Oracle ASAP™ Cartridge 1.1 for Vodafone AuC

Vodafone Authentication Centre v4.8 Cartridge Guide

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Contents

1

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. Extensions to the cartridge can be performed by Professional Services or systems integrators to support customer-specific requirements.

For more information on extending a cartridge, refer to the *ASAP Cartridge Development Guide for Service Activation*.

Cartridge content

An ASAP cartridge contains the following:

◆ An interface to the NE

◆ 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

This manual is a reference for system integrators, including managers, designers, programmers, and testers who are responsible for the adaptation and integration of ASAP-based solutions. It assumes that readers possess the following:

◆ A knowledge of ASAP programming concepts

◆ A thorough understanding of service and network provisioning

◆ Familiarity with telecommunications

About this guide

This guide provides a detailed description of the Vodafone Authentication Centre v4.8 cartridge. It contains overview and technical information to assist in 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:

◆ ASAP documentation set—for detailed information on the ASAP core product.

◆ ASAP Cartridge Development Guide for Service Activation—for information on how to extend a cartridge.

The Vodafone Authentication Centre v4.8 cartridge provides the ASAP service configuration and network element (NE) interface to activate AuC services on Vodafone AuC NEs.

Services, features, and options

The Vodafone AuC services cartridge provides the following services.

Table 1: Vodafone AuC services

Service	Description
Create AuC Subscriber	Creates a new authentication subscriber record from database.
Delete AuC Subscriber	Deletes an existing subscriber record from database.
Update AuC Subscriber	Updates the authentication subscriber record in the database.
View AuC Subscriber	Displays part of the database record for the authentication subscriber.
Update AuC SIM	Updates an attribute of a SIM in the AuC database.

Hardware and software requirements

The following sections contain the high-level software and hardware environment requirements for provisioning AuC services using this cartridge, including:

◆ Network element (NE) interface
◆ ASAP version
◆ Operating environment

Network element (NE) interface

This cartridge is designed to operate with the following:

◆ Vodafone AuC
◆ Software load 4.8

ASAP version

This cartridge was developed and tested using ASAP 4.6.2

Operating environment

The operating environments that are required to operate this version of ASAP in conjunction with the cartridge are:

◆ Operating System—HP-UNIX 11i

- Database Management System—Oracle 9i
- Third-Party Software—Not Applicable
- J2EE platform—BEA WebLogic 7.0.2

Connecting to the NE

This cartridge interfaces with the Vodafone AuC using its proprietary protocol over TCP/IP sockets.

2

Installing the Cartridge

This chapter describes how to install and test the Vodafone Authentication Centre v4.8 cartridge.

Preconditions

Before releasing the cartridge, perform the following steps:

1. Start ASAP by executing 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 running. If not, start the WebLogic instance.

More information on starting ASAP, the ASAP Daemon, and WebLogic is contained in the *ASAP System Configuration and Management Guide*.

Releasing the cartridge

Cartridges are available from Oracle's customer portal located at www.metalink.oracle.com. After you have logged in to the customer portal, navigate to Oracle ASAP > ASAP Cartridges > Components and download the Vodafone AuC cartridge tar file (VodafoneAuC.R1_1.tar).

Untar the tar file and copy the Vodafone_AUC_V4.8 directory and its contents to a repository directory.

```
tar xvf VodafoneAuC.R1_1.tar
cp -r Vodafone_AUC_V4.8 <repository_directory>
```

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>
    Vodafone_AUC_V4.8
        /README
        /installCartridge
        /uninstallCartridge
        /VODAFONE_AUC_V_4-8_AUC_SERVICES.sar
```

Installing the cartridge

Run the installation script installCartridge to install the Vodafone Authentication Centre v4.8 cartridge. This script is located in the Vodafone_AUC_V4.8 directory. The script executes the following tasks:

◆ Configures a new Vodafone Authentication Centre v4.8-specific NEP using the Service Activation Configuration Tool (SACT).

◆ Configures the Vodafone Authentication Centre v4.8-specific NE using the SACT.

◆ Deploys Vodafone Authentication Centre v4.8 cartridge service model (only if the Vodafone Authentication Centre v4.8 service model is not yet deployed) using the Service Activation Deployment Tool (SADT).

◆ Copies Vodafone Authentication Centre v4.8-specific jar files and cpp library file to ASAP environment.

◆ Loads the sample work orders and user error types to SRP database.

For information on the SACT and the SADT, refer to the *ASAP System Configuration and Management Guide*.

To install the cartridge

1. Run the script installCartridge at Vodafone_AUC_V4.8 directory. At the prompt, type:

```
installCartridge VODAFONE_AUC_V_4-8_AUC_SERVICES.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, sample work orders and user error types to the SRP database. It also copies the cartridge-specific jar files and cpp library file to ASAP environment.

3. Restart ASAP to upload the cartridge configuration into ASAP.

Uninstalling the cartridge

Run the uninstallation script uninstallCartridge to uninstall the Vodafone Authentication Centre v4.8 cartridge. This script is located under Vodafone_AUC_V4.8. The script executes the following tasks:

◆ Unconfigures a Vodafone Authentication Centre v4.8-specific NEP using the SACT.
◆ Unconfigures Vodafone Authentication Centre v4.8-specific NE using the SACT.
◆ Undeploys Vodafone Authentication Centre v4.8 cartridge service model (only if the Vodafone Authentication Centre v4.8 service model is already deployed) using the SADT.
◆ Removes the Vodafone Authentication Centre v4.8-specific jar files and cpp library file from ASAP environment.

For more information on the SACT and the SADT, refer to the *ASAP System Configuration and Management Guide*.

To uninstall the cartridge

1. Run the script uninstallCartridge from Vodafone_AUC_V4.8. At the prompt, type:

   ```
   uninstallCartridge VODAFONE_AUC_V_4-8_AUC_SERVICES<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 and cpp library file from the ASAP environment.

Testing the cartridge installation

Knowledge of the network element (NE), services, and basic ASAP configuration is required to test this cartridge installation. 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 parameters to test in loopback and live modes

The following sections provide details on the variables you must configure in the communication parameter for loopback and live testing modes.

Loopback mode

You must set the following communication parameters to test the cartridge in loopback mode.

Table 2: Loopback mode parameter settings

Configuration Variable	Parameter Settings	Location
LOOPBACK_ON	1	ASAP.cfg

Live mode

You must set the following communication parameters to test the cartridge in live mode.

Table 3: Live mode parameter settings

Configuration Variable	Parameter Settings	Location
LOOPBACK_ON	0	ASAP.cfg

Modifying vf_auc_v48_activation_configuration.xml

Use the following procedure to modify vf_auc_v48_activation_configuration.xml.

To modify vf_auc_v48_activation_configuration.xml

1. Create a new directory under Vodafone_AUC_V4.8.

   ```
   mkdir Vodafone_AuC_dir
   ```

2. Copy VODAFONE_AUC_V_4-8_AUC_SERVICES.sar to this new directory.

   ```
   cp VODAFONE_AUC_V_4-8_AUC_SERVICES.sar ./Vodafone_AuC_dir
   ```

3. Change directory to Vodafone_AuC_dir.

   ```
   cd Vodafone_AuC_dir
   ```

4. Un-jar VODAFONE_AUC_V_4-8_AUC_SERVICES.sar. This extracts the contents of the sar file (see the following page for an example of the resulting file structure).

   ```
   jar xvf VODAFONE_AUC_V_4-8_AUC_SERVICES.sar
   ```

5. Edit Vodafone_AuC_dir/Vodafone/common/application_config/ vf_auc_v48_activation_configuration.xml in with the appropriate changes.

   > If a user loses a connection which does not require HOST_USERID and HOST_PASSWORD, then from application_config file, remove HOST_USERID communication parameter.

6. Create a new sar file at the Vodafone_AuC_dir level.

   ```
   CreateSar $PWD
   ```

7. Uninstall the cartridge using the .sar file in Vodafone_AUC_V4.8 —the one that you copied in Step 2 above.

8. After you uninstall the cartridge, rename the sar file in Vodafone_AUC_V4.8 so that you have a backup copy of it.

9. Copy the new sar file from Vodafone_AuC_dir to Vodafone_AUC_V4.8.

10. Reinstall the cartridge (see installation instructions).

```
META-INF/activation-model.xml
Vodafone/
    AUC_V4_8/
        AUC_SERVICES/
            sample_wo/
            sarm/
                ne_progs/
                PLSQL/
            control/
                PLSQL/
            nep/
                PLSQL/
            java/
                lib/
            cpp/
                lib/
            service_model/{at least one .xml file}
            application_config/ {optional}
        common/
            sarm/
                ne_progs/
                PLSQL/
            control/
                PLSQL/
            nep/
                PLSQL/
            java/
                lib/
            cpp/
                lib/
            service_model/ {optional}
            application_config/ {optional}
            scripts/ {optional}
<vendor>
    …
```

Figure 1: Example file structure of an un-jared .sar file

Testing the Vodafone Authentication Centre v4.8 installation

It is recommended that you perform the initial test of the cartridge installation in loopback mode. The following procedure describes the steps required to test the cartridge installation in loopback mode.

To test the cartridge installation

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 in the Vodafone_AUC_V4.8/sample_wo 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 System Configuration and Management Guide*.

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

    ```
    asap_utils l
    ```

    All successful work orders return the 104 state.

    To view the sample work orders provided with this cartridge, refer to the Vodafone Authentication Centre v4.8 cartridge source.

Viewing the sample work orders

Sample work orders are located in the sample_wo directory in the sar file. The following procedure describes how to view the sample work orders.

To view the sample work orders

1. If necessary, create a repository directory under Vodafone_AUC_V4.8, copy the sar file to the new directory and un-jar the sar file, as described by Step 1 through Step 4 in "Modifying vf_auc_v48_activation_configuration.xml" on page 9.

2. Locate and view the sample work order files under Vodafone_AUC_V4.8/ NE_Technology/service pack/sample_wo.

3

Atomic Service Description Layer (ASDL) Commands

ASDL commands represent a set of atomic actions that can be performed on a network element (NE). ASDLs can be combined together to create meaningful services (CSDLs) within a cartridge.

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

Table 4: 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.
Type	Indicates one of the following parameter types: ◆ S—Scalar ◆ C—Compound ◆ I—Indexed
Class	Indicates one of the following parameter classifications: ◆ R—Required ◆ O—Optional

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

AuC services

This cartridge provides the following ASDL commands:

◆ A_VF-AUC_V4-8_CREATE_SUBSCRIBER

◆ A_VF-AUC_V4-8_DELETE_SUBSCRIBER

◆ A_VF-AUC_V4-8_UPDATE_SIM

◆ A_VF-AUC_V4-8_UPDATE_SUBSCRIBER

◆ A_VF-AUC_V4-8_VIEW_SUBSCRIBER

A_VF-AUC_V4-8_CREATE_SUBSCRIBER

Creates a new authentication subscriber record in the database. It is implemented by the Java method **com.metasolv.cartridge.oss.vf_auc_v48.prov.AUCProvisioning.createSubscriber.**

Table 5: A_VF-AUC_V4-8_CREATE_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	The name of the host NE.			S	R
IMSI	International mobile subscriber identity. The international mobile subscriber identity uniquely identifies a subscriber in the DMS-HLR. It is a mandatory parameter for all supported subscriber provisioning message types			S	R
ALGORITHM	Version of the A38 authentication algorithm used. Specify a value of 1 for this algorithm.		1	S	R
KI	The unique security key (Ki). Ki must be a string of 32 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	R
SKE_OPERATIONAL	Subscriber key encryption. If it is not specified and the SKE is not operational, the value is NO. If SKE is operational, value is YES.	YES, NO	NO	S	O

Table 5: A_VF-AUC_V4-8_CREATE_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
ENC_ID	Encryption key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
CHECK	Integrity check value. A string of 8 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
INT_ID	Integrity key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
COMMENT	Comments.			S	O

A_VF-AUC_V4-8_DELETE_SUBSCRIBER

Deletes an existing subscriber record from the database. It is implemented by the Java method **com.metasolv.cartridge.oss.vf_auc_v48.prov.AUCProvisioning.deleteSubscriber.**

Table 6: A_VF-AUC_V4-8_DELETE_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	The name of the host NE.			S	R
COMMENT	Comments.			S	O
IMSI	International mobile subscriber identity. The international mobile subscriber identity uniquely identifies a subscriber in the DMS-HLR. It is a mandatory parameter for all supported subscriber provisioning message types.			S	R

A_VF-AUC_V4-8_UPDATE_SIM

Changes the SIM attributes of the authentication subscriber. It is implemented by the Java method **com.metasolv.cartridge.oss.vf_auc_v48.prov.AUCProvisioning.updateSim.**

Table 7: A_VF-AUC_V4-8_UPDATE_SIM

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	The name of the host NE.			S	R
IMSI	International mobile subscriber identity. The international mobile subscriber identity uniquely identifies a subscriber in the DMS-HLR. It is a mandatory parameter for all supported subscriber provisioning message types.			S	R
ATTRIBUTE	Attribute to be changed. Value for this parameter can be: SQN, SIMTYPE, IND or AUTH-configure authentication.			S	R
SQN	The sequence for 3G authentication. The value of the subscribers sequence number cannot be decremented via admin interface. The SQN is updated as part of SDM. Value 0-2^43-1.			S	O
SIMTYPE	The type of SIM. SIM - second generation 2G, USIM third generation 3G USIM.			S	O
IND	Integer index value (0-31). A USIM can store up to 32 vectors. IND is used by an HLR to provide CS_IND (circuit switched index) and PS_IND (packet switched index).			S	O
ALGORITHM	Version of the A38 authentication algorithm used. Specify a value of 1 for this algorithm.			S	O

Table 7: A_VF-AUC_V4-8_UPDATE_SIM

Parameter Name	Description	Range	Default Value	Type	Class
KI	The unique security key (Ki). Ki must be a string of 32 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
SKE_OPERATI ONAL	Subscriber key encryption. If it is not specified and the SKE is not operational, the value is NO. If SKE is operational, value is YES.	YES, NO	NO	S	O
ENC_ID	Encryption key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
CHECK	Integrity check value. A string of 8 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
INT_ID	Integrity key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
COMMENT	Comments.			S	O

A_VF-AUC_V4-8_UPDATE_SUBSCRIBER

Updates the authentication subscriber record in the database. It is implemented by the Java method
com.metasolv.cartridge.oss.vf_auc_v48.prov.AUCProvisioning.updateSubscriber.

Table 8: A_VF-AUC_V4-8_UPDATE_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	The name of the host NE			S	R

Table 8: A_VF-AUC_V4-8_UPDATE_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
IMSI	International mobile subscriber identity. The international mobile subscriber identity uniquely identifies a subscriber in the DMS-HLR. It is a mandatory parameter for all supported subscriber provisioning message types.			S	R
ALGORITHM	Version of the A38 authentication algorithm used. Specify a value of 1 for this algorithm.		1	S	R
KI	The unique security key (Ki). Ki must be a string of 32 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	R
SKE_OPERATIONAL	Subscriber key encryption. If it is not specified and the SKE is not operational, the value is NO. If the SKE is operational, the value is YES.	YES, NO	NO	S	O
ENC_ID	Encryption key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
CHECK	Integrity check value. A string of 8 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
INT_ID	Integrity key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
COMMENT	Comments.			S	O

A_VF-AUC_V4-8_VIEW_SUBSCRIBER

Displays part of the database record for the authentication subscriber. It is implemented by the Java method
com.metasolv.cartridge.oss.vf_auc_v48.prov.AUCProvisioning.viewSubscriber.

Table 9: A_VF-AUC_V4-8_VIEW_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	The name of the host NE.			S	R
IMSI	International mobile subscriber identity. The international mobile subscriber identity uniquely identifies a subscriber in the DMS-HLR. It is a mandatory parameter for all supported subscriber provisioning message types.			S	R
COMMENT	Comments.			S	O

Customizing error handling

You can customize the cartridge's error handling behavior by updating the SARM database table tbl_user_err.

For more information on this table, refer to the *ASAP Developer's Reference*.

Through this static table, you can remap any user-type exit code (USER_TYPE) to a different base exit type (BASE_TYPE). For example, if on a given NE you want a particular ASDL to return a SOFT_FAIL instead of FAIL (hard fail) when it detects a specific error, you can change the BASE_TYPE associated with the appropriate USER_TYPE from FAIL to SOFT_FAIL (the ASDL is mapped to the USER_TYPE by way of the ASDL's script).

Before

USER_TYPE	BASE_TYPE	DESCRIPTION
*User_TypeCode*17	FAIL	NE Fault Code 17

After

USER_TYPE	BASE_TYPE	DESCRIPTION
*User_TypeCode*17	SOFT_FAIL	NE Fault Code 17

ASAP base exit types

◆ SUCCEED — successful ASDL execution.
◆ FAIL — hard error.
◆ SOFT_FAIL — a soft error occurred, but processing will be allowed to continue.
◆ RETRY — the ASDL was not provisioned, but will be retried again.
◆ MAINTENANCE — the ASDL detected the NE is in maintenance mode.
◆ DELAYED_FAIL — the ASDL failed; but processing will continue.

For a complete description of the ASAP base-error types, refer to the *ASAP Developer's Reference*.

The following table contains the tbl_user_err entries for the Vodafone Authentication Centre v4.8 cartridge.

Table 10: tbl_user_err — section containing entries for the Vodafone Authentication Centre v4.8

USER_TYPE	BASE_TYPE	DESCRIPTION	ASDL
VF_AUC_SUCCEED	SUCCEED	The successful provisioning C1:00000,00000	
VF_AUC_LOOPBACK	SUCCEED	The successful provisioning LOOPBACK	
VF_AUC_00002,00002	FAIL	Subscriber IMSI not in use.	
VF_AUC_00002,00016	FAIL	Authentication subscriber IMSI already in use.	
VF_AUC_00002,00017	FAIL	Authentication subscriber IMSI not in use.	
VF_AUC_00002,00018	FAIL	Unable to create authentication subscriber.	
VF_AUC_00002,00033	FAIL	Cannot update authentication algorithm and key separately.	
VF_AUC_00002,00042	FAIL	Inappropriate command for platform configuration.	
VF_AUC_00002,00055	FAIL	Unable to access subscriber record.	
VF_AUC_00002,00061	FAIL	HLR updated but subscriber data download failed.	
VF_AUC_00002,00062	FAIL	Invalid identifier for encryption key or integrity key, only if SKE is used.	
VF_AUC_00002,00063	FAIL	Integrity key not held in HLR table, only if SKE is used.	

Table 10: tbl_user_err — section containing entries for the Vodafone Authentication Centre v4.8

USER_TYPE	BASE_TYPE	DESCRIPTION	ASDL
VF_AUC_00002,00064	FAIL	Integrity check algorithm not found for given key, only if SKE is used.	
VF_AUC_00002,00065	FAIL	Integrity check failed, only if SKE is used.	
VF_AUC_00002,00066	SOFT_FAIL	Encryption key not held in HLR table, only if SKE is used.	
VF_AUC_00002,00067	SOFT_FAIL	Encryption algorithm not found for given key, only if SKE is used.	
VF_AUC_00002,00068	FAIL	Encryption/Decryption algorithm internal error, only if SKE is used.	
VF_AUC_00002,00099	FAIL	Internal software error.	
VF_AUC_00002,00115	FAIL	Sequence number should be updated to a higher value.	
VF_AUC_00002,00116	FAIL	Unable to allocate resource	
VF_AUC_00003,00001	FAIL	Syntax violation.	
VF_AUC_00004,00001	FAIL	Syntax violation.	
VF_AUC_00006,00001	FAIL	Incorrect number of parameter.	
VF_AUC_00007,00001	FAIL	Invalid parameter value.	
VF_AUC_00007,00002	FAIL	Invalid parameter value.	
VF_AUC_00007,00003	FAIL	Invalid parameter value.	
VF_AUC_00007,00004	FAIL	Invalid parameter value.	
VF_AUC_TELEXCEPTION	RETRY	Telnet exception occurred.	
VF_AUC_IOEXCEPTION	RETRY	IOException exception occurred.	

Table 10: tbl_user_err — section containing entries for the Vodafone Authentication Centre v4.8

USER_TYPE	BASE_TYPE	DESCRIPTION	ASDL
VF_AUC_EXCEPTION	FAIL	General exception occurred.	

4

Service Definition

The Vodafone Authentication Centre v4.8 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 are provided in this cartridge. The following table lists and describes the type of parameter information that is included.

Table 11: CSDL 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.
Type	Indicates one of the following parameter types: ◆ S—Scalar ◆ C—Compound ◆ I—Indexed
Class	Indicates one of the following parameter classifications: ◆ R—Required ◆ O—Optional

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

Common Service Description Layer (CSDL) commands

AuC services

This cartridge provides the following CSDL commands:

- ◆ C_VF-AUC_V4-8_CREATE_SUBSCRIBER
- ◆ C_VF-AUC_V4-8_DELETE_SUBSCRIBER
- ◆ C_VF-AUC_V4-8_UPDATE_SIM
- ◆ C_VF-AUC_V4-8_UPDATE_SUBSCRIBER
- ◆ C_VF-AUC_V4-8_VIEW_SUBSCRIBER

C_VF-AUC_V4-8_CREATE_SUBSCRIBER

Creates a new authentication subscriber record in the database.

Table 12: C_VF-AUC_V4-8_CREATE_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
ALGORITHM	Version of the A38 authentication algorithm used. Specify a value of 1 for this algorithm.		1	S	R
CHECK	Integrity check value. A string of 8 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
COMMENT	Comments.			S	O
ENC_ID	Encryption key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
IMSI	International mobile subscriber identity. The international mobile subscriber identity uniquely identifies a subscriber in the DMS-HLR. It is a mandatory parameter for all supported subscriber provisioning message types.			S	R

Table 12: C_VF-AUC_V4-8_CREATE_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
INT_ID	Integrity key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
KI	The unique security key (Ki). Ki must be a string of 32 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	R
NE_ID_VF-AUC	The name of the host NE.			S	R
SKE_OPERATI ONAL	Subscriber key encryption. If it is not specified and the SKE is not operational, the value is NO. If SKE is operational, value is YES.	YES, NO	NO	S	O

Mapping to ASDLs

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

Table 13: CSDL to ASDL Mapping

CSDL	ASDL
C_VF-AUC_V4-8_CREATE_SUBSCRIBER	A_VF-AUC_V4-8_CREATE_SUBSCRIBER

C_VF-AUC_V4-8_DELETE_SUBSCRIBER

Deletes an existing subscriber record from the database.

Table 14: C_VF-AUC_V4-8_DELETE_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
COMMENT	Comments.			S	O

Table 14: C_VF-AUC_V4-8_DELETE_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
IMSI	International mobile subscriber identity. The international mobile subscriber identity uniquely identifies a subscriber in the DMS-HLR. It is a mandatory parameter for all supported subscriber provisioning message types.			S	R
NE_ID_VF-AUC	The name of the host NE.			S	R

Mapping to ASDLs

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

Table 15: CSDL to ASDL Mapping

CSDL	ASDL
C_VF-AUC_V4-8_DELETE_SUBSCRIBER	A_VF-AUC_V4-8_DELETE_SUBSCRIBER

C_VF-AUC_V4-8_UPDATE_SIM

Changes the SIM attributes of the authentication subscriber.

Table 16: C_VF-AUC_V4-8_UPDATE_SIM

Parameter Name	Description	Range	Default Value	Type	Class
ALGORITHM	Version of the A38 authentication algorithm used. Specify a value of 1 for this algorithm.		1	S	O
ATTRIBUTE	Attribute to be changed. Value for this parameter can be: SQN, SIMTYPE, IND or AUTH-configure authentication.			S	R
CHECK	Integrity check value. A string of 8 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O

Table 16: C_VF-AUC_V4-8_UPDATE_SIM

Parameter Name	Description	Range	Default Value	Type	Class
COMMENT	Comments.			S	O
ENC_ID	Encryption key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
IMSI	International mobile subscriber identity. The international mobile subscriber identity uniquely identifies a subscriber in the DMS-HLR. It is a mandatory parameter for all supported subscriber provisioning message types.			S	R
IND	Integer index value (0-31). A USIM can store up to 32 vectors. IND is used by an HLR to provide CS_IND (circuit switched index) and PS_IND (packet switched index).			S	O
INT_ID	Integrity key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
KI	The unique security key (Ki). Ki must be a string of 32 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
NE_ID_VF-AUC	The name of the host NE.			S	R
SIMTYPE	The type of SIM. SIM - second generation 2G, USIM third generation 3G USIM.			S	O
SKE_OPERATIONAL	Subscriber key encryption. If it is not specified and the SKE is not operational, the value is NO. If SKE is operational, value is YES.	YES, NO	NO	S	O

Table 16: C_VF-AUC_V4-8_UPDATE_SIM

Parameter Name	Description	Range	Default Value	Type	Class
SQN	The sequence for 3G authentication. The value of the subscribers sequence number cannot be decremented via admin interface. The SQN is updated as part of SDM. Value 0-2^43-1.			S	O

Mapping to ASDLs

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

Table 17: CSDL to ASDL Mapping

CSDL	ASDL
C_VF-AUC_V4-8_UPDATE_SIM	A_VF-AUC_V4-8_UPDATE_SIM

C_VF-AUC_V4-8_UPDATE_SUBSCRIBER

Updates the authentication subscriber record in the database.

Table 18: C_VF-AUC_V4-8_UPDATE_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
ALGORITHM	Version of the A38 authentication algorithm used. Specify a value of 1 for this algorithm.		1	S	R
CHECK	Integrity check value. A string of 8 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
COMMENT	Comments.			S	O
ENC_ID	Encryption key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O

Table 18: C_VF-AUC_V4-8_UPDATE_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
IMSI	International mobile subscriber identity. The international mobile subscriber identity uniquely identifies a subscriber in the DMS-HLR. It is a mandatory parameter for all supported subscriber provisioning message types.			S	R
INT_ID	Integrity key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	O
KI	The unique security key (Ki). Ki must be a string of 32 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.	0 - 9 and A - F		S	R
NE_ID_VF-AUC	The name of the host NE.			S	R
SKE_OPERATIONAL	Subscriber key encryption. If it is not specified and the SKE is not operational, the value is NO. If SKE is operational, value is YES.	YES, NO	NO	S	O

Mapping to ASDLs

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

Table 19: CSDL to ASDL Mapping

CSDL	ASDL
C_VF-AUC_V4-8_UPDATE_SUBSCRIBER	A_VF-AUC_V4-8_UPDATE_SUBSCRIBER

C_VF-AUC_V4-8_VIEW_SUBSCRIBER

Displays part of the database record for the authentication subscriber.

Table 20: C_VF-AUC_V4-8_VIEW_SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
COMMENT	Comments.			S	O
IMSI	International mobile subscriber identity. The international mobile subscriber identity uniquely identifies a subscriber in the DMS-HLR. It is a mandatory parameter for all supported subscriber provisioning message types.			S	R
NE_ID_VF-AUC	The name of the host NE.			S	R

Mapping to ASDLs

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

Table 21: CSDL to ASDL Mapping

CSDL	ASDL
C_VF-AUC_V4-8_VIEW_SUBSCRIBER	A_VF-AUC_V4-8_VIEW_SUBSCRIBER

5

Configuring ASAP to Support Additional NE Instances

You can configure ASAP to support the Vodafone AuC - NEP configuration using the Service Activation Configuration Tool (SACT). Refer to the *ASAP System Configuration and Management Guide* fore more information.

Below is an example of Activation Configuration XML configuration file for Vodafone Authentication Centre v4.8 cartridge.

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XML Spy v4.3 U (http://www.xmlspy.com) by Tvrtko Meler
  -->
<!--Sample XML file generated by XML Spy v4.3 U (http://www.xml-
  spy.com)-->
<activationConfig xmlns="http://www.metasolv.com/ServiceActivation/
  2003/ActivationConfig" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
  instance" xsi:schemaLocation="http://www.metasolv.com/ServiceActi-
  vation/2003/ActivationConfig
C:\ASAP4.6\ActivationConfig.xsd">
  <connectionPool name="AUCPOOL">
      <device name="vfauc_dev1">
          <environment>MY_ASAP_SYS</environment>
          <lineType>TELNET_CONNECTION</lineType>
      </device>
  </connectionPool>
  <element name="VFAUC48">
      <technology>VF-AUC</technology>
      <softwareLoad>V4-8</softwareLoad>
      <nepServerName>$NEP</nepServerName>
      <primaryPool>AUCPOOL</primaryPool>
      <maximumConnections>1</maximumConnections>
      <dropTimeout>2</dropTimeout>
      <spawnThreshold>3</spawnThreshold>
      <killThreshold>2</killThreshold>
      <routingElement name="VFAUC48">
          <atomicService/>
      </routingElement>
      <communicationParameter>
          <label>HOST_IPADDR</label>
          <value>
              <value>10.6.1.90</value>
          </value>
```

```
        <description>The IP Address for the remote NE host</descrip-
tion>
        <deviceName>COMMON_DEVICE_CFG</deviceName>
        <lineType>TELNET_CONNECTION</lineType>
    </communicationParameter>
    <communicationParameter>
        <label>PORT</label>
        <value>
            <value>23</value>
        </value>
        <description>Port number to connect on remote  NE host</de-
scription>
        <deviceName>COMMON_DEVICE_CFG</deviceName>
        <lineType>TELNET_CONNECTION</lineType>
    </communicationParameter>
    <communicationParameter>
        <label>OPEN_TIMEOUT</label>
        <value>
            <value>5</value>
        </value>
        <description>Connection timeout (seconds)</description>
        <deviceName>COMMON_DEVICE_CFG</deviceName>
        <lineType>TELNET_CONNECTION</lineType>
    </communicationParameter>
    <communicationParameter>
        <label>READ_TIMEOUT</label>
        <value>
            <value>10</value>
        </value>
        <description>Read timeout (seconds)</description>
        <deviceName>COMMON_DEVICE_CFG</deviceName>
        <lineType>TELNET_CONNECTION</lineType>
    </communicationParameter>
    <communicationParameter>
        <label>HOST_USERID</label>
        <value>
            <value>AUC_ID</value>
        </value>
        <description>AUC User ID to login</description>
        <deviceName>COMMON_DEVICE_CFG</deviceName>
        <lineType>TELNET_CONNECTION</lineType>
    </communicationParameter>
    <communicationParameter>
        <label>HOST_PASSWORD</label>
        <value>
            <value>AUC_PASSWD</value>
        </value>
        <description>AUC Password to login</description>
        <deviceName>COMMON_DEVICE_CFG</deviceName>
        <lineType>TELNET_CONNECTION</lineType>
    </communicationParameter>
    <communicationParameter>
        <label>PROMPT</label>
        <value>
            <value>LOOPBACK&lt;</value>
        </value>
        <description>Loopback Interface prompt</description>
```

```
              <deviceName>COMMON_DEVICE_CFG</deviceName>
              <lineType>TELNET_CONNECTION</lineType>
       </communicationParameter>
       <communicationParameter>
                     <label>LOGIN_PROMPT</label>
                       <value>
                               <value>login:</value>
                       </value>
                       <description>Login prompt default value is
login:</description>
                       <deviceName>COMMON_DEVICE_CFG</deviceName>
                       <lineType>TELNET_CONNECTION</lineType>
               </communicationParameter>
               <communicationParameter>
                       <label>PASSWORD_PROMPT</label>
                       <value>
                               <value>Password:</value>
                       </value>
                       <description>Login prompt default value is
Password:</description>
                       <deviceName>COMMON_DEVICE_CFG</deviceName>
                       <lineType>TELNET_CONNECTION</lineType>
               </communicationParameter>
               <communicationParameter>
                       <label>ADM_INTERFACE</label>
                       <value>
                               <value>ADMP</value>
                       </value>
                     <description>String to access the administration
interface</description>
                       <deviceName>COMMON_DEVICE_CFG</deviceName>
                       <lineType>TELNET_CONNECTION</lineType>
               </communicationParameter>
               <communicationParameter>
                       <label>NODE_PROMPT</label>
                       <value>
                               <value>ADM&gt;</value>
                       </value>
                       <description>Administration command prompt</
description>
                       <deviceName>COMMON_DEVICE_CFG</deviceName>
                       <lineType>TELNET_CONNECTION</lineType>
               </communicationParameter>
               <communicationParameter>
                       <label>RESPONSELOG</label>
                       <value>
                               <value>TRUE</value>
                       </value>
                       <description>Response Log enable or disable
flag</description>
                       <deviceName>COMMON_DEVICE_CFG</deviceName>
                       <lineType>TELNET_CONNECTION</lineType>
               </communicationParameter>
               <communicationParameter>
                       <label>LOGIN_SLEEP</label>
                       <value>
                               <value>2</value>
```

```
                        </value>
                        <description>Sleep in seconds during login to
   AUC before getting prompt</description>
                        <deviceName>COMMON_DEVICE_CFG</deviceName>
                        <lineType>TELNET_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 under Vodafone_AUC_V4.8, copy the .sar file to the new directory and un-jar the sar file, as described by Step 2 through Step 4 in "Modifying vf_auc_v48_activation_configuration.xml" on page 9.

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 file, you must create a new sar file, then restart the cartridge using the new file.

Follow the instructions in "Modifying vf_auc_v48_activation_configuration.xml" on page 9 for directions on how to load a new XML file.

6

MML Commands

This chapter provides you with a list of the MML commands and the user exit types that this cartridge uses.

MML command execution overview

The following describes how the Java method executes the MML command.

1. The Java method retrieves the ASDL parameters.

2. Using the parameters, the method builds the MML command.

3. If the NE is in live mode, the method sends the MML to the remote host, then waits for the response.

4. The method checks the response from the NE for errors.

   ◆ If the response is error free, the method returns a SUCCEED message to the upstream system.

   ◆ If an error occurs, the method returns an error message to the SARM.

MML command descriptions

This section describes the MML commands and lists them by their associated Java method.

createAUCSUB

MML Command

```
CREATE:AUCSUB,<imsi>,<algorithm>,<ki>,<enc_id>,<check>,<int_id>;
```

Table 22: createAUCSUB

Parameter	Description
`<imsi>`	Authentication subscriber IMSI.
`<algorithm>`	Version of the A38 authentication algorithm used. Specify a value of 1 for this algorithm.
`<ki>`	The unique security key (Ki). Ki must be a string of 32 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.
`<end_id>`	Encryption key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.
`<check>`	Integrity check value and a string of 8 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.
<int_id>	Integrity key identifier and a string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.

Output Parameters

◆ ERRORINFO - In SARM DB table TBL_INFO_PARM if the work order fails.

◆ CSDL parameter - AUC_ADD_ERR_CODE

deleteAUCSUB

MML Command

```
DELETE:AUCSUB,<imsi>;
```

Table 23: deleteAUCSUB

Parameter	Description
`<imsi>`	Authentication subscriber IMSI.

Output Parameters

◆ ERRORINFO - In SARM DB table TBL_INFO_PARM if the work order fails.

◆ CSDL parameter - AUC_DEL_ERR_CODE

updateAUCSUB

MML Commands

```
UPDATE:AUCSUB,<imsi>,<algorithm>,<ki>,<end_id>,<check>,<int_id>;
```

Table 24: updateAUCSUB

Parameter	Description
`<imsi>`	Authentication subscriber IMSI.
`<algorithm>`	Version of the A38 authentication algorithm used. Specify a value of 1 for this algorithm.
`<ki>`	The unique security key (Ki). Ki must be a string of 32 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.
`<end_id>`	Encryption key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.
`<check>`	Integrity check value and a string of 8 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.
`<int_id>`	Integrity key identifier and a string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.

Output Parameters

◆ ERRORINFO - In SARM DB table TBL_INFO_PARM if the work order fails.

◆ CSDL parameter - AUC_MOD_ERR_CODE

viewAUCSUB

MML Commands

```
VIEW:AUCSUB,<imsi>;
```

Table 25: viewAUCSUB

Parameter	Description
`<imsi>`	Authentication subscriber IMSI

Output Parameters

In the SARM DB table tbl_info_parm, parameter label VIEWAUCINFO with a value should be inserted if the method returns success.

◆ ERRORINFO - In SARM DB table TBL_INFO_PARM if the work order fails.

◆ CSDL parameter - AUC_QRY_ERR_CODE

updateAUCSIM

MML Commands

```
UPDATE:AUCSIM,<imsi>,<attribute_name>,<attribute_value>,{(<attribute_
value>)};
```

Table 26: updateAUCSIM

Parameter	Description
`<imsi>`	Authentication subscriber IMSI.
`<attribute_name>`	Attribute to be changed (SQN, SIMTYPE, IND, AUTH).
`<attribute_name - SQN>`	value 0 - 2^43 - 1
`<attribute_name - SIMTYPE>`	SIM, USIM
`<attribute_name - IND>`	0 - 31
`<attribute_name - AUTH> values are as below:`	

Table 26: updateAUCSIM

Parameter	Description
`<algorithm>`	Version of the A38 authentication algorithm used. Specify a value of 1 for this algorithm.
`<ki>`	The unique security key (Ki). Ki must be a string of 32 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.
`<end_id>`	Encryption key identifier. A string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.
`<check>`	Integrity check value and a string of 8 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.
`<int_id>`	Integrity key identifier and a string of 4 characters consisting of numbers between 0 - 9 and letters between A - F, inclusively.

Output Parameters

◆ ERRORINFO - In SARM DB table TBL_INFO_PARM if the work order fails.

◆ CSDL parameter - AUC_MOD_SIM_ERR_CODE