OSLC Jama Adapter Features

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Brief Summary

- Producer and Consumer of OSLC Requirements Management (RM)
- Producer and Consumer of Jama Stakeholder Requirements

- Support for OSLC Core v2 Specification
  HTTP GET services for reading resources (no services to delete, update, create resources)
- Support for describing requirement resources in compliance with OSLC Requirements Management specification
- Support for describing Jama resources as documented online (https://dev.jamasoftware.com/rest#docs)

Features (1)

- Support for exposing resources of type OSLC Service Provider Catalog, OSLC Service Provider, OSLC Service, OSLC Query Capability, OSLC Resource Shape, OSLC Query Resource, OSLC Resource, OSLC ResponseInfo
- Support for OSLC Core v2 Specification
  HTTP GET services for reading resources (no services to delete, update, create resources)
- Support for describing requirement resources in compliance with OSLC Requirements Management specification
- Support for describing Jama resources as documented online (https://dev.jamasoftware.com/rest#docs)

Features (2)

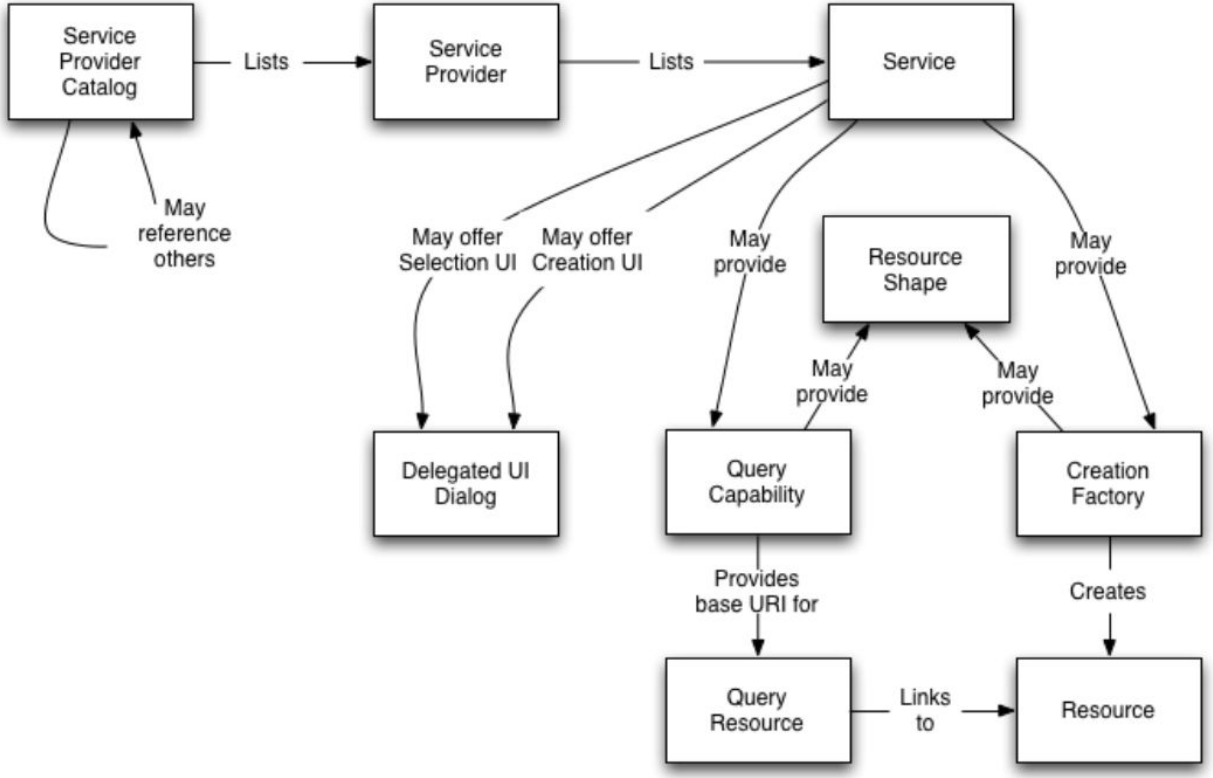
- Support for RDF representation of resources
- Support for UI Preview of requirement resources
- Support for exposing change events according to OSLC Tracked Resource Set (but only fake change events, not real ones occurring really in Jama)
- Support for configuration of adapter (port number, Jama instance to retrieve data from, time between periodic syncs)

- Support for syncing OSLC adapter with Jama REST API during launch of OSLC adapter as well as through periodic syncing based on configuration settingSupport for configuration of adapter (port number, Jama instance to retrieve data from, time between periodic syncs)

Features (3)

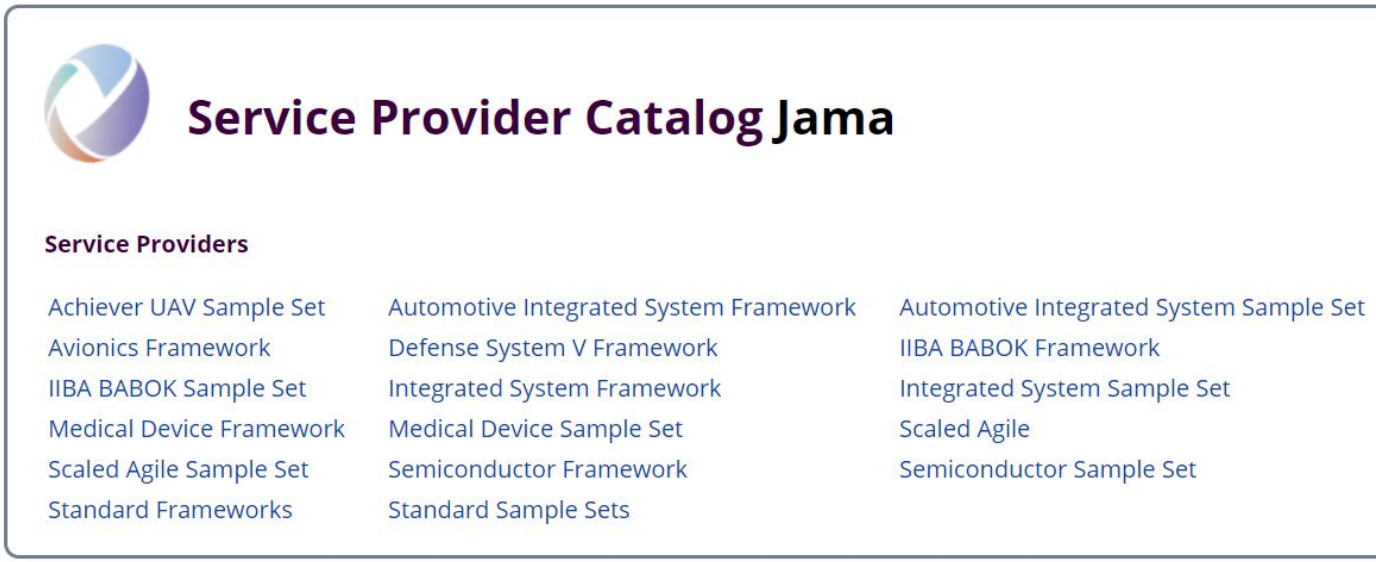
- Creation of OSLC adapter client in Java to test each OSLC adapter service
- Creation of HTML/JavaScript client to test OSLC UI Preview of requirement resources
- Support for hosting Jama RDF vocabulary
- Support for Jama-specific RDF namespace

Exposing OSLC resources



OSLC Service Provider Catalog

http://localhost:8080/jama-oslc-adapter/services/serviceProviderCatalog



OSLC Service Provider Catalog

http://localhost:8080/jama-oslc-adapter/services/serviceProviderCatalog
With
Accept=application/rdf+xml

```
<rdf:Description rdf:about="http://localhost:8080/jama-oslc-adapter/services/serviceProviderCatalog">
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Semiconductor_Sample_Set"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Avionics_Framework"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Automotive_Integrated_System_Framework"/>
        <rdf:type rdf:resource="http://open-services.net/ns/core#ServiceProviderCatalog"/>
        <dcterms:publisher rdf:nodeID="A44"/>
        <dcterms:description rdf:parseType="Literal">Jama OSLC Adapter Service Provider Catalog</dcterms:description>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Standard_Frameworks"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Medical_Device_Framework"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Achiever_UAV_Sample_Set"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Integrated_System_Sample_Set"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Standard_Sample_Sets"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Integrated_System_Framework"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Medical_Device_Sample_Set"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/IIBA_BABOK_Framework"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Scaled_Agile_Sample_Set"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Defense_System_V_Framework"/>
        <dcterms:title rdf:parseType="Literal">Jama OSLC Adapter Service Provider Catalog</dcterms:title>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Scaled_Agile"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Semiconductor_Framework"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Automotive_Integrated_System_Sample_Set"/>
        <oslc:serviceProvider rdf:resource="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/IIBA_BABOK_Sample_Set"/>
        <oslc:domain rdf:resource="http://jamacloud.com/#requirementSpec"/>
    </rdf:Description>
```

OSLC Service Provider

http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Semiconductor_Sample_Set

OSLC Service Provider Catalog

http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Semiconductor_Sample_Set
With Accept=application/rdf+xml

```
<rdf:Description rdf:about="http://localhost:8080/jama-oslc-adapter/services/serviceProvider/Semiconductor_Sample_Set">
        <oslc:prefixDefinition rdf:nodeID="A0"/>
        <oslc:prefixDefinition rdf:nodeID="A1"/>
        <oslc:prefixDefinition rdf:nodeID="A2"/>
        <dcterms:publisher rdf:nodeID="A3"/>
        <dcterms:title rdf:parseType="Literal">Semiconductor Sample Set</dcterms:title>
        <dcterms:identifier>Semiconductor_Sample_Set</dcterms:identifier>
        <oslc:service rdf:nodeID="A4"/>
        <dcterms:description rdf:parseType="Literal">Semiconductor Sample Set</dcterms:description>
        <rdf:type rdf:resource="http://open-services.net/ns/core#ServiceProvider"/>
</rdf:Description>
```

OSLC Query Capability

http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement

Jama Requirements Semiconductor_Sample_Set

Requirements

ID	Title
3920	Support High Level Operating Systems
3921	0.65mm Ball Pitch
3922	0.80mm Ball Pitch
3923	Cryptography
6916	newRequirement50
3924	Low Power
3925	3D Graphics Acceleration
3926	3D Graphics Standards
6917	newRequirement51
3919	32 Bit RISC Processor

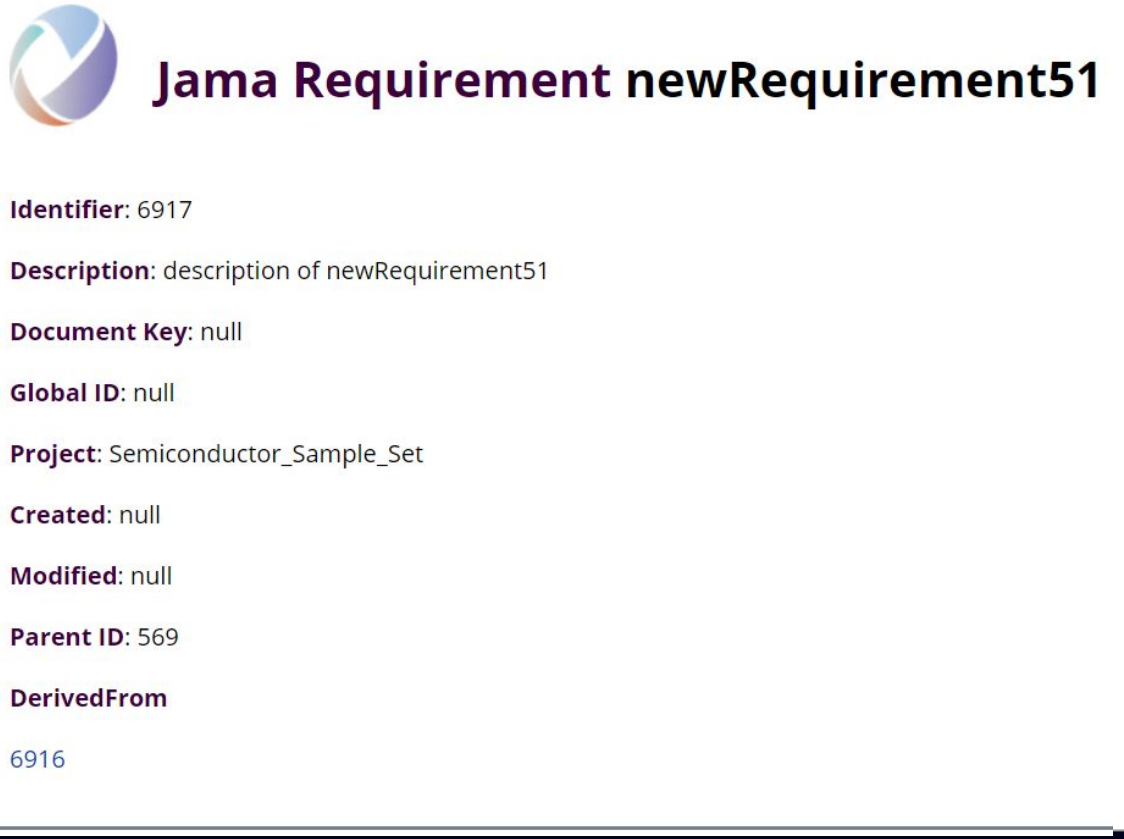
OSLC Query Capability

http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement
With Accept=application/rdf+xml

```
<rdf:Description rdf:about="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement">
    <rdfs:member rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/6917"/>
    <rdfs:member rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/3925"/>
    <rdfs:member rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/6916"/>
    <rdfs:member rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/3924"/>
    <rdfs:member rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/3921"/>
    <rdfs:member rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/3920"/>
    <rdfs:member rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/3919"/>
    <rdf:type rdf:resource="http://open-services.net/ns/core#ResponseInfo"/>
    <rdfs:member rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/3926"/>
    <rdfs:member rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/3923"/>
    <rdfs:member rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/3922"/>
    <oslc:totalCount rdf:datatype="http://www.w3.org/2001/XMLSchema#int">10</oslc:totalCount>
</rdf:Description>
```

OSLC Resource

http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/6917



OSLC Resource

http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/6917
With Accept=application/rdf+xml

```
<rdf:Description rdf:nodeID="A0">
    <rdf:subject rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/6917"/>
    <rdf:predicate rdf:resource="http://localhost:8080/jama-oslc-adapter/vocabulary/derivedFrom"/>
    <rdf:object rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/6916"/>
    <rdf:type rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#Statement"/>
</rdf:Description>
<rdf:Description rdf:about="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/6917">
    <dcterms:title rdf:parseType="Literal">newRequirement51</dcterms:title>
    <rdf:type rdf:resource="http://open-services.net/ns/rm#Requirement"/>
    <dcterms:identifier>6917</dcterms:identifier>
    <dcterms:description rdf:parseType="Literal">description of newRequirement51</dcterms:description>
    <jama:derivedFrom rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/6916"/>
    <jama:requirement_parentID rdf:parseType="Literal">569</jama:requirement_parentID>
    <jama:requirement_project rdf:parseType="Literal">Semiconductor_Sample_Set</jama:requirement_project>
    <rdf:type rdf:resource="http://localhost:8080/jama-oslc-adapter/vocabulary/Requirement"/>
</rdf:Description>
```

UI Preview

With Accept=application/rdf+xml

```
<rdf:Description rdf:nodeID="A0">
    <rdf:subject rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/6917"/>
    <rdf:predicate rdf:resource="http://localhost:8080/jama-oslc-adapter/vocabulary/derivedFrom"/>
    <rdf:object rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/6916"/>
    <rdf:type rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#Statement"/>
</rdf:Description>
<rdf:Description rdf:about="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/6917">
    <dcterms:title rdf:parseType="Literal">newRequirement51</dcterms:title>
    <rdf:type rdf:resource="http://open-services.net/ns/rm#Requirement"/>
    <dcterms:identifier>6917</dcterms:identifier>
    <dcterms:description rdf:parseType="Literal">description of newRequirement51</dcterms:description>
    <jama:derivedFrom rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/6916"/>
    <jama:requirement_parentID rdf:parseType="Literal">569</jama:requirement_parentID>
    <jama:requirement_project rdf:parseType="Literal">Semiconductor_Sample_Set</jama:requirement_project>
    <rdf:type rdf:resource="http://localhost:8080/jama-oslc-adapter/vocabulary/Requirement"/>
</rdf:Description>
```

OSLC Resource UI Preview (1)

http://localhost:8080/jama-oslc-adapter/uipreview

Hover over the link below to see the UI Preview of a Jama Requirement

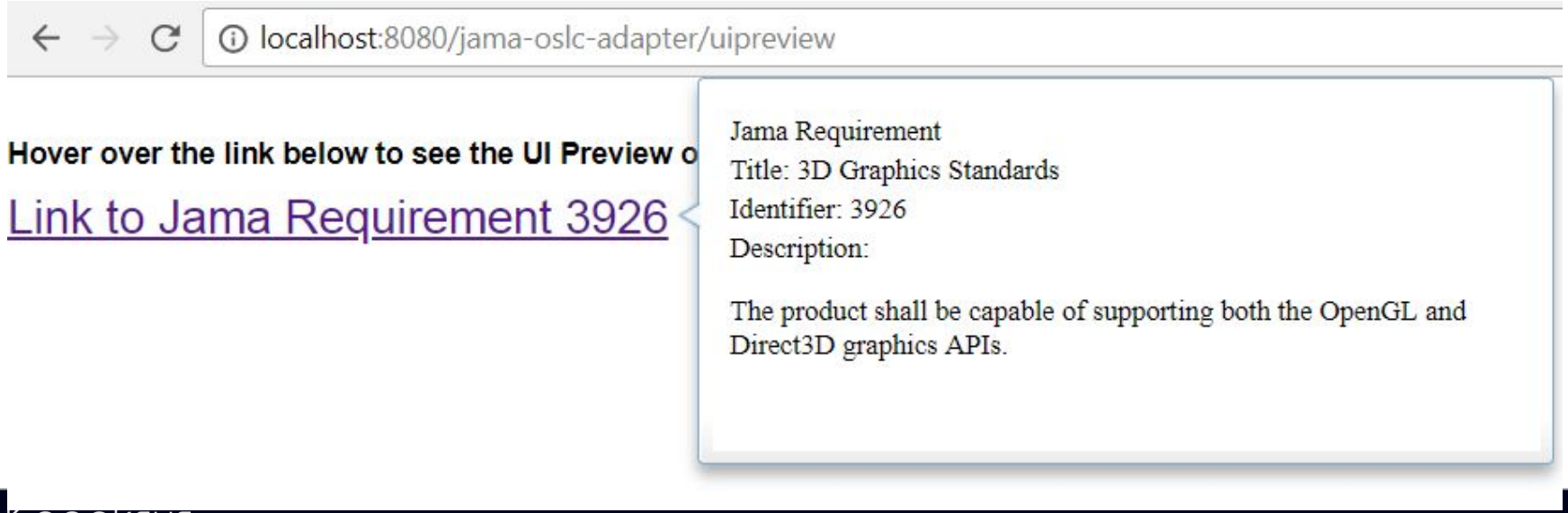
Link to Jama Requirement 3926

Hover over link

OSLC Resource UI Preview (2)

http://localhost:8080/jama-oslc-adapter/uipreview

See UI preview of Jama requirement when hovering over the link



OSLC TRS Resource

http://localhost:8080/jama-oslc-adapter/services/trs
With Accept=application/rdf+xml

Changes to Jama items can be exposed according to OSLC TRS specification

```
<rdf:Description rdf:about="http://localhost:8080/jama-oslc-adapter/services/trs">
    <trs:changeLog rdf:resource="http://localhost:8080/jama-oslc-adapter/services/trs/changeLog1"/>
    <trs:base rdf:resource="http://localhost:8080/jama-oslc-adapter/services/trs/base"/>
    <rdf:type rdf:resource="http://jazz.net/ns/trs#TrackedResourceSet"/>
</rdf:Description>
<rdf:Description rdf:about="http://localhost:8080/jama-oslc-adapter/services/trs/changeLog1">
    <rdf:type rdf:resource="http://open-services.net/ns/core/trs#ChangeLog"/>
    <trs:changes rdf:nodeID="A0"/>
    <rdf:type rdf:resource="http://jazz.net/ns/trs#ChangeLog"/>
</rdf:Description>
<rdf:Description rdf:about="http://localhost:8080/jama-oslc-adapter/services/trs/changeevents/FriApr1307:55:16PDT2018:4">
    <rdf:type rdf:resource="http://open-services.net/ns/core/trs#Modification"/>
    <trs:changed rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Semiconductor_Sample_Set/requirement/3923"/>
    <trs:order rdf:datatype="http://www.w3.org/2001/XMLSchema#int">4</trs:order>
    <rdf:type rdf:resource="http://jazz.net/ns/trs#ChangeEvent"/>
</rdf:Description>
<rdf:Description rdf:about="http://localhost:8080/jama-oslc-adapter/services/trs/changeevents/FriApr1307:55:16PDT2018:3">
    <rdf:type rdf:resource="http://open-services.net/ns/core/trs#Deletion"/>
    <trs:changed rdf:resource="http://localhost:8080/jama-oslc-adapter/services/Achiever_UAV_Sample_Set/requirement/9008"/>
    <trs:order rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</trs:order>
    <rdf:type rdf:resource="http://jazz.net/ns/trs#ChangeEvent"/>
</rdf:Description>
```

Configuration of OSLC Jama Adapter

https://github.com/OSLC/oslc-adapter-jama/blob/clean-ver/config.properties

```
# Specify the port number for the OSLC Jama adapter service (default is 8080)
portNumber = 8080

# time period in seconds after which the adapter will reload the data to be published as OSLC resources
# value must be an integer
delayInSecondsBetweenDataRefresh = none

# name of Jama instance (e.g. myjama if Jama is hosted at https://myjama.jamacloud.com)
jamaInstanceName = <enter here your subdomain name>

# name of Jama instance user (e.g. john)
username = <enter here your username>

# password of Jama instance user (e.g. 1234)
password = <enter here your password>
```

Change port number, Jama instance to retrieve data from, time between periodic syncs

OSLC adapter client to test each OSLC adapter service

https://github.com/OSLC/oslc-adapter-jama/blob/clean-ver/src/main/java/com/jama/oslc/client/OSLC_JamaAdapterDiscoveryClient.java

```
public class OSLC_JamaAdapterDiscoveryClient {

	public static void main(String[] args) {

		try {

			// retrieve serviceProviderCatalog resource (entry point to discover
			// all services and resources exposed by OSLC adapter)
			// based on one single hard coded URL
			String serviceProviderCatalogURL = "http://localhost:8080/jama-oslc-adapter/services/serviceProviderCatalog";

			Model serviceProviderCatalogModel = ModelFactory.createDefaultModel();
			serviceProviderCatalogModel.read(serviceProviderCatalogURL);
			Resource serviceProviderCatalogResource = serviceProviderCatalogModel
					.getResource(serviceProviderCatalogURL);
			ServiceProviderCatalog serviceProviderCatalog = (ServiceProviderCatalog) JenaModelHelper
					.fromJenaResource(serviceProviderCatalogResource, ServiceProviderCatalog.class);
			System.out.println("*** SERVICE PROVIDER CATALOG ***");
			System.out.println(serviceProviderCatalog.getTitle());
			System.out.println("");

			// retrieve all serviceProviders of serviceProviderCatalog
			for (ServiceProvider serviceProvider : serviceProviderCatalog.getServiceProviders()) {
```

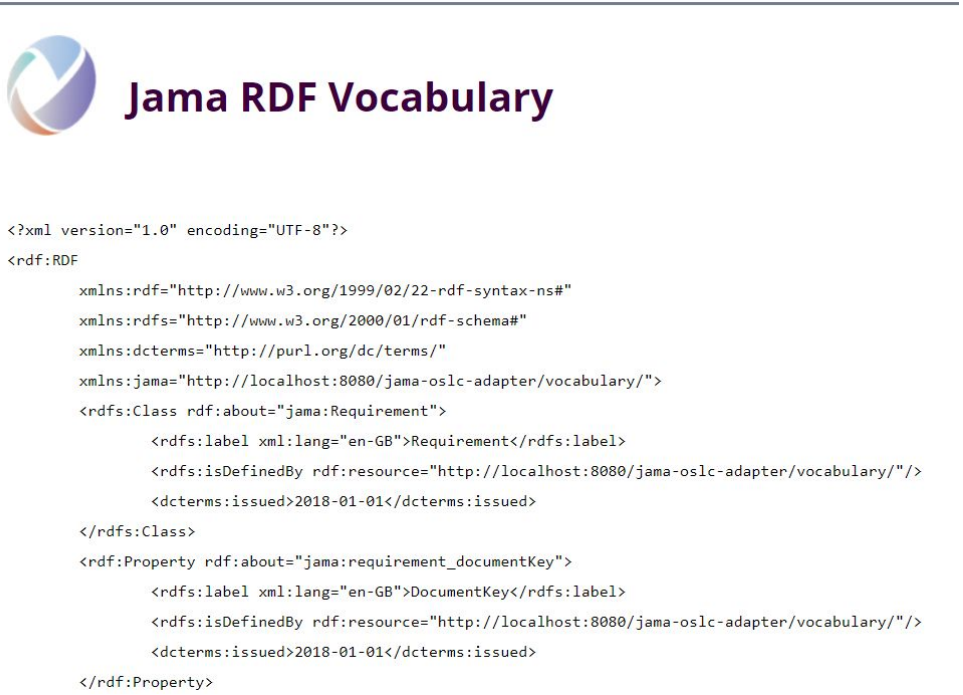
OSLC adapter client to test each OSLC adapter service

https://github.com/OSLC/oslc-adapter-jama/blob/clean-ver/src/main/java/com/jama/oslc/client/OSLC_JamaAdapterDiscoveryClient.java

```
public class OSLC_JamaAdapterDiscoveryClient {

	public static void main(String[] args) {

		try {

			// retrieve serviceProviderCatalog resource (entry point to discover
			// all services and resources exposed by OSLC adapter)
			// based on one single hard coded URL
			String serviceProviderCatalogURL = "http://localhost:8080/jama-oslc-adapter/services/serviceProviderCatalog";

			Model serviceProviderCatalogModel = ModelFactory.createDefaultModel();
			serviceProviderCatalogModel.read(serviceProviderCatalogURL);
			Resource serviceProviderCatalogResource = serviceProviderCatalogModel
					.getResource(serviceProviderCatalogURL);
			ServiceProviderCatalog serviceProviderCatalog = (ServiceProviderCatalog) JenaModelHelper
					.fromJenaResource(serviceProviderCatalogResource, ServiceProviderCatalog.class);
			System.out.println("*** SERVICE PROVIDER CATALOG ***");
			System.out.println(serviceProviderCatalog.getTitle());
			System.out.println("");

			// retrieve all serviceProviders of serviceProviderCatalog
			for (ServiceProvider serviceProvider : serviceProviderCatalog.getServiceProviders()) {
```

Jama RDF Vocabulary

http://localhost:8080/jama-oslc-adapter/services/vocabulary



Jama RDF Vocabulary

```
<?xml version="1.0" encoding="UTF-8"?>
<rdf:RDF
        xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
        xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
        xmlns:dcterms="http://purl.org/dc/terms/"
        xmlns:jama="http://localhost:8080/jama-oslc-adapter/vocabulary/">
        <rdfs:Class rdf:about="jama:Requirement">
                <rdfs:label xml:lang="en-GB">Requirement</rdfs:label>
                <rdfs:isDefinedBy rdf:resource="http://localhost:8080/jama-oslc-adapter/vocabulary/"/>
                <dcterms:issued>2018-01-01</dcterms:issued>
        </rdfs:Class>
        <rdf:Property rdf:about="jama:requirement_documentKey">
                <rdfs:label xml:lang="en-GB">DocumentKey</rdfs:label>
                <rdfs:isDefinedBy rdf:resource="http://localhost:8080/jama-oslc-adapter/vocabulary/"/>
                <dcterms:issued>2018-01-01</dcterms:issued>
        </rdf:Property>
```

Jama RDF Vocabulary

http://localhost:8080/jama-oslc-adapter/services/vocabulary

With Accept=application/rdf+xml

```
<rdf:Description rdf:nodeID="A0">
    <oslc:occurs rdf:resource="http://open-services.net/ns/core#Exactly-one"/>
    <dcterms:title rdf:parseType="Literal">globalId</dcterms:title>
    <oslc:valueType rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#XMLLiteral"/>
    <oslc:propertyDefinition rdf:resource="http://localhost:8080/jama-oslc-adapter/vocabulary/requirement_globalId"/>
    <dcterms:description rdf:parseType="Literal">globalId</dcterms:description>
    <oslc:name>globalId</oslc:name>
    <rdf:type rdf:resource="http://open-services.net/ns/core#Property"/>
</rdf:Description>
<rdf:Description rdf:nodeID="A1">
    <oslc:readOnly rdf:datatype="http://www.w3.org/2001/XMLSchema#boolean">false</oslc:readOnly>
    <oslc:name>trackedBy</oslc:name>
    <oslc:range rdf:resource="http://open-services.net/ns/rm#Requirement"/>
    <rdf:type rdf:resource="http://open-services.net/ns/core#Property"/>
    <dcterms:title rdf:parseType="Literal">tracked By</dcterms:title>
    <oslc:occurs rdf:resource="http://open-services.net/ns/core#Zero-or-many"/>
    <dcterms:description rdf:parseType="Literal">Resource, such as a change request, which tracks this requirement.</dcterms:description>
    <oslc:representation rdf:resource="http://open-services.net/ns/core#Reference"/>
    <oslc:propertyDefinition rdf:resource="http://open-services.net/ns/rm#trackedBy"/>
    <oslc:valueType rdf:resource="http://open-services.net/ns/core#Resource"/>
</rdf:Description>
<rdf:Description rdf:nodeID="A2">
    <oslc:occurs rdf:resource="http://open-services.net/ns/core#Exactly-one"/>
    <dcterms:title rdf:parseType="Literal">project</dcterms:title>
    <oslc:valueType rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#XMLLiteral"/>
    ...
```

Limitations

- Only requirements of type Stakeholder Requirement are exposed by OSLC Jama adapter
- Only relationships between requirements of type “DeriveFrom” are exposed by OSLC adapter

Potential Future Adapter Extensions

Now, OSLC adapter has a query Capability service exposing only Stakeholder Requirements

In the future: OSLC adapter can have

- Additional query Capability services for additional item types
- And/Or one additional query Capability service exposing every item as a generic item

Similarly, relationships can be exposed by OSLC adapter either in a type-specific and/or generic way

Potential Future Adapter Extensions

Support for pagination

Support POST for multiple items/relationships

Producer of requirements according to OSLC Requirements Management (RM)

Add a real OSLC TRS service

Add Oauth-based authentication

Extend Jama UI to have UI preview to other OSLC resources (example MagicDraw requirement)

Potential Future Adapter Extensions

Support for JSON-LD

Support for W3C LDP (to be truly conform to OSLC v3.0)

Thanks and get in touch!

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