

IBM SPSS Collaboration and Deployment Services  
Version 8 Release 1

*Process Management Service  
Developer's Guide*

**IBM**

**Note**

Before using this information and the product it supports, read the information in "Notices" on page 83.

**Product Information**

This edition applies to version 8, release 1, modification 0 of IBM SPSS Collaboration and Deployment Services and to all subsequent releases and modifications until otherwise indicated in new editions.

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# Contents

## Chapter 1. Introduction to web services 1

What are web services? . . . . .	1
Web service system architecture . . . . .	1
Web service protocol stack . . . . .	2
Simple Object Access Protocol . . . . .	2
Web Service Description Language . . . . .	3
Proxies . . . . .	5

## Chapter 2. Process Management Service overview . . . . . 7

Accessing the Process Management Service . . . . .	7
Calling Process Management Service operations . . . . .	7

## Chapter 3. Process management concepts . . . . . 9

Jobs . . . . .	9
Content repository Uniform Resource Identifiers . . . . .	9
Job variables . . . . .	10
Schedules . . . . .	10
Time-based schedules . . . . .	10
Message-based schedules . . . . .	11
Executions . . . . .	13
Queries . . . . .	14
Return specifiers . . . . .	16
Page selectors . . . . .	16
Page results . . . . .	17

## Chapter 4. Operation reference . . . . . 19

The cancelExecution operation . . . . .	19
The createMessageDrivenJob operation . . . . .	20
The createSchedule operation . . . . .	21
The deleteJobExecutions operation . . . . .	23
The deleteJobTrigger operation . . . . .	24
The deleteJobTriggers operation . . . . .	25
The deleteSchedule operation . . . . .	26
The deleteSchedules operation . . . . .	27
The finalizeRemoteWork operation . . . . .	28
The getCustomEventTypes operation . . . . .	28
The getExecutionDetails operation . . . . .	29
The getJobParameters operation . . . . .	30
The getJobStepChildExecutions operation . . . . .	32
The getJobStepExecutions operation . . . . .	33
The getMessageDrivenJob operation . . . . .	35
The getMessageDrivenJobs operation . . . . .	37
The getSchedule operation . . . . .	37
The getSchedules operation . . . . .	38
The getVersion operation . . . . .	40
The getWorkTypes operation . . . . .	41
The handleMessageDomainChanged operation . . . . .	42
The queryAllSchedules operation . . . . .	43
The queryExecutions operation . . . . .	46
The queryJobTriggers operation . . . . .	49
The querySchedules operation . . . . .	54
The querySubmittedExecutions operation . . . . .	58

The rerunFailedJobStepIterations operation . . . . .	61
The submitJob operation . . . . .	61
The submitJobWithOptions operation . . . . .	62
The submitWork operation . . . . .	64
The updateMessageDrivenJob operation . . . . .	65
The updateSchedule operation . . . . .	67

## Chapter 5. JAX-WS clients . . . . . 69

Generating a JAX-WS client . . . . .	69
Packaging a JAX-WS client . . . . .	69
Configuring a JAX-WS client . . . . .	69
SOAPHandler example . . . . .	70
Exercising web services from JAX-WS clients . . . . .	72

## Chapter 6. Microsoft .NET Framework-based clients . . . . . 73

Adding a service reference . . . . .	73
Service reference modifications . . . . .	73
Configuring the web service endpoint . . . . .	74
Configuring endpoint behaviors . . . . .	75
Exercising the service . . . . .	75
Single sign-on authentication . . . . .	76

## Chapter 7. Message header reference 77

Security headers . . . . .	77
Security element . . . . .	77
UsernameToken element . . . . .	78
BinarySecurityToken and BinarySecuritySSToken elements . . . . .	78
The client-accept-language element . . . . .	79
HTTP headers . . . . .	79

## Appendix. Deprecated features . . . . . 81

## Notices . . . . . 83

Privacy policy considerations . . . . .	84
Trademarks . . . . .	85

## Glossary . . . . . 87

A . . . . .	87
B . . . . .	87
C . . . . .	87
D . . . . .	88
E . . . . .	88
F . . . . .	89
G . . . . .	89
I . . . . .	89
J . . . . .	89
K . . . . .	89
L . . . . .	90
M . . . . .	90
N . . . . .	90
O . . . . .	90
P . . . . .	91

R. . . . .	91	W . . . . .	92
S. . . . .	91	X. . . . .	92
T. . . . .	92		
U. . . . .	92	<b>Index . . . . .</b>	<b>93</b>
V. . . . .	92		

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# Chapter 1. Introduction to web services

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## What are web services?

At a high level, a web service is a set of functionality distributed across a network (LAN or the Internet) using a common communication protocol. The web service serves as an intermediary between an application and its clients, providing both a standardized information structure and a standardized communication protocol for interaction between the two.

Where other methods of distributed application architecture rely on a single programming language being used on both the application and its clients, a web service allows the use of loosely coupled services between non-homogenous platforms and languages. This provides a non-architecture-specific approach allowing, for example, Java services to communicate with C# clients, or vice versa.

Advantages to implementing application functionality as web services include the following:

- Software written in different languages (Java or C#) running on different platforms (UNIX or Windows) can exchange services and data
- Application functionality can be accessed by a variety of clients. For example, both a thin-client interface and a rich-client interface can take advantage of the web service operations.
- Updates to the service are immediately available to all service clients

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## Web service system architecture

Web services are deployed and made publicly available using an application server, such as WebSphere<sup>®</sup>, JBoss Application Server, or Oracle WebLogic Server. The published web services are hosted by this application server to handle application requests, access permissions, and process load. A high-level architecture of how web services are implemented is displayed in the following diagram.

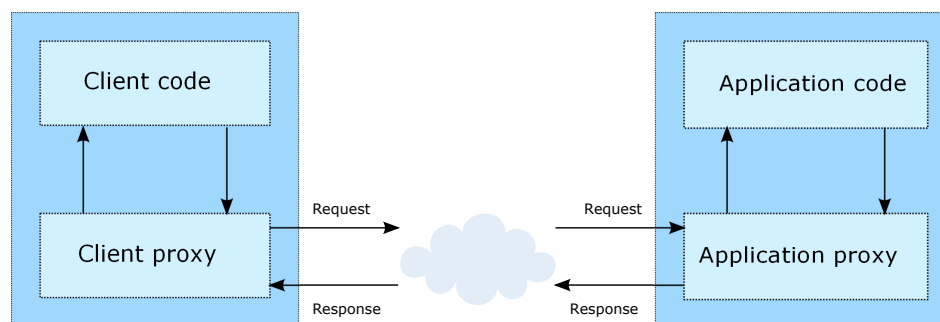


Figure 1. Web service architecture

The client code supplies input to an operation offered by a proxy class. The proxy class generates a request containing a standardized representation of the input and sends it across the network to the application. A proxy class on the server receives the request and unmarshals the contents into objects for processing by the application. Upon completing the operation, the application supplies a proxy with the output. The proxy creates a standardized representation of that output and sends the response back to the client. The client proxy unmarshals the response into native objects for subsequent processing by the client code.

Standardizing the format of the information passing between the client and the application allows a client written in one programming language to communicate with an application written in another. The proxy

classes, which are automatically generated from a web service description by a variety of toolkits, handle the translation between native programming objects and the standardized representation. See the topic “Proxies” on page 5 for more information.

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## Web service protocol stack

A web service implementation depends on technologies often organized in a layered stack. The implementation itself defines a standard protocol for each technology layer, with each layer depending on the layers appearing below it in the stack.

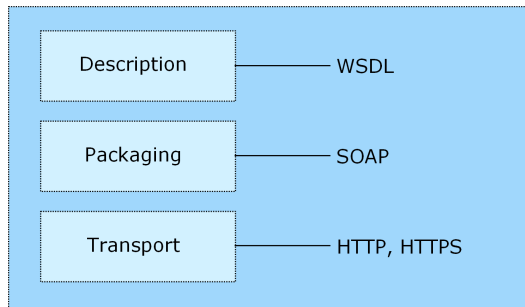


Figure 2. Web service protocol stack

Beginning at the bottom of the stack, the Transport layer defines the technology standards for communication, allowing information to move across the network. HTTP or HTTPS are often used as the standard for the transport layer.

The Packaging layer rests on top of Transport and defines the standard for structuring information for transport across the network. The SOAP format is commonly used, which offers an XML structure for packaging the data. See the topic “Simple Object Access Protocol” for more information.

The topmost layer is Description and identifies the standards used by the layers below it in the stack, as well as providing the definition of the interface available for client use. The most common means of conveying this information is through the use of a WSDL file. See the topic “Web Service Description Language” on page 3 for more information.

## Simple Object Access Protocol

The Simple Object Access Protocol (SOAP) is a way to pass information between applications in an XML format.

SOAP messages are transmitted from the sending application to the receiving application, typically over an HTTP session. The actual SOAP message is made up of the Envelope element, which contains a Body element and an optional Header element.

- **Envelope.** This mandatory element is the root of the SOAP message, identifying the transmitted XML as being a SOAP packet. An envelope contains a body section and an optional header section.
- **Header.** This optional element provides an extension mechanism indicating processing information for the message. For example, if the operation using the message requires security credentials, those credentials should be part of the envelope header.
- **Body.** This element contains the message payload, the raw data being transmitted between the sending and receiving applications. The body itself may consist of multiple child elements, with an XML schema typically defining the structure of this data.

A SOAP packet and the corresponding XML is structured in the following way:



Figure 3. An example SOAP packet

## Web Service Description Language

A Web Service Description Language (WSDL) file provides an XML-based map of what functionality the published web service allows, separating the implementation in the service from the interface. The WSDL defines the following:

- The access location of the web service
- Operations the web service exposes
- Parameters the exposed operations accept
- Any request or response messages associated with the operations

The WSDL provides the information necessary to generate a client-side proxy in the target programming language.

In accordance with the WSDL specification adopted by the World Wide Web Consortium, information in the WSDL is organized into the following sections:

- **Types.** Content definitions for web service operation input and output. See the topic “Types” for more information.
- **Messages.** Input and output definitions for the web service operations. See the topic “Messages” on page 4 for more information.
- **PortTypes.** Groups of operations offered by the web service. See the topic “Port types” on page 4 for more information.
- **Bindings.** Protocols and formats for the web service operations. See the topic “Bindings” on page 4 for more information.
- **Services.** Endpoints at which the web service functionality can be accessed. See the topic “Services” on page 5 for more information.

## Types

The types element of a WSDL file contains the data type definitions employed by messages processed by the web service. These definitions use XML to organize the information relevant to the type element being defined. Consider the following example type definitions:

```

<wsdl:types>
  <schema targetNamespace="http://xml.spss.com/security/remote"
xmlns="http://www.w3.org/2001/XMLSchema">
    <element name="getProviders">
      <complexType />
    </element>
    <element name="getProvidersResponse">
      <complexType>

```

```

        <sequence>
          <element name="providerInfo[unbounded]" type="tns1:providerInfo" />
        </sequence>
      </complexType>
    </element>
  </schema>
</wsdl:types>

```

This section defines two elements, *getProviders* and *getProvidersResponse*. The former is an empty element. The latter contains a sequence of *providerInfo* child elements. These children are all of the *providerInfo* type, which is defined elsewhere.

In practice, the WSDL file typically references type element definitions found in an external XML schema. For instance, the following definition uses *security-remote.xsd* to define type elements.

```

<wsdl:types>
  <xs:schema>
    <xs:import namespace="http://xml.spss.com/security/remote"
      schemaLocation="security-remote.xsd"/>
  </xs:schema>
</wsdl:types>

```

## Messages

The message elements of a WSDL file defines the input or output parameters for operations available in the web service. Each message can consist of one or more parts, with the parts similar to the parameters of a function call in a traditional programming language. Consider the following two example message definitions:

```

<wsdl:message name="getProvidersResponse">
  <wsdl:part element="tns2:getProvidersResponse" name="parameters" />
</wsdl:message>
<wsdl:message name="getProvidersRequest">
  <wsdl:part element="tns2:getProviders" name="parameters" />
</wsdl:message>

```

The *getProvidersResponse* message contains a single part, corresponding to the *getProvidersResponse* element defined in the types section of the WSDL file. Similarly, the *getProvidersRequest* message also contains a single part, as defined by the *getProviders* element in the types section. See the topic “Types” on page 3 for more information.

## Port types

The portType element of a WSDL file defines the actual interface to the web service. A port type is simply a group of related operations and is comparable to a function library, module, or class in a traditional programming language. The definition specifies the parameters for the operations, as well as any values returned. The parameters and return values correspond to messages defined elsewhere in the WSDL file. Consider the following example port type definition:

```

<wsdl:portType name="ProviderInformation">
  <wsdl:operation name="getProviders">
    <wsdl:input message="impl:getProvidersRequest" name="getProvidersRequest" />
    <wsdl:output message="impl:getProvidersResponse" name="getProvidersResponse" />
  </wsdl:operation>
</wsdl:portType>

```

The *ProviderInformation* port type consists of a single operation, *getProviders*. Input to this operation corresponds to the *getProvidersRequest* message. The operation returns information in the structure defined by the *getProvidersResponse* message. See the topic “Messages” for more information.

## Bindings

The binding element of a WSDL file binds the interface defined by the port type to transport and messaging protocols. Consider the following example binding definition:

```

<wsdl:binding name="ProviderInformationSoapBinding" type="impl:ProviderInformation">
  <wsdlsoap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http" />
  <wsdl:operation name="getProviders">
    <wsdlsoap:operation soapAction="" />
    <wsdl:input name="getProvidersRequest">
      <wsdlsoap:body namespace="http://xml.spss.com/security/remote" use="literal" />
    </wsdl:input>
    <wsdl:output name="getProvidersResponse">

```



```
<wsdl:soap:body namespace="http://xml.spss.com/security" use="literal" />
</wsdl:output>
</wsdl:operation>
</wsdl:binding>
```

In this case, the transport attribute of the `wsdl:soap:binding` element defines HTTP as the transport protocol. The `getProviders` operation in the interface is bound to the SOAP messaging protocol.

## Services

The service element of a WSDL file identifies the network location at which the service interface can be accessed. Consider the following example service definition:

```
<wsdl:service name="ProviderInformationService">
  <wsdl:port binding="impl:ProviderInformationSoapBinding" name="ProviderInformation">
    <wsdl:soap:address location="http://pes_server:8080/security-ws/services/ProviderInformation" />
  </wsdl:port>
</wsdl:service>
```

In this example, the operations comprising the *ProviderInformation* port type can be accessed at:

`http://pes_server:8080/security-ws/services/ProviderInformation`

---

## Proxies

Proxies serve as bridges between the client and the web service. A client-side proxy marshals the input objects into a standardized representation which is sent to the web service. A server-side proxy unmarshals the information into input objects for the service operations. The results of the operation are marshalled into standard representations and returned to the client. The client proxy unmarshals the response information into objects for any additional processing by the client.

Creating a proxy is the first step when developing a web service client; the proxy is the translation-unit between your application and the web service the application is using. Fortunately, many development environments include tools for automatically generating the client proxy from the web service WSDL file, allowing the client developer to focus on the client application code instead of transport and packaging protocols.

The proxy classes generated from a WSDL file depend on the tool used. For Java, the `wsdl2java` tool, which is part of the Apache Axis project, can be used. This tool produces a Java class for each type in the WSDL. Each port type results in a Java interface. A binding creates a stub class, and a WSDL service yields a service interface with a locator implementation. These generated classes and interfaces can be called directly from a client application written in Java to access the web service functionality.

An alternative Java proxy tool is `wsimport`, which is part of JAX-WS. The general structure of the generated classes is similar to that created by the Axis tool, but there are some differences. For example, instead of using arrays for input fields and returned items, the code generated from the `wsimport` tool uses `List` collections. In addition, if an input type matches an output type for a method, the `wsimport` tool uses a `Holder` class for the parameter.

In contrast, on the .NET platform, the `wsdl.exe` tool is often used to generate a web service proxy. This tool creates a single source file in a specified language containing the proxy class. This class includes both synchronous and asynchronous methods for each operation defined in the WSDL. For example, the web service operation `getProviders` results in the methods `getProviders`, `getProvidersBegin`, and `getProvidersEnd`. The latter two can be used for asynchronous processing.

A variety of other tools exist for other programming languages. For details, consult the documentation for those tools. In each case, the tool creates native programming constructs that permit leveraging a web service regardless of the service implementation language.



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## Chapter 2. Process Management Service overview

The Process Management Service allows a client to manage the artifacts associated with running jobs. The client can submit an existing job for processing, and retrieve the execution meta-data and results. In addition, schedules can be created and assigned to jobs, allowing execution at a future date or on a recurring basis.

---

### Accessing the Process Management Service

To access the functionality offered by the Process Management Service, create a client application using the proxy classes generated by your preferred web service tool. The endpoint for the service is:

```
http://<host-name>:<port-number>/<context-root>/process/services/ProcessManagement
```

The value of *<host-name>* corresponds to the name or IP address of the machine on which IBM® SPSS® Collaboration and Deployment Services Repository is installed.

**Note:** An IPv6 address must be enclosed in square brackets, such as [3ffe:2a00:100:7031::1]. The value of *<port-number>* indicates the port number on which the repository server is running. The *<context-root>* value specifies the custom context root, if any, configured for your repository server. If your system does not use a context root, omit this portion of the endpoint. To access the WSDL file for the service, append *?wsdl* to the service endpoint.

For example, if IBM SPSS Collaboration and Deployment Services Repository is running on port 80 of the machine *cads\_server* without a context root, the WSDL file can be accessed using the path:

```
http://cads_server:80/process/services/ProcessManagement?wsdl
```

---

### Calling Process Management Service operations

Clients access the operations offered by the web service using a stub for the service. The following is an example of how to acquire a stub in Java through Axis defined methods:

```
String context = "/process/services/ProcessManagement";
URL url = new URL("http", "cads_server", 80, context);
ProcessManagementService service = new ProcessManagementServiceLocator();
stub = service.getProcessManagement(url);
```

The service operations can be called directly from the stub, such as:

```
stub.submitJob(jobURI, false);
```



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## Chapter 3. Process management concepts

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### Jobs

A job is a container for a set of work, or events, to be executed. Each individual piece of work in a job is commonly referred to as a job step. Submission of the job results in execution of the steps it contains. When a job executes, the system creates **executions** for the overall job and for the individual steps. The executions report on the job status and provide information about any output generated. The execution of a job can be defined to occur on a recurring basis using **schedules**.

For example, a job may consist of a sequence of steps that invoke IBM SPSS Statistics for initial data processing and graphical displays, followed by IBM SPSS Modeler steps for modeling and scoring. Submitting the job creates a set of executions in the system from which the results can be obtained. The job can be scheduled to run automatically every week to generate executions containing updated graphs, models, and scores using the most current data.

The IBM SPSS Collaboration and Deployment Services Repository provides the storage mechanism for jobs to be executed. The Process Management Service references a job by its content repository URI.

### Content repository Uniform Resource Identifiers

Resources within the IBM SPSS Collaboration and Deployment Services Repository are often referenced using a uniform resource identifier. A content repository URI consists of the following items:

- The scheme *spsscr*:
- A hierarchical specification consisting of an authority definition and an optional object path
- An optional query specifying an object identifier
- Optional fragments defining version information

The URI has the following format:

```
spsscr://[host][:port]/[path/filename [?hierarchyType=type] | ?id=repositoryID][#1.label | #m.marker]
```

The hierarchical portion begins with two slashes, followed by the authority definition. This information identifies the host name and port number for the repository containing the object, followed by a slash. The authority definition may be omitted, in which case the URI indicates a relative location within the repository processing the service request.

```
spsscr:/// [path/filename [?hierarchyType=type] | ?id=repositoryID][#1.label | #m.marker]
```

The URI continues with either the full path to the object, including its name, or a question mark and a query term consisting of the key *id*, an equals sign, and the repository resource identifier for the object. This identifier can be obtained from the information returned by the `getResource` operation of the Content Repository Service.

If the URI specifies an object path, the path may be followed by a query parameter designating the type of hierarchy containing the object. This parameter begins with a question mark, followed by the key *hierarchyType*, an equals sign, and the hierarchy type designator. Valid hierarchy types include *folder*, *topic*, *configuration*, *server*, *credential*, *datasource*, *enterprise*, and *submitted*. If the *hierarchyType* parameter is omitted, the *folder* hierarchy is used by default. The *hierarchyType* parameter is valid only when using the path to identify the object.

Optional version fragments follow the object information. The fragments begin with a hash symbol (#), followed by a single letter indicating whether the fragment is a version label (l) or a version timestamp

marker (m). The fragment ends with a period and the actual label or marker for the version. Replace any spaces in the label or marker with escape characters. For example, the URI:

```
spsscr://myserver:80/marketing/campaign1#m.0:2006-10-08%2012:34:10.223
```

refers to the version of the *campaign1* job in the *marketing* folder saved at 12:34 on October 8, 2006. A URI that does not include a version fragment references the latest version of the object. For instance, the URI:

```
spsscr://localhost/campaign2
```

refers to the latest version of the job *campaign2*.

## Job variables

Job variables define parameters whose values can be passed to any step within the job. Using variables, any job can be used as an iterative consumer, in which values external to the job can be used to control job processing. Values for the variables can be defined:

- When initiating the job
- In schedules associated with the job
- In other jobs executing before the job

Each job variable can be characterized by the following properties:

- **Variable Name.** The name of the variable defined for the job.
- **Default Value.** The default value for a job variable. If a variable has no specified default value and a value has not been assigned in some other fashion, the user is prompted for a value during job execution.
- **Description.** Informative text about a variable typically used to aid in identifying the variable.

The Process Management Service includes operations for retrieving variable definitions and for specifying variable values during job submission.

---

## Schedules

Schedules provide a triggering mechanism to initiate job execution. Currently, a job is the only type of object that can be scheduled, using triggers based on either time or JMS messages. A job that is not associated with a schedule must be executed manually.

The Process Management Service includes operations for creating, retrieving, updating, and deleting schedules.

### Time-based schedules

A time-based schedule for a job designates a time, date, and optional recurrence pattern for execution of the job. When the specified date/time is reached, the schedule activates, causing any associated jobs to execute. Time-based schedules that can be assigned to jobs include the following:

- **Once.** Executes a job a single time at a specified date/time.
- **Hourly.** Executes a job on an hourly basis. The recurrence pattern indicates the number of hours between executions. For example, set the interval to 1 to execute the job every hour. To execute the job every other hour, set the interval to 2.
- **Daily.** Executes a job at a specified time of day. The recurrence pattern indicates the daily interval between executions. For example, set the interval to 1 to execute the job every day. For execution every other day, set the interval to 2.
- **Weekly.** Executes a job at a specified time of a designated weekday. The recurrence pattern indicates the weekly interval between executions. For example, set the interval to 1 to execute the job on the specified weekday every week. To execute the job every other week, set the interval to 2.

- **Monthly.** Executes a job at a specified time on a designated day of the month. The recurrence pattern indicates the monthly interval between executions. For example, set the interval to 1 to execute the job on the specified day of every month. For execution every other month, set the interval to 2. To execute the job quarterly, use an interval of 3.
- **Yearly.** Executes a job at a specified time, day, and month combination. The recurrence pattern indicates the yearly interval between executions. For example, set the interval to 1 to execute the job every year. To execute the job every other year, set the interval to 2.

Time-based schedules can be defined to end on a specific date. In the absence of an end date, the schedule will obey its recurrence pattern indefinitely.

## Message-based schedules

Message-based schedules allow external applications to initiate execution of jobs and job steps stored within the IBM SPSS Collaboration and Deployment Services Repository using the Java Message Service (JMS). JMS allows two primary approaches to messaging, point-to-point and publish-subscribe. In the former, a single message producer sends a message to a single message consumer using a queue. In the latter, one or more producers send messages to one or more consumers using topics. IBM SPSS Collaboration and Deployment Services employs the publish-subscribe model for messaging using the JMS server capabilities of the application server hosting the IBM SPSS Collaboration and Deployment Services Repository.

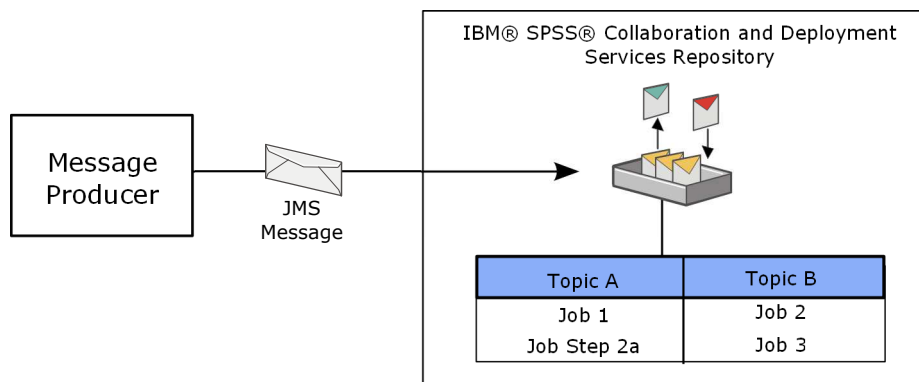


Figure 4. IBM SPSS Collaboration and Deployment Services messaging

A message producer publishes a message to a defined topic in the JMS server. Message consumers, or subscribers, that have subscribed to the topic receive the message and respond accordingly. In IBM SPSS Collaboration and Deployment Services, jobs and job steps correspond to the consumers and execution is the response to a message received. A message-based schedule for a job identifies a message destination to monitor for activity. When a message is received at that destination, the schedule activates, causing any job associated with the schedule to execute. For example, in the figure, if the producer sends a message to topic A, the subscribers Job 1 and Job Step 2a execute. Job 2 and Job 3 only execute when a message is sent to topic B.

Subscribing a consumer to a message involves associating the consumer with a message domain. The message domain defines the properties associated with destinations for JMS messaging, such as the following:

- **Destination Name.** The name of the topic or queue.
- **Naming Factory.** Application server specific string designating the JMS Java class. For example, for JBoss application server the naming factory is `org.jnp.interfaces.NamingContextFactory`.
- **Naming Service.** The URI location of the naming service. For example, for JBoss application server the naming service is `jnp://localhost:1099`.
- **Credentials.** Optional credentials. The credentials will only be required in certain instances, depending upon the configuration of the JMS server and how we are required to connect to the JMS server (whether the JMS Message topic is secured or not).

Any message sent to the destination defined for a domain will trigger a job associated with the domain. To control which subscribed jobs execute, use message filters. To create a message domain, use the Content Repository Service.

Subscriptions to message domains can be either nondurable or durable. Nondurable subscriptions will not receive any messages sent by producers while IBM SPSS Collaboration and Deployment Services Repository is not running. Those messages are effectively lost. In contrast, for a durable subscription, the JMS server saves the messages until the consuming application is running and the messages can be delivered.

## JMS message structure

A JMS message consists of header information, optional properties, and the message body. The header for a message includes information used for identification and routing. Standard header fields for JMS messages include the following:

- *JMSDestination*. The destination for the message.
- *JMSDeliveryMode*. The mode for delivery specified by the message producer.
- *JMSExpiration*. The message expiration time.
- *JMSPriority*. A number from 0 to 9 indicating the priority associated with the message. Higher numbers represent higher priorities, with 4 being the default priority value.
- *JMSMessageID*. A unique identifier for the message.
- *JMSTimestamp*. The time the message was available for sending.
- *JMSCorrelationID*. Allows linking of messages by specifying a related message identifier or string.
- *JMSReplyTo*. The location to which to send any responses to the message.
- *JMSType*. A string indicating the message content type.
- *JMSRedelivered*. Indicates whether or not the message was resent.

Message properties are optional header fields often classified into three categories. **Application properties** are any custom properties created by an application and usually only have meaning to the applications sending and receiving the messages. **Provider properties** correspond to proprietary fields for specific vendors offering JMS producers. Finally, **standard properties** are optional fields defined by the JMS specification but which may not be supported by all message producers and consumers. Standard properties include the following:

- *JMSXUserID*. String identifying the user sending the message.
- *JMSXAppID*. String identifying the application sending the message.
- *JMSXDeliveryCount*. Integer indicating the number of times message delivery has been attempted.
- *JMSXGroupID*. String identifying a message group for the message.
- *JMSXGroupSeq*. Integer indicating the sequential position of the message in its group.
- *JMSXProducerTXID*. String identifying the producer transaction that created the message.
- *JMSXConsumerTXID*. String identifying the consumer transaction that received the message.
- *JMSXRcvTimestamp*. The time the message was delivered to the consumer.
- *JMSXState*. Integer indicating the state of the message as waiting (1), ready (2), expired (3) or retained (4).

The message body contains the payload as one of the following types:

- **Stream**. A stream of Java primitive values
- **Map**. A set of name-value pairs.
- **Text**. A string.
- **Object**. A serializable Java object.
- **Bytes**. A stream consisting of uninterpreted bytes.



## Example JMS Message

An example message with a text body follows:

```
Header {
  jmsDestination : TOPIC.testTopic
  jmsDeliveryMode : 2
  jmsExpiration : 0
  jmsPriority : 4
  jmsMessageID : ID:33-11903898478381
  jmsTimeStamp : 1190389847838
  jmsCorrelationID: null
  jmsReplyTo : null
  jmsType : null
  jmsRedelivered : false
  jmsProperties : { TaskType=ETL, TaskStatus=complete}
  jmsPropReadWrite: false
  msgReadOnly : true
  producerClientId: ID:33
}
Body {
  text : ETL complete
}
```

For a complete discussion of the content of JMS messages, see the JMS Specification .

## Message filters

All messages sent to a topic get passed to all consumers subscribed to that topic. This implies that every job or job step subscribed to a message domain will execute when any message is sent to that domain. However, it may be desirable to use the message properties or content to dictate which subscribers should activate. For example, job *Run\_Report* executes if the message indicates success and job *Notify\_Admin* executes for a failure message. This selective execution of message-based jobs can be accomplished using message filters for subscribers. IBM SPSS Collaboration and Deployment Services offers text and selector filters.

A text filter specifies text that must be contained within the body of a JMS text message for subsequent triggering of subscribers. For example, subscribers specifying a text filter of *success* would only activate if a message containing the string *success* in its text body was received.

A selector filter defines a conditional expression that must be met for subscriber triggering. The expression is based on the message header field and property values using a subset of SQL-92 syntax. For example, if a message contains the property *TaskStatus*, a selector for a property value of *complete* is:

```
TaskStatus='complete'
```

For any subscriber, text and selector filters can be used in conjunction to restrict execution to messages that contain specific text and also have specific field and property values.

---

## Executions

An execution, or **event execution**, contains the results of executing an event. Every time an event executes, a new execution is created. The execution includes the following:

- The date and time when the event began execution
- The date and time when the event completed execution
- The completion code
- An indicator of whether the event succeeded or not
- Artifacts produced by the execution
- A log detailing the execution

Use the execution to access the results for an event.

The Process Management Service includes operations for retrieving and deleting executions for an event. In addition, you can cancel the execution for a specified event.

## Queries

The Process Management Service provides a query mechanism for retrieving schedules and executions from the IBM SPSS Collaboration and Deployment Services Repository that meet specified criteria. The information contained in the search result set can be customized to be as broad or focused as needed. For example, the query can return all available execution information for all jobs in the system, or for all jobs having a specific label that have failed. In addition, large result sets can be returned as individual pages containing a specified number of hits to optimize client performance.

Queries return information as field/value pairs. These fields can generally be classified into three categories: general, execution, and schedule. General fields indicate properties of the file or job associated with the returned schedule or execution.

*Table 1. General fields.*

Field Name	Description
file.objid	Identifier for the file associated with the schedule or execution
job.objid	Identifier for the job associated with the schedule or execution
file.name	Name of the file
file.path	Path to the associated file in the repository
jobpath	Path to the associated job in the repository
fileversion.marker	The timestamp for the file or job
fileversion.label	The label for the file or job, if any
fileversion.expirationDate	Expiration date of the file
usesfiledep.label	The label, if any, for the file or job

Execution fields report information about job executions. These properties include the execution time and state.

*Table 2. Execution fields.*

Field Name	Description
eventexe.objId	Identifier for the execution object
eventexe.mode	Method for initiating the execution
eventexe.state	State of the execution at the time of the query
eventexe.executionSuccess	Boolean indicating whether or not the execution succeeded
eventexe.completionCode	Value reflecting the state of the execution at completion
eventexe.startDateTime	Date and time that the execution began
eventexe.endDateTime	Date and time that the execution ended
eventexe.queuedDateTime	Date and time for the next execution
eventexe.userName	User under which the execution occurs
executionRuntime	Number of seconds to complete the job execution
scheduleEventExecution.state	State of the time-based schedule execution at the time of the query

Table 2. Execution fields (continued).

Field Name	Description
scheduleEventExecution.executionSuccess	Boolean indicating whether or not the time-based execution succeeded
scheduleEventExecution.startDateTime	Date and time that the time-based execution began
scheduleEventExecution.endDateTime	Date and time that the time-based execution ended
scheduleEventExecution.queuedDateTime	Date and time for the next time-based execution
msgEventExecution.state	State of the message-based execution at the time of the query
msgEventExecution.executionSuccess	Boolean indicating whether or not the message-based execution succeeded
msgEventExecution.startDateTime	Date and time that the message-based execution began
msgEventExecution.endDateTime	Date and time that the message-based execution ended
msgEventExecution.queuedDateTime	Date and time for the next message-based execution

Time-based schedule fields report information about job schedules. These properties include the schedule frequency and start date.

Table 3. Time-based schedule fields.

Field Name	Description
schedule.objId	Identifier for the schedule
schedule.frequency	Frequency
schedule.interval	Recurrence interval
schedule.month	The month in the year in which to run
schedule.dayOfMonth	The day in the month in which to run
schedule.daysOfWeek	Days of the week in which to run
schedule.timeOfDay	Time at which the schedule triggers
schedule.scheduleStartDate	Start date
schedule.scheduleEndDate	Date at which the schedule terminates
schedule.nextScheduleTime	Time of the next schedule triggering
schedule.scheduleEnabled	Indicator of whether or not the schedule is enabled

Message-based job fields report information about jobs initiated by messages. These properties include the message filters and domain information.

Table 4. Message-based job fields.

Field Name	Description
msgDrivenJob.objid	Identifier of a message-driven job
msgDrivenJob.messageSelector	Conditional expression that must be satisfied for the subscription to activate
msgDrivenJob.messageText	Filter text that must be matched for the subscription to activate
messageDomain.name	Name of the message domain
messageDomain.destinationName	Name of the message destination
messageDomain.namingService	URI location of the naming service

Table 4. Message-based job fields (continued).

Field Name	Description
messageDomain.namingFactory	String denoting the JMS Java class
trigger.summary	For scheduled jobs, this is the frequency of the schedule (e.g. once, daily, weekly, monthly). For message-driven jobs, this is the message domain.
next.trigger	For scheduled jobs, this is the next time the schedule will run. For message-driven jobs, this is the selector and message text.
lastrun.startDateTime	The queuedDateTime attribute for the last run of the job
lastrun.status	An indicator of the job success and state
credentials.name	Name of the credentials under which the job runs

Whether querying for executions or for schedules, the criterion for the query must be specified. A criterion consists of a return specifier and a page selector. The former identifies the structure of the information returned by the query. The latter specifies any filtering criteria that must be satisfied by matching objects, also known as **hits**, as well as paging requirements.

## Return specifiers

The return specifier for a query defines the following criteria:

- **Sort column.** The name of the field on which to sort the returned information. For a list of available field names, see “Queries” on page 14.
- **Sort order.** Whether the results should be sorted in ascending or descending order.
- **Page size.** The maximum number of matching objects to return.

The return specifier criteria are optional. If absent, the system uses defaults.

## Page selectors

A query criterion can include a **page selector** to reduce the number of returned objects. A page selector allows both filtering and paging of result sets.

A selector **filter** restricts the returned set to objects having a specified value for a designated property. Available filters include the following:

- **Version label.** Restricts the results to objects having a specified version label.
- **Execution state.** Returns only executions having a designated state. Valid state values for this filter include *dummy*, *initializing*, *queued*, *running*, *ended*, *cascading*, *error*, *cascade\_error*, *canceling*, *canceled*, *cancel\_pending\_cascade*, *cascade\_canceled*, *joining*, and *never\_joined*.
- **Completion status.** Limits the results to executions having a specified status. Valid status values for this filter include *success* and *failure*.
- **Job URI.** Limits the results to a specific job.
- **Date range.** Limits the results to those occurring within a specified date/time range.
- **Execution mode.** Limits the results to executions resulting from schedule triggers, manual execution, or submission.

A **page request** for a selector indicates the row of the result set at which to begin returning results. In addition to the row number, the request includes a key identifying the result set being accessed. The key allows clients to page through the results. For example, a client application could display ten query results in a single display. The 11<sup>th</sup> through the 20<sup>th</sup> results could be returned by initiating a query involving a page request beginning at row eleven using the same key as the first set of results.

## Page results

The Process Management Service returns query results in a table containing matching objects in the rows. The columns correspond to the field values. The table illustrates the structure for a query returning two executions of the same job. Some columns are omitted in the interest of space.

Table 5. Example Execution Query Results

Job ID	Job Marker	State	Completion Code	Start	End
0A0B32E0CFC42076000 0010EC3B57CAF81C3	1:2006-11-10 12:37:08.385	4	2	2006-11-10 12:37:16.927	2006-11-10 12:40:55.007
0A0B32E0CFC42076000 0010EC3B57CAF81C3	2:2006-11-10 13:11:04.257	4	2	2006-11-10 13:11:09.947	2006-11-10 13:13:46.707

Page results information can be classified into four categories: general metadata, column, row, and navigator. General metadata includes the following:

- The total number of hits in the result set
- The maximum number of hits for any page
- The page number for the current page
- The column used for sorting the hits
- The sort order as *ascending* or *descending*
- A client key value, which is an internal identifier used to synchronize requests for specific pages

Information for columns consists of the following:

- The display name for the column, such as *Title* or *Author*
- The internal field name for the column.
- An indicator of the type of information reported in the column. The type is *string* for all fields.

Row information returned by the Process Management Service includes the following:

- The row number
- The values for the individual cells in an order corresponding to the order of the columns. For example, the second value for each hit in the Table 5 table would be the value for the second column, *Job Marker*.

Navigators serve to facilitate the creation of user interfaces to display the results for multiple pages. This information consists of characteristics of each page in the results, as well as data for the preceding and following pages.



---

## Chapter 4. Operation reference

---

### The cancelExecution operation

The cancelExecution operation cancels the processing of an execution.

#### Input fields

The following table lists the input fields for the cancelExecution operation.

Table 6. Fields for cancelExecution.

Field	Type/Valid Values	Description
executionID	string	Identifier for the execution to be canceled.

#### Java example

To cancel the execution of a job, supply the cancelExecution operation with a string corresponding to the identifier for the job being canceled.

```
String [] executionID = new String[1];
executionID[0] = "0a0a4aac011937790000010d415272aa8ab4";
stub.cancelExecution(executionID);
```

#### SOAP request example

Client invocation of the cancelExecution operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
      </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <cancelExecution xmlns="http://xml.spss.com/prms/remote">
      <executionID>0a0a4aac011937790000010d415272aa8ab4</executionID>
    </cancelExecution>
  </soapenv:Body>
</soapenv:Envelope>
```

#### SOAP response example

The server responds to a cancelExecution operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <cancelExecutionResponse xmlns="http://xml.spss.com/prms/remote"/>
  </soapenv:Body>
</soapenv:Envelope>
```

---

## The createMessageDrivenJob operation

Creates a new message-based trigger for a job in the system.

### Input fields

The following table lists the input fields for the createMessageDrivenJob operation.

Table 7. Fields for createMessageDrivenJob.

Field	Type/Valid Values	Description
jobLocationURI	string	URI of the job associated with the schedule.
messageDrivenJobIn	messageDrivenJobSpecifier	Message Drive Job parameters.

### Return information

The following table identifies the information returned by the createMessageDrivenJob operation.

Table 8. Return Value.

Type	Description
messageDrivenJobSpecifier	Details of a Message Drive Job Schedule.

### Java example

Message-driven job creation requires the following two pieces of information:

- A string corresponding to the URI of the job associated with the trigger
- A MessageDrivenJobSpecifier object defining the parameters of the message-driven job

Typically, creating a message-driven job involves the following steps:

1. Create a MessageDrivenJob object.
2. Supply the setEnabled method with a boolean indicating whether or not the trigger is enabled.
3. Define the label for the job version associated with the trigger using the setLabel method.
4. Set the credentials for executing the message-driven job using the setCredentialID method.
5. Specify trigger filters using the setMessageText and setMessageSelector methods.
6. Create a MessageDrivenJobSpecifier object using the job object.
7. Define a string indicating the URI for the job.
8. Supply the MessageDrivenJobSpecifier object and the URI string to the createMessageDrivenJob operation. The operation returns a MessageDrivenJobSpecifier object containing the message-driven job parameters, including its identifier.

The following sample creates a message-driven job for the job *Monthly Update*. The job runs when messages having a text body of *My Text* that meet the selector criterion are received.

```
MessageDrivenJob mdJob = new MessageDrivenJob();
mdJob.setScheduleEnabled(true);
mdJob.setLabel("LATEST");
mdJob.setCredentialID("0a0a4a356f526f1d0000011450a1669680af");
mdJob.setMessageText("My Text");
mdJob.setMessageSelector("JMSType = 'ETL' AND status = 'complete'");
MessageDrivenJobSpecifier mdjSpecIn = new MessageDrivenJobSpecifier(wSchedule);

String uri = "spsscr://pesServer/Monthly%20Update";
MessageDrivenJobSpecifier scheduleOut = stub.createMessageDrivenJob(uri, mdjSpecIn);
```



## SOAP request example

Client invocation of the createMessageDrivenJob operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <createMessageDrivenJob xmlns="http://xml.spss.com/prms/remote">
      <jobLocationURI>spsscr://pesServer/Monthly%20Update</jobLocationURI>
      <ns2:messageDrivenJobIn xmlns:ns2="http://xml.spss.com/prms">
        <ns2:messageDrivenJob label="LATEST" credentialID="0a0a4a356f526fd0000011450a1669680af"
          messageText="My Text" messageSelector="JMSType = 'ETL' AND status = 'complete'"/>
      </ns2:messageDrivenJobIn>
    </createMessageDrivenJob>
  </soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a createMessageDrivenJob operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <createMessageDrivenJobResponse xmlns="http://xml.spss.com/prms/remote">
      <ns1:messageDrivenJobOut xmlns:ns1="http://xml.spss.com/prms">
        <ns1:messageDrivenJob uuid="0a0a4a351989557000000114a76f97678181" enabled="true"
          label="LATEST" messageText="My Text"/>
      </ns1:messageDrivenJobOut>
    </createMessageDrivenJobResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

---

## The createSchedule operation

Creates a new schedule in the system for a designated job.

### Input fields

The following table lists the input fields for the createSchedule operation.

Table 9. Fields for createSchedule.

Field	Type/Valid Values	Description
jobLocationURI	string	URI of the job associated with the schedule.
scheduleIn	scheduleSpecifier	Schedule parameters.

## Return information

The following table identifies the information returned by the createSchedule operation.

Table 10. Return Value.

Type	Description
scheduleSpecifier	Details of a schedule.

## Java example

Schedule creation requires the following two pieces of information:

- A string corresponding to the URI of the job associated with the schedule
- A ScheduleSpecifier object defining the parameters of the schedule

Typically, creating a schedule involves the following steps:

1. Create a Schedule object corresponding to the recurrence pattern. Available Schedule objects include OnceSchedule, HourlySchedule, DailySchedule, WeeklySchedule, MonthlySchedule, and YearlySchedule.
2. Supply the setScheduleEnabled method with a boolean indicating whether or not the schedule is enabled.
3. Define the label for the job version associated with the schedule using the setScheduledLabel method.
4. Set the recurrence interval using the setInterval method.
5. Specify the initial date and time for the schedule using the setStartDateTime method.
6. Specify the time of day the job should run using the setTimeOfDay method.
7. Create a ScheduleSpecifier object using the schedule object.
8. Define a string indicating the URI for the job.
9. Supply the ScheduleSpecifier object and the URI string to the createSchedule operation. The operation returns a ScheduleSpecifier object containing the schedule parameters, including the schedule identifier and the next scheduled date and time for execution.

The following sample creates a weekly schedule for the job *Report* that runs at 1:31PM every Sunday. The seven booleans in the WeeklySchedule constructor correspond to the seven days of the week beginning with Monday. The schedule runs on any day with a value of *true*.

```
WeeklySchedule wSchedule = new WeeklySchedule (false, false, false, false, false, false, true);
wSchedule.setScheduleEnabled(true);
wSchedule.setScheduledLabel("Production");
wSchedule.setInterval(BigInteger.valueOf(1));
Calendar startTime = new Calendar();
startTime.set(2006, 11, 10, 13, 31, 0);
wSchedule.setStartDateTime(startTime);
wSchedule.setTimeOfDay(Time.valueOf("13:31:00"));
ScheduleSpecifier scheduleIn = new ScheduleSpecifier(wSchedule);
```

```
String uri = "spsscr://pes_server:80/Jobs/Report";
ScheduleSpecifier scheduleOut = stub.createSchedule(uri, scheduleIn);
```

## SOAP request example

Client invocation of the createSchedule operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wssc:Security soapenv:mustUnderstand="0"
      xmlns:wssc="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wssc:UsernameToken>
        <wssc:Username xsi:type="xsd:string">validUser</wssc:Username>
        <wssc:Password xsi:type="xsd:string">password</wssc:Password>
      </wssc:UsernameToken>
    </wssc:Security>
  </soapenv:Header>
  <body>
    <createSchedule>
      <uri>spsscr://pes_server:80/Jobs/Report</uri>
      <scheduleIn>
        <wSchedule>
          <recurrencePattern>WEEKLY</recurrencePattern>
          <interval>1</interval>
          <startDateTime>2006-11-10T13:31:00</startDateTime>
          <timeOfDay>13:31:00</timeOfDay>
          <enabled>true</enabled>
          <label>Production</label>
        </wSchedule>
      </scheduleIn>
    </createSchedule>
  </body>
</soapenv:Envelope>
```

```

</wsse:Security>
<ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
</soapenv:Header>
<soapenv:Body>
<createSchedule xmlns="http://xml.spss.com/prms/remote">
<jobLocationURI>spsscr://pes_server:80/Jobs/Report</jobLocationURI>
<scheduleIn xmlns="http://xml.spss.com/prms">
<schedule scheduleEnabled="true" scheduledLabel="Production" interval="1"
startDateTime="2006-11-10T13:31:31.000-06:00" timeOfDay="13:31:00"
monday="false" tuesday="false" wednesday="false" thursday="false"
friday="false" saturday="false" sunday="true" xsi:type="weeklySchedule"/>
</scheduleIn>
</createSchedule>
</soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a createSchedule operation call by sending a SOAP response message containing the results. An example of such a message follows.

```

<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>
<createScheduleResponse xmlns="http://xml.spss.com/prms/remote">
<ns1:scheduleOut xsi:type="scheduleSpecifier" xmlns:ns1="http://xml.spss.com/prms">
<ns1:schedule uuid="0a0a4a35781b73930000010ed217fdaa81c1"
nextScheduledDateTime="2006-11-13T13:31:00.000-06:00" scheduleEnabled="true"
scheduledLabel="Production" interval="1" startDateTime="2006-11-10T13:31:31.000-06:00"
timeOfDay="13:31:00" monday="false" tuesday="false" wednesday="false" thursday="false"
friday="false" saturday="false" sunday="true" xsi:type="weeklySchedule"/>
</ns1:scheduleOut>
</createScheduleResponse>
</soapenv:Body>
</soapenv:Envelope>

```

---

## The deleteJobExecutions operation

Deletes one or more job executions from the repository.

### Input fields

The following table lists the input fields for the deleteJobExecutions operation.

*Table 11. Fields for deleteJobExecutions.*

Field	Type/Valid Values	Description
jobExecutionIDs	string[]	Execution IDs of the jobs to delete.

### Java example

To delete the executions of a job, supply the deleteJobExecutions operation with an array of strings corresponding to the identifiers for the job executions to delete.

```

String [] executionID = new String[1];
executionID[0] = "0a0a4aac011937790000010d415272aa8ab4";
stub.deleteJobExecutions(executionID);

```

### SOAP request example

Client invocation of the deleteJobExecutions operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```

<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:Header>
<wsse:Security soapenv:mustUnderstand="0"
xmlns:wss="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">

```

```

    <wsse:UsernameToken>
      <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
      <wsse:Password xsi:type="xsd:string">password</wsse:Password>
    </wsse:UsernameToken>
  </wsse:Security>
  <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
    xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
</soapenv:Header>
<soapenv:Body>
  <deleteJobExecutions xmlns="http://xml.spss.com/prms/remote">
    <jobExecutionIDs>0a0a4aac011937790000010d415272aa8ab4</jobExecutionIDs>
  </deleteJobExecutions>
</soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a deleteJobExecutions operation call by sending a SOAP response message containing the results. An example of such a message follows.

```

<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>
    <deleteJobExecutionsResponse xmlns="http://xml.spss.com/prms/remote"/>
  </soapenv:Body>
</soapenv:Envelope>

```

---

## The deleteJobTrigger operation

Deletes a message-based job trigger from the repository.

### Input fields

The following table lists the input fields for the deleteJobTrigger operation.

*Table 12. Fields for deleteJobTrigger.*

Field	Type/Valid Values	Description
objectID	string	Identifier for a schedule or messageDrivenJob to be deleted.

### Java example

To remove a job trigger from the system, supply the deleteJobTrigger operation with a string corresponding to the identifier for the trigger to delete.

```

String objectID = new String();
objectID = "0A0A4A3519BC8C6900000114D228EF1F8039";
stub.deleteJobTrigger(objectID);

```

### SOAP request example

Client invocation of the deleteJobTrigger operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```

<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>

```

```

    <deleteJobTrigger xmlns="http://xml.spss.com/prms/remote">
      <objectID>0A0A4A3519BC8C6900000114D228EF1F8039</objectID>
    </deleteJobTrigger>
  </soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a deleteJobTrigger operation call by sending a SOAP response message containing the results. An example of such a message follows.

```

<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>
    <deleteJobTriggerResponse xmlns="http://xml.spss.com/prms/remote"/>
  </soapenv:Body>
</soapenv:Envelope>

```

## The deleteJobTriggers operation

Deletes one or more message-based job triggers from the repository.

### Input fields

The following table lists the input fields for the deleteJobTriggers operation.

Table 13. Fields for deleteJobTriggers.

Field	Type/Valid Values	Description
objectID	string[]	Identifiers for the schedules or messageDrivenJobs to be deleted.

### Java example

To delete multiple job triggers, supply the deleteJobTriggers operation with array of strings corresponding to the identifiers for the triggers to delete.

```

String [] objectID = new String[2];
objectID[0] = "0A0A4A3578F9BA1100000114D5CED52780C4";
objectID[1] = "0A0A4A3578F9BA1100000114D5CED52780CC";
stub.deleteJobTriggers(objectID);

```

### SOAP request example

Client invocation of the deleteJobTriggers operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```

<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <deleteJobTriggers xmlns="http://xml.spss.com/prms/remote">
      <objectID>0A0A4A3578F9BA1100000114D5CED52780C4</objectID>
      <objectID>0A0A4A3578F9BA1100000114D5CED52780CC</objectID>
    </deleteJobTriggers>
  </soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a deleteJobTriggers operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <deleteJobTriggersResponse xmlns="http://xml.spss.com/prms/remote"/>
  </soapenv:Body>
</soapenv:Envelope>
```

---

## The deleteSchedule operation

Deletes a schedule from the repository.

### Input fields

The following table lists the input fields for the deleteSchedule operation.

Table 14. Fields for deleteSchedule.

Field	Type/Valid Values	Description
scheduleID	string	Identifier for a schedule to be deleted.

### Return information

The following table identifies the information returned by the deleteSchedule operation.

Table 15. Return Value.

Type	Description
string	

### Java example

To remove a schedule from the system, supply the deleteSchedule operation with a string corresponding to the identifier for the schedule to delete.

```
String [] scheduleID = new String[1];
scheduleID[0] = "ac140fd900072ffb0000010cak390g73uvm30";
stub.deleteSchedule(scheduleID);
```

### SOAP request example

Client invocation of the deleteSchedule operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <deleteSchedule xmlns="http://xml.spss.com/prms/remote">
```

```

        <scheduleID>ac140fd900072ffb0000010cak390g73uvm30</scheduleID>
    </deleteSchedule>
</soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a deleteSchedule operation call by sending a SOAP response message containing the results. An example of such a message follows.

```

<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>
    <deleteScheduleResponse xmlns="http://xml.spss.com/prms/remote"/>
  </soapenv:Body>
</soapenv:Envelope>

```

---

## The deleteSchedules operation

Deletes one or more schedules from the repository.

### Input fields

The following table lists the input fields for the deleteSchedules operation.

Table 16. Fields for deleteSchedules.

Field	Type/Valid Values	Description
scheduleID	string[]	Identifiers for the schedules to be deleted.

### Java example

To delete multiple schedules, supply the deleteSchedules operation with array of strings corresponding to the identifiers for the schedules to delete.

```

String [] scheduleID = new String[2];
scheduleID[0] = "ac140fd900072ffb0000010cak390g73uvm30";
scheduleID[1] = "bc740fd925072fgb0005518cei30c8700vng";
stub.deleteSchedules(scheduleID);

```

### SOAP request example

Client invocation of the deleteSchedules operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```

<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <deleteSchedules xmlns="http://xml.spss.com/prms/remote">
      <scheduleID>ac140fd900072ffb0000010cak390g73uvm30</scheduleID>
      <scheduleID>bc740fd925072fgb0005518cei30c8700vng</scheduleID>
    </deleteSchedules>
  </soapenv:Body>
</soapenv:Envelope>

```

---

## The finalizeRemoteWork operation

### Input fields

The following table lists the input fields for the finalizeRemoteWork operation.

Table 17. Fields for finalizeRemoteWork.

Field	Type/Valid Values	Description
remoteWorkCompletion	remoteWorkCompletion	Used internally.

---

## The getCustomEventTypes operation

Returns all custom event types in the system.

### Return information

The following table identifies the information returned by the getCustomEventTypes operation.

Table 18. Return Value.

Type	Description
string[]	List of the customEvent types allowed in the system.

### Java example

The following function checks whether or not a specified custom event type is supported. Using the service stub, the getCustomEventTypes operation returns an array of strings corresponding to the valid custom event types, from which a HashSet is created. If the specified custom type is in the set, the function returns *true*.

```
public boolean isSupportedCustomType(String customType)
    throws RemoteException, IOException, ServiceException {
    if (i_supportedCustomTypes == null) {
        String[] supportedTypes = stub.getCustomEventTypes();
        i_supportedCustomTypes = new HashSet(Arrays.asList(supportedTypes));
    }
    return i_supportedCustomTypes.contains(customType);
}
```

### SOAP request example

Client invocation of the getCustomEventTypes operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <getCustomEventTypes xmlns="http://xml.spss.com/prms/remote"/>
  </soapenv:Body>
</soapenv:Envelope>
```



## SOAP response example

The server responds to a `getCustomEventTypes` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <getCustomEventTypesResponse xmlns="http://xml.spss.com/prms/remote">
      <customEventType>ProcessManagement.MessageDrivenJobstep</customEventType>
    </getCustomEventTypesResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

---

## The `getExecutionDetails` operation

Retrieves the metadata and results for a specified execution.

### Input fields

The following table lists the input fields for the `getExecutionDetails` operation.

Table 19. Fields for `getExecutionDetails`.

Field	Type/Valid Values	Description
<code>executionID</code>	string	The execution ID of a job, job step, or job iteration.
<code>deliveryType</code>	<code>deliveryType</code>	The format for delivering the log file for the execution. Valid values include: MIME (Multipurpose Internet Mail Extensions), DIME (Direct Internet Message Encapsulation), STRING, and NONE.

### Return information

The following table identifies the information returned by the `getExecutionDetails` operation.

Table 20. Return Value.

Type	Description
<code>executionDetails</code>	Records the execution instance of a Event. Every time an Event is executed, a new <code>EventExecution</code> is created in the repository.

### Java example

Use the `getExecutionDetails` operation to return an `executionDetails` object containing information about an execution. Supply the operation with the ID for the execution and the format for log file delivery.

Accessor methods for the `executionDetails` object provide specific pieces of information for the execution. For example, the `getEventName` method returns the event name. Moreover, the `getStartDateTime` and `getEndDateTime` methods return the start and end times. The `getExecutionSuccess` and `getExecutionState` methods provide details about the success or failure of the execution.

```
String uri =
  "spsscr://pes_server:80/?id=0a0a4aac011937790000010d415272aa824a#m.1:2006-08-24%2013:16:21.069";
String executionID = stub.submitJob(uri, true);
ExecutionDetails exDetails = stub.getExecutionDetails(executionID, DeliveryType.STRING);
System.out.println("Event name: " + exDetails.getEventName());
```

```

Calendar start = exDetails.getStartDateTime();
System.out.println("Start time: " + start.getTime());
Calendar end = exDetails.getEndDateTime();
System.out.println("End time: " + end.getTime());
if (exDetails.getExecutionSuccess()) {
    System.out.println("Event succeeded.");
} else {
    System.out.println("Event failed.");
}
EventExecutionState state = exDetails.getExecutionState();
System.out.println("Execution state: " + state.toString());

```

## SOAP request example

Client invocation of the `getExecutionDetails` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```

<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <getExecutionDetails xmlns="http://xml.spss.com/prms/remote">
      <jobExecutionID>0a0a4aac011937790000010d415272aa8ab4</jobExecutionID>
      <deliveryType xmlns="http://xml.spss.com/prms">STRING</deliveryType>
    </getExecutionDetails>
  </soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a `getExecutionDetails` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```

<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>
    <getExecutionDetailsResponse xmlns="http://xml.spss.com/prms/remote">
      <ns1:executionDetails uuid="0a0a4aac011937790000010d415272aa8ab4"
        executionState="ended" queuedDateTime="2006-08-25T10:01:15.780-05:00"
        startDateTime="2006-08-25T10:01:16.157-05:00"
        endDateTime="2006-08-25T10:02:04.047-05:00" completionCode="0"
        executionSuccess="true" eventUuid="0a0a4aac011937790000010d415272aa836a"
        eventName="testSPSS" notificationEnabled="true"
        xmlns:ns1="http://xml.spss.com/prms"/>
    </getExecutionDetailsResponse>
  </soapenv:Body>
</soapenv:Envelope>

```

---

## The `getJobParameters` operation

Retrieves the variable definitions for a specified job.

### Input fields

The following table lists the input fields for the `getJobParameters` operation.

*Table 21. Fields for `getJobParameters`.*

Field	Type/Valid Values	Description
jobLocationURI	string	URI for a job.

## Return information

The following table identifies the information returned by the `getJobParameters` operation.

Table 22. Return Value.

Type	Description
jobParameters	The parameters for this job

## Java example

To access the variable definitions for a job, supply the `getJobParameters` operation with a string denoting the uniform resource identifier for the job. The operation returns an array of `JobParameter` objects containing the characteristics for each job variable. Use the `getName`, `getDescription`, and `getDefault` methods to extract specific settings.

```
String uri = "spssc:///Jobs/My%20Job#m.4:2009-03-17%2008:53:42.482";
JobParameter[] parameterArray = stub.getJobParameters(uri);

System.out.println("PARAMETER NAME\tDESCRIPTION\tDEFAULT\n");
for (int i = 0; i < parameterArray.length; i++) {
    System.out.println(parameterArray[i].getName() + "\t" +
        parameterArray[i].getDescription() + "\t" +
        parameterArray[i].getDefault());
}
```

## SOAP request example

Client invocation of the `getJobParameters` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <getJobParameters xmlns="http://xml.spss.com/prms/remote">
      <jobLocationURI>SPSSCR:///Jobs/My%20Job#m.4:2009-03-17%2008:53:42.482</jobLocationURI>
    </getJobParameters>
  </soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a `getJobParameters` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <getJobParametersResponse xmlns="http://xml.spss.com/prms/remote">
      <parms>
        <parameter name="command" default="dir" description="Command to run"
          xmlns="http://xml.spss.com/prms"/>
        <parameter name="options" default="c:" description="Options for the command"
          xmlns="http://xml.spss.com/prms"/>
      </parms>
    </getJobParametersResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

---

## The getJobStepChildExecutions operation

Retrieves the metadata and results for the executions resulting from job iterations. Job step execution IDs used as input to this operation can be obtained from the execution details returned by the getJobStepExecutions operation.

### Input fields

The following table lists the input fields for the getJobStepChildExecutions operation.

Table 23. Fields for getJobStepChildExecutions.

Field	Type/Valid Values	Description
jobStepExecutionID	string	The execution ID of a job step.
deliveryType	deliveryType	The format for delivering the log file for the execution. Valid values include: MIME (Multipurpose Internet Mail Extensions), DIME (Direct Internet Message Encapsulation), STRING, and NONE.

### Return information

The following table identifies the information returned by the getJobStepChildExecutions operation.

Table 24. Return Value.

Type	Description
jobStepChildExecutions	The event executions for the children of the job step.

### Java example

Use the getJobStepChildExecutions operation to return a JobStepChildExecutions object from which an array of ExecutionDetails objects containing information about child executions for job steps can be obtained. Supply the operation with the ID for the job step execution and the format for log file delivery.

Accessor methods for the ExecutionDetails objects provide specific pieces of information for the step executions. For example, the getEventName method returns the event name. Moreover, the getStartDateTime and getEndDateTime methods return the start and end times. The getExecutionSuccess and getExecutionState methods provide details about the success or failure of the step execution.

```
String stepExeID = new String();
stepExeID = "0a0a4a357ce2d48300000110597d9efb80db";
JobStepChildExecutions childExecutions = stub.getJobStepChildExecutions(stepExeID);
ExecutionDetails[] exDetails = childExecutions.getIterations();
for (int j = 0; j < exDetails.length; j++) {
    System.out.println("Event name: " + exDetails[j].getEventName());
    Calendar start = exDetails[j].getStartDateTime();
    System.out.println("Start time: " + start.getTime());
    Calendar end = exDetails[j].getEndDateTime();
    System.out.println("End time: " + end.getTime());
    if (exDetails[j].getExecutionSuccess()) {
        System.out.println("Event succeeded.");
    } else {
        System.out.println("Event failed.");
    }
}
EventExecutionState state = exDetails[j].getExecutionState();
System.out.println("Execution state: " + state.toString());
}
```

## SOAP request example

Client invocation of the `getJobStepChildExecutions` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <getJobStepChildExecutions xmlns="http://xml.spss.com/prms/remote">
      <jobStepExecutionID>0a0a4a357ce2d48300000110597d9efb80db</jobStepExecutionID>
      <deliveryType xmlns="http://xml.spss.com/prms">STRING</deliveryType>
    </getJobStepChildExecutions>
  </soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a `getJobStepChildExecutions` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <getJobStepChildExecutionsResponse xmlns="http://xml.spss.com/prms/remote">
      <ns1:jobStepChildExecutions xmlns:ns1="http://xml.spss.com/prms">
        <ns1:iterations uuid="0a0a4a357ce2d48300000110597d9efb80dc" executionState="ended"
          queuedDateTime="2007-01-25T08:45:46.390-06:00"
          startDateTime="2007-01-25T08:45:46.467-06:00" endDateTime="2007-01-25T08:45:53.110-06:00"
          completionCode="0" executionSuccess="true"
          eventUuid="0a0a4a355a576f48000001104fe9b57482b4" eventName="iterStep2.rptdesign_step"
          notificationEnabled="true" executionWarning="false" hasIterations="false">
          <ns1:artifactLocation>
            spsscr://pes_server:80/?id=0a0a4a355a576f48000001104fe9b5748049#m.2:2007-01-25%2008:45:50.148
          </ns1:artifactLocation>
        </ns1:iterations>
        <ns1:iterations uuid="0a0a4a357ce2d48300000110597d9efb80dd" executionState="ended"
          queuedDateTime="2007-01-25T08:45:46.403-06:00"
          startDateTime="2007-01-25T08:45:46.467-06:00" endDateTime="2007-01-25T08:45:52.937-06:00"
          completionCode="0" executionSuccess="true"
          eventUuid="0a0a4a355a576f48000001104fe9b57482b4" eventName="iterStep2.rptdesign_step"
          notificationEnabled="true" executionWarning="false" hasIterations="false">
          <ns1:artifactLocation>
            spsscr://pes_server:80/?id=0a0a4a355a576f48000001104fe9b5748048#m.3:2007-01-25%2008:45:50.023
          </ns1:artifactLocation>
        </ns1:iterations>
      </ns1:jobStepChildExecutions>
    </getJobStepChildExecutionsResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

---

## The `getJobStepExecutions` operation

Retrieves the metadata and results for the executions resulting from each step of a job.

## Input fields

The following table lists the input fields for the `getJobStepExecutions` operation.

Table 25. Fields for `getJobStepExecutions`.

Field	Type/Valid Values	Description
<code>jobExecutionID</code>	string	The execution ID of a job.
<code>deliveryType</code>	<code>deliveryType</code>	The format for delivering the log file for the execution. Valid values include: MIME (Multipurpose Internet Mail Extensions), DIME (Direct Internet Message Encapsulation), STRING, and NONE.

## Return information

The following table identifies the information returned by the `getJobStepExecutions` operation.

Table 26. Return Value.

Type	Description
<code>executionDetails[]</code>	Records the execution instance of a Event. Every time an Event is executed, a new <code>EventExecution</code> is created in the repository.

## Java example

Use the `getJobStepExecutions` operation to return an array of `executionDetails` objects containing information about executions for job steps. Supply the operation with the ID for the job execution and the format for log file delivery.

Accessor methods for the `executionDetails` objects provide specific pieces of information for the step executions. For example, the `getEventName` method returns the event name. Moreover, the `getStartDateTime` and `getEndDateTime` methods return the start and end times. The `getExecutionSuccess` and `getExecutionState` methods provide details about the success or failure of the step execution.

```
String [] executionID = new String[1];
executionID[0] = "0a0a4aac011937790000010d415272aa8ab4";
ExecutionDetails[] exDetails = stub.getJobStepExecutions(executionID);
for (int j = 0; j < exDetails.length; j++) {
    System.out.println("Event name: " + exDetails[j].getEventName());
    Calendar start = exDetails[j].getStartDateTime();
    System.out.println("Start time: " + start.getTime());
    Calendar end = exDetails[j].getEndDateTime();
    System.out.println("End time: " + end.getTime());
    if (exDetails[j].getExecutionSuccess()) {
        System.out.println("Event succeeded.");
    } else {
        System.out.println("Event failed.");
    }
    EventExecutionState state = exDetails[j].getExecutionState();
    System.out.println("Execution state: " + state.toString());
}
```

## SOAP request example

Client invocation of the `getJobStepExecutions` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
```

```

<wsse:Security soapenv:mustUnderstand="0"
  xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
  <wsse:UsernameToken>
    <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
    <wsse:Password xsi:type="xsd:string">password</wsse:Password>
  </wsse:UsernameToken>
</wsse:Security>
<ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
  xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
</soapenv:Header>
<soapenv:Body>
  <getJobStepExecutions xmlns="http://xml.spss.com/prms/remote">
    <jobExecutionID>0a0a4aac011937790000010d415272aa8ab4</jobExecutionID>
    <deliveryType xmlns="http://xml.spss.com/prms">STRING</deliveryType>
  </getJobStepExecutions>
</soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a `getJobStepExecutions` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```

<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>
    <getJobStepExecutionsResponse xmlns="http://xml.spss.com/prms/remote">
      <ns1:executionDetails uuid="0a0a4aac011937790000010d415272aa8ab5"
        executionState="ended" queuedDateTime="2006-08-25T10:01:15.877-05:00"
        startDateTime="2006-08-25T10:01:17.593-05:00"
        endDateTime="2006-08-25T10:02:02.813-05:00" completionCode="0"
        executionSuccess="true" eventId="0a0a4aac011937790000010d415272aa836c"
        eventName="tree_model.sps_step" notificationEnabled="true"
        xmlns:ns1="http://xml.spss.com/prms">
        <ns1:artifactLocation>
          spsscr://pes_server:80/?id=0a0a4aac011937790000010d415272aa848e#m.4:2006-08-25%2010:02:02.468
        </ns1:artifactLocation>
        <ns1:log>
          <ns1:logAsString>--- PRMS ---
          spssb -f syntax.sps -type html -out &quot;tree_model.html&quot; -LC_ALL en_US -language en
          The process terminated with the exit code 0.
          Adding artifact spsscr:/Jobs/tree_model.zip.
          --- STDOUT ---
          --- STDERR ---
        </ns1:logAsString>
        </ns1:log>
      </ns1:executionDetails>
    </getJobStepExecutionsResponse>
  </soapenv:Body>
</soapenv:Envelope>

```

---

## The `getMessageDrivenJob` operation

Returns information about the message-driven job corresponding to a specified identifier.

### Input fields

The following table lists the input fields for the `getMessageDrivenJob` operation.

*Table 27. Fields for `getMessageDrivenJob`.*

Field	Type/Valid Values	Description
<code>messageDrivenJobID</code>	string	Identifier for a <code>messageDrivenJob</code> .

## Return information

The following table identifies the information returned by the `getMessageDrivenJob` operation.

Table 28. Return Value.

Type	Description
<code>messageDrivenJobSpecifier</code>	Details of a Message Drive Job Schedule.

## Java example

To retrieve a message driven job from the system, supply the `getMessageDrivenJob` operation with a string corresponding to the identifier for the job. The operation returns a `MessageDrivenJobSpecifier` object, from which specific details relating to the job can be accessed.

The following sample uses the `getMessageDrivenJob` method to return the `MessageDrivenJob` object from the `MessageDrivenJobSpecifier`. The `getLabel` method returns the label for the job. If the message driven job is enabled, as determined by the `getEnabled` method, the `getCredentialID` and `getMessageText` methods return the associated credentials identifier and filter text.

```
String [] mdJobID = new String[1];
mdJobID[0] = "0a0a4a351989557000000114a76f97678181";
MessageDrivenJobSpecifier mdJobSpec = stub.getMessageDrivenJob(mdJobID);
MessageDrivenJob mdJob = mdJobSpec.getMessageDrivenJob();
System.out.println("Message driven job label: " + mdJob.getLabel());
if (mdJob.getEnabled()) {
    System.out.println("Credentials: " + mdJob.getCredentialID());
    System.out.println("Message text: " + mdJob.getMessageText());
}
System.out.println("Reserved: " + mdJobSpec.getReserved());
```

## SOAP request example

Client invocation of the `getMessageDrivenJob` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <getMessageDrivenJob xmlns="http://xml.spss.com/prms/remote">
      <messageDrivenJobID>0a0a4a351989557000000114a76f97678181</messageDrivenJobID>
    </getMessageDrivenJob>
  </soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a `getMessageDrivenJob` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <getMessageDrivenJobResponse xmlns="http://xml.spss.com/prms/remote">
      <ns1:messageDrivenJobOut xmlns:ns1="http://xml.spss.com/prms">
        <ns1:messageDrivenJob uuid="0a0a4a351989557000000114a76f97678181" enabled="true"
          label="LATEST" credentialID="0a0a4a356f526f1d0000011450a1669680af" messageText="My Text"/>
      </ns1:messageDrivenJobOut>
    </getMessageDrivenJobResponse>
  </soapenv:Body>
</soapenv:Envelope>
```



```
</ns1:messageDrivenJobOut>
</getMessageDrivenJobResponse>
</soapenv:Body>
</soapenv:Envelope>
```

---

## The getMessageDrivenJobs operation

Returns information about the message-based schedules for a specified job.

### Input fields

The following table lists the input fields for the getMessageDrivenJobs operation.

Table 29. Fields for getMessageDrivenJobs.

Field	Type/Valid Values	Description
jobLocationURI	string	URI for a job.

### Return information

The following table identifies the information returned by the getMessageDrivenJobs operation.

Table 30. Return Value.

Type	Description
messageDrivenJobList	A list of messageDrivenJobs.

---

## The getSchedule operation

Returns information about the schedule corresponding to a specified identifier.

### Input fields

The following table lists the input fields for the getSchedule operation.

Table 31. Fields for getSchedule.

Field	Type/Valid Values	Description
scheduleID	string	Identifier for a schedule.

### Return information

The following table identifies the information returned by the getSchedule operation.

Table 32. Return Value.

Type	Description
scheduleSpecifier	Details of a schedule.

### Java example

To retrieve a schedule from the system, supply the getSchedule operation with a string corresponding to the identifier for the schedule. The operation returns a ScheduleSpecifier object, from which specific details relating to the schedule can be accessed.

The following sample uses the `getSchedule` method to return the `Schedule` object from the `ScheduleSpecifier`. The `getScheduledLabel` method returns the label for the schedule. If the schedule is enabled, as determined by the `getScheduleEnabled` method, the `getNextScheduledDateTime` method returns the next scheduled execution time as a `Calendar` object.

```
String [] scheduleID = new String[1];
scheduleID[0] = "ac140fd900072ffb0000010cak390g73uvm30";
ScheduleSpecifier scheduleSpec = stub.getSchedule(scheduleID);
Schedule sched = scheduleSpec.getSchedule()
System.out.println("Schedule label: " + sched.getScheduledLabel());
if (sched.getScheduleEnabled()) {
    Calendar nextTime = sched.getNextScheduledDateTime();
    System.out.println("Next execution time: " + nextTime.getTime());
}
System.out.println("Reserved: " + scheduleSpec.getReserved());
```

## SOAP request example

Client invocation of the `getSchedule` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <getSchedule xmlns="http://xml.spss.com/prms/remote">
      <scheduleID>0a0a4a35781b73930000010ed217fdaa8173</scheduleID>
    </getSchedule>
  </soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a `getSchedule` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <getScheduleResponse xmlns="http://xml.spss.com/prms/remote">
      <ns1:scheduleOut xsi:type="scheduleSpecifier" xmlns:ns1="http://xml.spss.com/prms">
        <ns1:schedule uuid="0a0a4a35781b73930000010ed217fdaa8173"
          nextScheduledDateTime="2006-11-13T13:31:00.000-06:00" scheduleEnabled="true"
          scheduledLabel="LATEST" interval="1" startDateTime="2006-11-10T13:31:31.000-06:00"
          timeOfDay="13:31:00" monday="true" tuesday="false" wednesday="false" thursday="false"
          friday="false" saturday="false" sunday="false" xsi:type="weeklySchedule"/>
      </ns1:scheduleOut>
    </getScheduleResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

---

## The `getSchedules` operation

Retrieves all schedules associated with a specified job.

## Input fields

The following table lists the input fields for the `getSchedules` operation.

Table 33. Fields for `getSchedules`.

Field	Type/Valid Values	Description
<code>jobLocationURI</code>	string	URI for a job.

## Return information

The following table identifies the information returned by the `getSchedules` operation.

Table 34. Return Value.

Type	Description
<code>scheduleList</code>	A list of schedules.

## Java example

To retrieve all schedules associated with a job, supply the `getSchedules` operation with the URI for the job. Use the `getSchedule` method for the returned `ScheduleList` object to access individual schedules.

The following sample loops over all schedules associated with a job, reporting the next scheduled execution time for each. The `getScheduledLabel` method returns the label for a schedule. If a schedule is enabled, as determined by the `getScheduleEnabled` method, the `getNextScheduledDateTime` method returns the next scheduled execution time as a `Calendar` object.

```
String uri =
    "spsscr://localhost/?id=ac140fd900072ffb0000010c5f86c39b84f7#m.2:2006-07-12%2008:20:14.625";
ScheduleList schedList = stub.getSchedules(uri);
System.out.println("Reserved: " + schedList.getReserved());
Schedule[] schedArray = schedList.getSchedule();
for (int j = 0; j < schedArray.length; j++) {
    System.out.println("Schedule label: " + schedArray[j].getScheduledLabel());
    if (schedArray[j].getScheduleEnabled()) {
        Calendar nextTime = schedArray[j].getNextScheduledDateTime();
        System.out.println("Next execution time: " + nextTime.getTime());
    }
}
```

## SOAP request example

Client invocation of the `getSchedules` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">admin</wsse:Username>
        <wsse:Password xsi:type="xsd:string">spss</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <getSchedules xmlns="http://xml.spss.com/prms/remote">
      <jobLocationURI>spsscr://pes_server:80/Jobs/Analysis</jobLocationURI>
    </getSchedules>
  </soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a `getSchedules` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <getSchedulesResponse xmlns="http://xml.spss.com/prms/remote">
      <ns1:scheduleList xmlns:ns1="http://xml.spss.com/prms">
        <ns1:schedule uuid="0a0a4a35781b7393000010ed217fdaa8173"
          nextScheduledDateTime="2006-11-13T13:31:00.000-06:00" scheduleEnabled="true"
          scheduledLabel="LATEST" interval="1" startDateTime="2006-11-10T13:31:31.000-06:00"
          timeOfDay="13:31:00" monday="true" tuesday="false" wednesday="false" thursday="false"
          friday="false" saturday="false" sunday="false" xsi:type="weeklySchedule"/>
        <ns1:schedule uuid="0a0a4a35781b7393000010ed217fdaa8175"
          nextScheduledDateTime="2006-12-01T13:31:00.000-06:00" scheduleEnabled="true"
          scheduledLabel="LATEST" interval="1" startDateTime="2006-11-10T13:31:49.000-06:00"
          timeOfDay="13:31:00" dayOfMonth="1" xsi:type="monthlySchedule"/>
      </ns1:scheduleList>
    </getSchedulesResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

---

## The `getVersion` operation

Returns the version number of the service.

### Return information

The following table identifies the information returned by the `getVersion` operation.

*Table 35. Return Value.*

Type	Description
string	The version number of the web service.

## Java example

To access the version number of the service, call the `getVersion` operation from the service stub.

```
System.out.println("Service Version = " + stub.getVersion());
```

## SOAP request example

Client invocation of the `getVersion` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <getVersion xmlns="http://xml.spss.com/prms/remote"/>
  </soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a `getVersion` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <getVersionResponse xmlns="http://xml.spss.com/prms/remote">
      <version>4.20.000</version>
    </getVersionResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

---

## The `getWorkTypes` operation

Retrieves a list of the types of work that can be included in an event cluster. Examples of work types include:

- IBM SPSS Modeler streams
- IBM SPSS Statistics syntax
- SAS syntax

## Return information

The following table identifies the information returned by the `getWorkTypes` operation.

Table 36. Return Value.

Type	Description
string[]	List of the work types allowed in the system.

## Java example

The following function checks whether or not a specified work type is supported. Using the service stub, the `getWorkTypes` operation returns an array of strings corresponding to the valid work types, from which a `HashSet` is created. If the specified work type is in the set, the function returns `true`.

```
public boolean isSupportedWorkType(String workType)
  throws RemoteException, IOException, ServiceException {
  if (i_supportedWorkTypes == null) {
    String[] supportedTypes = stub.getWorkTypes();
    i_supportedWorkTypes = new HashSet(Arrays.asList(supportedTypes));
  }
  return i_supportedWorkTypes.contains(workType);
}
```

## SOAP request example

Client invocation of the `getWorkTypes` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
```

```

<soapenv:Body>
  <getWorkTypes xmlns="http://xml.spss.com/prms/remote"/>
</soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a `getWorkTypes` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```

<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>
    <getWorkTypesResponse xmlns="http://xml.spss.com/prms/remote">
      <workType>Clementine.ClementineStreamWork</workType>
      <workType>ModelManagement.ExecutableContentWork</workType>
      <workType>ModelManagement.SASSyntaxWork</workType>
      <workType>ProcessManagement.RunJavaClass</workType>
      <workType>ProcessManagement.CleanupExecutions</workType>
      <workType>ProcessManagement.WindowsCommandWork</workType>
      <workType>ModelManagement.SPSSSyntaxWork</workType>
      <workType>Reporting.BIRTRReportWork</workType>
      <workType>Scenario.ScenarioWork</workType>
    </getWorkTypesResponse>
  </soapenv:Body>
</soapenv:Envelope>

```

---

## The `handleMessageDomainChanged` operation

Restarts message listeners for existing subscribers to a message domain, allowing the subscribers to recognize updated message domain settings. If this operation is not used, any existing subscribers will continue to use the previous domain settings.

### Input fields

The following table lists the input fields for the `handleMessageDomainChanged` operation.

*Table 37. Fields for `handleMessageDomainChanged`.*

Field	Type/Valid Values	Description
<code>msgDomainID</code>	string	Identifier for the message Domain that changed.

### Java example

To restart listeners for subscribers, supply the `handleMessageDomainChanged` operation with a string corresponding to the identifier for the message domain that has been modified.

```

String domainID = "0a0a4a3578f9ba1100000114d5ced52780c8";
stub.handleMessageDomainChanged(domainID);

```

### SOAP request example

Client invocation of the `handleMessageDomainChanged` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```

<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>

```

```

</soapenv:Header>
<soapenv:Body>
  <handleMessageDomainChanged xmlns="http://xml.spss.com/prms/remote">
    <msgDomainID xmlns="http://xml.spss.com/prms">
      0a0a4a3578f9ba1100000114d5ced52780c8
    </msgDomainID>
  </handleMessageDomainChanged>
</soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a `handleMessageDomainChanged` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```

<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>
    <handleMessageDomainChangedResponse xmlns="http://xml.spss.com/prms/remote"/>
  </soapenv:Body>
</soapenv:Envelope>

```

## The queryAllSchedules operation

Returns all time-based and message-based schedules in the system meeting specified criteria. The information returned by the operation includes the fields identified in the following table.

Table 38. Return fields.

Field Name	Description
job.objid	Identifier for the job
jobPath	Path and file name for the job
fileversion.marker	Version marker associated with this scheduled job
usesfiledep.label	Version label specified on the schedule
schedule.objid	Identifier of the schedule
messagedriven.objid	Identifier of the message-driven job
trigger.summary	For scheduled jobs, this is the frequency of the schedule (e.g. once, daily, weekly, monthly). For message-driven jobs, this is the message domain.
next.trigger	For scheduled jobs, this is the next time the schedule will run. For message-driven jobs, this is the selector and message text.
lastrun.startDateTime	The <code>queuedDateTime</code> attribute for the last run of the job
lastrun.status	An indicator of the job success and state
credentials.name	Credential name used to run the job

The `trigger.summary` and the `next.trigger` fields will have mixed data (timestamps and strings) if the system includes both time-based and message-based schedules. The client application calling the operation needs to check each type to determine how to handle the information.

## Input fields

The following table lists the input fields for the `queryAllSchedules` operation.

Table 39. Fields for queryAllSchedules.

Field	Type/Valid Values	Description
jobTriggerCriterion	jobTriggerCriterion	Definition of the query parameters.

## Return information

The following table identifies the information returned by the queryAllSchedules operation.

Table 40. Return Value.

Type	Description
pageResult	Results of a search request to the search2.5 mechanism. This may either be an initial search based on any criterion, or a subsequent search for another page.

## Java example

Querying the repository for all schedules typically involves the following steps:

1. Create a JobTriggerCriterion object.
2. Create a ReturnSpecifier object and define the return settings.
3. Create a PageSelector object and define the selector settings.
4. Assign the ReturnSpecifier and PageSelector objects to the JobTriggerCriterion object.
5. Supply the JobTriggerCriterion object to the queryAllSchedules operation.

The following sample retrieves all schedules in the system, sending the returned fields and their values for each schedule to the standard output.

```
JobTriggerCriterion jobTriggerCrit = new JobTriggerCriterion();

ReturnSpecifier retSpec = new ReturnSpecifier();
retSpec.setSortOrder(ReturnSpecifierSortOrder.descending);
BigInteger pSize = new BigInteger("11");
retSpec.setPageSize(pSize);
jobTriggerCrit.setReturnSpecifier(retSpec);

PageSelector pageSel = new PageSelector();
JobTriggerFilter filter = new JobTriggerFilter();
filter.setJobLocationURI("SPSSCR://pes_server/Monthly%20Status");
pageSel.setFilter(filter);
jobTriggerCrit.setPageSelector(pageSel);

PageResult qResult = stub.queryAllSchedules(jobTriggerCrit);
ColumnType[] resultColumn = qResult.getColumn();
Row[] resultRow = qrResult.getRow();
Cell[] resultCell = new Cell[resultColumn.length];
for (int i = 0; i < resultRow.length; i++) {
    System.out.println("Hit " + i);
    resultCell = resultRow[i].getCell();
    for (int j = 0; j < resultCell.length; j++) {
        System.out.println(resultColumn[j].getFieldName() + "=" +
            resultCell[j].getValue().getDisplay());
    }
    System.out.println("\n");
}
```

## SOAP request example

Client invocation of the queryAllSchedules operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:actor="http://schemas.xmlsoap.org/soap/actor/next"
      soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username>validUser</wsse:Username>
        <wsse:Password>password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
  </soapenv:Header>
  <soapenv:Body>
  </soapenv:Body>
</soapenv:Envelope>
```



```

</wsse:Security>
<ns1:client-accept-language soapenv:actor="http://schemas.xmlsoap.org/soap/actor/next"
  soapenv:mustUnderstand="0" xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0,
  en;q=0.8</ns1:client-accept-language>
</soapenv:Header>
<soapenv:Body>
  <queryAllSchedules xmlns="http://xml.spss.com/prms/remote">
    <jobTriggerCriterion xmlns="http://xml.spss.com/prms">
      <returnSpecifier sortOrder="descending" pageSize="14"/>
      <pageSelector>
        <filter xsi:type="jobTriggerFilter">
          <jobLocationURI>SPSSCR://pes_server/Jobs/Results</jobLocationURI>
        </filter>
      </pageSelector>
    </jobTriggerCriterion>
  </queryAllSchedules>
</soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a queryAllSchedules operation call by sending a SOAP response message containing the results. An example of such a message follows.

```

<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>
    <queryAllSchedulesResponse xmlns="http://xml.spss.com/prms/remote">
      <pageResult hitCount="2" pageSize="14" pageNumber="1" clientKey="446cb951:116153f80a6:-7df9"
        sortColumn="job.objid" sortOrder="ascending" xmlns="http://www.spss.com/pes/pager">
        <column display="job.objid" fieldName="job.objid" colType="string"/>
        <column display="jobPath" fieldName="jobPath" colType="string"/>
        <column display="fileversion.marker" fieldName="fileversion.marker" colType="string"/>
        <column display="usesfiledep.label" fieldName="usesfiledep.label" colType="string"/>
        <column display="schedule.objid" fieldName="schedule.objid" colType="string"/>
        <column display="messagedriven.objid" fieldName="messagedriven.objid" colType="string"/>
        <column display="trigger.summary" fieldName="trigger.summary" colType="string"/>
        <column display="next.trigger" fieldName="next.trigger" colType="string"/>
        <column display="lastrun.startDateTime" fieldName="lastrun.startDateTime" colType="stamp"/>
        <column display="lastrun.status" fieldName="lastrun.status" colType="string"/>
        <column display="credentials.name" fieldName="credentials.name" colType="string"/>
        <row rowNumber="1">
          <cell>
            <value>
              <display xmlns="">0A0A4A352DEF32780000115CDABFC0A84EA</display>
            </value>
          </cell>
          <cell><value><display xmlns="">/Jobs/Results</display></value></cell>
          <cell><value><display xmlns="">0:2007-10-23 12:14:01.71</display></value></cell>
          <cell><value><display xmlns="">LATEST</display></value></cell>
          <cell><value><display xmlns=""><rawString xmlns=""></rawString></display></value></cell>
          <cell>
            <value>
              <display xmlns="">0A0A4A35446CB9510000116153F80A681B6</display>
            </value>
          </cell>
          <cell><value><display xmlns="">Trigger</display></value></cell>
          <cell><value><display xmlns=""><rawString xmlns=""></rawString></display></value>
          </cell>
          <cell>
            <value>
              <display xmlns=""><rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
            </value>
          </cell>
          <cell><value><display xmlns="">Not Available</display></value></cell>
          <cell><value><display xmlns="">kk-admin</display></value></cell>
        </row>
        <row rowNumber="2">
          <cell>
            <value>
              <display xmlns="">0A0A4A352DEF32780000115CDABFC0A84EA</display>
            </value>
          </cell>
          <cell><value><display xmlns="">/Jobs/Results</display></value></cell>
          <cell><value><display xmlns="">0:2007-10-23 12:14:01.71</display></value></cell>
          <cell><value><display xmlns="">Test</display></value></cell>
          <cell>
            <value>
              <display xmlns="">0A0A4A35446CB9510000116153F80A681C7</display>
            </value>
          </cell>
        </row>
      </queryAllSchedulesResponse>
    </soapenv:Body>
  </soapenv:Envelope>

```

```

<cell><value><display xmlns=""/><rawString xmlns=""/></value></cell>
<cell><value><display xmlns="">Weekly</display></value></cell>
<cell>
  <value>
    <display xmlns="">2007-11-12T14:48:00-0600</display>
    <rawStamp xmlns="">2007-11-12T14:48:00.000-06:00</rawStamp>
  </value>
</cell>
<cell>
  <value>
    <display xmlns=""/><rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
  </value>
</cell>
<cell><value><display xmlns="">Not Available</display></value></cell>
<cell><value><display xmlns="">kk</display></value></cell>
</row>
<navigator>
  <page display="1" selector="1" current="true" xmlns=""/>
</navigator>
</pageResult>
</queryAllSchedulesResponse> </soapenv:Body>
</soapenv:Envelope>

```

## The queryExecutions operation

Returns all executions in the system meeting specified criteria.

### Input fields

The following table lists the input fields for the queryExecutions operation.

Table 41. Fields for queryExecutions.

Field	Type/Valid Values	Description
executionCriterion	executionCriterion	Definition of the query parameters.

### Return information

The following table identifies the information returned by the queryExecutions operation.

Table 42. Return Value.

Type	Description
pageResult	Results of a search request to the search2.5 mechanism. This may either be an initial search based on any criterion, or a subsequent search for another page.

### Java example

Querying the repository for executions typically involves the following steps:

1. Create an ExecutionCriterion object.
2. Create a ReturnSpecifier object and define the return settings.
3. Create a PageSelector object and define the selector settings.
4. Assign the ReturnSpecifier and PageSelector objects to the ExecutionCriterion object.
5. Supply the ExecutionCriterion object to the queryExecutions operation.

The following sample retrieves all executions in the system, sending the returned fields and their values for each execution to the standard output.

```

ExecutionCriterion execCrit = new ExecutionCriterion();
PageResult qResult = stub.queryExecutions(execCrit);
ColumnType[] resultColumn = qResult.getColumn();
Row[] resultRow = qrResult.getRow();
Cell[] resultCell = new Cell[resultColumn.length];

```

```

for (int i = 0; i < resultRow.length; i++) {
    System.out.println("Hit " + i);
    resultCell = resultRow[i].getCell();
    for (int j = 0; j < resultCell.length; j++) {
        System.out.println(resultColumn[j].getFieldName() + "=" +
            resultCell[j].getValue().getDisplay());
    }
    System.out.println("\n");
}
}

```

## SOAP request example

Client invocation of the queryExecutions operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```

<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:Header>
        <wsse:Security soapenv:mustUnderstand="0"
            xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
            <wsse:UsernameToken>
                <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
                <wsse:Password xsi:type="xsd:string">password</wsse:Password>
            </wsse:UsernameToken>
        </wsse:Security>
        <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
            xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
    </soapenv:Header>
    <soapenv:Body>
        <queryExecutions xmlns="http://xml.spss.com/prms/remote">
            <executionCriterion xmlns="http://xml.spss.com/prms"/>
        </queryExecutions>
    </soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a queryExecutions operation call by sending a SOAP response message containing the results. An example of such a message follows.

```

<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>
        <queryExecutionsResponse xmlns="http://xml.spss.com/prms/remote">
            <ns1:pageResult hitCount="3" pageSize="255" pageNumber="1"
                clientKey="29f5f2b0:10ed2672a37:-7df4" sortColumn="file.objid" sortOrder="ascending"
                xmlns:ns1="http://www.spss.com/pes/pager">
                <ns1:column display="file.objid" fieldName="file.objid" colType="string"/>
                <ns1:column display="file.path" fieldName="file.path" colType="string"/>
                <ns1:column display="fileversion.marker" fieldName="fileversion.marker" colType="string"/>
                <ns1:column display="fileversion.label" fieldName="fileversion.label" colType="string"/>
                <ns1:column display="eventexe.objid" fieldName="eventexe.objid" colType="string"/>
                <ns1:column display="eventexe.state" fieldName="eventexe.state" colType="string"/>
                <ns1:column display="eventexe.completionCode" fieldName="eventexe.completionCode"
                    colType="string"/>
                <ns1:column display="eventexe.startDateTime" fieldName="eventexe.startDateTime"
                    colType="string"/>
                <ns1:column display="eventexe.endDateTime" fieldName="eventexe.endDateTime" colType="string"/>
                <ns1:column display="eventexe.queuedDateTime" fieldName="eventexe.queuedDateTime"
                    colType="string"/>
                <ns1:row rowNumber="1">
                    <ns1:cell>
                        <ns1:value><display xmlns="">0A0B32E0CFC42076000010EC3B57CAF81C3</display>
                            <rawString xmlns=""/></ns1:value>
                    </ns1:cell>
                    <ns1:cell>
                        <ns1:value><display xmlns="">/Sales Data Analysis</display>
                            <rawString xmlns=""/></ns1:value>
                    </ns1:cell>
                    <ns1:cell>
                        <ns1:value><display xmlns="">1:2006-11-10 12:37:08.385</display>
                            <rawString xmlns=""/></ns1:value>
                    </ns1:cell>
                    <ns1:cell><ns1:value><display xmlns=""/><rawString xmlns=""/></ns1:value></ns1:cell>
                    <ns1:cell>
                        <ns1:value><display xmlns="">0A0B32E029F5F2B0000010ED2672A37814D</display>
                            <rawString xmlns=""/></ns1:value>
                    </ns1:cell>
                </ns1:row>
            </ns1:pageResult>
        </queryExecutionsResponse>
    </soapenv:Body>
</soapenv:Envelope>

```

```

<ns1:cell>
  <ns1:value><display xmlns="">4</display><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns="">2</display><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns="">2006-11-10 12:37:16.927</display>
  <rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns="">2006-11-10 12:40:55.007</display>
  <rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns="">2006-11-10 12:37:16.44</display>
  <rawString xmlns=""/></ns1:value>
</ns1:cell>
</ns1:row>
<ns1:row rowNumber="2">
  <ns1:cell>
    <ns1:value><display xmlns="">0A0B32E0CFC420760000010EC3B57CAF81C3</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">/Sales Data Analysis</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">2:2006-11-10 13:11:04.257</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell><ns1:value><display xmlns=""/><rawString xmlns=""/></ns1:value></ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0A0B32E029F5F2B00000010ED2672A3781A3</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">4</display><rawString xmlns=""/>
    </ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">2</display><rawString xmlns=""/>
    </ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">2006-11-10 13:11:09.947</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">2006-11-10 13:13:46.707</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">2006-11-10 13:11:09.853</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
</ns1:row>
<ns1:row rowNumber="3">
  <ns1:cell>
    <ns1:value><display xmlns="">0A0B32E0CFC420760000010EC3B57CAF81C3</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">/Sales Data Analysis</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">3:2006-11-10 13:17:44.698</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">LATEST</display><rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0A0B32E029F5F2B00000010ED2672A3781F5</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">4</display><rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">2</display><rawString xmlns=""/></ns1:value>
  </ns1:cell>

```

```

<ns1:cell>
  <ns1:value><display xmlns="">2006-11-10 13:17:51.463</display>
  <rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns="">2006-11-10 13:21:19.277</display>
  <rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns="">2006-11-10 13:17:51.37</display>
  <rawString xmlns=""/></ns1:value>
</ns1:cell>
</ns1:row>
<ns1:navigator>
  <page display="1" selector="1" current="true" xmlns=""/>
</ns1:navigator>
</ns1:pageResult>
</queryExecutionsResponse>
</soapenv:Body>
</soapenv:Envelope>

```

---

## The queryJobTriggers operation

Returns all schedules in the system meeting specified criteria.

### Input fields

The following table lists the input fields for the queryJobTriggers operation.

Table 43. Fields for queryJobTriggers.

Field	Type/Valid Values	Description
jobTriggerCriterion	jobTriggerCriterion	Definition of the query parameters.

### Return information

The following table identifies the information returned by the queryJobTriggers operation.

Table 44. Return Value.

Type	Description
pageResult	Results of a search request to the search2.5 mechanism. This may either be an initial search based on any criterion, or a subsequent search for another page.

### Java example

Querying the repository for job triggers typically involves the following steps:

1. Create a JobTriggerCriterion object.
2. Create a ReturnSpecifier object and define the return settings.
3. Create a PageSelector object and define the selector settings.
4. Assign the ReturnSpecifier and PageSelector objects to the JobTriggerCriterion object.
5. Supply the JobTriggerCriterion object to the queryJobTriggers operation.

The following sample retrieves all job triggers in the system for a specified file, sending the returned fields and their values for each schedule to the standard output.

```

JobTriggerCriterion jobTriggerCrit = new JobTriggerCriterion();

ReturnSpecifier retSpec = new ReturnSpecifier();
retSpec.setSortOrder(ReturnSpecifierSortOrder.descending);
BigInteger pSize = new BigInteger("11");
retSpec.setPageSize(pSize);
jobTriggerCrit.setReturnSpecifier(retSpec);

```

```

PageSelector pageSel = new PageSelector();
JobTriggerFilter filter = new JobTriggerFilter();
filter.setJobLocationURI("SPSSCR://pes_server/Monthly%20Status");
pageSel.setFilter(filter);
jobTriggerCrit.setPageSelector(pageSel);

PageResult qResult = stub.queryJobTriggers(jobTriggerCrit);
ColumnType[] resultColumn = qResult.getColumn();
Row[] resultRow = qrResult.getRow();
Cell[] resultCell = new Cell[resultColumn.length];
for (int i = 0; i < resultRow.length; i++) {
    System.out.println("Hit " + i);
    resultCell = resultRow[i].getCell();
    for (int j = 0; j < resultCell.length; j++) {
        System.out.println(resultColumn[j].getFieldName() + "=" +
            resultCell[j].getValue().getDisplay());
    }
    System.out.println("\n");
}

```

## SOAP request example

Client invocation of the queryJobTriggers operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```

<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <queryJobTriggers xmlns="http://xml.spss.com/prms/remote">
      <ns2:jobTriggerCriterion xmlns:ns2="http://xml.spss.com/prms">
        <ns2:returnSpecifier sortOrder="descending" pageSize="11"/>
        <ns2:pageSelector>
          <ns2:filter xsi:type="jobTriggerFilter">
            <ns2:jobLocationURI>SPSSCR://pes_server/Monthly%20Status</ns2:jobLocationURI>
          </ns2:filter>
        </ns2:pageSelector>
      </ns2:jobTriggerCriterion>
    </queryJobTriggers>
  </soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a queryJobTriggers operation call by sending a SOAP response message containing the results. An example of such a message follows.

```

<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>
    <queryJobTriggersResponse xmlns="http://xml.spss.com/prms/remote">
      <ns1:pageResult hitCount="2" pageSize="11" pageNumber="1"
        clientKey="19bc8c69:114d228ef1f:-7f9a" sortColumn="job.objid" sortOrder="ascending"
        xmlns:ns1="http://www.spss.com/pes/pager">
        <ns1:column display="job.objid" fieldName="job.objid" colType="string"/>
        <ns1:column display="jobPath" fieldName="jobPath" colType="string"/>
        <ns1:column display="fileversion.marker" fieldName="fileversion.marker" colType="string"/>
        <ns1:column display="usesfiledep.label" fieldName="usesfiledep.label" colType="string"/>
        <ns1:column display="scheduleObjID" fieldName="scheduleObjID" colType="string"/>
        <ns1:column display="schedule.frequency" fieldName="schedule.frequency" colType="number"/>
        <ns1:column display="schedule.interval" fieldName="schedule.interval" colType="number"/>
        <ns1:column display="schedule.month" fieldName="schedule.month" colType="number"/>
        <ns1:column display="schedule.dayOfMonth" fieldName="schedule.dayOfMonth" colType="number"/>
        <ns1:column display="schedule.daysOfWeek" fieldName="schedule.daysOfWeek" colType="number"/>
        <ns1:column display="schedule.timeOfDay" fieldName="schedule.timeOfDay" colType="stamp"/>
        <ns1:column display="schedule.scheduleStartDate" fieldName="schedule.scheduleStartDate"
          colType="stamp"/>
      </ns1:pageResult>
    </queryJobTriggersResponse>
  </soapenv:Body>
</soapenv:Envelope>

```

```

<ns1:column display="schedule.scheduleEndDate" fieldName="schedule.scheduleEndDate"
  colType="stamp"/>
<ns1:column display="schedule.nextScheduledTime" fieldName="schedule.nextScheduledTime"
  colType="stamp"/>
<ns1:column display="schedule.scheduleEnabled" fieldName="schedule.scheduleEnabled"
  colType="string"/>
<ns1:column display="scheduleEventExecution.state" fieldName="scheduleEventExecution.state"
  colType="number"/>
<ns1:column display="scheduleEventExecution.executionSuccess"
  fieldName="scheduleEventExecution.executionSuccess" colType="string"/>
<ns1:column display="scheduleEventExecution.startDateTime"
  fieldName="scheduleEventExecution.startDateTime" colType="stamp"/>
<ns1:column display="scheduleEventExecution.endDateTime"
  fieldName="scheduleEventExecution.endDateTime" colType="stamp"/>
<ns1:column display="scheduleEventExecution.queuedDateTime"
  fieldName="scheduleEventExecution.queuedDateTime" colType="stamp"/>
<ns1:column display="credentials.name" fieldName="credentials.name" colType="string"/>
<ns1:column display="msgDrivenJob.objid" fieldName="msgDrivenJob.objid" colType="string"/>
<ns1:column display="msgDrivenJob.messageSelector"
  fieldName="msgDrivenJob.messageSelector" colType="string"/>
<ns1:column display="msgDrivenJob.messageText"
  fieldName="msgDrivenJob.messageText" colType="string"/>
<ns1:column display="msgEventExecution.state"
  fieldName="msgEventExecution.state" colType="number"/>
<ns1:column display="msgEventExecution.executionSuccess"
  fieldName="msgEventExecution.executionSuccess" colType="string"/>
<ns1:column display="msgEventExecution.startDateTime"
  fieldName="msgEventExecution.startDateTime" colType="stamp"/>
<ns1:column display="msgEventExecution.endDateTime"
  fieldName="msgEventExecution.endDateTime" colType="stamp"/>
<ns1:column display="msgEventExecution.queuedDateTime"
  fieldName="msgEventExecution.queuedDateTime" colType="stamp"/>
<ns1:column display="messageDomain.name" fieldName="messageDomain.name" colType="string"/>
<ns1:column display="messageDomain.destinationName"
  fieldName="messageDomain.destinationName" colType="string"/>
<ns1:column display="messageDomain.namingService"
  fieldName="messageDomain.namingService" colType="string"/>
<ns1:column display="messageDomain.namingFactory"
  fieldName="messageDomain.namingFactory" colType="string"/>
<ns1:row rowNumber="1">
  <ns1:cell>
    <ns1:value><display xmlns="">0A0A4A3519BC8C6900000114D228EF1F8023</display></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">/Monthly Status</display></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0:2007-09-04 15:36:33.548</display></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">LATEST</display></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0</display><rawNumber xmlns="">0</rawNumber></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0</display><rawNumber xmlns="">0</rawNumber></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0</display><rawNumber xmlns="">0</rawNumber></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0</display><rawNumber xmlns="">0</rawNumber></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value>
      <display xmlns=""/>
      <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value>
      <display xmlns=""/>
      <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value>

```

```

        <display xmlns=""/>
        <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value>
        <display xmlns=""/>
        <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns="">0</display><rawNumber xmlns="">0</rawNumber></ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value>
        <display xmlns=""/>
        <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value>
        <display xmlns=""/>
        <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value>
        <display xmlns=""/>
        <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns="">validUser</display></ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns="">0A0A4A3519BC8C6900000114D228EF1F8039</display></ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns="">0</display><rawNumber xmlns="">0</rawNumber></ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value>
        <display xmlns=""/>
        <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value>
        <display xmlns=""/>
        <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value>
        <display xmlns=""/>
        <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns="">MyDomain</display></ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns="">testTopic</display></ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns="">jnp://localhost:1099</display></ns1:value>
</ns1:cell>
<ns1:cell>
    <ns1:value><display xmlns="">org.jnp.interfaces.NamingContextFactory</display></ns1:value>

```



```

</ns1:cell>
</ns1:row>
<ns1:row rowNumber="2">
  <ns1:cell>
    <ns1:value><display xmlns="">0A0A4A3519BC8C6900000114D228EF1F8023</display></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">/Monthly Status</display></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0:2007-09-04 15:36:33.548</display></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">LATEST</display></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0A0A4A3519BC8C6900000114D228EF1F803D</display></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">3</display><rawNumber xmlns="">3</rawNumber></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">1</display><rawNumber xmlns="">1</rawNumber></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0</display><rawNumber xmlns="">0</rawNumber></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">1</display><rawNumber xmlns="">1</rawNumber></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0</display><rawNumber xmlns="">0</rawNumber></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value>
      <display xmlns="">1970-01-01T15:38:00-0600</display>
      <rawStamp xmlns="">1970-01-01T15:38:00.000-06:00</rawStamp>
    </ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value>
      <display xmlns="">2007-09-04T15:38:34-0500</display>
      <rawStamp xmlns="">2007-09-04T15:38:34.000-05:00</rawStamp>
    </ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value>
      <display xmlns="">/</display>
      <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value>
      <display xmlns="">2007-10-01T15:38:00-0500</display>
      <rawStamp xmlns="">2007-10-01T15:38:00.000-05:00</rawStamp>
    </ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">true</display></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0</display><rawNumber xmlns="">0</rawNumber></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns=""><rawString xmlns="">/</rawString></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value>
      <display xmlns="">/</display>
      <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value>
      <display xmlns="">/</display>
      <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value>
      <display xmlns="">/</display>
      <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value>
      <display xmlns="">/</display>
      <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
    </ns1:value>
  </ns1:cell>

```

```

<ns1:cell>
  <ns1:value><display xmlns="">validUser</display></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns="">0</display><rawNumber xmlns="">0</rawNumber></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value>
    <display xmlns=""/>
    <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
  </ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value>
    <display xmlns=""/>
    <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
  </ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value>
    <display xmlns=""/>
    <rawStamp xmlns="">1969-12-31T18:00:00.000-06:00</rawStamp>
  </ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
  <ns1:value><display xmlns=""><rawString xmlns=""/></ns1:value>
</ns1:cell>
</ns1:row>
<ns1:navigator>
  <page display="1" selector="1" current="true" xmlns=""/>
</ns1:navigator>
</ns1:pageResult>
</queryJobTriggersResponse>
</soapenv:Body>
</soapenv:Envelope>

```

---

## The querySchedules operation

Returns all schedules in the system meeting specified criteria.

### Input fields

The following table lists the input fields for the querySchedules operation.

*Table 45. Fields for querySchedules.*

Field	Type/Valid Values	Description
scheduleCriterion	scheduleCriterion	Definition of the query parameters.

## Return information

The following table identifies the information returned by the querySchedules operation.

Table 46. Return Value.

Type	Description
pageResult	Results of a search request to the search2.5 mechanism. This may either be an initial search based on any criterion, or a subsequent search for another page.

## Java example

Querying the repository for schedules typically involves the following steps:

1. Create a ScheduleCriterion object.
2. Create a ReturnSpecifier object and define the return settings.
3. Create a PageSelector object and define the selector settings.
4. Assign the ReturnSpecifier and PageSelector objects to the ScheduleCriterion object.
5. Supply the ScheduleCriterion object to the querySchedules operation.

The following sample retrieves all schedules in the system, sending the returned fields and their values for each schedule to the standard output.

```
ScheduleCriterion schedCrit = new ScheduleCriterion();
PageResult qResult = stub.querySchedules(schedCrit);
ColumnType[] resultColumn = qResult.getColumn();
Row[] resultRow = qrResult.getRow();
Cell[] resultCell = new Cell[resultColumn.length];
for (int i = 0; i < resultRow.length; i++) {
    System.out.println("Hit " + i);
    resultCell = resultRow[i].getCell();
    for (int j = 0; j < resultCell.length; j++) {
        System.out.println(resultColumn[j].getFieldName() + "=" +
            resultCell[j].getValue().getDisplay());
    }
    System.out.println("\n");
}
```

## SOAP request example

Client invocation of the querySchedules operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <querySchedules xmlns="http://xml.spss.com/prms/remote">
      <scheduleCriterion xmlns="http://xml.spss.com/prms"/>
    </querySchedules>
  </soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a querySchedules operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <querySchedulesResponse xmlns="http://xml.spss.com/prms/remote">
      <ns1:pageResult hitCount="3" pageSize="255" pageNumber="1"
        clientKey="781b7393:10ed217fdaa:-7e80" sortColumn="file.objid" sortOrder="ascending"
        xmlns:ns1="http://www.spss.com/pes/pager">
        <ns1:column display="file.objid" fieldName="file.objid" colType="string"/>
        <ns1:column display="file.path" fieldName="file.path" colType="string"/>
        <ns1:column display="fileversion.marker" fieldName="fileversion.marker" colType="string"/>
        <ns1:column display="usesfiledep.label" fieldName="usesfiledep.label" colType="string"/>
        <ns1:column display="schedule.frequency" fieldName="schedule.frequency" colType="string"/>
        <ns1:column display="schedule.interval" fieldName="schedule.interval" colType="string"/>
        <ns1:column display="schedule.month" fieldName="schedule.month" colType="string"/>
        <ns1:column display="schedule.dayOfMonth" fieldName="schedule.dayOfMonth" colType="string"/>
        <ns1:column display="schedule.daysOfWeek" fieldName="schedule.daysOfWeek" colType="string"/>
        <ns1:column display="schedule.timeOfDay" fieldName="schedule.timeOfDay" colType="string"/>
        <ns1:column display="schedule.scheduleStartDate" fieldName="schedule.scheduleStartDate"
          colType="string"/>
        <ns1:column display="schedule.scheduleEndDate" fieldName="schedule.scheduleEndDate"
          colType="string"/>
        <ns1:column display="schedule.nextScheduleTime" fieldName="schedule.nextScheduleTime"
          colType="string"/>
        <ns1:column display="schedule.scheduleEnabled" fieldName="schedule.scheduleEnabled"
          colType="string"/>
        <ns1:column display="eventexe.state" fieldName="eventexe.state" colType="string"/>
        <ns1:column display="eventexe.completionCode" fieldName="eventexe.completionCode"
          colType="string"/>
        <ns1:column display="eventexe.startDateTime" fieldName="eventexe.startDateTime"
          colType="string"/>
        <ns1:column display="eventexe.endDateTime" fieldName="eventexe.endDateTime" colType="string"/>
        <ns1:column display="eventexe.queuedDateTime" fieldName="eventexe.queuedDateTime"
          colType="string"/>
        <ns1:row rowNumber="1">
          <ns1:cell>
            <ns1:value><display xmlns="">0A0A4A35057D4A5E000010ECCFED0BA81B6</display>
              <rawString xmlns=""/>
            </ns1:value>
          </ns1:cell>
          <ns1:cell>
            <ns1:value><display xmlns="">/Jobs/Analysis</display><rawString xmlns=""/></ns1:value>
          </ns1:cell>
          <ns1:cell>
            <ns1:value><display xmlns="">0:2006-11-09 15:07:31.52</display>
              <rawString xmlns=""/></ns1:value>
            </ns1:cell>
          <ns1:cell>
            <ns1:value><display xmlns="">LATEST</display><rawString xmlns=""/></ns1:value>
          </ns1:cell>
          <ns1:cell>
            <ns1:value><display xmlns="">2</display><rawString xmlns=""/></ns1:value>
          </ns1:cell>
          <ns1:cell>
            <ns1:value><display xmlns="">1</display><rawString xmlns=""/></ns1:value>
          </ns1:cell>
          <ns1:cell>
            <ns1:value><display xmlns="">0</display><rawString xmlns=""/></ns1:value>
          </ns1:cell>
          <ns1:cell>
            <ns1:value><display xmlns="">0</display><rawString xmlns=""/></ns1:value>
          </ns1:cell>
          <ns1:cell>
            <ns1:value><display xmlns="">4</display><rawString xmlns=""/></ns1:value>
          </ns1:cell>
          <ns1:cell>
            <ns1:value><display xmlns="">1970-01-01 13:31:00.0</display>
              <rawString xmlns=""/></ns1:value>
            </ns1:cell>
          <ns1:cell>
            <ns1:value><display xmlns="">2006-11-10 13:31:31.0</display>
              <rawString xmlns=""/></ns1:value>
            </ns1:cell>
          <ns1:cell><ns1:value><display xmlns=""/><rawString xmlns=""/></ns1:value></ns1:cell>
          <ns1:cell>
            <ns1:value><display xmlns="">2006-11-13 13:31:00.0</display>
              <rawString xmlns=""/></ns1:value>
            </ns1:cell>
        </ns1:row>
      </ns1:pageResult>
    </querySchedulesResponse>
  </soapenv:Body>
</soapenv:Envelope>
```



```

    <ns1:value><display xmlns="">0</display><rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0</display><rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">0</display><rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">1970-01-01 13:32:00.0</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">2006-11-10 13:32:57.0</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell><ns1:value><display xmlns=""/><rawString xmlns=""/></ns1:value></ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">2006-11-11 13:32:00.0</display>
    <rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell>
    <ns1:value><display xmlns="">1</display><rawString xmlns=""/></ns1:value>
  </ns1:cell>
  <ns1:cell><ns1:value><display xmlns=""/><rawString xmlns=""/></ns1:value></ns1:cell>
  <ns1:cell><ns1:value><display xmlns=""/><rawString xmlns=""/></ns1:value></ns1:cell>
  <ns1:cell><ns1:value><display xmlns=""/><rawString xmlns=""/></ns1:value></ns1:cell>
  <ns1:cell><ns1:value><display xmlns=""/><rawString xmlns=""/></ns1:value></ns1:cell>
  <ns1:cell><ns1:value><display xmlns=""/><rawString xmlns=""/></ns1:value></ns1:cell>
  </ns1:row>
  <ns1:navigator>
    <page display="1" selector="1" current="true" xmlns=""/>
  </ns1:navigator>
</ns1:pageResult>
</querySchedulesResponse>
</soapenv:Body>
</soapenv:Envelope>

```

---

## The querySubmittedExecutions operation

Returns all submitted executions in the system meeting specified criteria.

### Input fields

The following table lists the input fields for the querySubmittedExecutions operation.

Table 47. Fields for querySubmittedExecutions.

Field	Type/Valid Values	Description
submittedExecutionCriterion	submittedExecutionCriterion	Definition of the query parameters.

### Return information

The following table identifies the information returned by the querySubmittedExecutions operation.

Table 48. Return Value.

Type	Description
pageResult	Results of a search request to the search2.5 mechanism. This may either be an initial search based on any criterion, or a subsequent search for another page.

### Java example

Querying the repository for executions typically involves the following steps:

1. Create a SubmittedExecutionCriterion object.
2. Create a ReturnSpecifier object and define the return settings.

3. Create a PageSelector object and define the selector settings.
4. Assign the ReturnSpecifier and PageSelector objects to the SubmittedExecutionCriterion object.
5. Supply the SubmittedExecutionCriterion object to the querySubmittedExecutions operation.

The following sample retrieves all submitted executions with the label *Production*, sending the returned fields and their values for each execution to the standard output. Results are sorted by the completion code for the execution.

```
SubmittedExecutionCriterion execCrit = new SubmittedExecutionCriterion();
ReturnSpecifier retSpec = new ReturnSpecifier();
retSpec.setSortColumn("eventexe.completionCode");
execCrit.setReturnSpecifier(retSpec);

PageSelector pageSel = new PageSelector();
SubmittedExecutionFilter filter = new SubmittedExecutionFilter();
filter.setVersionLabel("Production");
pageSel.setFilter(filter);
execCrit.setPageSelector(pageSel);

PageResult qResult = stub.querySubmittedExecutions(execCrit);
ColumnType[] resultColumn = qResult.getColumn();
Row[] resultRow = qrResult.getRow();
Cell[] resultCell = new Cell[resultColumn.length];
for (int i = 0; i < resultRow.length; i++) {
    System.out.println("Hit " + i);
    resultCell = resultRow[i].getCell();
    for (int j = 0; j < resultCell.length; j++) {
        System.out.println(resultColumn[j].getFieldName() + "=" +
            resultCell[j].getValue().getDisplay());
    }
    System.out.println("\n");
}
```

## SOAP request example

Client invocation of the querySubmittedExecutions operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <querySubmittedExecutions xmlns="http://xml.spss.com/prms/remote">
      <submittedExecutionCriterion xmlns="http://xml.spss.com/prms">
        <returnSpecifier sortColumn="eventexe.completionCode"/>
        <pageSelector>
          <submittedExecutionFilter>
            <versionLabel>Production</versionLabel>
          </submittedExecutionFilter>
        </pageSelector>
      </submittedExecutionCriterion>
    </querySubmittedExecutions>
  </soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a querySubmittedExecutions operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <querySubmittedExecutionsResponse xmlns="http://xml.spss.com/prms/remote">
      <ns1:pageResult hitCount="9" pageSize="2" pageNumber="1">
```

```

clientKey="50f84fe9:10f33316d48:-7671" sortColumn="eventexe.completionCode"
sortOrder="ascending" xmlns:ns1="http://www.spss.com/pes/pager">
<ns1:column display="file.objid" fieldName="file.objid" colType="string"/>
<ns1:column display="file.name" fieldName="file.name" colType="string"/>
<ns1:column display="fileversion.marker" fieldName="fileversion.marker" colType="string"/>
<ns1:column display="fileversion.expirationDate" fieldName="fileversion.expirationDate"
colType="string"/>
<ns1:column display="eventexe.objid" fieldName="eventexe.objid" colType="string"/>
<ns1:column display="eventexe.state" fieldName="eventexe.state" colType="string"/>
<ns1:column display="eventexe.startDateTime" fieldName="eventexe.startDateTime"
colType="string"/>
<ns1:column display="eventexe.endDateTime" fieldName="eventexe.endDateTime" colType="string"/>
<ns1:column display="eventexe.queuedDateTime" fieldName="eventexe.queuedDateTime"
colType="string"/>
<ns1:column display="eventexe.completionCode" fieldName="eventexe.completionCode"
colType="string"/>
<ns1:row rowNumber="1">
<ns1:cell>
<ns1:value>
<display xmlns="">0A58C34649AB87F00000010EFafa4C3D89CC</display><rawString xmlns=""/>
</ns1:value>
</ns1:cell>
<ns1:cell>
<ns1:value><display xmlns="">Employee.dbq.html</display><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
<ns1:value><display xmlns="">0:2006-11-20 10:35:49.342</display><rawString xmlns=""/>
</ns1:value>
</ns1:cell>
<ns1:cell><ns1:value><display xmlns=""/><rawString xmlns=""/></ns1:value></ns1:cell>
<ns1:cell>
<ns1:value>
<display xmlns="">0A58C34649AB87F00000010EFafa4C3D89C5</display><rawString xmlns=""/>
</ns1:value>
</ns1:cell>
<ns1:cell><ns1:value><display xmlns="">4</display><rawString xmlns=""/></ns1:value></ns1:cell>
<ns1:cell>
<ns1:value><display xmlns="">2006-11-20 10:35:46.967</display><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
<ns1:value><display xmlns="">2006-11-20 10:35:50.153</display><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
<ns1:value><display xmlns="">2006-11-20 10:35:46.953</display><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell><ns1:value><display xmlns="">0</display><rawString xmlns=""/></ns1:value></ns1:cell>
</ns1:row>
<ns1:row rowNumber="2">
<ns1:cell>
<ns1:value>
<display xmlns="">0A58C34649AB87F00000010EFafa4C3D89DD</display><rawString xmlns=""/>
</ns1:value>
</ns1:cell>
<ns1:cell>
<ns1:value><display xmlns="">Employee.dbq.html</display><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
<ns1:value><display xmlns="">0:2006-11-20 10:36:38.699</display><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell><ns1:value><display xmlns=""/><rawString xmlns=""/></ns1:value></ns1:cell>
<ns1:cell>
<ns1:value>
<display xmlns="">0A58C34649AB87F00000010EFafa4C3D89D5</display><rawString xmlns=""/>
</ns1:value>
</ns1:cell>
<ns1:cell><ns1:value><display xmlns="">4</display><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
<ns1:value><display xmlns="">2006-11-20 10:36:35.95</display><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
<ns1:value><display xmlns="">2006-11-20 10:36:39.76</display><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell>
<ns1:value><display xmlns="">2006-11-20 10:36:35.933</display><rawString xmlns=""/></ns1:value>
</ns1:cell>
<ns1:cell><ns1:value><display xmlns="">0</display><rawString xmlns=""/></ns1:value></ns1:cell>
</ns1:row>
<ns1:navigator>
<next display="pager/navNext" selector="3" current="false" xmlns=""/>
<page display="1" selector="1" current="true" xmlns=""/>
<page display="2" selector="3" current="false" xmlns=""/>
<page display="3" selector="5" current="false" xmlns=""/>
<page display="4" selector="7" current="false" xmlns=""/>

```



```

    <page display="5" selector="9" current="false" xmlns="" />
  </ns1:navigator>
</ns1:pageResult>
</querySubmittedExecutionsResponse>
</soapenv:Body>
</soapenv:Envelope>

```

---

## The rerunFailedJobStepIterations operation

Submits only the failed job step iterations for execution.

### Input fields

The following table lists the input fields for the rerunFailedJobStepIterations operation.

Table 49. Fields for rerunFailedJobStepIterations.

Field	Type/Valid Values	Description
oldJobStepExecutionID	string	Identifier for a job step execution.

### Return information

The following table identifies the information returned by the rerunFailedJobStepIterations operation.

Table 50. Return Value.

Type	Description
string	Identifier for the job step execution resulting from re-running the failed steps.

---

## The submitJob operation

Submits a designated job for processing, generating an execution from which the results can be obtained. Any job variables are processed using their default values.

### Input fields

The following table lists the input fields for the submitJob operation.

Table 51. Fields for submitJob.

Field	Type/Valid Values	Description
jobLocationURI	string	URI for a job.
notificationEnabled	boolean	Indicator of whether or not notifications associated with the job should be sent as a result of the job submission.

### Return information

The following table identifies the information returned by the submitJob operation.

Table 52. Return Value.

Type	Description
string	Identifier for the job execution.

## Java example

Submitting a job for execution requires the specification of two parameters. The first is a string corresponding to the URI for the job. The second is a boolean indicating whether or not any notifications defined for the job should be sent as a result of the submission. The `submitJob` operation returns the identifier for the execution of the specified job, from which specific result details can be obtained. See the topic “The `getExecutionDetails` operation” on page 29 for more information.

```
String uri =
    "spsscr://pes_server:80/?id=0a0a4aac011937790000010d415272aa824a#m.1:2006-08-24%2013:16:21.069";
String executionID = stub.submitJob(uri, true);
ExecutionDetails exDetails = stub.getExecutionDetails(executionID, DeliveryType.STRING);
```

## SOAP request example

Client invocation of the `submitJob` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <submitJob xmlns="http://xml.spss.com/prms/remote">
      <jobLocationURI>
        spsscr://pes_server:80/?id=0a0a4aac011937790000010d415272aa824a#m.1:2006-08-24%2013:16:21.069
      </jobLocationURI>
      <notificationEnabled>true</notificationEnabled>
    </submitJob>
  </soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a `submitJob` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <submitJobResponse xmlns="http://xml.spss.com/prms/remote">
      <jobExecutionID>0a0a4aac011937790000010d415272aa8ab4</jobExecutionID>
    </submitJobResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

---

## The `submitJobWithOptions` operation

Submits a designated job for processing using specified options. Options include the following:

- Values for any job variables
- Whether or not notifications should be sent

## Input fields

The following table lists the input fields for the `submitJobWithOptions` operation.

Table 53. Fields for `submitJobWithOptions`.

Field	Type/Valid Values	Description
<code>jobLocationURI</code>	string	URI for a job.
<code>jobOptions</code>	<code>jobOptions</code>	Options for running a job.

## Return information

The following table identifies the information returned by the `submitJobWithOptions` operation.

Table 54. Return Value.

Type	Description
string	Identifier for the job execution.

## Java example

To specify options when submitting a job for execution:

1. Create a `JobOptions` object.
2. Supply the `setNotificationEnabled` method with a boolean indicating whether or not notifications defined for the job should be submitted as a result of submitting the job.
3. Create an array of `JobParameterValue` objects. Use the `setName` and `setValue` methods to assign the name and value for each parameter value in the job.
4. Create a `JobParameterValues` object. Use the `setParameterValue` method to assign the parameter value array to the object.
5. Assign the parameter values to the options object using the `setParameterValues` method.
6. Supply the `submitJobWithOptions` operation with a string denoting the uniform resource identifier for the job and the options object. The operation returns the identifier for the execution of the specified job, from which specific result details can be obtained. See the topic “The `getExecutionDetails` operation” on page 29 for more information.

The following sample specifies the values for two job variables when submitting a job.

```
String uri = "spssc://Jobs/My%20Job#m.4:2009-03-17%2008:53:42.482";

JobOptions options = new JobOptions();
options.setNotificationEnabled(true);

JobParameterValue[] valArray = new JobParameterValue[2];
valArray[0].setName("command");
valArray[0].setValue("dir");
valArray[1].setName("options");
valArray[1].setValue("c:");
JobParameterValues pValues = new JobParameterValues();
pValues.setParameterValue(valArray);
options.setParameterValues(pValues);

String executionID = stub.submitJobWithOptions(uri, options);

ExecutionDetails exDetails = stub.getExecutionDetails(executionID, DeliveryType.STRING);
```

## SOAP request example

Client invocation of the `submitJobWithOptions` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```

<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <submitJobWithOptions xmlns="http://xml.spss.com/prms/remote">
      <jobLocationURI>SPSSCR:///Jobs/My%20Job#m.4:2009-03-17%2008:53:42.482</jobLocationURI>
      <jobOptions xmlns="http://xml.spss.com/prms">
        <parameterValues>
          <parameterValue name="command" value="dir"/>
          <parameterValue name="options" value="c:"/>
        </parameterValues>
        <notificationEnabled>true</notificationEnabled>
      </jobOptions>
    </submitJobWithOptions>
  </soapenv:Body>
</soapenv:Envelope>

```

## SOAP response example

The server responds to a `submitJobWithOptions` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```

<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>
    <submitJobWithOptionsResponse xmlns="http://xml.spss.com/prms/remote">
      <jobExecutionID>0a010a0706890875000001201009f4f583fd</jobExecutionID>
    </submitJobWithOptionsResponse>
  </soapenv:Body>
</soapenv:Envelope>

```

---

## The submitWork operation

Submits a designated piece of work for processing, generating an execution from which the results can be obtained.

### Input fields

The following table lists the input fields for the `submitWork` operation.

*Table 55. Fields for submitWork.*

Field	Type/Valid Values	Description
workSpec	workSpec	Defines a specification for submitting work.

### Return information

The following table identifies the information returned by the `submitWork` operation.

*Table 56. Return Value.*

Type	Description
string	Identifier for the job step execution.

## Java example

Submitting work for execution requires the creation of a work specification. The specification defines the following two parameters:

- The identifier for the work to submit
- A name for the work, used to organize the work in the submitted hierarchy

The following sample begins by constructing a Work object for an SPSS syntax file. The `setUuid` method defines the identifier for the syntax file. The `WorkSpec` constructor accepts this work object and a string indicating the work name, in this case *Results*. The `submitWork` operation returns the identifier for the execution of the work, from which specific result details can be obtained. See the topic “The `getExecutionDetails` operation” on page 29 for more information.

```
Work work = new Work("ModelManagement.SPSSSyntaxWork");
Id id = new Id("0a0a4aac011937790000010d415272aa81e8");
work.setUuid(id);
WorkSpec wSpec = new WorkSpec(work, "Results");
String executionID = stub.submitWork(wSpec);
```

## SOAP request example

Client invocation of the `submitWork` operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <submitWork xmlns="http://xml.spss.com/prms/remote">
      <workSpec xmlns="http://xml.spss.com/prms">
        <work uuid="0a0a4aac011937790000010d415272aa81e8" workType="ModelManagement.SPSSSyntaxWork"/>
        <workName>Results</workName>
      </workSpec>
    </submitWork>
  </soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a `submitWork` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <submitWorkResponse xmlns="http://xml.spss.com/prms/remote">
      <jobStepExecutionID>0a0a4aac011937790000010d415272aa8d0a</jobStepExecutionID>
    </submitWorkResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

---

## The `updateMessageDrivenJob` operation

Updates an existing message-driven job with new characteristics.

## Input fields

The following table lists the input fields for the updateMessageDrivenJob operation.

Table 57. Fields for updateMessageDrivenJob.

Field	Type/Valid Values	Description
messageDrivenJobIn	messageDrivenJobSpecifier	Message Drive Job parameters.

## Java example

Updating a message driven job typically involves the following steps:

1. Obtain a MessageDrivenJobSpecifier object for the job to be updated by supplying the getMessageDrivenJob operation with the message driven job identifier.
2. Retrieve the MessageDrivenJob object.
3. Update the parameters.
4. Update the MessageDrivenJobSpecifier object with the new settings.
5. Supply the updateMessageDrivenJob operation with the revised specifier object.

The following sample changes the filter text used for an existing message driven job.

```
String id = "0A0A4A3578F9BA1100000114D5CED52780E6";
MessageDrivenJobSpecifier mdjSpec = stub.getMessageDrivenJob(id);
MessageDrivenJob mdJob = mdjSpec.getMessageDrivenJob();
mdJob.setMessageText("ETL complete");
mdjSpec.setMessageDrivenJob(mdJob);
stub.updateMessageDrivenJob(mdjSpec);
```

## SOAP request example

Client invocation of the updateMessageDrivenJob operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```
<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
    </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <updateMessageDrivenJob xmlns="http://xml.spss.com/prms/remote">
      <messageDrivenJobIn xmlns="http://xml.spss.com/prms">
        <messageDrivenJob uuid="0a0a4a3578f9ba1100000114d5ced52780e6" enabled="true" label="LATEST"
          credentialID="0a0a4a3519bc8c6900000114d228ef1f8033"
          messageDomainID="0a0a4a3578f9ba1100000114d5ced52780c8" messageText="ETL complete"
          durableSubscription="false"/>
      </messageDrivenJobIn>
    </updateMessageDrivenJob>
  </soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a updateMessageDrivenJob operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
  <updateMessageDrivenJobResponse xmlns="http://xml.spss.com/prms/remote"/>
</soapenv:Body>
</soapenv:Envelope>

```

## The updateSchedule operation

Updates an existing schedule with new characteristics.

### Input fields

The following table lists the input fields for the updateSchedule operation.

Table 58. Fields for updateSchedule.

Field	Type/Valid Values	Description
scheduleIn	scheduleSpecifier	Schedule parameters.

### Java example

Updating a schedule typically involves the following steps:

1. Obtain a ScheduleSpecifier object for the schedule to be updated by supplying the getSchedule operation with the schedule identifier.
2. Retrieve the Schedule object.
3. Update the schedule parameters.
4. Update the ScheduleSpecifier object with the new schedule settings.
5. Supply the updateSchedule operation with the revised ScheduleSpecifier object.

The following sample changes the day a weekly schedule runs from Sunday to Monday.

```

String id = "0a0a4a35781b7393000010ed217fdaa81c1";
ScheduleSpecifier schedSpec = stub.getSchedule(id);
Schedule schedule = schedSpec.getSchedule();
schedule.setMonday(true);
schedule.setSunday(false);
schedSpec.setSchedule(schedule);
stub.updateSchedule(schedSpec);

```

### SOAP request example

Client invocation of the updateSchedule operation generates a SOAP request message that is sent to the server for processing. An example of such a message follows.

```

<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:Header>
    <wsse:Security soapenv:mustUnderstand="0"
      xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
      <wsse:UsernameToken>
        <wsse:Username xsi:type="xsd:string">validUser</wsse:Username>
        <wsse:Password xsi:type="xsd:string">password</wsse:Password>
      </wsse:UsernameToken>
      </wsse:Security>
    <ns1:client-accept-language soapenv:mustUnderstand="0" xsi:type="xsd:string"
      xmlns:ns1="http://xml.spss.com/ws/headers">en-US;q=1.0, en;q=0.8</ns1:client-accept-language>
  </soapenv:Header>
  <soapenv:Body>
    <updateSchedule xmlns="http://xml.spss.com/prms/remote">
      <scheduleIn xmlns="http://xml.spss.com/prms">
        <schedule uuid="0a0a4a35781b7393000010ed217fdaa81c1"
          scheduleEnabled="true" scheduledLabel="Production" interval="1"
          startDateTime="2006-11-10T13:31:31.000-06:00" timeOfDay="13:31:00"
          monday="true" tuesday="false" wednesday="false" thursday="false"
          friday="false" saturday="false" sunday="false" xsi:type="weeklySchedule"/>
      </scheduleIn>
    </updateSchedule>
  </soapenv:Body>
</soapenv:Envelope>

```

```
</scheduleIn>
</updateSchedule>
</soapenv:Body>
</soapenv:Envelope>
```

## SOAP response example

The server responds to a `updateSchedule` operation call by sending a SOAP response message containing the results. An example of such a message follows.

```
<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>
    <updateScheduleResponse xmlns="http://xml.spss.com/prms/remote"/>
  </soapenv:Body>
</soapenv:Envelope>
```



---

## Chapter 5. JAX-WS clients

Java developers can create custom web service clients by using JAX-WS.

The discussion here assumes the use of Java 6. In general, the process for accessing IBM SPSS Collaboration and Deployment Services web services involves the following steps:

1. Generate a web service client using `wsimport`
2. Package the client
3. Programmatically configure the client
4. Exercise the web service

---

### Generating a JAX-WS client

To generate a JAX-WS client, open a command prompt and execute the Java 6 `wsimport` command.

The `wsimport` command creates JAX-WS service classes and JAXB classes that represent the WSDL schema. For example, the following command executes `wsimport` for the `Scoring.HttpV2` service, storing the output in the current directory:

```
"c:\Program Files\IBM\Java60\bin\wsimport.exe" http://localhost:7001/scoring/services/Scoring.HttpV2?wsdl
```

In this example, the command obtained the WSDL from the server by using the endpoint name followed by `?wsdl`. The `wsimport` command requires access to the WSDL in order to generate the files. JAX-WS also requires access to the WSDL file during runtime, so this example hard codes the value provided to `wsimport` in the Java code. The generated client fetches the WSDL from that same location unless otherwise specified. An alternative is to store the WSDL locally and refer to the local copy rather than downloading the WSDL from the server.

---

### Packaging a JAX-WS client

A JAX-WS client must be packaged as a jar file.

The following example command creates a jar file named `scoring.jar`:

```
"c:\Program Files\IBM\Java60\bin\jar.exe" -cvf scoring.jar *
```

This command assumes the command prompt is in the same location in which the client was generated.

If you store the WSDL locally, include the WSDL and XSD files in the jar file. Place the files in the `\META-INF\wsdl` directory within the file. Refer to that directory programmatically when configuring the client.

---

### Configuring a JAX-WS client

JAX-WS clients can obtain the WSDL file remotely from the server or locally from within the jar file.

The following example demonstrates obtaining the WSDL from the server:

```
com.spss.scoring.ws.jaxws.ScoringServices service =  
    new com.spss.scoring.ws.jaxws.ScoringServices(  
        new URL("http://localhost:7001/scoring/services/Scoring.HttpV2?wsdl"),  
        new QName("http://xml.spss.com/scoring/wsdl", "ScoringServices"));
```

The URL includes the host and port for your server.

The following example demonstrates obtaining the WSDL from the within the jar file:

```
com.spss.scoring.ws.jaxws.ScoringServices service =
    new com.spss.scoring.ws.jaxws.ScoringServices(
        DemoClass.class.getResource("/META-INF/wsd1/scoring.wsd1"),
        new QName("http://xml.spss.com/scoring/wsd1", "ScoringServices"));
```

In order to include the required SOAP security headers, create an object that implements `SOAPHandler<SOAPMessageContext>`. See “SOAPHandler example” for an example handler object. The following example shows how this object is used:

```
service.setHandlerResolver(new HandlerResolver()
{
    @Override
    public List<Handler> getHandlerChain(PortInfo portInfo)
    {
        List<Handler> handlerChain = new ArrayList<Handler>();
        handlerChain.add(new SecurityHandler("user", "password", "en-US;q=1.0, en;q=0.8"));
        return handlerChain;
    }
});
```

Next, access the service endpoint:

```
ScoringV2 serviceEndpoint = service.getHttpV2();
```

After obtaining the service endpoint, set the JAX-WS standard endpoint address property, which specifies the URL at which to access the endpoint.

```
Map<String, Object> requestContext = ((BindingProvider)serviceEndpoint).getRequestContext();
requestContext.put(BindingProvider.ENDPOINT_ADDRESS_PROPERTY,
    "http://localhost:7001/scoring/services/Scoring.HttpV2");
```

## SOAPHandler example

JAX-WS clients must include an object that implements `SOAPHandler<SOAPMessageContext>`.

The following code provides an example of this object.

```
/*
*****
** Licensed Materials - Property of IBM
** IBM SPSS Products: Collaboration and Deployment Services
** © Copyright IBM Corp. 2000, 2013
** US Government Users Restricted Rights - Use, duplication or
** disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
**
*****
*/

import java.util.Collections;
import java.util.Set;

import javax.xml.namespace.QName;
import javax.xml.soap.SOAPElement;
import javax.xml.soap.SOAPEnvelope;
import javax.xml.soap.SOAPFactory;
import javax.xml.soap.SOAPHeader;
import javax.xml.soap.SOAPMessage;
import javax.xml.ws.handler.MessageContext;
import javax.xml.ws.handler.soap.SOAPHandler;
import javax.xml.ws.handler.soap.SOAPMessageContext;

/**
 * This is a SOAP handler that applies a security header and a language header to a SOAP message.
 */
public class SecurityHandler implements SOAPHandler<SOAPMessageContext>
{
    // WS-Security header values
    public static final String SECURITY = "Security";
    public static final String USERNAME_TOKEN = "UsernameToken";
    public static final String USERNAME = "Username";
    public static final String PASSWORD = "Password";
    public static final String WS_SECURITY_NAMESPACE =
        "http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd";

    // prefixes
```

```

public static final String WSSE_PREFIX = "wsse"; // ws service security
public static final String SPSS_PREFIX = "spss"; // spss prefix

// SPSS custom language header values
public static final String SPSS_HEADER_NAMESPACE = "http://xml.spss.com/ws/headers";
public static final String CLIENT_ACCEPT_LANGUAGE_HEADER = "client-accept-language";

private String i_username;
private String i_password;
private String i_acceptLanguage;

/**
 * Creates a security and language handler
 * @param username A user name to access the web service. Cannot be null.
 * @param password A password to access the web service. Cannot be null.
 * @param acceptLanguage The language that should be used by the web service.
 * This value should be formatted according to the HTTP specification regarding
 * the Accept-Language HTTP header (e.g. en-US;q=1.0, en;q=0.8)
 * If the value is null, the language header will not be added.
 */
public SecurityHandler(String username, String password, String acceptLanguage)
{
    i_username = username;
    i_password = password;
    i_acceptLanguage = acceptLanguage;
}

@Override
public boolean handleMessage(SOAPMessageContext context)
{
    // Apply this handler to only outbound traffic
    if((Boolean)context.get(SOAPMessageContext.MESSAGE_OUTBOUND_PROPERTY))
    {
        // get the message
        SOAPMessage message = context.getMessage();
        try
        {
            // get the message header
            SOAPEnvelope envelope = message.getSOAPPart().getEnvelope();
            SOAPHeader header = envelope.getHeader();
            if (header == null)
            {
                header = envelope.addHeader();
            }

            // add the UsernameToken header
            header.addChildElement(createUsernameTokenSecurityHeader());
            // assuming the language was provided, apply the custom language header
            if(i_acceptLanguage != null)
            {
                header.addChildElement(createLanguageHeader());
            }
        }
        catch (Exception e)
        {
            e.printStackTrace();
        }
    }
    // allow any other handler to execute
    return true;
}

/**
 * This method creates a custom language header, which allows the scoring service
 * to use the given language if possible.
 * @return A custom language header
 * @throws Exception
 */
private SOAPElement createLanguageHeader() throws Exception
{
    SOAPFactory factory = SOAPFactory.newInstance();

    // create a custom language header
    SOAPElement languageHeader =
        factory.createElement(CLIENT_ACCEPT_LANGUAGE_HEADER, SPSS_PREFIX, SPSS_HEADER_NAMESPACE);

    // include the language text
    languageHeader.addTextNode(i_acceptLanguage);

    return languageHeader;
}

/**
 * Creates the WS-Security SOAP header for UsernameToken as SOAPElement.

```

```

*
* @return the WS-Security SOAP header for UsernameToken
* @throws Exception as appropriate
*/
private SOAPElement createUsernameTokenSecurityHeader() throws Exception
{
    SOAPFactory factory = SOAPFactory.newInstance();

    // create a UsernameToken element
    SOAPElement usernameToken =
        factory.createElement(USERNAME_TOKEN, WSSE_PREFIX, WS_SECURITY_NAMESPACE);

    // add the username element
    SOAPElement usernameElement =
        factory.createElement(USERNAME, WSSE_PREFIX, WS_SECURITY_NAMESPACE);
    usernameElement.addTextNode(i_username);
    usernameToken.addChildElement(usernameElement);

    // add the password element
    SOAPElement passwordElement =
        factory.createElement(PASSWORD, WSSE_PREFIX, WS_SECURITY_NAMESPACE);
    passwordElement.addTextNode(i_password);
    usernameToken.addChildElement(passwordElement);

    // create the Security Header
    SOAPElement securityHeader =
        factory.createElement(SEcurity, WSSE_PREFIX, WS_SECURITY_NAMESPACE);
    securityHeader.addChildElement(usernameToken);

    return securityHeader;
}

@Override
public boolean handleFault(SOAPMessageContext context)
{
    // allow any other handler to execute
    return true;
}

@Override
public void close(MessageContext context)
{
    // do nothing
}

@Override
public Set<QName> getHeaders()
{
    return Collections.emptySet();
}
}

```

---

## Exercising web services from JAX-WS clients

Once properly configured, a JAX-WS client can make calls to IBM SPSS Collaboration and Deployment Services web services.

For example, the following code calls the `getConfigurations` operation of the Scoring Service:

```
serviceEndpoint.getConfigurations();
```

---

## Chapter 6. Microsoft® .NET Framework-based clients

In order to use the web services from a Microsoft Windows Communication Foundation (WCF) client, you will need Visual Studio 2008 or later. The discussion here assumes the use of Visual Studio 2008. In general, the process for accessing IBM SPSS Collaboration and Deployment Services web services involves the following steps:

1. Add a Service Reference. See the topic “Adding a service reference” for more information.
2. Configure the web service endpoint. See the topic “Configuring the web service endpoint” on page 74 for more information.
3. Programmatically configure the necessary endpoint behaviors. See the topic “Configuring endpoint behaviors” on page 75 for more information.
4. Exercise the web service. See the topic “Exercising the service” on page 75 for more information.

---

### Adding a service reference

The first step in using a WCF client to access IBM SPSS Collaboration and Deployment Services web services is to make the service available to the Visual Studio project by adding it as a Service Reference.

1. In Visual Studio, right-click the folder’s *References* folder and select **Add Service Reference**.
2. Type the URL of the service WSDL location in the **Address** field, and click **Go**. The value corresponds to the service endpoint appended with `?wsdl`.
3. Specify the namespace in the **Namespace** field.
4. Click **OK**.

Visual Studio adds a new service reference to the Service Reference directory for the project. The name of the reference corresponds to the specified namespace.

**Important:** If you have a .NET client created by using a version of IBM SPSS Collaboration and Deployment Services before 6.0, you must regenerate your service references from the current WSDL files to allow successful communication between your application and the current server. If you do not regenerate your service references, you may experience a variety of errors that may include incorrect namespace assignments, `NullPointerExceptions` in the web services being invoked, and data type assignment errors.

### Service reference modifications

Due to known compatibility issues between Microsoft tooling and some WSDL files, you need to manually modify some service references before they can be used successfully. For information about the specific issues, see articles 891386 and 326790 on the Microsoft Support site.

To modify a service reference:

1. In Visual Studio, select the project and click **Show All Files** from the Project menu.
2. Expand the service reference that needs to be modified.
3. Expand the **Reference.svcmap** node.
4. Open the `Reference.cs` file.
5. Make the required modifications.
6. Save the file.

For the Content Repository Service , Content Repository URI Service, and Process Management Service, you need to make the following changes to the `RowType` class:

- private value[][] cellField should be changed to private value[] cellField
- public value[][] cell should be changed to public value[] cell

For the Scoring Service, you need to make the following changes:

- in the returnedDPDOutputTable class, private returnedDPDOutputValue[][] returnedDPDOutputrowField should be changed to private returnedDPDOutputValue[] returnedDPDOutputrowField
- in the returnedDPDOutputTable class, private returnedDPDOutputValue[][] returnedDPDOutputRow should be changed to private returnedDPDOutputValue[] returnedDPDOutputRow
- in the returnedRequestInputTable class, private returnedRequestInputValue[][] returnedRequestInputRow should be changed to private returnedRequestInputValue[] returnedRequestInputRow
- in the returnedRequestInputTable class, private returnedRequestInputValue[][] returnedRequestInputRowField should be changed to private returnedRequestInputValue[] returnedRequestInputRowField
- in the requestInputTable class, private input1[][] requestInputRowField should be changed to private input1[] requestInputRowField
- in the requestInputTable class, private input1[][] requestInputRow should be changed to private input1[] requestInputRow

For the PevServices Service, you need to make the following changes:

- in the avTableConflict class, private avColumnMeta[][] avColumnConflictField should be changed to private avColumnMeta[] avColumnConflictField
- in the avTableConflict class, private avColumnMeta[][] avColumnConflict should be changed to private avColumnMeta[] avColumnConflict
- in the evTableConflict class, private evColumnMeta[][] evColumnConflictField should be changed to private evColumnMeta[] evColumnConflictField
- in the evTableConflict class, private evColumnMeta[][] evColumnConflict should be changed to private evColumnMeta[] evColumnConflict

---

## Configuring the web service endpoint

In WCF, you can configure a service endpoint either declaratively using an *app.config* file, or programmatically using the WCF APIs. The following steps describe the creation of a basic configuration within an *app.config* file.

1. In Visual Studio, double-click the *app.config* file for the application (or *web.config* for a web-application).
2. Find the `system.serviceModel` element. Create it if it does not already exist.
3. Find the `client` element. Create it if it does not already exist.
4. Create a new endpoint element as a child of the `client` element.
5. Specify the appropriate service endpoint URL as the value of the *address* attribute.
6. Specify *basicHttpBinding* as the value of the *binding* attribute.
7. Specify the appropriate service contract as the value of the *contract* attribute. The service contract is the value of the service reference namespace appended with the service name.
8. Optionally specify a value for the *name* attribute that identifies a name for the endpoint configuration. If the *name* is blank, the configuration is used as the default for the service.

The resulting *app.config* file should be similar to the following example:

```
<system.serviceModel>
  <client>
    <endpoint
      address="http://cads_server:8080/cr-ws/services/ContentRepository"
```

```

        binding="basicHttpBinding"
        bindingConfiguration=""
        contract="IBM.SPSS.ContentRepository"
        name="" />
    </client>
</system.serviceModel>

```

---

## Configuring endpoint behaviors

The following two issues complicate the use of IBM SPSS Collaboration and Deployment Services web services by WCF clients:

- WCF does not allow the username and password to be transmitted over HTTP
- WCF does not correctly understand the SOAP Fault format returned by the services

To address these problems, a sample Visual Studio project is available that contains classes adding endpoint behaviors that resolve both issues. The IBM SPSS Collaboration and Deployment Services installation media includes this project.

To use these classes, ensure that the *IBM.SPSS.WCF.Utilities* project containing these classes has been compiled and added as a referenced DLL to the Visual Studio project that exercises the web services. When constructing a new service client instance, ensure that the behaviors are added as follows:

```

ContentRepositoryClient serviceClient = new ContentRepositoryClient();
serviceClient.Endpoint.Behaviors.Add(
    new ApplyClientInspectorsBehavior(
        new HeaderInjectionMessageInspector(
            new UsernameTokenSecurityHeader("admin", "Abcdefg1")
        ),
        new SOAPFaultFormatMessageInspector())
);

```

This adds two message inspectors to the behaviors for the endpoint. The first allows message headers to be injected, permitting a UsernameToken security header containing the username and password to be transmitted over HTTP. The second message inspector intercepts SOAP Faults, ensuring that they are formatted for proper WCF processing.

---

## Exercising the service

After adding the service reference to the project, configuring the endpoint, and adding the necessary endpoint behaviors, the WCF-based web service client is ready. Add the .NET source code to the project to exercise the web service as needed.

There may be instances in which the .NET client proxies are generated incorrectly, leading to unexpected missing results at runtime. If a web service call returns no results when results are expected, the generated .NET types associated with the request and response should be examined. Specifically, members of the types may have two .NET attributes assigned. The first, *MessageBodyMemberAttribute*, will often include the proper namespace for the member type. The second, *XmlElementAttribute*, should have the same namespace as *MessageBodyMemberAttribute*. If this is not the case, add the namespace to *XmlElementAttribute*. Moreover, the addition of XML serialization attributes, such as *System.Xml.Serialization.XmlElementAttribute*, may be necessary to correctly name the expected namespace or element. For example, the following generated client code would need to be modified:

```

public partial class getUsersResponse {
    System.ServiceModel.MessageBodyMemberAttribute(Namespace =
        "http://xml.spss.com/pes/userPref/remote", Order = 0)]
    public IBM.SPSS.ManagerUserPref.usersResponse usersResponse;
}

```

The corrected code is as follows:

```

public partial class getUsersResponse {
    [System.ServiceModel.MessageBodyMemberAttribute(Namespace =
        "http://xml.spss.com/pes/userPref/remote", Order = 0)]
    [System.Xml.Serialization.XmlElementAttribute(ElementName="usersRequestResponse")]
    public IBM.SPSS.ManagerUserPref.usersResponse usersResponse;
}

```

## Single sign-on authentication

You can use single sign-on authentication for web service calls by obtaining a service ticket that you include in your SOAP requests.

The general process of using single sign-on authentication for WCF clients includes the following steps:

1. Obtain a ticket-grating ticket (TGT) using .NET or WCF code.
2. Send the TGT to the IBM SPSS Collaboration and Deployment Services Repository server using the SSO Authentication Service `getToken` operation to obtain a service ticket. This ensures that single sign-on authentication occurs on the repository server.
3. Send the service ticket in the SOAP header for all subsequent web services calls from your client application.



---

## Chapter 7. Message header reference

The headers for the transport and packaging layers contain vital information for processing a web service call.

For IBM SPSS Collaboration and Deployment Services, the SOAP headers contain the security information under which the web service call is processed. In addition, the HTTP headers contain information about the client that initiated the web service request.

---

### Security headers

Most IBM SPSS Collaboration and Deployment Services web service calls require security information in the request message.

In general, the structure of this content follows the WS-Security extension to the SOAP 1.1 standard. This documentation provides details on the XML elements and attributes that are recognized by IBM SPSS Collaboration and Deployment Services. Some of the elements and attributes are required, some are optional, and some are ignored. Refer to the following official specifications for details, but IBM SPSS Collaboration and Deployment Services requires some special values not referenced in the official specifications.

- <http://docs.oasis-open.org/wss/v1.1/wss-v1.1-spec-os-SOAPMessageSecurity.pdf>
- <http://docs.oasis-open.org/wss/v1.1/wss-v1.1-spec-os-UsernameTokenProfile.pdf>
- <http://docs.oasis-open.org/wss/v1.1/wss-v1.1-spec-os-KerberosTokenProfile.pdf>

The following table defines the values of namespaces that are used for the SOAP header elements.

*Table 59. SOAP header namespaces*

Namespace prefix	Namespace value
wsse	<a href="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd</a>
wsu	<a href="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd">http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd</a>
soapenv	<a href="http://schemas.xmlsoap.org/soap/envelope/">http://schemas.xmlsoap.org/soap/envelope/</a>
spssec	<a href="http://xml.spss.com/security">http://xml.spss.com/security</a>

### Security element

The `wsse:Security` element is the main security header element included in a `soapenv:Header` element.

*Table 60. Attributes of `wsse:Security`*

Attribute	Description	Example
<code>soapenv:actor</code>	Targets a given endpoint along the message path. This value is ignored.	<a href="http://schemas.xmlsoap.org/soap/actor/next">http://schemas.xmlsoap.org/soap/actor/next</a>
<code>soapenv:mustUnderstand</code>	Clients can specify if the server must process this element. This value is ignored.	0

## UsernameToken element

Use the `wsse:UsernameToken` element when a traditional user and password combination is required.

Table 61. Attributes of `wsse:UsernameToken`

Attribute	Description
<code>wsu:Id</code>	An optional string label for the security token. This value is ignored.

Table 62. Child elements of `wsse:UsernameToken`

Attribute	Description	Example
<code>wsse:Username</code>	The xml value represents the identity of the user.	<code>a_user</code>
<code>wsse:Password</code>	The attribute <code>Type</code> specifies the type of password. <code>PasswordText</code> is currently the only supported type.  The xml value can handle plain text passwords and encrypted data.	<code>myPassword</code> <code>[{AES}KrY+KLIOYo4O6545tgGsYQ==]</code>
<code>wsse:Nonce</code>	The xml value represents a cryptographically random nonce encoded as base64 data. This is currently ignored.	<code>RUx1ugQo0o3g0Xyl+sUEsA==</code>
<code>wsu:Created</code>	The xml value represents the creation time as a timestamp conforming to <code>wsu:Timestamp</code> . This is currently ignored.	<code>2013-10-08T02:09:20Z</code>

## BinarySecurityToken and BinarySecuritySSOToken elements

Binary security tokens may be used when IBM SPSS Collaboration and Deployment Services communicates with itself or when single sign-on (SSO) is used. Customer usage of these token types is limited to SSO.

The `wsse:BinarySecurityToken` and `wsse:BinarySecuritySSOToken` elements have the same format, but only `wsse:BinarySecurityToken` is recognized in the official WS-Security standard. The element `wsse:BinarySecuritySSOToken` was added as a nonstandard element when used in SSO.

Of these two elements, you should use `wsse:BinarySecurityToken` and you must supply the correct attributes for proper handling. The most critical attribute is the `wsu:Id` value which is used during web service request processing to handle the security token correctly.

Table 63. Attributes of `wsse:BinarySecurityToken`

Attribute	Description	Example
<code>ValueType</code>	Indicates the type of the security token. IBM SPSS Collaboration and Deployment Services always writes these values when creating its own XML, but this value is currently ignored during processing. You should use <code>spssec:BinarySecuritySSOToken</code> .	<code>spssec:BinarySecurityToken</code> <code>spssec:BinarySecuritySSOToken</code>

Table 63. Attributes of `wsse:BinarySecurityToken` (continued)

Attribute	Description	Example
EncodingType	Indicates the encoding type for the token. The only currently supported type is base64, so this value should always be <code>wsse:Base64Binary</code> . IBM SPSS Collaboration and Deployment Services always writes these values when creating its own XML, but this value is currently ignored during processing.	<code>wsse:Base64Binary</code>
<code>wsu:Id</code>	An identifier for the token. This value must be correctly provided. You should always provide <code>spssSSOToken</code> . The only valid case for using <code>spssToken</code> is for internal web service calls, which use an internal token format.	<code>spssToken</code> <code>spssSSOToken</code>
anyAttribute	An extension mechanism to allow any arbitrary attribute in other namespaces. These extensions are ignored.	

The XML value for `wsse:BinarySecurityToken` and `wsse:BinarySecuritySSOToken` is string data in base64 format.

## The client-accept-language element

This element restricts the set of natural languages that are preferred as a response to the request.

This element is inserted into a `soapenv:Header` element and is not related to WS-Security in any way. This is the same value found in the HTTP header named `Accept-Language` as defined in RFC2068. The xml value for this element might look like the following:

```
en-US;q=1.0, en;q=0.8
```

The namespace for this element could be any allowed value, such as `ns1`, which has an associated value of `http://xml.spss.com/ws/headers`.

## HTTP headers

In addition to SOAP headers, it is possible to apply HTTP headers as well. None of the HTTP headers is required.

Table 64. HTTP headers

HTTP header	Description
<code>Accept-Language</code>	The accept language header value, as defined in RFC2068 (e.g. <code>en-US;q=1.0, en;q=0.8</code> ). If not supplied the server language setting is used as a default.
<code>CLIENT_ADDR</code>	The client IP address that ultimately initiated the request.
<code>CLIENT_HOSTNAME</code>	The client host name that ultimately initiated the request.
<code>X-FORWARDED-FOR</code>	The client IP address that ultimately initiated the request. This is standard for determining the originating IP address.

The `CLIENT_ADDR`, `CLIENT_HOSTNAME`, and `X-FORWARDED-FOR` values are useful when a client application makes a call through an HTTP proxy, load balancer, or when IBM SPSS Collaboration and Deployment Services components make internal calls. The `CLIENT_ADDR` and `CLIENT_HOSTNAME` entries are specific HTTP headers that can be set by IBM SPSS Collaboration and Deployment Services itself. The `X-FORWARDED-FOR` header is a standard that some load balancers understand. These headers are used to make a best-effort attempt in determining the originating client for a given call, allowing information to be used for auditing purposes. The headers may not work as intended, but IBM SPSS Collaboration and Deployment Services will fall back to reasonable defaults in those situations.

## Appendix. Deprecated features

If you are migrating from an earlier release of IBM SPSS Collaboration and Deployment Services, you should be aware of the various features that have been deprecated since the last version.

If a feature is deprecated, IBM Corp. might remove this capability in a subsequent release of the product. Future investment will be focussed on the strategic function listed under recommended migration action. Typically, a feature is not deprecated unless an equivalent alternative is provided.

The following tables indicate what is deprecated. Where possible, the table also indicates the recommended migration action.

*Table 65. Features deprecated in previous versions*

Deprecation	Recommended migration action
Security Provider: Active Directory with local override, which supports extended groups and allowed users	Use the standard Active Directory security provider with any necessary groups added
IBM SPSS Collaboration and Deployment Services Enterprise View	Use the Analytic Data View feature
IBM SPSS Collaboration and Deployment Services Enterprise View Driver	Use the Analytic Data View feature
Scenario files	Scenario files (.scn) are no longer supported. Enterprise View source nodes cannot be modified in Deployment Manager. Old scenario files can be modified in IBM SPSS Modeler client and resaved as stream files. Also, scoring configurations that used a scenario file must be deleted and recreated based on a stream file.
Web Install for IBM SPSS Deployment Manager	Use the standalone installer
BIRT Report Designer for IBM SPSS	None
BIRT Report Designer for IBM SPSS viewer	None
IBM SPSS Collaboration and Deployment Services Portlet	Use the IBM SPSS Collaboration and Deployment Services Deployment Portal directly, or use the web services APIs
IBM SPSS Collaboration and Deployment Services Web Part	Use the IBM SPSS Collaboration and Deployment Services Deployment Portal directly, or use the web services APIs
Scoring Service V1 API	Scoring Service V2 API
Scheduling Server Service	None
Reporting Service	None
Authentication Service login operation	Authentication Service doLogin operation
Search Service search operation	Search Service search2.5 operation
SPSS AXIS/Castor web services client jar	Use the tools provided with the Java Runtime Environment, Integrated Development Environment, or Eclipse Web Tools Platform (WTP)

For updated information about deprecated features, see the IBM Knowledge Center.



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## Glossary

This glossary includes terms and definitions for IBM SPSS Collaboration and Deployment Services.

The following cross-references are used in this glossary:

- See refers you from a term to a preferred synonym, or from an acronym or abbreviation to the defined full form.
- See also refers you to a related or contrasting term.

To view glossaries for other IBM products, go to [www.ibm.com/software/globalization/terminology](http://www.ibm.com/software/globalization/terminology) (opens in new window).

---

### A

#### **access control list (ACL)**

In computer security, a list associated with an object that identifies all the subjects that can access the object and their access rights.

**ACL** See access control list.

**action** A permission for an aspect of system functionality. For example, the ability to set up notifications is defined as an action. Actions are grouped and assigned to users through roles. See also role.

#### **Active Directory (AD)**

A hierarchical directory service that enables centralized, secure management of an entire network, which is a central component of the Microsoft Windows platform.

**AD** See Active Directory.

#### **allowed user**

A subset of the users defined in a remote directory, such as SiteMinder or Windows Active Directory, that are allowed access to SPSS Predictive Enterprise Services. Allowed users are defined when only a few users in a remote directory need access to the application.

**API** See application programming interface.

#### **appender**

A component that receives logging

requests from a logger and writes log statements to a specified file or console. See also logger.

#### **application programming interface (API)**

An interface that allows an application program that is written in a high-level language to use specific data or functions of the operating system or another program.

---

### B

#### **batch file**

A file that contains instructions that are processed sequentially, as a unit.

#### **binary large object (BLOB)**

A data type whose value is a sequence of bytes that can range in size from 0 bytes to 2 gigabytes less 1 byte. This sequence does not have an associated code page and character set. BLOBs can contain, for example, image, audio, or video data.

**BLOB** See binary large object.

#### **break group**

A set of rows of returned data that are grouped according to a common column value. For example, in a column of states, the rows of data for each state are grouped together.

#### **burst report**

A report that generates multiple output files during a single run by using multiple input parameters taken from break groups in the report.

---

### C

#### **cascading permission**

A permission of a parent folder in the content repository that has been propagated to its child objects.

#### **character large object (CLOB)**

A data type whose value is a sequence of characters (single byte, multibyte, or both) that can range in size from 0 bytes to 2 gigabytes less 1 byte. In general, the CLOB data type is used whenever a

character string might exceed the limits of the VARCHAR data type.

**CLOB** See character large object.

**common warehouse metamodel (CWM)**

A metamodel written to be a common standard by the Object Management Group (OMG).

**content repository**

A centralized location for storing analytical assets, such as models and data. Content repository includes facilities for security and access control, content management, and process automation.

**context data**

Input data that is passed with a scoring request in real time. For example, when a score is requested for a customer based on credit rating and geocode, the credit score and geocode will be the context data for the request.

**credential**

Information acquired during authentication that describes a user, group associations, or other security-related identity attributes, and that is used to perform services such as authorization, auditing, or delegation. For example, a user ID and password are credentials that allow access to network and system resources.

**CWM** See common warehouse metamodel.

---

## D

**data warehouse**

A subject-oriented collection of data that is used to support strategic decision making. The warehouse is the central point of data integration for business intelligence. It is the source of data for data marts within an enterprise and delivers a common view of enterprise data.

**distinguished name (DN)**

The name that uniquely identifies an entry in a directory. A distinguished name is made up of attribute:value pairs, separated by commas. For example, CN=person name and C=country or region.

**DN** See distinguished name.

**Document Object Model (DOM)**

A system in which a structured document, for example an XML file, is viewed as a tree of objects that can be programmatically accessed and updated. See also Simple API for XML.

**document type definition (DTD)**

The rules that specify the structure for a particular class of SGML or XML documents. The DTD defines the structure with elements, attributes, and notations, and it establishes constraints for how each element, attribute, and notation can be used within the particular class of documents.

**DOM** See Document Object Model.

**dormant schedule**

A schedule associated with a deleted or unlabeled version of a job. A dormant schedule cannot be used until it is associated with a valid labeled job version.

**DTD** See document type definition.

---

## E

**EAR** See enterprise archive.

**enterprise archive (EAR)**

A specialized type of JAR file, defined by the Java EE standard, used to deploy Java EE applications to Java EE application servers. An EAR file contains EJB components, a deployment descriptor, and web archive (WAR) files for individual web applications. See also Java archive, web archive.

**execution server**

A server that enables analytical processing of resources stored in the repository. For example, to execute an IBM SPSS Statistics syntax in an IBM SPSS Collaboration and Deployment Services job, an IBM SPSS Statistics execution server must be designated.

**export** The process of storing objects and metadata from the content repository to an external file.

**extended group**

A locally-defined group of remote users. Extended groups are defined when groups in the remote directory are not fine-grained enough.

---

**Extensible Markup Language (XML)**

A standard metalanguage for defining markup languages that is based on Standard Generalized Markup Language (SGML).

**Extensible Stylesheet Language (XSL)**

A language for specifying style sheets for XML documents. Extensible Stylesheet Language Transformation (XSLT) is used with XSL to describe how an XML document is transformed into another document.

---

**F****field content assist**

A feature that provides predefined system and variable values for entry fields.

---

**G****general job step**

A method for running native operating system commands and executable programs on a host or a remote process server. General jobs have access to files stored within the repository and on the file system and can be used to control the input/output of analytical processing.

---

**I****import**

The process of adding objects and metadata defined in an external file generated by export, to the content repository.

**iterative consumer reporting job step**

A job step that is passed a set of input values generated by a preceding iterative producer reporting job step. The report in iterative consumer job step is executed for each tuple in the received data set.

**iterative producer reporting job step**

A job step that generates a set of values passed as input parameters to a following iterative consumer job step.

---

**J**

**JAAS** See Java Authentication and Authorization Service.

**JAR** See Java archive.

**Java archive (JAR)**

A compressed file format for storing all of the resources that are required to install and run a Java program in a single file. See also enterprise archive, web archive.

**Java Authentication and Authorization Service (JAAS)**

In Java EE technology, a standard API for performing security-based operations. Through JAAS, services can authenticate and authorize users while enabling the applications to remain independent from underlying technologies.

**Java Generic Security Services (JGSS)**

A specification that provides Java programs access to the services that include the signing and sealing of messages and a generic authentication mechanism.

**Java Naming and Directory Interface (JNDI)**

An extension to the Java platform that provides a standard interface for heterogeneous naming and directory services.

**JGSS** See Java Generic Security Services.

**JNDI** See Java Naming and Directory Interface.

**job** A mechanism for automating analytical processing. A job consists of job steps, executed sequentially or conditionally. Input parameters can be defined for a job. A job can be run on demand or triggered by time-based or message-based schedules, with records of job execution stored as job history.

**job step**

A discrete unit of processing in a job. Depending on the type, job steps can be run on the content repository host or specially defined execution or remote process servers. Objects stored in the repository or the file system can provide input for a job step, and job step output can be stored in the repository or written to the file system.

---

**K**

**KDC** See key distribution center.

**Kerberos**

A network authentication protocol that is based on symmetric key cryptography. Kerberos assigns a unique key, called a

ticket, to each user who logs on to the network. The ticket is embedded in messages that are sent over the network. The receiver of a message uses the ticket to authenticate the sender.

**key distribution center (KDC)**

A network service that provides tickets and temporary session keys. The KDC maintains a database of principals (users and services) and their associated secret keys. It is composed of the authentication server and the ticket granting ticket server.

**keystore**

In security, a file or a hardware cryptographic card where identities and private keys are stored, for authentication and encryption purposes. Some keystores also contain trusted or public keys.

---

**L**

**LDAP** See Lightweight Directory Access Protocol.

**Lightweight Directory Access Protocol (LDAP)**

An open protocol that uses TCP/IP to provide access to directories that support an X.500 model and that does not incur the resource requirements of the more complex X.500 Directory Access Protocol (DAP). For example, LDAP can be used to locate people, organizations, and other resources in an Internet or intranet directory.

**lock** The process by which integrity of data is ensured by preventing more than one user from accessing or changing the same data or object at the same time.

**logger** A component that prepares log statements to be written to console or log file. See also appender.

---

**M**

**message-based schedule**

A schedule that is used to trigger job execution by an event signalled by a Java Messaging Service (JMS) message. For example, when a job relies on the input from a third-party application, the application must send a JMS message when the input file is ready for processing.

**metamodel**

A model that defines the language for expressing a model.

**meta-object**

An instance of an XMI class as defined in the metamodel.

**meta-object facility (MOF)**

A generalized facility and repository for storing abstract information about concrete object systems; dealing mostly with construction, standardized by the Object Management Group (OMG).

**MIME** See Multipurpose Internet Mail Extensions.

**MOF** See meta-object facility.

**Multipurpose Internet Mail Extensions (MIME)**

An Internet standard that allows different forms of data, including video, audio, or binary data, to be attached to email without requiring translation into ASCII text.

---

**N**

**notification**

A mechanism that is used to generate email messages informing users of specific types of system events, such as changes to content repository objects and processing success and failure. Unlike subscriptions, notifications can be set up to send email to multiple users.

---

**O**

**Object Management Group (OMG)**

A non-profit consortium whose purpose is to promote object-oriented technology and the standardization of that technology. The Object Management Group was formed to help reduce the complexity, lower the costs, and hasten the introduction of new software applications.

**ODS** See Output Delivery System.

**OMG** See Object Management Group.

**Output Delivery System (ODS)**

A method of controlling the destination for output within SAS. ODS can route SAS output to a SAS data file, a text listing file, HTML files, and files optimized for high-resolution printing.

---

## P

### package

An installable unit of a software product. Software product packages are separately installable units that can operate independently from other packages of that software product.

### principal

An entity that can communicate securely with another entity. A principal is identified by its associated security context, which defines its access rights.

---

## R

### remote process server

A remote system that is designated for running native operating system commands and executable programs.

### repository content adapter

An optional software package that enables storing and processing content from other IBM SPSS applications, such as Statistics, Modeler, and Data Collection, as well as third parties.

### repository database

A relational database that is used for storing content repository objects and metadata.

### resource

A content repository object.

### resource definition

A subset of content repository resources used to enable analytical processing, such as definitions of data sources, credentials, execution servers, and JMS message domains.

### role

A set of permissions or access rights. See also action.

---

## S

**SAX** See Simple API for XML.

### schedule

A content repository object that triggers job execution.

### scoring configuration

A configuration that defines model-specific settings for generating

real-time scores, such as input data, processing rules, outputs, logging, etc.

### security provider

A system that performs user authentication. Users and groups can be defined locally (in which case, IBM SPSS Collaboration and Deployment Services itself is the security provider) or derived from a remote directory, such as Windows Active Directory or OpenLDAP.

### service provider interface (SPI)

An API that supports replaceable components and can be implemented or extended by a third party.

### SGML

See Standard Generalized Markup Language.

### shell script

A program, or script, that is interpreted by the shell of an operating system.

### Simple API for XML (SAX)

An event-driven, serial-access protocol for accessing XML documents, used. A Java-only API, SAX is used by most servlets and network programs to transmit and receive XML documents. See also Document Object Model.

### single sign-on (SSO)

An authentication process in which a user can access more than one system or application by entering a single user ID and password.

**SOAP** A lightweight, XML-based protocol for exchanging information in a decentralized, distributed environment. SOAP can be used to query and return information and invoke services across the Internet.

**SPI** See service provider interface.

**SSO** See single sign-on.

### Standard Generalized Markup Language (SGML)

A standard metalanguage for defining markup languages that is based on the ISO 8879 standard. SGML focuses on structuring information rather than presenting information; it separates the structure and content from the presentation. It also facilitates the interchange of documents across an electronic medium.

**stop word**

A word that is commonly used, such as "the," "an," or "and," that is ignored by a search application.

**subscription**

Email notices and Really Simple Syndication (RSS) feeds that repository users create to receive when the state of an asset changes.

---

**T**

**TGT** See ticket-granting ticket.

**ticket-granting ticket (TGT)**

A ticket that allows access to the ticket granting service on the key distribution center (KDC). Ticket granting tickets are passed to the principal by the KDC after the principal has completed a successful request. In a Windows 2000 environment, a user logs on to the network and the KDC will verify the principal's name and encrypted password and then send a ticket granting ticket to the user.

**time-based schedule**

A schedule that triggers job execution at a specified time or date. For example, a time-based schedule may run a job at 5:00 pm every Thursday.

---

**U****Universally Unique Identifier (UUID)**

The 128-bit numeric identifier that is used to ensure that two components do not have the same identifier.

**UUID** See Universally Unique Identifier.

---

**V****Velocity**

A Java-based template engine that provides a simple and powerful template language to reference objects defined in Java code. Velocity is an open source package directed by the Apache Project.

---

**W**

**W3C** See World Wide Web Consortium.

**WAR** See web archive.

**web archive (WAR)**

A compressed file format, defined by the Java EE standard, for storing all the resources required to install and run a web application in a single file. See also enterprise archive, Java archive.

**Web Services Description Language (WSDL)**

An XML-based specification for describing networked services as a set of endpoints operating on messages containing either document-oriented or procedure-oriented information.

**World Wide Web Consortium (W3C)**

An international industry consortium set up to develop common protocols to promote evolution and interoperability of the World Wide Web.

**WSDL**

See Web Services Description Language.

---

**X**

**XMI** See XML Metadata Interchange.

**XML** See Extensible Markup Language.

**XML Metadata Interchange (XMI)**

A model-driven XML integration framework for defining, interchanging, manipulating, and integrating XML data and objects. XMI-based standards are in use for integrating tools, repositories, applications, and data warehouses.

**XSL** See Extensible Stylesheet Language.



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# Index

## Special characters

.NET framework 73  
.NET proxies 5

## A

app.config files  
WCF clients 74

## B

BinarySecuritySSOToken element  
in SOAP headers 78  
BinarySecurityToken element  
in SOAP headers 78  
bindings  
in WSDL files 4  
body elements  
in SOAP messages 2

## C

cancelExecution operation 19  
child columns  
in page results 17  
client-accept-language element  
in SOAP headers 79  
columns  
in page results 17  
Content Repository service  
WCF clients 73  
Content Repository URI service  
WCF clients 73  
Created element  
in SOAP headers 78  
createMessageDrivenJob operation 20  
createSchedule operation 21

## D

daily schedules 10  
deleteJobExecutions operation 23  
deleteJobTrigger operation 24  
deleteJobTriggers operation 25  
deleteSchedule operation 26  
deleteSchedules operation 27  
domains 11  
durable subscriptions 11

## E

event executions 13  
event types  
retrieving 28  
events  
event executions 13  
executions 13  
canceling 19

executions (*continued*)  
deleting 23  
querying 46, 58  
retrieving 29, 32, 33

## F

field names  
in queries 14  
filters  
in queries 16  
finalizeRemoteWork operation 28

## G

getCustomEventTypes operation 28  
getDefault method  
for JobParameter objects 30  
getDescription method  
for JobParameter objects 30  
getExecutionDetails operation 29  
getJobParameters operation 30  
getJobStepChildExecutions operation 32  
getJobStepExecutions operation 33  
getMessageDrivenJob operation 35  
getMessageDrivenJobs operation 37  
getName method  
for JobParameter objects 30  
getSchedule operation 37  
getSchedules operation 38  
getVersion operation 40  
getWorkTypes operation 41  
glossary 87

## H

handleMessageDomainChanged  
operation 42  
header elements  
in SOAP messages 2, 77  
SOAP security elements 77  
Holder classes  
in JAX-WS 5  
hourly schedules 10  
HTTP 2  
HTTP headers  
for SOAP messages 79  
HTTPS 2

## J

Java clients 69, 70, 72  
Java proxies 5  
JAX-WS 5, 69, 70, 72  
JMS 11  
message structure 12  
JobOptions objects 62  
JobParameter objects 30  
JobParameterValue objects 62

JobParameterValues objects 62  
jobs 9  
submitting 61, 62  
variables 10, 30, 62

## L

List collections  
in JAX-WS 5

## M

message domains 11, 42  
message selectors 13  
MessageBodyMemberAttribute  
for WCF clients 75  
messages  
in WSDL files 4  
monthly schedules 10

## N

namespaces  
for SOAP security elements 77  
navigators  
in page results 17  
Nonce element  
in SOAP headers 78

## P

page requests  
in queries 16  
page selectors  
in queries 16  
Password element  
in SOAP headers 78  
PevServices service  
WCF clients 73  
port types  
in WSDL files 4  
Process Management service 7  
stubs 7  
WCF clients 73  
protocols  
in web services 2  
proxies 5  
.NET 5  
Java 5

## Q

queries 14  
filters 16  
page requests 16  
page selectors 16  
return specifiers 16  
queryAllSchedules operation 43  
queryExecutions operation 46

queryJobTriggers operation 49  
querySchedules operation 54  
querySubmittedExecutions operation 58

## R

rerunFailedJobStepIterations  
operation 61  
return specifiers 16  
rows  
in page results 17

## S

schedules 10  
creating 20, 21  
deleting 24, 25, 26, 27  
message-based 11, 20, 24, 25, 35, 37,  
42, 65  
querying 43, 49, 54  
retrieving 35, 37, 38  
time-based 10  
updating 65, 67  
Scoring service  
WCF clients 73  
Security element  
in SOAP headers 77  
selectors  
for JMS messages 13  
services  
in WSDL files 5  
setName method  
for JobParameterValue objects 62  
setNotificationEnabled method  
for JobOptions objects 62  
setParameterValue method  
for JobParameterValues objects 62  
setParameterValues method  
for JobOptions objects 62  
setValue method  
for JobParameterValue objects 62  
single sign-on  
for WCF clients 76  
WCF clients 73  
SOAP 2  
SOAPHandler 70  
sorting  
in queries 16  
SSO  
*See* single sign-on  
stubs  
Process Management service 7  
submitJob operation 61  
submitJobWithOptions operation 62  
submitting  
jobs 61, 62  
work 64  
submitWork operation 64  
subscriptions  
durable 11

## T

types  
in WSDL files 3

## U

updateMessageDrivenJob operation 65  
updateSchedule operation 67  
Username element  
in SOAP headers 78  
UsernameToken element  
in SOAP headers 78

## V

Visual Studio 73

## W

WCF clients 73, 75, 76  
endpoint behaviors 75  
endpoint configuration 74  
limitations 73  
service reference 73  
single sign-on 73  
web services  
introduction to web services 1  
protocol stack 2  
system architecture 1  
what are web services? 1  
web.config files  
WCF clients 74  
weekly schedules 10  
Windows Communication  
Foundation 73  
work  
submitting 64  
types 41  
WSDL files 2, 3  
bindings 4  
messages 4  
port types 4  
services 5  
types 3  
wsdl.exe 5  
wsdl2java 5  
wsimport 5, 69

## X

XmlElementAttribute  
for WCF clients 75

## Y

yearly schedules 10





Printed in USA