Oracle Communications® ASAP™ Cartridge 1.0
GA Release for RIM BlackBerry (XML) 2.1

RIM BlackBerry 2.1 (XML) Cartridge Guide

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Cartridge Overview

ASAP cartridges are discrete software components that are developed for the ASAP product. An ASAP cartridge offers specific domain behavior on top of the core ASAP software, and provides the configuration that supports a set of services on a network element (NE).

An ASAP cartridge is not a stand-alone component, but operates in conjunction with the ASAP core product. ASAP cartridges offer the following benefits:

- **Reduced Time to Market** - time to market of new services is reduced through simplified development, implementation, and extension of cartridges on customer sites.
- **Extendable** - cartridges can be extended to include additional services and components that deliver business value, without requiring changes to the original cartridge.
- **Simplified Effort** - the effort and technical knowledge that is required to perform customizations is reduced.
- **Ease of Installation** - cartridges can be installed into an ASAP environment without interfering with the existing install base.

An ASAP cartridge can be used to configure ASAP to provision the following:

- NEs from a specific vendor, such as Nortel or Lucent.
- Technologies, such as Asynchronous Transfer Mode (ATM) and Frame Relay switches, or Internet Protocol (IP) routers.
- Services that are supported on the NE, such as ATM, IP Virtual Private Networks (VPN), Wireless, or Optical.

Cartridges are designed for a specific technology, software load, and service.

An ASAP cartridge supports a particular set of services on an NE. These services are independent of customer-specific service definitions. Professional Services or systems integrators can perform extensions to the cartridge to support customer-specific requirements.

Cartridge content

An ASAP cartridge contains the following:

- Sample NE configuration
- A set of scripts, such as State Tables or Java methods

- A set of atomic actions in the form of Atomic Service Description Layer (ASDL) commands
- A set of Common Service Description Layer (CSDL) commands that form meaningful services
- Sample work orders
- Installation scripts

Prerequisites

System integrators such as managers, designers, programmers, and testers who are responsible for the adaptation and integration of ASAP-based solutions should use this manual as a reference. It assumes that readers possess the following skills:

- A knowledge of ASAP programming concepts
- A good working knowledge of the UNIX operating system
- A thorough understanding of service and network provisioning
- Familiarity with telecommunications

About this guide

This guide provides a detailed description of the RIM BlackBerry cartridge. It contains overview and technical information to assist with extending and integrating the cartridge into a customer environment.

The scope of this guide includes ASAP as it pertains to the use of this cartridge. It is not intended to be a complete ASAP reference guide.

For additional information when using this cartridge, refer to the following supporting documentation:

- **Activation documentation set**—for detailed information on the ASAP component.

The RIM BlackBerry cartridge provides the ASAP service configuration and network element (NE) interface to activate subscriber services on NE_RIM-BLACKBERRY_2-1-HOST NEs.

Services, features, and options

This cartridge supports the following services:

Table 1: Supported services

Service	Description
Activate BlackBerry service	This service activates the BlackBerry service.
Cancel BlackBerry service	This service cancels the BlackBerry service.
Modify BlackBerry non-billing item	This service modifies the BlackBerry non-billing item.
Modify BlackBerry billing item (IMSI)	This service modifies the BlackBerry billing item.
Query (status) BlackBerry service	This services queries the BlackBerry service.
Resume BlackBerry service	This service resumes the BlackBerry service.
Suspend BlackBerry service	This service suspends the BlackBerry service.

Hardware and software requirements

The following sections contain the high-level software and hardware environment requirements for provisioning subscriber services on authentication center including:

- Network element (NE) interface
- ASAP version

Network element (NE) interface

The following database tables in SARM are configured to support the NE configuration:

- tbl_host_clli
- tbl_clli_route
- tbl_comm_param
- tbl_resource_pool
- tbl_ne_config

ASAP version

This cartridge was developed and tested using ASAP version 4.7.2.

For more information on the operating environment of this ASAP version, refer to the ASAP version 4.7.2 Release Record.

Connecting to the NE

The cartridge uses XML over secure HTTP (HTTPS) protocol. Apache HttpClient component (part of Jakarta Commons project) has been used to implement the client (cartridge) side.

Related documentations

This cartridge was developed according to the following Network Element Provisioning Specifications:

- XML Development Tips.doc
- XML_Interface_Specification_21.doc

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Installing and Testing the Cartridge

This chapter describes the following procedures related to installing and testing the cartridge:

- Downloading the cartridge
- Installing the cartridge using scripts
- Uninstalling the cartridge using scripts
- Testing the cartridge installation
- Deployment of the cartridge using Studio
- Uninstallation and Undeployment of the cartridge using Studio

Downloading the cartridge

Before you can install the cartridge, you must use the internet to download the cartridge's TAR file from Oracle's Customer Portal.

Use the following instructions to download, then unTAR the TAR file.

To download the TAR file

1. Login to Oracle MetaLink internet home page (http://www.metalink.oracle.com).
2. Download the cartridge patch to your workstation.

To unTAR the TAR file

1. On your workstation, create a repository directory—the naming of which is your choice.

```
mkdir <repository dir>
```

2. Copy the TAR file to the repository directory.
3. Untar RIMBlackberryXML_2_1_R1_0_0.<buildId>.tar.

```
tar xvf RIMBlackberryXML_2_1_R1_0_0.<buildId>.tar
```

The directory structure in the repository directory should look like the following illustration. (this illustration describes the minimum required structure; you can enhance this directory structure with additional directories based on your requirements and deliverables).

```
<repository_directory>
       /README
       /installCartridge
       /uninstallCartridge
```

```
/RIMBlackberry.sar
```

Starting ASAP

Before installing the cartridge, ensure that ASAP is running.

To start ASAP

1. To start ASAP, execute the following script:

   ```
   start_asap_sys
   ```

2. Ensure the ASAP Daemon (DAM_$ENV_ID) is running by checking the ASAP status using the ASAP script “status”.
3. Check whether the WebLogic instance for this ASAP environment is running. If not, start the WebLogic instance.

The *ASAP Administration Guide* contains more information on starting ASAP, the ASAP Daemon, and WebLogic.

Installing the cartridge using scripts

Run the installation script *installCartridge* to install the cartridge. The script executes the following tasks:

- Configures the RIM BlackBerry-specific NE using the SACT.
- Deploys the RIM BlackBerry cartridge service model (only if the RIM BlackBerry service model is not yet deployed) using the Service Activation Deployment Tool (SADT).
- Copies the RIM BlackBerry-specific jar files to the ASAP environment.
- Loads the sample work orders to the SRP database.

For information on the SACT and the SADT, refer to the *ASAP Administration Guide*.

To install the cartridge

1. Run the installCartridge script. At the prompt, type:

   ```
   installCartridge RIMBlackberry.sar
   ```

2. The script prompts you for the values of the following WebLogic login parameters:

   - WebLogic Hostname
   - WebLogic HTTP Port
   - WebLogic Login User ID
   - WebLogic Login Password

   The script loads the NEP-NE configuration and the CSDL-ASDL configuration to the SARM database, and loads sample work orders to the SRP database. The script also copies the cartridge-specific jar files to the ASAP environment.

3. Copy studio_2_6_0.jar file to the $ASAP_BASE/lib directory.
4. Add ${ASAP_BASE}/lib/studio_2_6_0.jar to the CLASSPATH in the JInterpreter file under $ASAP_BASE/programs directory.
5. Restart ASAP to upload the cartridge configuration into ASAP.

Uninstalling the cartridge using scripts

Run the uninstallation script *uninstallCartridge* to uninstall the RIM BlackBerry cartridge. The script executes the following tasks:

- Unconfigures RIM BlackBerry-specific NEs using the SACT.
- Undeploys the RIM BlackBerry cartridge service model (only if the RIM BlackBerry service model is already deployed) using the Service Activation Deployment Tool (SADT).
- Removes the RIM BlackBerry-specific jar files from the ASAP environment.

For more information on the SACT and the SADT, refer to the *ASAP Administration Guide*.

To uninstall the cartridge

1. Run the *uninstallCartridge* script. At the prompt, type:

   ```
   uninstallCartridge RIMBlackberry.<timestamp>.sar
   ```

2. The script prompts you for the values of the following parameters:
   - WebLogic Hostname
   - WebLogic HTTP Port
   - WebLogic Login User ID
   - WebLogic Login Password

The script unloads the NEP-NE configuration and CSDL-ASDL configuration from SARM database. It also removes the cartridge specific jar files from the ASAP environment.

Testing the cartridge installation

To test this cartridge installation, you need to know about the network element (NE), services, and basic Activation configuration. You may need to perform adjustments to provision a service for a specific NE, network, or connectivity configuration.

You can test the cartridge installation using one of the following methods:

- **Loopback mode**—does not actually connect to or send commands to the NE.
- **Live mode**—connects to and sends commands to a live NE.

Configuring loopback and live mode parameters

Set the following variables to test the cartridge in loopback or live testing modes.

Loopback mode

Set the following parameter to test the cartridge in loopback mode.

Table 2: Loopback Mode Parameter Settings

Configuration Variable	Parameter Settings	Location
LOOPBACK_ON	1 (default setting)	ASAP.cfg

Live mode

Set the following parameter to test the cartridge in live mode.

Table 3: Live Mode Parameter Settings

Configuration Variable	Parameter Settings	Location
LOOPBACK_ON	0	ASAP.cfg

Communication parameters

The following are the list of parameters for the sample NE configuration XML used by SACT.

Table 4: Communication parameters

param_label	param_value	param_desc
BB_USER	telstraari	User login
BB_PASSWORD	asap123	User password
BB_URL	https://provisioning.etr.blackberry.net/ari/submitXML	Target(provisioning) URL
CONNECTION_TIMEOUT	20	Connection timeout
READ_TIMEOUT	30	Read (socket) timeout
RESPONSELOG	true	When on, will log NE conversation (cmd and response)
PROXY_HOST	http-gw.fwall.telstra.com.au	Proxy remote host
PROXY_PORT	80	Proxy port
PROXY_TUNNELING_ENABLED	true	Flag for proxy tunneling
PROXY_AUTH_TYPE	BASIC	Proxy Authentication Type
PROXY_USER	ACCOUNT-01_UserID	Proxy user
PROXY_PASSWORD	password	Proxy Password

Modifying NE_RIM-BLACKBERRY_2-1-HOST.xml

Use the following procedure to modify NE_RIM-BLACKBERRY_2-1-HOST.xml.

To modify NE_RIM-BLACKBERRY_2-1-HOST.xml

1. Create a new source directory. You can give this directory any appropriate, meaningful name you want to.

   ```
   mkdir <new_source_directory>
   ```

2. Copy RIMBlackberry.sar to this new source directory.

   ```
   cp RIMBlackberry.sar ./<new_source_directory>
   ```

3. Change directory to <new_source_directory>.

   ```
   cd <new_source_directory>
   ```

4. Un-jar RIMBlackberry.sar. This extracts the contents of the sar file.

   ```
   jar xvf RIMBlackberry.sar
   ```

5. Edit <new_source_directory>NE_RIM-BLACKBERRY_2-1-HOST.xml in with the appropriate changes.

6. Create a new sar file at the <new_source_directory> level.

   ```
   CreateSar $PWD
   ```

7. Uninstall the cartridge using RIMBlackberry.sar. (That is, use the original sar file that you copied in Step 2 above—see "Uninstalling the cartridge using scripts" on page 7 for uninstallation instructions).

8. After you uninstall the cartridge, rename the sar file, so you have a backup copy of it.

9. Copy the new sar file from <new_source_directory>.

10. Reinstall the cartridge (see "Installing the cartridge using scripts" on page 7 for installation instructions).

Testing the installation

The following procedure describes the steps required to test the cartridge installation in loopback mode. We recommend that you perform the initial cartridge installation test in loopback mode.

To test in loopback mode

1. Stop ASAP by typing the following command at the UNIX prompt:

   ```
   stop_asap_sys
   ```

2. Ensure loop back mode is on. See "Loopback mode" on page 8 for a description of how to set the loop back parameter to "On".

3. Start ASAP by typing:

   ```
   start_asap_sys
   ```

4. Send the sample work orders through the SRP Emulator by typing:

```
run_suite $SRP <ctrl_password> <suite name>
```

You can locate the suite names by typing:

```
grep SUITE * | grep -v END
```

A list of all available suites appears.

For more information on the SRP Emulator, refer to the *ASAP Administration Guide*.

5. Verify the status of the sample work orders by typing:

   ```
   asap_utils l
   ```

   All successful work orders returns to the 104 state.

   To view the sample work orders provided with this cartridge, refer to the RIM BlackBerry cartridge source.

Viewing the sample work orders

You find the sample work orders under the **SampleWorkOrders** directory in the sar file. The following procedure describes how to view the sample work orders.

To view the sample work orders

1. Create a repository directory, copy the sar file to the new directory and un-jar the sar file, as described by Step 1 through Step 4 in "Modifying NE_RIM-BLACKBERRY_2-1-HOST.xml" on page 9.
2. Locate and view the sample work order files.

Deployment of the cartridge using Studio

Before installing the cartridge, ensure weblogic and ASAP are started and running.

The following are the steps involved:

1. Open Studio in design perspective. Choose **Import** from the **File** menu and select **Activation Archive (SAR)** under **Studio Wizards** to import the sar file. Browse for the path to the sar file and click **Finish**.
2. Create a new **Service Activation Project**.
3. Define a new **NE Entity**, based on the **NE Template** contained in the cartridge provided by Oracle.
4. Ensure that the primary pool of the newly created NE is different from the NE template primary pool. You can modify it, if necessary.
5. Ensure that the test work order provided with the cartridge targets the newly defined NE. If not, then modify the test work orders file(s).

6. Create a new **Activation Environment Project** from the **Studio** menu. (Use Studio help for more information).
7. Create **Activation Environment** inside the **Activation Environment Project** and configure the **Connection Details** tab with your Environment ID, Activation version and weblogic data.
8. Connect to your environment using the **Connect** button.
9. Select the **Cartridge** tab of the **Activation Environment** and click **Add** to add your projects to the environment. The cartridge and the newly created **Service Activation** should appear in the **Cartridges** list.
10. Deploy the **NetworkActivation** (NA) cartridge provided by Oracle. (No NE information is to be deployed with this cartridge, therefore it isn't necessary to deploy the **NEP map** info).
11. Deploy the **Service Activation** (SA) project as follows:
    - On the **Cartridge** tab, select the necessary SA cartridge and press the **Deploy** button.
    - Select the **NEP Map** tab of the **Activation Environment**. Choose the necessary **NEP** server from the drop-down box of the **Network Element Processors**.(Use Studio help for more information).
    - Select the SA cartridge from the **Network Element Processor Map** and click the **Deploy** button.
12. Verify the **SADT** console to confirm the installation.
13. Go to ASAP environment.
14. Copy studio_2_6_0.jar file to the $ASAP_BASE/lib directory.
15. Add ${ASAP_BASE}/lib/studio_2_6_0.jar to the CLASSPATH in the JInterpreter file under $ASAP_BASE/programs directory.
16. Restart **ASAP** in order to start working with the cartridge.

Uninstallation and Undeployment of the cartridge using Studio

The following are the steps involved:

1. Connect to your environment using the **Connect** button.
2. Select the necessary cartridge from the **Environment Cartridge** list in Studio 2.6 and click the **Undeploy** button.
3. Verify the **Environment Cartridge** list. The check box with the name of the cartridge that is disabled should be unchecked.

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Atomic Service Description Layer (ASDL) Commands

ASDL commands represent a set of atomic actions that ASAP can perform on a network element (NE). ASAP can combine ASDLs to create meaningful services (CSDLs) within a cartridge.

This chapter presents detailed information on the ASDL parameters that we provide with this cartridge. The following table lists and describes the type of parameter information that is included.

Table 5: ASDL parameter information

Item	Description
Parameter Name	Identifies the parameter that is configured for the stated service.
Description	Describes the parameter.
Range	Describes or lists the range of values that can be used to satisfy this parameter.
Default Value	Configures a default value for the parameter so that it is not mandatory for the upstream system to provide a value.

Table 5: ASDL parameter information

Item	Description
Type	Indicates one of the following parameter types: ◆ S—Scalar, specifies the parameter label transmitted on the ASDL command. Scalar parameters are conventional name-value pair parameters. ◆ C—Compound, specifies the base name of the compound parameter transmitted on the ASDL command. A compound parameter contains structures or arrays of information that are represented by a particular structure name or compound parameter name. Each compound parameter can contain a large number of elements. If you use compound parameters, you only require a single entry in the ASAP translation tables to call the compound parameter and all its associated parameter elements. ◆ I—Indexed, identifies a parameter that contains a sequential numerical index value to tell the SARM that it should execute the same operation (for example, an ASDL command) for all occurrences of that index. Consequently, if there are several options on a particular CSDL command (OPT1, OPT2, OPT3, etc.), you can specify the OPT parameter as an indexed parameter. When you specify the OPT parameter as an indexed parameter, the SARM generates several occurrences of that same ASDL command and each command has a different value for the option being transmitted to the NEP. For more information on parameter types, refer to the *ASAP Developer Reference*.
Class	Indicates one of the following parameter classifications: ◆ R—Required scalar parameter ◆ O—Optional scalar parameter ◆ C—Required compound parameter ◆ N—Optional compound parameter ◆ M—Mandatory indexed parameter ◆ I—Optional indexed parameter ◆ S—Parameter count

For a detailed description of the Required and Optional parameter classifications, refer to the *ASAP Administration Guide.*

ASDL commands

This cartridge provides the following ASDL commands:

- A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE
- A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE-RB
- A_RIM-BLACKBERRY_2-1_CANCEL_BBSERVICE
- A_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE
- A_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE-RB
- A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE
- A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE-RB
- A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE
- A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE-RB
- A_RIM-BLACKBERRY_2-1_RESUME_BBSERVICE
- A_RIM-BLACKBERRY_2-1_SUSPEND_BBSERVICE

A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE

Activates the BlackBerry service.

It is implemented by the following Java method:

com.mslv.activation.cartridge.rim.blackberry.x2_1.bbservice.activate.generated.ActivateBbserviceProxy.execute.

Table 6: A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	Network element identifier.	String(80)		S	R
IMSI	International mobile subscriber identity.	String(15)		S	R
MSISDN	Mobile station international subscriber directory number.	String(20)		S	O
IMEI	International mobile equipment number.	String(15)		S	O
BILLING_ID	Billing identifier.	String(40)		S	O

Table 6: A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
BILLING_COMMENT	Billing comment.	String(40)		S	O
PIN	Device PIN.	String(20)		S	O
ICCID	Integrated circuit card ID.	String(20)		S	O
ESN	Electronic subscriber number.	String(15)		S	O
SIM_ID	SIM card ID.	String(20)		S	O
SERVICE	BlackBerry service.	Customer specific. Example:"Prosumer", "Enterprise" ,"Enterprise Plus", " Internet Browsing"		I	O
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O

MML Commands

Sample 1:

```
<?xml version="1.0" encoding="UTF-8"?>
<!--ProvisioningRequest.xml-->
<!DOCTYPE ProvisioningRequest SYSTEM "ProvisioningRequest.dtd">
<ProvisioningRequest TransactionId="0000000332" Version="1.2"
TransactionType="Activate" ProductType="BlackBerry">
<Header>
<Sender>
<Login>telstraari</Login>
<Password>asap123</Password>
</Sender
<TimeStamp>2001-11-15T13:18:08-08:00</TimeStamp>
</Header>
<Body>
<ProvisioningEntity name="subscriber">
```

```
<ProvisioningDataItem name="MSISDN">4168709121</ProvisioningDataItem>
<ProvisioningDataItem name="IMEI">001020000312470</ProvisioningDataItem>
<ProvisioningDataItem name="IMSI">0103400000000598664</ProvisioningDataItem>
</ProvisioningEntity>
</Body>
</ProvisioningRequest>
```

Sample 2:

```
<?xml version="1.0" encoding="UTF-8"?>
<!--ProvisioningRequest.xml-->
<!DOCTYPE ProvisioningRequest SYSTEM "ProvisioningRequest.dtd">
<ProvisioningRequest TransactionId="0000000332" Version="1.2"
TransactionType="Activate" ProductType="BlackBerry">
<Header>
<Sender id="101" name="WirelessCarrier" >
<Login>wirelesscarrier</Login>
<Password>pwd1dwp</Password>
</Sender>
<TimeStamp>2001-11-15T13:18:08-08:00</TimeStamp>
</Header>
<Body>
<ProvisioningEntity name="subscriber">
<ProvisioningDataItem name="IMSI">0103400000000598664</ProvisioningDataItem>
<ProvisioningEntity name="service">
<ProvisioningDataItem name="ServiceName">Prosumer</ProvisioningDataItem>
</ProvisioningEntity>
</ProvisioningEntity>
</Body>
</ProvisioningRequest>
```

Sample 3:

```
<?xml version="1.0" encoding="UTF-8"?>
<!--ProvisioningRequest.xml-->
<!DOCTYPE ProvisioningRequest SYSTEM "ProvisioningRequest.dtd">
<ProvisioningRequest TransactionId="0000000332" Version="1.2"
TransactionType="Activate" ProductType="BlackBerry">
<Header>
<Sender id="101" name="WirelessCarrier" >
<Login>wirelesscarrier</Login>
<Password>pwd1dwp</Password>
</Sender>
```

```
<TimeStamp>2001-11-15T13:18:08-08:00</TimeStamp>
</Header>
<Body>
<ProvisioningEntity name="subscriber">
<ProvisioningDataItem name="IMSI">010340000000598664</ProvisioningDataItem>
<ProvisioningEntity name="service">
<ProvisioningDataItem name="ServiceName">Prosumer</ProvisioningDataItem>
</ProvisioningEntity>
<ProvisioningEntity name="service">
<ProvisioningDataItem name="ServiceName">Internet Browsing</
ProvisioningDataItem>
</ProvisioningEntity>
</ProvisioningEntity>
</Body>
</ProvisioningRequest>
```

Output Parameters

Returns as CSDL parameter:

A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE_UDET=<user defined exit type>

Returns as INFO parameter:

A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE__RETURN_INFO=<NE error code>:<NE error description>

A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE-RB

Rollback action for the activate BlackBerry service option.

It is implemented by the following Java method:

com.mslv.activation.cartridge.rim.blackberry.x2_1.bbservice_rb.activate.generated.ActivateBbserviceRbProxy.execute.

Table 7: A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE-RB

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	Network element identifier.	String(80)		S	R

Table 7: A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE-RB

Parameter Name	Description	Range	Default Value	Type	Class
IMSI	International mobile subscriber identity.	String(15)		S	R
OLD_MSISDN	Old mobile station international ISDN number.	String(20)		S	O
OLD_IMEI	Old international mobile equipment number.	String(15)		S	O
OLD_BILLING_ID	Old billing identifier.	String(40)		S	O
OLD_BILLING_COMMENT	Old billing comment.	String(40)		S	O
OLD_PIN	Old device PIN.	String(20)		S	O
OLD_ICCID	Old integrated circuit card ID.	String(20)		S	O
OLD_ESN	Old electronic subscriber number.	String(15)		S	O
OLD_SIM_ID	OLD_SIM card ID.	String(20)		S	O
OLD_SERVICE	Old BlackBerry service.	Customer specific. Example:"Prosumer", “Enterprise”,“Enterprise Plus", " Internet Browsing"		C	O
OLD_SERVICESTATUS	Old service status.			C	N
DATA_DELETED	Internal flag indicating that data has been modified on the NE.	Y/y or N/n		S	O

MML Commands

```
See sample XML request for direct Activate action
```

Output Parameters

Return as CSDL parameter:

A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE-RB_UDET=<user defined exit type>

Return as info parameter:

A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE-RB_RETURN_INFO=<NE error code>:<NE error description>

A_RIM-BLACKBERRY_2-1_CANCEL_BBSERVICE

Cancels the BlackBerry service.

It is implemented by the following Java method:

com.mslv.activation.cartridge.rim.blackberry.x2_1.bbservice.cancel.generated.CancelBbserviceProxy.execute.

Table 8: A_RIM-BLACKBERRY_2-1_CANCEL_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	Network element identifier.	String(80)		S	R
IMSI	International mobile subscriber identity.	String(15)		S	R
MSISDN	Mobile station international subscriber directory number.	String(20)		S	O
IMEI	International mobile equipment number.	String(15)		S	O
BILLING_ID	Billing identifier.	String(40)		S	O
BILLING_COMMENT	Billing comment.	String(40)		S	O
PIN	Device PIN.	String(20)		S	O
ICCID	Integrated circuit card ID.	String(20)		S	O

Table 8: A_RIM-BLACKBERRY_2-1_CANCEL_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
ESN	Electronic subscriber number.	String(15)		S	O
SIM_ID	SIM card ID.	String(20)		S	O
SERVICE	BlackBerry service.	Customer specific. Example:"Prosumer", "Enterprise" ,"Enterprise Plus", " Internet Browsing"		I	O
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O

MML Commands

```
<?xml version="1.0" encoding="UTF-8"?>
<!--ProvisioningRequest.xml-->
<!DOCTYPE ProvisioningRequest SYSTEM "ProvisioningRequest.dtd">
<ProvisioningRequest TransactionId="0000000333" Version="1.2"
TransactionType="Cancel" ProductType="BlackBerry">
<Header>
<Sender>
<Login>telstraari</Login>
<Password>asap123</Password>
</Sender
<TimeStamp>2001-11-15T15:45:12-08:00</TimeStamp>
</Header>
<Body>
<ProvisioningEntity name="subscriber">
<ProvisioningDataItem name="IMSI">010340000000598664</ProvisioningDataItem>
</ProvisioningEntity>
</Body>
</ProvisioningRequest>
```

Output Parameters

Return as CSDL parameter:

A_RIM-BLACKBERRY_2-1_CANCEL_BBSERVICE_UDET=<user defined exit type>

Return as info parameter:

_RIM-BLACKBERRY_2-1_CANCEL_BBSERVICE_RETURN_INFO=<NE error code>:<NE error description>

A_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE

Modifies the billing ID for BlackBerry service.

It is implemented by the following Java method:

com.mslv.activation.cartridge.rim.blackberry.x2_1.bbservice.modifyimsi.generated.ModifyimsiBbserviceProxy.execute.

Table 9: A_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	Network element identifier.	String(80)		S	R
BILLING_ID	Billing Identifier	String(40)		S	R
OLD_BILLING_ID	Old billing ID.	String(40)		S	R
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O

MML Commands

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE ProvisioningRequest SYSTEM "ProvisioningRequest.dtd">
<ProvisioningRequest TransactionId="26" Version="1.2"
TransactionType="Modify" ProductType="BlackBerry">
<Header>
<Sender>
<Login>telstraari</Login>
<Password>asap123</Password>
</Sender>
```

```
<TimeStamp>2007-01-15T19:41:03.59Z</TimeStamp>
</Header>
<Body>
<ProvisioningEntity name="subscriber">
<ProvisioningDataItem name="BillingId">505011111112222</
ProvisioningDataItem>
<ProvisioningDataItem name="OldBillingId">505010000000000</
ProvisioningDataItem>
</ProvisioningEntity>
</Body>
</ProvisioningRequest>
```

Output Parameters

Return as CSDL parameter:

A_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE_UDET=<user defined exit type>

Return as info parameter:

A_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE_RETURN_INFO=<NE error code>:<NE error description>

A_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE-RB

Rollback functionality for the modify billing ID action.

It is implemented by the Java method:

com.mslv.activation.cartridge.rim.blackberry.x2_1.bbservice_rb.modifyimsi.generated.ModifyimsiBbserviceRbProxy.execute

Table 10: A_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE-RB

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	Network element identifier.	String(80)		S	R
BILLING_ID	Billing ID.	String(40)		S	R

Table 10: A_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE-RB

Parameter Name	Description	Range	Default Value	Type	Class
OLD_MSISDN	Old Mobile Station International ISDN Number.	String(20)		S	O
OLD_IMEI	Old International Mobile Equipment Number.	String(15)		S	O
OLD_BILLING_ID	Old Billing Identifier.	String(40)		S	O
OLD_BILLING_COMMENT	Old Billing Comment.	String(40)		S	O
OLD_PIN	Old Device PIN.	String(20)		S	O
OLD_ICCID	Old Integrated Circuit Card ID.	String(20)		S	O
OLD_ESN	Old Electronic Subscriber Number.	String(15)		S	O
OLD_SIM_ID	OLD_SIM Card ID.	String(20)		S	O
OLD_SERVICE	Old BlackBerry Service.	Customer specific. Example:"Prosumer", "Enterprise" ,"Enterprise Plus", " Internet Browsing"		C	N
OLD_SERVICESTATUS	Old service status.			C	N

MML Commands

```
Depending on the initial NE data, in order to restore initial status,
several or all of this commands will be executed: cancel, activate, suspend.
See XML requests for these commands for samples
```

Output Parameters

Return as CSDL parameter:

A_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE-RB_UDET=<user defined exit type>

Return as info parameter:

A_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE-RB_RETURN_INFO=<NE error code>:<NE error description>

A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE

Modifies BlackBerry service.

It is implemented by the following Java method: **com.mslv.activation.cartridge.rim.blackberry.x2_1.bbservice.modify.generated.ModifyBbserviceProxy.execute.**

Table 11: A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	Network element identifier.	String(80)		S	R
IMSI	International mobile subscriber identity.	String(15)		S	R
MSISDN	Mobile station international subscriber directory number.	String(20)		S	O
IMEI	International mobile equipment number.	String(15)		S	O
BILLING_ID	Billing identifier.	String(40)		S	O
BILLING_COMMENT	Billing comment.	String(40)		S	O
PIN	Device PIN.	String(20)		S	O
ICCID	Integrated circuit card ID.	String(20)		S	O
ESN	Electronic subscriber number.	String(15)		S	O
SIM_ID	SIM card ID.	String(20)		S	O

Table 11: A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
SERVICE	BlackBerry service.	Customer specific. Example:"Prosumer", "Enterprise" ,"Enterprise Plus", " Internet Browsing"		I	O
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O

MML Commands

```
Sample 1:(modify a non-billing identifier, here MSISDN)
<?xml version="1.0" encoding="UTF-8"?>
<!--ProvisioningRequest.xml-->
<!DOCTYPE ProvisioningRequest SYSTEM "ProvisioningRequest.dtd">
<ProvisioningRequest TransactionId="0000000336" Version="1.2"
TransactionType="Modify" ProductType="BlackBerry">
<Header>
<Sender>
<Login>telstraari</Login>
<Password>asap123</Password>
</Sender
<TimeStamp>2001-11-15T22:40:10-08:00</TimeStamp>
</Header>
<Body>
<ProvisioningEntity name="subscriber">
<ProvisioningDataItem name="IMSI">010340000000598664</ProvisioningDataItem>
<ProvisioningDataItem name="MSISDN">4168709121</ProvisioningDataItem>
</ProvisioningEntity>
</Body>
</ProvisioningRequest>
Sample 2(change the service):
<?xml version="1.0" encoding="UTF-8"?>
<!--ProvisioningRequest.xml-->
```

```
<!DOCTYPE ProvisioningRequest SYSTEM "ProvisioningRequest.dtd">
<ProvisioningRequest TransactionId="0000000332" Version="1.2"
TransactionType="Modify" ProductType="BlackBerry">
<Header>
<Sender id="101" name="WirelessCarrier" >
<Login>wirelesscarrier</Login>
<Password>pwd1dwp</Password>
</Sender>
<TimeStamp>2001-11-15T13:18:08-08:00</TimeStamp>
</Header>
<Body>
<ProvisioningEntity name="subscriber">
<ProvisioningDataItem name="IMSI">010340000000598664</ProvisioningDataItem>
<ProvisioningEntity name="service">
<ProvisioningDataItem name="ServiceName">Prosumer</ProvisioningDataItem>
</ProvisioningEntity>
</ProvisioningEntity>
</Body>
</ProvisioningRequest>
```

Output Parameters

Return as CSDL parameter:

A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE_UDET=<user defined exit type>

Return as info parameter:

A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE_RETURN_INFO=<NE error code>:<NE error description>

A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE-RB

Modifies BlackBerry service, which is used for rollback.

It is implemented by the following Java method:

com.mslv.activation.cartridge.rim.blackberry.x2_1.bbservice_rb.modify.generated.ModifyBbserviceRbProxy.execute.

Table 12: A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE-RB

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	Network element identifier.	String(80)		S	R
IMSI	International mobile subscriber identity.	String(15)		S	R
OLD_MSISDN	Old mobile station international ISDN number.	String(20)		S	O
OLD_IMEI	Old international mobile equipment number.	String(15)		S	O
OLD_BILLING_ID	Old billing identifier.	String(40)		S	O
OLD_BILLING_COMMENT	Old billing comment.	String(40)		S	O
OLD_PIN	Old device PIN.	String(20)		S	O
OLD_ICCID	Old integrated circuit card ID.	String(20)		S	O
OLD_ESN	Old electronic subscriber number.	String(15)		S	O
OLD_SIM_ID	OLD_SIM card ID.	String(20)		S	O
OLD_SERVICE	Old BlackBerry service.	Customer specific. Example:"Prosumer", "Enterprise" ,"Enterprise Plus", " Internet Browsing"		C	N
OLD_SERVICESTATUS	Old service status.			C	N
DATA_MODIFIED	Internal flag indicating that data has been modified on the NE.	Y/y or N/n		S	O

MML Commands

```
See sample XML request for direct Modify action
```

Output Parameters

Return as CSDL parameter:

A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE-RB_UDET=<user defined exit type>

Return as INFO parameter:

A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE-RB_RETURN_INFO=<NE error code>:<NE error description>

A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE

Queries the BlackBerry service.

It is implemented by the following Java method:

com.mslv.activation.cartridge.rim.blackberry.x2_1.bbservice.query.generated.QueryBbserviceProxy.execute.

Table 13: A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	Network element identifier.	String(80)		S	R
IMSI	International mobile subscriber identity.	String(15)		S	R
MSISDN	Mobile station international subscriber directory number.	String(20)		S	O
IMEI	International mobile equipment number.	String(15)		S	O
BILLING_ID	Billing identifier.	String(40)		S	O
BILLING_COMMENT	Billing comment.	String(40)		S	O
PIN	Device PIN.	String(20)		S	O

Table 13: A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
ICCID	Integrated circuit card ID.	String(20)		S	O
ESN	Electronic subscriber number.	String(15)		S	O
SIM_ID	SIM card ID.	String(20)		S	O
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O

MML Commands

```
<?xml version="1.0" encoding="UTF-8"?>
<!--ProvisioningRequest.xml-->
<!DOCTYPE ProvisioningRequest SYSTEM "ProvisioningRequest.dtd">
<ProvisioningRequest TransactionId="0000000338" Version="1.2"
TransactionType="Status" ProductType="BlackBerry">
<Header>
<Sender>
<Login>telstraari</Login>
<Password>asap123</Password>
</Sender
<TimeStamp>2001-11-15T23:59:01-08:00</TimeStamp>
</Header>
<Body>
<ProvisioningEntity name="subscriber">
<ProvisioningDataItem name="IMSI">010340000000598664</ProvisioningDataItem>
</ProvisioningEntity>
</Body>
</ProvisioningRequest>
```

Output Parameters

Return as CSDL parameter:

A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE_UDET=<user defined exit type>

Example:

IMSI = 505019999999999

MSISDN = 8181818181

SERVICE_LABEL1= Enterprise

SERVICE_STATUS_CODE1 = 19

SERVICE_STATUS_DESCRIPTION1 = Activated

SERVICE_LABEL2= Internet Browsing

SERVICE_STATUS_CODE2 = 5

SERVICE_STATUS_DESCRIPTION2 = Suspended

ICCID = 01111111111111111

Return as info parameters:

1. A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE_RETURN_INFO=<NE error code>:<NE error description>

2. All subscriber data in name-value pairs .

The status and status code of each service will be returned as well.

Example:

IMSI = 505019999999999

MSISDN = 8181818181

SERVICE_LABEL1= Enterprise

SERVICE_STATUS_CODE1 = 19

SERVICE_STATUS_DESCRIPTION1 = Activated

SERVICE_LABEL2= Internet Browsing

SERVICE_STATUS_CODE2 = 5

SERVICE_STATUS_DESCRIPTION2 = Suspended

ICCID = 01111111111111111

A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE-RB

Queries BlackBerry service, which is used for rollback.

It is implemented by the following Java method:

com.mslv.activation.cartridge.rim.blackberry.x2_1.bbservice_rb.query.generated.QueryBbserviceRbProxy.execute.

Table 14: A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE-RB

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	Network element identifier.	String(80)		S	R
OLD_BILLING_ID	Billing identifier.	String(40)		S	O
IMSI	International mobile subscriber identity.	String(15)		S	R

MML Commands

```
See sample XML request for direct Status(query) action
```

Output Parameters

Return as CSDL parameters:

1. A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE-RB_UDET=<user defined exit type>

2. All subscriber data in name-value pairs with "OLD" prefix .

The status and status code of each service will be returned as well.

Example:

OLD_IMSI = 505019999999999

OLD_MSISDN = 8181818181

OLD_SERVICE[1]= Enterprise

OLD_SERVICE_STATUS_CODE[1] = 19

OLD_SERVICESTATUS[1] = Activated

OLD_SERVICE[2]= Internet Browsing

OLD_SERVICE_STATUS_CODE[2] = 5

OLD_SERVICESTATUS[2] = Suspended

OLD_ICCID = 01111111111111111

Return as info parameters:

1. A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE-RB_RETURN_INFO=<NE error code>:<NE error description>

2. All subscriber data in name-value pairs with "OLD" prefix.

The status and status code of each service will be returned as well.

Example:

OLD_IMSI = 505019999999999

OLD_MSISDN = 8181818181

OLD_SERVICE[1]= Enterprise

OLD_SERVICE_STATUS_CODE[1] = 19

OLD_SERVICESTATUS[1] = Activated

OLD_SERVICE[2]= Internet Browsing

OLD_SERVICE_STATUS_CODE[2] = 5

OLD_SERVICESTATUS[2] = Suspended

OLD_ICCID = 01111111111111111

A_RIM-BLACKBERRY_2-1_RESUME_BBSERVICE

Resumes BlackBerry service.

It is implemented by the following Java method:

com.mslv.activation.cartridge.rim.blackberry.x2_1.bbservice.resume.generated.ResumeBbserviceProxy.execute.

Table 15: A_RIM-BLACKBERRY_2-1_RESUME_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	Network element identifier.	String(80)		S	R
IMSI	International mobile subscriber identity.	String(15)		S	R
MSISDN	Mobile station international subscriber directory number.	String(20)		S	O
IMEI	International mobile equipment number.	String(15)		S	O

Table 15: A_RIM-BLACKBERRY_2-1_RESUME_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
BILLING_ID	Billing identifier.	String(40)		S	O
BILLING_COMMENT	Billing comment.	String(40)		S	O
PIN	Device PIN.	String(20)		S	O
ICCID	Integrated circuit card ID.	String(20)		S	O
ESN	Electronic subscriber number.	String(15)		S	O
SIM_ID	SIM card ID.	String(20)		S	O
SERVICE	BlackBerry service.	Customer specific. Example:"Prosumer", "Enterprise" ,"Enterprise Plus", " Internet Browsing"		I	O
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O

MML Commands

```
<?xml version="1.0" encoding="UTF-8"?>
<!--ProvisioningRequest.xml-->
<!DOCTYPE ProvisioningRequest SYSTEM "ProvisioningRequest.dtd">
<ProvisioningRequest TransactionId="0000000335" Version="1.2"
TransactionType="Resume" ProductType="BlackBerry">
<Header>
<Sender>
<Login>telstraari</Login>
<Password>asap123</Password>
</Sender
<TimeStamp>2001-11-15T19:25:33-08:00</TimeStamp>
</Header>
<Body>
```

```
<ProvisioningEntity name="subscriber">
<ProvisioningDataItem name="MSISDN">4168709121</ProvisioningDataItem>
</ProvisioningEntity>
</Body>
</ProvisioningRequest>
```

Output Parameters

Return as CSDL parameter:

A_RIM-BLACKBERRY_2-1_RESUME_BBSERVICE_UDET=<user defined exit type>

Return as info parameter:

A_RIM-BLACKBERRY_2-1_RESUME_BBSERVICE_RETURN_INFO=<NE error code>:<NE error description>

A_RIM-BLACKBERRY_2-1_SUSPEND_BBSERVICE

Suspends BlackBerry service.

It is implemented by the following Java method:

com.mslv.activation.cartridge.rim.blackberry.x2_1.bbservice.suspend.generated.SuspendBbserviceProxy.execute.

Table 16: A_RIM-BLACKBERRY_2-1_SUSPEND_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	Network element identifier.	String(80)		S	R
IMSI	International mobile subscriber identity.	String(15)		S	R
MSISDN	Mobile station international subscriber directory number.	String(20)		S	O
IMEI	International mobile equipment number.	String(15)		S	O
BILLING_ID	Billing identifier.	String(40)		S	O
BILLING_COMMENT	Billing comment.	String(40)		S	O

Table 16: A_RIM-BLACKBERRY_2-1_SUSPEND_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
PIN	Device PIN.	String(20)		S	O
ICCID	Integrated circuit card ID.	String(20)		S	O
ESN	Electronic subscriber number.	String(15)		S	O
SIM_ID	SIM card ID.	String(20)		S	O
SERVICE	BlackBerry service.	Customer specific. Example:"Prosumer", "Enterprise" ,"Enterprise Plus", " Internet Browsing"		I	O
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O

MML Commands

```
<?xml version="1.0" encoding="UTF-8"?>
<!--ProvisioningRequest.xml-->
<!DOCTYPE ProvisioningRequest SYSTEM "ProvisioningRequest.dtd">
<ProvisioningRequest TransactionId="0000000334" Version="1.2"
TransactionType="Suspend" ProductType="BlackBerry">
<Header>
<Sender>
<Login>telstraari</Login>
<Password>asap123</Password>
</Sender
<TimeStamp>2001-11-15T17:33:46-08:00</TimeStamp>
</Header>
<Body>
<ProvisioningEntity name="subscriber">
<ProvisioningDataItem name="IMSI">010340000000598664</ProvisioningDataItem>
</ProvisioningEntity>
```

```
</Body>
</ProvisioningRequest>
```

Output Parameters

Return as CSDL parameter:

A_RIM-BLACKBERRY_2-1_SUSPEND_BBSERVICE_UDET=<user defined exit type>

Return as info parameter:

A_RIM-BLACKBERRY_2-1_SUSPEND_BBSERVICE_RETURN_INFO=<NE error code>:<NE error description>

User exit types

User exit types allow cartridge developers and systems administrators to map ASDL exit codes to one of the predefined base exit types. Base exit types determine the product behavior. Cartridges map return codes and status values from a network element to a user defined exit type.

Regular expressions (regex) are used to perform pattern searches on responses from network elements. The pattern is stored in "tbl_user_err" in the SARM database. The user exit type contains a regex pattern that is applied at runtime.

Regular expressions enable users to associate a series of responses to a specific base type. For example, a regular expression "6." can identify a pattern where any response with the character "6" followed by any number of characters will translate to base type of FAIL.

Regular expressions can also allow very specific searches within a response from a network element. Regular expressions are typically compiled before being executed. Compilation produces a binary version of the expression and ensures that the syntax of the regular expression is correct. This compilation occurs using SACT\SADT when user exit types are deployed into ASAP. If the syntax is deemed to be incorrect during compilation, SADT displays an error message and the deployment of the user exit type will fail.

For more information on pattern matching, refer to the *ASAP Developer Reference* and the *ASAP Administration Guide*.

Understanding user exit type XML files

```
…
<userDefinedExitType>
    <neDescriptor>
        <softwareLoad>DYNAMIC_SL</softwareLoad>
        <technology>DYNAMIC_VENDOR-DYNAMIC_TECH</technology>
    </neDescriptor>
    <searchPattern>SUCCESS.</searchPattern>[1]
    <userType>U_SUCCEED</userType>[2]
```

```
    <baseType>SUCCEED</baseType>[1]
    <description>The ASDL provisioning was successful</description>
</userDefinedExitType>
<userDefinedExitType>
    <searchPattern>90.</searchPattern>
    <userType>U_FAIL</userType>
    <baseType>FAIL</baseType>
    <description>The ASDL failed - fail the current order
       and stop processing.</description>
</userDefinedExitType>
<userDefinedExitType>
    <searchPattern>101-110[201-215]</searchPattern>[2]
    <userType>U_SOFT_FAIL</userType>
    <baseType>SOFT_FAIL</baseType>
    <description>The ASDL has encountered a soft failure. Processing will
       continue.</description>
</userDefinedExitType>
<userDefinedExitType>
    <searchPattern>801-850</searchPattern>[3]
    <userType>U_MINOR_ERROR</userType>
    <baseType>SOFT_FAIL</baseType>
    <description>The ASDL has encountered a soft failure. Processing will
       continue.</description>
</userDefinedExitType>
<userDefinedExitType>
    <searchPattern>251-275&&[^261-265]</searchPattern>[4]
    <userType>U_DELAYED_FAIL</userType>
    <baseType>DELAYED_FAIL</baseType>
    <description>The ASDL has failed during provisioning.</description>
</userDefinedExitType>
<userDefinedExitType>
    <neDescriptor>
       <softwareLoad>BCS36</softwareLoad>
       <technology>NORTEL_DMS</technology>
       <neVendor>Nortel</neVendor>
    </neDescriptor>
```

1. Pattern searches accommodate situations in which responses from the device contain small variants that represent the same meaning. The user type contains an associated search pattern that is applied at runtime. Using regular expressions, you can default a series of responses. For example a regular expression "90." can specify a pattern where any response with the character "90" followed by any character will translate to base type of FAIL. If the regular expression is defined as "90*", then any response with the character "90" followed by any number of characters will translate to base type of FAIL
2. The user type that the search pattern maps to.
1. The base type that maps to the user type.
2. 101 to 110 and 201 to 215 will translate to a base type of SOFT_FAIL
3. 801-850 will translate to a base type of SOFT_FAIL. Note that the user type differs from the previous range.
4. 251 to 275 but not 261 to 265 will translate to a base type of DELAYED_FAILURE.

```
    <searchPattern>*.</searchPattern>
    <userType>U_MAINTAIN</userType>
    <baseType>MAINTENANCE</baseType>
    <description>The ASDL will Wait until the NE comes out of
       Maintenance Mode</description>
</userDefinedExitType>
```

The previous code sample shows some typical search pattern examples. Some additional examples follow:

- ^.*\b(one|two|three)\b.*$ = matches a complete line of text that contains any of the words "one", "two" or "three"
- ^(?=.*?\bone\b)(?=.*?\btwo\b)(?=.*?\bthree\b).*$ matches a complete line of text that contains all of the words "one", "two" and "three"
- "[^"\r\n]*" matches a single-line string that does not allow the quote character to appear inside the string.
- \b\d{1,3}\.\d{1,3}\.\d{1,3}\.\d{1,3}\b matches any IP address.

For more information on search patterns, refer to http://java.sun.com/j2se/1.4.2/docs/api/java/util/regex/Pattern.html.

For more information on user exit types, refer to chapter 3 of the *ASAP Developer Reference*.

User defined ASDL exit types

The following table lists the user defined ASDL exit types

Table 17:

Search pattern	User_type	Base_type	Atomic Action	Description
21020	ALREADY_ACTIVE_ACT	FAIL		Warning:Entity is already active for an Activate action
21030	ALREADY_ACTIVE_RES	FAIL		Warning:Entity is already active for a Resume action
21040	ALREADY_ACTIVE_CAN	FAIL		Warning:Entity is already active for a Cancel action
21050	ALREADY_ACTIVE_SUSP	FAIL		Warning:Entity is already active for a Suspend action

Table 17:

Search pattern	User_type	Base_type	Atomic Action	Description
21510	NO_PROV_ENTITIES	FAIL		No Provision Entities (line items) found in request
46010	NO_ACTIV_LOGIN_PERM	FAIL		No adequate permissions for login for an Activate request
46020	NO_MOD_LOGIN_PERM	FAIL		No adequate permissions for Cancel or Modify request
46030	NO_SUSP_LOGIN_PERM	FAIL		No adequate permissions for Suspend request
46040	NO_RES_LOGIN_PERM	FAIL		No adequate permissions for Resume request
46050	PROV_NOT_ALLOWED	FAIL		Not authorized to provision this handheld or subscriber
46060	NO_ASSIGN_LOGIN_PERM	FAIL		No adequate permissions for Assign request
61010	INVALID_IMSI	FAIL		Invalid Data: Invalid IMSI for carrier
61020	MISSING_BILLING_ID	FAIL		Invalid Data: Missing Billing Identifier
61030	INSUFFICIENT_INPUT	FAIL		Invalid Data: Insufficient Input
61040	INVALID_SERV_OR_ACT	FAIL		Invalid Request: Service Inactive or Service Not Found in Database
61050	BILLING_ID_IS_ACT	FAIL		An active account/billing id already exists for the subscriber
61080	MISSING_DEVICE_INFO	FAIL		Invalid Data: Missing Device/SIM information

Table 17:

Search pattern	User_type	Base_type	Atomic Action	Description
61090	MISSING_INPUT	FAIL		Invalid Data: Missing Input Information
61100	WRONG_DATA_LENGTH	FAIL		Data provided is outside of the acceptable length range
61110	DATA_NOT_RECOGNIZED	FAIL		Data provided is not recognized as valid
61120	WRONG_DATA_FORMAT	FAIL		Data provided does not adhere to a specified format
61130	INTERNAL_ERROR	FAIL		Internal Error: Please contact product support
61140	BILLING_ID_SUSPENDED	FAIL		A suspended account already exists for the new Billing ID
61150	BILLING_ID_INACTIVE	FAIL		A cancelled account already exists for the new Billing ID
61180	BILLING_ID_INACT_MOD	FAIL		Cannot Modify Billing Id to a value previously Deactivated
61190	BILLING_ID_ISACT_MOD	FAIL		The new Billing Id provided is already active for Modify action
61210	OTHER_CARR_PROF	FAIL		A subscriber identifier is recognized as owned by a different carrier profile
61220	CARR_PROF_NOT_FOUND	FAIL		Carrier profile cannot be identified for request
61310	NOT_BB_PRODUCT	FAIL		Subscriber is already registered on the BlackBerry infrastructure using a non-BlackBerry product

Table 17:

Search pattern	User_type	Base_type	Atomic Action	Description
61320	NOT_BB_CONNECT	FAIL		BlackBerry Connect is identified as the product type but the subscriber is already registered on the BlackBerry infrastructure using a BlackBerry product
61410	SERVICE_NOT_AVAILB	FAIL		Service that is not available to the customer
61420	SERVICE_EXISTS	FAIL		A similar service with the same type already exists. Use Modify
61430	MISSING_DEPENDENCY	FAIL		The service requested depends on another service that has not been provisioned
61440	SERVICE_CONFLICT	FAIL		The service requested is a duplicate or it conflicts with another service requested
61510	UNKNOWN_SYS_ERR	RETRY		Unexpected system exception
61520	PENDING_BILLING_OPER	RETRY		System Error: Billing Operation is pending
PROV_CARTRIGE_EXCEPTION	INTERNAL_CART_EX	FAIL		Internal Cartridge Exception
IO_EXCEPTION	JAVA_IO_EX	FAIL		Java IO Exception
ARI_PROV_EXCEPTION	ARI_PROV_EX	FAIL		Specific RIM Processing Exception
REMOTE_EXCEPTION	JAVA_REMOTE_EX	FAIL		Java Remote Exception
GEN_JAVA_EXCEPTION	GEN_JAVA_EX	FAIL		General Java Exception

Table 17:

Search pattern	User_type	Base_type	Atomic Action	Description
0	REQUEST_COMPLETED	SUCCEED		Request completed successfully
NO_UDET_MATCH	NO_UDET_MATCH	FAIL		No UDET match for search pattern
HTTP_EXCEPTION	HTTP_EXCEPTION	FAIL		Http Exception encountered
21020	ALREADY_ACTIVE_ACTRB	SOFT_FAIL	A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE-RB	Warning:Entity is already active for an Activate action-during activate rollback
21040	ALREADY_CANCEL_ACRB	SOFT_FAIL	A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE-RB	Warning:Entity is already active for a Cancel action-during activate rollback
61170	BILLING_ID_EXISTS	FAIL		Cannot Modify BillingId to a value already active
21020	ALREADY_ACTIVE_MODRB	SOFT_FAIL	A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE-RB	Warning:Entity is already active for an Activate action-during modify rollback
21040	ALREADY_CANCEL_MODRB	SOFT_FAIL	A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE-RB	Warning:Entity is already active for a Cancel action-during modify rollback

UserExitType.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<serviceModel xmlns:ude="http://www.mslv.com/studio/activation/model/
userDefinedExitType" xmlns:sm="http://www.metasolv.com/ServiceActivation/
2003/ServiceModel" xmlns="http://www.metasolv.com/ServiceActivation/2003/
ServiceModel" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
```

```
          <searchPattern>21020</searchPattern>
          <userType>ALREADY_ACTIVE_ACT</userType>
          <baseType>FAIL</baseType>
          <description>Warning:Entity is already active for an Activate
action</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>21030</searchPattern>
          <userType>ALREADY_ACTIVE_RES</userType>
          <baseType>FAIL</baseType>
          <description>Warning:Entity is already active for a Resume action</
description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>21040</searchPattern>
          <userType>ALREADY_ACTIVE_CAN</userType>
          <baseType>FAIL</baseType>
          <description>Warning:Entity is already active for a Cancel action</
description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>21050</searchPattern>
          <userType>ALREADY_ACTIVE_SUSP</userType>
          <baseType>FAIL</baseType>
          <description>Warning:Entity is already active for a Suspend action</
description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>21510</searchPattern>
          <userType>NO_PROV_ENTITIES</userType>
          <baseType>FAIL</baseType>
```

```
          <description>No Provision Entities (line items) found in request</
description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>46010</searchPattern>
          <userType>NO_ACTIV_LOGIN_PERM</userType>
          <baseType>FAIL</baseType>
          <description>No adequate permissions  for login for an Activate
request</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>46020</searchPattern>
          <userType>NO_MOD_LOGIN_PERM</userType>
          <baseType>FAIL</baseType>
          <description>No adequate permissions  for Cancel or Modify
request</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>46030</searchPattern>
          <userType>NO_SUSP_LOGIN_PERM</userType>
          <baseType>FAIL</baseType>
          <description>No adequate permissions  for Suspend  request</
description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>46040</searchPattern>
          <userType>NO_RES_LOGIN_PERM</userType>
          <baseType>FAIL</baseType>
          <description>No adequate permissions  for Resume  request</
description>
     </userDefinedExitType>
     <userDefinedExitType>
```

```
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>46050</searchPattern>
          <userType>PROV_NOT_ALLOWED</userType>
          <baseType>FAIL</baseType>
          <description>Not authorized to provision this handheld or
subscriber</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>46060</searchPattern>
          <userType>NO_ASSIGN_LOGIN_PERM</userType>
          <baseType>FAIL</baseType>
          <description>No adequate permissions  for Assign  request</
description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61010</searchPattern>
          <userType>INVALID_IMSI</userType>
          <baseType>FAIL</baseType>
          <description>Invalid Data: Invalid IMSI for carrier</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61020</searchPattern>
          <userType>MISSING_BILLING_ID</userType>
          <baseType>FAIL</baseType>
          <description>Invalid Data: Missing Billing Identifier</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61030</searchPattern>
```

```
          <userType>INSUFFICIENT_INPUT</userType>
          <baseType>FAIL</baseType>
          <description>Invalid Data: Insufficient Input</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61040</searchPattern>
          <userType>INVALID_SERV_OR_ACT</userType>
          <baseType>FAIL</baseType>
         <description>Invalid Request: Service Inactive or Service Not Found
in Database</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61050</searchPattern>
          <userType>BILLING_ID_IS_ACT</userType>
          <baseType>FAIL</baseType>
          <description>An active account/billing id already exists for the
subscriber</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61080</searchPattern>
          <userType>MISSING_DEVICE_INFO</userType>
          <baseType>FAIL</baseType>
          <description>Invalid Data: Missing Device/SIM information</
description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61090</searchPattern>
          <userType>MISSING_INPUT</userType>
          <baseType>FAIL</baseType>
          <description>Invalid Data: Missing Input Information</description>
     </userDefinedExitType>
     <userDefinedExitType>
```

```
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61100</searchPattern>
          <userType>WRONG_DATA_LENGTH</userType>
          <baseType>FAIL</baseType>
         <description>Data provided is outside of the acceptable length range
</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61110</searchPattern>
          <userType>DATA_NOT_RECOGNIZED</userType>
          <baseType>FAIL</baseType>
         <description>Data provided  is not recognized as valid</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61120</searchPattern>
          <userType>WRONG_DATA_FORMAT</userType>
          <baseType>FAIL</baseType>
          <description>Data provided does not adhere to a specified format</
description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61130</searchPattern>
          <userType>INTERNAL_ERROR</userType>
          <baseType>FAIL</baseType>
          <description>Internal Error: Please contact product support</
description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
```

```
          <searchPattern>61140</searchPattern>
          <userType>BILLING_ID_SUSPENDED</userType>
          <baseType>FAIL</baseType>
         <description>A suspended account already exists for the new Billing
ID</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61150</searchPattern>
          <userType>BILLING_ID_INACTIVE</userType>
          <baseType>FAIL</baseType>
         <description>A cancelled account already exists for the new Billing
ID</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61180</searchPattern>
          <userType>BILLING_ID_INACT_MOD</userType>
          <baseType>FAIL</baseType>
          <description>Cannot Modify Billing Id to a value previously
Deactivated</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61190</searchPattern>
          <userType>BILLING_ID_ISACT_MOD</userType>
          <baseType>FAIL</baseType>
          <description>The new Billing Id provided is already active for
Modify action</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61210</searchPattern>
          <userType>OTHER_CARR_PROF</userType>
          <baseType>FAIL</baseType>
```

```
          <description>A subscriber identifier is recognized as owned by a
different carrier profile</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61220</searchPattern>
          <userType>CARR_PROF_NOT_FOUND</userType>
          <baseType>FAIL</baseType>
          <description>Carrier profile cannot be identified for request</
description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61310</searchPattern>
          <userType>NOT_BB_PRODUCT</userType>
          <baseType>FAIL</baseType>
          <description>Subscriber is already registered on the BlackBerry
infrastructure using a non-BlackBerry product</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61320</searchPattern>
          <userType>NOT_BB_CONNECT</userType>
          <baseType>FAIL</baseType>
          <description>BlackBerry Connect is identified as the product type
but the subscriber is already registered on the BlackBerry infrastructure
using a BlackBerry product</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61410</searchPattern>
          <userType>SERVICE_NOT_AVAILB</userType>
          <baseType>FAIL</baseType>
          <description>Service that is not available to the customer</
description>
     </userDefinedExitType>
```

```
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61420</searchPattern>
          <userType>SERVICE_EXISTS</userType>
          <baseType>FAIL</baseType>
          <description>A similar service with the same type already exists.
Use Modify</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61430</searchPattern>
          <userType>MISSING_DEPENDENCY</userType>
          <baseType>FAIL</baseType>
          <description>The service requested depends on another service that
has not been provisioned</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61440</searchPattern>
          <userType>SERVICE_CONFLICT</userType>
          <baseType>FAIL</baseType>
          <description>The service requested is a duplicate or it conflicts
with another service requested</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61510</searchPattern>
          <userType>UNKNOWN_SYS_ERR</userType>
          <baseType>RETRY</baseType>
          <description>Unexpected system exception</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
```

```
            </neDescriptor>
            <searchPattern>61520</searchPattern>
            <userType>PENDING_BILLING_OPER</userType>
            <baseType>RETRY</baseType>
            <description>System Error: Billing Operation is pending</
description>
      </userDefinedExitType>
      <userDefinedExitType>
            <neDescriptor>
                  <softwareLoad>2-1</softwareLoad>
                  <technology>BLACKBERRY</technology>
                  <neVendor>RIM</neVendor>
            </neDescriptor>
            <searchPattern>PROV_CARTRIGE_EXCEPTION</searchPattern>
            <userType>INTERNAL_CART_EX</userType>
            <baseType>FAIL</baseType>
            <description>Internal Cartridge Exception</description>
      </userDefinedExitType>
      <userDefinedExitType>
            <neDescriptor>
                  <softwareLoad>2-1</softwareLoad>
                  <technology>BLACKBERRY</technology>
                  <neVendor>RIM</neVendor>
            </neDescriptor>
            <searchPattern>IO_EXCEPTION</searchPattern>
            <userType>JAVA_IO_EX</userType>
            <baseType>FAIL</baseType>
            <description>Java IO Exception</description>
      </userDefinedExitType>
      <userDefinedExitType>
            <neDescriptor>
                  <softwareLoad>2-1</softwareLoad>
                  <technology>BLACKBERRY</technology>
                  <neVendor>RIM</neVendor>
            </neDescriptor>
            <searchPattern>ARI_PROV_EXCEPTION</searchPattern>
            <userType>ARI_PROV_EX</userType>
            <baseType>FAIL</baseType>
            <description>Specific RIM Processing Exception</description>
      </userDefinedExitType>
      <userDefinedExitType>
            <neDescriptor>
                  <softwareLoad>2-1</softwareLoad>
                  <technology>BLACKBERRY</technology>
                  <neVendor>RIM</neVendor>
            </neDescriptor>
            <searchPattern>REMOTE_EXCEPTION</searchPattern>
            <userType>JAVA_REMOTE_EX</userType>
            <baseType>FAIL</baseType>
            <description>Java Remote Exception</description>
      </userDefinedExitType>
      <userDefinedExitType>
```

```
            <neDescriptor>
                  <softwareLoad>2-1</softwareLoad>
                  <technology>BLACKBERRY</technology>
                  <neVendor>RIM</neVendor>
            </neDescriptor>
            <searchPattern>GEN_JAVA_EXCEPTION</searchPattern>
            <userType>GEN_JAVA_EX</userType>
            <baseType>FAIL</baseType>
            <description>General Java Exception</description>
      </userDefinedExitType>
      <userDefinedExitType>
            <neDescriptor>
                  <softwareLoad>2-1</softwareLoad>
                  <technology>BLACKBERRY</technology>
                  <neVendor>RIM</neVendor>
            </neDescriptor>
            <searchPattern>0</searchPattern>
            <userType>REQUEST_COMPLETED</userType>
            <baseType>SUCCEED</baseType>
            <description>Request completed successfully</description>
      </userDefinedExitType>
      <userDefinedExitType>
            <neDescriptor>
                  <softwareLoad>2-1</softwareLoad>
                  <technology>BLACKBERRY</technology>
                  <neVendor>RIM</neVendor>
            </neDescriptor>
            <searchPattern>NO_UDET_MATCH</searchPattern>
            <userType>NO_UDET_MATCH</userType>
            <baseType>FAIL</baseType>
            <description>No UDET match for search pattern</description>
      </userDefinedExitType>
      <userDefinedExitType>
            <neDescriptor>
                  <softwareLoad>2-1</softwareLoad>
                  <technology>BLACKBERRY</technology>
                  <neVendor>RIM</neVendor>
            </neDescriptor>
            <searchPattern>HTTP_EXCEPTION</searchPattern>
            <userType>HTTP_EXCEPTION</userType>
            <baseType>FAIL</baseType>
            <description>Http Exception encountered</description>
      </userDefinedExitType>
      <userDefinedExitType>
            <atomicService>A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE-RB</
atomicService>
            <neDescriptor>
                  <softwareLoad>2-1</softwareLoad>
                  <technology>BLACKBERRY</technology>
                  <neVendor>RIM</neVendor>
            </neDescriptor>
            <searchPattern>21020</searchPattern>
```

```
          <userType>ALREADY_ACTIVE_ACTRB</userType>
          <baseType>SOFT_FAIL</baseType>
          <description>Warning:Entity is already active for an Activate
action-during activate rollback</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <atomicService>A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE-RB</
atomicService>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>21040</searchPattern>
          <userType>ALREADY_CANCEL_ACRB</userType>
          <baseType>SOFT_FAIL</baseType>
          <description>Warning:Entity is already active for a Cancel action-
during activate  rollback</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>61170</searchPattern>
          <userType>BILLING_ID_EXISTS</userType>
          <baseType>FAIL</baseType>
          <description>Cannot Modify BillingId to a value already active</
description>
     </userDefinedExitType>
     <userDefinedExitType>
          <atomicService>A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE-RB</
atomicService>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
          </neDescriptor>
          <searchPattern>21020</searchPattern>
          <userType>ALREADY_ACTIVE_MODRB</userType>
          <baseType>SOFT_FAIL</baseType>
          <description>Warning:Entity is already active for an Activate
action-during modify rollback</description>
     </userDefinedExitType>
     <userDefinedExitType>
          <atomicService>A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE-RB</
atomicService>
          <neDescriptor>
               <softwareLoad>2-1</softwareLoad>
               <technology>BLACKBERRY</technology>
               <neVendor>RIM</neVendor>
```

```
          </neDescriptor>
          <searchPattern>21040</searchPattern>
          <userType>ALREADY_CANCEL_MODRB</userType>
          <baseType>SOFT_FAIL</baseType>
          <description>Warning:Entity is already active for a Cancel action-
during modify  rollback</description>
     </userDefinedExitType>
</serviceModel>
```

4

Service Definition

The RIM Blackberry cartridge contains a set of CSDLs that map to one or more ASDL commands. You can also create additional CSDLs that map to existing and newly-created ASDLs. An upstream system can assemble any of these CSDL commands onto a work order for provisioning.

This chapter presents detailed information on the CSDL parameters that we provide in this cartridge. The following table lists and describes the type of parameter information that is included.

Table 18: ASDL parameter information

Item	Description
Parameter Name	Identifies the parameter that is configured for the stated service.
Description	Describes the parameter.
Range	Describes or lists the range of values that can be used to satisfy this parameter.
Default Value	Configures a default value for the parameter so that it is not mandatory for the upstream system to provide a value.

Table 18: ASDL parameter information

Item	Description
Type	Indicates one of the following parameter types: ◆ S—Scalar, specifies the parameter label transmitted on the ASDL command. Scalar parameters are conventional name-value pair parameters. ◆ C—Compound, specifies the base name of the compound parameter transmitted on the ASDL command. A compound parameter contains structures or arrays of information that are represented by a particular structure name or compound parameter name. Each compound parameter can contain a large number of elements. If you use compound parameters, you only require a single entry in the ASAP translation tables to call the compound parameter and all its associated parameter elements. ◆ I—Indexed, identifies a parameter that contains a sequential numerical index value to tell the SARM that it should execute the same operation (for example, an ASDL command) for all occurrences of that index. Consequently, if there are several options on a particular CSDL command (OPT1, OPT2, OPT3, etc.), you can specify the OPT parameter as an indexed parameter. When you specify the OPT parameter as an indexed parameter, the SARM generates several occurrences of that same ASDL command and each command has a different value for the option being transmitted to the NEP. For more information on parameter types, refer to the *ASAP Developer Reference*.
Class	Indicates one of the following parameter classifications: ◆ R—Required scalar parameter ◆ O—Optional scalar parameter ◆ C—Required compound parameter ◆ N—Optional compound parameter ◆ M—Mandatory indexed parameter ◆ I—Optional indexed parameter ◆ S—Parameter count

For a detailed description of the Required and Optional parameter classifications, refer to the *ASAP Administration Guide.*

CSDL commands

This cartridge provides the following CSDL Commands:

- C_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE
- C_RIM-BLACKBERRY_2-1_CANCEL_BBSERVICE
- C_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE
- C_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE
- C_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE
- C_RIM-BLACKBERRY_2-1_RESUME_BBSERVICE
- C_RIM-BLACKBERRY_2-1_SUSPEND_BBSERVICE

C_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE

Activates the BlackBerry service.

Table 19: C_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
BILLING_COMMENT	Billing comment.	String(40)		S	O
BILLING_ID	Billing identifier.	String(40)		S	O
ESN	Electronic subscriber number.	String(15)		S	O
ICCID	Integrated circuit card ID.	String(20)		S	O
IMEI	International mobile equipment number.	String(15)		S	O
IMSI	International mobile subscriber identity.	String(15)		S	R
MSISDN	Mobile station international subscriber directory number.	String(20)		S	O
NE_ID_RIM-BB	Network element identifier.	String(80)		S	R
PIN	Device PIN.	String(20)		S	O

Table 19: C_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O
SERVICE++	BlackBerry service.	Customer specific. Example:"Prosumer", "Enterprise" ,"Enterprise Plus", " Internet Browsing"		I	O
SIM_ID	SIM card ID.	String(20)		S	O

Mapping to ASDLs

The following table illustrates the CSDL to ASDL mapping for this service.

Table 20: CSDL to ASDL Mapping

CSDL	ASDL
C_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE	A_RIM-BLACKBERRY_2-1_ACTIVATE_BBSERVICE

C_RIM-BLACKBERRY_2-1_CANCEL_BBSERVICE

Cancel BlackBerry Service.

Table 21: C_RIM-BLACKBERRY_2-1_CANCEL_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
BILLING_COMMENT	Billing comment.	String(40)		S	O
BILLING_ID	Billing identifier.	String(40)		S	O
ESN	Electronic subscriber number.	String(15)		S	O
ICCID	Integrated circuit card ID.	String(20)		S	O

Table 21: C_RIM-BLACKBERRY_2-1_CANCEL_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
IMEI	International mobile equipment number.	String(15)		S	O
IMSI	International mobile subscriber identity.	String(15)		S	R
MSISDN	Mobile station international subscriber directory number.	String(20)		S	O
NE_ID_RIM-BB	Network element identifier.	String(80)		S	R
PIN	Device PIN.	String(20)		S	O
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O
SERVICE++	BlackBerry service.	Customer specific. Example:"Prosumer", "Enterprise" ,"Enterprise Plus", " Internet Browsing"		I	O
SIM_ID	SIM card ID.	String(20)		S	O

Mapping to ASDLs

The following table illustrates the CSDL to ASDL mapping for this service.

Table 22: CSDL to ASDL Mapping

CSDL	ASDL
C_RIM-BLACKBERRY_2-1_CANCEL_BBSERVICE	A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE-RB
	A_RIM-BLACKBERRY_2-1_CANCEL_BBSERVICE

C_RIM-BLACKBERRY_2-1_MODIFY_BILLING_ID_BBSERVICE

Modify IMSI for BlackBerry Service.

Table 23: C_RIM-BLACKBERRY_2-1_MODIFYIMSI_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
BILLING_ID	Billing Identifier.	String(40)		S	R
IMSI	International mobile subscriber identity.	String(15)		S	R
NE_ID_RIM-BB	Network element identifier.	String(80)		S	R
OLD_BILLING_ID	Old billing ID.	String(40)		S	R
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O

Mapping to ASDLs

The following table illustrates the CSDL to ASDL mapping for this service.

Table 24: CSDL to ASDL Mapping

CSDL	ASDL
C_RIM-BLACKBERRY_2-1_MODIFYIMSI_BBSERVICE	A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE-RB
	A_RIM-BLACKBERRY_2-1_MODIFYIMSI_BBSERVICE

C_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE

Modify BlackBerry Service.

Table 25: C_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
BILLING_COMMENT	Billing comment.	String(40)		S	O
BILLING_ID	Billing identifier.	String(40)		S	O
ESN	Electronic subscriber number.	String(15)		S	O
ICCID	Integrated circuit card ID.	String(20)		S	O
IMEI	International mobile equipment number.			S	O
IMSI	International mobile subscriber identity.	String(15)		S	R
MSISDN	Mobile station international subscriber directory number.	String(20)		S	O
NE_ID_RIM-BB	Network element identifier.	String(80)		S	R
PIN	Device PIN.	String(20)		S	O
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O
SERVICE++	BlackBerry service.	Customer specific. Example:"Prosumer", "Enterprise" ,"Enterprise Plus", " Internet Browsing"		I	O
SIM_ID	SIM card ID.	String(20)		S	O

Mapping to ASDLs

The following table illustrates the CSDL to ASDL mapping for this service.

Table 26: CSDL to ASDL Mapping

CSDL	ASDL
C_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE	A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE-RB
	A_RIM-BLACKBERRY_2-1_MODIFY_BBSERVICE

C_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE

Query BlackBerry Service Data.

Table 27: C_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
BILLING_COMMENT	Billing comment.	String(40)		S	O
BILLING_ID	Billing identifier.	String(40)		S	O
ESN	Electronic subscriber number.	String(15)		S	O
ICCID	Integrated circuit card ID.	String(20)		S	O
IMEI	International mobile equipment number.	String(15)		S	O
IMSI	International mobile subscriber identity.	String(15)		S	R
MSISDN	Mobile station international subscriber directory number.	String(20)		S	O
NE_ID_RIM-BB	Network element identifier.	String(80)		S	R
PIN	Device PIN.	String(20)		S	O

Table 27: C_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O
SIM_ID	SIM card ID.	String(20)		S	O

Mapping to ASDLs

The following table illustrates the CSDL to ASDL mapping for this service.

Table 28: CSDL to ASDL Mapping

CSDL	ASDL
C_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE	A_RIM-BLACKBERRY_2-1_QUERY_BBSERVICE

C_RIM-BLACKBERRY_2-1_RESUME_BBSERVICE

Resume BlackBerry Service.

Table 29: C_RIM-BLACKBERRY_2-1_RESUME_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
BILLING_COMMENT	Billing comment.	String(40)		S	O
BILLING_ID	Billing identifier.	String(40)		S	O
ESN	Electronic subscriber number.	String(15)		S	O
ICCID	Integrated circuit card ID.	String(20)		S	O
IMEI	International mobile equipment number.	String(15)		S	O
IMSI	International mobile subscriber identity.	String(15)		S	R

Table 29: C_RIM-BLACKBERRY_2-1_RESUME_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
MSISDN	Mobile station international subscriber directory number.	String(20)		S	O
NE_ID_RIM-BB	Network element identifier.	String(80)		S	R
PIN	Device PIN.	String(20)		S	O
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O
SERVICE++	BlackBerry service.	Customer specific. Example:"Prosumer", "Enterprise" ,"Enterprise Plus", " Internet Browsing"		I	O
SIM_ID	SIM card ID.	String(20)		S	O

Mapping to ASDLs

The following table illustrates the CSDL to ASDL mapping for this service.

Table 30: CSDL to ASDL Mapping

CSDL	ASDL
C_RIM-BLACKBERRY_2-1_RESUME_BBSERVICE	A_RIM-BLACKBERRY_2-1_RESUME_BBSERVICE

C_RIM-BLACKBERRY_2-1_SUSPEND_BBSERVICE

Suspend BlackBerry Service.

Table 31: C_RIM-BLACKBERRY_2-1_SUSPEND_BBSERVICE

Parameter Name	Description	Range	Default Value	Type	Class
BILLING_COMMENT	Billing comment.	String(40)		S	O
BILLING_ID	Billing identifier.	String(40)		S	O
ESN	Electronic subscriber number.	String(15)		S	O
ICCID	Integrated circuit card ID.	String(20)		S	O
IMEI	International mobile equipment number.	String(15)		S	O
IMSI	International mobile subscriber identity.	String(15)		S	R
MSISDN	Mobile station international subscriber directory number.	String(20)		S	O
NE_ID_RIM-BB	Network element identifier.	String(80)		S	R
PIN	Device PIN.	String(20)		S	O
RETURN_DATA_PREFIX	Parameter to identify ASDLs for multiple nodes.	Optional prefix for output parameters.		S	O
SERVICE++	BlackBerry service.	Customer specific. Example:"Prosumer", "Enterprise" ,"Enterprise Plus", " Internet Browsing"		I	O
SIM_ID	SIM card ID.	String(20)		S	O

Mapping to ASDLs

The following table illustrates the CSDL to ASDL mapping for this service.

Table 32: CSDL to ASDL Mapping

CSDL	ASDL
C_RIM-BLACKBERRY_2-1_SUSPEND_BBSERVICE	A_RIM-BLACKBERRY_2-1_SUSPEND_BBSERVICE

5

Configuring ASAP to Support Additional NE Instances

You can configure ASAP to support the NE_RIM-BLACKBERRY_2-1-HOST - NEP configuration using the Service Activation Configuration Tool (SACT). Refer to the *ASAP Administration Guide* for more information.

Below is an example of the Activation.Configuration.XML file for the RIM BlackBerry cartridge.

```
<?xml version="1.0" encoding="UTF-8"?>
<activationConfig xmlns="http://www.metasolv.com/ServiceActivation/
  2003/ActivationConfig" xmlns:cfg="http://www.mslv.com/studio/acti-
  vation/model/config" xmlns:route="http://www.mslv.com/studio/acti-
  vation/model/routing" xmlns:sm="http://www.metasolv.com/
  ServiceActivation/2003/ServiceModel" xmlns:xsi="http://www.w3.org/
  2001/XMLSchema-instance">
   <connectionPool name="BB21_POL">
      <device name="NE_RIM-BLACKBERRY_2-1-HOST_conn_1">
         <environment/>
         <lineType>GENERIC_MESSAGE_BASED_CONNECTION</lineType>
      </device>
   </connectionPool>
   <element name="NE_RIM-BLACKBERRY_2-1-HOST">
      <vendor>RIM</vendor>
      <technology>BLACKBERRY</technology>
      <softwareLoad>2-1</softwareLoad>
      <nepServerName>$NEP</nepServerName>
      <primaryPool>BB21_POL</primaryPool>
      <maximumConnections>5</maximumConnections>
      <dropTimeout>1</dropTimeout>
      <spawnThreshold>6</spawnThreshold>
      <killThreshold>3</killThreshold>
      <routingElement name="NE_RIM-BLACKBERRY_2-1-HOST"/>
      <communicationParameter>
         <label>BB_USER</label>
         <value>
            <value>telstraari</value>
         </value>
         <description>User login</description>
         <lineType>GENERIC_MESSAGE_BASED_CONNECTION</lineType>
      </communicationParameter>
      <communicationParameter>
         <label>BB_PASSWORD</label>
         <value>
            <value>asap123</value>
```

```
            </value>
            <description>User password</description>
            <lineType>GENERIC_MESSAGE_BASED_CONNECTION</lineType>
         </communicationParameter>
         <communicationParameter>
            <label>BB_URL</label>
            <value>
               <value>https://provisioning.etr.blackberry.net/ari/
               submitXML </value>
            </value>
            <description>Target(provisioning) URL</description>
            <lineType>GENERIC_MESSAGE_BASED_CONNECTION</lineType>
         </communicationParameter>
         <communicationParameter>
            <label>CONNECTION_TIMEOUT</label>
            <value>
               <value>20</value>
            </value>
            <description>Connection timeout</description>
            <lineType>GENERIC_MESSAGE_BASED_CONNECTION</lineType>
         </communicationParameter>
         <communicationParameter>
            <label>READ_TIMEOUT</label>
            <value>
               <value>30</value>
            </value>
            <description>Read (socket) timeout</description>
            <lineType>GENERIC_MESSAGE_BASED_CONNECTION</lineType>
         </communicationParameter>
         <communicationParameter>
            <label>RESPONSELOG</label>
            <value>
               <value>true</value>
            </value>
            <description>When on, will log NE conversation (cmd and
            response)</description>
         <lineType>GENERIC_MESSAGE_BASED_CONNECTION</lineType>
         </communicationParameter>
      </element>
   </activationConfig>
```

Extracting source files

Before you can access an XML file to modify it, you must extract it from the .sar file. Use the following procedure to extract source files from the sar file.

To extract source files

1. If necessary, create a repository directory, copy the .sar file to the new directory and un-jar the sar file.
2. After you un-jar the sar file, you can access the XML files.

Loading a new XML file

When you finish modifying an XML, you must create a new sar file, then restart the cartridge using the new file.

Follow the instructions in "Testing the installation" on page 10, for directions on how to load a new XML file.