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JasperReports Server Web Services Guide

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TABLE OF CONTENTS

Chapter 1 Introduction to Web Services **9**

1.1 REST Web Services Overview 10

1.2 REST Authentication 12

1.2.1 Login Encryption 13

1.2.2 Login Service 14

1.3 REST Server Information 15

1.4 SOAP Web Services Overview 16

1.5 SOAP Authentication 17

1.6 Syntax of resourceDescriptor 18

1.6.1 Overview 18

1.6.2 wsType Attribute 19

1.6.3 isNew Attribute 20

1.6.4 Resource Descriptor Parameters 20

1.6.5 Examples of resourceDescriptor 20

Chapter 2 REST v2 - Repository Services **23**

2.1 The v2/resources Service 23

2.1.1 V2 Resource Descriptors 23

2.1.2 V2 Resource Descriptor Types 28

2.1.3 Searching the Repository 38

2.1.4 Viewing Resource Details 40

2.1.5 Downloading File Resources 41

2.1.6 Creating a Resource 41

2.1.7 Modifying a Resource 43

2.1.8 Copying a Resource 45

2.1.9 Moving a Resource 45

2.1.10 Uploading File Resources 46

2.1.11 Deleting Resources 48

2.2 The v2/domains/metadata Service 49

2.2.1 Working with Domain Schemas 52

2.2.2 Accessing Domain Bundles and Security Files 54

2.3 The v2/permissions Service 54

2.3.1 Viewing Multiple Permissions 55

2.3.2 Viewing a Single Permission 56
2.3.3 Setting Multiple Permissions 57
2.3.4 Setting a Single Permission 58
2.3.5 Deleting Permissions in Bulk 59
2.3.6 Deleting a Single Permission 59
2.4 The v2/export Service 60
2.4.1 Checking the Export State 61
2.4.2 Fetching the Export Output 62
2.5 The v2/import Service 62

Chapter 3 REST v2 - Report Services 65

3.1 The v2/reports Service 65
3.1.1 Running a Report 65
3.1.2 Finding Running Reports 66
3.1.3 Terminate Running Report 67
3.2 The v2/reportExecutions Service 68
3.2.1 Running a Report Asynchronously 68
3.2.2 Polling Report Execution 71
3.2.3 Requesting Report Execution Details 71
3.2.4 Requesting Report Output 72
3.2.5 Exporting a Report Asynchronously 73
3.2.6 Polling Export Execution 74
3.2.7 Finding Running Reports and Jobs 75
3.2.8 Stopping Running Reports and Jobs 76
3.3 The v2/inputControls Service 77
3.3.1 Listing Input Control Structure 77
3.3.2 Listing Input Control Values 79
3.3.3 Setting Input Control Values 79
3.4 The v2/options Service 81
3.4.1 Listing Report Options 81
3.4.2 Creating Report Options 82
3.4.3 Updating Report Options 82
3.4.4 Deleting Report Options 83
3.5 The v2/jobs Service 83
3.5.1 Listing Report Jobs 83
3.5.2 Viewing a Job Definition 84
3.5.3 Extended Job Search 87
3.5.4 Scheduling a Report 88
3.5.5 Viewing Job Status 89
3.5.6 Editing a Job Definition 89
3.5.7 Updating Jobs in Bulk 89
3.5.8 Pausing Jobs 90
3.5.9 Resuming Jobs 91
3.5.10 Restarting Failed Jobs 91
3.5.11 Specifying FTP Output 92
3.5.12 Calendar Exclusion for the Scheduler 92

3.6 The v2/queryExecutor Service 97

Chapter 4 REST v2 - Administration Services 101

4.1 The v2/organizations Service 101
4.1.1 Searching for Organizations 101
4.1.2 Viewing an Organization 103
4.1.3 Creating an Organization 103
4.1.4 Modifying Organization Properties 105
4.1.5 Setting the Theme of an Organization 105
4.1.6 Deleting an Organization 106
4.2 The v2/users Service 106
4.2.1 Searching for Users 106
4.2.2 Viewing a User 108
4.2.3 Creating a User 109
4.2.4 Modifying User Properties 110
4.2.5 Deleting a User 111
4.3 The v2/attributes Service 112
4.3.1 Viewing User Attributes 112
4.3.2 Setting User Attributes 114
4.3.3 Deleting User Attributes 115
4.4 The v2/roles Service 116
4.4.1 Searching for Roles 117
4.4.2 Viewing a Role 118
4.4.3 Creating a Role 119
4.4.4 Modifying a Role 120
4.4.5 Setting Role Membership 120
4.4.6 Deleting a Role 120

Chapter 5 REST v1 - Repository Services 123

5.1 The resources Service 123
5.2 The resource Service 125
5.2.1 Requesting the Contents of a JasperReport 127
5.2.2 Requesting the Contents of a File Resource 129
5.2.3 Requesting the Values of a Query-Based Input Control 130
5.2.4 Creating a Resource 132
5.2.5 Setting the Temporary Upload Directory 134
5.2.6 Modifying a Resource 134
5.2.7 Copying or Moving a Resource 135
5.2.8 Deleting a Resource 135
5.3 Working with Dashboards 136
5.4 Working with Virtual Data Sources 139
5.5 Working with Domains 140
5.6 The permission Service 142
5.6.1 Viewing Permissions 142
5.6.2 Setting Permissions 144

Chapter 6 REST v1 - Report Services 145

6.1 The report Service 145
6.1.1 Running a Report 145
6.1.2 Downloading Report Output 147
6.1.3 Regenerating Report Output 148
6.2 The jobsummary Service 148
6.3 The job Service 149
6.3.1 Viewing a Job Definition 149
6.3.2 Scheduling a Report 150
6.3.3 Editing a Job Definition 152
6.3.4 Deleting a Job Definition 152
Chapter 7 REST v1 - Administration Services 153
7.1 The organization Service 153
7.1.1 Viewing an Organization 153
7.1.2 Creating an Organization 154
7.1.3 Modifying Organization Properties 155
7.1.4 Deleting an Organization 155
7.2 The user Service 156
7.2.1 Creating a User 157
7.2.2 Editing a User 158
7.2.3 Deleting a User 158
7.3 The attribute Service 158
7.4 The role Service 159
7.4.1 Creating a New Role 160
7.4.2 Editing a Role 160
7.4.3 Deleting a Role 161
Chapter 8 SOAP - Repository Web Service 163
8.1 Request and Operation Result 163
8.2 List Operation 165
8.3 Get Operation 167
8.4 Put Operation 172
8.5 Delete Operation 173
8.6 Move Operation 174
8.7 Copy Operation 174
8.8 runReport Operation 175
8.8.1 Report Output 176
8.8.2 Report Locales 176
8.9 Errors 177
8.10 Implementation Suggestions 178
Chapter 9 SOAP - Report Scheduling Web Service 179
9.1 Types Defined in the WSDL 179
9.2 Operations in the Scheduling Service 182
9.2.1 Operation Descriptions 182
9.2.2 Example Request and Operation Result 183
9.3 Java Client Classes 185

Chapter 10 SOAP - Domain Web Service 187
10.1 Types Defined in the WSDL 187
10.2 Operations in the Domain Service 188
10.2.1 The getDomainMetaData Operation 188
10.2.2 The executeDomainQuery Operation 191
10.2.3 Java Client Classes 193
Chapter 11 SOAP - Web Services for Administration 195
11.1 Types Defined in the WSDL 196
11.2 Users and Roles 198
11.2.1 findUsers 198
11.2.2 putUser 199
11.2.3 deleteUser 199
11.2.4 findRoles 200
11.2.5 putRole 200
11.2.6 updateRoleName 201
11.2.7 deleteRole 201
11.3 Organizations/Tenants 202
11.3.1 getTenant 202
11.3.2 getSubTenantList 202
11.3.3 putTenant 203
11.3.4 deleteTenant 203
11.4 Permissions 203
11.4.1 getPermissionsForObject 204
11.4.2 putPermission 204
11.4.3 deletePermission 205
11.5 Related Files 205
Appendix A ResourceDescriptor API Constants 207
Index 209

Chapter 1 Introduction to Web Services

JasperReports Server is a component of both a community project and commercial offerings. Each integrates the standard features such as security, scheduling, a web services interface, and much more for running and sharing reports. This guide discusses all editions. Sections of the guide that apply only to the commercial editions are indicated with a special note.

This document describes the JasperReports Server's web services that allow client applications to interact with the server programmatically.

There are three different Application Programming Interfaces (APIs) using two different protocols:

- REST (REpresentational State Transfer) – A RESTful interface depends on the standard methods provided by HTTP: GET, PUT, POST, and DELETE. The API sends and receives resource descriptors that are the object or result of the operation.
    - REST v2 – Jaspersoft has fully re-implemented the original REST API to improve performance and use simpler resource descriptors in JSON (JavaScript Object Notation). Jaspersoft strongly recommends using or upgrading to the REST v2 API for support of the latest features in JasperReports Server.
    - REST (v1) – The original REST API supports only XML descriptors, and it is not as efficient or simple to use. This interface is deprecated: it is still supported but is not enhanced with new features. The REST (v1) API may be unsupported and later removed in future versions of the server.
- SOAP (Simple Object Access Protocol) – The SOAP interface sends and receives XML documents to describe operations, process requests and provide results. The SOAP interface is no longer supported nor maintained, but it is still included in JasperReports Server for backwards compatibility. The SOAP API may be removed in future versions of the server.

In order to describe the contents of resources in the repository, both REST and SOAP web services use a custom XML format called a `resourceDescriptor`. When the client requests information about resources, the server responds with lists of resource descriptors, and when the client creates or modifies a resource, it must send a well-formed `resourceDescriptor` that describes the resource. Newer RESTful APIs also support JSON (JavaScript Object Notation) objects.

This chapter contains the following sections:

- **REST Web Services Overview**
- **REST Authentication**
- **REST Server Information**
- **SOAP Web Services Overview**
- **SOAP Authentication**
- **Syntax of resourceDescriptor**

1.1 REST Web Services Overview

The RESTful interface of JasperReports Server responds to HTTP requests from client applications, in particular the following methods (sometimes called verbs):

- GET to list, search and acquire information about repository resources.
- PUT to create new resources and execute reports.
- POST to modify resources.
- DELETE to remove resources.

In order to introduce new features and keep backwards compatibility, Jaspersoft has introduced a second RESTful API using the rest_v2 URL.

By default, the REST web services are available at the following URLs, where `<host>` is the name of the computer hosting JasperReports Server and `<port>` is the port you specified during installation. By default, the context name is `jasperserver` for the Community Project and `jasperserver-pro` for commercial editions. The context name may also be customized on your specific installation of JasperReports Server.

Table 1-1 REST v2 - Web Services and URLs

Web Service	URLs
Login (optional)	http://<host>:<port>/jasperserver[-pro]/rest/GetEncryptionKey http://<host>:<port>/jasperserver[-pro]/rest/login
Repository	http://<host>:<port>/jasperserver[-pro]/rest_v2/resources http://<host>:<port>/jasperserver-pro/rest_v2/domains/.../metadata * http://<host>:<port>/jasperserver[-pro]/rest_v2/permissions http://<host>:<port>/jasperserver[-pro]/rest_v2/export http://<host>:<port>/jasperserver[-pro]/rest_v2/import
Reports	http://<host>:<port>/jasperserver[-pro]/rest_v2/reports http://<host>:<port>/jasperserver[-pro]/rest_v2/reportExecutions http://<host>:<port>/jasperserver[-pro]/rest_v2/reports/.../inputControls http://<host>:<port>/jasperserver[-pro]/rest_v2/reports/.../options http://<host>:<port>/jasperserver[-pro]/rest_v2/jobs http://<host>:<port>/jasperserver-pro/rest_v2/queryExecutor *
Administration without organizations	http://<host>:<port>/jasperserver[-pro]/rest_v2/users http://<host>:<port>/jasperserver[-pro]/rest_v2/users/.../attributes http://<host>:<port>/jasperserver[-pro]/rest_v2/roles
Administration with organizations *	http://<host>:<port>/jasperserver-pro/rest_v2/organizations http://<host>:<port>/jasperserver-pro/rest_v2/organizations/.../users http://<host>:<port>/jasperserver-pro/rest_v2/organizations/.../users/.../attributes http://<host>:<port>/jasperserver-pro/rest_v2/organizations/.../roles http://<host>:<port>/jasperserver-pro/rest_v2/serverInfo
* Available only in commercial editions of JasperReports Server.	

Applications may receive the machine-readable XML description of all supported REST v2 services in Web Application Desciption Language (WADL) at the following URL:

http://<host>:<port>/jasperserver[-pro]/rest_v2/application.wadl

The original REST (now called v1) API is being deprecated. These services are still supported but no longer include the latest features of the server.

Table 1-2 REST v1 - Deprecated Web Services and URLs

Web Service	URLs
Login (optional)	http://<host>:<port>/jasperserver[-pro]/rest/GetEncryptionKey http://<host>:<port>/jasperserver[-pro]/rest/login
Repository	http://<host>:<port>/jasperserver[-pro]/rest/resources http://<host>:<port>/jasperserver[-pro]/rest/resource http://<host>:<port>/jasperserver[-pro]/rest/permission
Reports	http://<host>:<port>/jasperserver[-pro]/rest/report http://<host>:<port>/jasperserver[-pro]/rest/jobsummary http://<host>:<port>/jasperserver[-pro]/rest/job
Administration without organizations	http://<host>:<port>/jasperserver[-pro]/rest/user http://<host>:<port>/jasperserver[-pro]/rest/attribute http://<host>:<port>/jasperserver[-pro]/rest/role
Administration with organizations *	http://<host>:<port>/jasperserver-pro/rest/organization http://<host>:<port>/jasperserver-pro/rest/user http://<host>:<port>/jasperserver-pro/rest/attribute http://<host>:<port>/jasperserver-pro/rest/role
* Available only in commercial editions of JasperReports Server.	

As with any RESTful service, not all methods (GET, PUT, POST, and DELETE) are supported on every service. The URLs usually include a path to the resource being acted upon, as well as any paramters that are accepted by the method. For example, to search for input control resources in the repository, your application would send the following HTTP request:

GET http://<host>:<port>/jasperserver-pro/rest_v2/resources?type=inputControl

The reference chapters in this book give the full description of the methods supported by each URL, the path or resource expected for each method, and the parameters that are required or optional. The description of each method includes a sample of the return value.

JasperReports Server REST services return standard HTTP status codes. In case of an error, a detailed message may be present in the body in form of plain text. Client error codes are of type 4xx, while server errors are of type 5xx. The following table lists all the standard HTTP codes.

Table 1-3 REST - HTTP Return Codes

Success Messages		Client Error		Server Errors	
Code	**Message**	**Code**	**Message**	**Code**	**Message**
100	Continue	400	Bad Request	500	Internal Server Error
101	Switching Protocols	401	Unauthorized	501	Not Implemented
200	OK	402	Payment Required	502	Bad Gateway
201	Created	403	Forbidden	503	Service Unavailable
202	Accepted	404	Not Found	504	Gateway Time-out
203	Non-Authoritative Information	405	Method Not Allowed	505	HTTP Version Not Supported
204	No Content	406	Not Acceptable		
205	Reset Content	407	Proxy Authentication Required		
206	Partial Content	408	Request Time-out		
300	Multiple Choices	409	Conflict		
301	Moved Permanently	410	Gone		
302	Found	411	Length Required		
303	See Other	412	Precondition Failed		
304	Not Modified	413	Request Entity Too Large		
305	Use Proxy	414	Request-URI Too Large		
307	Temporary Redirect	415	Unsupported Media Type		
		416	Requested Range Not Satisfiable		
		417	Expectation Failed		

1.2 REST Authentication

When using web services, the calling application must provide a valid user ID and password to JasperReports Server. The REST web services in JasperReports Server support two types of authentication:

- HTTP Basic Authentication, where the user ID and password are sent in the header with every request. Basic Authentication with REST is the same as described in section **section 1.5, "SOAP Authentication," on page 17**.
- The special login service that allows authentication using a POST request to create a session and return a session ID that is used with subsequent requests. Use of the login service is optional, and it is useful only when HTTP Basic Authentication does not work.

  One example where you may need to use the login service is when the username or password contain UTF-8 characters that may be corrupted by the basic authentication mechanism.

Normally, RESTful implementations do not rely on the use of persistent sessions, such as the login service. However, the JasperReports Server architecture automatically creates user sessions internally, and the login service takes advantage of this. By using the login service, you can avoid making the server verify user credentials for each API call. If your server is configured with external authentication, repeatedly verifying credentials may be a performance issue you can avoid with the login service.

1.2.1 Login Encryption

JasperReports Server 4.7 introduced the ability to encrypt plain-text passwords over non-secure HTTP. Encryption does not make passwords more secure, it only prevents them from being readable to humans. For more information about security and how to enable login encryption, see the JasperReports Server Administrator Guide.

When login encryption is enabled, passwords in both HTTP Basic Authentication and using the login service must be encrypted by the client. Login encryption has two modes:

- Static key encryption – The server only uses one key that never changes. The client only needs to encrypt the password once and can use it for every web service call.
- Dynamic key encryption – The server changes the encryption key for every session. The client must request the new key and re-encrypt the password before every call using HTTP Basic Authentication or every session using the login service.

The GetEncryptionKey service does not take any arguments or content input.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**GetEncryptionKey**/

Return Value on Success	Typical Return Values on Failure

200 OK – Body contains a JSON representation of public key:
`{`
`  "maxdigits":"131",`
`  "e":"10001",`
`  "n":"9f8a2dc4baa260a5835fa33ef94c..."`
`}`
	200 OK – Body contains {Error: Key generation is off}

To encrypt a password with the server's public key, use the Bouncy Castle provider with the RSA/NONE/NoPadding algorithm.

1.2.2 Login Service

When making a login request, the user ID and password can be pass as URL arguments or as content in the request body:

Method	URL
POST GET	http://<host>:<port>/jasperserver[-pro]/**rest/login**/ http://<host>:<port>/jasperserver[-pro]/**rest/login**?<arguments>

Argument	Type/Value	Description
j_username	Text	The user ID. In commercial editions of the server that implement multiple organizations, the argument must specify the organization ID or alias in the following format: j_username%7Corganization_id (%7C is the | character).
j_password?	Text	The user's password. If the server has login encryption enabled, the password must be encrypted as explained in section **1.2.1**. The argument is optional but authentication will fail without the password.

Content-Type	Content
application/x-www-form-urlencoded	j_username=<userID>[%7C<organization_id>]&j_password=<password> Example: j_username=jasperadmin&j_password=jasperadmin or j_username=jasperadmin%7Corganization_1&j_password=jasperadmin

Return Value on Success	Typical Return Values on Failure
200 OK – Session ID in cookie (POST only), empty body.	401 Unauthorized – Empty body. 302 – License expired or otherwise not valid.

The login service has several uses:

- POST method – Applications should use the POST method, because it returns the session cookie to use in future requests.
- GET method – Developers can test the login service and the user credentials from a browser, which uses the GET method.
- Credentials in arguments – When testing the login service in a browser, credentials are passed as arguments in the URL:

  http://<host>:<port>/jasperserver[-pro]/rest/login?j_username=<userID>[%7C<organization_id>]
  &j_password=<password>
- Credentials in content – When using the POST method, credentials can either be sent in the URL arguments as shown above, or sent in the content of the request, as shown in the second example below.

The following example shows the HTTP request and response when testing the login service in a browser. In this case, the user credentials are passed as arguments and the browser sends a GET request. Because the GET request is meant only for testing, it does not return a cookie with the session ID.

```
GET /jasperserver/rest/login?j_username=jasperadmin&j_password=jasperadmin HTTP/1.1
Host: localhost:8080
User-Agent: Mozilla/5.0 (Windows NT 6.0; rv:5.0) Gecko/20100101 Firefox/5.0
Connection: keep-alive

HTTP/1.1 200 OK
Server: Apache-Coyote/1.1
Pragma: No-cache
Cache-Control: no-cache
Expires: Wed, 31 Dec 1969 16:00:00 PST
Content-Length: 0
Date: Fri, 19 Aug 2011 00:52:48 GMT
```

The following example shows the content of a POST request where the credentials are passed in the content.

```
POST /jasperserver/rest/login HTTP/1.1
User-Agent: Jakarta Commons-HttpClient/3.1
Host: localhost:8080
Content-Length: 45
Content-Type: application/x-www-form-urlencoded
j_username=jasperadmin&j_password=jasperadmin

HTTP/1.1 200 OK
Server: Apache-Coyote/1.1
Set-Cookie: JSESSIONID=52E79BCEE51381DF32637EC69AD698AE; Path=/jasperserver
Content-Length: 0
Date: Fri, 19 Aug 2011 01:52:48 GMT
```

For optimal performance, the session ID from the cookie should be used to keep the session open. To do this, include the cookie in future requests to the other RESTful services. For example, given the response to the POST request above, future requests to the repository services should include the following line in the header:

```
Cookie: $Version=0; JSESSIONID=52E79BCEE51381DF32637EC69AD698AE; $Path=/jasperserver
```

However, maintaining a session with cookies is not mandatory, and your application can use any combination of session cookie, HTTP Basic Authentication, or both.

1.3 REST Server Information

Use the following service to verify the server information, the same as the **About JasperReports Server** link in the user interface.

Method	**URL**
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/serverInfo**
Options	
accept: application/xml accept: application/json	
Return Value on Success	**Typical Return Values on Failure**
200 OK – Body described below.	This request should always succeed when the server is running.

The server returns a structure containing the information in the requested format, XML or JSON:

```
<serverInfo>                                          {
  <build>20121029_1532</build>                          "version" : "5.0.0",
  <edition>PRO</edition>                                "edition" : "PRO",
  <editionName>Enterprise</editionName>                 "editionName" : "Enterprise",
  <expiration/>                                         "licenseType" : "Commercial",
  <features>Fusion AHD EXP DB AUD ANA                   "build" : "20121029_1532",
            MT</features>                               "expiration" : "",
  <licenseType>Commercial</licenseType>                 "features" : "Fusion AHD EXP DB AUD ANA
  <version>5.0.0</version>                                            MT "
</serverInfo>                                         }
```

You can access each value separately with the following URLs:

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/serverInfo/version** http://<host>:<port>/jasperserver[-pro]/**rest_v2/serverInfo/edition** http://<host>:<port>/jasperserver[-pro]/**rest_v2/serverInfo/editionName** http://<host>:<port>/jasperserver[-pro]/**rest_v2/serverInfo/build** http://<host>:<port>/jasperserver[-pro]/**rest_v2/serverInfo/licenseType** http://<host>:<port>/jasperserver[-pro]/**rest_v2/serverInfo/features** http://<host>:<port>/jasperserver[-pro]/**rest_v2/serverInfo/expiration**

Return Value on Success	Typical Return Values on Failure
200 OK – The requested value.	These requests should always succeed when the server is running.

1.4 SOAP Web Services Overview

With the completion of the REST v2 API in JasperReports Server 5.5, Jaspersoft announces the end of life of the SOAP web services. The SOAP web services will no longer be maintained or updated to support new features of the server. In particular, the SOAP web services do not support interactive charts or interactive HTML5 tables.

For now, the SOAP web services are still available at the following URLs, where `<host>` is the name of the computer hosting JasperReports Server and `<port>` is the port you specified during installation:

Table 1-4 SOAP - Deprecated Web Services and URLs

Edition	Web Service	URL
Community Project	Repository	http://<host>:<port>/jasperserver/services/repository
	Scheduling	http://<host>:<port>/jasperserver/services/ReportScheduler
	Administration	http://<host>:<port>/jasperserver/services/UserAndRoleManagementService

Edition	Web Service	URL
Commercial Editions	Repository	http://<host>:<port>/jasperserver-pro/services/repository
	Scheduling	http://<host>:<port>/jasperserver-pro/services/ReportScheduler
	Domains	http://<host>:<port>/jasperserver-pro/services/DomainServices
	Administration	http://<host>:<port>/jasperserver-pro/services/UserAndRoleManagementService

The context name (by default jasperserver or jasperserver-pro) may also depend on the specific installation of JasperReports Server.

The web services take as input an XML document (the request) and return another XML document (the operation result). Because they use XML, the web services provide easy, natural integration with the most common programming languages and environments.

Jaspersoft provides two complete sample applications that demonstrate the SOAP web service: a simple J2EE (Java 2 Enterprise Edition) web application and the same application written in PHP (PHP Hypertext Preprocessor).

The SOAP web services often refer a namespace with the value of `http://www.jasperforge.org/jasperserver/ws` namespace. This namespace is only an identifier; it is not intended to be a valid URL.

1.5 SOAP Authentication

The calling application must supply a valid user and password with HTTP Basic Authentication to access the web services. In basic authentication, the user ID and password are concatenated with a colon (:) and Base64 encoded in the HTTP request header. Usually, your client library does this for you. For example, the administrator's default credentials are `jasperadmin:jasperadmin`, which is encoded as follows:

```
Authorization: Basic amFzcGVyYWRtaW46amFzcGVyYWRtaW4=
```

The web services accept the same accounts and credentials as the JasperReports Server user interface.

- If there is only one organization, such as in the JasperReports Server default installation, you should specify the user name only: `WSUser`. For example, `jasperadmin`.
- In deployments with multiple organizations, the organization ID or alias must be added, in the form `WSUser|TenantId` or `WSUser|TenantAlias`. For example, you could use `jasperadmin|organization_1` (`WSUser|TenantId`) or `jasperadmin|CanadaBranch` (`WSUser|TenantAlias`).
- See section **section 11.3, "Organizations/Tenants," on page 202**, for explanations of `WSUser`, `TenantId`, and `TenantAlias`.

If login encryption in enabled in your server, you must encrypt the password before base64-encoding it with the username. To encode the password, see section **section 1.2.1, "Login Encryption," on page 13**.

To simplify the development of web services in Java, Jaspersoft provides a set of helper classes, including a ready-to-use client that can make it easier to integrate an external application with JasperReports Server, be it web- or desktop-based. These classes include an object model that represents resources and creates requests and operation results, along with a Marshaller and an Unmarshaller class to quickly move between XML and the Java object model. The presentation of each service includes code samples that show how to use these classes.

1.6 Syntax of resourceDescriptor

Resources (such as reports, images, queries, and content resources) are stored in a repository, which is organized like a file system, with a root and a hierarchical set of folders. Each object in the repository is considered a resource: a folder is a resource of type folder, a JRXML resource is a resource of type file, just as images and JAR files are of type file. Some resources are more abstract, such as connection definitions and an input controls. The repository web services operates on all resources.

1.6.1 Overview

A resource is identified by:

- A name.
- A label.
- A unique Uniform Resource Identifier (URI) that defines the location of the resource in the repository. A URI is similar to a Unix path (for example, /reports/samples/AllAccounts).

A resource can have a set of properties (depending on its type) and a set of children resources.

The resource descriptor is a complex structure that transfers data regarding a specific resource between the server and the client. A request can include only one resource descriptor. Often, the request only includes a small portion of the entire resource descriptor definition: the part that describes the specific details of the resource in question.

For example, when a `resourceDescriptor` is used as an input parameter in a request document (for example, to specify a folder to list or a file to download), the descriptor includes only a small portion of the entire resource descriptor definition: the part that describes the specific resource details in question. In many cases, the only information required to identify a resource in the repository is its `wsType`, `name`, and `URI`.

The resource descriptors that the server sends are completely populated with all the data about the resources being described.

A `resourceDescriptor` tag is defined by the following DTD (Document Type Definition):

```
<!ELEMENT resourceDescriptor (label, description?, resourceProperty*, resourceDescriptor*, parameter*)
>
<!ATTLIST resourceDescriptor
  name CDATA #REQUIRED
  wsType CDATA #REQUIRED
  uriString CDATA #REQUIRED
  isNew ( true | false ) false
>
<!ELEMENT resourceProperty (value?, resourceProperty*)>
<!ATTLIST resourceProperty
  name CDATA #REQUIRED
>
<!ELEMENT value (#PCDATA)>
<!ELEMENT parameter (#PCDATA)>
<!ATTLIST parameter
  name CDATA #REQUIRED
  isListItem ( true | false ) false
>
```

The following sections describe the DTD:

- **wsType Attribute**
- **isNew Attribute**

- **Resource Descriptor Parameters**
- **Examples of resourceDescriptor**

1.6.2 wsType Attribute

The `wsType` attribute defines the nature of the resource. The possible values for this attribute are:

Table 1-5 Values for wsType

wsType Value	Description
aws	Amazon Web Services data source
bean	Data source of type Spring bean
contentResource	The output of a report
datasource	Generic data source – This type is normally used for a data source ReportUnit child resource when it is not defined locally to the ReportUnit.
dataType	Datatype (used with the input controls)
folder	Folder
font	Font file (normally a True Type font)
img	Image file
inputControl	Input control
jar	JAR file
jdbc	Data source of type JDBC
jndi	Data source of type JNDI
jrxml	JRXML source file
lov	List of values (used with input controls)
olapMondrianCon	OLAP Mondrian connection. A direct connection to an OLAP source.
olapMondrianSchema	OLAP Mondrian Schema
olapXmlaCon	OLAP XMLA connection. A remote connection to an OLAP source.
prop	Resource bundle file (ending with .properties) for specific reports
query	Query used to retrieve data from a data source
reference	Reference to another resource. References are only present in report units

wsType Value	Description
reportUnit	A complete report that can be run in JasperReports Server
virtual	Virtual data source – This type has a child ResourceDescriptor for each data source contained in the virtual data source.
xmlaConnection	XML/A Connection

For all the other resource types found in the repository, the repository web service sets the attribute `wsType` to `UNKNOWN`.

1.6.3 isNew Attribute

The `isNew` attribute is used with the `put` operation to indicate whether the resource being uploaded is new or replaces an existing resource in the repository.

1.6.4 Resource Descriptor Parameters

A resource descriptor can contain one or more parameters: they do not describe the resource; they store the values users select when the `runReport` service is invoked.

A `resourceProperty` is normally a simple pair of a name and a value. The Java class `com.jaspersoft.jasperserver.api.metadata.xml.domain.impl.ResourceDescriptor` contains constants for each property name. For a list of parameter names, see **section Appendix A, "ResourceDescriptor API Constants," on page 207**. Jaspersoft may add further constants in future releases.

1.6.5 Examples of resourceDescriptor

The following `resourceDescriptor` sample contains a set of simple properties that describe a JDBC connection resource:

```
<resourceDescriptor name="JServerJdbcDS" wsType="jdbc"
                    uriString="/datasources/JServerJdbcDS" isNew="false">
  <label>JServer Jdbc data source</label>
  <description>JServer Jdbc data source</description>
  <resourceProperty name="PROP_PARENT_FOLDER">
    <value>/datasources</value>
  </resourceProperty>
  <resourceProperty name="PROP_VERSION">
    <value>0</value>
  </resourceProperty>
  <resourceProperty name="PROP_DATASOURCE_DRIVER_CLASS">
    <value>com.mysql.jdbc.Driver</value>
  </resourceProperty>
  <resourceProperty name="PROP_DATASOURCE_CONNECTION_URL">
    <value>jdbc:mysql://localhost/test?autoReconnect=true</value>
  </resourceProperty>
  <resourceProperty name="PROP_DATASOURCE_USERNAME">
    <value>username</value>
  </resourceProperty>
  <resourceProperty name="PROP_DATASOURCE_PASSWORD">
    <value>password</value>
  </resourceProperty>
</resourceDescriptor>
```

Some properties cannot be represented by a simple value. To accommodate more complicated properties, a resourceProperty can recursively contain other resourceProperties. This is the case for a List of Values type resource (used to define input controls for report parameters); the list values are contained in the `resourceProperty` named `PROP_LOV` and are represented by sub-resourceProperties. For example:

```
<resourceDescriptor name="SampleLOV" wsType="lov" uriString="/datatypes/SampleLOV" isNew="false">
  <label>Sample List of Values</label>
  <resourceProperty name="PROP_RESOURCE_TYPE">
    <value>com.jaspersoft.jasperserver.api.metadata.common.domain.ListOfValues
    </value>
  </resourceProperty>
  <resourceProperty name="PROP_PARENT_FOLDER">
    <value>/datatypes</value>
  </resourceProperty>
  <resourceProperty name="PROP_VERSION">
    <value>-1</value>
  </resourceProperty>
  <resourceProperty name="PROP_HAS_DATA">
    <value>false</value>
  </resourceProperty>
  <resourceProperty name="PROP_IS_REFERENCE">
    <value>false</value>
  </resourceProperty>

  <resourceProperty name="PROP_LOV">
    <resourceProperty name="US">
      <value>United States</value>
    </resourceProperty>
    <resourceProperty name="CA">
      <value>Canada</value>
    </resourceProperty>      <resourceProperty name="IN">
      <value>India</value>
    </resourceProperty>
    <resourceProperty name="IT">
      <value>Italy</value>
    </resourceProperty>
    <resourceProperty name="DE">
      <value>Germany</value>
    </resourceProperty>
    <resourceProperty name="RO">
      <value>Romania</value>
    </resourceProperty>
  </resourceProperty>
</resourceDescriptor>
```

This example defined a list of countries. Notice that, for each list item, the `resourceProperty` name represents the item value, and the `resourceProperty` value contains the item label.

Chapter 2 REST v2 - Repository Services

For authentication using the REST web services, see section **section 1.2, “REST Authentication,” on page 12**.

This chapter includes the following sections:

- **The v2/resources Service**
- **The v2/domains/metadata Service**
- **The v2/permissions Service**
- **The v2/export Service**
- **The v2/import Service**

2.1 The v2/resources Service

The REST v2/resources service replaces the original resource and resources services to search the repository and access the resources it contains. This new service provides greater performance and more consistent handling of resource descriptors for all repository resource types. The service has two formats, one takes search parameters to find resources, the other takes a repository URI to access resource descriptors and file contents.

2.1.1 V2 Resource Descriptors

The v2/resources service introduces new resource descriptors for nearly all repository objects. This section introduces the features of the new descriptors, and the next section, **V2 Resource Descriptor Types**, lists all the descriptors and the specific attributes of each.

2.1.1.1 Resource IDs

The ID of a resource is its unique name within the folder where it resides. Resource descriptors do not have an explicit ID attribute, but the ID is always the last component of the URI field in responses from the server.

When sending resource descriptors in requests, the URI field is ignored. The URI and ID of a created resource is determined in one of the following ways:

- POST operations on the v2/resources service specify a folder. The resource descriptor in the request is created in the specified folder. The ID is created automatically from the label of the resource by replacing special characters with underscores (_). The URI of the new resource is returned in the server's response and consists of the target folder with the automatic ID appended to it.

- PUT operations on the v2/resources service send a descriptor to create the resource at the URI specified in the request. The resource ID is the last element of this URI, as long as it is unique in the parent folder. The server's response should confirm that the resource was successfully created with the requested URI.

2.1.1.2 Custom Media Types

In order to specify all the different types of resources, the v2/resources service relies on custom media types with the following syntax:

application/repository.<resourceType>+<format>

where:

- <resourceType> is the name for each type of repository resource, such as reportUnit, dataType, or jdbcDataSource. The names of all supported types are given in **V2 Resource Descriptor Types**.
- <format> is the representation format of the descriptor, either json or xml.

For example:

application/repository.dataType+json - JSON representation of a datatype resource

application/repository.reportUnit+xml - XML representation of a JRXML report

The custom media types should be used in Content-Type and Accept HTTP headers, as described in the following sections. According to the HTTP specification, headers should be case insensitive; the headers and custom media types can be upper case, lower case, or any mixture of upper and lower case.

2.1.1.3 Accept HTTP Headers

Client applications should use the Accept HTTP header in a request to specify the desired format in the server's response. Generally, regardless of the resource type, it's enough to specify:

- Accept: application/json to get response in JSON format or
- Accept: application/xml to get response in XML fomat.

The server will respond with the specific custom media type for the requested resource, as described in the next section.

However, there are some special cases where client must specify a precise resource type:

- When requesting the resource details of the root folder, client must specify application/repository.folder+<format> to get its resource descriptor. Otherwise, the request is considered a search of the root folder.
- When requesting the resource details of a file resource, as opposed to the file contents, the client must specify application/repository.file+<format>. Without this Accept header, the response will contain the file contents. The custom media type also distinguishes between the XML descriptor of a file and the contents of an XML file.

If the client specifies a custom type in the Accept header that does not match the resource being requested, the server responds with the error code 406 Not Acceptable.

2.1.1.4 Content-Type HTTP Headers

The Content-Type HTTP header indicates the media type being sent in the body of the request or response. For example, if the client requests a valid datatype resource, and depending on the format that the client specified in the Accept header of the request, the server's response includes:

- Content-Type: application/repository.dataType+json or
- Content-Type: application/repository.dataType+xml

When the client uploads a resource descriptor to create or update a resource, it must set the Content-Type connector accurately. For example, when uploading a datatype resource represented in XML, the client must send:

Content-Type: application/repository.dataType+xml

The server relies on the Content-Type header to parse the body of the request, and it will respond with the error code 400 Bad Request if there is a mismatch. In the example above, the following headers will result in an error:

- Content-Type: application/xml - custom media type not included
- Content-Type: application/repository.reportUnit+xml - media type mismatch
- Content-Type: application/repository.dataType+json - format mismatch

2.1.1.5 Nested Resources

Many types of resources in the repository are defined in terms of other resources. For example, some types of input controls require a query, and the query itself requires a data source. The nested query and data source can be defined in two ways:

- Referenced resources - a link to a valid resource defined elsewhere in the repository. JasperReports Server manages the references between resources by enforcing permissions and protecting dependencies from deletion.
- Local resources - a resource descriptor nested within the parent descriptor. The nested resource is fully defined within the parent resource and not available for being referenced from elsewhere.

Both types of nested resources are further described in the following sections.

2.1.1.6 Referenced Resources

Referenced resources are defined by special structures within the descriptors of other resources. For example, in the following query resource, the data source field contains a dataSourceReference object that contains the URI of the target reference:

```
{
    "version": 0,
    "permissionMask": 1,
    "creationDate": "2013-10-03 16:32:37",
    "updateDate": "2013-10-03 16:32:37",
    "label": "Country Query",
    "description": null,
    "uri": "/adhoc/topics/Cascading_multi_select_topic_files/Country_multi_select_files/country_
query",
    "dataSource": {
        "dataSourceReference": {
            "uri": "/datasources/JServerJNDIDS"
        }
    },
    "value": "select distinct billing_address_country from accounts order by billing_address_country",
    "language": "sql"
}
```

To create referenced resources, send requests to the server that contain the appropriate reference objects for the target resource. See the **V2 Resource Descriptor Types** for the specific reference objects available in each resource descriptor.

When reading resources with referenced resources, the `uri` attribute gives the repository URI of the reference. To simplify the parsing of referenced resources, the v2/resources service GET method supports the expanded=true parameter. Instead of following references and requiring two or more GET requests, the expanded=true parameter returns all referenced resources fully expanded within the parent resource, as if it were a local resource.

The following resource types support referenced resources, and the table gives the name of the field that contains the referenced URI, and the name of the expanded type that replaces the reference.

Resource Type	Reference Attribute(s)	Expanded Name and Descriptor
query	dataSourceReference	awsDataSource, beanDataSource, customDataSource, jdbcDataSource, jndiJdbcDataSource, virtualDataSource, semanticLayerDataSource or advDataSource (adhocDataView)
inputControl	datatypeReference listOfValuesReference queryReference	dataType listOfValues query
reportUnit	jrxmlFileReference dataSourceReference queryReference inputControlReference fileReference (images, ...)	jrxmlFile with file attributes see query dataSourceReference query inputControl fileResource with file attributes
semanticLayerDataSource (Domain)	dataSourceReference schemaFileReference fileReference (bundle) securityFileReference	see query dataSourceReference schemaFile with file attributes file of appropriate type securityFile with file attributes
olapUnit	olapConnectionReference	xmlaConnection, mondrianConnection, or secureMondrianConnection
mondrianConnection	dataSourceReference schemaReference	see query dataSourceReference schema with file attributes
secureMondrianConnection	dataSourceReference schemaReference accessGrantSchemaReference	see query dataSourceReference schema with file attributes accessGrantSchema with file attributes
mondrianXmlaDefinition	mondrianConnectionReference	mondrianConnection or secureMondrianConnection

2.1.1.7 Local Resources

Nested resources that are not referenced resources must be defined locally within the parent resource. The nested resource is defined by a complete resource descriptor of the appropriate type. The following example shows a data source that is defined locally within the parent query resource:

```
{
    "version": 0,
    "permissionMask": 1,
    "creationDate": "2013-10-03 16:32:37",
    "updateDate": "2013-10-03 16:32:37",
    "label": "Country Query",
    "description": null,
    "uri": "/adhoc/topics/Cascading_multi_select_topic_files/Country_multi_select_files/country_
query",
    "dataSource": {
        "jndiJdbcDataSource": {
            "version": 0,
            "permissionMask": 1,
            "creationDate": "2013-10-03 16:32:05",
            "updateDate": "2013-10-03 16:32:05",
            "label": "my JNDI ds",
            "description": "Local JNDI Data Source",
            // URI of expanded nested resource is ignored. Resource is created locally
            "uri": "/datasources/JServerJNDIDS",
            "jndiName": "jdbc/sugarcrm",
            "timezone": null
        }
    },
    "value": "select distinct billing_address_country from accounts order by billing_address_country",
    "language": "sql"
}
```

Use nested descriptors such as the ones above to create resources that contain local resources. Descriptors can be nested to any level, as long as the syntax of each descriptor is valid. See **V2 Resource Descriptor Types** for the correct syntax of both the parent and the nested resource.

Internally, the v2/repository service handles local resources as normal resources contained in a hidden folder. The hidden folder containing local resources has the following name:

<parentURI>_files/

and local resources can be accessed at the following URI:

<parentURI>_files/<resourceID>

In the example above, we can see that the parent query resource is a nested resource itself. Its URI shows us that it is the query resource for a query-based input-control of a topic resource:

/adhoc/topics/Cascading_multi_select_topic_files/Country_multi_select_files/country_query

and the new nested data source will have the following URI:

/adhoc/topics/Cascading_multi_select_topic_files/Country_multi_select_files/country_query_files/my_
JNDI_ds

The ID of the nested resource (my_JNDI_ds) is created automatically from the label of the nested resource.

The _files folder that exists in all parents of local resources is hidden so that its local resources do not appear in repository searches. You can set the showHiddenItems=true parameter on the v2/resources request to search a _
files folder for all local resources, such as in a JRXML report (reportUnit).

Local resources in the hidden _files folder can also be created and updated separately from their parent resources by using PUT and POST methods of the v2/resources service and specifying the complete URI of the local resource as shown above.

2.1.1.8 Optimistic Locking

The v2/resources service supports optimistic locking on all write and update operations (PUT, POST, and PATCH). When using the service to search the repository and receive descriptors of the resources, all descriptors contain a version number field. Clients should return the same version number when writing or updating a given resources. The server compares the version number in the modify request the current version of the resource to assure that no other client has updated the same resource.

If the version numbers do not match, the server replies with error code 409 Conflict. In that case, the client should request the resource again (read operation with GET) and send the modify request with an updated version number.

When a modify operation is successful, the server increments the version number on the affected resource and returns the new descriptor with the new version as confirmation that the operation was successful.

2.1.1.9 Update-only Passwords

Some resource descriptors such as jdbcDataSource and xmlaConnection contain a password field. All password fields are blank or missing when reading (GET) a resource descriptor. This prevents anyone, even administrators from seeing existing passwords.

Write or update operations (PUT or POST) may send the password field in descriptors that support it. In this case, the password value is updated in the resource in the repository. Make sure that resources with sensitive passwords have the proper permissions so that only authorized users can modify them.

2.1.2 V2 Resource Descriptor Types

The following sections show the name and attributes of each descriptor for repositry resources used by the v2/resources service.

2.1.2.1 Common Attributes

All resource types contain the following attributes. Of these common attributes, only the label and description fields are writable.

In general, writable fields are ones that can be set by the client when sending a descriptor for a write or update operation (PUT or POST). The other fields are read-only fields that the server sets automatically.

application/repository.{resourceType}+json	application/repository.{resourceType}+xml
`{`	`<?xml version="1.0" encoding="UTF-8"`
`    "uri" :"/sample/resource/uri",`	`standalone="yes"?>`
`    "label":"Sample Label",`	`<{resourceType}>`
`    "description":"Sample Description",`	`    <uri>/sample/resource/uri</uri>`
`    "permissionMask":"0",`	`    <label>Sample Label</label>`
`    "creationDate": "2013-07-04 12:18:47",`	`    <description>Sample Description</description>`
`    "updateDate": "2013-07-04 12:18:47",`	`    <permissionMask>0</permissionMask>`
`    "version":"0"`	`    <creationDate>2013-07-04`
`    ...`	`12:18:47</creationDate>`
`}`	

application/repository.{resourceType}+json	application/repository.{resourceType}+xml

	<updateDate>2013-07-04 12:18:47</updateDate>
	    <version>0</version>
	    ...
	</{resourceType}>

Throughout the rest of the resource type sections, the common attributes are included in every descriptor as `{commonAttributes}`.

2.1.2.2 Folder

Folder types do not contain any additional fields beyond the common attributes shown above.

application/repository.folder+json	application/repository.folder+xml

{
    "uri" :"{resourceUri}",
    "label":"Sample Label",
    "description":"Sample Description",
    "permissionMask":"0",
    "creationDate": "2013-07-04 12:18:47",
    "updateDate": "2013-07-04 12:18:47",
    "version":"0"
}
	<folder>
	    <uri>/sample/resource/uri</uri>
	    <label>Sample Label</label>
	    <description>Sample Description</description>
	    <permissionMask>0</permissionMask>
	    <creationDate>2013-07-04
	12:18:47</creationDate>
	    <updateDate>2013-07-04 12:18:47</updateDate>
	    <version>0</version>
	</folder>

Only the label and description fields are writable.

2.1.2.3 JNDI Data Source

application/repository.jndiJdbcDataSource+json	application/repository.jndiJdbcDataSource+xml

{
    {commonAttributes},
    "jndiName":"{jndiName}",
    "timezone":"{timezone}"
}
	<jndiDataSource>
	    {commonAttributes}
	    <jndiName>{jndiName}</jndiName>
	    <timezone>{timezone}</timezone>
	</jndiDataSource>

2.1.2.4 JDBC Data Source

application/repository.jdbcDataSource+json	application/repository.jdbcDataSource+xml

{
    {commonAttributes},
    "driverClass":"{driverClass}",
    "password":"{password}",
    "username":"{username}",
    "connectionUrl":"{connectionUrl}",
    "timezone":"{timezone}"
}
	<jdbcDataSource>
	    {commonAttributes}
	    <driverClass>{driverClass}</driverClass>
	    <password>{password}</password>
	    <username>{username}</username>
	    <connectionUrl>
	        {connectionUrl}
	    </connectionUrl>
	    <timezone>{timezone}</timezone>
	</jdbcDataSource>

2.1.2.5 AWS Data Source

application/repository.awsDataSource+json

```
{
    {commonAttributes},
    "driverClass":"{driverClass}",
    "password":"{password}",
    "username":"{username}",
    "connectionUrl":"{connectionUrl}",
    "timezone":"{timezone}",
    "accessKey":"{accessKey}",
    "secretKey":"{secretKey}",
    "roleArn":"{roleArn}",
    "region":"{region}",
    "dbName":"{dbName}",
    "dbInstanceIdentifier":"{dbInstanceIdentifier}
",
    "dbService":"{dbService}"
}
```

application/repository.awsDataSource+xml

```
<awsDataSource>
    {commonAttributes}
    <driverClass>{driverClass}</driverClass>
    <password>{password}</password>
    <username>{username}</username>
    <connectionUrl>
        {connectionUrl}
    </connectionUrl>
    <timezone>{timezone}</timezone>
    <accessKey>{accessKey}</accessKey>
    <secretKey>{secretKey}</secretKey>
    <roleArn>{roleArn}</roleArn>
    <region>{region}</region>
    <dbName>{dbName}</dbName>
    <dbInstanceIdentifier>
        {dbInstanceIdentifier}
    </dbInstanceIdentifier>
    <dbService>{dbService}</dbService>
</awsDataSource>
```

2.1.2.6 Virtual Data Source

application/repository.virtualDataSource+json

```
{
    {commonAttributes},
    "subDataSources":[
        {
            "id":"{subDataSourceId}",
            "uri":"{subDataSourceUri}"
        },
        ...
    ]
}
```

application/repository.virtualDataSource+xml

```
<virtualDataSource>
    {commonAttributes}
    <subDataSources>
        <subDataSource>
            <id>{subDataSourceId}</id>
            <uri>{subDataSourceUri}</uri>
        </subDataSource>
        ...
    </subDataSources>
</virtualDataSource>
```

2.1.2.7 Custom Data Source

application/repository.customDataSource+json

```
{
    {commonAttributes},
    "serviceClass":"{serviceClass}",
    "dataSourceName":"{dataSourceName}",
    "properties":[
        {
            "key":"{key}",
            "value":"{value}"
        },
        ...
    ]
```

application/repository.customDataSource+xml

```
<customDataSource>
    {commonAttributes}
    <serviceClass>
        {serviceClass}
    </serviceClass>
    <dataSourceName>
        {dataSourceName}
    </dataSourceName>
    <properties>
        <property>
            <key>{key}</key>
```

application/repository.customDataSource+json	application/repository.customDataSource+xml

}	<value>{value}</value>
	        </property>
	        ...
	    </properties>
	</customDataSource>

2.1.2.8 Bean Data Source

application/repository.beanDataSource+json	application/repository.beanDataSource+xml

{
    {commonAttributes},
    "beanName":"{beanName}",
    "beanMethod":"{beanMethod}"
}
	<beanDataSource>
	    {commonAttributes}
	    <beanName>{beanName}<beanName>
	    <beanMethod>{beanMethod}</beanMethod>
	</beanDataSource>

2.1.2.9 XML/A Connection

application/repository.xmlaConnection+json	application/repository.xmlaConnection+xml

{
    {commonAttributes},
    "url":"{xmlaServiceUrl}",
    "xmlaDataSource":"{xmlaDataSource}",
    "catalog":"{catalog}",
    "username":"{username}",
    "password":"{password}"
}
	<xmlaConnection>
	    {commonAttributes}
	    <url>{xmlaServiceUrl}</url>
	    <xmlaDataSource>
	        {xmlaDataSource}
	    </xmlaDataSource>
	    <catalog>{catalog}</catalog>
	    <username>{username}</username>
	    <password>{password}</password>
	</xmlaConnection>

2.1.2.10 Datatypes

application/repository.dataType+json	application/repository.dataType+xml

{
    {commonAttributes},
    "type":"text|number|date|dateTime|time",
    "pattern":"{pattern}",
    "maxValue":"{maxValue}",
    "strictMax":"true|false",
    "minValue":"{minValue}",
    "strictMin":"true|false"
    "maxLength":"{maxLengthInteger}"
}
	<dataType>
	    {commonAttributes}
	    <type>text|number|date|dateTime|time</type>
	    <pattern>{pattern}</pattern>
	    <maxValue>{maxValue}</maxValue>
	    <strictMax>true|false</strictMax>
	    <minValue>{minValue}</minValue>
	    <strictMin>true|false</strictMin>
	    <maxLength>{maxLengthInteger}</maxLength>
	</dataType>

2.1.2.11 List of Values

application/repository.listOfValues+json

```
{
    {commonAttributes},
    "items":[
        {
            "label":"{label}",
            "value":"{value}"
        },
        ...
    ]
}
```

application/repository.listOfValues+xml

```
<listOfValues>
    {commonAttributes}
    <items>
        <item>
            <label>{label}</label>
            <value>{value}</value>
        </item>
        ...
    </items>
</listOfValues>
```

2.1.2.12 Query

The dataSource field of the query is nullable. Set an empty dataSource field when you want to remove a local datasource, either a reference or a local definition. When the data source of a query is not defined, the query uses the data source of its parent, for example its JRXML report (reportUnit).

application/repository.query+json

```
{
    {commonAttributes},
    "value":"{query}",
    "language":"{language}",
    "dataSource":{
        "dataSourceReference": {
            "uri":"{dataSourceUri}"
        }
    }
}
```

application/repository.query+xml

```
<query>
    {commonAttributes}
    <value>{query}</value>
    <language>{language}</language>
    <dataSourceReference>
        <uri>{dataSourceUri}</uri>
    </dataSourceReference>
</query>
```

2.1.2.13 Input Control

Input controls come in several types that require different fields. The following table shows all possible fields, not all of which are mutually compatible.

application/repository.inputControl+json

```
{
    {commonAttributes},
    "mandatory":"{true|false}",
    "readOnly":"{true|false}",
    "visible":"{true|false}",
    "type":"{inputControlTypeByteValue}",
    "usedFields":"{field1;field2;...}",
    "dataType": {
        "dataTypeReference": {
            "uri": "{dataTypeResourceUri}"
        }
    },
```

application/repository.inputControl+xml

```
<inputControl>
    {commonAttributes}
    <mandatory>true|false</mandatory>
    <readOnly>true|false</readOnly>
    <visible>true|false</visible>
    <type>{inputControlTypeByteValue}</type>
    <usedFields>{field1;field2;...}</usedFields>
    <dataTypeReference>
        <uri>{dataTypeResourceUri}</uri>
    </dataTypeReference>
    <listOfValuesReference>
        <uri>{listOfValuesResourceUri}</uri>
```

application/repository.inputControl+json

```
    "listOfValues": {
        "listOfValuesReference": {
            "uri": "listOfValuesResourceUri"
        }
    }
    "visibleColumns":["column1", "colum2", ...],
    "valueColumn":"{valueColumn}",
    "query": {
        "queryReference": {
            "uri": "{queryResourceUri}"
        }
    }
}
```

application/repository.inputControl+xml

```
    </listOfValuesReference>
    <queryReference>
        <uri>{queryResourceUri}</uri>
    </queryReference>
    <visibleColumns>
        <column>{column1}</column>
        <column>{column2}</column>
        <column>...</column>
    </visibleColumns>
    <valueColumn>{valueColumn}</valueColumn>
</inputControl>
```

The following list shows the numerical code and meaning for the {inputControlTypeByteValue}. The input control type determines the other fields that are required. The list of required fields may appear in a field named usedFields, separated by semi-colons (`;`).

"type"	Type of Input Control	Other Fields Required (usedFields)
1	Boolean	None
2	Single value	dataType
3	Single-select list of values	listOfValues
4	Single-select query	query; queryValueColumn
5	*Not used*	
6	Multi-select list of values	listOfValues
7	Multi-select query	query; queryValueColumn
8	Single-select list of values radio buttons	listOfValues
9	Single-select query radio buttons	query; queryValueColumn
10	Multi-select list of values check boxes	listOfValues
11	Multi-select query check boxes	query; queryValueColumn

2.1.2.14 File

The repository.file+<format> descriptor is used to identify the file type. The content field is used only when uploading a file resource as base-64 encoded content. For other ways to upload file contents, see **Uploading File Resources**. The content field is absent when requesting a file resource descriptor. For more information, see **Downloading File Resources**.

application/repository.file+json

```
{
    {commonAttributes},
    "type":"pdf|html|xls|rtf|csv|odt|txt
            |docx|ods|xlsx|img|font|jrxml
            |jar|prop|jrtx|xml|css
            |olapMondrianSchema
            |accessGrantSchema
            |unspecified}",
    // content is write-only;
    // it is not included in a response
    "content":"{base64EncodedContent}"
}
```

application/repository.file+xml

```
<file>
    {commonAttributes}
    <type>pdf|html|xls|rtf|csv|odt|txt
        |docx|ods|xlsx|img|font|jrxml
        |jar|prop|jrtx|xml|css
        |olapMondrianSchema
        |accessGrantSchema|unspecified}
    </type>
    <content>{base64EncodedContent}</content>
</file>
```

2.1.2.15 Report Unit (JRXML Report)

A report unit contains mostly references to the files that make up a report within the server. A report unit is a composite resource that may contain other local resources. In this case, the URIs that it references include a URI in the following format:

<reportUnitURI>_files/<localResourceID>

For example, the main JRXML of a sample report is referenced as follows:

/reports/samples/Cascading_multi_select_report_files/Cascading_multi_select_report

For more information, see **V2 Resource Descriptors**.

application/repository.reportUnit+json

```
{
    {commonAttributes},
    "alwaysPromptControls":
        "{true|false}",
    // default is "popupScreen"
    "controlsLayout":
        "{popupScreen|separatePage
          |topOfPage|inPage}",
    "inputControlRenderingView":
        "{inputControlRenderingView}",
    "reportRenderingView":
        "{reportRenderingView}",
    "dataSource":{
        "dataSourceReference": {
            "uri":"{dataSourceUri}"
        }
    },
    // "query" is nullable
    "query:" {
        "queryReference": {
            uri: "{queryResourceUri}"
        }
    },
    "jrxml": {
```

application/repository.reportUnit+xml

```
<reportUnit>
    {commonAttributes}
    <alwaysPromptControls>true|false
        </alwaysPromptControls>
    <!-- default is "popupScreen" -->
    <controlsLayout>
        popupScreen|separatePage
        |topOfPage|inPage
    </controlsLayout>
    <inputControlRenderingView>
        {inputControlRenderingView}
    </inputControlRenderingView>
    <reportRenderingView>
        {reportRenderingView}
    </reportRenderingView>
    <dataSourceReference>
        <uri>{dataSourceUri}</uri>
    </dataSourceReference>
    <queryReference>
        <uri>{queryResourceUri}</uri>
    </queryReference>
    <jrxmlFileReference>
        <uri>{jrxmlFileResourceUri}</uri>
    </jrxmlFileReference>
    <inputControls>
```

application/repository.reportUnit+json

```
        "jrxmlFileReference": {
            "uri": "{jrxmlFileResourceUri}"
        }
    }
    "inputControls": [
        {
            "inputControlReference": {
                "uri": "{inputControlUri}"
            }
        },
        ...
    ],
    "resources": [
        "resource": {
            "name": "{resourceName}",
            "file": {
                "fileReference": {
                    "uri": "{fileResourceUri}"
                }
            }
        },
        ...
    ]
}
```

application/repository.reportUnit+xml

```
        <inputControlReference>
            <uri>{inputControlUri}</uri>
        </inputControlReference>
        ...
    </inputControls>
    <resources>
        <resource>
            <name>{resourceName}</name>
            <file>
                <fileReference>
                    <uri>{fileResourceUri}</uri>
                </fileReference>
            </file>
        </resource>
        ...
    </resources>
</reportUnit>
```

2.1.2.16 Report Options

application/repository.reportOptions+json

```
{
    {commonAttributes},
    "reportUri":"{reportUri}",
    "reportParameters":[
        {
            "name":"{parameterName}",
            "value":[
                "value_1",
                "value_2",
                ...
            ]
        },
        ...
    ]
}
```

application/repository.reportOptions+xml

```
<reportOptions>
    {commonAttributes}
    <reportUri>{reportUri}</reportUri>
    <reportParameters>
        <reportParameter>
            <name>{parameterName}</name>
            <value>value_1</value>
            <value>value_2</value>
            ...
        </reportParameter>
        ...
    </reportParameters>
</reportOptions>
```

2.1.2.17 Domain (semanticLayerDataSource)

For more information about accessing the schema of a Domain, see **The v2/domains/metadata Service**.

application/repository.semanticLayerDataSource+js-on

```
{
    {commonAttributes},
    "dataSource":{
        "dataSourceReference": {
            "uri":"{dataSourceUri}"
        }
    },
    "schema": {
        "schemaFileReference": {
            "uri": "{schemaFileResourceUri}"
        }
    },
    "bundles": [
        {
            // empty localeString indicates
default bundle
            "locale": "{localeString}",
            "file": {
                "fileReference": {
                    "uri": "
{propertiesFileResourceUri}"
                }
            }
        },
        ...
    ],
    "securityFile": {
        "securityFileReference": {
            "uri": "{securityFileResourceUri}"
        }
    }
}
```

application/repository.semanticLayerDataSource-+xml

```
<semanticLayerDataSource>
    {commonAttributes}
    <dataSourceReference>
        <uri>{dataSourceUri}</uri>
    </dataSourceReference>
    <schemaFileReference>
        <uri>{schemaFileResourceUri}</uri>
    </schemaFileReference>
    <bundles>
        <bundle>
            <!-- <locale/> indicates default
bundle -->
            <locale>{localeString}</locale>
            <fileReference>
                <uri>
{propertiesFileResourceUri}</uri>
            </fileReference>
        </bundle>
        ...
    </bundles>
    <securityFileReference>
        <uri>{securityFileResourceUri}</uri>
    </securityFileReference>
</semanticLayerDataSource>
```

2.1.2.18 Domain Topic

A Domain Topic is a Topic created by selecting database fields from a Domain. It is structurally equivalent to a JRXML report, and thus it has the same type attributes (see **Report Unit (JRXML Report)**). The only difference is that the data source field will reference a Domain (semanticLayerDataSource).

application/repository.domainTopic+json	application/repository.domainTopic+xml
Same attributes as application/repository.reportUnit+json	Same attributes as application/repository.reportUnit+xml

2.1.2.19 Mondrian Connection

Mondrian connections without the access grant schemas are used in the communuity edition of JasperReports Server.

application/repository.mondrianConnection+json

```
{
    {commonAttributes},
    "dataSource":{
        "dataSourceReference": {
            "uri":"{dataSourceUri}"
        }
    },
    "schema": {
        "schemaReference": {
            "uri": "{schemaFileResourceUri}"
        }
    }
}
```

application/repository.mondrianConnection+xml

```
<mondrianConnection>
    {commonAttributes}
    <dataSourceReference>
        <uri>{dataSourceUri}</uri>
    </dataSourceReference>
    <schemaReference>
        <uri>{schemaFileResourceUri}</uri>
    </schemaReference>
</mondrianConnection>
```

2.1.2.20 Secure Mondrian Connection

Secure Mondrian Connections are available only in commercial releases of JasperReports Server.

application/repository.secureMondrianConnection+j-son

```
{
    {commonAttributes},
    "dataSource":{
        "dataSourceReference": {
            "uri":"{dataSourceUri}"
        }
    },
    "schema": {
        "schemaReference": {
            "uri": "{schemaFileResourceUri}"
        }
    },
    "accessGrantSchemas": [
        {
            "accessGrantSchemaReference": {
                "uri": "
{accessGrantSchemaFileResourceUri}"
            }
        },
        ...
    ]
}
```

application/repository.secureMondrianConnection-+xml

```
<secureMondrianConnection>
    {commonAttributes}
    <dataSourceReference>
        <uri>{dataSourceUri}</uri>
    </dataSourceReference>
    <schemaReference>
        <uri>{schemaFileResourceUri}</uri>
    </schemaReference>
    <accessGrantSchemas>
        <accessGrantSchemaReference>
            <uri>
{accessGrantSchemaFileResourceUri}</uri>
        </accessGrantSchemaReference>
    </accessGrantSchemas>
</secureMondrianConnection>
```

2.1.2.21 OLAP Unit

application/repository.olapUnit+json

```
{
    {commonAttributes},
    "mdxQuery":"{mdxQuery}",
    "olapConnection": {
```

application/repository.olapUnit+xml

```
<olapUnit>
    {commonAttributes}
    <mdxQuery>{mdxQuery}</mdxQuery>
    <olapConnectionReference>
```

application/repository.olapUnit+json	application/repository.olapUnit+xml

`        "olapConnectionReference": {`
`            "uri": "{olapConnectionReferenceUri}"`
 	
`        }`
`    }`
`}`
	`        <uri>{olapConnectionReferenceUri}</uri>`
	`    </olapConnectionReference>`
	`</olapUnit>`

2.1.2.22 Mondrian XML/A Definition

application/repository.mondrianXmlaDefinition+json	application/repository.mondrianXmlaDefinition+x-ml

`{`
`    {commonAttributes},`
`    "catalog":"{catalog}",`
`    "mondrianConnection": {`
`        "mondrianConnectionReference": {`
`            "uri": "`
`{mondrianConnectionResourceUri}"`
`        }`
`    }`
`}`
	`<mondrianXmlaDefinition>`
	`    {commonAttributes}`
	`    <catalog>{catalog}</catalog>`
	`    <mondrianConnectionReference>`
	`        <uri>{mondrianConnectionResourceUri}`
	`</uri>`
	`    </mondrianConnectionReference>`
	`</mondrianXmlaDefinition>`

2.1.2.23 Other Types

The following types are defined in commercial editions of the server and appear in the repository. However, they are meant only to describe the corresponding resources as read-only objects in the repository. The REST API does not support services for clients to create or modify these types.

The types in the following table contain only the **Common Attributes**.

Type String	Description
application/repository.dashboard+json application/repository.dashboard+xml	The dashboard resource descriptors are deprecated and subject to change.
application/repository.adhocDataView+json application/repository.adhocDataView+xml	The Ad Hoc view type is not fully defined yet and subject to change. Ad Hoc views may be referenced as data sources in other repository types, in which case they are called advDataSource.

2.1.3 Searching the Repository

The v2/resources service, when used without specifying any repository URI, is used to search the repository. The various parameters listed in the following table let you refine the search and specify how you receive search results. For example, the search and results pagination parameters can be used to implement an interface to repository resources in a REST client application.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**?<parameters>

Parameter	Type/Value	Description
q	String	Search for resources having the specified text in the name or description. Note that the search string does not match in the ID of resources.
folderUri	String	The path of the base folder for the search.
recursive	true|false	Indicates whether search should include all sub-folders recursively. When omitted, the default behavior is recursive (true).
type	String	Match only resources of the given type. Valid types are listed in**V2 Resource Descriptor Types**, for example: dataType, jdbcDataSource, reportUnit, or file. Multiple type parameters are allowed. Wrong values are ignored.
accessType	viewed |modified	Filters the results by access events: viewed (by current user) or modified (by current user). By default, no access event filter is applied.
showHidden Items	true|false	When set to true, results include nested local resources (in _files) as if they were in the repository. For more information, see **Local Resources** for more information. By default, hidden items are not shown (false).
sortBy	optional String	One of the following strings representing a field in the results to sort by: uri, label, description, type, creationDate, updateDate, accessTime, or popularity (based on access events). By default, results are sorted alphabetically by label.
limit	integer	Used for pagination to specify the maximum number of resources to return in each response. This is eqivalent to the number of results per page. The default limit is 100.
offset	integer	Used for pagination to request an offset in the set of results. This is equivalent to a specific page number. The default offset is 1 (first page).
forceTotal Count	true|false	When true, the Total-Count header is set in every paginated response, which impacts performance. When false, the default, the header is set in the first page only.

Options
accept: application/json (default) accept: application/xml

Return Value on Success	Typical Return Values on Failure
200 OK – The body contains a list of resourceLookup descriptors representing the results of the search.	404 Not Found – The specified folder is not found in the repository. 204 No Content – All type values specified are invalid.

The response of a search is a set of shortened descriptors showing only the common attributes of each resource. One additional attribute specifies the type of the resource. This allows the client to quickly receive a list of resources for display or further processing.

application/json

```
[
    {
        "uri" :"/sample/resource/uri",
        "label":"Sample Label",
        "description":
            "Sample Description",
        "type":"folder"
        "permissionMask":"0",
        "creationDate":
            "2013-07-04 12:18:47",
        "updateDate":
            "2013-07-04 12:18:47",
        "version":"0"
    },
    ...
]
```

application/xml

```
<resources>
    <resourceLookup>
        <uri>/sample/resource/uri</uri>
        <label>Sample Label</label>
        <description>Sample Description
            </description>
        <type>folder</type>
        <permissionMask>0</permissionMask>
        <creationDate>2013-07-04 12:18:47
            </creationDate>
        <updateDate>2013-07-04 12:18:47
            </updateDate>
        <version>0</version>
    </resourceLookup>
    ...
</resources>
```

2.1.4 Viewing Resource Details

Use the GET method and a resource URI to request the resource's complete descriptor.

Method	URL	
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/resource	
Parameter	**Type/Value**	**Description**
expanded	true|false	When true, all nested resources will be given as full descriptors. The default behavior, false, has all nested resources given as references. For more information, see **Local Resources**.
Options		
accept: application/json (default) accept: application/xml accept: application/repository.folder+<format> (specifically to view the folder resource)		
Return Value on Success	**Typical Return Values on Failure**	
200 OK – The response will indicate the content-type and contain the corresponding descriptor, for example: application/repository.dataType+json	404 Not Found – The specified resource is not found in the repository.	

2.1.5 Downloading File Resources

There are two operations on file resources:

- Viewing the file resource details to determine the file format
- Downloading the binary file contents

To view the file resource details, specify the URL and the file descriptor type as follows:

Method	**URL**
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/file/resource
Options	
accept: application/repository.file+json accept: application/repository.file+xml	
Return Value on Success	**Typical Return Values on Failure**
200 OK – The response will the the file resource descriptor.	404 Not Found – The specified resource is not found in the repository.

The type attribute of the file resource descriptor indicates the format of the contents. However, you can also download the binary file contents directly, with the format indicated by the MIME content-type of the response:

Method	**URL**
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/file/resource
Return Value on Success	**Typical Return Values on Failure**
200 OK – The response content-type will indicate the MIME type of the binary contents. See for the list of MIME types that correspond to file resource types.	404 Not Found – The specified resource is not found in the repository.

2.1.6 Creating a Resource

The POST and PUT methods offer alternative ways to create resources. Both take a resource descriptor but each handles the URL differently.

With the POST method, specify a folder in the URL, and the new resource ID is created automatically from the label attribute in its descriptor.

Method	**URL**
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/folder?<param>

Parameter	Type/Value	Description
create Folders	true|false	By default, this is true, and the service will create all parent folders if they don't already exist. When set to false, the folders specified in the URL must all exist, otherwise the service returns an error.

Content-Type	Content
application/repository. <resourceType>+json application/repository. <resourceType>+xml	A well defined descriptor of the specified type and format. See **V2 Resource Descriptor Types**

Return Value on Success	Typical Return Values on Failure
201 Created – The request was successful and, for confirmation, the response contains the full descriptor of the resource that was just created.	400 Bad Request – Mismatch between the content-type and the fields or syntax of the actual descriptor.

With the PUT method, specify a unique new resource ID as part of the URL. For more information, see **Resource IDs**.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/resource ?<parameters>

Parameters	Type/Value	Description
create Folders	true|false	True by default, and the service will create all parent folders if they don't already exist. When set to false, the folders specified in the URL must all exist, otherwise the service returns an error.
overwrite	true|false	When true, the resource given in the URL is overwritten even if it is a different type than the resource descriptor in the content. The default is false.

Content-Type	Content
application/repository. <resourceType>+json application/repository. <resourceType>+xml	A well defined descriptor of the specified type and format. See **V2 Resource Descriptor Types**

Return Value on Success	Typical Return Values on Failure
201 Created – The request was successful and, for confirmation, the response contains the full descriptor of the resource that was just created.	400 Bad Request – Mismatch between the content-type and the fields or syntax of the actual descriptor.

The POST method also supports a way to create complex resources and their nested resources in a single multipart request.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/folder

Content-Type	Content
multipart/form-data	Root resource multipart item name: resource Root resource multipart Content-type and corresponding item names: • mondrianConnection: - schema: mondrian schema XML file • secureMondrianConnection: - schema: mondrian schema XML file - accessGrantSchemas.accessGrantSchema[{itemIndex}]: XML file • semanticLayerDataSource: - schema: domain schema XML file - securityFile: security file XML - bundles.bundle[{bundleIndex}]: i18n properties file • reportUnit - jrxml: report unit JRXML file - files.{fileName}: report unit attached resource file (e.g. images)

Return Value on Success	Typical Return Values on Failure
201 Created – The request was successful and, for confirmation, the response contains the full descriptor of the resource that was just created.	400 Bad Request – Mismatch between the content-type and the fields or syntax of the actual descriptor.

2.1.7 Modifying a Resource

Use the PUT method above to overwrite an entire resource. Specify the path of the target resource in the URL and specify resource of the same type. Use overwrite=true to replace a resource of a different type.

The resource descriptor must completely describe the updated resource, not use individual fields. The descriptor must also use only references for nested resources, not other resources expanded inline. You can update the local resources using the hidden folder _file. For more informations, see **Local Resources**.

In JasperReports Server 5.5, Jaspersoft introduces a new method for modifying resoures. The PATCH method updates individual descriptor fields on the target resource. It also accept expressions that modify the descriptor in the Spring Expression Language. This expression language lets you easily modify the structure and values of descriptors.

Method	URL
PATCH	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/resource

Content-Type	Content

application/json	`{`
	`    "version" : 0,`
	`    "patch":[`
	`        {`
	`            "field":"label",`
	`            "value":"New Label"`
	`        },`
	`        {`
	`            "field":"query",`
	`            "value":"/path/to/query/resource"`
	`        },`
	`        {`
	`            "expression":"inputControls.add(new com.jaspersoft.`
	`                jasperserver.dto.resources.ClientReference().`
	`                setUri('/datatypes/decorate'))"`
	`        }`
	`    ]`
	`}`

application/xml	`<patchItems>`
	`  <version>0</version>`
	`    <patch>`
	`        <field>label</field>`
	`        <value>New Label</value>`
	`    </patch>`
	`    <patch>`
	`        <field>query</field>`
	`        <value>/path/to/query/resource</value>`
	`    </patch>`
	`    <patch>`
	`        <expression>inputControls.add(new com.jaspersoft.`
	`            jasperserver.dto.resources.ClientReference().`
	`            setUri('/datatypes/decorate'))`
	`        </expression>`
	`    </patch>`
	`</patchItems>`

Return Value on Success	Typical Return Values on Failure
For confirmation, the response contains the full descriptor of the resource that was just modified.	400 Bad Request – Mismatch between the patch fields and the fields or syntax of the actual descriptor. 409 Conflict – Old version number; the resource was updated more recently than the last version number received.

The patch descriptor contains attributes of the target resource. It can't be used to specify the attributes of nested resources. However, you can apply the patch operation directly to the local resource in the hidden _files folder.

If your client does not support the PATCH method, use the POST method and specify the following HTTP header:

```
X-HTTP-Method-Override: PATCH
```

2.1.8 Copying a Resource

Copying a resource uses the Content-Location HTTP header to specify the source of the copy operation. If any resource descriptor is sent in the request, it is ignored.

Method	**URL**	
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/folder ?<parameters>	
Parameters	**Type/Value**	**Description**
create Folders	true|false	True by default, and the service will create all parent folders if they don't already exist. When set to false, the folders specified in the URL must all exist, otherwise the service returns an error.
overwrite	true|false	When true, the target resource given in the URL is overwritten even if it is a different type than the resource descriptor in the content. The default is false.
Options		
Content-Location: {resourceSourceUri} - Specifies the resource to be copied.		
Return Value on Success		**Typical Return Values on Failure**
201 Created – The request was successful and, for confirmation, the response contains the full descriptor of the resource that was just copied.		404 Not Found – When the {resourceSourceUri} is not valid.

2.1.9 Moving a Resource

Moving a resource uses the PUT method, whereas copying it uses the POST method.

Method	**URL**	
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/folder ?<parameters>	
Parameters	**Type/Value**	**Description**
create Folders	true|false	True by default, and the service will create all parent folders if they don't already exist. When set to false, the folders specified in the URL must all exist, otherwise the service returns an error.

overwrite	true|false	When true, the target resource given in the URL is overwritten even if it is a different type than the resource descriptor in the content. The default is false.
Options		
Content-Location: {resourceSourceUri} - Specifies the resource to be moved.		

Return Value on Success	**Typical Return Values on Failure**
201 Created – The request was successful and, for confirmation, the response contains the full descriptor of the resource that was just moved.	404 Not Found – When the {resourceSourceUri} is not valid.

2.1.10 Uploading File Resources

There are several ways of uploading file contents to create file resources. The simplest way is to POST a file descriptor containing the file in base64 encoding.

Method	**URL**	
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/folder?<param>	
Parameters	**Type/Value**	**Description**
create Folders	true|false	True by default, and the service will create all parent folders if they don't already exist. When set to false, the folders specified in the URL must all exist, otherwise the service returns an error.
Content-Type		**Content**
application/repository. file+json application/repository. file+xml		A well defined file resource descriptor, as described in **File**. The contents of the file are base64 encoded in the content attribute of the descriptor.

Return Value on Success	**Typical Return Values on Failure**
201 Created – The request was successful and, for confirmation, the response contains the full descriptor of the resource that was just created.	400 Bad Request – Mismatch between the content-type and the fields or syntax of the actual descriptor.

You can also create a file resource with a multipart form request.

Method	**URL**
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/folder

Content-Type	Content
multipart/form-data	The request should include the following parameters: • label contains {fileLabel} • description contains {fileDescription} • type contains {fileType} • data contains {fileContent}
Return Value on Success	**Typical Return Values on Failure**
201 Created – The request was successful and, for confirmation, the response contains the full descriptor of the resource that was just created.	400 Bad Request – Mismatch between the content-type and the fields or syntax of the actual descriptor.

Another form allows you to create a file resource by direct streaming, without needing to created it first as a descriptor object. In this case, the required fields of the file descriptor are specified in HTTP headers.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/folder?<param>
Options	

Content-Description: {fileResourceDescription}
Content-Disposition: attachment; filename={fileResourceLabel}	

Content-Type	**Content**
{MIME type}	The MIME type that corresponds to the desired file type. The body then contains the binary data representation of that file format.
Return Value on Success	**Typical Return Values on Failure**
201 Created – The request was successful and, for confirmation, the response contains the full descriptor of the resource that was just created.	400 Bad Request – Mismatch between the content-type and the fields or syntax of the actual descriptor.

When using MIME types, you must specify the MIME type that corresponds with the desired file type, as shown in the following table.

File Descriptor Types	Corresponding MIME Types
pdf	application/pdf
html	text/html
xls	application/xls

File Descriptor Types	Corresponding MIME Types
rtf	application/rtf
csv	text/csv
ods	application/vnd.oasis.opendocument.spreadsheet
odt	application/vnd.oasis.opendocument.text
txt	text/plain
docx	application/vnd.openxmlformats-officedocument.wordprocessingml.document
xlsx	application/vnd.openxmlformats-officedocument.spreadsheetml.sheet
font	font/*
img	image/*
jrxml	application/jrxml
jar	application/zip
prop	application/properties
jrtx	application/jrtx
xml	application/xml
css	text/css
accessGrantSchema	application/accessGrantSchema
olapMondrianSchema	application/olapMondrianSchema

You can cusomize this list of MIME types in the server by editing the `contentTypeMapping` map in the file .../WEB-INF/applicationContext-rest-services.xml. You can change MIME types for predefined types, add MIME types, or add custom types.

2.1.11 Deleting Resources

The DELETE method has two forms, one for single resources and one for multiple resources.

Method	URL
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**/path/to/resource

Return Value on Success	Typical Return Values on Failure
204 No Content – The request was successful and there is no descriptor to return.	404 Not Found – When the resource path or ID is not valid.

To delete multiple resources at once, specify multiple URIs with the resourceUri parameter.

Method	URL	
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest_v2/resources**?resourceUri={uri}&...	
Parameter	**Type/Value**	**Description**
resourceURI	string	Specifies a resource to delete. Repeat this paramter to delete multiple resources.
Return Value on Success	**Typical Return Values on Failure**	
204 No Content – The request was successful and there is no descriptor to return.	404 Not Found – When the {resourceUri} is not valid.	

2.2 The v2/domains/metadata Service

This section describes functionality that can be restricted by the software license for JasperReports Server. If you don’t see some of the options described in this section, your license may prohibit you from using them. To find out what you're licensed to use, or to upgrade your license, contact Jaspersoft.

The REST v2/domains/metadata service gives access to the sets and items exposed by a Domain for use in Ad Hoc reports. Items are database fields exposed by the Domain, after all joins, filters, and calculated fields have been applied to the database tables selected in the Domain. Sets are groups of items, arranged by the Domain creator for use by report creators.

A limitation of the v2/domains/metadata service only allows it to operate on Domains with a single data island. A data island is a group of fields that are all related by joins between the database tables in the Domain. Fields that belong to tables that are not joined in the Domain belong to separate data islands.

If your Domain contains localization bundles you can specify a locale and an optional alternate locale and preference (called q-value, a decimal between 0 and 1).

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/domains**/path/to/Domain/**metadata**
Options	
Accept-Language: <locale>[, <alt-locale>;q=0.8]	
Accept: application/xml (default)	
Accept: application/json	

Return Value on Success	Typical Return Values on Failure
200 OK – The body is XML containing the list of resourceDescriptors.	404 Not Found – The specified Domain URI is not found in the repository. This service also returns an XML `errorDescriptor` giving a human-readable error message.

The response of the v2/domains/metadata service is an XML or JSON structure that describes the sets and items available in the selected Domain. This metadata includes the localized labels for the sets and items, as well as the datatypes of the items. The `resourceId` of the sets and items are internal to the Domain and not meaningful or otherwise useable.

For more information about Domains, refer to the *JasperReports Server User Guide*.

The following example shows the JSON response for a Domain with:

- A set named expense containing:
  - An item named Exp Date of type Date
  - An item named Amount of type BigDecimal
- A set named store containing:
  - An item named Store Type of type String
  - ...

```
{
    "rootLevel": {
        "id":"root",
        "subLevels":[
            {
                "id":"expense_join",
                "label":"expense",
                "properties": {
                        "resourceId": "expense_join"
                },
                "items":[
                    {
                        "id":"ej_expense_fact_exp_date",
                        "label":"Exp Date",
                        "properties": {
                                "JavaType": "java.sql.Date",
                                "resourceId": "expense_join.e.exp_date"
                        }
                    },
                    {
                        "id":"ej_expense_fact_amount",
                        "label":"Amount",
                        "properties": {
                                "JavaType": "java.math.BigDecimal",
                                "resourceId": "expense_join.e.amount"
                        }
                    }
                ]
            },
            {
                "id":"expense_join_store",
                "label":"store",
                "properties": {
                        "resourceId":"expense_join"
                },
                "items":[
                    {
                        "id":"ej_store_store_type",
                        "label":"Store Type",
                        "properties": {
                                "JavaType": "java.lang.String",
                                "resourceId": "expense_join.s.store_type"
                        }
                    },
                    ...
                ]
            }
        ]
    }
}
```

The following example shows the same Domain as returned by the v2/domains/metadata service in XML format:

```
<?xml version="1.0" encoding="UTF-8"?>
<domainMetadata>
    <rootLevel>
        <id>root</id>
        <subLevels>
            <subLevel>
                <id>expense_join</id>
                <label>expense</label>
                <properties>
                    <entry>
                        <key>resourceId</key>
                        <value>expense_join</value>
                    </entry>
                </properties>
                <items>
                    <item>
                        <id>ej_expense_fact_exp_date</id>
                        <label>Exp Date</label>
                        <properties>
                            <entry>
                                <key>JavaType</key>
                                <value>java.sql.Date</value>
                            </entry>
                            <entry>
                                <key>resourceId</key>
                                <value>expense_join.e.exp_date</value>
                            </entry>
                        </properties>
                    </item>
                    <item>
                        <id>ej_expense_fact_amount</id>
                        <label>Amount</label>
                        <properties>
                            <entry>
                                <key>JavaType</key>
                                <value>java.math.BigDecimal</value>
                            </entry>
                            <entry>
                                <key>resourceId</key>
                                <value>expense_join.e.amount</value>
                            </entry>
                        </properties>
                    </item>
                </items>
            </subLevel>
            <subLevel>
                <id>expense_join_store</id>
                <label>store</label>
                <properties>
                    <entry>
                        <key>resourceId</key>
                        <value>expense_join</value>
                    </entry>
                </properties>
                <items>
                    <item>
                        <id>ej_store_store_type</id>
                        <label>Store Type</label>
                        <properties>
                            <entry>
                                <key>JavaType</key>
                                <value>java.lang.String</value>
                            </entry>
                            <entry>
                                <key>resourceId</key>
                                <value>expense_join.s.store_type</value>
                            </entry>
                        </properties>
                    </item>
                    ...
                </items>
            </subLevel>
        </subLevels>
    </rootLevel>
</domainMetadata>
```

.

2.2.1 Working with Domain Schemas

The v2/domains/metadata service returns only the display information about a Domain, not its internal definition. The fields, joins, filters, and calculated fields that define the internal structure of a Domain make up the Domain design. The XML representation of a Domain design is called the Domain schema.

Currently, there is no REST service to interact with Domain schemas, but you can use the v2/resources service to retrieve the raw schema. First, retrieve the resource descriptor for the Domain. For example, to view the descriptor for the Supermart Domain, use the following request (when logged in as jasperadmin):

GET http://<host>:<port>/jasperserver-pro/rest_v2/resources/Domains/supermartDomain

This descriptor contains the Domain schema as an internal resource:

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<semanticLayerDataSource>
    <creationDate>2013-10-10 15:30:31</creationDate>
    <description>Comprehensive example of Domain (pre-joined table sets for complex reporting, custom
query based dataset, column and row security, I18n bundles)</description>
    <label>Supermart Domain</label>
    <permissionMask>1</permissionMask>
    <updateDate>2013-10-10 15:30:31</updateDate>
    <uri>/organizations/organization_1/Domains/supermartDomain</uri>
    <version>1</version>
    <dataSourceReference>
        <uri>/organizations/organization_1/analysis/datasources/FoodmartDataSourceJNDI</uri>
    </dataSourceReference>
    <bundles>
        <bundle>
            <fileReference><uri>/organizations/organization_1/Domains/supermartDomain_files/supermart_
domain.properties</uri></fileReference>
            <locale></locale>
        </bundle>
        <bundle>
            <fileReference><uri>/organizations/organization_1/Domains/supermartDomain_files/supermart_
domain_en_US.properties</uri></fileReference>
            <locale>en_US</locale>
        </bundle>
        <bundle>
            <fileReference><uri>/organizations/organization_1/Domains/supermartDomain_files/supermart_
domain_de.properties</uri></fileReference>
            <locale>de</locale>
        </bundle>
        <bundle>
            <fileReference><uri>/organizations/organization_1/Domains/supermartDomain_files/supermart_
domain_fr.properties</uri></fileReference>
            <locale>fr</locale>
        </bundle>
        <bundle>
            <fileReference><uri>/organizations/organization_1/Domains/supermartDomain_files/supermart_
domain_es.properties</uri></fileReference>
            <locale>es</locale>
        </bundle>
        <bundle>
            <fileReference><uri>/organizations/organization_1/Domains/supermartDomain_files/supermart_
domain_ja.properties</uri></fileReference>
            <locale>ja</locale>
        </bundle>
        <bundle>
            <fileReference><uri>/organizations/organization_1/Domains/supermartDomain_files/supermart_
domain_zh_CN.properties</uri></fileReference>
            <locale>zh_CN</locale>
        </bundle>
    </bundles>
    <schemaFileReference>
        <uri>/organizations/organization_1/Domains/supermartDomain_files/supermartDomain_schema</uri>
    </schemaFileReference>
    <securityFileReference>
        <uri>/organizations/organization_1/Domains/supermartDomain_files/supermartDomain_domain_
security</uri>
    </securityFileReference>
</semanticLayerDataSource>
```

Use the following request to access the Domain schema file inside the Domain resource:

GET http://<host>:<port>/jasperserver-pro/rest_v2/resources/Domains/supermartDomain_files/supermartDomain_schema

The Domain schema is an XML file with a structure explained in the *JasperReports Server User Guide*. If you wish to modify the schema programmatically, you must write your own parser to access its fields and definitions. You can then replace the schema file in the Domain with one of the file updating methods described in .

2.2.2 Accessing Domain Bundles and Security Files

Once you have the descriptor of a Domain resource as shown in the previous section, you can access the other files that help define a Domain. For example, you can access the language bundles of the Supermart Domain with the following request:

GET http://<host>:<port>/jasperserver-pro/rest_v2/resources/Domains/supermartDomain_files/supermart_domain_<locale>.properties

Language bundles are Java properties files that follow the language bundle naming convention, and that contain the names of the sets and fields in the language of the locale in the filename.

You can also retrieve the localized set and item names by specifying Accept-Language when using the v2/domains/metadat service. However, by accessing the language bundles through the Domain descriptor, you read the default bundle to see the pattern of keys and values, and then create a bundle for a new locale.

Domains may also contain a security file that is also stored as an internal resource of the Domain descriptor. Use the following example to request the security file of the Supermart Domain in the sample data:

GET http://<host>:<port>/jasperserver-pro/rest_v2/resources/Domains/supermartDomain_files/supermart_domain_security

A security file defines a complex set of access permissions to the data in the rows and columns returned by the Domain, based on the username, roles, or profile attributes of the user running a Domain-based report. As with the Domain schema file, you must write your own parser to interpret this file and modify it.

You can then upload an updated language bundle or security file for the Domain with one of the methods described in .

For more information about language bundles and security files in Domains, see the *JasperReports Server User Guide*.

2.3 The v2/permissions Service

In the REST v2/permissions service, the syntax is expanded so that you can specify the resource, the recipient (user name or role name) and the permission value within the URL. This makes it simpler to set permissions because you don't need to send a resource descriptor to describe the permissions. In order to set, modify, or delete permissions, you must use credentials or login with a user that has "administer" permissions on the target resource.

The permissions for each user and each role are indicated by the following values. These values are not a true mask; they should be treated as constants:

- No access: 0
- Read-delete: 18

- Administer: 1
- Read-only: 2
- Read-write-delete: 30
- Execute-only: 32

Because a permission can apply to either a user or a role, the permissions service uses the concept of a "recipient." A recipient specifies whether the permission applies to a user or a role, and gives the ID of the user or role, including any organization, for example:

role:/ROLE_SUPERUSER

user:/organization_1/joeuser

Recipients are listed when viewing permissions, and they are also used to set a permission. A recipient can be used in the URL when allowed, but in this case, the forward slash (/) characters must be encoded as %2F.

There are two qualities of a permission:

- The assigned permission is one that is set explicitly for a given resource and a given user or role. Not all permissions are assigned, in which case the permission is inherited from the parent folder.
- The effective permission is the permission that is being enforced, whether it is assigned or inherited.

There is one permission that is not defined: you cannot read or write the ROLE_SUPERUSER's permission on the root .

2.3.1 Viewing Multiple Permissions

The GET method of the v2/permissions service lists permissions on a given resource according to several arguments.

Method	URL	
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/permissions**/path/to/resource/?<arguments>	
Argument	**Type/Value**	**Description**
effective Permissions	boolean optional	When set to true, the effective permissions are returned. By default, this argument is false and only assigned permissions are returned.
recipientType	String optional	Either `user` or `role`. When not specified, the recipient type is the role.
recipientId	String optional	Id of the user or role. In environments with multiple organizations, specify the the organization as %2F<orgID>%2F<recipientID>
resolveAll	boolean optional	When set to true, shows the effective permissions for all users and all roles.
Options		
accept: application/xml (default) accept: application/json		

Return Value on Success	Typical Return Values on Failure
200 OK – The body describes the requested permissions for the resource.	400 Bad Request – When the recipient type is invalid. 404 Not Found – When the specified resource URI is not found in the repository or the recipient ID cannot be resolved.

For example, the following request shows all permission for a resource, similar to the permissions dialog in the user interface:

GET http://localhost:8080/jasperserver-pro/rest_v2/permissions/public?resolveAll=true

```
<permissions>
  <permission>
    <mask>0</mask>
    <recipient>user:/anonymousUser</recipient>
  </permission>
  <permission>
    <mask>0</mask>
    <recipient>user:/organization_1/CaliforniaUser</recipient>
  </permission>
  ...
  <permission>
    <mask>2</mask>
    <recipient>role:/ROLE_USER</recipient>
    <uri>/public</uri>
  </permission>
</permissions>
```

2.3.2 Viewing a Single Permission

Specify the recipient in the URL to see a specific assigned permission. To view effective permissions, use the form above.

Method	URL	
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/permissions**/path/to/resource;recipient=<recipient>	
Argument	**Type/Value**	**Description**
recipient	string required	The recipient format specifies `user` or `role`, the organization if necessary, and the object ID. The slash characters must be encoded, for example: user:%2Forganization_1%2Fjoeuser
Options		
accept: application/xml (default) accept: application/json		

Return Value on Success	Typical Return Values on Failure
200 OK – The body describes the requested permission.	404 Not Found – When the specified resource URI or recipient is invalid.

2.3.3 Setting Multiple Permissions

The POST method assigns any number of permissions to any number of resources specified in the body of the request. All permissions must be newly assigned, and the request will fail if a recipient already has an assigned (not inherited) permission. Use the PUT method to update assigned permissions.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/permissions**

Content-Type	Content
application/collection+json	A JSON object that describes a set of permissions, for example:

```
{
  "permission" :[
    {
    "uri":"/properties",
    "recipient":"role:/ROLE_USER",
    "mask":"1"
    },
    {
    "uri":"/properties",
    "recipient":"role:/ROLE_ADMIN",
    "mask":"32"
    }
]}
```

Return Value on Success	Typical Return Values on Failure
201 Created – The request was successful.	400 Bad Request – A permission is already assigned or the given permission mask is invalid.

The PUT method modifies exiting permissions (already assigned).

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/permissions**/path/to/resource

Content-Type	Content
application/collection+json	A JSON object that describes a set of permissions. Because a single resource is specified in the URL, all permissions apply to the same resource, and the server ignores the `uri` field in the JSON object.

```
{
```

	`"permission" :[`
	`{`
	`"uri":"/foo",`
	`"recipient":"role:/organization_1/ROLE_MANAGER",`
	`"mask":"30"`
	`},`
	`{`
	`"uri":"/bar",`
	`"recipient":"user:/organization_1/joeuser",`
	`"mask":"32"`
	`}`
	`]}`

Return Value on Success	Typical Return Values on Failure
200 OK – The request was successful.	400 Bad Request – If a recipient or mask is invalid. 404 Not Found – If the resource in the URL is invalid.

2.3.4 Setting a Single Permission

The POST method accepts a single permission descriptor.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/permissions**

Content-Type	Content

application/json	A JSON object that describes a single permission on a single resource, for example:
	`{`
	`"uri":"/properties",`
	`"recipient":"role:/ROLE_USER",`
	`"mask":"1"`
	`}`

Return Value on Success	Typical Return Values on Failure
201 Created – The request was successful.	400 Bad Request – The permission is already assigned or the given mask is invalid.

The PUT method accepts a resource and recipient in the URL.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/permissions**/path/to/resource;recipient= <recipient>

Argument	Type/Value	Description
recipient	string required	The recipient format specifies `user` or `role`, the organization if necessary, and the object ID. The slash characters must be encoded, for example: user:%2Forganization_1%2Fjoeuser

Content-Type	Content

application/json	A JSON object that describes only the mask, for example:
	`{`
	`  "uri": null,`
	`  "recipient": null,`
	`  "mask":"2"`
	`}`

Return Value on Success	Typical Return Values on Failure
200 OK – The request was successful, and the response body contains the single permission that was modified.	400 Bad Request – If the mask is invalid. 404 Not Found – If the resource or the recipient in the URL is invalid.

2.3.5 Deleting Permissions in Bulk

The DELETE method removes all assigned permissions from the designated resource. After returning successfully, all effective permissions for the resource are inherited.

Method	URL
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest_v2/permissions**/path/to/resource

Return Value on Success	Typical Return Values on Failure
204 No Content – The request was successful.	404 Not Found – If the resource in the URL is invalid.

2.3.6 Deleting a Single Permission

Specify a recipient in the URL of the DELETE method to remove only that permission.

Method	URL
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest_v2/permissions**/path/to/resource;recipient=<recipient>

Argument	Type/Value	Description
recipient	string required	The recipient format specifies `user` or `role`, the organization if necessary, and the object ID. The slash characters must be encoded, for example:

		user:%2Forganization_1%2Fjoeuser

Return Value on Success	Typical Return Values on Failure
204 No Content – The request was successful.	404 Not Found – If the resource or the recipient in the URL is invalid.

2.4 The v2/export Service

The export service works asynchronously: first you request the export with the desired options, then you monitor the state of the export, and finally you request the output file. Each step requires a different service call. You must be authenticated as the system admin (superuser) for the export services.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/export**/

Content-Type	Content
application/json	A JSON object that describes the export options.

Return Value on Success	Typical Return Values on Failure
200 OK – Returns a JSON object that gives the ID of the started export operation.	401 Unauthorized – Export is available only to the system admin user (superuser).

The content to send describes the export options, for example:

```
{
  roles: ["ROLE_USER","organization_1|ROLE_MANAGER"],
  users: ["jasperadmin","organization_1|joe"],
  uris: ["path/to/resource/1", "organizations/organization_1/path/to/resource/2"]
  parameters: ["role-users", "repository-permissions"]
}
```

As shown above, commercial editions must use the organization syntax for all roles, users, and URIs. The following table describes the export parameters:

Export Options	
everything	Export everything except audit and monitoring: all repository resources, permissions, report jobs, users, roles, and server settings.
role-users	When this option is present, each role export triggers the export of all users belonging to the role. This option should only be used if roles are specified

Export Options	
repository-permissions	When this option is present, repository permissions are exported along with each exported folder and resource. This option should only be used if uris are specified.
include-access-events	When this option is present, access events (date, time, and user name of last modification) are exported along with each exported folder and resource. This option should only be used if uris are specified.
include-audit-events	Include audit data for all resources and users in the export. The audit feature must be enabled in the server configuration.
include-monitoring-events	Include monitoring events. The monitoring feature must be enabled in the server configuration.

The body of the response contains the ID of the export operation needed to check its status and later download the file:

```
{
  id: "njkhfs8374",
  state: {
    phase: "inprogress",
    message: "Progress..."
  }
}
```

2.4.1 Checking the Export State

After receiving the export ID, you can check the state of the export operation.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/export**/<export-id>/**state**

Return Value on Success	Typical Return Values on Failure
200 OK – Returns a JSON object that gives the current state of the export operation.	404 Not Found – When the specified export ID is not found.

The body of the response contains the current state of the export operation:

```
{                               {                               {
  phase: "inprogress",            phase: "ready",                 phase: "failure",
  message: "Progress..."          message: "Ready!"               message: "Not enough space on
}                               }                                          disk"
                                                                }
```

2.4.2 Fetching the Export Output

When the export state is `ready`, you can download the zip file containing the export catalog.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/export**/<export-id>/<fileName>
Return Value on Success	**Typical Return Values on Failure**
200 OK – Returns the exported catalog as a zip file with the given <fileName>.	404 Not Found – When the specified export ID is not found.

2.5 The v2/import Service

Use the following service to upload a catalog as a zip file and import it with the given options. Specify options as arguments in the format <argument>=true. Arguments that are omitted are assumed to be false. You must be authenticated as the system admin (superuser) for the import service.

Jaspersoft does not recommend uploading files greater than 2 gigabytes.

Method	URL	
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/import**?<arguments>	
Argument	**Value**	**Description**
update?	true	Resources in the catalog replace those in the repository if their URIs and types match.
skip-user-update?	true	When used with update=true, users in the catalog are not imported or updated. Use this option to import catalogs without overwriting currently defined users.
include-access-events?	true	Restores the date, time, and user name of last modification if they are included in the catalog to import.
include-audit-events?	true	Imports audit events if they are included in the catalog.
include-monitoring-events?	true	Imports audit events if they are included in the catalog.
include-server-setting?	true	Imports server settings if they are included in the catalog.
Content-Type		**Content**
application/zip		The catalog file to import.

Return Value on Success	Typical Return Values on Failure
200 OK – Returns a JSON object that indicates the import was a success.	401 Unauthorized – Import is available only to the system admin user (superuser).

The body of the response indicates the success of the import:

```
{
  phase: "ready",
  message: "Ready!"
}
```

Chapter 3 REST v2 - Report Services

For authentication using the REST web services, see **section 1.2, "REST Authentication," on page 12**.

This chapter includes the following sections:

- **The v2/reports Service**
- **The v2/reportExecutions Service**
- **The v2/inputControls Service**
- **The v2/options Service**
- **The v2/jobs Service**
- **The v2/queryExecutor Service**

3.1 The v2/reports Service

The rest_v2/reports service reimplements the functionality of the rest/report service. The new service simplifies the API for obtaining report output, such as PDF and XLS. The new service also provides more functionality to interact with running reports, report options, and input controls.

3.1.1 Running a Report

The new v2/reports service allows clients to receive report output in a single request-response. The output format is specified in the URL as a file extension to the report URI.

Method	**URL**	
GET	http://<host>:<port>/jasperserver[-pro]/**rest_ v2/reports**/path/to/report.<format>?<arguments>	
Argument	**Type/Value**	**Description**
<format>	output type	One of the following formats: pdf, html, xls, xlsx, rtf, csv, xml, docx, odt, ods, jprint.
`page?`	Integer > 0	An integer value used to export a specific page

<inputControl>	String	Any input control that is defined for the report. Input controls that are multi-select may appear more than once. See examples below.
`interactive?`	Boolean	In a commercial editions of the server where HighCharts are used in the report, this property determines whether the JavaScript necessary for interaction is generated when exporting to HTML. By default it is true. If set to false, the chart is generated as a non-interactive image file.
`onePagePerShee-t?`	Boolean	Valid only for the XLS format. When true, each page of the report is on a separate spreadsheet. When false or omitted, the entire report is on a single spreadsheet. If your reports are very long, set this argument to true, otherwise the report will not fit on a single spreadsheet and cause an error.

Return Value on Success	**Typical Return Values on Failure**
200 OK – The content is the requested file.	404 Not Found – When the specified report URI is not found in the repository.

The follow examples show various combinations of formats, arguments, and input controls:

http://<host>:<port>/jasperserver[-pro]/rest_v2/reports/reports/samples/AllAccounts.html (all pages)

http://<host>:<port>/jasperserver[-pro]/rest_v2/reports/reports/samples/AllAccounts.html?page=43

http://<host>:<port>/jasperserver[-pro]/rest_v2/reports/reports/samples/AllAccounts.pdf (all pages)

http://<host>:<port>/jasperserver[-pro]/rest_v2/reports/reports/samples/AllAccounts.pdf?page=1

http://<host>:<port>/jasperserver[-pro]/rest_
v2/reports/reports/samples/EmployeeAccounts.html?EmployeeID=sarah_id

http://<host>:<port>/jasperserver[-pro]/rest_v2/reports/reports/samples/Cascading_multi_select_report.html?
Country_multi_select=USA&Cascading_state_multi_select=WA&Cascading_state_multi_select=CA

JasperReports Server does not support exporting Highcharts charts with background images to PDF, ODT, DOCX, or RTF formats. When exporting or downloading reports with Highcharts that have background images to these formats, the background image is removed from the chart. The data in the chart is not affected.

3.1.2 Finding Running Reports

The new v2/reports service provides functionality to stop reports that are running. Reports can be running from user interaction, web service calls, or scheduling. The following method provides several ways to find reports that are currently running, in case the client wants to stop them.

This syntax of the v2/reports service is deprecated. See **"The v2/reportExecutions Service" on page 68**.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reports**/path/to/report/ http://<host>:<port>/jasperserver[-pro]/**rest_v2/reports**?<arguments>

Argument	Type/Value	Description
`jobID?`	String	Find the running report based on its jobID in the scheduler.
`jobLabel?`	String	Find the running report based on its jobLabel in the scheduler.
`userName?`	String	Name of user who has scheduled a report, in the format <username>%7C<organizationID>. The |<organizationID> is required for all users except system admins (superuser).
`fireTime From?`	date/time	Date and time in the following pattern: yyyy-MM-dd'T'HH:mmZ. Together, these arguments create a time range to find when the running report was started. Both of the range limits are inclusive. Either argument may be null to signify an open-ended range.
`fireTimeTo?`	date/time	

Return Value on Success	Typical Return Values on Failure
200 OK – The content is a list of execution IDs that can be used for cancellation.	404 Not Found – When the specified report URI is not found in the repository.

For security purposes, the search for running reports is has the following restrictions:

- The system administrator (`superuser`) can see and cancel any report running on the server.
- An organization admin (`jasperadmin`) can see every running report, but can cancel only the reports that were started by a user of the same organization or one of its child organizations.
- A regular user can see every running report, but can cancel only the reports that he initiated.

3.1.3 Terminate Running Report

Use the following method to stop a running report, as found with the previous method.

This syntax of the v2/reports service is deprecated. See **"The v2/reportExecutions Service" on page 68**.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reports**/<executionID>**/status/**

Content-Type	Content
application/xml	Either an empty instance of the ReportExecutionCancellation class or <status>cancelled</status>.

Return Value on Success	Typical Return Values on Failure
200 OK – The content also contains: <status>cancelled</status>.	204 No Content – When the specified execution ID is not found on the server, and the response body is empty.

3.2 The v2/reportExecutions Service

The v2/reports service allows clients to easily run a report, wait for the reply, and receive the output. This is called synchronous report execution because the client must wait for the response. When managing large reports that may take minutes to complete, or when running a large number of reports simultaneously, sychronous report execution slows down the client or uses many threads, each waiting for a report.

The v2/reportExecutions service provides asynchronous report execution, so that the client does not need to wait for report output. Instead, the client obtains a reqest ID and periodicallychecks the status of the report to know when it is ready. When the report is finished, the client can download the output. The client can also send an asynchronous request for other export formats (PDF, Excel, and others) of the same report. Again the client can check the status of the export and download the result when the export has completed.

Reports being scheduled on the server also run asynchronously, and the v2/reportExecutions allows you to access jobs that are triggered by the scheduler. Finally, the v2/reportExecutions service allows the client to stop any report execution or job that has been triggered.

3.2.1 Running a Report Asynchronously

In order to run a report asynchronously, the v2/reportExecutions service provides a method to specify all the parameters needed to launch a report. Report parameters are all sent as a `reportExecutionRequest` object. The response from the server contains the request ID needed to track the execution until completion.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reportExecutions**

Content-Type	Content
application/xml application/json	A complete `ReportExecutionRequest` in either XML or JSON format. See the example and table below for an explanation of its properties.

Return Value on Success	Typical Return Values on Failure
200 OK – The content contains a ReportExecution descriptor. See below for an example	403 Forbidden – When the logged-in user does not have permission to access the report in the request. 404 Not Found – When the report URI specified in the request does not exist.

The following example shows the structure of the `ReportExecutionRequest`:

```
<reportExecutionRequest>
    <reportUnitUri>/supermart/details/CustomerDetailReport</reportUnitUri>
    <async>true</async>
    <freshData>false</freshData>
    <saveDataSnapshot>false</saveDataSnapshot>
    <outputFormat>html</outputFormat>
    <interactive>true</interactive>
    <ignorePagination>false</ignorePagination>
    <pages>1-5</pages>
    <parameters>
        <reportParameter name="someParameterName">
            <value>value 1</value>
            <value>value 2</value>
        </reportParameter>
        <reportParameter name="someAnotherParameterName">
            <value>another value</value>
        </reportParameter>
    </parameters>
</reportExecutionRequest>
```

The following table describes the properties you can specify in the `ReportExecutionRequest`:

Table 3-1 Report Execution Properties

Property	Required or Default	Description
`reportUnitUri`	Required	Repository path (URI) of the report to run. For commercial editions with organizations, the URI is relative the the logged-in user's organization.
`outputFormat`	Required	Specifies the desired output format: pdf, html, xls, xlsx, rtf, csv, xml, docx, odt, ods, jprint.
`freshData`	false	When data snapshots are enabled, specifies whether the report should get fresh data by querying the data source or if false, use a previously saved data snapshot (if any). By default, if a saved data snapshot exists for the report it will be used when running the report.
`saveDataSnapshot`	false	When data snapshots are enabled, specifies whether the data snapshot for the report should be written or overwritten with the new data from this execution of the report.
`interactive`	true	In a commercial editions of the server where HighCharts are used in the report, this property determines whether the JavaScript necessary for interaction is generated and returned as an attachment when exporting to HTML. If false, the chart is generated as a non-interactive image file (also as an attachment).
`ignorePagination`	false	When set to true, the report is generated as a single long page. This can be used with HTML output to avoid pagination.

Property	Required or Default	Description
`pages`	Optional	Specify a page range to generate a partial report. The format is <startPageNumber>-<endPageNumber>
`async`	false	Determines whether reportExecution is synchronous or asynchronous. When set to true, the response is sent immediately and the client must poll the report status and later download the result when ready. By default, this property is false and the operation will wait until the report execution is complete, forcing the client to wait as well, but allowing the client to download the report immediately after the response.
`transformerKey`	Optional	Advanced property used when requesting a report as a JasperPrint object. This property can specify a JasperReports Library generic print element transformers of class net.sf.jasperreports.engine.export. GenericElementTransformer. These transformers are pluggable as JasperReports. extensions
`attachmentsPrefix`	attachments	For HTML output, this property specifies the URL path to use fo downloading the attachment files (JavaScript and images). The full path of the devault value is: {contextPath}/rest_v2/reportExecutions/{reportExecutionId}/exports/{exportOptions}/attachments/ You can specify a different URL path using the placeholders {contextPath}, {reportExecutionId} and {exportOptions}.
`parameters`		A list of input control parameters and their values.

When successful, the reply from the server contains the `reportExecution` descriptor. This descriptor contains the request ID and status needed in order for the client to request the output. There are two statuses, one for the report execution itself, and one for the chosen output format. The following descriptor shows that the report is still executing (`<status>execution</status>)`.

```
<reportExecution>
    <currentPage>1</currentPage>
    <exports>
        <export>
            <id>html</id>
            <status>queued</status>
        </export>
    </exports>
    <reportURI>/supermart/details/CustomerDetailReport</reportURI>
    <requestId>677629003_1355225037212_1</requestId>
    <status>execution</status>
</reportExecution>
```

The value of the `async` property in the request determines whether or not the report output is available when the response is received. Your client should implement either synchronous or asynchronous processing of the response depending on the value you set for the `async` property.

3.2.2 Polling Report Execution

When requesting reports asynchronously, use the following method to poll the status of the report execution. The request ID in the URL is the one returned in the `reportExecution` descriptor.

Method	URL	
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reportExecutions/**requestID/**status**/	
Options		
accept: application/xml (default) accept: application/json		
Return Value on Success		**Typical Return Values on Failure**
200 OK – The content contains the report status, for example: XML: `<status>ready</status>` JSON: `{ "value": "ready" }`		404 Not Found – When the request ID specified in the request does not exist.

3.2.3 Requesting Report Execution Details

Once the report is ready, your client must determine the names of the files to download by requesting the `reportExecution` descriptor again. Specify the requestID in the URL as follows:

Method	URL	
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reportExecutions/**requestID	
Options		
accept: application/xml (default) accept: application/json		
Return Value on Success		**Typical Return Values on Failure**
200 OK – The content contains a ReportExecution descriptor. See below for an example.		404 Not Found – When the request ID specified in the request does not exist.

The report execution descriptor now contains the list of exports for the report, including the report output itself and any other file attachments. File attachments such as images and JavaScript occur only with HTML export.

```
<reportExecution>
  <reportURI>/reports/samples/AllAccounts</reportURI>
  <requestId>912382875_1366638024956_2</requestId>
  <status>ready</status>
  <totalPages>47</totalPages>
  <currentPage>1</currentPage>
  <exports>
    <export>
      <id>html</id>
      <outputResource>
        <contentType>text/html</contentType>
      </outputResource>
      <status>ready</status>

      <attachments>
        <attachment>
          <contentType>image/jpeg</contentType>
          <fileName>img_0_46_1</fileName>
        </attachment>
        <attachment>
          <contentType>image/png</contentType>
          <fileName>img_0_0_0</fileName>
        </attachment>
        <attachment>
          <contentType>image/png</contentType>
          <fileName>img_0_46_0</fileName>
        </attachment>
      </attachments>
    </export>
  </exports>
</reportExecution>
```

3.2.4 Requesting Report Output

After requesting a report execution and waiting synchronously or asynchronously for it to finish, your client is ready to download the report output.

Every export format of the report has an ID that is used to retrieve it. For example, the HTML export in the previous example has the ID `html`. To download the main report output, specify this export ID in the following method:

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_ v2/reportExecutions/**requestID/**exports**/exportID/**outputResource**

Return Value on Success	Typical Return Values on Failure
200 OK – The content is the main output of the report, in the format specified by the `contentType` property of the `outputResource` descriptor, for example: `text/html`	404 Not Found – When the request ID specified in the request does not exist.

For example, to download the main HTML of the report execution response above, use the following URL:

GET http://localhost:8080/jasperserver-pro/rest_v2/reportExecutions/912382875_1366638024956_
2/exports/html/outputResource

JasperReports Server does not support exporting Highcharts charts with background images to PDF, ODT, DOCX, or RTF formats. When exporting or downloading reports with Highcharts that have background images to these formats, the background image is removed from the chart. The data in the chart is not affected.

To download file attachments for HTML output, use the following method. You must download all attachments to display the HMTL content properly. The given URL is the default path, but it can be modified with the `attachmentsPrefix` property in the reportExecutionRequest, as described in **Table 3-1, "Report Execution Properties," on page 69**.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_ v2/reportExecutions/**requestID/**exports**/exportID/**attachments**/fileName

Return Value on Success	Typical Return Values on Failure
200 OK – The content is the attachment in the format specifiedin the `contentType` property of the `attachment` descriptor, for example: `image/png`	404 Not Found – When the request ID specified in the request does not exist.

For example, to download the one of the images for the HTML report execution response above, use the following URL:

GET http://localhost:8080/jasperserver-pro/rest_v2/reportExecutions/912382875_1366638024956_
2/exports/html/attachments/img_0_46_0

3.2.5 Exporting a Report Asynchronously

After running a report and downloading its content in a given format, you can request the same report in other formats. As with exporting report formats through the user interface, the report does not run again because the export process is independent of the report.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reportExecutions/**requestID/**exports/**

Content-Type	Content

application/xml
application/json
	Send an `export` descriptor in either XML or JSON format to specify the format and details of your request. For example:
	`<export>`
	`    <outputFormat>html</outputFormat>`
	`    <pages>10-20</pages>`
	`    <attachmentsPrefix>./images/</attachmentsPrefix>`
	`</export>`

Options	
accept: application/xml (default) accept: application/json	
Return Value on Success	**Typical Return Values on Failure**
200 OK – The content contains an `exportExecution` descriptor. See below for an example.	404 Not Found – When the request ID specified in the request does not exist.

The following example shows the `exportExecution` descriptor that the server sends in response to the export request:

```
<exportExecution>
    <id>html;attachmentsPrefix=./images/</id>
    <status>ready</status>
    <outputResource>
        <contentType>text/html</contentType>
    </outputResource>
</exportExecution>
```

3.2.6 Polling Export Execution

As with the execution of the main report, you can also poll the execution of the export process.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reportExecutions**/requestID/**exports**/exportID/**status**
Options	
accept: application/xml (default) accept: application/json	

Return Value on Success	Typical Return Values on Failure
200 OK – The content contains the status of the export process, similar to the status field of the `exportExecution` descriptor. For example: XML: `<status>ready</status>` JSON: `{ "value": "ready" }`	404 Not Found – When the request ID specified in the request does not exist.

For example, to get the status of the HTML export in the previous example, use the following URL:

GET http://localhost:8080/jasperserver-pro/rest_v2/reportExecutions/912382875_1366638024956_2/exports/html/status

When the status is “ready” your client can download the new export output and any attachments as described in section **section 3.2.4, “Requesting Report Output,” on page 72**. For example:

GET http://localhost:8080/jasperserver-pro/rest_v2/reportExecutions/912382875_1366638024956_2/exports/html/outputResource

GET http://localhost:8080/jasperserver-pro/rest_v2/reportExecutions/912382875_1366638024956_2/exports/html/images/img_0_46_0

3.2.7 Finding Running Reports and Jobs

The v2/reportExecutions service provides a method to search for reports that are running on the server, including report jobs triggered by the scheduler.

To search for running reports, use the search arguments with the following URL:

Method	URL	
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reportExecutions**?<arguments>	
Argument	**Type/Value**	**Description**
`reportURI`	Optional String	This string matches the repository URI of the running report, relative the currently logged-in user’s organization.
`jobID`	Optional String	For scheduler jobs, this argument matches the ID of the job that triggered the running repot.
`jobLabel`	Optional String	For scheduler jobs, this argument matches the name of the job that triggered the running repot.
`userName`	Optional String	For scheduler jobs, this argument matches the user ID that created the job.
`fireTimeFrom`	Optional Date/Time	For scheduler jobs, the fire time arguments define a range of time that matches if the job that is currently running was triggered during this time. You can specify either or both of the arguments. Specify the date and time in the following pattern: yyyy-MM-dd'T'HH:mmZ.
`fireTimeTo`		

Options	
accept: application/xml (default) accept: application/json	
Return Value on Success	**Typical Return Values on Failure**
200 OK – The content is a descriptor for each of the matching results. 204 No Content – When the search results are empty.	

The response contains a list of summary `reportExecution` descriptors, for example in XML:

```
<reportExecutions>
    <reportExecution>
        <reportURI>repo:/supermart/details/CustomerDetailReport</reportURI>
        <requestId>2071593484_1355224559918_5</requestId>
    </reportExecution>
</reportExecutions>
```

Given the request ID, you can obtain more information about each result by downloading the full `reportExecution` descriptor, as described in section **section 3.2.3, "Requesting Report Execution Details," on page 71**.

For security purposes, the search for running reports is has the following restrictions:

- The system administrator (`superuser`) can see and cancel any report running on the server.
- An organization admin (`jasperadmin`) can see every running report, but can cancel only the reports that were started by a user of the same organization or one of its child organizations.
- A regular user can see every running report, but can cancel only the reports that he initiated.

3.2.8 Stopping Running Reports and Jobs

To stop a report that is running and cancel its output, use the PUT method and specify a status of "cancelled" in the body of the request.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reportExecutions/**requestID/**status**/

Content-Type	Content
application/xml application/json	Send a `status` descriptor in either XML or JSON format with the value `cancelled`. For example: XML: `<status>cancelled</status>` JSON: `{ "value": "cancelled" }`

Options	
accept: application/xml (default) accept: application/json	
Return Value on Success	**Typical Return Values on Failure**
200 OK – When the report execution was successfully stopped, the server replies with the same status: XML: `<status>cancelled</status>` JSON: `{ "value": "cancelled" }` 204 No Content – When the report specified by the request ID is not running, either because it finished running, failed, or was stopped by another process.	404 Not Found – When the request ID specified in the request does not exist.

3.3 The v2/inputControls Service

The v2/reports service includes methods for reading and setting input controls. The inputControls methods return an XML descriptor by default, but you can optionally specify the JSON format. The examples in this section use the JSON format.

3.3.1 Listing Input Control Structure

The following method returns a description of the structure of the input controls for a given report.

Method	**URL**
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reports**/path/to/report/**inputControls/**
Options	
accept: application/json	
Return Value on Success	**Typical Return Values on Failure**
200 OK – The content is a JSON object that describes the input control structure. See example below.	404 Not Found – When the specified report URI is not found in the repository.

The body of the response contains the structure of the input controls for the report. This structure contains the information needed by your application to display the input controls to your users and allow them to make a selection. In particular, this includes any cascading structure as a set of dependencies between input controls. Each input control also has a type that indicates how the user should be allowed to make a choice:

- bool
- singleSelect
- singleSelectRadio
- multiSelectCheckbox
- multiSelect
- singleValue
- singleValueText
- singleValueNumber
- singleValueDate
- singleValueDatetime
- singleValueTime

The following example shows a response in the JSON format:

```
{
"inputControl" : [ {
  "id":"Cascading_name_single_select",
  "label":"Cascading name single select",
  "mandatory":"true",
  "readOnly":"false",
  "type":"singleSelect",
  "uri":"repo:/reports/samples/Cascading_multi_select_report_files/Cascading_name_single_select",
  "visible":"true",
  "masterDependencies":{"controlId":["Country_multi_select","Cascading_state_multi_
                      select"]},
  "slaveDependencies":null,
  "validationRules": [{ ... }]
    "state": {
    "uri": "/reports/samples/Cascading_multi_select_report_files/
            Cascading_name_single_select",
    "id": "Cascading_name_single_select",
    "value": null,
    "options": [{
      "selected": false,
      "label": "A & U Jaramillo Telecommunications, Inc",
      "value": "A & U Jaramillo Telecommunications, Inc"
      },      ...      ]}               }
  },
  ...
]}
```

The structure includes a set of validation rules for each input control. These rules indicate what type of validation your client should perform on input control values it receives from your users, and if the validation fails, the message to display. Depending on the type of the input control, the following validations are possible:

- mandatoryValidationRule – This input is required and your client should ensure the user enters a value.
- dateTimeFormatValidation – This input must have a data time format and your client should ensure the user enters a valid date and time.

The following sample shows the structure of these two possible validation rules.

```
  "validationRules": [{
    "mandatoryValidationRule" : {
      "errorMessage" : "This field is mandatory so you must enter data."
    },
    "dateTimeFormatValidationRule" : {
      "errorMessage" : "Specify a valid date value.",
      "format" : "yyyy-MM-dd"
    }
  }]
```

3.3.2 Listing Input Control Values

The following method returns a description of the possible values of all input controls for the report. Among these choices, it shows which ones are selected.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reports**/path/to/report/**inputControls/values/**
Options	
accept: application/json	
Return Value on Success	**Typical Return Values on Failure**
200 OK – The content is a JSON object that describes the input control values and selection.	404 Not Found – When the specified report URI is not found in the repository.

The body of the response contains the structure of the input controls for the report. The following example shows a response in the JSON format:

```
{
  "inputControlState" : [ {
    "uri" : "/reports/samples/.../Country_multi_select",
    "value" : "",
    "options" : {
      "option" : [ {
        "label" : "Canada",
        "selected" : "false",
        "value" : "Canada"
      }, {
        "label" : "Mexico",
        "selected" : "false",
        "value" : "Mexico"
      }, {

        "label" : "USA",
        "selected" : "true",
        "value" : "USA"
      } ]
    }
  },
  ...
  ]
}
```

If a selection-type input control has a null value, it is given as `~NULL~`. If no selection is made, its value is given as `~NOTHING~`.

3.3.3 Setting Input Control Values

The following method updates the state of current input control values, so they are set for the next run of the report.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reports**/path/to/report/**inputControls/**<ic1>;<ic2>;.../**values/**

Content-Type	Content

application/json	A JSON object that lists the new selected values. The value of every input control is given as an array of string values, even for single-select controls or multi-select controls with a single value. See also the example below:
	`{`
	`  "boolean-input-control" : ["true"],`
	`  "integer-input-control" : ["123456"],`
	`  "single-select-input-control" : ["some value"],`
	`  "multiple-select-input-control-1" : ["another value"],`
	`  "multiple-select-input-control-2" : ["first", "second", "third"]`
	`}`

Options
accept: application/json

Return Value on Success	Typical Return Values on Failure
200 OK – The content is a JSON object that describes the new selection of input control values.	404 Not Found – When the specified report URI is not found in the repository.

Assuming the client receives the response given in section **section 3.3.2, “Listing Input Control Values,” on page 79**, it can send the following request body:

```
{
   "Country_multi_select":["Mexico"],
   "Cascading_state_multi_select":["Guerrero", "Sinaloa"]
}
```

When specifying the option for the JSON format, the server’s response is:

```
{
  "inputControlState" : [ {
    "uri" : "/reports/samples/.../Country_multi_select",
    "value" : "",
    "options" : {
      "option" : [ {
        "label" : "Canada",
        "selected" : "false",
        "value" : "Canada"
      }, {
        "label" : "Mexico",
        "selected" : "true",
        "value" : "Mexico"
      }, {
        "label" : "USA",
        "selected" : "false",
        "value" : "USA"
      } ]
    }
  },
  ...
  ]
}
```

3.4 The v2/options Service

Report options are sets of input control values that are saved in the repository. A report option is always associated with a report.

3.4.1 Listing Report Options

The following method retrieves a list of report options summaries. The summaries give the name of the report options, but not the input control values that are associated with it.

Method	**URL**
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reports**/path/to/report**/options/**
Options	
accept: application/json	
Return Value on Success	**Typical Return Values on Failure**
200 OK – The content is a JSON object that lists the names of the report options for the given report.	404 Not Found – When the specified report URI is not found in the repository.

The body of the response contains the labels of the report options, for example:

```
{
  "reportOptionsSummary": [{
    "uri": "/reports/samples/Options",
    "id": "Options",
    "label": "Options"
  },
  {
    "uri": "/reports/samples/Options_2",
    "id": "Options_2",
    "label": "Options 2"
  }]
}
```

3.4.2 Creating Report Options

The following method creates a new report option for a given report. A report option is defined by a set of values for all of the report's input controls.

Method	URL	
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reports**/path/to/report/**options**?<arguments>	
Argument	**Type/Value**	**Description**
`label`	string	The name to give the new report option.
`overwrite?`	true / false	If true, any report option that has the same label is replaced. If false or omitted, any report option with the same label will not be replaced.
Content-Type		**Content**
application/json		A JSON object that lists the input control selections. See example below.
Options		
accept: application/json		
Return Value on Success		**Typical Return Values on Failure**
200 OK – The content is a JSON object that describes the new selection of input control values.		404 Not Found – When the specified report URI is not found in the repository.

In this example, we create new options for the sample report named Cascading_multi_select_report:

http://<host>:<port>/jasperserver[-pro]/rest_v2/reports/reports/samples/Cascading_multi_select_report/options?label=MyReportOption

With the following request body:

```
{
   "Country_multi_select":["Mexico"],
   "Cascading_state_multi_select":["Guerrero", "Sinaloa"]
}
```

When successful, the server responds with a JSON object that describes the new report options, for example:

```
{
  "uri":"/reports/samples/MyReportOption",
  "id":"MyReportOption",
  "label":"MyReportOption"
}
```

3.4.3 Updating Report Options

Use the following method to modify the values in a given report option.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reports**/path/to/report/**options**/<optionID>/

Content-Type	Content
application/json	A JSON object that lists the input control selections. See example below.

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the specified report URI is not found in the repository.

For example, we change the report option we created in section **section 3.4.2, "Creating Report Options," on page 82** with the following header:

http://<host>:<port>/jasperserver[-pro]/rest_v2/reports/reports/samples/Cascading_multi_select_report/options/MyReportOption

And the following request body:

```
{
   "Country_multi_select":["USA"],
   "Cascading_state_multi_select":["CA", "WA"]
}
```

3.4.4 Deleting Report Options

Use the following method to delete a given report option.

Method	URL
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest_v2/reports**/path/to/report/**options**/<optionID>/

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the specified report URI is not found in the repository.

3.5 The v2/jobs Service

The rest_v2/jobs service provides the interface to schedule reports and manage scheduled reports (also called jobs). It replaces the functionality of the jobsummary and job services. In addition, the new service provides an API to scheduler features that were introduced in JasperReports Server 4.7, such as bulk updates, pausing jobs, FTP output and exclusion calendars.

3.5.1 Listing Report Jobs

Use the following method to list jobs, either all jobs managed by the scheduler or the jobs for a specific report:

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs** http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs**/path/to/report

Return Value on Success	Typical Return Values on Failure
200 OK – The body contains XML that describes jobs in the scheduler.	404 Not Found – When no job is not found in the server.

The jobs are described in the `jobsummary` element such as the following example:

The jobsummary XML element returned by the rest_v2/jobs service has a different structure than the element with the same name returned by the rest/jobsummary service.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<jobs>
   <jobsummary>
    <id>2042</id>
    <label>JUnit_Job_New</label>
    <reportUnitURI>/organizations/organization_1/reports/samples/AllAccounts
      </reportUnitURI>
    <state>
      <nextFireTime>2222-02-04T13:47:00+02:00</nextFireTime>
      <value>NORMAL</value>
    </state>
    <version>1</version>
  </jobsummary>
</jobs>
```

3.5.2 Viewing a Job Definition

The GET method with a specific job ID retrieves the detailed information about that scheduled job.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs**/<jobID>/

Options
accept: application/xml (default) accept: application/job+json

Return Value on Success	Typical Return Values on Failure
200 OK – The body contains XML that describes all the job properties.	404 Not Found – When the specified job is not found in the server.

The GET method returns a `job` element that gives the output, scheduling, and parameter details, if any, for the job.

The job XML element returned by the rest_v2/jobs service has a different structure than the element with the same name returned by the rest/job service.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<job>
  <baseOutputFilename>AllAccounts</baseOutputFilename>
  <repositoryDestination>
    <folderURI>/reports/samples</folderURI>
    <id>2041</id>
    <outputDescription/>
    <overwriteFiles>false</overwriteFiles>
    <sequentialFilenames>false</sequentialFilenames>
    <version>0</version>
  </repositoryDestination>
  <description/>
  <id>2042</id>
  <label>MyNewJob</label>
  <mailNotification>
    <bccAddresses/>
    <ccAddresses/>
    <id>2007</id>
    <includingStackTraceWhenJobFails>false</includingStackTraceWhenJobFails>
    <messageText>Body of message</messageText><
    resultSendType>SEND_ATTACHMENT</resultSendType>
    <skipEmptyReports>true</skipEmptyReports>
    <skipNotificationWhenJobFails>false</skipNotificationWhenJobFails>
    <subject>Subject of message</subject>
    <toAddresses><address>name@example.com</address></toAddresses>
    <version>0</version>
  </mailNotification>
  <outputFormats>
    <outputFormat>XLS</outputFormat>
    <outputFormat>CSV</outputFormat>
    <outputFormat>PDF</outputFormat>
    <outputFormat>HTML</outputFormat>
    <outputFormat>DOCX</outputFormat>
  </outputFormats>
  <outputLocale/>
  <reportUnitURI>/reports/samples/AllAccounts</reportUnitURI>
  <simpleTrigger>
    <id>2040</id>
    <startDate>2222-02-04T03:47:00+02:00</startDate>
    <timezone>America/Los_Angeles</timezone>
    <version>0</version>
    <occurrenceCount>1</occurrenceCount>
  </simpleTrigger>
  <version>1</version>
</job>
```

As of JasperReports Server 5.5, the v2/jobs service also supports the extended application/job+json syntax. This format allows you to specify the scheduler features introduced in release 5.5, such as alert messages:

```
{
    "id": 3819,
    "version": 0,
    "username": "superuser",
    "label": "test",
    "description": "",
    "creationDate": "2013-08-30T02:02:40.382+03:00",
    "trigger": {
        "simpleTrigger": {
            "id": 3816,
            "version": 0,
            "timezone": "America/Los_Angeles",
            "calendarName": null,
            "startType": 2,
            // startDate format is yyyy-MM-dd HH:mm
            // time zone specified in a 'timezone' filed getting applied on a server
            "startDate": "2013-09-26 10:00",
            // endDate format is yyyy-MM-dd HH:mm
            // time zone specified in a 'timezone' filed getting applied on a server
            "endDate": null,
            "misfireInstruction": 0,
            "occurrenceCount": 1,
            "recurrenceInterval": null
        }
    },
    "source": {
        "reportUnitURI": "/organizations/organization_1/reports/samples/Cascading_multi_select_
report",
        "parameters": {
            "parameterValues": {
                "Country_multi_select": ["Mexico"],
                "Cascading_name_single_select": ["Chin-Lovell Engineering Associates"],
                "Cascading_state_multi_select": ["DF","Jalisco","Mexico"]
            }
        }
    },
    "baseOutputFilename": "Cascading_multi_select_report",
    "outputLocale": "",
    "mailNotification": null,
    "alert": {
        "id": 0,
        "version": -1,
        "recipient": "OWNER_AND_ADMIN",
        "toAddresses": {
            "address": []
        },
        "jobState": "FAIL_ONLY",
        "messageText": null,
        "messageTextWhenJobFails": null,
        "subject": null,
        "includingStackTrace": true,
        "includingReportJobInfo": true
    },
    "outputTimeZone": "America/Los_Angeles",
    "repositoryDestination": {
        "id": 3817,
        "version": 0,
        "folderURI": "/organizations/organization_1/reports/samples",
        "sequentialFilenames": false,
        "overwriteFiles": false,
        "outputDescription": "",
        "timestampPattern": null,
        "saveToRepository": true,
        "defaultReportOutputFolderURI": null,
        "usingDefaultReportOutputFolderURI": false,
        "outputLocalFolder": null,
        "outputFTPInfo": {
            "userName": null,
            "password": null,
            "folderPath": null,
            "serverName": null
        }
    },
    "outputFormats": {
        "outputFormat": ["PDF"]
    }
}
```

3.5.3 Extended Job Search

The GET method is also used for more advanced job searches. Some field of the jobsummary descriptor can be used directly as parameters, and fields of the job descriptor can also be used as search criteria. You can also control the pagination and sorting order of the reply.

Method	**URL**	
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs**?<arguments>	
Argument	**Type/Value**	**Description**
`label`	string	The name of the report job.
`owner`	string	The username of the report job creator; the user who scheduled the report.
`reportUnitUR-I?`	/path/to/repor-t	Gives the repository URI of a report to list all jobs. When this argument is omitted, this method returns all jobs for all reports.
`example?`	JSON jobModel	Searches for jobs that match the JSON jobModel. The jobModel is a fragment of a job descriptor containing one or more fields to be matched.
`numberOf Rows`	integer	Turns on pagination of the result by specifying the number of jobsummary descriptors per results page.
`startIndex`	integer	Determines the page number in paginated results by specifying the index of the first jobsummary to be returned.

sortType		Possible values are: NONE, SORTBY_JOBID, SORTBY_JOBNAME, SORTBY_REPORTURI, SORTBY_REPORTNAME, SORTBY_REPORTFOLDER, SORTBY_OWNER, SORTBY_STATUS, SORTBY_LASTRUN, SORTBY_NEXTRUN
isAscending	true / false	Determines the sort order: ascending if true, descending if false or omitted.

Return Value on Success	Typical Return Values on Failure
200 OK – The body contains XML that describes jobs in the scheduler that match the search criteria.	404 Not Found – When the specified report is not found in the server.

The body of the return value is an XML jobs descriptor containing jobsummary descriptors, as shown in section **section 3.5.1, "Listing Report Jobs," on page 83**.

The `example` parameter lets you specify a search on fields in the job descriptor, such as output formats. Some fields may be specified in both the `example` parameter and in a dedicated parameter, for example label. In that case, the search specified in the `example` parameter takes precedence.

For example, you can search for all jobs that specify and output format of PDF. The JSON string to specify this field is:

{"outputFormat":"PDF"}

And the corresponding URI, with proper encoding, is:

http://<host>:<port>/jasperserver[-pro]/rest_
v2/jobs?example=%7b%22outputFormat%22%3a%22PDF%22%7d

3.5.4 Scheduling a Report

To schedule a report, create its job descriptor similar to the one returned by the GET method, and use the PUT method of the V2/jobs service. Specify the report being scheduled inside the job descriptor. You do not need to specify any job IDs in the descriptor, because the server will assign them.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs/**

Content-Type	Content
application/xml application/json	A well-formed XML or JSON job descriptor.

Return Value on Success	Typical Return Values on Failure
201 Created – The body contains the XML job descriptor of the newly created job. It is similar to the one that was sent but now contains the jobID for the new job.	404 Not Found – When the report specified in the job descriptor is not found in the server.

3.5.5 Viewing Job Status

The following method returns the current runtime state of a job:

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs/**<jobID>**/state/**

Return Value on Success	Typical Return Values on Failure
200 OK – Body contains the status descriptor.	404 Not Found – When the specified <jobID> does not exist.

3.5.6 Editing a Job Definition

To modify an existing job definition, use the GET method to read its job descriptor, modify the descriptor as required, and use the POST method of the v2/jobs service. The POST method replaces the definition of the job with the given job ID.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs**/<jobID>/

Content-Type	Content
application/xml application/json	A well-formed XML or JSON job descriptor.

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the specified job is not found in the server.

3.5.7 Updating Jobs in Bulk

The POST method also supports other parameters to perform bulk updates on scheduled jobs.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs**?<arguments>

Argument	Type/Value	Description
`id?`	jobID string	Can be used multiple times to create a list of jobIDs to update

`replace Trigger IgnoreType`	true / false	When true, the trigger is replaced from the content being sent and the trigger type is ignored. When false or omitted, the trigger is updated automatically by the scheduler.
Content-Type		**Content**
application/xml		A well-formed XML jobModel descriptor. The jobModel is a fragment of a job descriptor containing only the fields to be updated. See example below.
Return Value on Success		**Typical Return Values on Failure**
200 OK – Body empty.		404 Not Found – When the specified job is not found in the server.

For example, the following request will update the job description in several jobs:

POST request: http://localhost:8080/jasperserver-pro/rest_v2/jobs?id=3798&id=3799&id=3800

And the body of the request contains:

```
<jobModel>
  <description>This description updated in bulk</description>
</jobModel>
```

3.5.8 Pausing Jobs

The following method pauses currently scheduled job execution. Pausing keeps the job schedule and all other details but prevents the job from running. It does not delete the job.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs/pause**/

Content-Type	Content
application/xml	A well-formed XML jobIdList descriptor that specifies the IDs of the jobs. See example below. If the body of the request is empty, or the list is empty, all jobs in the scheduler will be paused.

Return Value on Success	Typical Return Values on Failure
200 OK	

The following example shows a list of jobs sent in the body of the request.

```
<jobIdList>
  <jobId>1236</jobId>
  <jobId>1237</jobId>
  <jobId>1238</jobId>
  <jobId>1239</jobId>
</jobIdList>
```

3.5.9 Resuming Jobs

Use the following method to resume any or all paused jobs in the scheduler. Resuming a job means that any defined trigger in the schedule that occurs after the time it is resumed will cause the report to run again. Missed schedule triggers that occur before the job is resumed are never run.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs/resume**/

Content-Type	Content
application/xml	A well-formed XML jobIdList descriptor that specifies the IDs of the jobs. See example below. If the body of the request is empty, or the list is empty, all paused jobs in the scheduler will resume.

Return Value on Success	Typical Return Values on Failure
200 OK	

The XML format of the jobIdList descriptor in the request body is identical to the one used when pausing jobs:

```
<jobIdList>
  <jobId>1236</jobId>
  <jobId>1237</jobId>
</jobIdList>
```

3.5.10 Restarting Failed Jobs

Use the following method to rerun failed jobs in the scheduler. For each job to be restarted, the scheduler creates an immediate single-run copy of job, to replace the one that failed. Therefore, all jobs listed in the request body will run once immediately after issuing this command. The single-run copies have a misfire policy set so that they do not trigger any further failures (`MISFIRE_ INSTRUCTION_IGNORE_MISFIRE_POLICY`). If the single-run copies fail themselves, no further attempts are made automatically.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs/restart**/

Content-Type	Content
application/xml	A well-formed XML jobIdList descriptor that specifies the IDs of the jobs. See example below.

Return Value on Success	Typical Return Values on Failure
200 OK	

The XML format of the jobIdList descriptor in the request body is identical to the one used when pausing jobs:

```
<jobIdList>
  <jobId>8321</jobId>
  <jobId>8322</jobId>
</jobIdList>
```

3.5.11 Specifying FTP Output

The REST service allows a job to specify output to remote files through FTP (File Transfer Protocol). In addition to the repository location, you can specify an FTP server and path where JasperReports Server will write the output files when the job runs. You also need to provide a username and password to access the FTP server.

To specify these parameters, add the `outputFTPInfo` element to the XML job descriptor, as shown in the following example:

```
<job>
  <reportUnitURI>/reports/samples/AllAccounts</reportUnitURI>
  <label>MyJob</label>
  <description>MyJob description</description>
  <baseOutputFilename>WeeklyAccountsReport</baseOutputFilename>
  <repositoryDestination>
    <folderURI>/reports/samples</folderURI>
    <outputDescription/>
    <overwriteFiles>true</overwriteFiles>
    <sequentialFilenames>false</sequentialFilenames>

     <outputFTPInfo>

       <serverName>ftpserver.example.com</serverName>

       <userName>ftpUser</userName>

       <password>ftpPassword</password>

       <folderPath>/Shared/Users/ftpUser</folderPath>

     </outputFTPInfo>
   </repositoryDestination>
   <outputFormats>
     <outputFormat>XLS</outputFormat>
     <outputFormat>PDF</outputFormat>
   </outputFormats>
   ...
</job>
```

FTP output is always specified in addition to repository output, and the output will be written to both the repository and the FTP location. You cannot specify FTP output alone. The file names to be written are the same ones that are generated by the job output, as specified by the `baseOutputFilename`, sequential pattern if any, and format extensions such as .pdf. Similarly, the file overwrite and sequential filename behavior specified for repository output also apply to FTP output.

3.5.12 Calendar Exclusion for the Scheduler

The scheduler allows a job to be defined with a list of excluded days or times when you do not want the job to run. For example, if you have a report scheduled to run every business day, you want to exclude holidays that change every year. The list for excluded days and times is defined as a calendar, and there are various ways to define the calendar.

The scheduler stores any number of exclusion calendars that you can reference by name. When scheduling a report, reference the name of the calendar to exclude, and the scheduler automatically calculates the correct days to trigger the report. The scheduler also allows you to update an exclusion calendar and update all of the report jobs that used it. Therefore, you can update the calendar of excluded holidays every year and not need to modify any report jobs.

3.5.12.1 Listing All Registered Calendar Names

The following method returns the list of all calendar names that were added to the scheduler.

Method	URL	
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs/calendars/**?<parameter>	
Argument	**Type/Value**	**Description**
calendar Type	optional string	A type of calendar to return: annual, base, cron, daily, holiday, monthly, or weekly. See **Adding or Updating an Exclusion Calendar** for a description of the various types. You may specify only one calendarType parameter. When calendarType isn't specified, then all calendars names are returned. If calendarType has an invalid value, then an empty collection is returned.

Return Value on Success	Typical Return Values on Failure
200 OK – Body is XML that contains a list of calendar names.	401 Unauthorized

The list of calendar names in the result has the following XML format:

```
<calendarNameList>
  <calendarName>name1</calendarName>
  <calendarName>name2</calendarName>
</calendarNameList>
```

3.5.12.2 Viewing an Exclusion Calendar

The following method takes the name of an exclusion calendar and returns the definition of the calendar:

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs/calendars**/<calendarName>/

Return Value on Success	Typical Return Values on Failure
200 OK – Body is XML that contains the requested calendar.	404 Not Found – When the specified calendar name does not exist.

The calendar descriptor in the result has the following XML format:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<reportJobCalendar>
  <baseCalendar>
    <calendarType>base</calendarType>
    <excludeDates/>
    <description>Base calendar description</description>
    <excludeDays/>
    <timeZone>GMT+03:00</timeZone>
  </baseCalendar>
  <calendarType>daily</calendarType>
  <excludeDates/>
  <description>Main calendar description</description>
  <excludeDays/>
  <invertTimeRange>false</invertTimeRange>
  <rangeEndingCalendar  >2012-03-20T14:44:37.353+03:00</rangeEndingCalendar>
  <rangeStartingCalendar>2012-03-20T14:43:37.353+03:00</rangeStartingCalendar>
  <timeZone>GMT+03:00</timeZone>
</reportJobCalendar>
```

3.5.12.3 Deleting an Exclusion Calendar

Use the following method to delete a calendar by name.

Method	URL
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs/calendars**/<calendarName>/

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the specified calendar name does not exist.

3.5.12.4 Adding or Updating an Exclusion Calendar

This method creates a named exclusion calendar that you can use when scheduling reports. If the calendar already exists, you have the option of replacing it and updating all the jobs that used it.

Method	URL	
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/jobs/calendars**/<calendarName>?<arguments>	
Argument	**Type/Value**	**Description**
replace?	true / false	If true, any calendar existing in the JobStore with the same name is overwritten. When this argument is omitted, it is false by default.
update Triggers?	true / false	Whether or not to update existing triggers that referenced the already existing calendar so that they are based on the new trigger.

Content-Type	Content
application/xml	A well-formed XML calendar descriptor (see examples below).

Return Value on Success	Typical Return Values on Failure
200 OK –	404 Not Found – When the specified calendar name does not exist.

The following examples show the types of exclusion calendars that you can add to the scheduler:

- Base calendar.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<reportJobCalendar>
  <calendarType>base</calendarType>
  <description>Base calendar description</description>
  <timeZone>GMT+03:00</timeZone>
</reportJobCalendar>
```

- Annual calendar – A list of days that you want to exclude every year.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<reportJobCalendar>
  <calendarType>annual</calendarType>
  <description>Annual calendar description</description>
  <timeZone>GMT+03:00</timeZone>

  <excludeDays>
    <excludeDay>2012-03-20</excludeDay>
    <excludeDay>2012-03-21</excludeDay>
    <excludeDay>2012-03-22</excludeDay>
  </excludeDays>
</reportJobCalendar>
```

- Cron calendar – Defines the days and times to exclude as a cron expression.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<reportJobCalendar>
  <calendarType>cron</calendarType>
  <description>Cron format description</description>
  <cronExpression>0 30 10-13 ? * WED,FRI</cronExpression>
  <timeZone>GMT+03:00</timeZone>
</reportJobCalendar>
```

- Daily calendar – Defines a time range to exclude every day.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<reportJobCalendar>
  <calendarType>daily</calendarType>
  <description>Daily calendar description</description>
  <invertTimeRange>false</invertTimeRange>
  <rangeEndingCalendar>2012-03-20T14:44:37.353+03:00</rangeEndingCalendar>
  <rangeStartingCalendar>2012-03-20T14:43:37.353+03:00</rangeStartingCalendar>
  <timeZone>GMT+03:00</timeZone>
</reportJobCalendar>
```

- Holiday calendar – Defines a set of days to exclude that can be updated every year.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<reportJobCalendar>
  <calendarType>holiday</calendarType>
  <description>Holiday calendar description</description>
  <excludeDays>
    <excludeDay>2012-03-20</excludeDay>
    <excludeDay>2012-03-21</excludeDay>
    <excludeDay>2012-03-22</excludeDay>
  </excludeDays>
  <timeZone>GMT+03:00</timeZone>
</reportJobCalendar>
```

- Weekly calendar – Defines a set of days to be excluded each week.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<reportJobCalendar>
  <calendarType>weekly</calendarType>
  <description>test description</description>
  <excludeDaysFlags>
    <excludeDayFlag>false</excludeDayFlag> <!--SUNDAY--->
    <excludeDayFlag>true</excludeDayFlag>  <!--MONDAY--->
    <excludeDayFlag>false</excludeDayFlag>  <!--TUESDAY--->
    <excludeDayFlag>true</excludeDayFlag>  <!--WEDNESDAY--->
    <excludeDayFlag>false</excludeDayFlag>  <!--THURSDAY--->
    <excludeDayFlag>true</excludeDayFlag>  <!--FRIDAY--->
    <excludeDayFlag>false</excludeDayFlag>  <!--SATURDAY--->
  </excludeDaysFlags>
  <timeZone>GMT+03:00</timeZone>
</reportJobCalendar>
```

- Monthly calendar – Defines the dates to exclude every month.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<reportJobCalendar>
  <calendarType>monthly</calendarType>
  <description>Monthly calendar description</description>
  <excludeDaysFlags>
    <excludeDayFlag>true</excludeDayFlag> <!--01--->
    <excludeDayFlag>false</excludeDayFlag> <!--02--->
    <excludeDayFlag>true</excludeDayFlag> <!--03--->
    <excludeDayFlag>false</excludeDayFlag> <!--04--->
    <excludeDayFlag>true</excludeDayFlag> <!--05--->
    <excludeDayFlag>false</excludeDayFlag> <!--06--->
    <excludeDayFlag>true</excludeDayFlag> <!--07--->
    <excludeDayFlag>false</excludeDayFlag> <!--08--->
    <excludeDayFlag>true</excludeDayFlag> <!--09--->
    <excludeDayFlag>false</excludeDayFlag> <!--10--->
    <excludeDayFlag>true</excludeDayFlag> <!--11--->
    <excludeDayFlag>false</excludeDayFlag> <!--12--->
    <excludeDayFlag>false</excludeDayFlag> <!--13--->
    <excludeDayFlag>true</excludeDayFlag> <!--14--->
    <excludeDayFlag>false</excludeDayFlag> <!--15--->
    <excludeDayFlag>false</excludeDayFlag> <!--16--->
    <excludeDayFlag>false</excludeDayFlag> <!--17--->
    <excludeDayFlag>false</excludeDayFlag> <!--18--->
    <excludeDayFlag>false</excludeDayFlag> <!--19--->
    <excludeDayFlag>false</excludeDayFlag> <!--20--->
    <excludeDayFlag>false</excludeDayFlag> <!--21--->
    <excludeDayFlag>false</excludeDayFlag> <!--22--->
    <excludeDayFlag>false</excludeDayFlag> <!--23--->
    <excludeDayFlag>false</excludeDayFlag> <!--24--->
    <excludeDayFlag>false</excludeDayFlag> <!--25--->

    <excludeDayFlag>false</excludeDayFlag> <!--26--->
    <excludeDayFlag>false</excludeDayFlag> <!--27--->
    <excludeDayFlag>false</excludeDayFlag> <!--28--->
    <excludeDayFlag>false</excludeDayFlag> <!--29--->
    <excludeDayFlag>false</excludeDayFlag> <!--30--->
    <excludeDayFlag>false</excludeDayFlag> <!--31--->
</excludeDaysFlags>
<timeZone>GMT+03:00</timeZone>
</reportJobCalendar>
```

3.6 The v2/queryExecutor Service

In addition to running reports, JasperReports Server exposes queries that you can run through the rest_v2/queryExecutor service. In release 5.1, the only resource that supports queries is a Domain.

Method	URL
GET	http://<host>:<port>/jasperserver-pro/**rest_v2/queryExecutor/**path/to/Domain/?q=<query>

Argument	Type/Value	Description
q	Required String	The query string is a special format that references the fields and measures exposed by the Domain. To write this query, you must have knowledge of the Domain schema that is not available through the REST services. See below.
Options		
accept: application/xml (default) accept: application/json Accept-Language: <locale>, <relativeQualityFactor>; for example en_US, q=0.8;		

Return Value on Success	Typical Return Values on Failure
200 OK – The body contains the data that is the result of the query. See the format of the data below.	404 Not Found – When the specified Domain does not exist.

If the query is too large to fit in the argument in the URL, use the POST method to send it as request content:

Method	URL
POST	http://<host>:<port>/jasperserver-pro/**rest_v2/queryExecutor/**path/to/Domain/

Content-Type	Content
application/xml	The query string is a special format that references the fields and measures exposed by the Domain. To write this query, you must have knowledge of the Domain schema that is not available through the REST services. See below.
Options	
accept: application/xml (default) accept: application/json Accept-Language: <locale>, <relativeQualityFactor>; for example en_US, q=0.8;	

Return Value on Success	Typical Return Values on Failure
200 OK – The body contains the data that is the result of the query. See the format of the data below.	404 Not Found – When the specified Domain does not exist.

The following example show the format of a query in XML:

```
<query>
  <queryFields>
    <queryField id="expense_join_store.ej_store_store_city"/>
    <queryField id="expense_join_store.ej_store_store_country"/>
    <queryField id="expense_join_store.ej_store_store_name"/>
    <queryField id="expense_join_store.ej_store_store_state"/>
    <queryField id="expense_join_store.ej_store_store_street_address"/>
  </queryFields>
  <queryFilterString>expense_join_store.ej_store_store_country == 'USA'
                     and expense_join_store.ej_store_store_state == 'CA'
  </queryFilterString>
</query>
```

And the following sample shows the result of query. In order to optimize the size of the response, rows are presented as sets of values without the column names repeated for each row. The column IDs appear at the top of the result, as shown in the following example. As with the query, the result requires knowledge of the Domain schema to identify the human-readable column names.

```
<queryResult>
  <names>
    <name>expense_join_account.ej_account_account_description</name>
    <name>expense_join_account.ej_expense_fact_account_id</name>
    <name>expense_join_account.ej_account_account_parent</name>
    <name>expense_join_account.ej_account_account_rollup</name>
    <name>expense_join_account.ej_account_account_type</name>
    <name>expense_join_account.ej_account_Custom_Members</name>
    <name>expense_join.ej_expense_fact_amount</name>
    <name>expense_join_store.ej_store_store_type</name>
    <name>expense_join_store.ej_store_store_street_address</name>
    <name>expense_join_store.ej_store_store_city</name>
    <name>expense_join_store.ej_store_store_state</name>
    <name>expense_join_store.ej_store_store_postal_code</name>
    <name>expense_join_store.sample_time</name>
  </names>
  <values>
    <row>
      <value xsi:type="xs:string">Marketing</value>
      <value xsi:type="xs:int">4300</value>
      <value xsi:type="xs:int">4000</value>
      <value xsi:type="xs:string">+</value>
      <value xsi:type="xs:string">Expense</value>
      <value xsi:nil="true"/>
      <value xsi:type="xs:double">1884.0000</value>
      <value xsi:type="xs:dateTime">1997-01-01T04:05:06+02:00</value>
      <value xsi:type="xs:string">HeadQuarters</value>
      <value xsi:type="xs:string">1 Alameda Way</value>
      <value xsi:type="xs:string">Alameda</value>
      <value xsi:type="xs:string">CA</value>
      <value xsi:type="xs:int">94502</value>
      <value xsi:type="xs:string">USA</value>

      <value xsi:type="xs:time">04:05:06+02:00</value>
    </row>
     ...
  </values>
</queryResult>
```

Both date-only and timestamp fields are given in the ISO date-time format such as 1997-01-01T04:05:06+02:00.

For database columns that store a time and date that includes a time zone, such as “timestamp with time zone” in PostgreSQL, the result is not guaranteed to be in the same timezone as stored in the database. These dates and times are converted to the server’s time zone.

Chapter 4 REST v2 - Administration Services

Only administrative users may access the REST services for administration. For authentication using the REST web services, see section **section 1.2, "REST Authentication," on page 12**.

This chapter includes the following sections:

- **The v2/organizations Service**
- **The v2/users Service**
- **The v2/attributes Service**
- **The v2/roles Service**

4.1 The v2/organizations Service

This section describes functionality that can be restricted by the software license for JasperReports Server. If you don't see some of the options described in this section, your license may prohibit you from using them. To find out what you're licensed to use, or to upgrade your license, contact Jaspersoft.

In commercial editions of JasperReports Server 5.1 and later, the rest_v2/organizations service replaces the rest/organization service. It provides similar methods that allow you to list, view, create, modify, and delete organizations (also known as tenants). New functionality allows you to search for organizations by name and retrieve hierarchies of organizations.

Because the organization ID is used in the URL, this service can operate only on organizations whose ID is less than 100 characters long and does not contain spaces or special symbols. As with resource IDs, the organization ID is permanent and cannot be modified for the life of the organization.

4.1.1 Searching for Organizations

The GET method without any organization ID searches for organizations by ID, alias, or display name. If no search is specified, it returns a list of all organizations. Searches and listings start from but do not include the logged-in user's organization or the specified base (`rootTenantId`).

Method	URL
GET	http://<host>:<port>/jasperserver-pro/**rest_v2/organizations**?<arguments>

Argument	Type	Description
`q`	Optional String	Specify a string or substring to match the organization ID, alias, or name of any organization. The search is not case sensitive. Only the matching organizations are returned in the results, regardless of their hierarchy.
`include Parents`	Optional Boolean	When used with a search, the result will include the parent hierarchy of each matching organization. When not specified, this argument is false by default.
`rootTenantId`	Optional String	Specifies an organization ID as a base for searching and listing child organizations. The base is not included in the results. Regardless of this base, the `tenantFolderURI` values in the result are always relative to the logged-in user's organization. When not specified, the default base is the logged-in user's organization.

Options
accept: application/xml (default) accept: application/json

Return Value on Success	Typical Return Values on Failure
200 OK – The content is a set of descriptors for all organizations in the result. 204 No Content – The search did not return any organizations.	

The following example shows a search for an organization and its parent hierarchy:

GET http://localhost:8080/jasperserver-pro/rest_v2/organizations?q=acc&includeParents=true

This request has the following response, as viewed by superuser at the root of the organization hierarchy:

```
<organizations>
  <organization>
    <alias>Finance</alias>
    <id>Finance</id>
    <parentId>organizations</parentId>
    <tenantDesc></tenantDesc>
    <tenantFolderUri>/organizations/Finance</tenantFolderUri>
    <tenantName>Finance</tenantName>
    <tenantUri>/Finance</tenantUri>
    <theme>default</theme>
  </organization>

  <organization>
    <alias>Accounts</alias>
    <id>Accounts</id>
    <parentId>Finance</parentId>
    <tenantDesc></tenantDesc>
    <tenantFolderUri>/organizations/Finance/organizations/Accounts</tenantFolderUri>
    <tenantName>Accounts</tenantName>
    <tenantUri>/Finance/Accounts</tenantUri>
    <theme>default</theme>
  </organization>
</organizations>
```

4.1.2 Viewing an Organization

The GET method with an organization ID retrieves a single descriptor containing the list of properties for the organization. When you specify an organization, use its unique ID, not its path.

Method	URL
GET	http://<host>:<port>/jasperserver-pro/**rest_v2/organizations**/organizationID

Options
accept: application/xml (default) accept: application/json

Return Value on Success	Typical Return Values on Failure
200 OK – The content is the descriptor for the given organization.	404 Not Found – When the ID does not match any organization. The content includes an error message. 403 Forbidden – When the logged-in user does not have permission to view the given organization

The organization descriptor is identical to the one returned when searching or listing organization, but only a single descriptor is ever returned. The following example shows the descriptor in JSON format:

```
{
  "id":"Finance",
  "alias":"Finance",
  "parentId":"organizations",
  "tenantName":"Finance",
  "tenantDesc":" ",
  "tenantNote":null,
  "tenantUri":"/Finance",
  "tenantFolderUri":"/organizations/Finance",
  "theme":"default"
}
```

4.1.3 Creating an Organization

To create an organization, put all information in an organization descriptor, and include it in a POST request to the rest_v2/organizations service, with no ID specified in the URL. The organization is created in the organization specified by the `parentId` value of the descriptor.

Method	URL
POST	http://<host>:<port>/jasperserver-pro/**rest_v2/organizations**?<argument>

Argument	Type	Description
`createDefaultUsers`	Optional Boolean	Set this argument to false to suppress the creation of default users (joeuser, jasperadmin) in the new organization. When not specified, the default behavior is true and organizations are created with the standard default users.

Content-Type	Content
application/xml application/json	A partial or complete organization descriptor that includes the desired properties for the organization.

Return Value on Success	Typical Return Values on Failure
201 Created – The organization was successfully created using the values in the descriptor or default values if missing.	404 Not Found – When the ID of the parent organization cannot be resolved. 400 Bad Request – When the ID or alias of the new organization is not unique on the server, or when the ID in the description contains illegal symbols. The following symbols are not allowed: id and alias: `~!+-#$%^|` tenantName: `|&*?<>/\`

The descriptor sent in the request should contain all the properties you want to set on the new organization. Specify the `parentId` value to set the parent of the organization, not the `tenantUri` or `tenantFolderUri` properties. The following example shows the descriptor in JSON format:

```
{
  "id":"Audit",
  "alias":"Audit",
  "parentId":"Finance",
  "tenantName":"Audit",
  "tenantDesc":"Audit Department of Finance",
  "theme":"default"
}
```

However, all properties have defaults or can be determined based on the alias value. The minimal descriptor necessary to create an organization is simply the alias property. In this case, the organization is created as a child of the logged-in user's home organization. For example, if `superuser` posts the following descriptor, the server creates an organization with the name, ID, and alias of "HR" as a child of the root organization:

```
{
  "alias":"HR"
}
```

4.1.4 Modifying Organization Properties

To modify the properties of an organization, use the PUT method and specify the organization ID in the URL. The request must include an organization descriptor with the values you want to change. You cannot change the ID of an organization, only its name (used for display) and its alias (used for logging in).

Method	URL
PUT	http://<host>:<port>/jasperserver-pro/**rest_v2/organizations**/organizationID/

Content-Type	Content
application/xml application/json	A partial organization descriptor that includes the properties to change. Do not specify the following properties: • `id` – The organization ID is permanent and can never be modified. • `parentId` – Organizations cannot change parents. • `tenantUri` – Organizations cannot change the organization hierarchy. • `tenantFolderUri` – The organization folder is automatically based on its parent, which cannot be changed.

Return Value on Success	Typical Return Values on Failure
200 OK – The organization was successfully updated.	400 Bad Request – When some dependent resources cannot be resolved.

The following example shows a descriptor sent to update the name and description of an organization:

```
{
  "tenantName":"Audit Dept",
  "tenantDesc":"Audit Department of Finance Division"
}
```

4.1.5 Setting the Theme of an Organization

A theme determines how the JasperReports Server interface appears to users. Administrator can create and set different themes for each organization. To set a theme through web services, use the PUT method of the REST v2/organizations service to modify the corresponding property of the desired organization.

For example:

PUT http://localhost:8080/jasperserver-pro/rest_v2/organizations/Audit

```
{
  "theme":"jasper_dark"
}
```

For more information about themes, see the JasperReports Server Administrator Guide.

4.1.6 Deleting an Organization

To delete an organization, use the DELETE method and specify the organization ID in the URL. When deleting an organization, all of its resources in the repository, all of its sub-organizations, all of its users, and all of its roles are permanently deleted.

Method	URL
DELETE	http://<host>:<port>/jasperserver-pro/**rest_v2/organizations**/organizationID/
Return Value on Success	**Typical Return Values on Failure**
204 No Content – The organization was successfully deleted.	400 Bad Request – When attempting to delete the organization of the logged-in user. 404 Not Found – When the ID of the organization cannot be resolved.

4.2 The v2/users Service

The rest_v2/users service replaces the rest/user service. It provides similar methods that allow you to list, view, create, modify, and delete user accounts, including setting role membership. The new service provides improved search functionality, such as organization-based searches in commercial editions licensed to use organizations. Every method has two URL forms, one with an organization ID and one without.

Because the user ID and organization ID are used in the URL, this service can operate only on users and organizations whose ID is less than 100 characters long and does not contain spaces or special symbols. As with resource IDs, the user ID is permanent and cannot be modified for the life of the user account.

4.2.1 Searching for Users

The GET method without any user ID searches for and lists user accounts. It has options to search for users by name or by role. If no search is specified, it returns all users. The method has two forms:

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL without an organization ID.
- In commercial editions with organizations, use the first URL to list all users starting from the logged-in user's organization (root for the system admin), and use the second URL to list all users in a specified organization.

Method	URL	
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/users**?<arguments> http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**users**?<arguments>	
Argument	**Type**	**Description**
`search`	Optional String	Specify a string or substring to match the user ID or full name of any user. The search is not case sensitive.

`requiredRole`	Optional String	Specify a role name to list only users with this role. Repeat this argument to filter with multiple roles. In commercial editions with multiple organizations, specify roles as <roleName>%7C<orgID> (%7C is the | character).
`hasAll Required Roles`	Optional Boolean	When set to false with multiple requiredRole arguments, users will match if they have any of the given roles (OR operation). When true or not specified, users must match all of the given roles (AND operation).
`include SubOrgs`	Optional Boolean	Limits the scope of the search or list in commercial editions with multiple organizations. When set to false, the first URL form is limited to the logged-in user's organization, and the second URL form is limited to the organization specified in the URL. When true or not specified, the scope includes the hierarchy of all child organizations.

Options
accept: application/xml (default) accept: application/json

Return Value on Success	**Typical Return Values on Failure**
200 OK – The content is a set of descriptors for all users in the result. 204 No Content – The search did not return any users.	404 Not Found – When the organization ID does not match any organization. The content includes an error message.

The following example shows the first form of the URL on a community edition server:

GET http://localhost:8080/jasperserver/rest_v2/users?search=j

The response is a set of summary descriptors for all users containing the string "j":

```
<users>
  <user>
    <externallyDefined>false</externallyDefined>
    <fullName>jasperadmin User</fullName>
    <username>jasperadmin</username>
  </user>
  <user>
    <externallyDefined>false</externallyDefined>
    <fullName>Joe User</fullName>
    <username>joeuser</username>
  </user>
</users>
```

The next example shows the second form of the URL on a commercial edition server with multiple organizations:

GET http://localhost:8080/jasperserver/rest_v2/organizations/Finance/users

On servers with multiple organizations, the summary user descriptors include the organization (tenant) ID:

```
<users>
  <user>
    <externallyDefined>false</externallyDefined>
    <fullName>jasperadmin</fullName>
    <tenantId>Finance</tenantId>
    <username>jasperadmin</username>
  </user>
  <user>
    <externallyDefined>false</externallyDefined>
    <fullName>jasperadmin</fullName>
    <tenantId>Audit</tenantId>
    <username>jasperadmin</username>
  </user>
  <user>
    <externallyDefined>false</externallyDefined>
    <fullName>joeuser</fullName>
    <tenantId>Finance</tenantId>
    <username>joeuser</username>
  </user>
  <user>
    <externallyDefined>false</externallyDefined>
    <fullName>joeuser</fullName>
    <tenantId>Audit</tenantId>
    <username>joeuser</username>
  </user>
</users>
```

4.2.2 Viewing a User

The GET method with a user ID (`username`) retrieves a single descriptor containing the full list of user properties and roles.

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL.
- In commercial editions with organizations, use the second URL to specify the user's organization. When specifying the organization, use its unique ID, not its path. When logged in as the system admin (`superuser`), use the first URL to specify users of the root organization.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/users**/userID http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**users**/userID
Options	
accept: application/xml (default) accept: application/json	
Return Value on Success	**Typical Return Values on Failure**
200 OK – The content is the descriptor for the given user.	404 Not Found – When the user ID or organization ID does not match any user or organization. The content includes an error message.

The full user descriptor includes detailed information about the user account, including any roles. The following example shows the descriptor in XML format:

GET http://localhost:8080/jasperserver/rest_v2/users/joeuser

```
<user>
  <enabled>true</enabled>
  <externallyDefined>false</externallyDefined>
  <fullName>Joe User</fullName>
  <previousPasswordChangeTime>2013-04-19T18:53:07.602-07:00
  </previousPasswordChangeTime>
  <roles>
    <role>
      <externallyDefined>false</externallyDefined>
      <name>ROLE_USER</name>
    </role>
  </roles>
  <username>joeuser</username>
</user>
```

In servers with multiple organizations, the full descriptor includes the organization (tenant) ID. The following example shows the descriptor in JSON format:

GET http://localhost:8080/jasperserver/rest_v2/organizations/Finance/users/joeuser

```
{
  "fullName":"joeuser",
  "emailAddress":"",
  "externallyDefined":false,
  "enabled":true,
  "previousPasswordChangeTime":1366429181984,
  "tenantId":"Finance",
  "username":"joeuser",
  "roles":[
    {"name":"ROLE_USER","externallyDefined":false}]
}
```

4.2.3 Creating a User

To create a user account, put all required information in a user descriptor, and include it in a PUT request to the rest_v2/users service, with the intended user ID (username) specified in the URL.

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL.
- In commercial editions with organizations, use the second URL to specify the user's organization. When specifying the organization, use its unique ID, not its path. When logged in as the system admin (`superuser`), use the first URL to create users in the root organization.

To create a user, the user ID in the URL must be unique on the server or in the organization. If the user ID already exists, that user account will be modified, as described in section **section 4.2.4, "Modifying User Properties," on page 110**.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/users**/userID http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**users**/userID

Content-Type	Content
application/xml application/json	A user descriptor that includes at least the `fullName` and `password` for the user. The role ROLE_USER is automatically assigned to all users, so it does not need to be specified. Do not specify the following properties: • `username` – Specified in the URL and cannot be modified in the descriptor. • `tenantID` – Specified in the URL and cannot be modified in the descriptor. • `externallyDefined` – Computed automatically by the server. • `previousPasswordChangeTime` – Computed automatically by the server.

Return Value on Success	Typical Return Values on Failure
201 Created – The user was successfully created using the values in the descriptor. The response contains the full descriptor of the new user.	404 Not Found – When the organization ID cannot be resolved.

The descriptor sent in the request should contain all the properties you want to set on the new user, except for the username that is specified in the URL. To set roles on the user, specify them as a list of roles. The following example shows the descriptor in JSON format:

```
{
  "fullName":"Joe User",
  "emailAddress":"juser@example.com",
  "enabled":false,
  "password":"mySecretPassword",
  "roles":[
    {"name":"ROLE_MANAGER"}]
}
```

4.2.4 Modifying User Properties

To modify the properties of a user account, put all desired information in a user descriptor, and include it in a PUT request to the rest_v2/users service, with the existing user ID (username) specified in the URL.

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL.
- In commercial editions with organizations, use the second URL to specify the user's organization. When specifying the organization, use its unique ID, not its path. When logged in as the system admin (`superuser`), use the first URL to modify users of the root organization.

To modify a user, the user ID in the URL must already exist on the server or in the organization. If the user ID doesn't exist, a user account will be created, as described in section **section 4.2.3, "Creating a User," on page 109**.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/users**/userID http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**users**/userID

Content-Type	Content
application/xml application/json	A user descriptor that includes the properties you want to change. Do not specify the following properties: • `username` – Specified in the URL and cannot be modified in the descriptor. • `tenantID` – Specified in the URL and cannot be modified in the descriptor. • `externallyDefined` – Computed automatically by the server. • `previousPasswordChangeTime` – Computed automatically by the server.

Return Value on Success	Typical Return Values on Failure
200 OK – The user properties were successfully updated.	404 Not Found – When the organization ID cannot be resolved.

To add a role to the user, specify the entire list of roles with the desired role added. To remove a role from a user, specify the entire list of roles with the desired role removed. The following example shows the descriptor in JSON format:

```
{
  "enabled":true,
  "password":"newPassword",
  "roles":[
    {"name":"ROLE_USER"}]
    {"name":"ROLE_STOREMANAGER"}]
}
```

4.2.5 Deleting a User

To delete a user, send the DELETE method and specify the user ID in the URL.

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL.
- In commercial editions with organizations, use the second URL to specify the user's organization. When specifying the organization, use its unique ID, not its path. When logged in as the system admin (`superuser`), use the first URL to delete users of the root organization.

When this method is successful, the user is permanently deleted.

Method	URL
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest_v2/users**/userID

	http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**users**/userID
Return Value on Success	**Typical Return Values on Failure**
204 No Content – The user was successfully deleted.	404 Not Found – When the ID of the organization cannot be resolved.

4.3 The v2/attributes Service

Attributes, also called profile attributes, are name-value pairs associated with a user. Certain advanced features such as Domain security and OLAP access grants use profile attributes in addition to roles to grant certain permissions. Unlike roles, attributes are not pre-defined, and thus any attribute name can be assigned any value at any time.

The rest_v2/attributes service replaces the rest/attribute service. It provides methods for reading, writing, and deleting attributes on any given user account. All attribute operations apply to a single specific user; there are no operations for reading or searching attributes from multiple users.

Because the user ID and organization ID are used in the URL, this service can operate only on users and organizations whose ID is less than 100 characters long and does not contain spaces or special symbols. In addition, both attribute names and attribute values being written with this service are limited to 255 characters and may not be empty (null) or contain only whitespace characters.

4.3.1 Viewing User Attributes

The GET method of the attributes service retrieves the list of attributes, if any, defined for the user.

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL.
- In commercial editions with organizations, you must use the second URL to specify the user's organization. When specifying the organization, use its unique ID, not its path. When logged in as the system admin (`superuser`), use the first URL to specify users of the root organization.

Method	**URL**	
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/users**/userID/**attributes**?<arguments> http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**users**/userID/**attributes**? <arguments>	
Argument	**Type**	**Description**
`name`	Optional String	Specify an attribute name to list the value of that specific attribute. Repeat this argument to view multiple attributes. When this argument is omitted, all attributes and their values are returned for the given user.
Options		
accept: application/xml (default)		

accept: application/json	
Return Value on Success	**Typical Return Values on Failure**
200 OK – The content is the list of attributes for the given user. 204 No Content – The search did not return any attributes or the user has no attributes.	404 Not Found – When the user ID or organization ID does not match any user or organization. The content includes an error message.

The list of attributes includes the name and value of each attribute. Each attribute may only have one value, however that value may contain a comma-separated list that is interpreted by the server as being multi-valued. The following example shows attributes in JSON format:

GET http://localhost:8080/jasperserver/rest_v2/users/joeuser/attributes

```
{
  "attribute":[
    {
      "name": "Attr1",
      "value":"Value1a, Value1b, Value1c"
    },
    ...
    {
      "name": "AttrN",
      "value":"ValueN"
    }
  ]
}
```

An alternative syntax exists to read a single attribute by specifying its name in the URL:

Method	**URL**
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/users**/userID/**attributes**/attrName http://<host>:<port>/jasperserver[-pro]/**rest_ v2/organizations**/orgID/**users**/userID/**attributes**/attrName
Options	
accept: application/xml (default) accept: application/json	
Return Value on Success	**Typical Return Values on Failure**
200 OK – The content is a single attributes for the given user.	404 Not Found – When the user ID or organization ID does not match any user or organization. The content includes an error message.

The response is a single attribute name-value pair. The following example shows an attribute in JSON format:

GET http://localhost:8080/jasperserver/rest_v2/users/joeuser/attributes/Attr2

```
{
  "name": "Attr2",
  "value":"Value2"
}
```

4.3.2 Setting User Attributes

The PUT method of the attributes service adds or replaces attributes on the specified user.

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL.
- In commercial editions with organizations, you must use the second URL to specify the user's organization. When specifying the organization, use its unique ID, not its path. When logged in as the system admin (`superuser`), use the first URL to specify users of the root organization.

There are two syntaxes, the following one is for adding or replacing all attributes

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/users**/userID/**attributes** http://<host>:<port>/jasperserver[-pro]/**rest_ v2/organizations**/orgID/**users**/userID/**attributes**

Content-Type	Content
application/xml application/json	An attribute descriptor that includes the new list of attributes. All previously defined attributes are replaced by this new list.

Return Value on Success	Typical Return Values on Failure
201 Created – When the attributes were successfully created for the user. 200 OK – When the attributes were successfully updated.	404 Not Found – When the user ID or organization ID does not match any user or organization. The content includes an error message. 400 Bad Request – When an attribute name or value is null, blank, or too long. If one attribute causes an error, the operation stops and returns an error, but attributes that were already processed remain in their new state.

The list of attributes defines the name and value of each attribute. Each attribute may only have one value, however, that value may contain a comma separated list that is interpreted by the server as being multi-valued.

```
{
  "attribute":[
    {
      "name": "Attr1",
      "value":"newValue1"
    },
    {
      "name": "Attr2",
      "value":"newValue2a, newValue2b"
    }
  ]
}
```

The second syntax of the PUT attributes method is for adding or replacing individual attributes.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/users**/userID/**attributes**/attrName http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**users**/userID/**attributes**/attrName

Content-Type	Content
application/xml application/json	A single attribute name-value pair. The attribute name must match the *attrName* exactly as it appears in the URL. If this attribute name already exists on the specified user, this attribute's value is updated. If the attribute does not exist, it is added to the user's list of attributes.

Return Value on Success	Typical Return Values on Failure
201 Created – When the attribute was successfully created for the user. 200 OK – When the attribute was successfully updated.	404 Not Found – When the user ID or organization ID does not match any user or organization. The content includes an error message.

The content in the request is a single attribute, for example:

PUT http://localhost:8080/jasperserver/rest_v2/users/joeuser/attributes/Attr3

```
{
  "name": "Attr3",
  "value":"NewValue3"
}
```

4.3.3 Deleting User Attributes

The DELETE method of the attributes service removes attributes from the specified user. When attributes are removed, both the name and the value of the attribute are removed, not only the value.

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL.
- In commercial editions with organizations, you must use the second URL to specify the user's organization. When specifying the organization, use its unique ID, not its path. When logged in as the system admin (`superuser`), use the first URL to specify users of the root organization.

There are two syntaxes; the following one is for deleting multiple attributes or all attributes at once.

Method	URL
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest_v2/users**/userID/**attributes**?<arguments>

	http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**users**/userID/**attributes**? <arguments>	
Argument	**Type**	**Description**
`name`	Optional String	Specify an attribute name to remove that attribute from the user. Repeat this argument to delete multiple attributes. When this argument is omitted, all attributes are deleted from the given user.

Return Value on Success	**Typical Return Values on Failure**
204 No Content – The attributes were successfully removed from the user.	404 Not Found – When the user ID or organization ID does not match any user or organization. The content includes an error message. 400 Bad Request – When an attribute name is null, blank, or too long. If one attribute causes an error, the operation stops and returns an error, but attributes that were already deleted remain deleted.

The second syntax deletes a single attribute named in the URL from the specified user.

Method	**URL**
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest_v2/users**/userID/**attributes**/attrName http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**users**/userID/**attributes**/attrName

Return Value on Success	**Typical Return Values on Failure**
204 No Content – The attribute was successfully removed from the user.	404 Not Found – When the user ID or organization ID does not match any user or organization. The content includes an error message. 400 Bad Request – When an attribute name is null, blank, or too long.

4.4 The v2/roles Service

The rest_v2/roles service replaces the rest/role service. It provides similar methods that allow you to list, view, create, modify, and delete roles. The new service provides improved search functionality, including user-based role searches. Every method has two URL forms, one with an organization ID and one without.

Because the role ID and organization ID are used in the URL, this service can operate only on roles and organizations whose ID is less than 100 characters long and does not contain spaces or special symbols. Unlike resource IDs, the role ID is the role name and can be modified.

4.4.1 Searching for Roles

The GET method without any role ID searches for and lists role definitions. It has options to search for roles by name or by user that belong to the role. If no search is specified, it returns all roles. The method has two forms:

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL without an organization ID.
- In commercial editions with organizations, use the first URL to search or list all roles starting from the logged-in user's organization (root for the system admin), and use the second URL to search or list all roles in a specified organization.

Method	**URL**
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/roles**?<arguments> http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**roles**?<arguments>

Argument	**Type**	**Description**
`search`	Optional String	Specify a string or substring to match the role ID of any role. The search is not case sensitive.
`user`	Optional String	Specify a username (ID) to list the roles to which this user belongs. Repeat this argument to list all roles of multiple users. In commercial editions with multiple organizations, specify users as <userID>%7C<orgID> (%7C is the | character).
`hasAllUsers`	Optional Boolean	When set to true with multiple user arguments, this method returns only the roles to which all specified users belong (intersection of users' roles). When false or not specified, all roles of all users are found (union of users' roles).
`include SubOrgs`	Optional Boolean	Limits the scope of the search or list in commercial editions with multiple tenants. When set to false, the first URL form is limited to the logged-in user's organization, and the second URL form is limited to the organization specified in the URL. When true or not specified, the scope includes the hierarchy of all child organizations.

Options
accept: application/xml (default) accept: application/json

Return Value on Success	**Typical Return Values on Failure**
200 OK – The content is a set of descriptors for all roles in the result. 204 No Content – The search did not return any roles.	404 Not Found – When the organization ID does not match any organization. The content includes an error message.

The following example shows the first form URL on a commercial edition server with multiple organizations:

```
GET http://localhost:8080/jasperserver/rest_v2/roles
```

This method returns the set of all default system and root roles defined on a server with the sample data (no organization roles have been defined yet):

```
<roles>
  <role>
    <externallyDefined>false</externallyDefined>
    <name>ROLE_ADMINISTRATOR</name>
  </role>
  <role>
    <externallyDefined>false</externallyDefined>
    <name>ROLE_ANONYMOUS</name>
  </role>
  <role>
    <externallyDefined>false</externallyDefined>
    <name>ROLE_DEMO</name>
  </role>
  <role>
    <externallyDefined>false</externallyDefined>
    <name>ROLE_PORTLET</name>
  </role>
  <role>
    <externallyDefined>false</externallyDefined>
    <name>ROLE_SUPERMART_MANAGER</name>
  </role>
  <role>
    <externallyDefined>false</externallyDefined>
    <name>ROLE_SUPERUSER</name>
  </role>
  <role>
    <externallyDefined>false</externallyDefined>
    <name>ROLE_USER</name>
  </role>
</roles>
```

The `externallyDefined` property is true when the role is synchronized from a 3rd party such as an LDAP directory or single sign-on mechanism. For more information, see the *JasperReports Server Authentication Cookbook*.

4.4.2 Viewing a Role

The GET method with a role ID retrieves a single role descriptor containing the role properties.

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL.
- In commercial editions with organizations, use the second URL to specify the role's organization. When specifying the organization, use its unique ID, not its path. When logged in as the system admin (`superuser`), use the first URL to specify roles of the root organization.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest_v2/roles**/roleID http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**roles**/roleID

Options	
accept: application/xml (default) accept: application/json	
Return Value on Success	**Typical Return Values on Failure**
200 OK – The content is the descriptor for the given role.	404 Not Found – When the role ID or organization ID does not match any role or organization. The content includes an error message.

After adding roles to an organization, the following example shows the simple role descriptor for an organization role in JSON format:

GET http://localhost:8080/jasperserver-pro/rest_v2/organizations/Finance/roles/ROLE_MANAGER

```
{
  "name":"ROLE_MANAGER",
  "externallyDefined":false,
  "tenantId":"Finance"
}
```

4.4.3 Creating a Role

To create a role, send the PUT request to the rest_v2/roles service with the intended role ID (name) specified in the URL.

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL.
- In commercial editions with organizations, use the second URL to specify the user's organization. When specifying the organization, use its unique ID, not its path. When logged in as the system admin (`superuser`), use the first URL to create roles in the root organization.

Roles do not have any properties to specify other than the role ID, but the request must include a descriptor that can be empty.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/roles**/roleID http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**roles**/roleID
Content-Type	**Content**
application/xml application/json	An empty role descriptor, either <role></role> or {}. Do *not* specify the following properties: • `name` – Specified in the URL and should not be modified in the descriptor. • `tenantID` – Specified in the URL and cannot be modified in the descriptor. • `externallyDefined` – Computed automatically by the server.

Return Value on Success	Typical Return Values on Failure
201 Created – The role was successfully created. The response contains the full descriptor of the new role.	404 Not Found – When the organization ID cannot be resolved.

4.4.4 Modifying a Role

To change the name of a role, send a PUT request to the rest_v2/roles service and specify the new name in the role descriptor.

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL.
- In commercial editions with organizations, use the second URL to specify the user's organization. When specifying the organization, use its unique ID, not its path. When logged in as the system admin (`superuser`), use the first URL to modify roles in the root organization.

The only property of a role that you can modify is the role's name. After the update, all members of the role are members of the new role name, and all permissions associated with the old role name are updated to the new role name.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest_v2/roles**/roleID http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**roles**/roleID

Content-Type	Content
application/xml application/json	A role descriptor containing a single property: • `name` – The new name for the role.

Return Value on Success	Typical Return Values on Failure
200 OK – The role was successfully updated. The response contains the full descriptor of the updated role.	404 Not Found – When the organization ID cannot be resolved.

4.4.5 Setting Role Membership

To assign role membership to a user, set the roles property on the user account with the PUT method of the rest_v2/users service. For details, see section **section 4.2.4, "Modifying User Properties," on page 110**.

4.4.6 Deleting a Role

To delete a role, send the DELETE method and specify the role ID (name) in the URL.

- In the community edition of the server, or commercial editions without organizations, use the first form of the URL.

- In commercial editions with organizations, use the second URL to specify the user's organization. When specifying the organization, use its unique ID, not its path. When logged in as the system admin (`superuser`), use the first URL to delete roles of the root organization.

When this method is successful, the role is permanently deleted.

Method	URL
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest_v2/roles**/roleID http://<host>:<port>/jasperserver[-pro]/**rest_v2/organizations**/orgID/**roles**/roleID

Return Value on Success	Typical Return Values on Failure
204 No Content – The role was successfully deleted.	404 Not Found – When the ID of the organization cannot be resolved.

CHAPTER 5 REST V1 - REPOSITORY SERVICES

This chapter documents the HTTP methods (sometimes called verbs) and parameters for each of these requests. In every case, you specify the folder, resource, or report to be acted up by adding its repository URI to the request URL. This chapter uses the following notation:

http://<host>:<port>/jasperserver[-pro]/rest/<service>/path/to/object

Arguments are passed in the URL with the conventional syntax:

http://<host>:<port>/jasperserver[-pro]/rest/<service>/path/to/object?<arg1>=<value>&<arg2>=<value>&...

The documentation for each method gives the list of arguments it supports. Optional arguments are listed with a question mark after the name, for example `<arg2>?`. Arguments that are not marked optional are mandatory and must be included in the URL with a valid value.

For authentication using the REST web services, see section **section 1.2, “REST Authentication,” on page 12**.

The RESTful repository services gives responses that contain the same XML data structure that are used in the SOAP repository web service. These data structures are shown as examples throughout the chapter and documented in section **section 1.6, “Syntax of resourceDescriptor,” on page 18**, with reference material in **section Appendix A, “ResourceDescriptor API Constants,” on page 207**.

This chapter includes the following sections:

- **The resources Service**
- **The resource Service**
- **Working with Dashboards**
- **Working with Virtual Data Sources**
- **Working with Domains**
- **The permission Service**

5.1 The resources Service

The resources service lets you browse or search the repository. When used without arguments, it gives the list of resources in the folder specified in the URL. With the arguments, you can search for terms in the resource names or descriptions, search for all resources of a given type, and specify whether to search in subfolders. This service is similar to the `list` operation in the SOAP web services.

The resources service is a read only service. Requests for PUT, POST, and DELETE operations receive the error 405, method not allowed.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest/resources**/path/to/folder/

Argument	Type/Value	Description
q?	String	Match only resources having the specified text in the name or description. Note that the search string does not match in the ID of resources.
type?	wsType	Match only resources of the given type. Valid types are listed in **section Table 1-5, “Values for wsType,” on page 19**, for example: datasource, reportUnit, img, folder. Searching by type does not always yield the expected results when using newer versions of the server (5.0 and later). New repository types may appear unexpectedly in the results. The v2/resources service resolves this issue, but the (v1) resources service is deprecated and will no longer be updated.
recursive?	0 | 1	Search for resources recursively and not only in the specified folder. This parameter is used only when a search criteria is specified (either q or type). When not specified, the default is 0, meaning only in the specified folder. Note that searching recursively in the whole repository may cause performance issues, because the number of resources returned may be huge.
limit?	Integer >= 0	Maximum number of items returned to the client. The default is 0, meaning no limit.

Return Value on Success	Typical Return Values on Failure
200 OK – The body is XML containing the list of resourceDescriptors.	404 Not Found – The specified URI is not found in the repository.

The XML content in the result consists of resourceDescriptors described in section **section 1.6, “Syntax of resourceDescriptor,” on page 18**. However, the list may be empty in the following conditions:

- If the specified URI is a resource instead of a folder.
- If the folder is empty or the search returns no results.

The following example shows the request to list the resources in the /reports folder:

```
GET /jasperserver/rest/resources/reports HTTP/1.1
User-Agent: Jakarta Commons-HttpClient/3.1
Authorization: Basic amFzcGVyYWRtaW46amFzcGVyYWRtaW4=
Host: localhost:8080
Cookie: $Version=0; JSESSIONID=6854BF45EC89F3D3CE3E6F4FD6FF1BBD; $Path=/jasperserver
```

Because the example is not a recursive search, it simply returns the contents of the folder, in this case a subfolder and a report:

```
HTTP/1.1 200 OK
Server: Apache-Coyote/1.1
```

```
Pragma: No-cache
Cache-Control: no-cache
Expires: Thu, 01 Jan 1970 01:00:00 CET
Content-Length: 1518
Date: Fri, 24 Jun 2011 12:09:45 GMT

<resourceDescriptors>
  <resourceDescriptor name="samples" wsType="folder" uriString="/reports/samples"
                      isNew="false">
    <label>Samples</label>
    <description>Samples</description>
    <creationDate>1302268917000</creationDate>
    <resourceProperty name="PROP_HAS_DATA"><value>false</value></resourceProperty>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.Folder</value>
    </resourceProperty>
    <resourceProperty name="PROP_PARENT_FOLDER"><value>/reports</value>
    </resourceProperty>
    <resourceProperty name="PROP_SECURITY_PERMISSION_MASK"><value>31</value>
    </resourceProperty>
    <resourceProperty name="PROP_VERSION"><value>0</value></resourceProperty>
  </resourceDescriptor>

  <resourceDescriptor name="test" wsType="reportUnit" uriString="/reports/test"
                      isNew="false">
    <label>A test</label>
    <creationDate>1303206124000</creationDate>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.jasperreports.domain.
             ReportUnit</value>
    </resourceProperty>
    <resourceProperty name="PROP_PARENT_FOLDER"><value>/reports</value>
    </resourceProperty>
    <resourceProperty name="PROP_SECURITY_PERMISSION_MASK"><value>31</value>
    </resourceProperty>
    <resourceProperty name="PROP_VERSION"><value>19</value></resourceProperty>
    <resourceProperty name="PROP_RU_ALWAYS_PROPMT_CONTROLS"><value>true</value>
    </resourceProperty>
    <resourceProperty name="PROP_RU_CONTROLS_LAYOUT"><value>1</value>
    </resourceProperty>
  </resourceDescriptor>
</resourceDescriptors>
```

The following sample request is intended to list all the reports available in the /reports folder and subfolders. The result, not shown, is a long list of resourceDescriptors for reports in the designated folders.

```
GET /jasperserver/rest/resources/reports?type=reportUnit&recursive=1 HTTP/1.1
User-Agent: Jakarta Commons-HttpClient/3.1
Authorization: Basic amFzcGVyYWRtaW46amFzcGVyYWRtaW4=
Host: localhost:8080
Cookie: $Version=0; JSESSIONID=60B573BDC47098E6379FC867B24C5C0E; $Path=/jasperserver
```

5.2 The resource Service

The resource service supports several HTTP methods to view, download, create, and modify resources in the repository.

GET is used to show the information about a specific resource. Getting a resource can serve several purposes:

- In the case of JasperReports, also known as report units, this service returns the structure of the JasperReport, including resourceDescriptors for any linked resources.
- For resources that contain files, specifying the `fileData=true` argument downloads the file content.
- Specifying a query-based input control with arguments for running the query returns the dynamic values for the control.

A new service is also available to interact with report options. See section **section 3.4, "The v2/options Service," on page 81**.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest/resource**/path/to/resource/?<arguments>

Argument	Type/Value	Description
fileData?	Boolean	For resources that contain a file, set this argument to true to download the file. When not specified, this argument is false by default and the method returns the description of the resource.
IC_GET_ QUERY_ DATA?	String	Used to get the items to fill an input control which subtend a query resource. The value of this parameter must be the URI of the data source to use to execute the query. Set the null string to use the default data source.
P_<param name>?	String	If the IC_GET_QUERY_DATA is specified, one or more parameters can be specified to be used in the query: • Use the "P_" prefix for single values. • Use the "PL_" prefix for list of values.
PL_<param name>?	String	

Return Value on Success	Typical Return Values on Failure
200 OK – The body is either: • XML giving the resourceDescriptors that make up the resource, including nested descriptors. • The native content of the specified file.	404 Not Found – When the specified resource URI is not found in the repository

The GET method returns the structure and definition of resources in the repository, and using that information can be used to download any files attached to the resources. Resources are defined through `resourceDescriptor` tags in XML.

The following example shows the resource descriptor of a folder:

```
<resourceDescriptor name="datasources" wsType="folder" uriString="/datasources"
                    isNew="false">
  <label>Data Sources</label>
  <description>Data Sources used by reports</description>
  <creationDate>1317838605320</creationDate>
  <resourceProperty name="PROP_RESOURCE_TYPE">
    <value>com.jaspersoft.jasperserver.api.metadata.common.domain.Folder</value>
  </resourceProperty>
  <resourceProperty name="PROP_PARENT_FOLDER"><value>/</value></resourceProperty>
  <resourceProperty name="PROP_VERSION"><value>0</value></resourceProperty>
  <resourceProperty name="PROP_HAS_DATA"><value>false</value></resourceProperty>
</resourceDescriptor>
```

The following example shows the resource descriptor of a data source. The various `resourceProperty` tags define the properties of the data source, specific to the JNDI type:

```
<resourceDescriptor name="SugarCRMDataSourceJNDI" wsType="jndi"
  uriString="/analysis/datasources/SugarCRMDataSourceJNDI" isNew="false">
  <label>SugarCRM Data Source JNDI</label>
  <description>SugarCRM Data Source JNDI</description>
  <creationDate>1318380229907</creationDate>
  <resourceProperty name="PROP_RESOURCE_TYPE">
    <value>com.jaspersoft.jasperserver.api.metadata.jasperreports.domain.
           JndiJdbcReportDataSource</value>
  </resourceProperty>
  <resourceProperty name="PROP_PARENT_FOLDER"><value>/analysis/datasources</value>
  </resourceProperty>
  <resourceProperty name="PROP_VERSION"><value>0</value></resourceProperty>
  <resourceProperty name="PROP_DATASOURCE_JNDI_NAME"><value>jdbc/sugarcrm</value>
  </resourceProperty>
</resourceDescriptor>
```

The following example shows the resource descriptor of a query resource, with properties for the query string and query language:

```
<resourceDescriptor name="CustomerCityQuery" wsType="query"
  uriString="/datatypes/CustomerCityQuery" isNew="false">
  <label>Customer City Query</label>
  <description>Retrieves names of all customers' home cities</description>
  <creationDate>1318380317602</creationDate>
  <resourceProperty name="PROP_RESOURCE_TYPE">
    <value>com.jaspersoft.jasperserver.api.metadata.common.domain.Query</value>
  </resourceProperty><resourceProperty name="PROP_PARENT_FOLDER">
    <value>/JUNIT_NEW_FOLDER</value></resourceProperty>
  <resourceProperty name="PROP_VERSION"><value>0</value></resourceProperty>
  <resourceProperty name="PROP_HAS_DATA"><value>false</value></resourceProperty>
  <resourceProperty name="PROP_IS_REFERENCE"><value>false</value></resourceProperty>
  <resourceProperty name="PROP_QUERY">
    <value>select distinct customer.city from customer</value></resourceProperty>
  <resourceProperty name="PROP_QUERY_LANGUAGE"><value>sql</value></resourceProperty>
</resourceDescriptor>
```

5.2.1 Requesting the Contents of a JasperReport

A JasperReport is a complex resource that contains many parts such as a data source, input controls, and file resources. These can be either references to other resources in the repository or resources that are fully defined internally to the report.

In the following example, a simple request gives the contents of a JasperReport:

GET http://localhost:8080/jasperserver/rest/resource/reports/samples/AllAccounts

The following response in this example shows the content of the AllAccounts report:

- The reportUnit, which is the container for all the resources of the report.
- The data source, which is an external link to a data source in the repository.
- The main JRXML, which is a file defined internally to this resource.
- Two image files, one of which is defined internally to this resource, the other references a file resource in the repository.

The structure of the JasperReport is defined through nested `resourceDescriptor` tags in XML. In the nested descriptor for each file that is part of the JasperReport, we can find its URI and use `fileData=true` to retrieve that file:

```
<resourceDescriptor name="AllAccounts" wsType="reportUnit"
                    uriString="/reports/samples/AllAccounts" isNew="false">
  <label>Accounts Report</label>
  <description>All Accounts Report</description>
  <creationDate>1302268918000</creationDate>
  <resourceProperty name="PROP_RESOURCE_TYPE">
    <value>com.jaspersoft.jasperserver.api.metadata.jasperreports.domain.
           ReportUnit</value>
  </resourceProperty>
  <resourceProperty name="PROP_PARENT_FOLDER"><value>/reports/samples</value>
  </resourceProperty>
  <resourceProperty name="PROP_VERSION"><value>2</value></resourceProperty>
  <resourceProperty name="PROP_RU_ALWAYS_PROPMT_CONTROLS"><value>false</value>
  </resourceProperty>
  <resourceProperty name="PROP_RU_CONTROLS_LAYOUT"><value>1</value>
  </resourceProperty>

  <resourceDescriptor name="" wsType="datasource" uriString="" isNew="false">
    <label>null</label>
    <resourceProperty name="PROP_REFERENCE_URI">
      <value>/datasources/JServerJNDIDS</value>
    </resourceProperty>
    <resourceProperty name="PROP_IS_REFERENCE"><value>true</value>
    </resourceProperty>
  </resourceDescriptor>

  <resourceDescriptor name="AllAccountsReport" wsType="jrxml" uriString="/reports/
samples/AllAccounts_files/AllAccountsReport" isNew="false">
    <label>All Accounts Jasper Report</label>
    <description>All Accounts Jasper Report</description>
    <creationDate>1302268918000</creationDate>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.FileResource
</value>
    </resourceProperty>
    <resourceProperty name="PROP_PARENT_FOLDER">
      <value>/reports/samples/AllAccounts_files</value>
    </resourceProperty>
    <resourceProperty name="PROP_VERSION"><value>2</value></resourceProperty>
    <resourceProperty name="PROP_IS_REFERENCE"><value>false</value>
    </resourceProperty>
    <resourceProperty name="PROP_HAS_DATA"><value>true</value></resourceProperty>
    <resourceProperty name="PROP_ATTACHMENT_ID"><value>attachment</value>
    </resourceProperty>
    <resourceProperty name="PROP_RU_IS_MAIN_REPORT"><value>true</value>
    </resourceProperty>
  </resourceDescriptor>

  <resourceDescriptor name="AllAccounts_Res2" wsType="img" uriString="/reports/
samples/AllAccounts_files/AllAccounts_Res2" isNew="false">
    <label>AllAccounts_Res2</label>
    <description>AllAccounts_Res2</description>
    <creationDate>1302268918000</creationDate>
    <resourceProperty name="PROP_RESOURCE_TYPE">
```

```
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.FileResource
</value>
    </resourceProperty>
    <resourceProperty name="PROP_PARENT_FOLDER">
      <value>/reports/samples/AllAccounts_files</value></resourceProperty>
    <resourceProperty name="PROP_VERSION"><value>0</value></resourceProperty>
    <resourceProperty name="PROP_IS_REFERENCE"><value>false</value>
    </resourceProperty>
    <resourceProperty name="PROP_HAS_DATA"><value>true</value></resourceProperty>
    <resourceProperty name="PROP_ATTACHMENT_ID"><value>attachment</value>
    </resourceProperty>
  </resourceDescriptor>

  <resourceDescriptor name="AllAccounts_Res3" wsType="img" uriString="/reports/
samples/AllAccounts_files/AllAccounts_Res3" isNew="false">
    <label>AllAccounts_Res3</label>
    <description>AllAccounts_Res3</description>
    <creationDate>1302268918000</creationDate>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.FileResource
</value></resourceProperty>
    <resourceProperty name="PROP_PARENT_FOLDER">
      <value>/reports/samples/AllAccounts_files</value></resourceProperty>
    <resourceProperty name="PROP_VERSION"><value>0</value></resourceProperty>
    <resourceProperty name="PROP_IS_REFERENCE"><value>false</value>
    </resourceProperty>
    <resourceProperty name="PROP_HAS_DATA"><value>true</value></resourceProperty>
    <resourceProperty name="PROP_ATTACHMENT_ID"><value>attachment</value>
    </resourceProperty>
  </resourceDescriptor>

  <resourceDescriptor name="LogoLink" wsType="reference" uriString="/reports/
                      samples/AllAccounts_files/LogoLink" isNew="false">
    <label>LogoLink_label</label>
    <description>LogoLink description</description>
    <creationDate>1302268918000</creationDate>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.FileResource
      </value></resourceProperty>
    <resourceProperty name="PROP_PARENT_FOLDER">
      <value>/reports/samples/AllAccounts_files</value></resourceProperty>
    <resourceProperty name="PROP_VERSION"><value>0</value></resourceProperty>
    <resourceProperty name="PROP_IS_REFERENCE"><value>true</value>
    </resourceProperty>
    <resourceProperty name="PROP_REFERENCE_URI"><value>/images/JRLogo</value>
    </resourceProperty>

    <resourceProperty name="PROP_HAS_DATA"><value>true</value></resourceProperty>
    <resourceProperty name="PROP_ATTACHMENT_ID"><value>attachment</value>
    </resourceProperty>
  </resourceDescriptor>
</resourceDescriptor>
```

5.2.2 Requesting the Contents of a File Resource

In order to retrieve the contents of a file, first retrieve the descriptor of its enclosing resource to find the resource URI. The resource can either be internal to the report, or referenced from the repository. In either case it has a URI in the repository that we can extract from the parent resource.

In the previous sample, we see the attachments that are internal to the AllAccounts report. There is an image named `AllAccounts_Res3` that is not a reference and has data. To download the image, we create the following request to the resource service, giving it the internal URI of the image and `fileData=true`.

```
GET /jasperserver/rest/resource/reports/samples/AllAccounts_files/AllAccounts_Res3?
fileData=true HTTP/1.1
User-Agent: Jakarta Commons-HttpClient/3.1
Authorization: Basic amFzcGVyYWRtaW46amFzcGVyYWRtaW4=
Host: localhost:8080
Cookie: $Version=0; JSESSIONID=6854BF45EC89F3D3CE3E6F4FD6FF1BBD; $Path=/jasperserver
```

Notice that the URI to the file includes the path AllAccounts_files. This is a local path that exists to access the local resources of the report, not a folder that exists in the repository.

In the case of a resource that is referenced in the repository, you can download the contents of the file in the same way. From the resource descriptor in the previous section, we see there is another resource where `PROP_IS_REFERENCE` is `true`. We can extract the repository URI from the `PROP_REFERENCE_URI` property and use that with `fileData=true` to obtain the image:

```
GET /jasperserver-pro/rest/resource/images/JRLogo?fileData=true HTTP/1.1
User-Agent: Jakarta Commons-HttpClient/3.1
Authorization: Basic amFzcGVyYWRtaW46amFzcGVyYWRtaW4=
Host: localhost:8080
Cookie: $Version=0; JSESSIONID=6854BF45EC89F3D3CE3E6F4FD6FF1BBD; $Path=/jasperserver
```

In both cases, the response contains the binary contents of the file. The response header contains the information to decode it:

```
Content-Disposition: attachment; filename=JRLogo
Content-Type: application/octet-stream
Content-Length: 1491
```

The descriptor does not store the extension nor the format of a file resource. Jaspersoft recommends using the filename *with the file extension* as the resource ID when creating file resources so that the extension is available when downloading the file.

5.2.3 Requesting the Values of a Query-Based Input Control

A newer service is available to interact with input controls, including query-based input controls. See section **section 3.3, "The v2/inputControls Service," on page 77**.

The following sample request specifies a resource that is a query-based input control, and by specifying the appropriate parameters, we can receive the current values. In this case, one of the parameters to the query is a list of two values, USA and Mexico:

GET http://localhost:8080/jasperserver/rest/resource/reports/samples/Cascading_multi_select_report_files/Cascading_state_multi_select?IC_GET_QUERY_DATA=/datasources/JServerJNDIDS&PL_Country_multi_select=USA&PL_Country_multi_select=Mexico

The following response shows the resource descriptor for the requested input control, and it contains extra properties that give all the values that are the results of the query. You can see they are from Mexico and USA. The resource descriptor also includes the nested descriptor for the query that is part of the input control.

If a selection-type input control has a null value, it is given as `~NULL~`. If no selection is made, its value is given as `~NOTHING~`.

```
<resourceDescriptor name="Cascading_state_multi_select" wsType="inputControl"
                    uriString="/reports/samples/Cascading_multi_select_report_files/
                    Cascading_state_multi_select" isNew="false">
  <label>Cascading state multi select control</label>
  <description>Cascading state multi select control</description>
  <creationDate>1302268918000</creationDate>
  <resourceProperty name="PROP_RESOURCE_TYPE">
    <value>com.jaspersoft.jasperserver.api.metadata.common.domain.InputControl
    </value>
  </resourceProperty>
  <resourceProperty name="PROP_PARENT_FOLDER">
    <value>/reports/samples/Cascading_multi_select_report_files</value>
  </resourceProperty>
  <resourceProperty name="PROP_VERSION"><value>0</value></resourceProperty>
  <resourceProperty name="PROP_HAS_DATA"><value>false</value></resourceProperty>
  <resourceProperty name="PROP_IS_REFERENCE"><value>false</value></resourceProperty>
  <resourceProperty name="PROP_INPUTCONTROL_IS_MANDATORY"><value>true</value>
  </resourceProperty>
  <resourceProperty name="PROP_INPUTCONTROL_IS_READONLY"><value>false</value>
  </resourceProperty>
  <resourceProperty name="PROP_INPUTCONTROL_IS_VISIBLE"><value>true</value>
  </resourceProperty>
  <resourceProperty name="PROP_INPUTCONTROL_TYPE"><value>7</value>
  </resourceProperty>
  <resourceProperty name="PROP_QUERY_VALUE_COLUMN">
    <value>billing_address_state</value></resourceProperty>
  <resourceProperty name="PROP_QUERY_VISIBLE_COLUMNS">
    <resourceProperty name="PROP_QUERY_VISIBLE_COLUMN_NAME">
      <value>billing_address_country</value></resourceProperty>
    <resourceProperty name="PROP_QUERY_VISIBLE_COLUMN_NAME">
      <value>billing_address_state</value></resourceProperty>
  </resourceProperty>
  <resourceProperty name="PROP_QUERY_DATA">
    <resourceProperty name="PROP_QUERY_DATA_ROW"><value>DF</value>
      <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
        <value>Mexico</value></resourceProperty>
      <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
        <value>DF</value></resourceProperty>
    </resourceProperty>

    ...
    <resourceProperty name="PROP_QUERY_DATA_ROW"><value>Zacatecas</value>
      <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
        <value>Mexico</value></resourceProperty>
      <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
        <value>Zacatecas</value></resourceProperty>
    </resourceProperty>
    <resourceProperty name="PROP_QUERY_DATA_ROW"><value>CA</value>
      <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
        <value>USA</value></resourceProperty>
      <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
        <value>CA</value></resourceProperty>
    </resourceProperty>
    ...
    <resourceProperty name="PROP_QUERY_DATA_ROW"><value>WA</value>
      <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
        <value>USA</value></resourceProperty>
      <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
        <value>WA</value></resourceProperty>
    </resourceProperty>
  </resourceProperty>
  <resourceDescriptor name="Cascading_state_query" wsType="query" uriString="/
                    reports/samples/Cascading_multi_select_report_files/
                    Cascading_state_multi_select_files/Cascading_state_query"
                    isNew="false">
    <label>Cascading state query</label>
    <creationDate>1302268918000</creationDate>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.Query</value>
    </resourceProperty>
    <resourceProperty name="PROP_PARENT_FOLDER">
      <value>/reports/samples/Cascading_multi_select_report_files/
             Cascading_state_multi_select_files</value></resourceProperty>
    <resourceProperty name="PROP_VERSION"><value>0</value></resourceProperty>
    <resourceProperty name="PROP_HAS_DATA"><value>false</value></resourceProperty>
    <resourceProperty name="PROP_IS_REFERENCE"><value>false</value>
    </resourceProperty>
    <resourceProperty name="PROP_QUERY">
      <value>select distinct billing_address_state, billing_address_country
             from accounts where $X{IN, billing_address_country,
             Country_multi_select} order by billing_address_country,
             billing_address_state</value>
    </resourceProperty>
    <resourceProperty name="PROP_QUERY_LANGUAGE"><value>sql</value>
    </resourceProperty>
    <resourceDescriptor name="" wsType="datasource" uriString="" isNew="false">
      <label>null</label>
      <resourceProperty name="PROP_REFERENCE_URI">
        <value>/datasources/JServerJNDIDS</value></resourceProperty>
      <resourceProperty name="PROP_IS_REFERENCE"><value>true</value>
      </resourceProperty>

    </resourceDescriptor>
  </resourceDescriptor>
</resourceDescriptor>
```

5.2.4 Creating a Resource

The PUT method on the resource service is used to create a new resource. If the resource has one or more file resources, they must be provided using a multipart request.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest/resource**/path/to/resource/

Argument	Type/Value	Description
Resource Descriptor	String	This parameter identifies the part with an XML resource descriptor in a multipart request. This is a required argument when using multipart requests.

Content-Type	Content
multipart/form-data text/plain (in the first part) application/octet-stream (for files)	A well-formed XML resourceDescriptor that fully describes the resource, including any locally defined resources. File resources are uploaded in separate parts.

Return Value on Success	Typical Return Values on Failure
201 Created – The body is XML containing the resourceDescriptor of the resource just created.	An error if the resource cannot be created for some reason. If you have very large files, see section **section 5.2.5, "Setting the Temporary Upload Directory," on page 134**.

In the following sample request, the URI is the location where we want to create the resource, in this case / (the root), and the content includes the resource descriptor for a new folder called myfolder.

```
PUT /jasperserver/rest/resource/ HTTP/1.1
Content-Length: 473
Content-Type: multipart/form-data; boundary=1afdzzMUQLfSOmu0Pgb2F-nmEnTwWuPf3
Host: localhost:8080
User-Agent: Apache-HttpClient/4.1.1 (java 1.5)
Cookie: JSESSIONID=3370EC843B09363C0A8DD09A2D1F21E3
Cookie2: $Version=1
--1afdzzMUQLfSOmu0Pgb2F-nmEnTwWuPf3
Content-Disposition: form-data; name="ResourceDescriptor"
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 8bit
<resourceDescriptor name="myfolder" wsType="folder" uriString="/myfolder"
                    isNew="false">
  <label>REST created folder</label>
  <resourceProperty name="PROP_PARENT_FOLDER">
    <value>/</value>
  </resourceProperty>
</resourceDescriptor>
--1afdzzMUQLfSOmu0Pgb2F-nmEnTwWuPf3--
```

Also, the example above shows a multi-part request even though it is only sending the plain-text resource descriptor and not a binary file. Usually, such requests could be sent without multiple parts, and multiple parts are used to send a binary file, for example when creating a report.

When the ResourceDescriptor contains the ResourceProperty `PROP_PARENT_FOLDER`, that property overrides the path/to/resource given as the URL and determines the location of the new resource.

The response to the PUT request is the complete resource descriptor for the new folder:

```
HTTP/1.1 201 Created
Server: Apache-Coyote/1.1
Cache-Control: no-cache
Content-Length: 648
Date: Mon, 01 Aug 2011 14:44:05 GMT
<resourceDescriptor name="myfolder" wsType="folder" uriString="/myfolder"
                    isNew="false">
  <label>REST created folder</label>
  <creationDate>1312209845000</creationDate>
  <resourceProperty name="PROP_RESOURCE_TYPE">
    <value>com.jaspersoft.jasperserver.api.metadata.common.domain.Folder</value>
  </resourceProperty>
  <resourceProperty name="PROP_PARENT_FOLDER">
    <value>/</value>
  </resourceProperty>
  <resourceProperty name="PROP_VERSION">
    <value>0</value>
  </resourceProperty>
  <resourceProperty name="PROP_HAS_DATA">
    <value>false</value>
  </resourceProperty>
</resourceDescriptor>
```

5.2.5 Setting the Temporary Upload Directory

When you create a resource by uploading a large file, the server stores the file in a temporary location while receiving and processing it. Uploaded files may be huge and cause errors if the local disk is limited or full. If you are having issues when creating resources with large files, set the following property to a directory location with sufficient capacity.

Temporary Upload Directory for Web Services		
Configuration File		
…\WEB-INF\applicationContext-webservices.xml		
Property	**Bean**	**Description**
`attachmentsTempFolder`	`managementServiceI-mpl`	Change this property to an absolute path such as /tmp/jasperserver/axis_attachments or a relative path such as {java.io.tmpdir}/jasperserver/axis_attachments.

5.2.6 Modifying a Resource

The POST method on the resource service is used to modify a resource. If the resource has one or more file resources, they must be provided using a multipart request. A POST operates on the URL of an existing resource, otherwise it is identical to the PUT method for a new resource.

Method	**URL**	
POST	http://<host>:<port>/jasperserver[-pro]/**rest/resource**/path/to/resource/	
Argument	**Type/Value**	**Description**
Resource Descriptor	String	This parameter identifies the part with an XML resource descriptor in a multipart request. This is a required argument when using multipart requests.
Content-Type		**Content**
multipart/form-data text/plain (in the first part) application/octet-stream (for files)		A well-formed XML resourceDescriptor that fully describes the modified resource, including any locally defined resources. File resources are uploaded in separate parts.
Return Value on Success		**Typical Return Values on Failure**
201 Created – The body is XML containing the resourceDescriptor of the resource just modified.		An error if the resource cannot be modified for some reason.

5.2.7 Copying or Moving a Resource

The POST method on the resource service also has parameters to copy or move a resource. Both folders and individual resources can be copied or moved. The ID of the resource being copied or moved must be unique within the destination folder, otherwise the operation will fail. This implies that copying cannot be used to duplicate a resource within the same folder.

Method	**URL**	
POST	http://<host>:<port>/jasperserver[-pro]/**rest/resource**/path/to/resource/?<argument>	
Argument	**Type/Value**	**Description**
copyTo?	/path/to/folder	Destination folder in the repository.
moveTo?	/path/to/folder	Destination folder in the repository.
Return Value on Success		**Typical Return Values on Failure**
200 OK– The resource was successfully moved or copied.		An error if the resource cannot be moved or copied, for example if a resource with the same ID already exists in the destination folder.

5.2.8 Deleting a Resource

The DELETE method can be used with either a folder or a resource. For the delete to succeed:

- The logged in user must have read-delete, read-write-delete, or administer permission on the folder or resource.
- The resource must not be a dependency of any other resource, for example the data source of a JasperReport. In this case, you must modify or delete the other resource first.
- If the target is a folder, the above requirements must be satisfied for every resource and folder it contains, including any those contained recursively in subfolders to any level.

Method	**URL**
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest/resource**/path/to/resource/

Return Value on Success	**Typical Return Values on Failure**
200 OK – The resource was deleted.	404 Not Found – When the specified resource URI is not found in the repository

5.3 Working with Dashboards

This section describes functionality that can be restricted by the software license for JasperReports Server. If you don't see some of the options described in this section, your license may prohibit you from using them. To find out what you're licensed to use, or to upgrade your license, contact Jaspersoft.

The resource service also gives access to dashboard resources in commercial editions of JasperReports Server. Dashboards are managed as normal resources whose descriptors can be created, viewed, modified, or deleted with the resource service. However, dashboards can be viewed only through the web interface of JasperReports Server because they do not have any output format that can be generated or transmitted through the REST API.

Therefore, an application using the REST API can only manipulate the definition of the dashboard, that is the selection of reports to display and their layout. In order to work with a dashboard, your application must parse its resource descriptor, make changes, and generate a new, valid descriptor to send back to the server.

The general structure of a dashboard descriptor contains:

- Typical descriptor properties such as `label`, `description`, and `PROP_PARENT_FOLDER`.
- The `dashboardState` descriptor containing:
  - The `ADHOC_FRAMES` property that lists the reports, labels, and buttons, and gives their coordinates in the dashboard.
  - The `ADHOC_PROPERTIES` property that gives the overall dashboard layout properties.
- `reference` descriptors for each of the reports included in the `ADHOC_FRAMES` property. These references ensure that the reports can't be deleted from the repository as long as they are used in this dashboard.

The following example shows the contents of a dashboard's resource descriptor:

```
<resourceDescriptor name="SampleDashboard"
  wsType="dashboard" uriString="/Dashboards/SampleDashboard" isNew="false">
  <label>Sample Dashboard</label>
  <description>Created in Dashboard Designer, viewed through REST.</description>
  <creationDate>1318380317305</creationDate>
  <resourceProperty name="PROP_RESOURCE_TYPE">
```

```
    <value>com.jaspersoft.ji.adhoc.DashboardResource</value></resourceProperty>
  <resourceProperty name="PROP_PARENT_FOLDER"><value>/Dashboards</value>
  </resourceProperty>
  <resourceProperty name="PROP_VERSION"><value>0</value></resourceProperty>
  <resourceProperty name="PROP_HAS_DATA"><value>false</value></resourceProperty>
  <resourceDescriptor name="" wsType="dashboardState" uriString="" isNew="false">
    <label>null</label>
    <creationDate>1318380317305</creationDate>
    <resourceProperty name="PROP_RESOURCE_TYPE"><value>dashboardState</value>
    </resourceProperty>
    <resourceProperty name="PROP_PARENT_FOLDER">
      <value>/Dashboards/SampleDashboard</value></resourceProperty>
    <resourceProperty name="ADHOC_PAPER_SIZE"><value>content</value>
    </resourceProperty>
    <resourceProperty name="ADHOC_FRAMES">
      <value>frame_1,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameLeft=0;
frame_1,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameTop=0;
frame_1,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameWidth=246;
frame_1,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameHeight=405;
frame_1,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameResourceType=
  com.jaspersoft.jasperserver.api.metadata.jasperreports.domain.ReportUnit;
frame_1,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameResourceName=
  Top Fives Report;

frame_1,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameSource=%2Fflow.html
  %3F_flowId%3DviewReportFlow%26viewAsDashboardFrame%3Dtrue%26reportUnit%3D;
frame_1,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashResourceIndex=0;
frame_1,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameScrollBars=false;

frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameLeft=254;
frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameTop=0;
frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameWidth=450;
frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameHeight=418;
frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameResourceType=
  com.jaspersoft.jasperserver.api.metadata.jasperreports.domain.ReportUnit;
frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameResourceName=
  Sales By Month Report;

frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameSource=%2Fflow.html
  %3F_flowId%3DviewReportFlow%26viewAsDashboardFrame%3Dtrue%26reportUnit%3D;
frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashResourceIndex=1;
frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameScrollBars=false;
frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameResourceType=
  com.jaspersoft.jasperserver.api.metadata.jasperreports.domain.ReportUnit;
frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameResourceName=
  Sales By Month Report;
frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameSource=%2Fflow.html
  %3F_flowId%3DviewReportFlow%26viewAsDashboardFrame%3Dtrue%26reportUnit%3D;
frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashResourceIndex=1;
frame_2,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameScrollBars=false;
frame_3,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameLeft=712;
frame_3,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameTop=0;
frame_3,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameWidth=200;
frame_3,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameHeight=350;
frame_3,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameResourceType=
  com.jaspersoft.jasperserver.api.metadata.jasperreports.domain.ReportUnit;
frame_3,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameResourceName=
  Sales Gauges Report;
```

```
frame_3,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameSource=%2Fflow.html
  %3F_flowId%3DviewReportFlow%26viewAsDashboardFrame%3Dtrue%26reportUnit%3D;
frame_3,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashResourceIndex=2;
frame_3,com.jaspersoft.ji.adhoc.DashboardContentFrame,dashFrameScrollBars=false;

text_2,com.jaspersoft.ji.adhoc.DashboardTextFrame,dashFrameLeft=736;
text_2,com.jaspersoft.ji.adhoc.DashboardTextFrame,dashFrameTop=352;
text_2,com.jaspersoft.ji.adhoc.DashboardTextFrame,dashFrameWidth=66;
text_2,com.jaspersoft.ji.adhoc.DashboardTextFrame,dashFrameHeight=16;
text_2,com.jaspersoft.ji.adhoc.DashboardTextFrame,dashTextFrameLabel=Start Month;
text_2,com.jaspersoft.ji.adhoc.DashboardTextFrame,fontResizes=false;
text_2,com.jaspersoft.ji.adhoc.DashboardTextFrame,dashTextFrameFontSize=11;
text_2,com.jaspersoft.ji.adhoc.DashboardTextFrame,maxFontSize=11;
control_2,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashFrameLeft=816;
control_2,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashFrameTop=352;
control_2,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashFrameWidth=85;
control_2,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashFrameHeight=16;

control_2,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashControlFrameParamName=
  startMonth;
control_2,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashControlFrameParamValue=
  1;
control_2,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashControlFrameDefaultParam
  Value=1;
control_2,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashControlFrameDataType=
  String;

text_3,com.jaspersoft.ji.adhoc.DashboardTextFrame,dashFrameLeft=744;
text_3,com.jaspersoft.ji.adhoc.DashboardTextFrame,dashFrameTop=376;
text_3,com.jaspersoft.ji.adhoc.DashboardTextFrame,dashFrameWidth=59;
text_3,com.jaspersoft.ji.adhoc.DashboardTextFrame,dashFrameHeight=16;
text_3,com.jaspersoft.ji.adhoc.DashboardTextFrame,dashTextFrameLabel=End Month;
text_3,com.jaspersoft.ji.adhoc.DashboardTextFrame,fontResizes=false;
text_3,com.jaspersoft.ji.adhoc.DashboardTextFrame,dashTextFrameFontSize=11;
text_3,com.jaspersoft.ji.adhoc.DashboardTextFrame,maxFontSize=11;

control_3,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashFrameLeft=816;
control_3,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashFrameTop=376;
control_3,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashFrameWidth=85;
control_3,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashFrameHeight=16;
control_3,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashControlFrameParamName=
  endMonth;
control_3,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashControlFrameParamValue=
  12;
control_3,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashControlFrameDefaultParam
  Value=12;
control_3,com.jaspersoft.ji.adhoc.DashboardControlFrame,dashControlFrameDataType=
  String;

button_1,com.jaspersoft.ji.adhoc.DashboardClickableFrame,dashFrameLeft=832;
button_1,com.jaspersoft.ji.adhoc.DashboardClickableFrame,dashFrameTop=400;
button_1,com.jaspersoft.ji.adhoc.DashboardClickableFrame,dashFrameWidth=72;
button_1,com.jaspersoft.ji.adhoc.DashboardClickableFrame,dashFrameHeight=24;

button_1,com.jaspersoft.ji.adhoc.DashboardClickableFrame,dashClickableFrameID=
  submit;
button_1,com.jaspersoft.ji.adhoc.DashboardClickableFrame,dashClickableFrameType=
  button;
```

```
button_2,com.jaspersoft.ji.adhoc.DashboardClickableFrame,dashFrameLeft=744;
button_2,com.jaspersoft.ji.adhoc.DashboardClickableFrame,dashFrameTop=400;
button_2,com.jaspersoft.ji.adhoc.DashboardClickableFrame,dashFrameWidth=72;
button_2,com.jaspersoft.ji.adhoc.DashboardClickableFrame,dashFrameHeight=24;
button_2,com.jaspersoft.ji.adhoc.DashboardClickableFrame,dashClickableFrameID=reset;
button_2,com.jaspersoft.ji.adhoc.DashboardClickableFrame,dashClickableFrameType=
  button;
      </value>
    </resourceProperty>

    <resourceProperty name="ADHOC_PROPERTIES">
      <value>layoutSize=1024x768;
        useAbsoluteSizing=true;
        paperSize=content;
        LayoutLeft=286;
        paramValuesChanged=true;
        LayoutTop=176;
        localDatePattern=MM-dd-yyyy;
      </value>
    </resourceProperty>
  </resourceDescriptor>

  <resourceDescriptor name="" wsType="reference" uriString="" isNew="false">
    <label>null</label>
    <resourceProperty name="PROP_REFERENCE_URI">
      <value>/supermart/details/TopFivesReport</value></resourceProperty>
  </resourceDescriptor>
  <resourceDescriptor name="" wsType="reference" uriString="" isNew="false">
    <label>null</label>
    <resourceProperty name="PROP_REFERENCE_URI">
      <value>/supermart/salesByMonth/SalesByMonthReport</value></resourceProperty>
  </resourceDescriptor>
  <resourceDescriptor name="" wsType="reference" uriString="" isNew="false">
    <label>null</label>
    <resourceProperty name="PROP_REFERENCE_URI">
      <value>/supermart/revenueAndProfit/SalesGaugesReport</value>
    </resourceProperty>
  </resourceDescriptor>
</resourceDescriptor>
```

5.4 Working with Virtual Data Sources

Data sources define a connection to a database or other source of data for running reports. Data sources are resources in the repository that can be created, modified, and deleted with the repository service.

As with all descriptors, the descriptors for data sources contain properties and values that define the data source. Different types of data sources have different properties, but all are self-explanatory. For example, the following call returns the descriptor for a virtual data source in the sample data:

GET http://localhost:8080/jasperserver/rest/resource/datasources/SugarFoodmartVDS

The resource descriptor is shown below. The data sources that make up the virtual data source are given as children descriptors of type generic datasource. Each child descriptor has an ID within the virtual data source (PROP_DATASOURCE_SUB_DS _ID) and a repository URI (PROP_REFERENCE_URI):

```
<resourceDescriptor name="SugarFoodmartVDS" wsType="virtual"
```

```
    uriString="/datasources/SugarFoodmartVDS" isNew="false">
  <label>SugarCRM-Foodmart Virtual Data Source</label>
  <description>Virtual Data Source Combining SugarCRM and Foodmart</description>
  <creationDate>1366267873303</creationDate>

  <resourceProperty name="PROP_RESOURCE_TYPE">
    <value>com.jaspersoft.jasperserver.api.metadata.jasperreports.domain.
           VirtualReportDataSource</value>
  </resourceProperty>
  <resourceProperty name="PROP_PARENT_FOLDER">
    <value>/datasources</value>
  </resourceProperty>
  <resourceProperty name="PROP_VERSION">
    <value>0</value>
  </resourceProperty>
  <resourceProperty name="PROP_SECURITY_PERMISSION_MASK">
    <value>33</value>
  </resourceProperty>
  <resourceDescriptor wsType="datasource" isNew="false">
    <resourceProperty name="PROP_REFERENCE_URI">
      <value>/analysis/datasources/SugarCRMDataSourceJNDI</value>
    </resourceProperty>
    <resourceProperty name="PROP_IS_REFERENCE">
      <value>true</value>
    </resourceProperty>
    <resourceProperty name="PROP_DATASOURCE_SUB_DS_ID">
      <value>SugarCRMDataSource</value>
    </resourceProperty>
  </resourceDescriptor>
  <resourceDescriptor wsType="datasource" isNew="false">
    <resourceProperty name="PROP_REFERENCE_URI">
      <value>/analysis/datasources/FoodmartDataSourceJNDI</value>
    </resourceProperty>
    <resourceProperty name="PROP_IS_REFERENCE">
      <value>true</value>
    </resourceProperty>
    <resourceProperty name="PROP_DATASOURCE_SUB_DS_ID">
      <value>FoodmartDataSource</value>
    </resourceProperty>
  </resourceDescriptor>
</resourceDescriptor>
```

If you wanted more information about the child data sources, use the resource service again to request their descriptors, for example:

GET http://localhost:8080/jasperserver/rest/resource/analysis/datasources/FoodmartDataSourceJNDI

5.5 Working with Domains

The repository services can also be used to read and write Domains. Like JasperReport resources, Domains are complex resources that contain other files. The files that make up a Domain are its Domain schema, its optional security files, and its optional language bundles. You can find the name and location of these files by requesting the Domain itself. For example, the following request shows the contents of the Supermart Domain:

GET http://localhost:8080/jasperserver-pro/rest/resource/Domains/supermartDomain

All repository URIs sent and received are relative the organization of the user ID that performs the REST operation. The URIs in this section assume the user is an organization admin such as jasperadmin.

Looking carefully through the resulting descriptor, we find the relevant information:

```
<resourceDescriptor name="supermartDomain" wsType="domain"
  uriString="/Domains/supermartDomain" isNew="false">
  <label>Supermart Domain</label>
  <description>Comprehensive example of Domain (pre-joined table sets for complex reporting, custom
query based dataset, column and row security, I18n bundles)</description>
  <resourceProperty name="PROP_RESOURCE_TYPE">
    <value>com.jaspersoft.commons.semantic.datasource.SemanticLayerDataSource
  ...

  <resourceDescriptor name="supermartDomain_schema" wsType="xml"
    uriString="/Domains/supermartDomain_files/supermartDomain_schema" isNew="false">
    <label>supermartDomain_schema</label>
    <description>supermartDomain_schema</description>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.FileResource
    ...
  </resourceDescriptor>

  <resourceDescriptor name="supermart_domain.properties" wsType="prop"
    uriString="/Domains/supermartDomain_files/supermart_domain.properties"
    isNew="false">
    <label>supermart_domain.properties</label>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.FileResource
    ...
  </resourceDescriptor>

  <resourceDescriptor name="supermart_domain_en_US.properties" wsType="prop"
    uriString="/Domains/supermartDomain_files/supermart_domain_en_US.properties"
    isNew="false">
    <label>supermart_domain_en_US.properties</label>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.FileResource
    ...
  </resourceDescriptor>
  ...

  <resourceDescriptor name="supermartDomain_domain_security" wsType="xml"
    uriString="/Domains/supermartDomain_files/supermartDomain_domain_security"
    isNew="false">
    <label>supermartDomain_domain_security</label>
    <description>supermartDomain_domain_security</description>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.FileResource
    ...
    <resourceProperty name="PROP_SECURITY_BUNDLE">
      <value>true</value>
    </resourceProperty>
  </resourceDescriptor>

  <resourceDescriptor name="dsFoodMart" wsType="reference" referenceType="jndi"
    uriString="/analysis/datasources/FoodmartDataSourceJNDI" isNew="false">
    <resourceProperty name="PROP_REFERENCE_URI">
      <value>/analysis/datasources/FoodmartDataSourceJNDI</value>
    </resourceProperty>
  </resourceDescriptor>
</resourceDescriptor>
```

The files contained in this Domain are:

- `/Domains/supermartDomain_files/supermartDomain_schema`
- `/Domains/supermartDomain_files/supermartDomain_domain_security`
- `/Domains/supermartDomain_files/supermart_domain.properties`
- `/Domains/supermartDomain_files/supermart_domain_en_US.properties`
- `...`

To download these files, use the same syntax as for downloading file resource contents:

GET http://localhost:8080/jasperserver-pro/rest/resource/Domains/supermartDomain_files/supermartDomain_schema?fileData=true

Domain schema files, security files, and language bundles have a special syntax described in the JasperReports Server User Guide. To process these files automatically, you would need to write your own parser.

If you have valid schema files, security files, and language bundles, you can also create Domain resources in the repository using the PUT method described in section **section 5.2.4, "Creating a Resource," on page 132**. The following procedure outlines the step required to create a Domain resource programmatically through the REST API:

1. Create the resource descriptor for the Domain using the descriptor shown above as an example. Make sure the files are referenced correctly in the descriptor.
2. Create the PUT request to the resource service using the resource descriptor created in the previous step.
3. Add the files to the request as multi-part request. For example use the class `org.apache.http.entity.mime. MultipartEntity` to build a multi-part request. Add each file as a separate part to the request.
4. Send the multi-part request to JasperReports Server.
5. Process the response to verify the request was successful.

5.6 The permission Service

The permission service lets you view and set access permission on repository folders and resources. Only administrative users and users granted the Administer permission may view and set permissions.

As it is implemented, the permission service returns and sets only explicit permissions on resources. The lack of an explicit permission for a given role or user means that the permission is inherited from its parent folder. To find the value of inherited permissions on a given resource, you must obtain the permissions of all of its parent folders.

5.6.1 Viewing Permissions

The GET method retrieves the permissions defined on a resource, including both user-based and role-based permissions.

Method	**URL**
GET	http://<host>:<port>/jasperserver[-pro]/**rest/permission**/path/to/resource/

Return Value on Success	**Typical Return Values on Failure**
200 OK – The body is XML that describes all permissions for the resource.	404 Not Found – When the specified resource URI is not found in the repository.

The permissions for each user and each role are indicated by the following values. These values are not a true mask; they should be treated as constants:

- No access: 0
- Administer: 1
- Read-only: 2
- Read-delete: 18
- Read-write-delete: 30
- Execute-only: 32

The response to the GET request is an `entityResource` that defines each permission on the resource. Permissions for roles or users that are not specified are inherited from their parent folder:

```
<entityResource>
  <Item xsi:type="objectPermissionImpl"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <permissionMask>2</permissionMask>
    <permissionRecipient xsi:type="roleImpl">
      <externallyDefined>false</externallyDefined>
      <roleName>ROLE_USER</roleName>
    </permissionRecipient>
    <URI>repo:/path/to/resource</URI>
  </Item>

  <Item xsi:type="objectPermissionImpl"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <permissionMask>30</permissionMask>
    <permissionRecipient xsi:type="roleImpl">
      <externallyDefined>false</externallyDefined>
      <roleName>ROLE_DEMO</roleName>
    </permissionRecipient>
    <URI>repo:/path/to/resource</URI>
  </Item>

  <Item xsi:type="objectPermissionImpl"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <permissionMask>30</permissionMask>
    <permissionRecipient xsi:type="userImpl">
      <externallyDefined>false</externallyDefined>
      <fullName>California User</fullName>
      <tenantId>organization_1</tenantId>
      <username>CaliforniaUser</username>

    </permissionRecipient>
    <URI>repo:/path/to/resource</URI>
  </Item>

  <Item xsi:type="objectPermissionImpl"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <permissionMask>30</permissionMask>
    <permissionRecipient xsi:type="userImpl">
      <externallyDefined>false</externallyDefined>
      <fullName>Joe User</fullName>
      <tenantId>organization_1</tenantId>
      <username>joeuser</username>
    </permissionRecipient>
    <URI>repo:/path/to/resource</URI>
  </Item>
</entityResource>
```

5.6.2 Setting Permissions

PUT is implemented as a synonym of POST for the permission service. Both will create an explicit permission for a given role or user on a resource, overriding the previous explicit permission for the same role or user. To set a permission use either method and include the permission descriptors (`objectPermissionImpl`) such as those returned by the GET method.

Method	URL
PUT or POST	http://<host>:<port>/jasperserver[-pro]/**rest/permission**/path/to/resource/

Content-Type	Content
text/plain	A well-formed XML entityResource that defines the permissions you want to set.

Return Value on Success	Typical Return Value on Failure
200 OK	404 Not Found – When the specified resource URI is not found in the repository.

Setting a permission creates an explicit permission for the given user or role. To reset the inherited permission value, remove the explicit permission with the DELETE method. This method does not take a permission descriptor, instead specify the roles and users to reset to the inherited permission as parameters.

Method	URL
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest/permission**/path/to/resource/?<argument>

Argument	Type/Value	Description
roles	String	A comma-separated list of role names. The access permission for the specified roles will revert to the resource's inherited permission for those roles.
users	String	A comma-separated list of user IDs. The access permission for the specified users will revert to the resource's inherited permission for those users.

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the specified resource URI is not found in the repository.

CHAPTER 6 REST V1 - REPORT SERVICES

For authentication using the REST web services, see section **section 1.2, “REST Authentication,” on page 12**.

The RESTful report services gives responses that contain the same XML data structure that are used in the SOAP repository web service. These data structures are documented in section **section 1.6, “Syntax of resourceDescriptor,” on page 18**, with reference material in **section Appendix A, “ResourceDescriptor API Constants,” on page 207**.

This chapter includes the following sections:

- **The report Service**
- **The jobsummary Service**
- **The job Service**

6.1 The report Service

The rest/report service is superseded by **“The v2/reports Service” on page 65** and **“The v2/reportExecutions Service” on page 68**.

The report service uses a combination of the PUT, GET, and POST methods to run reports and make them available in multiple ways through the API:

- The PUT method generates the report in any number of formats, stores the output in the session, and returns an identifier.
- The GET method with the identifier and file ID downloads any one of the file outputs.
- The POST method can be used to regenerate the report, for example in different formats, and supports page-by-page downloading of the PDF output.

The report service relies on the user session to store the report output in memory. While this does not follow the stateless nature of REST implementations, it reflects the performance optimization strategies in the JasperReports Server architecture. Filling and generating a report is resource intensive, so it is better to fill and generate once and store multiple output files temporarily than to generate the report from scratch for every output type that is requested.

6.1.1 Running a Report

The PUT request for the report service runs the report and generates the specified output. The response contains the ID of the saved output for downloading later with a GET request.

Method	URL	
PUT	http://<host>:<port>/jasperserver[-pro]/**rest/report**/path/to/report	
Argument	**Type/Value**	**Description**
`RUN_OUTPUT_FORMAT?`	OutputType	The format of the report output. The possible values are: PDF, HTML, XLS, XLSX, RTF, CSV, XML, DOCX, ODT, ODS, JRPRINT. The Default is PDF.
<Resource Descriptor>	String	Argument used to pass a transformer key to be used when running a report using JRPRINT as output format. The transformer key will be used to transform generic elements in the generated report as per net.sf.jasperreports.engine. export.GenericElementReportTransformer. This is a required argument when using multipart requests.
`interactive?`	Boolean	In a commercial editions of the server where HighCharts are used in the report, this property determines whether the JavaScript necessary for interaction is generated when exporting to HTML. By default it is true. If set to false, the chart is generated as a non-interactive image file.
`IMAGES_URI?`	String	The uri prefix used for images when exporting in HTML. The default is `images`.
`X-Method-Override?`	POST	This method can be used to perform a POST instead of a PUT.
`PAGE?`	Integer > 0	An integer value used to export a specific page
`ignore Pagination`	Boolean	When true, the report output will be generated on a single page in all export formats. When false or omitted, all export formats will be paginated.
`onePagePerShe-et`	Boolean	Valid only for the XLS format. When true, each page of the report is on a separate spreadsheet. When false or omitted, the entire report is on a single spreadsheet. If your reports are very long, set this argument to true, otherwise the report will not fit on a single spreadsheet and cause an error.

Return Value on Success	Typical Return Values on Failure
200 OK – The body is XML containing a summary of the report execution (UUID, pages, generated files, etc...). See sample return below.	404 Not Found – When the specified report URI is not found in the repository.

The body of the PUT request should contain a resource descriptor of type `reportUnit` with the URI of the report unit to run. The resource descriptor can contain one or more parameter tags to specify parameters. Lists can be passed using parameters with the same name and the `isListItem` attribute set to true.

The arguments can be placed in the URL of the request or by encoding them in the multipart request. However, some application servers such as Apache Tomcat do not process arguments that are www-url-encoded in the request when sent to a PUT method, so be sure you are using a multipart request or you are using the GET style parameters when using this method.

The return value of the PUT request provides the UUID of the report output in this session and the ID of the files.

```
<report>
  <uuid>d7bf6c9-9077-41f7-a2d4-8682e74b637e</uuid>
  <originalUri>/reports/samples/AllAccounts</originalUri>
  <totalPages>43</totalPages>
  <startPage>1</startPage>
  <endPage>43</endPage>
  <file type="image/png">img_0_0_0</file>
  <file type="image/gif">px</file>
  <file type="text/html">report</file>
  <file type="image/jpeg">img_0_42_27</file>
  <file type="image/png">img_0_42_26</file>
</report>
```

6.1.2 Downloading Report Output

Once a report has been generated with the PUT request, it is possible to download its files using a GET request.

Method	URL	
GET	http://<host>:<port>/jasperserver[-pro]/**rest/report**/<UUID>?<arguments> (see example below)	
Argument	**Type/Value**	**Description**
file?	String	One of the files specified in the report xml. If the file parameter is not specified, the service returns the report descriptor.

Return Value on Success	Typical Return Values on Failure
200 OK – The content is the requested file.	404 Not Found – When the specified UUID is not found in the user's session.

For example, the URL to download the HTML of the report generated in the previous example is:

http://<host>:<port>/jasperserver[-pro]/rest/report/d7bf6c9-9077-41f7-a2d4-8682e74b637e?file=report

As a side effect of storing the report output in the user session, the UUID in the URL is visible only to the currently logged user. Other applications using different user IDs cannot access this report output.

JasperReports Server does not support exporting Highcharts charts with background images to PDF, ODT, DOCX, or RTF formats. When exporting or downloading reports with Highcharts that have background images to these formats, the background image is removed from the chart. The data in the chart is not affected.

6.1.3 Regenerating Report Output

To export a report in a different format after its first execution, or to export a specific page, use the POST method of the report service. For example, it is possible to download the report one page at a time by repeatedly sending the appropriate POST and GET requests.

Method	URL	
POST	http://<host>:<port>/jasperserver[-pro]/**rest/report**/<UUID>?<arguments> (see example below)	
Argument	**Type/Value**	**Description**
`RUN_OUTPUT_FORMAT?`	OutputType	The format of the report output. Possible values: PDF, HTML, XLS, RTF, CSV, XML, JRPRINT. The Default is PDF.
`IMAGES_URI?`	String	The uri prefix used for images when exporting in HTML. The default is `images`.
`PAGE?`	Integer > 0	An integer value used to export a specific page.

Return Value on Success	Typical Return Values on Failure
200 OK – The new details of the report. The old files produces are discarded and replaced with new ones.	404 Not Found – When the specified UUID is not found in the user's session.

For example, the following request exports page 10 of the PDF report:

POST http://host/rest/report/d7bf6c9-9077-41f7-a2d4-8682e74b637e?PAGE=10&RUN_OUTPUT_FORMAT=PDF

You then need to take the file name from the return value and create a GET request for it.

6.2 The jobsummary Service

The rest/jobsummary service is superseded by **"The v2/jobs Service" on page 83**.

In order to schedule reports and interact with jobs that are created to run a report at a later time, the REST API provides two services:

- The jobsummary service lists all currently defined jobs on a given report.
- The job service lets you create, modify, and delete a specific job.

The jobsummary service is a read only service. Requests for PUT, POST, and DELETE operations receive the error 405, method not allowed.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest/jobsummary**/path/to/report/

Return Value on Success	Typical Return Values on Failure
200 OK – The body contains XML that describes all the active jobs	404 Not Found – When the specified report is not found in the server.

The jobs are described in `jobsummary` elements such as the following example:

```
<jobs>
  <jobsummary>
    <id>22164</id>
    <label>MyJob</label>
    <nextFireTime>2011-11-11T11:11:11-08:00</nextFireTime>
    <reportUnitURI>/organizations/organization_1/reports/samples/AllAccounts
      </reportUnitURI>
    <state>
      <value>NORMAL</value>
    </state>
    <version>0</version>
  </jobsummary>
  <jobsummary>
  ...
  </jobsummary>
</jobs>
```

The job summary gives the ID of the job that you need to interact with it using the job service. It also gives the next occurrence ("fire time") of the job, and its status that would indicate any errors.

6.3 The job Service

The rest/job service is superseded by **"The v2/jobs Service" on page 83**.

The job service lets you view details of a scheduled report (called a job), edit them, create new jobs, and delete existing ones. For interacting with existing jobs, use the jobID that you obtained from the jobsummary service.

6.3.1 Viewing a Job Definition

The GET method for the job service retrieves the information about a scheduled job.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest/job**/<jobID>/

Return Value on Success	Typical Return Values on Failure
200 OK – The body contains XML that describes all the job properties	404 Not Found – When the specified job is not found in the server.

The GET method returns a `job` element that gives the output, scheduling, and parameter details, if any, for the job:

```
<job>
  <baseOutputFilename>AllAccounts</baseOutputFilename>
  <description>Sample job</description>
  <id>22164</id>
  <label>MyJob</label>

  <mailNotification>
    <id>22163</id>
    <messageText></messageText>
    <resultSendType><value>SEND</value></resultSendType>
    <skipEmptyReports>false</skipEmptyReports>
    <subject>Scheduled AllAccounts report</subject>
    <toAddresses>example@example.com</toAddresses>
    <version>2</version>
  </mailNotification>

  <outputFormats>PDF</outputFormats>
  <outputFormats>HTML</outputFormats>
  <outputLocale></outputLocale>
  <reportUnitURI>/reports/samples/AllAccounts</reportUnitURI>

  <repositoryDestination>
    <folderURI>/reports/samples</folderURI>
    <id>22162</id>
    <outputDescription></outputDescription>
    <overwriteFiles>false</overwriteFiles>
    <sequentialFilenames>false</sequentialFilenames>
    <version>0</version>
  </repositoryDestination>

  <simpleTrigger>
    <id>22161</id>
    <startDate>2011-11-11T11:11:11-08:00</startDate>
    <timezone>America/Los_Angeles</timezone>
    <version>0</version>
    <occurrenceCount>1</occurrenceCount>
  </simpleTrigger>
  <version>0</version>
</job>
```

6.3.2 Scheduling a Report

To schedule a report, create its job descriptor and use the PUT method of the job service. Specify the report being scheduled inside the job descriptor. You do not need to specify any job IDs in the descriptor, because the server will assign them.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest/job/**

Content-Type	Content
text/plain	A well-formed XML job descriptor.

Return Value on Success	Typical Return Values on Failure
201 Created – The body contains XML Job descriptor. This is the only case where a descriptor returns for a put request and that id due to the fact that the job id (the job handle) is created in the server.	404 Not Found – When the report specified in the job descriptor is not found in the server.

The output formats are those supported by JasperReports server, as given by the following values:

• PDF	• XLS	• DOCX
• HTML	• XLS_NOPAG	• RTF
• CSV	• XLSX	• ODT
• ODS	• XLSX_NOPAG	•

The recurrence can be defined as follows:

- No recurrence (single run), for example:

```
<simpleTrigger>
  <startDate>2011-11-11T11:11:11-08:00</startDate>
  <timezone>America/Los_Angeles</timezone>
  <version>0</version>
  <occurrenceCount>1</occurrenceCount>
</simpleTrigger>
```

- Simple recurrence, for example every day until a given date:

```
<simpleTrigger>
  <endDate>2011-11-11T11:11:11-08:00</endDate>
  <startDate>2012-12-12T12:12:12-08:00</startDate>
  <timezone>America/Los_Angeles</timezone>
  <version>0</version>
  <occurrenceCount>-1</occurrenceCount>
  <recurrenceInterval>1</recurrenceInterval>
  <recurrenceIntervalUnit>
    <value>DAY</value>
  </recurrenceIntervalUnit>
</simpleTrigger>
```

- Calendar recurrence, for example every Tuesday and Thursday in February, April, and June until next year:

```
< <calendarTrigger>
    <endDate>2012-12-12T12:12:12-08:00</endDate>
    <timezone>America/Los_Angeles</timezone>
    <version>0</version>
    <daysType><value>WEEK</value></daysType>
    <hours>0</hours>
    <minutes>0</minutes>
    <monthDays></monthDays>
    <months>2</months>
    <months>4</months>
    <months>6</months>
    <weekDays>3</weekDays>
    <weekDays>5</weekDays>
  </calendarTrigger>
```

6.3.3 Editing a Job Definition

To modify an existing job definition, use the GET method to read its job descriptor, modify the descriptor as required, and use the POST method of the job service. The POST method replaces the definition of the job with the given job ID.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest/job**/<jobID>/

Content-Type	Content
text/plain	A well-formed XML job descriptor.

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the specified job is not found in the server.

6.3.4 Deleting a Job Definition

Use the DELETE method to delete a job identified by its jobID. Use the jobsummary service to see the job IDs for a given report.

Method	URL
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest/job**/<jobID>/

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the specified job is not found in the server.

CHAPTER 7 REST V1 - ADMINISTRATION SERVICES

Only administrative users may access the REST services for administration. For authentication using the REST web services, see section **section 1.2, “REST Authentication,” on page 12**.

The RESTful administration services gives responses that contain the same XML data structure that are used in the SOAP administration web service. These data structures are documented in section **section 1.6, “Syntax of resourceDescriptor,” on page 18**, with reference material in **section Appendix A, “ResourceDescriptor API Constants,” on page 207**.

This chapter includes the following sections:

- **The organization Service**
- **The user Service**
- **The attribute Service**
- **The role Service**

7.1 The organization Service

This section describes functionality that can be restricted by the software license for JasperReports Server. If you don’t see some of the options described in this section, your license may prohibit you from using them. To find out what you're licensed to use, or to upgrade your license, contact Jaspersoft.

In commercial editions of JasperReports Server, the organization service lets you view, create, modify, and delete organizations (also known as tenants).

The rest/organization service is replaced by the rest_v2/organizations service. Jaspersoft recommends using the latest rest_v2 services.

7.1.1 Viewing an Organization

The GET method retrieves information about an organization and optionally its child organizations. To specify an organization, use its ID, not its path.

Method	URL	
GET	http://<host>:<port>/jasperserver-pro/**rest/organization**/organizationID?<arguments>	
Argument	**Type/Value**	**Description**
listSubOrgs?	Boolean	When this argument is omitted or is false, only the specified organization is returned. When true only the suborganizations are returned.
Return Value on Success		**Typical Return Values on Failure**
200 OK – The content is a descriptor for the organization or its suborganizations.		404 Not Found – When the specified organization ID is not found in the server.

When the `listSubOrgs` argument is omitted or false, the GET method returns a single `tenant` descriptor for the given organization:

```
<tenant>
  <alias>organization_1</alias>
  <id>organization_1</id>
  <parentId>organizations</parentId>
  <tenantDesc> </tenantDesc>
  <tenantFolderUri>/organizations/organization_1</tenantFolderUri>
  <tenantName>Organization</tenantName>
  <tenantNote> </tenantNote>
  <tenantUri>/organization_1</tenantUri>
  <theme>default</theme>
</tenant>
```

The tenantFolderURI is always relative to the user ID that authenticated the request. In these two examples, the user ID is superuser.

When the `listSubOrgs` argument is true, the GET method returns a list of tenant descriptors. If the given organization has no suborganizations, the list is empty.

```
<tenantsList>
  <tenant>
    <alias>SubOrganization</alias>
    <id>SubOrganization</id>
    <parentId>organization_1</parentId>
    <tenantDesc>My SubOrganization</tenantDesc>
    <tenantFolderUri>/organizations/organization_1/organizations/SubOrganization
      </tenantFolderUri>
    <tenantName>SubOrganization</tenantName>
    <tenantUri>/organization_1/SubOrganization</tenantUri>
    <theme>default</theme>
  </tenant>
</tenantsList>
```

7.1.2 Creating an Organization

Use the PUT method of the organization service to create a new organization.

Method	URL
PUT	http://<host>:<port>/jasperserver-pro/**rest/organization**/

Content-Type	Content
text/plain	A well-formed `tenant` descriptor that accurately describes the desired organization.

Return Value on Success	Typical Return Values on Failure
201 Created	404 Not Found – When the parent organization ID in the descriptor is not found in the server.

7.1.3 Modifying Organization Properties

Use the POST method of the organization service to update the properties of an existing organization.

Method	URL
POST	http://<host>:<port>/jasperserver-pro/**rest/organization**/organizationID/

Content-Type	Content
text/plain	A well-formed `tenant` descriptor with updated property values for the desired organization.

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the organization ID is not found in the server.

As with organizations managed in the user interface, only certain fields may be modified in the tenant descriptor:

- `alias` – Can be used for logging in, but must be unique among all organization aliases.
- `tenantDesc` – Description of the organization, visible only to administrators.
- `tenantName` – Display name of the organization, appearing to users on the organization’s root folder.
- `theme` – The user interface theme that is active for all organization users.

7.1.4 Deleting an Organization

Use the DELETE method of the organization service to remove an existing organization.

Method	URL
DELETE	http://<host>:<port>/jasperserver-pro/**rest/organization**/organizationID/

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the organization ID is not found in the server.

Deleting an organization removes all of its users, roles, and all of its suborganizations recursively.

7.2 The user Service

The GET method for the user service returns descriptors for all users that match the search string. In commercial editions, the scope of the search is the administrator's organization and all suborganizations. In the community project, there are no organizations, and the scope is all users defined in the server. If no search string is specified, all users are returned. If no users match the search string, the method returns an empty list.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest/user**/<searchString>

Return Value on Success	Typical Return Values on Failure
200 OK – The content is a descriptor for each of the users that match the search.	

The following example shows the descriptors for users that match the search string "joe":

```
<users>
  <user>
    <enabled>true</enabled>
    <externallyDefined>false</externallyDefined>
    <fullName>Joe User</fullName>
    <previousPasswordChangeTime>2011-11-29T10:18:38.062-08:00
      </previousPasswordChangeTime>
    <roles>
      <externallyDefined>false</externallyDefined>
      <roleName>ROLE_USER</roleName>
    </roles>
    <tenantId>organization_1</tenantId>
    <username>joeuser</username>
  </user>
  <user>
    <emailAddress></emailAddress>
    <enabled>true</enabled>
    <externallyDefined>false</externallyDefined>
    <fullName>joeuser</fullName>
    <previousPasswordChangeTime>2011-11-29T15:52:18.407-08:00
      </previousPasswordChangeTime>
    <roles>
      <externallyDefined>false</externallyDefined>
      <roleName>ROLE_USER</roleName>
    </roles>
    <tenantId>SubOrganization</tenantId>
    <username>joeuser</username>
  </user>
</users>
```

The descriptor above is from a commercial edition, and each user has a `tenantId` element to indicate which organization the user belongs to. The community project does not have organizations and thus does not specify the `tenantId` element.

The `externallyDefined` property is true when the user is authenticated by a 3rd party such as an LDAP directory or single sign-on mechanism. For more information, see the *JasperReports Server Authentication Cookbook*.

7.2.1 Creating a User

Use the PUT method of the user service to create a new user. In commercial editions, specify the user's organization in the `tenantId` element of the `user` descriptor.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest/user**/

Content-Type	Content
text/plain	A well-formed `user` descriptor that describes the properties of the desired user. You can set the following properties on the user account: • username – Required. • password – Required. • fullName – Required. • tenantId – Required on commercial editions with multiple organizations. • enabled – Optional. • emailAddress – Optional. • roles – Optional list of roles. The ROLE_USER is assigned automatically. All other properties seen in user descriptors are generated by the server and should not be set.

Return Value on Success	Typical Return Values on Failure
201 Created	404 Not Found – When the organization ID in the descriptor is not found in the server.

The following example shows a user descriptor for creating a user:

```
<user>
  <username>Alice</username>
  <password>myPassword</password>
  <fullName>Alice Adams</fullName>
  <tenantId>organization_1</tenantId>
  <emailAddress>alice@example.com</emailAddress>
  <roles>
    <roleName>ROLE_DEMO</roleName>
  </roles>
</user>
```

7.2.2 Editing a User

Use the POST method of the user service to update the properties of an existing user.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest/user**/<userID>/

Content-Type	Content
text/plain	A well-formed `user` descriptor that describes the properties of the desired user.

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the user ID is not found in the server.

7.2.3 Deleting a User

Use the DELETE method of the user service to remove an existing user.

Method	URL
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest/user**/<userID>/

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the specified user ID is not found in the server.

7.3 The attribute Service

The attribute service lets you view and update profile attributes, which are custom properties associated with a user. This service does not delete attributes in this release.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest/attribute**/<userID>/

Return Value on Success	Typical Return Values on Failure
200 OK – The content is a descriptor for the user attributes.	404 Not Found – When the specified user ID is not found in the server.

The following example show the user attributes specified in an `entityResource` element:

```
<entityResource>
  <Item xsi:type="profileAttributeImpl"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <attrName>State</attrName>
    <attrValue>CA</attrValue>
  </Item>
  <Item xsi:type="profileAttributeImpl"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <attrName>Cities</attrName>
    <attrValue>San Francisco, Oakland, San Jose</attrValue>
  </Item>
</entityResource>
```

Use the PUT or POST methods of the attribute service to add attributes to a user. For this service, these methods are synonyms.

Method	URL
PUT or POST	http://<host>:<port>/jasperserver[-pro]/**rest/attribute**/<userID>/
Content-Type	**Content**
text/plain	A well-formed descriptor that contains the attributes to add to the given user.
Return Value on Success	**Typical Return Values on Failure**
201 Created	404 Not Found – When the user ID is not found in the server.

The DELETE on the attribute service is not implemented in this release.

7.4 The role Service

The role service allows administrators to view, create, edit, and delete role definitions. However, the role service does not define role membership. To add users to a role, edit the user's properties, as described in **section 7.2.2, "Editing a User," on page 158**.

The GET method of the role service returns descriptors for all roles that match the search string. In commercial editions, the scope of the search is the administrator's organization and all suborganizations. In the community project, there are no organizations, and the scope is all roles defined in the server. If no search string is specified, all roles are returned. If no roles match the search string, the method returns an empty list.

Method	URL
GET	http://<host>:<port>/jasperserver[-pro]/**rest/role**/<searchString>/
Return Value on Success	**Typical Return Values on Failure**
200 OK – The content is a descriptor for each of the roles that match the search.	

In commercial editions, roles defined in an organization specify its ID in the `tenantID` element. System roles that appear in every organization are listed without a tenantID property. The community project does not have organizations and thus does not specify the `tenantId` element on any roles.

```
<roles>
  <role>
    <externallyDefined>false</externallyDefined>
    <roleName>ROLE_ADMINISTRATOR</roleName>
  </role>
  <role>
    <externallyDefined>false</externallyDefined>
    <roleName>ROLE_ANONYMOUS</roleName>
  </role>
  <role>
    <externallyDefined>false</externallyDefined>
    <roleName>ROLE_DEMO</roleName>
  </role>
  <role>
    <externallyDefined>false</externallyDefined>
    <roleName>ROLE_SUPERMART_MANAGER</roleName>
  </role>
  <role>
    <externallyDefined>false</externallyDefined>
    <roleName>ROLE_USER</roleName>
  </role>
  <role>
    <externallyDefined>false</externallyDefined>
    <roleName>ROLE_SAMPLE</roleName>
    <tenantId>organization_1</tenantId>
  </role>
</roles>
```

7.4.1 Creating a New Role

Use the PUT method of the role service to create a new role. In commercial editions, specify the role's organization in the `tenantID` element of the `role` descriptor.

Method	URL
PUT	http://<host>:<port>/jasperserver[-pro]/**rest/role**/

Content-Type	Content
text/plain	A well-formed `role` descriptor that describes the properties of the desired role.

Return Value on Success	Typical Return Values on Failure
201 Created	404 Not Found – When the organization ID in the descriptor is not found in the server.

7.4.2 Editing a Role

Use the POST method of the role service to update the properties of an existing role.

Method	URL
POST	http://<host>:<port>/jasperserver[-pro]/**rest/role**/<roleName>/

Content-Type	Content
text/plain	A well-formed `role` descriptor that describes the properties of the desired role.

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the roleName is not found in the server.

7.4.3 Deleting a Role

Use the DELETE method of the role service to remove an existing role.

Method	URL
DELETE	http://<host>:<port>/jasperserver[-pro]/**rest/role**/<roleName>/

Return Value on Success	Typical Return Values on Failure
200 OK	404 Not Found – When the specified role is not found in the server.

CHAPTER 8 SOAP - REPOSITORY WEB SERVICE

With the completion of the REST v2 API in JasperReports Server 5.5, Jaspersoft announces the end of life of the SOAP web services. The SOAP web services will no longer be maintained or updated to support new features of the server. In particular, the SOAP web services do not support interactive charts or interactive HTML5 tables.

The repository web service is comprised of seven methods: `list`, `get`, `put`, `move`, `copy`, `delete`, and `runReport`.

You can retrieve the WSDL (Web Services Description Language) document that describes the repository service by invoking the URL of the service and appending the string `?wsdl`. For example:

```
http://localhost:8080/jasperserver-pro/services/repository?wsdl
```

This chapter contains the following sections:

- **Request and Operation Result**
- **List Operation**
- **Get Operation**
- **Put Operation**
- **Delete Operation**
- **Move Operation**
- **Copy Operation**
- **runReport Operation**
- **Errors**
- **Implementation Suggestions**

8.1 Request and Operation Result

The repository web services operation takes a single input parameter of type `String`. This XML document represents the request. The following shows its DTD:

```
<!ELEMENT request (argument*, resourceDescriptor?)>
<!ATTLIST request
  operationName (get | list | put | runReport) "list"
  locale #IMPLIED
>
<!ELEMENT argument (#PCDATA)>
```

```
<!ATTLIST argument
  name CDATA #REQUIRED
>
```

A request is a very simple document that contains:

- The operation to execute (`list`, `get`, `put`, `delete`, or `runReport`).
- A set of optional arguments. Each argument is a pair of a key and a value that is used to achieve very particular results; arguments are only used rarely.
- A resource descriptor.

The operation name is redundant, since the operation to execute is intrinsic in the invoked service. However, including the name can clarify the request document.

The services act on a single resource at time. The resource that is the subject of the request is described by a `resourceDescriptor`.

To get error messages in a particular locale supported by the server, specify the locale code with the `locale` attribute. Locale codes are in the form `<language code>[_<country>[_<variant>]`. Valid examples include `en_US`, `it_IT`, `fr_FR`, `de_DE`, `ja_JP`, and `es_ES`. For a list of Java-compliant locales, refer to Sun's Java web site.

The following sample request lists the repository root:

```
<?xml version="1.0" encoding="UTF-8"?>
<request operationName="list" locale="en">
  <resourceDescriptor name="" wsType="folder" uriString="/">
    <label>null</label>
  </resourceDescriptor>
</request>
```

Executing a service produces the `operationResult` in the form of a new XML document.

The DTD is very simple:

```
<!ELEMENT operationResult (code, message?, resourceDescriptor*)>
<!ATTLIST operationResult
  version NMTOKEN #REQUIRED
>
<!ELEMENT code (#PCDATA)>
<!ELEMENT message (#PCDATA)>
```

The operation result contains a return code, an optional return message, and zero or more resource descriptors. A return code other than 0 indicates an error, which is normally described in the message tag.

The operation result always includes the `version` attribute: it can be used to detect the server version. For example, you can list the repository root and read the version set by the server in the response. In this case, we aren't interested in the root folder's content. We just want the version information from the response object itself.

The operation result of such a request is:

```
<operationResult version="1.2.1">
  <returnCode>0</returnCode>
  ...
  several resource descriptors...
  ...
</operationResult>
```

8.2 List Operation

This service lists the contents of the specified folder or report unit. The following sample request lists the contents of the
/ContentFiles folder in the repository:

```
<request operationName="list" locale="en">
  <resourceDescriptor name="" wsType="folder" uriString="/ContentFiles"   isNew=
    "false">
    <label>null</label>
  </resourceDescriptor>
</request>
```

Sample response:

```
<operationResult version="1.2.0">
  <returnCode>0</returnCode>
  <resourceDescriptor name="html" wsType="folder" uriString="/ContentFiles/html"
    isNew="false">
    <label>html</label>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.Folder</value>
    </resourceProperty>
    <resourceProperty name="PROP_PARENT_FOLDER">
      <value>/ContentFiles</value>
    </resourceProperty>
    <resourceProperty name="PROP_VERSION">
      <value>0</value>
    </resourceProperty>
  </resourceDescriptor>
  <resourceDescriptor name="pdf" wsType="folder" uriString="/ContentFiles/pdf"
    isNew="false">
  <label>pdf</label>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.Folder</value>
    </resourceProperty>
    <resourceProperty name="PROP_PARENT_FOLDER">
      <value>/ContentFiles</value>
    </resourceProperty>
    <resourceProperty name="PROP_VERSION">
      <value>0</value>
    </resourceProperty>
  </resourceDescriptor>
  <resourceDescriptor name="xls" wsType="folder" uriString="/ContentFiles/xls"
    isNew="false">
    <label>xls</label>
    <resourceProperty name="PROP_RESOURCE_TYPE">
      <value>com.jaspersoft.jasperserver.api.metadata.common.domain.Folder</value>
    </resourceProperty>
    <resourceProperty name="PROP_PARENT_FOLDER">
      <value>/ContentFiles</value>
    </resourceProperty>

    <resourceProperty name="PROP_VERSION">
      <value>0</value>
    </resourceProperty>
  </resourceDescriptor>
</operationResult>
```

When it lists a folder, the repository web service returns a set of resource descriptors: one for each resource that resides in the specified folder. Use / as the URI of the root folder.

Similarly, when it lists a report unit, the repository web service returns a set of resource descriptors that contain (at a minimum) the main JRXML source file. Since a resource in a report unit can be either a local resource or a reference to another repository resource, you should keep a few details in mind:

- If a report unit data source is not defined locally, its `wsType` is set to `datasource`, which does not indicate the exact nature of the resource. Its type should simply be `reference`, but since the data source used by the report unit is a special child resource, it's easy to recognize. The URI of the referenced resource is available in the `PROP_REFERENCE_URI` property.
- The main JRXML resource's `wsType` is always set to `jrxml`, even if it's a reference to an external JRXML resource. By looking at the `PROP_IS_REFERENCE` and `PROP_REFERENCE_URI` properties, you can determine where the resource is actually stored. The `PROP_RU_IS_MAIN_REPORT` property identifies the main JRXML source file of the report unit, even if the order of its children is altered.
- The purpose of listing a report unit is to get the list of the resources contained in the report unit. To retrieve the entire report unit (report unit resource as well as its children) at the same time, use the `get` service.

The following Java sample illustrates `wsclient` as an instance of `com.jaspersoft.jasperserver.irplugin.wsclient.WSClient`:

```
ResourceDescriptor rd = new ResourceDescriptor();
rd.setWsType( ResourceDescriptor.TYPE_FOLDER );
rd.setUriString("/");
List lst = wsclient.list(rd);
```

PHP sample:

```
$result = ws_list("/");
if (get_class($result) == 'SOAP_Fault')
{
  $errorMessage = $result->getFault()->faultstring;
}
else
{
  $folders = getResourceDescriptors($result);
}
```

This PHP sample uses the client.php file found in the PHP sample provided with JasperReports Server. This file defines the most important constants you may find useful when integrating with the JasperReports Server web services, as well as useful functions that wrap the `list`, `get`, and the `runReport` operations.

The `list` operation also provides a shortcut to get the list of all resources of a given type in the repository, for example all the reports. This use of the `list` operation has the following syntax:

```
<request operationName="list">
  <argument name="LIST_RESOURCES"/>
  <argument name="RESOURCE_TYPE">reportUnit</argument>
  <argument name="PARENT_DIRECTORY">/reports</argument>
</request>

or
<request operationName="list">
  <argument name="LIST_RESOURCES"/>
  <argument name="RESOURCE_TYPE">reportUnit</argument>
  <argument name="START_FROM_DIRECTORY">/reports</argument>
</request>
```

No value is needed for the LIST_RESOURCES argument. The value of the RESOURCE_TYPE argument can be any value of wsType except folder. The PARENT_DIRECTORY argument is the name of folder in which you want to look for resources. If you want to look for the resources in a branch of the repository, use the START_FROM_DIRECTORY argument.

Using LIST_RESOURCES is the only case in which a request doesn't require a resource descriptor.

Several Java methods in com.jaspersoft.jasperserver.irplugin.wsclient.WSClient use LIST_RESOURCES:

- list(String xmlRequest) - Sends any custom request, including one using LIST_RESOURCES as shown above.
- listResources(String type) - Lists all resources of the given type in the repository visible to the logged in user.
- listResourcesInFolder(String type, String parentFolder) - Lists resources of the given type in the folder.
- listResourcesUnderFolder(String type, String ancestorFolder) - Lists resources of the given type in the folder and the entire tree beneath that folder.

8.3 Get Operation

The get operation is used to obtain information about a resource. In the case of file resources, such as images, fonts, JRXML files, and JAR files, the resource file is attached to the response message.

This method's behavior differs according to the type of object specified:

- Generally, a simple resource descriptor is returned.
- If you get a resource file, the file content is attached to the response; if you do not want the server to attach files to the response, set the request's NO_ATTACHMENT argument to true.
- If you get a report unit, all the related resources are added as child resource descriptors to the report unit descriptor.
- To get an input control that is based on a query, you must set the IC_GET_QUERY_DATA argument to the valid URI of a datasource for the control, or you can handle the NONE condition as in the sample code java-webapp-sample.

  If you set the datasource in the input control, that datasource is used to execute the query and populate the resource descriptor. This can be useful when the input control must be rendered (for example, on a web page) in order to capture a value to pass when executing a report.
- You can use parameters in the input control to select query values, including the datasource. See the examples starting on **page 175**.

The following sample request gets a file resource:

```
<request operationName="get" locale="en">
  <resourceDescriptor name="JRLogo" wsType="img" uriString="/images/JRLogo" isNew="false">
    <label>JR logo</label>
    <description>JR logo</description>
  </resourceDescriptor>
</request>
```

The service only uses the `uriString` to identify the resource to get and check for access permissions. This means that other information present in the resource description (such as resource properties, label, and description) are not actually used or required.

If a file is attached to the response, the returned resource descriptor has the `PROP_HAS_DATA` property set to `true`. By default, the attachments format is MIME. You can use DIME attachments by specifying the `USE_DIME_ATTACHMENTS` argument in the request.

A `get` call always returns a resource descriptor. If the specified resource is not found, or the specified user cannot access it, an error with code 2 is returned.

Java sample:

```
String imgUri = "/images/JRLogo";
ResourceDescriptor rdis = new ResourceDescriptor();
rdis.setParentFolder("/images");
rdis.setUriString(imgUri);
ResourceDescriptor result = wsclient.get(rdis, null);
```

PHP sample:

```
$result = ws_get($someInputControlUri, array( IC_GET_QUERY_DATA =>
$someDatasourceUri ) );
```

The resource descriptor of an input control that includes data obtained by setting the `IC_GET_QUERY_DATA` argument to `true` would be similar to the following XML:

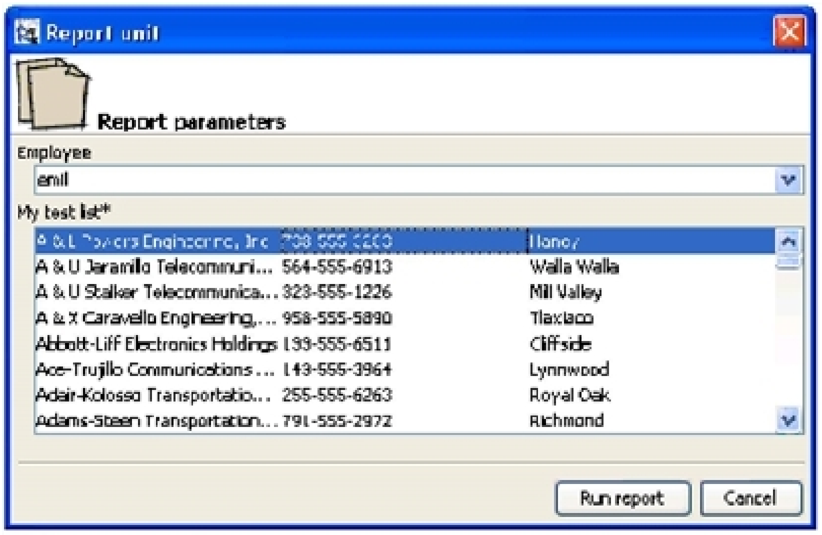
```
<resourceDescriptor name="TEST_LIST" wsType="inputControl" uriString=  "/MyInputControls/TEST_LIST"
isNew="false">
  <label>My test list</label>
  <description>My test list</description>
  <resourceProperty name="PROP_RESOURCE_TYPE">
    <value>com.jaspersoft.jasperserver.api.metadata.common.domain.InputControl</
      value>
  </resourceProperty>
  <resourceProperty name="PROP_PARENT_FOLDER">
    <value>/MyInputControls</value>
  </resourceProperty>
  <resourceProperty name="PROP_VERSION">
    <value>6</value>
  </resourceProperty>
  <resourceProperty name="PROP_HAS_DATA">
    <value>false</value>
  </resourceProperty>
  <resourceProperty name="PROP_IS_REFERENCE">
    <value>false</value>
  </resourceProperty>
  <resourceProperty name="PROP_INPUTCONTROL_IS_MANDATORY">
    <value>true</value>
  </resourceProperty>
  <resourceProperty name="PROP_INPUTCONTROL_IS_READONLY">
    <value>false</value>
  </resourceProperty>
  <resourceProperty name="PROP_INPUTCONTROL_TYPE">
    <value>7</value>
  </resourceProperty>
```

```
<resourceProperty name="PROP_QUERY_VALUE_COLUMN">
  <value>name</value>
</resourceProperty>
<resourceProperty name="PROP_QUERY_VISIBLE_COLUMNS">
  <resourceProperty name="PROP_QUERY_VISIBLE_COLUMN_NAME">
    <value>name</value>
  </resourceProperty>
  <resourceProperty name="PROP_QUERY_VISIBLE_COLUMN_NAME">
    <value>phone_office</value>
  </resourceProperty>
  <resourceProperty name="PROP_QUERY_VISIBLE_COLUMN_NAME">
    <value>billing_address_city</value>
  </resourceProperty>
</resourceProperty>
<resourceProperty name="PROP_QUERY_DATA">
  <resourceProperty name="PROP_QUERY_DATA_ROW">
    <value>A &amp; L Powers Engineering, Inc</value>
    <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
      <value>A &amp; L Powers Engineering, Inc</value>
    </resourceProperty>
    <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
      <value>738-555-3283</value>
    </resourceProperty>
    <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
      <value>Haney</value>
    </resourceProperty>
  </resourceProperty>
  <resourceProperty name="PROP_QUERY_DATA_ROW">
    <value>A &amp; U Jaramillo Telecommunications, Inc</value>
    <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
      <value>A &amp; U Jaramillo Telecommunications, Inc</value>
    </resourceProperty>
    <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
      <value>564-555-6913</value>
    </resourceProperty>
    <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
      <value>Walla Walla</value>
    </resourceProperty>
  </resourceProperty>
  <resourceProperty name="PROP_QUERY_DATA_ROW">
    <value>A &amp; U Stalker Telecommunications, Inc</value>
    <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
      <value>A &amp; U Stalker Telecommunications, Inc</value>
    </resourceProperty>
    <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
      <value>323-555-1226</value>
    </resourceProperty>
    <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
      <value>Mill Valley</value>
    </resourceProperty>
  </resourceProperty>

  <resourceProperty name="PROP_QUERY_DATA_ROW">
    <value>A &amp; X Caravello Engineering, Inc</value>
```

```
      <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
        <value>A &amp; X Caravello Engineering, Inc</value>
      </resourceProperty>
      <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
        <value>958-555-5890</value>
      </resourceProperty>
      <resourceProperty name="PROP_QUERY_DATA_ROW_COLUMN">
        <value>Tlaxiaco</value>
      </resourceProperty>
    </resourceProperty>
  </resourceProperty>
  <resourceDescriptor name="query" wsType="query" uriString="/MyInputControls/
    TEST_LIST_files/query" isNew="false">
    <label>query</label>
  <description>query</description>
  <resourceProperty name="PROP_RESOURCE_TYPE">
    <value>com.jaspersoft.jasperserver.api.metadata.common.domain.Query</value>
  </resourceProperty>
  <resourceProperty name="PROP_PARENT_FOLDER">
    <value>/MyInputControls/TEST_LIST_files</value>
  </resourceProperty>
  <resourceProperty name="PROP_VERSION">
    <value>1</value>
  </resourceProperty>
  <resourceProperty name="PROP_HAS_DATA">
    <value>false</value>
  </resourceProperty>
  <resourceProperty name="PROP_IS_REFERENCE">
    <value>false</value>
  </resourceProperty>
  <resourceProperty name="PROP_QUERY">
    <value>SELECT name, phone_office, billing_address_city FROM accounts order by
      name</value>
  </resourceProperty>
  <resourceProperty name="PROP_QUERY_LANGUAGE">
    <value>sql</value>
  </resourceProperty>
    <resourceDescriptor name="" wsType="datasource" uriString="" isNew="false">
      <label>null</label>
      <resourceProperty name="PROP_REFERENCE_URI">
        <value>/datasources/JServerJdbcDS</value>
      </resourceProperty>
      <resourceProperty name="PROP_IS_REFERENCE">
        <value>true</value>
      </resourceProperty>
    </resourceDescriptor>
  </resourceDescriptor>
</resourceDescriptor>
```

The query result is a set of rows that represents the full set of possible values for the input control. For each row, the repository web service returns the value that `runReport` expects for that particular option in the input control. Each row also includes the column values that should be displayed in the input control when prompting users.



Employee

emil

My test list*

A & L Powers Engineering, Inc	[illegible]	Nancy
A & U Jaramillo Telecommuni...	564-555-6913	Walla Walla
A & U Stalker Telecommunica...	323-555-1226	Mill Valley
A & X Caravello Engineering,...	958-555-5890	Tlaxiaco
Abbott-Liff Electronics Holdings	139-555-6511	Cliffside
Ace-Trujillo Communications ...	143-555-3964	Lynnwood
Adair-Kolosso Transportatio...	255-555-6263	Royal Oak
Adams-Steen Transportation...	791-555-2972	Richmond

Figure 8-1 Query Results

This figure shows input controls based on queries, as they are rendered by the iReport Designer plugin for JasperReports Server. When the web services run report units, the rendering of input controls is left to the client application. The best way to proceed is:

- Get the report unit.
- Check for query-based input controls by looking at the `PROP_INPUTCONTROL_TYPE` resource property or each child resource descriptor where `wsType` is equal to `inputControl`.
- Get each query-based input control by setting the `IC_GET_QUERY_DATA` argument to true.
- Render the input controls (if used in the report unit), being mindful of the input control properties (such as read only and mandatory).
- Call the runReport service and pass the user-selected values.

The rows are stored in the `PROP_QUERY_DATA` resource property: for each row, a child resource property named `PROP_QUERY_DATA_ROW` contains the value and a set of children that contain the column values; these last resource properties are named `PROP_QUERY_DATA_ROW_COLUMN`.

The following schema may elucidate the whole data structure:

```
PROP_QUERY_DATA
  (
  PROP_QUERY_DATA_ROW, value
    (
    PROP_QUERY_DATA_ROW_COLUMN, value
    PROP_QUERY_DATA_ROW_COLUMN, value
    ...
    )
  PROP_QUERY_DATA_ROW, value
    (
    PROP_QUERY_DATA_ROW_COLUMN, value
    PROP_QUERY_DATA_ROW_COLUMN, value
    ...
    )
  PROP_QUERY_DATA_ROW, value
    (
    PROP_QUERY_DATA_ROW_COLUMN, value
    PROP_QUERY_DATA_ROW_COLUMN, value
    ...
    )
  )
```

In Java, to simplify response processing, the `resourceDescriptor` class provides the `getQueryData()` method that returns a list of `InputControlQueryDataRow`, which is a convenient class containing all the row information (row and column values).

8.4 Put Operation

The `put` operation adds new resources to the repository or modifies existing ones. Whether the service adds or modifies a resource depends on whether the request's `isNew` resource descriptor attribute is set to `true`. The parent URI of the new resource must exist, and can be the repository root (/). When modifying a resource, you must provide the whole resource descriptor; the changes do not impact child resources.

You cannot use the `put` web service to create report options.

In the web interface, report options are created when users specify values for a report's input controls or filters, and then choose to save those settings. A new instance of the report appears as a child of the report itself. Users click the report instance to run the report using the saved values.

The following XML code creates a folder called `test` inside the /reports/samples folder:

```
<request operationName="put" locale="en">
  <resourceDescriptor name="test" wsType="folder" uriString="/reports/samples/test"
    isNew="true">
  <label>Test</label>
  <description>This is a test</description>
  <resourceProperty name="PROP_PARENT_FOLDER">
    <value>/reports/samples</value>
  </resourceProperty>

  </resourceDescriptor>
</request>
```

When adding a file resource, the data must be added as an attachment to the SOAP request, and the `PROP_HAS_DATA` property must be set to `true`. When modifying a file resource, you only need to attach the file if it must be replaced; otherwise `PROP_HAS_DATA` can be set to FALSE. In this case, the properties you provide are changed (for example, the label and the description).

The following Java sample creates a new image resource in the repository using the sample classes provided with JasperReports Server:

```
ResourceDescriptor rdis = new ResourceDescriptor();
rdis.setResourceType(ResourceDescriptor.TYPE_IMAGE);
rdis.setName("testImageName");
rdis.setLabel("TestImageLabel");
rdis.setDescription("Test Image Description");
rdis.setParentFolder("/images");
rdis.setUriString(rdis.getParentFolder() + "/" + rdis.getName());
rdis.setWsType(ResourceDescriptor.TYPE_IMAGE);
File img = new File("/some/file/logo.jpg"));
rdis.setHasData(true);
rdis.setIsNew(true);
ResourceDescriptor result = wsclient.addOrModifyResource(rdis, img);
```

Working with report units is a bit more complicated. When creating a new report unit, the request must contain a child JRXML resource descriptor where the `PROP_RU_IS_MAIN_REPORT` property is set to `true`. This resource becomes the main JRXML of the report unit. If it is defined locally to the report, the file must be attached to the SOAP request (in this case, the parent URI for report unit's children is not relevant, and can be set to something like `<report unit parent uri>/<report unit name>_files`).

If the report unit's main JRXML already resides in the repository, the descriptor is still defined as a JRXML resource (that is, the `wsType` property must be set to `jrxml`), and the `PROP_FILERESOURCE_REFERENCE_URI` property must be set to the URI of the correct JRXML resource in the repository.

A second child resource is recognized during creation: a data source descriptor of the data source that the server will use to run the report. This resource is optional, and can be defined either locally to the report unit or as a reference to another resource in the repository:

- When the data source is defined locally, the resource's `wsType` must be a valid data source type, such as `jdbc`, `jndi`, or `bean`.
- If the data source is defined elsewhere in the repository, its `wsType` must be set to `datasource`, which indicates an undefined resource that can be used as a data source, and its `PROP_FILERESOURCE_IS_REFERENCE` property must be set to `true`. The resource's actual URI must be set using the `PROP_FILERESOURCE_REFERENCE_URI` property.

Other resources such as input controls and subreports, must be added separately using the `put` operation to modify the report unit.

Creating, modifying, and removing resources in a report unit is similar to working with resources in a folder. The main difference is that you must set the request's `MODIFY_REPORTUNIT_URI` argument to the URI of the report unit you want to modify. You cannot remove the JRXML resource flagged as main JRXML, but can replace or modify it. The repository web service doesn't allow you to add more than a single data source to the report unit; the report unit is always run against this data source.

When creating reports with parameters, note that the corresponding input controls must be added using a subsequent web service request; you cannot create the input controls in the same web service request that created the report.

8.5 Delete Operation

This operation deletes resources from the repository. If the specified resource is located in a report unit, you must set the request's `MODIFY_REPORTUNIT_URI` argument to the URI of the report unit you want to modify.

If you are deleting a folder, all its content is removed recursively. There is no way to recover a deleted resource or folder, so use caution when calling this service.

The following sample request deletes a resource from a report unit:

```
<request operationName="delete" locale="en">
<argument name="MODIFY_REPORTUNIT_URI">/reports/JD_New_report</argument>
```

```
<resourceDescriptor name="test_img" wsType="img" uriString="/reports/JD_New_report_files/test_img">
<label>test image</label>
<description>test image</description>
</resourceDescriptor>
</request>
```

8.6 Move Operation

This operation moves a repository folder or resource to a different folder in the repository. The operation exposes the API repository service `moveResource` and `moveFolder` methods.

The operation expects (as part of the request) a resource descriptor that identifies the resource or folder to be moved. The new location of the resource or folder must be provided as the value of the `DESTINATION_URI` request argument. The destination URI must resolve to an existing repository folder.

The following request moves the report unit located at /Reports/NewReport to /MyReports:

```
<request operationName="move" locale="en"
<argument name="DESTINATION_URI">/MyReports</argument>
<resourceDescriptor name="NewReport" wsType="reportUnit" uriString="/Reports/NewReport">
</resourceDescriptor>
</request>
```

8.7 Copy Operation

This operation creates a copy of an existing resource or folder. The operation exposes the repository service `copyResource` and `copyFolder` API methods.

The resource or folder to be copied is sent as the resource descriptor of the request; the caller does not need to provide the full resource information; just the information required to locate the resource is required.

The full location of the copy must be provided as the value of the `DESTINATION_URI` request argument. If this location already exists in the repository at the moment the operation is called, the server automatically changes the name part of the destination URI and saves the resource or folder copy at the new URI.

The copy operation response includes a descriptor for the saved resource or folder copy. The response descriptor is particularly useful in determining whether the copy has been created at the specified destination URI or at a different/generated URI.

When a folder is being copied, all its subfolders and contained resources are copied recursively.

The following request copies the report unit located at /Reports/NewReport to /MyReports/NewReportCopy:

```
<request operationName="copy" locale="en"
<argument name="DESTINATION_URI">/MyReports/NewReportCopy</argument>
<resourceDescriptor name="NewReport" wsType="reportUnit" uriString="/Reports/NewReport">
</resourceDescriptor>
</request>
```

8.8 runReport Operation

This operation executes a report on the server then returns the report's results in the specified format. The client application is responsible for prompting users for values to pass to any input controls referenced by the report, as shown in the following sample request XML:

```
<request operationName="runReport" locale="en">
<argument name="RUN_OUTPUT_FORMAT">JRPRINT</argument>
<resourceDescriptor name="" wsType=""
uriString="/reports/samples/EmployeeAccounts"
isNew="false">
<label>null</label>
<parameter name="EmployeeID">emil_id</parameter>
<parameter name="TEST_LIST" isListItem="true">A &amp; L Powers Engineering, Inc</parameter>
<parameter name="TEST_LIST" isListItem="true">A &amp; U Jaramillo Telecom, Inc</parameter>
<parameter name="TEST_LIST" isListItem="true">A &amp; U Stalker Telecom, Inc</parameter>
</resourceDescriptor>
</request>
```

This example shows a parameter tag:

```
<!ELEMENT parameter (#PCDATA)>
<!ATTLIST parameter
name CDATA #REQUIRED
isListItem ( true | false ) false
```

In the example, `name` is the input control to set. If the input control is of type `multi-select`, the list of selected values is composed of a set of parameter tags that have the same names and have the `isListItem` attribute set to true, indicating that the parameter is part of a list.

The next example shows the `getInputControlValues` call for a cascading multi-select input control:

1. The IC_GET_QUERY_DATA argument gets the data from the data source.
2. The RU_REF_URI argument points to the report in which the input control is used.
3. Parameter tags under `resourceDescriptor` supply the parameters for the input control. The parameters' specifics are derived from the `ReportUnit` resource properties (**page 207**).

```
ResourceDescriptor rd = new ResourceDescriptor();
rd.setUriString("/reports/samples/Cascading_multi_select_report_files/                Cascading_
state_multi_select");
rd.setResourceProperty(rd.PROP_QUERY_DATA, null);
ListItem li1 = new ListItem("Country_multi_select", "USA");
li1.setIsListItem(true);
rd.getParameters().add(li1);
ListItem li2 = new ListItem("Country_multi_select", "Mexico");
li2.setIsListItem(true);
rd.getParameters().add(li2);
java.util.List args = new java.util.ArrayList();
args.add(new Argument( Argument.IC_GET_QUERY_DATA, ""));
args.add(new Argument( Argument.RU_REF_URI,                       "/reports/samples/Cascading_multi_
select_report"));
ResourceDescriptor rd2 = wsclnt.get(rd, null, args);

if (rd2.getQueryData() != null) {
  List l = (List) rd2.getQueryData();
  for (Object dr : l) {
    InputControlQueryDataRow icdr = (InputControlQueryDataRow) dr;
    for (Object cv : icdr.getColumnValues()) {
      System.out.print(cv + " | ");
    }
    System.out.println();
  }
}
```

Note the following conventions for parameter values:

- All parameter values are treated as strings; only number, string, and date/time values are allowed.
- Numbers cannot include punctuation for the digit grouping symbol (thousands separator) and must use a period (.) as the decimal separator (if the relative parameter is not an integer).
- Dates and date/times must be represented as the number of milliseconds since January 1, 1970, 00:00:00 GMT.

8.8.1 Report Output

The files produced are attached to the response. Specify the final format of the report by setting the request RUN_OUTPUT_FORMAT argument. Its possible values are: PDF, JRPRINT, HTML, XLS, XML, CSV and RTF. The default is PDF.

If the final format is set to JRPRINT, the data attached to the response contains a serialized instance of a JasperPrint object. This is the best format to use for clients in Java environments, because it provides the Java client with access to all of JasperReports' export options, and only relies on the server to fill the report.

The following Java code shows how to access the serialized object and get the JasperPrint object:

```
FileContent content = null;
if (attachments != null && !attachments.isEmpty()) {
content = (FileContent)(attachments.values().toArray()[0]);
}
if (content == null) {
throw new Exception("No JasperPrint");
}

InputStream is = new ByteArrayInputStream(content.getData());
JasperPrint print = (JasperPrint) JRLoader.loadObject(is);
```

If the specified output format is HTML, the URI for images can be set using the RUN_OUTPUT_IMAGES_URI argument: the default value is images/. If images are found, they are attached to the response.

If only a single page should be printed, use the RUN_OUTPUT_PAGE argument, which must contain the index of page to fill.

8.8.2 Report Locales

Reports that have resource bundles for localization can be generated in a specific languages when the locale is passed using the REPORT_LOCALE built-in report parameter. If this parameter is not specified in the web service request, the report locale defaults to the request's locale. If no locale was specified for the request, the report is generated in the server's default locale.

The following XML shows a request to run a report in the Italian locale, which is passed as the value of the REPORT_LOCALE built-in report parameter:

```
<request operationName="runReport" locale="fr">
<argument name="RUN_OUTPUT_FORMAT">JRPRINT</argument>
<resourceDescriptor name="" wsType="" uriString="/reports/samples/EmployeeAccounts"
                    isNew="false">
<label>null</label>
<parameter name="REPORT_LOCALE">it</parameter>
<parameter name="EmployeeID">emil_id</parameter>
</resourceDescriptor>
</request>
```

If the built-in report parameter is removed from this request, the report is generated in French, based on the locale attribute of the request.

8.9 Errors

When the repository web service returns a code other than 0, an error has occurred during the server execution. The exact error is described in the message field of the operation result.

If the problem is environmental, such as an incorrect service URL, an incorrect user name or password, network errors, or an unavailable service, a web services error is retuned.

In deployments with multiple organizations, the organization ID must be included in the user name in the format `username|organization_ID`. When there is only one organization exists in JasperReports Server, such as in the default installation, specify the user name alone.

The following shows an Axis connection refused error:

```
AxisFault
faultCode: {http://schemas.xmlsoap.org/soap/envelope/}Server.userException
faultSubcode:
faultString: java.net.ConnectException: Connection refused: connect
faultActor:
faultNode:
faultDetail:
{http://xml.apache.org/axis/}stackTrace:java.net.ConnectException: Connection refused: connect
at java.net.PlainSocketImpl.socketConnect(Native Method)
at java.net.PlainSocketImpl.doConnect(PlainSocketImpl.java:333)
at java.net.PlainSocketImpl.connectToAddress(PlainSocketImpl.java:195)
at java.net.PlainSocketImpl.connect(PlainSocketImpl.java:182)
at java.net.SocksSocketImpl.connect(SocksSocketImpl.java:366)
```

The following shows an Axis user name/password error:

```
AxisFault
faultCode: {http://xml.apache.org/axis/}HTTP
faultSubcode:
faultString: (401)Bad credentials
faultActor:
faultNode:
faultDetail:
{}:return code: 401

&lt;html&gt;&lt;head&gt;&lt;title&gt;Apache Tomcat/5.5.16 - Error re
port&lt;/title&gt;&lt;style&gt;&lt;!--H1 {font-family:Tahoma,Arial,sans-serif;co
lor:white;background-color:#525D76;font-size:22px;} H2 {font-family:Tahoma,Arial
,sans-serif;color:white;background-color:#525D76;font-size:16px;} H3 {font-famil
y:Tahoma,Arial,sans-serif;color:white;background-color:#525D76;font-size:14px;}
BODY {font-family:Tahoma,Arial,sans-serif;color:black;background-color:white;} B
{font-family:Tahoma,Arial,sans-serif;color:white;background-color:#525D76;} P {
font-family:Tahoma,Arial,sans-serif;background:white;color:black;font-size:12px;
}A {color : black;}A.name {color : black;}HR {color : #525D76;}--&gt;&lt;/style&
gt; &lt;/head&gt;&lt;body&gt;&lt;h1&gt;HTTP Status 401 - Bad credentials&lt;/h1&
gt;&lt;HR size=&quot;1&quot; noshade=&quot;noshade&quot;&gt;&lt;p&gt;&lt;b&gt;ty
pe&lt;/b&gt; Status report&lt;/p&gt;&lt;p&gt;&lt;b&gt;message&lt;/b&gt; &lt;u&gt
;Bad credentials&lt;/u&gt;&lt;/p&gt;&lt;p&gt;&lt;b&gt;description&lt;/b&gt; &lt;
u&gt;This request requires HTTP authentication (Bad credentials).&lt;/u&gt;&lt;/
p&gt;&lt;HR size=&quot;1&quot; noshade=&quot;noshade&quot;&gt;&lt;h3&gt;Apache T
omcat/5.5.16&lt;/h3&gt;&lt;/body&gt;&lt;/html&gt;
{http://xml.apache.org/axis/}HttpErrorCode:401

(401)Bad credentials
at org.apache.axis.transport.http.HTTPSender.readFromSocket(HTTPSender.java:744)
at org.apache.axis.transport.http.HTTPSender.invoke(HTTPSender.java:144)
at org.apache.axis.strategies.InvocationStrategy.visit(InvocationStrategy.java:32)
at org.apache.axis.SimpleChain.doVisiting(SimpleChain.java:118)
at org.apache.axis.SimpleChain.invoke(SimpleChain.java:83)
at org.apache.axis.client.AxisClient.invoke(AxisClient.java:165)
```

8.10 Implementation Suggestions

The iReport plugin for JasperReports Server relies on the repository web service described in this document. If you use Java, Jaspersoft recommends that you familiarize yourself with the plugin's source code, as it can help you understand how best to implement your own web services client. It is included in JasperReports Server Professional and Enterprise editions. It is also available in the JasperReports Server source code on SourceForge. In the source code, look for the plug-in files in this location: `jasperserver/jasperserver-ireport-plugin`. Download the ZIP file that contains the iReport plugin. In particular, this JAR can be very illuminating:

<js-install>\ireport\ireport\modules\com-jaspersoft-ireport-jasperserver.jar

Its dependencies, located in <js-install>\ireport\ireport\modules\ext, are:

- `js_activation-1.1.jar`
- `js_axis-1.4patched.jar`
- `js_commons-codec-1.3.jar`
- `js_commons-discovery-0.2.jar`
- `js_commons-httpclient-3.1.jar`
- `js_jasperserver-common-ws-3.5.0.jar`
- `js_jaxrpc.jar`
- `js_mail-1.4.jar`
- `js_saaj-api-1.3.jar`
- `js_wsdl4j-1.5.1.jar`

If necessary, you can marshal and unmarshal request and response objects by using the following classes:

- `com.jaspersoft.jasperserver.ws.xml.Marshaller`
- `com.jaspersoft.jasperserver.ws.xml.Unmarshaller`

If you use a development environment other than Java (such as .NET), you can easily generate a client from the WSDL.

Chapter 9 SOAP - Report Scheduling Web Service

With the completion of the REST v2 API in JasperReports Server 5.5, Jaspersoft announces the end of life of the SOAP web services. The SOAP web services will no longer be maintained or updated to support new features of the server.

The scheduling web service exposes JasperReports Server's report scheduling functionality to integrating applications by the means of a dedicated web service. The web service is the equivalent of the API report scheduling service (`com.jaspersoft.jasperserver.api.engine.scheduling.service.ReportSchedulingService`) and exposes the same operations as this API service.

The service works via XML-RPC calls that use the SOAP encoding. It uses the HTTP protocol to send and receive requests and responses. By default, it is deployed at `/services/ReportScheduler`. You can retrieve the service WSDL (Web Service Description Language) document by appending `?wsdl` to the service URL. For example:

```
http://localhost:8080/jasperserver-pro/services/ReportScheduler?wsdl
```

This chapter includes the following sections:

- **Types Defined in the WSDL**
- **Operations in the Scheduling Service**
- **Java Client Classes**

9.1 Types Defined in the WSDL

The WSDL defines several types that are used by the parameters and operation result of the service. The types belong to the `http://www.jasperforge.org/jasperserver/ws` namespace. The namespace is only an identifier; it is not a valid URL.

This section provides a partial list of the types used for report scheduling; for the complete reference, refer to the WSDL document. The report scheduling types include:

Type	Type Element	Description
`Job`		Encapsulates all the attributes of a report job. This type is used when full report job details are passed to or returned by an operation.
	`ID` and `version`	Required when updating a report job
	`reportUnitURI`	URI of the report
	`username`	Set automatically to the name of the calling user when a report job is created
	`label`	Job label.
	`simpleTrigger` or `calendarTrigger`	Job trigger, which can be either a simple (fixed interval) trigger or a calendar trigger
	`parameters`	List of report parameter/input control values
	`baseOutputFilename`	Base name for the job output
	`outputFormats`	List of job output formats (as strings). JasperReports Server has built-in support for the following formats: PDF, HTML, XLS, RTF and CSV.
	`outputLocale`	String representation of a `java.util.Locale` to be used as report locale
	`repositoryDestination`	Location in the repository where the report output is saved
	`mailNotification`	Information regarding the email notification that is sent when the job executes. Set this value to NULL to suppress notifications. **Note:** To use this feature, you must configure a mail server, as described in *JasperReports Server Administrator Guide.*
`JobSimpleTrigger`		Job trigger that fires at fixed intervals
	`startDate` and `endDate`	Start and end dates of the job
	`timezone`	Time zone of the start and end dates
	`occurrenceCount`	How many times to run the job. If a single run job is wanted, use `1` as occurrence count; if the job is to be fired indefinitely or until the end date, use `-1`.

Type	Type Element	Description
	recurrenceInterval and recurrenceIntervalUni-t	Interval at which the job should recur: MINUTE, HOUR, DAY, WEEK.
JobCalendarTrigger		Job trigger that fires at a time specified by a CRON-like expression
	startDate and endDate	Start and end dates of the job
	timezone	Time zone of the start and end dates
	minutes	Minute or minutes of the day when the job is to run.
	hours	Hour or hours of the day when the job is to run.
	daysType	How days are specified. Possible values are ALL, WEEK, and MONTH.
	weekDays	Used when daysType is WEEK; this indicates the days of the week from Saturday (1) to Sunday (7).
	monthDays	Used when daysType is MONTH, this indicates the month days.
	months	Months (from 0 to 11) on which the job should be triggered.
JobRepositoryDestination		Information about where to save the report job output in the repository.
	folderURI	URI of the folder where the report output will be saved.
	sequentialFilenames	Flag indicating whether to append timestamps to the base output name.
JobMailNotification		Encapsulates the attributes of the mail notification to send regarding the report job.
	toAddresses	List of email addresses to which the notification will be sent.
	subject	Subject of the email notification.

Type	Type Element	Description
	`resultSendType`	Indicates whether to attach the report output to the email; the value is either SEND (only the messages is sent) or SEND_ATTACHMENT (the report output is sent along as a message attachment).
`JobSummary`		Used when a list of report jobs is retrieved via the service. The full report job information can be retrieved individually for required jobs.
	`id`	Unique identifier of the job.
	`label`	Display label of the job.
	`state`	State of the job. For example, NORMAL indicates that the job is waiting for next execution; EXECUTING means the job is running.
	`previousFireTime`	Most recent run time.
	`nextFireTime`	Next run time.

9.2 Operations in the Scheduling Service

9.2.1 Operation Descriptions

The report scheduling web service consists of the following operations:

- `getAllJobs`. Returns the list of all accessible report jobs.
- `getReportJobs`. Returns the list of all accessible report jobs for a specific report (whose URL is sent as a parameter).
- `scheduleJob`. Schedules a new job. The job details must be sent as parameters; the operation returns the saved job details as its result.
- `updateJob`. Updates an existing job. The full job details (as retrieved via `getJob`) must be sent as a parameter; the operation returns the updated job details as saved by the JasperReports Server scheduling service.
- `getJob`. Returns the full job details of a report job whose ID is sent as a parameter.
- `deleteJob` and `deleteJobs`. Delete a single or several report job specified by their IDs. These operations do not return any information.

If an exception occurs while processing an operation request, the exception is converted to a SOAP fault which is sent as its response. In this case, the exception stacktrace is included in the response, and can be used for debugging.

Exceptions thrown by the JasperReports Server code have localizable messages. The operation caller can specify the locale in which the messages of such exceptions are returned by setting a SOAP envelope header. The header should be named `locale` and should use `http://www.jasperforge.org/jasperserver/ws` as namespace; the header value is a string representation of the desired message locale. For more information, refer to **section 8.1, “Request and Operation Result,” on page 163**.

9.2.2 Example Request and Operation Result

This is the full SOAP request for a `scheduleJob` operation that creates a job with four report parameters:

```
<?xml version="1.0" encoding="UTF-8"?>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <soapenv:Body>
  <ns1:scheduleJob soapenv:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/
      " xmlns:ns1="http://www.jasperforge.org/jasperserver/ws">
      <job xsi:type="ns1:Job">
        <reportUnitURI xsi:type="xsd:string">/reports/samples/SalesByMonth
        </reportUnitURI>
        <username xsi:type="xsd:string" xsi:nil="true"/>
        <label xsi:type="xsd:string">Label 3</label>
        <description xsi:type="xsd:string">Description 3</description>
        <simpleTrigger xsi:type="ns1:JobSimpleTrigger">
          <timezone xsi:type="xsd:string" xsi:nil="true"/>
          <startDate xsi:type="xsd:dateTime">2008-10-09T09:25:00.000Z</startDate>
          <endDate xsi:type="xsd:dateTime" xsi:nil="true"/>
          <occurrenceCount xsi:type="xsd:int">1</occurrenceCount>
          <recurrenceInterval xsi:type="xsd:int" xsi:nil="true"/>
          <recurrenceIntervalUnit xsi:type="ns1:IntervalUnit" xsi:nil="true"/>
        </simpleTrigger>
        <calendarTrigger xsi:type="ns1:JobCalendarTrigger" xsi:nil="true"/>
        <parameters soapenc:arrayType="ns1:JobParameter[4]" xsi:type="soapenc:Array"
          xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/">
          <parameters xsi:type="ns1:JobParameter">
            <name xsi:type="xsd:string">TextInput</name>
            <value xsi:type="soapenc:int">22</value>
          </parameters>
          <parameters xsi:type="ns1:JobParameter">
            <name xsi:type="xsd:string">CheckboxInput</name>
            <value xsi:type="soapenc:boolean">true</value>
          </parameters>
          <parameters xsi:type="ns1:JobParameter">
            <name xsi:type="xsd:string">ListInput</name>
            <value xsi:type="soapenc:string">2</value>
          </parameters>
          <parameters xsi:type="ns1:JobParameter">
            <name xsi:type="xsd:string">DateInput</name>
            <value xsi:type="xsd:dateTime">2007-10-09T09:00:00.000Z</value>
          </parameters>
        </parameters>
        <baseOutputFilename xsi:type="xsd:string">Sales3</baseOutputFilename>
        <outputFormats soapenc:arrayType="xsd:string[1]" xsi:type=
          "soapenc:Array" xmlns:soapenc="http://schemas.xmlsoap.org/soap/
          encoding/">
          <outputFormats xsi:type="xsd:string">PDF</outputFormats>
        </outputFormats>
        <outputLocale xsi:type="xsd:string" xsi:nil="true"/>

        <repositoryDestination xsi:type="ns1:JobRepositoryDestination">
```

```
          <folderURI xsi:type="xsd:string">/ContentFiles</folderURI>
          <sequentialFilenames xsi:type="xsd:boolean">false
          </sequentialFilenames>
          <overwriteFiles xsi:type="xsd:boolean">false</overwriteFiles>
        </repositoryDestination>
        <mailNotification xsi:type="ns1:JobMailNotification" xsi:nil="true"/>
      </job>
    </ns1:scheduleJob>
  </soapenv:Body>
</soapenv:Envelope>
```

The response of the request contains the job details as saved by the server:

```
<?xml version="1.0" encoding="utf-8"?>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/
  XMLSchema-instance">
  <soapenv:Body>
    <ns1:scheduleJobResponse soapenv:encodingStyle="http://schemas.xmlsoap.org/soap/
      encoding/" xmlns:ns1="http://www.jasperforge.org/jasperserver/ws">
      <scheduleJobReturn xsi:type="ns1:job">
        <id xsi:type="xsd:long">7</id>
        <version xsi:type="xsd:int">0</version>
        <reportUnitURI xsi:type="xsd:string">/reports/samples/SalesByMonth</
          reportUnitURI>
        <username xsi:type="xsd:string">tomcat</username>
        <label xsi:type="xsd:string">Label 3</label>
        <description xsi:type="xsd:string">Description 3</description>
        <simpleTrigger xsi:type="ns1:jobSimpleTrigger">
          <id xsi:type="xsd:long">7</id>
          <version xsi:type="xsd:int">0</version>
<timezone xsi:type="xsd:string">Europe/Minsk</timezone>
          <startDate xsi:type="xsd:dateTime">2008-10-09T09:25:00.000Z</startDate>
          <endDate xsi:type="xsd:dateTime" xsi:nil="true"/>
          <occurrenceCount xsi:type="xsd:int">1</occurrenceCount>
          <recurrenceInterval xsi:type="xsd:int" xsi:nil="true"/>
          <recurrenceIntervalUnit xsi:type="ns1:IntervalUnit" xsi:nil="true"/>
        </simpleTrigger>
 <calendarTrigger xsi:type="ns1:JobCalendarTrigger" xsi:nil="true"/>
        <parameters soapenc:arrayType="ns1:JobParameter[4]" xsi:type="soapenc:Array"
          xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/">
          <parameters xsi:type="ns1:jobParameter">
            <name xsi:type="xsd:string">CheckboxInput</name>
            <value xsi:type="soapenc:boolean">true</value>
          </parameters>
          <parameters xsi:type="ns1:jobParameter">
            <name xsi:type="xsd:string">TextInput</name>
            <value xsi:type="soapenc:int">22</value>
          </parameters>

          <parameters xsi:type="ns1:jobParameter">
            <name xsi:type="xsd:string">DateInput</name>
            <value xsi:type="xsd:dateTime">2007-10-09T09:00:00.000Z</value>
          </parameters>
          <parameters xsi:type="ns1:jobParameter">
            <name xsi:type="xsd:string">ListInput</name>
            <value xsi:type="soapenc:string">2</value>
          </parameters>
        </parameters>
        <baseOutputFilename xsi:type="xsd:string">Sales3</baseOutputFilename>
        <outputFormats soapenc:arrayType="xsd:string[1]" xsi:type="soapenc:Array"
          xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/">
          <outputFormats xsi:type="xsd:string">PDF</outputFormats>
        </outputFormats>
          <outputLocale xsi:type="xsd:string" xsi:nil="true"/>
          <repositoryDestination xsi:type="ns1:jobRepositoryDestination">
            <id xsi:type="xsd:long">7</id>
            <version xsi:type="xsd:int">0</version>
            <folderURI xsi:type="xsd:string">/ContentFiles</folderURI>
            <sequentialFilenames xsi:type="xsd:boolean">false</sequentialFilenames>
            <overwriteFiles xsi:type="xsd:boolean">false</overwriteFiles>
          </repositoryDestination>
        <mailNotification xsi:type="ns1:JobMailNotification" xsi:nil="true"/>
      </scheduleJobReturn>
    </ns1:scheduleJobResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

9.3 Java Client Classes

The JasperReports Server web service client jars contain classes that can be used by Java clients to easily communicate with the report scheduling web service.

XML types used by the report scheduling web service are mapped to Java bean classes found in the `weekday` package (for example, `Job`, `JobSimpleTrigger`, and `CalendarDaysType`). Instances of these classes can be used as report job objects that are sent to or returned by the web service.

The service itself is represented by Apache Axis-generated client stub classes. A façade (`com.jaspersoft.jasperserver.ws.scheduling.ReportSchedulerFacade`) has been developed on top of these classes. The façade can be instantiated by providing the information required to locate and connect to a web service (the endpoint URL and the username/password for authentication).

Jaspersoft recommends using the façade because it handles items such as the Axis client configuration and the messages locale header.

Chapter 10 SOAP - Domain Web Service

With the completion of the REST v2 API in JasperReports Server 5.5, Jaspersoft announces the end of life of the SOAP web services. The SOAP web services will no longer be maintained or updated to support new features of the server.

This section describes functionality that can be restricted by the software license for JasperReports Server. If you don't see some of the options described in this section, your license may prohibit you from using them. To find out what you're licensed to use, or to upgrade your license, contact Jaspersoft.

The Domain web service exposes a limited subset of JasperReports Server's Domain functionality to integrating applications by the means of a dedicated web service. Applications may only read the contents of a Domain, not create or edit Domains.

The service works via XML-RPC calls that use the SOAP encoding. It uses the HTTP protocol to send and receive requests and responses. By default, it is deployed at `/services/DomainServices`. You can retrieve the WSDL document by appending `?wsdl` to the service URL. For example:

```
http://localhost:8080/jasperserver-pro/services/DomainServices?wsdl
```

This chapter contains the following sections:

- **Types Defined in the WSDL**
- **Operations in the Domain Service**

10.1 Types Defined in the WSDL

The WSDL defines several types that are returned by operations of the service. The types belong to the `http://www.jasperforge.org/jasperserver/ws` namespace. The namespace is only an identifier; it is not a valid URL. For the complete reference, refer to the WSDL document.

These are the objects returned when accessing Domains:

- `SimpleMetaData`. Encapsulates all the sets and items in a Domain structure.
- `SimpleMetaLevel`. Represents an item set in the Domain. It may contain items, other item sets, or both.
- `SimpleMetaItem`. An item in the Domain. Unlike a level or set, an item is a source of data referenceable in a query.
- `ResultSetData`. Object returned by a Domain query. It contains column names and rows of data.
- `DataRow`. Contains values for each column in a row.

10.2 Operations in the Domain Service

The Domain web service provides the following operations:

- `getDomainMetaData`. Returns the tree structure of sets and items in a Domain. The object returned can be used to render the Domain for users and allow them to select items for a query.
- `executeDomainQuery`. Returns a set of values in response to a query.

If an exception occurs while processing an operation request, the exception is converted to a SOAP fault that is sent as its response. In this case, the exception stacktrace is included in the response, which can be useful for debugging.

Exceptions thrown by JasperReports Server have localizable messages. The operation caller can specify the locale in which the messages of such exceptions are returned by setting a SOAP envelope header. The header should be named `locale` and should use `http://www.jasperforge.org/jasperserver/ws` as its namespace; the header value is a string representation of the desired message locale. For more information, see **section 8.1, "Request and Operation Result," on page 163**.

10.2.1 The getDomainMetaData Operation

The `getDomainMetaData` operation takes these parameters:

- `domainUri` - a string containing the path to the Domain on the server, for example `/domains/John/ExpenseDomain`.
- `localeStr` - a string giving the user locale, for example `en`, `en_US`, or `es_ES_Traditional_WIN`.

The operation returns the tree structure of item sets and items in the requested Domain. The tree structure consists of levels that represent the nested sets and items that represent the items in the Domain. Levels may contain sub-levels, items, or both, thus modelling the hierarchical structure of the Domain.

The following object types are combined to create the tree structure in the return value:

- `SimpleMetaData`. Encapsulates all the item sets and items in a Domain structure:
  - `rootLevel`. The `SimpleMetaLevel` object that is the root of the Domain tree structure.
  - `properties`.Tthere are currently no properties on this object.
- `SimpleMetaLevel`. Represents an item set in the Domain. It has the following attributes:
  - `id` and `label`. Unique identifier and label string for this item set.
  - `items`. An array of `SimpleMetaItem` objects representing the items in this set.
  - `subLevels`. An array of `SimpleMetaLevel` objects representing the sub-sets of this set.
  - `properties`. The `resourceId` key indicates the resource identifier of this item set.
- `SimpleMetaItem`. An item in the Domain. It has the following attributes:
  - `id` and `label`. Unique identifier and label string for this item.
  - `javaType`. The Java class name of this item, for example `java.lang.String`.
  - `properties`. The `javaType` key is identical to the `javaType` attribute, and the `resourceId` key indicates the resource identifier of this item.

A resource identifier is an internal property that identifies the data resource that the set or item references. Web applications do not need to process or return this value.

This is the full SOAP request for a `getDomainMetaData` operation:

```
<?xml version="1.0" encoding="utf-8"?>
```

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/
  XMLSchema-instance">
  <soapenv:Body>
    <ns1:getDomainMetaData soapenv:encodingStyle="http://schemas.xmlsoap.org/soap/
      encoding/" xmlns:ns1="http://www.jasperforge.org/jasperserver/ws">
      <domainUri xsi:type="xsd:string">/Domains/examples/SampleDomain</domainUri>
      <localeStr xsi:type="xsd:string">US</localeStr>
    </ns1:getDomainMetaData>
  </soapenv:Body>
</soapenv:Envelope>
```

The response of the request contains the tree structure of the Domain:

```
<?xml version="1.0" encoding="UTF-8"?><soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <soapenv:Body>
    <ns1:getDomainMetaDataResponse soapenv:encodingStyle="http://schemas.xmlsoap.org/
      soap/encoding/" xmlns:ns1="http://www.jasperforge.org/jasperserver/ws">
      <getDomainMetaDataReturn xsi:type="ns1:SimpleMetaData">
        <rootLevel xsi:type="ns1:SimpleMetaLevel">
          <id xsi:type="xsd:string">root</id>
          <label xsi:type="xsd:string" xsi:nil="true"/>
          <properties soapenc:arrayType="ns1:SimpleProperty[0]" xsi:type="soapenc:Array"
            xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"/>
          <items soapenc:arrayType="ns1:SimpleMetaItem[0]" xsi:type="soapenc:Array"
            xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"/>
          <subLevels soapenc:arrayType="ns1:SimpleMetaLevel[7]" xsi:type="soapenc:Array"
            xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/">
            <subLevels xsi:type="ns1:SimpleMetaLevel">
              <id xsi:type="xsd:string">expense_join</id>
              <label xsi:type="xsd:string">expense</label>
              <properties soapenc:arrayType="ns1:SimpleProperty[1]" xsi:type=
                "soapenc:Array">
                <properties xsi:type="ns1:SimpleProperty">
                  <key xsi:type="xsd:string">resourceId</key>
                  <value xsi:type="xsd:string">expense_join</value>
                </properties>
              </properties>
              <items soapenc:arrayType="ns1:SimpleMetaItem[2]" xsi:type="soapenc:Array">
                <items xsi:type="ns1:SimpleMetaItem">
                  <id xsi:type="xsd:string">ej_expense_fact_exp_date</id>
                  <label xsi:type="xsd:string">Exp Date</label>
                  <javaType xsi:type="xsd:string">java.sql.Date</javaType>
                  <properties soapenc:arrayType="ns1:SimpleProperty[2]" xsi:type=
                    "soapenc:Array">
                    <properties xsi:type="ns1:SimpleProperty">
                      <key xsi:type="xsd:string">JavaType</key>
                      <value xsi:type="xsd:string">java.sql.Date</value>
                    </properties>
                    <properties xsi:type="ns1:SimpleProperty">
                      <key xsi:type="xsd:string">resourceId</key>
                      <value xsi:type="xsd:string">expense_join.e.exp_date</value>
                    </properties>
                  </properties>
                </items>
                <items xsi:type="ns1:SimpleMetaItem">
                  <id xsi:type="xsd:string">ej_expense_fact_amount</id>
                  <label xsi:type="xsd:string">Amount</label>
                  <javaType xsi:type="xsd:string">java.math.BigDecimal</javaType>
                  <properties soapenc:arrayType="ns1:SimpleProperty[2]" xsi:type=
                    "soapenc:Array">
                    <properties xsi:type="ns1:SimpleProperty">
                      <key xsi:type="xsd:string">JavaType</key>
                      <value xsi:type="xsd:string">java.math.BigDecimal</value>

                    </properties>
                    <properties xsi:type="ns1:SimpleProperty">
                      <key xsi:type="xsd:string">resourceId</key>
                      <value xsi:type="xsd:string">expense_join.e.amount</value>
                    </properties>
                  </properties>
                </items>
              </items>
              <subLevels soapenc:arrayType="ns1:SimpleMetaLevel[0]" xsi:type=
                "soapenc:Array"/>
            </subLevels>
            <subLevels xsi:type="ns1:SimpleMetaLevel">
              <id xsi:type="xsd:string">expense_join_store</id>
              <label xsi:type="xsd:string">store</label>
              <properties soapenc:arrayType="ns1:SimpleProperty[1]" xsi:type=
                "soapenc:Array">
                <properties xsi:type="ns1:SimpleProperty">
                  <key xsi:type="xsd:string">resourceId</key>
                  <value xsi:type="xsd:string">expense_join</value>
                </properties>
              </properties>
              <items soapenc:arrayType="ns1:SimpleMetaItem[24]" xsi:type=
                "soapenc:Array">
                <items xsi:type="ns1:SimpleMetaItem">
                  <id xsi:type="xsd:string">ej_store_store_type</id>
                  <label xsi:type="xsd:string">Store Type</label>
                  <javaType xsi:type="xsd:string">java.lang.String</javaType>
                  <properties soapenc:arrayType="ns1:SimpleProperty[2]" xsi:type=
                    "soapenc:Array">
                    <properties xsi:type="ns1:SimpleProperty">
                      <key xsi:type="xsd:string">JavaType</key>
                      <value xsi:type="xsd:string">java.lang.String</value>
                    </properties>
                    <properties xsi:type="ns1:SimpleProperty">
                      <key xsi:type="xsd:string">resourceId</key>
                      <value xsi:type="xsd:string">expense_join.s.store_type</value>
                    </properties>
                  </properties>
                </items>
                ...
              </items>
              <subLevels soapenc:arrayType="ns1:SimpleMetaLevel[0]" xsi:type=
                "soapenc:Array"/>
            </subLevels>
          </subLevels>
        </rootLevel>
        <properties soapenc:arrayType="ns1:SimpleProperty[0]" xsi:type="soapenc:Array"
```

```
          xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"/>
      </getDomainMetaDataReturn>
    </ns1:getDomainMetaDataResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

10.2.2 The executeDomainQuery Operation

The `executeDomainQuery` operation takes these parameters:

- `domainUri` - a string containing the path to the Domain on the server, for example `/domains/John/ExpenseDomain`.
- `queryStr` - a string containing the Domain query composed of fields and a filter expression (see below for the syntax).
- `localeStr` - a string giving the user locale, for example `en`, `en_US`, or `es_ES_Traditional_WIN`.
- `dateFormatStr` - a string giving the date format desired in date fields, for example `MM/dd/yyyy` or `h:mm a`.

Be sure the format has date and time portions if you expect to have both date and time fields, for example `yyyy.MM.dd G 'at' HH:mm:ss z`

The query string is composed of the following elements that create a syntax for the Domain query:

- `<query>` - encapsulates the whole query.
- `<queryFields>` - contains a sequence of `<queryField>` elements. The order of fields will be preserved in the results.
- `<queryField id="<fullyQualifiedID>" />` - an empty element where `<fullyQualifiedID>` gives the unique identifier of an item you want to appear as a column in the results. The identifier must be fully qualified, which means it includes the identifiers of the set and super-sets to which the item belongs. The fully qualified identifier is similar to the path of the item in the Domain, using a period (`.`) to separate each set identifier.
- `<queryFilterString>` - the filter string for the query uses an application-specific syntax called Domain Expression Language (DomEL).

The following example shows a filter string that must match two values:

```
<query>
  <queryFields>
    <queryField id="expense_join_store.ej_store_store_city" />
    <queryField id="expense_join_store.ej_store_store_country" />
    <queryField id="expense_join_store.ej_store_store_name" />
    <queryField id="expense_join_store.ej_store_store_state" />
    <queryField id="expense_join_store.ej_store_store_street_address" />
  </queryFields>
  <queryFilterString>expense_join_store.ej_store_store_country == 'USA' and
    expense_join_store.ej_store_store_state == 'CA'</queryFilterString>
</query>
```

Note that when the query string appears in the SOAP example below, special characters such as < and > are converted to their corresponding character entities, `&lt;` and `&gt;` respectively.

The `executeDomainQuery` operation returns results in the following objects:

- `ResultSetData`. Encapsulates the results of the Domain query. It contains column names and rows of data:
  - `names`. Array of column names in the result set. These names match the order and items in the query fields.

  - `data`. An array of data rows.
- `DataRow`. Represents a record and contains values for each column in a row:
  - `data`. An array of strings, one for the value in each column, in the same order as the names array.

Note that all values are given in string format.

The following example shows the full SOAP request for an `executeDomainQuery` operation on a sample Domain:

```
<?xml version="1.0" encoding="utf-8"?>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSc
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <soapenv:Body>
    <ns1:executeDomainQuery soapenv:encodingStyle="http://schemas.xmlsoap.org/soap/
      encoding/" xmlns:ns1="http://www.jasperforge.org/jasperserver/ws">
      <domainUri xsi:type="xsd:string">/Domains/examples/SampleDomain</domainUri>
      <queryStr xsi:type="xsd:string">&lt;query&gt;  &lt;queryFields&gt;    &lt;queryField id=&quot;expense_join_ac
account_description&quot;/&gt;&lt;queryField id=&quot;expense_join_account.ej_expense_fact_account_id&quot; /&gt;
id=&quot;expense_join_account.ej_account_account_parent&quot; /&gt;    &lt;queryField id=&quot;expense_join_account
rollup&quot; /&gt;    &lt;queryField id=&quot;expense_join_account.ej_account_account_type&quot; /&gt;    &lt;query
id=&quot;expense_join_account.ej_account_Custom_Members&quot; /&gt;    &lt;queryField id=&quot;expense_join.ej_expe
amount&quot; /&gt;    &lt;queryField id=&quot;expense_join.ej_expense_fact_exp_date&quot; /&gt; &lt;queryField id=&
store.ej_store_store_type&quot; /&gt;&lt;queryField id=&quot;expense_join_store.ej_store_store_street_address&quot;
&lt;queryField id=&quot;expense_join_store.ej_store_store_city&quot; /&gt; &lt;queryField id=&quot;expense_join_sto
state&quot; /&gt;&lt;queryField id=&quot;expense_join_store.ej_store_store_postal_code&quot; /&gt; &lt;queryField i
join_store.ej_store_store_country&quot; /&gt; &lt;queryFields&gt;  &lt;queryFilterString&gt;expense_join_account.ej
description == 'Marketing'&lt;/queryFilterString&gt;&lt;/query&gt;</queryStr>



      <localeStr xsi:type="xsd:string">US</localeStr>
      <dateFormatStr xsi:type="xsd:string">MM/dd/yyyy</dateFormatStr>
    </ns1:executeDomainQuery>
  </soapenv:Body>
</soapenv:Envelope>
```

The response to the request contains the current values in the specified Domain:

```
<?xml version="1.0" encoding="UTF-8"?>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <soapenv:Body>
    <ns1:executeDomainQueryResponse soapenv:encodingStyle="http://schemas.xmlsoap.org/
      soap/encoding/" xmlns:ns1="http://www.jasperforge.org/jasperserver/ws">
      <executeDomainQueryReturn xsi:type="ns1:ResultSetData">
        <names soapenc:arrayType="xsd:string[31]" xsi:type="soapenc:Array"
          xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/">
          <names xsi:type="xsd:string">expense_join_account.ej_account_account_
            description/>
          <names xsi:type="xsd:string">expense_join_account.ej_expense_fact_
            account_id/>
          <names xsi:type="xsd:string">expense_join_account.ej_account_account_parent/>
          <names xsi:type="xsd:string">expense_join_account.ej_account_account_rollup/>
          <names xsi:type="xsd:string">expense_join_account.ej_account_account_type/>
          <names xsi:type="xsd:string">expense_join_account.ej_account_Custom_Members/>
          <names xsi:type="xsd:string">expense_join.ej_expense_fact_amount/>
          <names xsi:type="xsd:string">expense_join_store.ej_store_store_type/>
          <names xsi:type="xsd:string">expense_join_store.ej_store_store_street_
            address/>
          <names xsi:type="xsd:string">expense_join_store.ej_store_store_city/>
          <names xsi:type="xsd:string">expense_join_store.ej_store_store_state/>
          <names xsi:type="xsd:string">expense_join_store.ej_store_store_postal_code/>
        </names>
        <data soapenc:arrayType="ns1:DataRow[600]" xsi:type="soapenc:Array"
          xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/">
          <data xsi:type="ns1:DataRow">
            <data soapenc:arrayType="xsd:string[31]" xsi:type="soapenc:Array">
              <data xsi:type="xsd:string">Marketing</data>
              <data xsi:type="xsd:string">4300</data>
              <data xsi:type="xsd:string">4000</data>
              <data xsi:type="xsd:string">+</data>
              <data xsi:type="xsd:string">Expense</data>
              <data xsi:type="xsd:string" xsi:nil="true"/>
              <data xsi:type="xsd:string">1884.0000</data>
              <data xsi:type="xsd:string">01/01/1997</data>
              <data xsi:type="xsd:string">HeadQuarters</data>
              <data xsi:type="xsd:string">1 Alameda Way</data>
              <data xsi:type="xsd:string">Alameda</data>
              <data xsi:type="xsd:string">CA</data>
              <data xsi:type="xsd:string">94502</data>
              <data xsi:type="xsd:string">USA</data>
            </data>
          </data>
...
        </data>
      </executeDomainQueryReturn>
    </ns1:executeDomainQueryResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

10.2.3 Java Client Classes

The JasperReports Server web service includes classes in JAR files that can be used by Java clients to easily communicate with the Domain web service.

Java bean classes for the XML types declared in WSDL (for example, `SimpleMetaLevel`, `SimpleMetaItem`, `ResultSetData` and `DataRow`) are located in `ji-common-ws-server-5.5.0.jar` in the `com.jaspersoft.ji.ws.axis2.domain.generate` package. Instances of these classes can be used to communicate with the Domain web service.

Chapter 11 SOAP - Web Services for Administration

With the completion of the REST v2 API in JasperReports Server 5.5, Jaspersoft announces the end of life of the SOAP web services. The SOAP web services will no longer be maintained or updated to support new features of the server.

Web services for administration expose a limited set of JasperReports Server's system administration functionality. There are three services:

- Users and Roles
- Organizations/Tenants
- Permissions

The services work via XML-RPC calls that use the SOAP encoding. They use the HTTP protocol to send and receive requests and responses. By default, they are deployed at `/services/UserAndRoleManagementService`, `/services/OrganizationManagementService`, and `/services/PermissionsManagementService`. You can retrieve the WSDL documents by appending `?wsdl` to the service URL. For example:

```
http://localhost:8080/jasperserver-pro/services/UserAndRoleManagementService?wsdl
```

If an exception occurs while processing an operation request, the exception is converted to a SOAP fault that is sent as its response. In this case, the exception stacktrace is included in the response, which can be useful for debugging.

Exceptions thrown by JasperReports Server have localizable messages. The operation caller can specify the locale in which the messages of such exceptions are returned by setting a SOAP envelope header. The header should be named `locale` and should use `http://www.jasperforge.org/jasperserver/ws` as its namespace; the header value is a string representation of the desired message locale. For more information, refer to section **section 8.1, "Request and Operation Result," on page 163**.

All authentication and authorization rules established in the system apply to operations run through the web services. Refer to *Jasper Administrator Guide* for more information about the rules.

This chapter includes the following sections:

- **Types Defined in the WSDL**
- **Users and Roles**
- **Organizations/Tenants**
- **Permissions**
- **Related Files**

11.1 Types Defined in the WSDL

The WSDL (Web Services Description Language) document defines the types that are returned by operations of the services. The types belong to the `http://www.jasperforge.org/jasperserver/ws` namespace. The namespace is only an identifier; it is not a valid URL. For the complete reference, refer to the WSDL document in jasperserver-ws-server-4.0.jar.

The following tables summarize the services' operations.

Users and Roles Service				
Operation	**Paramete-r**	**Parameter Type**	**Return Type**	**Description**
`findUsers`	`criteria`	`WSUserSearchCriteri-a`	`WSUser[]`	Returns a list of one or more users. `criteria` has username mask, organization/tenant ID, `includeSubOrgs`, list of required roles, and `maxRecords`; `null` in parameters means "any." Note: `includeSubOrgs and tenantID` are reserved for use in our commercial products. If they are used in community project products, they must be `NULL`.
`putUser`	`user`	`WSUser`	`WSUser`	Adds or updates a user. Returns the new or updated `WSUser`.
`deleteUser`	`user`	`WSUser`	*`No return`*	Deletes the named user.
`findRoles`	`criteria`	`WSRoleSearchCriteri-a`	`WSRole[]`	Returns `WSRole[]`, a list of roles. `criteria` has rolename mask, organization/tenant ID, `includeSubOrgs`, `maxRecords`; `null` in parameters means "any." Note: `includeSubOrgs and tenantID` are reserved for use in our commercial products. If they are used in community project products, they must be `NULL`.
`putRole`	`role`	`WSRole`	`WSRole`	Adds or updates a role.

Users and Roles Service				
Operation	**Paramete-r**	**Parameter Type**	**Return Type**	**Description**
				Returns new or updated `WSRole`.
`updateRoleNam-e`	`oldRole`	`WSRole`	`WSRole`	Returns `WSRole`.
	`newName`	`String`	`WSRole`	New name of role.
`deleteRole`	`role`	`WSRole`	*`No return`*	Deletes the named role.

Organizations/Tenants Service				
Operation	**Paramete-r**	**Parameter Type**	**Return Type**	**Description**
`getTenant`	`tenantId`	`String`	`WSTenant []`	Organization/tenant identifier. Returns an organization/tenant.
`getSubTenantLi-st`	`tenantId`	`String`	`WSTenant []`	Organization/tenant identifier. Returns `WSTenant[]`, a list of suborganizations in the specified organization.
`putTenant`	`tenant`	`WSTenant`	`WSTenant`	Adds or updates a tenant. Returns the new or updated `WSTenant`.
`deleteTenant`	`tenantId`	`String`	*`No return`*	Deletes the named organization/tenant.

Permissions Service				
Operation	**Paramet-er**	**Parameter Type**	**Return Type**	**Description**
`getPermissionsForO-bject`	`targetU-RI`	`String`	`WSObjectPermis-sion[]`	Repository object URI. Returns `WSObjectPermission[]`, a list of permissions for the specified object.
`putPermissions`	`objPerm`	`WSObjectPermis-sion`	`WSObjectPermis-sion`	Object permission.

Permissions Service				
Operation	**Paramet-er**	**Parameter Type**	**Return Type**	**Description**
				Returns `WSObjectPermission`, a new or updated object permission.
`deletePermissions`	`objPerm`	`WSObjectPermis-sion`	*`No return`*	Deletes the named permission.

11.2 Users and Roles

The web service for administration of users and roles has these operations:

- `findUsers` and `findRoles`. Return a list of users or roles that meet specified criteria.
- `putUser` and `putRole`. Return the named user or role. If the object is not already in the database, the call creates a new one.
- `deleteUser` and `deleteRole`. Delete the named user or role.

11.2.1 findUsers

In `findUsers`, the parameter `criteria` has the type `WSUserSearchCriteria` and returns type `WSUser`. `criteria` can be a username mask, an organization/tenant ID, `includeSubOrgs`, a list of required users, and `maxRecords`. Null values indicate "any."

- The mask has an SQL-like notation. For instance, `U2_`.
- When `includeSubOrgs` is TRUE, all objects of the specified type are within a search's scope and result. Otherwise, only objects in the requested organization (or root if `tenantId`=null) are searched.
- To limit the number of objects to return, set `maxRecords` to the desired number. To allow an infinite number of objects, set `maxRecords` to 0.

To call `findUsers`:

```
WSUserSearchCriteria searchCriteria = new WSUserSearchCriteria();
  searchCriteria.setName("demo");
  searchCriteria.setTenantId("organization_1"); // Name of orga  nization or null
  searchCriteria.setMaxRecords(5);
  searchCriteria.setIncludeSubOrgs(false);
  searchCriteria.setRequiredRoles(requiredRoles);
WSRole role = new WSRole();
role.setRoleName("ROLE_USER");
role.setTenantId(null);
searchCriteria.setRequiredRoles(new WSRole[] {role});
WSUser[] list = binding.findUsers(searchCriteria);
```

The return is:

```
String getUsername()
String getFullName()
String getPassword()
String getEmailAddress()
Boolean getExternallyDefined()
Boolean getEnabled()
Date getPreviousPasswordChangeTime()
String getTenantId()
WSRole[] getRoles()
String getRoleName()
String getTenantId()
WSUser[] getUsers()
```

11.2.2 putUser

In `putUser`, the parameter `user` has the type `WSUser` and returns type `WSUser`.

`putUser` updates an existing object; if the specified user does not exist, a new one is created.

Before adding users and roles, note that there is a server-side configuration which specifies the default roles that a new user can receive. See the *JasperReports Server Administrator Guide* for details

To call `putUser`:

```
WSUser user = new WSUser();
user.setUsername("john");
user.setTenantId("organization_1");
user.setEnabled(true);
user.setFullName("John Doe");
WSRole role = new WSRole();
role.setRoleName("ROLE_ANONYMOUS");
role.setTenantId(null);
user.setRoles(new WSRole[] {role});
WSUser value = binding.putUser(user);
```

The return is:

```
String getUsername()
String getFullName()
String getPassword()
String getEmailAddress()
Boolean getExternallyDefined()
Boolean getEnabled()
Date getPreviousPasswordChangeTime()
String getTenantId()
WSRole[] getRoles()
String getRoleName()
String getTenantId()
WSUser[] getUsers()
```

11.2.3 deleteUser

In `deleteUser`, the parameter `user` has the type `WSUser`.

To call `deleteUser`:

```
WSUser user = new WSUser();
user.setUsername("john");
user.setTenantId("organization_1");
binding.deleteUser(user);
```

There is no return.

11.2.4 findRoles

In `findRoles`, the parameter `criteria` has the type `WSRoleSearchCriteria` and returns type `WSRole`.

`criteria` can be a rolename mask, an organization/tenant ID, `includeSubOrgs`, a list of required users or roles, and `maxRecords`. Null values indicate "any."

- The mask has a SQL-like notation. For instance, `Ad%`, `U2_`.
- When `includeSubOrgs` is TRUE, all objects of the specified type are within a search's scope and result. Otherwise, only objects in the requested organization (or root if `tenantId`=null) are searched.
- To limit the number of objects to return, set `maxRecords` to the desired number. To allow an infinite number of objects, set `maxRecords` to 0.

To call `findRoles`:

```
WSRoleSearchCriteria searchCriteria = new WSRoleSearchCriteria();
  searchCriteria.setRoleName("ROLE_USER");
  searchCriteria.setTenantId("organization_1");
  searchCriteria.setMaxRecords(5);
  searchCriteria.setIncludeSubOrgs(false);
WSRole[] list = binding.findRoles(searchCriteria);
```

The return is:

```
String getUsername()
String getFullName()
String getPassword()
String getEmailAddress()
Boolean getExternallyDefined()
Boolean getEnabled()
Date getPreviousPasswordChangeTime()
String getTenantId()
WSRole[] getRoles()
String getRoleName()
String getTenantId()
WSUser[] getUsers()
```

11.2.5 putRole

In `putRole`, the parameter `role` has the type `WSRole` and returns type `WSRole`. `putRole` updates an existing object; if the specified role does not exist, a new one is created.

Before adding users and roles, note that there is a server-side configuration which specifies the default roles that a new user can receive. See *JasperReports Server Administrator Guide* for details.

To call `putRole`:

```
WSRole role = new WSRole();
role.setRoleName("ROLE_ANONYMOUS");
role.setTenantId(null);
WSRole value = binding.putRole(role);
```

The return is:

```
String getRoleName()
String getTenantId()
WSUser[] getUsers()
String getUserName()
String getFullName()
String getPassword()
String getEmailAddress()
Boolean getExternallyDefined()
Boolean getEnabled()
Date getPreviousPasswordChangeTime()
String getTenantId()
WSRole[] getRoles()
```

11.2.6 updateRoleName

In `updateRoleName`, the parameter `oldRole` has the type `WSRole`, and the parameter `newName` has the type `String`. They both return type `WSRole`.

To update a role with a call to `oldRole`:

```
WSRole oldRole= new WSRole();
role.setRoleName("ROLE_WS");
role.setTenantId("organization_1");
WSRole value = binding.updateRoleName(oldRole, "ROLE_WEB_SERVICE");
```

To rename the role with a call to `newName`: `"ROLE_WEB_SERVICE"`. The return for an updated role:

```
String getRoleName()
String getTenantId()
WSUser[] getUsers()
String getUsername()
String getFullName()
String getPassword()
String getEmailAddress()
Boolean getExternallyDefined()
Boolean getEnabled()
Date getPreviousPasswordChangeTime()
String getTenantId()
WSRole[] getRoles()
```

11.2.7 deleteRole

In `deleteUser`, the parameter `user` has the type `WSUser`. In `deleteRole`, the parameter `role` has the type `WSRole`.

Here are examples of calls to `deleteUser` and `deleteRole`:

```
WSRole role = new WSRole();
role.setRoleName("ROLE_WS");
role.setTenantId("organization_1");
binding.deleteRole(role);
```

There is no return.

11.3 Organizations/Tenants

This section describes functionality that can be restricted by the software license for JasperReports Server. If you don't see some of the options described in this section, your license may prohibit you from using them. To find out what you're licensed to use, or to upgrade your license, contact Jaspersoft.

At present, there is no practical difference between organizations and tenants; both kinds of entity are administered with these `tenant` operations:

- `getTenant`. Returns a list of tenants that meet specified criteria.
- `getSubTenantList`. Returns a list of sub-tenants (units within a tenant).
- `putTenant`. Returns the named tenant. If the object is not already in the database, the call creates a new one.
- `deleteTenant`. Deletes the named tenant.

11.3.1 getTenant

In `getTenant`, the parameter `tenantId` has the type `String` and returns type `WSTenant`.

To call `getTenant`:

```
String tenantId = "organization_1";
```

The return is:

```
String getTenantId()
String getTenantName()
String getTenantAlias()
String getTenantDesc()
String getTenantNote()
String getTenantUri()
String getTenantFolderUri()
String getParentId()
```

11.3.2 getSubTenantList

In `getSubTenantList`, the parameter `tenantId` has the type `String` and returns type `WSTenant[]`.

To call `getSubTenantList`:

```
String tenantId = "organization_1";
```

The return is:

```
String getTenantId()
String getTenantName()
String getTenantAlias()
String getTenantDesc()
String getTenantNote()
String getTenantUri()
String getTenantFolderUri()
String getParentId()
```

11.3.3 putTenant

In `putTenant`, the parameter `tenant` has the type `WSTenant` and returns type `WSTenant`.

To call `putTenant`. Note that `tenantUri` and `tenantFolderUri` are calculated automatically from the tenant's `tenantId` and `parentId`. As a result, the `tenantUri` and `tenantFolderUri` fields of the `WSTenant` object are ignored:

```
WSTenant wsTenant = new WSTenant();
  wsTenant.setTenantId("suborg1");
  wsTenant.setParentId("organization_1");
  wsTenant.setTenantAlias("organization_1");
  wsTenant.setTenantName("Sub organization1");
  wsTenant.setTenantDesc("Sub organization1 description");
  wsTenant.setTenantNote("Sub organization notes");
```

The return is:

```
String getTenantId()
String getTenantName()
String getTenantAlias()

String getTenantDesc()
String getTenantNote()
String getTenantUri()
String getTenantFolderUri()
String getParentId()
```

11.3.4 deleteTenant

In `deleteTenant`, the parameter `tenantId` has the type `String`.

To call `deleteTenant`.

```
String tenantId = "organization_1";
```

There is no return.

11.4 Permissions

The web service for administration of permissions has these operations:

- `getPermissionsForObject`. Returns a list of permissions for the specified object.

- `putPermission`. Returns the named permission. If the object is not already in the database, the call creates a new one.
- `deletePermission`. Deletes the named permission.

11.4.1 getPermissionsForObject

In `getPermissionsForObject`, the parameter `targetURI` has the type `String` and returns type `WSObjectPermission[]`.

To call `getPermissionsForObject`:

```
WSObjectPermission[] objectPermissions = binding.getPermissionsForObject(“repo:/”);
```

In the return, the permissioned object can be a user or role:

```
String getUri()
Object getPermissionRecipient()
int getPermissionMask()
String getRoleName()
String getTenantId()
WSUser[] getUsers()
String getUsername()
String getFullName()
String getPassword()
String getEmailAddress()
Boolean getExternallyDefined()
Boolean getEnabled()
Date getPreviousPasswordChangeTime()
String getTenantId()
WSRole[] getRoles()
```

11.4.2 putPermission

In `putPermission`, the parameter `objPerm` has the type `WSObjectPermission` and returns type `WSObjectPermission`.

To call `putPermission`:

```
WSObjectPermission objectPermission = new WSObjectPermission();
objectPermission.setUri(resourceUri);
objectPermission.setPermissionMask(2);
WSUser wsUser = new WSUser();
wsUser.setUsername("joeuser");
wsUser.setTenantId("organization_1");
objectPermission.setPermissionRecipient(wsUser);
WSObjectPermission value = binding.putPermission(objectPermission);
```

The setPermissionMask() function accepts the following values. It is not a true mask because bit-wise combinations of these values are not supported by the server. These values should be treated as constants:

- No access: 0
- Administer: 1
- Read-only: 2
- Read-delete: 18
- Read-write-delete: 30
- Execute-only: 32

The return is:

```
String getUri()
Object getPermissionRecipient()
int getPermissionMask()
String getRoleName()
String getTenantId()
WSUser[] getUsers()
String getUsername()
String getFullName()
String getPassword()
String getEmailAddress()
Boolean getExternallyDefined()
Boolean getEnabled()
Date getPreviousPasswordChangeTime()
String getTenantId()
WSRole[] getRoles()
```

11.4.3 deletePermission

In `deletePermission`, the parameter `objPerm` has the type `WSObjectPermission`. To call `deletePermission`:

```
WSObjectPermission objectPermission = new WSObjectPermission();
objectPermission.setUri(resourceUri);
objectPermission.setPermissionMask(2);
WSUser wsUser = new WSUser();
wsUser.setUsername("joeuser");
wsUser.setTenantId("organization_1");
objectPermission.setPermissionRecipient(wsUser);
binding.deletePermission(objectPermission);
```

There is no return.

11.5 Related Files

The web services distribution files include WSDL files as well as client stub classes. The WSDL file for the administration service is in jasperserver-ws-server-4.0.jar. Client stub files contain return types; they are in jasperserver-common-ws-4.0.jar. The JasperReports Server Professional and Enterprise implementation of the services is in ji-ws-server-4.0.jar.

APPENDIX A RESOURCEDESCRIPTOR API CONSTANTS

The constants that the services require are defined in the following classes:

- `com.jaspersoft.jasperserver.api.metadata.xml.domain.impl.ResourceDescriptor`
- `com.jaspersoft.jasperserver.api.metadata.xml.domain.impl.Argument`

The following values are extracted from `ResourceDescriptor`:

```
// Resource wsTypes
TYPE_FOLDER = "folder";
TYPE_REPORTUNIT = "reportUnit";
TYPE_DATASOURCE = "datasource";
TYPE_DATASOURCE_JDBC = "jdbc";
TYPE_DATASOURCE_JNDI = "jndi";
TYPE_DATASOURCE_BEAN = "bean";
TYPE_DATASOURCE_VIRTUAL = "virtual";
TYPE_DATASOURCE_CUSTOM = "custom";
TYPE_DATASOURCE_AWS = "aws"; // Amazon Web Services
TYPE_IMAGE = "img";
TYPE_FONT = "font";
TYPE_JRXML = "jrxml";
TYPE_CLASS_JAR = "jar";
TYPE_RESOURCE_BUNDLE = "prop";
TYPE_REFERENCE = "reference";
TYPE_INPUT_CONTROL = "inputControl";
TYPE_DATA_TYPE = "dataType";
TYPE_OLAP_MONDRIAN_CONNECTION = "olapMondrianCon";
TYPE_OLAP_XMLA_CONNECTION = "olapXmlaCon";
TYPE_MONDRIAN_SCHEMA = "olapMondrianSchema";
TYPE_ACCESS_GRANT_SCHEMA = "accessGrantSchema"; // Pro-only
TYPE_UNKNOW = "unknow";
TYPE_LOV = "lov"; // List of values...
TYPE_QUERY = "query";
TYPE_CONTENT_RESOURCE = "contentResource";
TYPE_STYLE_TEMPLATE = "jrtx";
TYPE_XML_FILE = "xml";

// These constants are copied here from DataType for facility
DT_TYPE_TEXT = 1;
DT_TYPE_NUMBER = 2;
DT_TYPE_DATE = 3;
```

```
...
// ReportUnit resource properties
...RU_CONTROLS_LAYOUT_POPUP_SCREEN = 1;
RU_CONTROLS_LAYOUT_SEPARATE_PAGE = 2;
RU_CONTROLS_LAYOUT_TOP_OF_PAGE = 3;
RU_CONTROLS_LAYOUT_IN_PAGE = 4;
...
// Content resource properties
...
CONTENT_TYPE_PDF = "pdf";
CONTENT_TYPE_HTML = "html";
CONTENT_TYPE_XLS = "xls";
CONTENT_TYPE_RTF = "rtf";
CONTENT_TYPE_CSV = "csv";
CONTENT_TYPE_IMAGE = "img";
```

The constants in the `Argument` class are:

```
// Arguments
MODIFY_REPORTUNIT = "MODIFY_REPORTUNIT_URI";
CREATE_REPORTUNIT = "CREATE_REPORTUNIT_BOOLEAN";
LIST_DATASOURCES  = "LIST_DATASOURCES";
IC_GET_QUERY_DATA  = "IC_GET_QUERY_DATA";
VALUE_TRUE = "true";
VALUE_FALSE = "false";
RUN_OUTPUT_FORMAT = "RUN_OUTPUT_FORMAT";
RUN_OUTPUT_FORMAT_PDF = "PDF";
RUN_OUTPUT_FORMAT_JRPRINT = "JRPRINT";
RUN_OUTPUT_FORMAT_HTML = "HTML";
RUN_OUTPUT_FORMAT_XLS = "XLS";
RUN_OUTPUT_FORMAT_XML = "XML";
RUN_OUTPUT_FORMAT_CSV = "CSV";
RUN_OUTPUT_FORMAT_RTF = "RTF";
RUN_OUTPUT_IMAGES_URI = "IMAGES_URI";
RUN_OUTPUT_PAGE = "PAGE";
RUN_TRANSFORMER_KEY = "TRANSFORMER_KEY";
RU_REF_URI = "RU_REF_URI";
PARAMS_ARG = "PARAMS_ARG";
LIST_RESOURCES = "LIST_RESOURCES";
RESOURCE_TYPE = "RESOURCE_TYPE";
REPORT_TYPE = "REPORT_TYPE";
START_FROM_DIRECTORY = "START_FROM_DIRECTORY";
NO_RESOURCE_DATA_ATTACHMENT = "NO_ATTACHMENT";
NO_SUBRESOURCE_DATA_ATTACHMENTS = "NO_SUBRESOURCE_ATTACHMENTS";
DESTINATION_URI = "DESTINATION_URI";
```

INDEX

A

Accept header 24
administration
    operations 196
    parameters 196
    permissions 203
    users and roles 198
    WSDL 196, 205
API constants 207

C

Content-Type header 24

D

domain
    operations 187-188
    WSDL 187

E

errors
    repository 177

H

HTTP header
    Accept 24
    Content-Type 24

I

iReport 178

M

methods. See operations. 188

O

operations
    administration 196
    domain 187-188
    repository 165
    scheduling 182

P

parameters
    administration 196
    repository 20
passing parameters in runReport operations 175

R

repository
    API constants 207
    errors 177
    operations 165
    parameters 20
    resources 18
resources 18

S

scheduling
    operations 182
    types 179
    WSDL 179

W

web services
- administration 195, 205
- domain 187, 193
- repository 163, 178
- scheduling 179, 185

Web Services Description Language. See WSDL. 196

WSDL
- administration 196, 205
- domain 187
- scheduling 179