependent URI.

OSLC Automation service providers **MAY** provide a [Service Provider Catalog Resource](http://open-services.net/bin/view/Main/OSlcCoreSpecification#Resource_Service_Provider_Catalo) (http://open-services.net/bin/view/Main/OSlcCoreSpecification#Resource_Service_Provider_Catalo) that can be retrieved at a implementation dependent URI.

It is **RECOMMENDED** that OSLC Automation service providers provide a `oslc:serviceProvider` property for their defined resources that will be the URI to a [Service Provider Resource](http://open-services.net/bin/view/Main/OSlcCoreSpecification#Service_Provider_Resources) (http://open-services.net/bin/view/Main/OSlcCoreSpecification#Service_Provider_Resources).

Creation Factories

If an OSLC Automation service provider supports the creation of resources, there **MUST** be at least one [Creation Factories](http://open-services.net/bin/view/Main/OSlcCoreSpecification#Creation_Factories) (http://open-services.net/bin/view/Main/OSlcCoreSpecification#Creation_Factories) entry in the Services definition.

See [HTTP Method support table](#) for further clarification on support for HTTP methods and media types for each OSLC Automation resource.

Query Capabilities

OSLC Automation service providers **SHOULD** have at least one Query Capabilities entry in the its Services definition that allows a client to query !AutomationResults.

Note: OSLC Automation does not require providers to keep resources accessible forever. Clients should not expect automation results to be available for any particular length of time once the request has finished (has a state of completed or canceled). Some providers might respond to an AutomationRequest creation request with an AutomationRequest that is also an AutomationResult, and might make the result inaccessible immediately thereafter.

Note: If an OSLC Automation provider does expose a Query Capability that applies to AutomationResults, and if its AutomationRequest creation responses are not also AutomationResults, then its Query Capability is the only Automation-defined way for clients to find the corresponding AutomationResults.

The Query Capability **MUST** support these OSLC query parameters and **MAY** support others:

- `oslc:where`
- `oslc:select`

If shape information is NOT present with the Query Capability, service providers **SHOULD** use the default properties defined in [OSLC Core RDF/XML Examples](http://open-services.net/bin/view/Main/OSLCCoreSpecRDFXMLExamples#Specifying_the_shape_of_a_query) (http://open-services.net/bin/view/Main/OSLCCoreSpecRDFXMLExamples#Specifying_the_shape_of_a_query) to contain the result.

Selective Property Values

OSLC Automation providers **SHOULD** support the `oslc.properties` syntax for selective property value retrieval when a resource is accessible via its resource URI.

Delegated UIs

OSLC Automation service providers support the selection and creation of Automation resources as defined by [Delegated UIs](http://open-services.net/bin/view/Main/OSlcCoreSpecification#Delegated_User_Interface_Dialogs) (http://open-services.net/bin/view/Main/OSlcCoreSpecification#Delegated_User_Interface_Dialogs) in OSLC Core.

The service providers supports requirements for delegated UIs is as follows:

Automation Resource Selection Creation

AutomationPlan	SHOULD	MAY
AutomationRequest	MAY	SHOULD
AutomationResult	SHOULD	MAY

State and Verdict properties

OSLC Automation service providers can identify the state and verdict using references to property values in the OSLC Automation vocabulary or to property values that are not in the Automation vocabulary (i.e. in the service provider's own vocabulary). It is expected that the state and verdict values will be URI references to property values, but inline resources defining the state and verdict property values are also valid. Automation service providers **MUST** use at least one verdict (Automation Results) and state (Automation Requests and Results) defined in the OSLC automation vocabulary in addition to any states or verdicts not in the Automation vocabulary.

The additional property values for `oslc_auto:state` are:

- <http://open-services.net/ns/auto#new> - used to indicate an automation request or result has just been created in the service provider and has not yet been acted upon.
- <http://open-services.net/ns/auto#queued> - primarily used to indicate an automation request or result is queued for additional actions by the service provider
- <http://open-services.net/ns/auto#inProgress> - used to indicate an automation request or result is active in the service provider.
- <http://open-services.net/ns/auto#canceling> - used to indicate the service provider is in the process of canceling an automation request or result.
- <http://open-services.net/ns/auto#canceled> - used to indicate that an automation request or result has been canceled.
- <http://open-services.net/ns/auto#complete> - used to indicate that an automation request or result is complete.

The additional property values for `oslc_auto:verdict` are:

- <http://open-services.net/ns/auto#unavailable> - used to indicate an automation result is in a state where a final verdict such as `oslc_auto:passed` or `oslc_auto:failed` is not yet available. Usually used when the result is in a state other than `oslc_auto:complete`.
- <http://open-services.net/ns/auto#passed> - used to indicate an automation result represents a successful execution.
- <http://open-services.net/ns/auto#warning> - used to indicate an automation result represents an execution which encountered conditions which prevented successful execution but did not result in a failed execution.
- <http://open-services.net/ns/auto#failed> - used to indicate an automation result represents a failed execution.
- <http://open-services.net/ns/auto#error> - used to indicate an automation result has completed but did not run successfully due to some error. This could be a timeout, automation coding error, network problem or other error which prevented the automation from running successfully to a passed, warning or failed verdict as described above.

Automation Service Provider HTTP method support

For V2 of the OSLC Automation specification, support for all HTTP methods in [the compliance table](#) is not required for all Automation resources. The following table summarizes the requirements for each resource type, HTTP method and for each media type.

Resource	RDF/XML	XML	JSON	OSLC Compact	HTML	Unspecified
Automation Plan						
GET	MUST	MAY	SHOULD	SHOULD	SHOULD	N/A
PUT	MAY	MAY	MAY	N/A	N/A	N/A
POST	MAY	MAY	MAY	N/A	N/A	N/A
DELETE	N/A	N/A	N/A	N/A	N/A	MAY
Automation Request						
GET	MUST	MAY	SHOULD	SHOULD	SHOULD	N/A
PUT	MAY	MAY	MAY	N/A	N/A	N/A
POST	MUST	MAY	SHOULD	N/A	N/A	N/A
DELETE	N/A	N/A	N/A	N/A	N/A	MAY
Automation Result						
GET	MUST	MAY	MAY	SHOULD	SHOULD	N/A
PUT	SHOULD	MAY	SHOULD	N/A	N/A	N/A
POST	MAY	MAY	MAY	N/A	N/A	N/A
DELETE	N/A	N/A	N/A	N/A	N/A	MAY
Parameter Definition						
GET	MAY	MAY	MAY	MAY	MAY	N/A
PUT	MAY	MAY	MAY	N/A	N/A	N/A
POST	MAY	MAY	MAY	N/A	N/A	N/A
DELETE	N/A	N/A	N/A	N/A	N/A	MAY
Parameter Instance						
GET	MAY	MAY	MAY	MAY	MAY	N/A
PUT	MAY	MAY	MAY	N/A	N/A	N/A
POST	MAY	MAY	MAY	N/A	N/A	N/A
DELETE	N/A	N/A	N/A	N/A	N/A	MAY

OSLC Automation service providers **SHOULD** support deletion of any resources for which it allows creation.

Automation Specification Guidance

This section is informative.

Canceling the execution of an automation

The [Automation Request](#) and [Automation Result](#) resources have an `oslc_auto:desiredState` attribute. A consumer can indicate a desire to cancel the execution of an automation by doing a PUT to the artifact with this attribute set to a value of <http://open-services.net/ns/auto#canceled>. If the service provider supports cancellation of automation executions, the receipt of a PUT with this attribute set should trigger the necessary provider processing. If the cancellation is successful, the service provider should set the appropriate artifact `oslc_auto:state` to <http://open-services.net/ns/auto#canceled>.

- When only an Automation Request is active (Automation Result not created yet), the consumer should request cancellation by setting `oslc_auto:desiredState` on the Automation Request.
- When Automation Requests and Automation Results are active (in an `oslc_auto:state` other than `oslc_auto:canceled` or `oslc_auto:complete`), the consumer should request cancellation by setting `oslc_auto:desiredState` on the Automation Request.
- When only an Automation Result is active (Automation Request completed, canceled or no longer exists), the consumer should request cancellation by setting `oslc_auto:desiredState` on the Automation Result.
- Consumers are responsible for checking the status code of the response to the request for cancellation and for checking the `oslc_auto:state` of the resource.

Responses to Cancellation Requests

If a service provider does not support cancellation of an automation, or if an error occurs preventing successful cancellation, the service provider should respond to the PUT request with an HTTP status code 500 and an [OSLC Error Resource](#) (http://open-services.net/bin/view/Main/OslcCoreSpecification/Error_Responses) detailing the cause for the failed cancellation.

State consistency

The [Automation Request](#) and [Automation Result](#) resources have an `oslc_auto:state` attribute. Automation service providers should, where possible, enforce state consistency for related Automation Requests and Results. In general, this means an Automation Result in a final state (completed, canceled) should not have a related Automation Request in a non-final state. Other contradictions such as completed Automation Result with a new Automation Request should also be avoided. Suggested consistent (C) and inconsistent (I) states are:

Automation Result

	AutoRequest	new	queued	inProgress	canceling	canceled	complete
new	C	I	I	I	I	I	
queued	C	C	I	I	I	I	
inProgress	C	C	C	I	I	I	
canceling	C	C	C	C	C	C	
canceled	I	I	I	C	C	I	
complete	C	C	C	C	C	C	

Parameters Added During Execution

When Automation Requests are created for an Automation Plan, the creator of the request supplies `oslc_auto:inputParameter` attributes based on the `oslc_auto:parameterDefinition` attributes found in the Automation Plan instance. There are scenarios where a provider may add additional parameters during the course of execution and a consumer of Automation Results might wish to discover what these added parameters will be. One method of discovery is for the consumer to simply examine the `oslc_auto:outputParameter` attributes of the Automation Result. This may not be sufficient for consumers who have a need to know the added parameters prior to executing the Automation Plan.

Service providers can advertise which parameters will be added during the course of execution using the `oslc:readOnly` attribute of the `oslc:Property` resource which is the basis for the `oslc_auto:parameterDefinition` in the Automation Plan. By setting `oslc:readOnly` to `true`, the provider indicates that this parameter is not available for the consumer to set, but will or may be added to the Automation Result's `oslc_auto:outputParameters`. Whether it is guaranteed to be added to the Result is based on the value of `oslc:occurs` for the specific `parameterDefinition`.

Example 1: An Automation Plan `parameterDefinition` fragment showing a parameter guaranteed to be added during execution

```
<oslc_auto:parameterDefinition>
  <oslc:name>DeployedIPAddress</oslc:name>
  <oslc:readOnly>true</oslc:readOnly>
  <oslc:occurs>http://open-services.net/ns/core#Exactly-one</oslc:occurs>
  <oslc:valueType rdf:resource="http://www.w3.org/2001/XMLSchema#string" />
</oslc_auto:parameterDefinition>
```

Example 2: An Automation Plan `parameterDefinition` fragment showing a parameter which may be added during execution

```
<oslc_auto:parameterDefinition>
  <oslc:name>FailedTestName</oslc:name>
  <oslc:readOnly>true</oslc:readOnly>
  <oslc:occurs>http://open-services.net/ns/core#Zero-or-many</oslc:occurs>
  <oslc:valueType rdf:resource="http://www.w3.org/2001/XMLSchema#string" />
</oslc_auto:parameterDefinition>
```

Appendix A: Samples

(this section is informative)

See [OSLC Automation Version 2.0 Samples \(http://open-services.net/wiki/automation/OSLC-Automation-Version-2.0-Samples\)](http://open-services.net/wiki/automation/OSLC-Automation-Version-2.0-Samples)

Appendix B: Resource Shapes

(this section is informative)

See [OSLC Automation Version 2.0 Resource Shapes \(http://open-services.net/wiki/automation/OSLC-Automation-Version-2.0-Resource-Shapes\)](http://open-services.net/wiki/automation/OSLC-Automation-Version-2.0-Resource-Shapes)

Appendix C: Notices and References

Reporting Issues on the Specification

The working group participants who author and maintain this working draft specification, monitor a distribution list where issues or questions can be raised, see [Automation Mailing List \(http://open-services.net/mailman/listinfo/oslc-automation_open-services.net\)](http://open-services.net/mailman/listinfo/oslc-automation_open-services.net)

Also the issues found with this specification and their resolution can be found at [Automation Specification Version 2.0 Issues \(http://open-services.net/wiki/automation/Automation-Specification-Version-2.0-Issues\)](http://open-services.net/wiki/automation/Automation-Specification-Version-2.0-Issues).

Contributors and Contact Information

- [CharlesRankin \(http://open-services.net/bin/view/Main/CharlesRankin\)](http://open-services.net/bin/view/Main/CharlesRankin) (IBM)
- [DavidBrauneis \(http://open-services.net/forums/member/266/\)](http://open-services.net/forums/member/266/) (IBM)
- [DanBerg \(http://open-services.net/bin/view/Main/DanBerg\)](http://open-services.net/bin/view/Main/DanBerg) (IBM)
- [JohnArwe \(http://open-services.net/bin/view/Main/JohnArwe\)](http://open-services.net/bin/view/Main/JohnArwe) (IBM)
- [LucasPanjer \(http://open-services.net/bin/view/Main/LucasPanjer\)](http://open-services.net/bin/view/Main/LucasPanjer) (Tasktop)
- [MaxVohlken \(http://open-services.net/bin/view/Main/MaxVohlken\)](http://open-services.net/bin/view/Main/MaxVohlken) (IBM)
- [MichaelFiedler \(http://open-services.net/forums/member/265/\)](http://open-services.net/forums/member/265/) (IBM)
- [PaulMcMahan \(http://open-services.net/bin/view/Main/PaulMcMahan\)](http://open-services.net/bin/view/Main/PaulMcMahan) (IBM)
- [Pramod Chandoria \(http://open-services.net/bin/view/Main/PramodChandoria\)](http://open-services.net/bin/view/Main/PramodChandoria) (IBM)
- [RobertElves \(http://open-services.net/bin/view/Main/RobertElves\)](http://open-services.net/bin/view/Main/RobertElves) (Tasktop)
- [VaibhavSrivastava \(http://open-services.net/bin/view/Main/VaibhavSrivastava\)](http://open-services.net/bin/view/Main/VaibhavSrivastava) (IBM)
- [XinPengLiu \(http://open-services.net/bin/view/Main/XinPengLiu\)](http://open-services.net/bin/view/Main/XinPengLiu) (IBM)
- [JingQian \(http://open-services.net/bin/view/Main/JingQian\)](http://open-services.net/bin/view/Main/JingQian) (IBM)

Intellectual Property Covenant

The members of the Working Group (or as appropriate, their employers) have documented a Patent Non-Assertion Covenant for implementations of the Automation 2.0 Specification, as described in the open-services.net [Terms of Use \(http://open-services.net/html/Terms.html\)](http://open-services.net/html/Terms.html). Details of the Covenant may be found [here \(http://open-services.net/wiki/automation/Patent-Non-Assert-Covenants-for-Automation-Specification-version-2.0\)](http://open-services.net/wiki/automation/Patent-Non-Assert-Covenants-for-Automation-Specification-version-2.0).

References

- OSLC Core - [OSLC Core Specification 2.0 \(http://open-services.net/bin/view/Main/OslcCoreSpecification\)](http://open-services.net/bin/view/Main/OslcCoreSpecification)
- Dublin Core 1.1 - [Dublin Core Metadata Element Set, Version 1.1 \(http://dublincore.org/documents/2010/10/11/dces/\)](http://dublincore.org/documents/2010/10/11/dces/)
- FOAF - [Friend of a Friend \(FOAF\) v0.98 \(http://xmlns.com/foaf/spec/20100809.html\)](http://xmlns.com/foaf/spec/20100809.html)
- HTTP 1.1 - [Hyper-text Transfer Protocol \(HTTP/1.1\) \(http://tools.ietf.org/html/rfc2616\)](http://tools.ietf.org/html/rfc2616)
- OAuth 1.0a - [RFC5849 - The OAuth 1.0 Protocol \(http://tools.ietf.org/html/rfc5849\)](http://tools.ietf.org/html/rfc5849)
- RDF/XML Concepts - [RDF/XML Concepts and Abstract Syntax \(http://www.w3.org/TR/2004/REC-rdf-concepts-20040210/\)](http://www.w3.org/TR/2004/REC-rdf-concepts-20040210/)
- RDF/XML Syntax - [RDF / XML Syntax Specification \(Revised\) \(http://www.w3.org/TR/2004/REC-rdf-syntax-grammar-20040210/\)](http://www.w3.org/TR/2004/REC-rdf-syntax-grammar-20040210/)
- URI Syntax - [URI Generic Syntax \(http://tools.ietf.org/html/rfc3986\)](http://tools.ietf.org/html/rfc3986)
- XML Namespaces - [Namespaces in XML 1.0 \(Third Edition\) \(http://www.w3.org/TR/REC-xml-names/\)](http://www.w3.org/TR/REC-xml-names/)
- XSD Datatypes - [XML Schema Part 2: Datatypes Second Edition \(http://www.w3.org/TR/xmlschema-2\)](http://www.w3.org/TR/xmlschema-2)