

REST API

DSpace REST API

This page is outdated, and refers to documentation for the 2011 Google Summer of Code prototype REST API project. This GSoC project is not developed anymore and it has spawned successors and alternatives. You can learn more about current REST API efforts here:

- [Official REST API in DSpace 4.x](#) (JERSEY based, Read Only)
- [Official REST API in DSpace 5.x](#) (JERSEY based, CRUD)
- [Review of Existing Dspace REST API Frameworks](#)
- [DSpace Futures - REST API](#)

This is a wiki page for DSpace REST API addon. The project is in development phase, but can be tested by the users. For the details please check this page.

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Details

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SCM Location for Project:	http://scm.dspace.org/svn/repo/modules/dspace-rest/
Alternative (improved)	https://github.com/wijiti/dspace-rest-api

Project description

The REST approach promotes simplification and decoupling of software architecture, enabling further scalability, portability, granularity and simplified interaction of software systems and components.

The aim of this project is to provide DSpace with REST capable API and underlying component, which will enable developers and end-users to exploit the advantages of such approach.

Some of uses this module is intended to provide could be, for instance:

- interaction between DSpace systems and/or other repositories
- automation of different activities, e.g. submission of packages
- integrating repositories in process workflows of other applications or systems

- interaction with many kinds of systems or web applications, such as CMS, LMS, LCMS, VLS, AMS etc
- providing of other approaches to UI, such as client based/run UI
- crawling of repositories, exposing information in structural way

This project is continuation of [GSoC 2009](#) and [GSoC 2010](#) . In the first stage the basic support for REST for DSpace is provided, exposing many parts of DSpace functionality to the clients. Currently the module is being tested and improved in preparation for upcoming DSpace release.

Based on REST API for DSpace the new GSoC (2011) project is started. Vibhaj Rajan DSpace UI Client based on JavaScript and appropriate framework (jQuery). More information: [Client UI REST API](#)

Important: During Q1-Q3 of 2012 thanks to **Hayden Young** and other contributors from **Wijiti Pty Ltd** a great effort has been invested to continue the development of REST API for DSpace. They reworked the code base, refreshed the project to be compatible with newest DSpace 1.8.1 version, fixed the bugs and provided the integration of DSpace, REST API and Joomla CMS. There are also other numerous improvements introduced. **Their contribution can be reached via [GitHub](#), including [development site](#) and [documentation update](#).**

Based on this update, the integration with Joomla CMS is provided as a part of the [Saber Project](#), which has been [implemented and demonstrated](#) at Monash University.

Release plan and issues

It is expected to have working and tested code for DSpace 1.8 release. According to relevant discussions on DSpace developer meetings, there is possibility to have this code released asynchronously of DSpace, as independent module. After initial release the code will be actively maintained.

Currently (mid October 2010) there are several issues opened, of them I would notice the following:

- Performance issues during browsing bigger datasets. This is generally related to DSpace API. I have reported this problem and proposed solution at <http://jira.dspace.org/jira/browse/DS-659>. However as I am not sure whether it will be accepted and included in the upcoming release I will change the code and translate some functions used from DSpace API to DSpace REST API. This way some handling will be done directly at REST API level. Consequently some additional features related to sorting/ordering will be available.
- Multiple loops in listing Collections and some other entities. This issue is resolved as of end September. Additionally, option to fine-grain details level of the output is implemented (three levels).
- HTTP Basic Auth - this is easily to implement and will be done shortly
- Some Authorization related issues: the authorization handling is done on the level of DSpace API. However some functions translated to REST API are not directly available to users and thus do not provide Authorization mechanisms. In order to prevent misuse etc. this gap should be filled at REST API level.
- Not finished end-points. Working on them.
- Testing. Testing. I also need cooperation of you potential users. **I need repository for testing containing at least several hundreds of items. If you can provide me with that please contact me via email.**
- DSpace 1.5 and older versions support - planned to be implemented at the end of initial public release.

Recent changes

- June 10: XML input/digestion change, based on the input from Dhaivat Dave
- June 6: Added support for logo in communities and collections (issue reported by Vibhaj Rayan and Hayden Young)
- June 1: Applied Peter Dietz's patches (<https://gist.github.com/952058>) and pom.xml improvements discussed below on this page; fixed collection /items display reported by Hayden Young

Detailed activities

In the following sections main activities are elaborated in detail.

REST API Endpoints

In the following section listed are supported endpoints on the application level. **The items marked with dot (in C column) are in phase of implementation, while other items are considered already working.**

Please note that additional tests should be made in order to ensure proper stability of the whole application.

The sorting of the fields / output results is currently partially supported. This part of the application is implemented independently of the endpoints and will be worked on after the most of endpoints are completed.

Naming convention for endpoints



DSpace 1.x and 2.x are treating the resources on different way. 2.x is more generalized, suggesting the use of RDF-like interrelation notations.

Repository browsing

[Earlier Implementation Description - GSoC09](#)

C	Verb	URL	Description	Mandatory parameters	Optional parameters	Sorting fields	Response Data	Formats	Response codes
	GET	/communities	Returns a list of all communities on the system or return just top level communities.	-	topLevelOnly=true idOnly=false detail=standard	id name countitems	The list of communities containing respective fields . Response code details: 204 - if there are no communities on the system	json xml	200, 204, 400, 500
	GET	/communities/{id}	Return detailed information about id community.	id	idOnly=false detail=standard	-	Fields describing community.	json xml	200, 400, 404, 500
	GET	/communities/{id}/{element}	Return a particular data field found in the community id Fields supported (for element): id - entity identifier, internal to the system name - entity name countItems - number of items under community handle - handle of the community (unique persistent resource identifier) type - entity type (object type in the system) collections - collections contained in the community, ordered by id canedit - states user permission on the community (editing) ancestor - ancestors of the community children - subcommunities, ordered by id administrators - group administrators, ordered by id recent - recent items in the community shortDescription - short description copyrightText - copyright text sidebarText - sidebar text introductoryText - introductory text logo - community logo; to retrieve use returned id with /bistream/receive endpoint	id	idOnly=false immediateOnly=true detail=standard	id name countitems	Respective field info	json xml	200, 204, 400, 500
	GET	/collections	Return a list of all collections in the system.	-	idOnly=false isAuthorized=false detail=standard	id name countitems	The list of the collections containing respective fields . Response code details: 204 - if there are no communities on the system	json xml	200, 204, 400, 500
	GET	/collections/{id}	Return detailed information about id collection	id	idOnly=false detail=standard	id name countitems	Fields of the collection entity.	json xml	200, 204, 400, 500
	GET	/collections/{id}/{element}	Return a particular data field found in the collection id. Fields supported (for element): id - entity identifier, internal to the system name - collection name licence - collection licence items - items contained in collection handle - handle of the collection (unique persistent resource identifier) canedit - states user permission on the collection (edit) communities - communities collection is a part of countItems - number of the items in the collection type - entity type (object type in the system) shortDescription - short description of the collection introText - introductory text for the collection copyrightText - copyright text for the collection sidebarText - sidebar text for the collection provenance - provenance logo - information about collection's logo (to retrieve use logo id in /bistream/receive endpoint)	id	idOnly=false immediateOnly=true #immediateonly detail=standard	id name countitems	Respective field info	json xml	200, 204, 400, 500
	GET	/items	Return a list of the items in the system	-	detail=standard	-	The list of the items containing related fields . Response code details: 204 - if there are no communities on the system		

	GET	/items/{id}	Return detailed information about an item.	id	detail=stand ard	id name lastmodified submitter	Fields of the item entity.	json xml	200, 204, 400, 500
	GET	/items/{id} /{element}	Return a particular data field found in the item id Fields supported (for element): metadata - item metadata submitter - submitter group isArchived - archival status of the item isWithdrawn - states if the item is withdrawn owningCollection - owning collection of the item lastModified - last modified time collections - collections the item appears in communities - communities the item appears in name - name of the item bitstreams - bitstreams related to the item handle - item handle (unique identified) canedit - states can user edit the item id - item id type - element type bundles - bundles related to the item	id, element	detail=stand ard	-	Respective field info	json xml	200, 204, 400, 500
	GET	/bitstream/ {id}	Return bitstream object - usually the library item file.	id	-	-	Fields of the bitstream entity.	json, xml	200, 400, 401, 403, 404, 500
	GET	/bitstream/ {id}/ {element}	Return a particular data field found in bitstream id. Supported fields (for element): mimeType - mime type of file bundles - bundles the bitstream is a part of checksum - checksum of the file checksumAlgorithm - checksum algorithm used description - bitstream description formatDescription - file format description sequenceId - sequence id of the file size - size of the file source - source (typically filename with path information) storeNumber - asset store number where the bitstream is stored userFormatDescription - user's format description name - bitstream name handle - unique id of the bitstream id - internal id of the bitstream type - type of the entity (referring to bitstream) Note: bitstream can be not only the content of the item (like book pdf file etc), but also licence file or logo of community	id, element	detail=stand ard	-	Respective field info	json, xml	200, 400, 401, 403, 404, 500
	GET	/bitstream/ {id} /receive	Return bitstream	id	-	-	Return bitstream	binary	200, 400, 401, 403, 404, 500
	GET	/groups	Return a list of the groups in the system	-	detail=stand ard	-	The list of the groups containing related fields . 204 if there are no groups in the system.	json,xml	200, 204, 400, 500
	GET	/groups/{id}	Return a group object	id	detail=stand ard	-	Fields of the group entity.	json,xml	200, 204, 400, 500
	GET	/groups/ {id}/ {element}	Return a particular data field found in the group entity id. Supported fields (for element): handle - unique id (external) id - internal id of the group isEmpty - is the group empty members - group members (as users) memberGroups - group members (as groups) name - group name type - entity type (referring to group)	id, element	detail=stand ard	-	Respective field info	json,xml	200, 204, 400, 500
	GET	/users	Return a list of the users in the system	-	detail=stand ard	-	The list of the users containing related fi elds .	json,xml	200,204,400,5 00
	GET	/users/{id}	Return a user info	id	detail=stand ard	-	Fields of the user entity.	json,xml	200,204,400,5 00

	GET	/users/{id}/{element}	Return a particular data field found in the user id Supported fields (for element): email - user's email firstName - first name fullName - full name handle - handle (unique, external) id - internal id of the user language - preferred language lastName - last name name - name netId - network id requireCertificate - requires certificate to login selfRegistered - is user self registered type - type of the object	id,element	detail=standard	-	Respective field info	json,xml	200,204,400,500
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Note: modifier idOnly is referred only to first layer of the results. For all other layers (e.g. nested results) only ids are returned in some cases, due to possible loops. Example: for community containing collections, on second level the response contains only ids for some elements where multiple loops may be created (community->has_collection->has_community....). Other data is modified according to idOnly flag.

Optional parameters

Parameter	Description
topLevelOnly	returns only top level communities
idOnly	if true return only the identifiers for the record
immediateOnly	return only direct parent community
isAuthorized	return only collections user has permission to work on
inArchive	return archived items for respective collection
detail	parameters: minimum, standard or extended control amount of details/deepthness exposed to user; e.g. should the sub-entities contain full descriptions

Sorting fields:

Not completed!



The sorting of the fields / output results is currently partially supported. This part of the application is implemented independently of the endpoints and will be worked on after the most of endpoints are completed.

Parameter	Description	Ordering supported
id	sort results by entity id	asc ascending desc descending
name	sort results by entity name	asc ascending desc descending
countitems	sort results by number of items contained	asc ascending desc descending
lastmodified	sort results by date of last item modification	asc ascending desc descending
submitterName	sort results by submitter name	asc ascending desc descending
submitterId	sort results by submitter id	asc ascending desc descending

Controlling results

Parameter	Description	Default	Example
_start	position of the first entity to return	0 (first)	_start=5 to list 6th item and onwards

_page	page of data to display	0 (first)	_page=2, to display second page with query results
_perpage	number of results to show on each page	0 (all)	_perpage=10 to display 10 results per page
_limit	maximum number of entities to return	0 (all)	_limit=50
_sort		the sort order to return entities in should be comma separated list of field names suffix determines ordering suffixes: _asc, _ascending, _desc, _descending ascending default	sort=name _sort=name, email_desc, lastname_desc

Response codes

Code	Description
200	OK
201	Created
204	No content
400	Bad request
401	Unauthorized
403	Forbidden
404	Not found
405	Method not allowed
500	Internal server error
503	Service unavailable

Authentication/Authorization

Currently only standard authentication is supported. The authentication data is provided in the request or header body.

Example:

```
/rest/communities.json?user=user@email.com&pass=userpassword
```

The same elements user and pass are used for header based authentication.

Authorization is done on underlying api level; in the case of error the proper message and error code are returned to the user.

Repository manipulation

C	Verb	URL	Description	Mandatory parameters	Optional parameters	Response Data	Formats	Response codes
	POST	/communities	Action to be done under community id, adding new content or values. Supported actions: createAdministrators createCollection createSubcommunity	id, action - name name	-	Id of newly created entity, depending on the action selected: id of group of administrators id of collection id of subcommunity	json xml	200, 400, 401, 403, 500
	PUT	/communities/{id}/ {element}	Update the field element of the community id. Supported fields: name - change name shortDescription - change short description copyrightText - change copyright text sidebarText - change sidebar text introductoryText - change introductory text collections - add existing collection children - add existing subcommunity	id value value value value value cid cid	-	Response code		200, 400, 401, 403, 500
	PUT	/communities/{id}/ logo	Set the logo for community id	id	-	Response code	binary	200, 400, 401, 403, 500
	DELETE	/communities/{id}	Delete community from the system	id	-	Response code	json xml	200, 400, 401, 403, 500

	DELETE	/communities/{id}/{element}/{eid}	Remove attribute/value eid of element element from the community id. Supported elements: collections children administrators	id, eid cid cid -	-	Response code	json xml	
	POST	/collections	Action to be done under collection id, adding new content or values. Supported actions: createAdministrators createSubmitters createTemplateItem createWorkflowGroup	id, action - - - step	-	Id of newly created element	json xml	200, 400, 401, 403, 500
	PUT	/collections/{id}/{element}	Update field element of the collection id. Supported elements: shortDescription - short description introText - introductory text copyrightText - copyright text sidebarText - sidebar text provenance - provenance licence - collection licence name - collection name	id value value value value value value	-	Response code	json xml	200, 400, 401, 403, 500
	DELETE	/collections/{id}	Delete collection from the system - CANNOT BE DONE DIRECTLY	-	-	Response code	json xml	200, 400, 401, 403, 500
	DELETE	/collections/{id}/{element}/{cid}	Remove attribute/value cid from collection id Supported attributes: administrators item submitters templateItem	id, cid	-	Response code	json xml	200,400,401,403,500
•	PUT	/collections/{id}/logo	Set the logo for collection id	id		Response code	binary	200,400,401,403,500
•	POST	/items	Action to be done under item id, adding content or value. Supported actions: createBundle createBitstream	id, action name name, input		Id of newly created element	json,xml, binary	200,400,401,403,500
•	PUT	/items/{id}/{element}	Update field element of the item id Supported fields: isArchived isWithdrawn owningCollection submitter	id,element	-	Response code	json,xml	200,400,401,403,500
•	DELETE	/items/{id}	Delete item from the system	id	-	Response code	json,xml	200,400,401,403,500
•	DELETE	/items/{id}/{element}/{eid}	Delete element/attribute eid from the item id Supported fields for element: bundle licences	id,element,eid	-	Response code	json,xml	200,400,401,403,500

Content searching

C	Verb	URL	Description	Mandatory parameters	Optional parameters	Sorting fields	Response Data	Formats	Response codes
	GET	/search	Return a list of all objects found by searching criteria. Notice: community and collection are mutually exclusive options.	-	modifiers{{query=query}}&(community=id or collection={{id}} idOnly=false	id name lastmodified ied submitter	Item info with basic metadata for the search results. Additionally return only identifiers when idOnly=true is used.	json xml	200, 204, 400, 500
	GET	/harvest	Return a list of all objects that have been created, modified or withdrawn within specified time range.	-	startdate {enddate}} community collection idOnly=false withdrawn=false Notice: community and collection are mutually exclusive options	-	Contains item info including id, name, handle, metadata, bitstreams according to the defined requirements. Additionally when idOnly=true only identifiers of results are returned. If the date is in incompatible format, error 400 is returned.	json xml	200, 204, 400, 500

Statistical info

C	Verb	URL	Description	Mandatory parameters	Optional parameters	Sorting fields	Response Data	Formats	Response codes
	GET	/stats	Return general statistics.	-	-	-	Cummulative list of statistics data for the system currently available.	json xml	200, 400, 500

Relationships interface

Experimental feature



This is considered as a experimental feature in the phase of being considered for compability with future versions of DSpace. Consider not important section; the status of the feature for upcoming release yet to be determined.

C	Verb	URL	Description	Mandatory parameters	Optional parameters	Sorting fields	Response Data	Formats	Response codes
•	GET	/resource/{handle}/relations	Return entities according to relation and parameters specified	handle property	rtype rfield	-	obtains entities selected and sorted in conformance to request parameters. For more details see description of rtype and rfield.	json xml	200, 204, 400, 401, 403, 500

Mandatory parameters

Parameter	Description	Values	Example
property	Return entities satisfying requested property relation	Structural properties ds:isPartOfSite ds:isPartOfCommunity ds:isPartOfCollection ds:isPartOfItem ds:isPartOfBundle ds:hasCommunity ds:hasCollection ds:hasItem ds:hasBundle ds:hasBitstream ds:hasBitstreamFormat Communities and collections ds:logo Bistream format ds:support ds:fileExtension ds:mimeType Bitstream ds:messageDigest ds:messageDigestAlgorithm ds:messageDigestOriginator ds:size Eperson ds:language	property=ds:hasCommunity - return subcommunities of a community property=ds:isPartOfCommunity - return communities current community is part of (children) property=ds:hasCollection - return collections belonging to community property=ds:hasItem - return Items belonging to community
rtype	restriction on type - only entity with specified type(s) would be returned	ds:Bitstream ds:Bundle ds:Collection ds:Community ds:EPerson ds:Group ds:Item ds:DSpaceObject ds:Policy ds:Site ds:BitstreamFormat	rtype=ds:Collection - return entities of Collection type
rfield	restriction on fields - return only selected fields; by default all fields are returned	id name countitems metadata subcommunities ancestors owner other (depending on object type, will be documented later)	rfield=id,name - return only entity id and name in response

Note: incomplete/orientative properties, for more info check [\[Vocabularies\]](http://code.google.com/p/dspace-sandbox/source/browse/#svn/modules/dspace-rdf/tags/dspace-rdf-1.5.1/src/main/java/org/dspace/adapters/rdf/vocabularies)<http://code.google.com/p/dspace-sandbox/source/browse/#svn/modules/dspace-rdf/tags/dspace-rdf-1.5.1/src/main/java/org/dspace/adapters/rdf/vocabularies>].

Visitors' suggestions or wishes

Here the visitors and stakeholders can insert their suggestions or describe the needs for their applications in detail.

Comment: In this case it is not clear how to treat recent part of endpoint. If we stick to semantic mapping, then it should look like `/resource/id/mapping`, but recent in this case obviously do not represent a mapping, but the property.

Comment #2: Semantic mapping presented in this case should be probably hardcoded for 1.x branch, but on abstraction level which enables easy replacement with some auto-discovery method prepared for 2.x and eventually backported to 1.x. This way we would be able to call something similar to `/communities/id` or `communities/id/capabilities` in order to get supported mappings (amongst other data).

Suggesting new options:

Instead of changing wiki contents visitors can enter their suggestions as a comments.

1) **Kevin S. Clarke and Tim Donhue** suggested adding of the new feature related to HTTP Basic Auth. Ok, I will investigate how it could be done and included here. More info coming.

Integration in the system

It is planned to consult two external subjects for cooperation and the assistance during integration process (LMS and national library internal automation process). More information coming soon - awaiting approval of other parties.

Documentation tasks

Although provided software module exposes basic documentation automatically to the end user, in order to make it easier for other developers and users the documentation in the following forms is additionally to be provided:

- Confluence pages, current location
- integrated documentation in PDF form (manual)
- short slides containing technology overview, advocacy/facts, configuration and usage guidelines and examples
- code will be additionally commented

Example of usage

At the end of the current stage of this project as a bonus task (if time constraints allow) the examples of usage will be provided for several languages, the use-cases will be presented (example of integration in other software, e.g. LMS) and optionally simple client system demonstrating UI customization will be demonstrated (e.g. Flex or JavaFX like).

How to install and test the module?

Here I will show two ways to install and test this module.

Update: Current version includes this update (thanks Peter!). This explanation will be shortly removed.

~~Note: The code for the REST API from the Google Summer of Code 2010 may be out of date with the latest version of dspace. It may help to import the latest stable version of DSpace through the REST API pom.~~

~~To do so, modify [dspace-rest-api-source]/pom.xml~~

```
Index: pom.xml
=====
--- pom.xml      (revision 6356)
+++ pom.xml      (working copy)
@@ -18,7 +18,7 @@
     <parent>
       <artifactId>dspace-parent</artifactId>
       <groupId>org.dspace</groupId>
-       <version>1.6.0-SNAPSHOT</version><!-- dspace2.version -->
+       <version>1.7.1</version><!-- dspace2.version -->
     </parent>

     <repositories>
@@ -100,7 +100,7 @@
       <groupId>org.dspace</groupId>
       <artifactId>dspace-api</artifactId>
       <scope>compile</scope>
-       <version>1.6.2-SNAPSHOT</version>
+       <version>1.7.1</version>
     </dependency>

     <dependency>
@@ -121,7 +121,7 @@
       <groupId>org.dspace</groupId>
       <artifactId>dspace-jspui-api</artifactId>
       <scope>compile</scope>
-       <version>1.6.2-SNAPSHOT</version>
+       <version>1.7.1</version>
       <exclusions>
         <exclusion>
           <groupId>org.dspace</groupId>
@@ -133,7 +133,7 @@
       <groupId>org.dspace</groupId>
       <artifactId>dspace-api-lang</artifactId>
       <scope>compile</scope>
-       <version>1.5.2.2-SNAPSHOT</version>
+       <version>1.7.1.0</version>
     </dependency>

<!--
```

For both approaches you should have [Apache Maven](#) installed. Then proceed using [Subversion](#) and check out the code from <http://scm.dspace.org/svn/repo/modules/dspace-rest/trunk>

1) This way assumes you are running DSpace under Tomcat. Locate `src/main/webapp/WEB-INF/web.xml` (under directory you just downloaded DSpace REST API). Find variable named `dspace-config` and alter it to point to current location of `dspace.cfg` file of your DSpace instance. Navigate to the root directory of the REST API and type `mvn package`. If everything goes well, in target directory will be packaged `dspace-rest-[version].war`. Deploy this file (changing the name to `rest.war`) to your current Tomcat webapp directory. The application will be available under <http://localhost:8080/rest/> by default.

2) You can run REST API under Jetty container. Proceed with the same steps as under #1. Then instead to deploy .war file to Tomcat web server, from the root of REST API source tree issue command `mvn jetty:run-war`. This will run REST support under Jetty and the web point will be available at <http://localhost:8080/dspace-rest/> by default.

(Option 3) Install as a DSpace Module

If you have an existing instance of DSpace that you are developing, you can connect the rest api module to your existing code base by adding it as a module.

Modify `[dspace-source]/dspace/pom.xml` by adding the path to the checked out rest code.

```

--- a/dspace/pom.xml
+++ b/dspace/pom.xml
@@ -505,6 +505,7 @@
    -->
    <modules>
      <module>modules</module>
+     <module>../../dspace-rest-gsoc10</module>
    </modules>

    <build>

```

Once you rebuild your dspace-src code with mvn package and ant update, you will additionally need to copy the compiled .war file produced in the dspace-rest-gsoc10 target directory to tomcat's webapps directory.

```
cp /path/to/dspace-rest-gsoc10/target/dspace.war /var/lib/tomcat6/webapps/rest.war
```

Afterwards you can restart tomcat and visit the rest api in action at: <http://localhost:8080/rest>

(Option 3a) Install as a DSpace Module in a source code installation

Its unlikely you will want to do this unless you are a committer or just nosey like me and like to play around with the code.

- 1) Create a new directory for the REST module source code - dspace-src/dspace-rest.
- 2) Checkout the source code from <http://scm.dspace.org/svn/repo/modules/dspace-rest/trunk/> into the new directory.
- 3) Incorporate the new module into your project by adding a new <module> element for dspace-rest to the 'all' profile in dspace-src/pom.xml.
- 4) Tell Maven to use your new local module by adding a new <profile> to dspace-src/dspace/pom.xml. If you don't do this the project will build okay but won't be using your local source code for that module.
- 5) Create a new directory dspace-src/dspace/modules/rest.
- 5a) Add a sub-directory src/main/webapp and a pom.xml to the directory created in 5. (Copy the pom from any other modules/xxxx module).
- 6) Add a <profile> to dspace-src/dspace/modules/pom.xml.
- 7) Rebuild your project.

Possible problems:

- If you have trouble starting the application, check the **dspace-config** variable and make sure it points to the location of the dspace.cfg file. Use absolute addressing (see comment in src/main/webapp/WEB-INF/web.xml).
- If you receive HTTP 500 errors with a SQL exception indication *and* you are using Oracle, make sure you have ojdbc14.jar in your CLASSPATH when you start tomcat or jetty.
- If you are already running another application on **port 8080** try instead to start Jetty container with the following line: `mvn jetty:run-war -Djetty.port=9090` for port 9090.

Please note this is still an experimental module so there may be bugs/errors in processing. Use it at your own risk.

I would highly appreciate user input. If you have comments or feature requests or anything else you can post it on this wiki in comments section. Additionally for the bugs/errors/issues found you can use JIRA at <https://jira.duraspace.org/browse/DS/component/10190> to report or contact me directly via email (*bojan.suzic* AT *gmail_DOT_com* - using subject line *DSpace REST*).

Information for developers

In this section the main sections of the software will be briefly explained in order to ease update or extension of the components.

The REST API for DSpace uses Aaron Zeckoski's [EntityBus](#) and DSpace standard libraries, as dspace-api.

There are two main packages: **org.dspace.rest.providers** and **org.dspace.rest.entities**. Providers are responsible for serving content/feeds to the users. They usually prepare entities or particular entity and/or handle update/delete/create functions. The main class there is **AbstractBaseProvider**, which is extended by other providers.

In the providers, at the constructor level created are mappings between particular endpoints (e.g. /rest/items/1/collections) and related functions in entities (org.dspace.entities.items.getCollections). Thus, for each GET, PUT, POST or DELETE function in the entity provider's constructor defined are such mappings between URL endpoints and functions. After the client makes specific call, the provider prepares answer and in this phase calls mapped function and prepare results for display.

So, if you want to extend currently available endpoints for already present providers and entities, it is necessary to define mapping at provider level and prepare corresponding function at the entity level (based on the template). The system then calls this function and provides necessary arguments for its successfully handling.

If you want to develop a new provider, it is usually necessary to create new provider class in `org.dspace.rest.providers` and then create related entity in `org.dspace.rest.entities`. The currently available providers are good example how to do that.