Oracle Communications ASAP™ Cartridge 1.0 for VLR

Nokia M12 ED1 VLR Cartridge Guide

First Edition
September 2008

Copyright and Trademark Information

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. Professional Services or systems integrators can perform extensions to the cartridge 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

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 Nokia M12 ED1 VLR (Visiter Location Register) 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 this cartridge. It is not a complete ASAP reference guide.

For additional ASAP 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 Nokia M12 ED1 VLR cartridge provides the ASAP service configuration and network element (NE) interface to activate VLR services on Nokia HLR NEs.

Services, features, and options

Table 1: Services provided in the cartridge

Service	Service Description
Create subscriber	Create a subscriber in the VLR.
Delete subscriber	Deletes a subscriber from the VLR. The HLR of the subscriber is informed of the removal.
Query subscriber's Camel data	Retrieves the CAMEL data that belongs to a specified subscriber from the Visitor Location Register.
Query number of subscribers	Retrieves the total number of normal as well as telemetric subscribers from the Visitor Location Register.
Query subscriber data	Retrieves the subscriber's data from the Visitor Location Register.
Query subscriber's equipment identity	Retrieves the international mobile station equipment identity (IMEI) of the subscriber from the Visitor Location Register.
Query subscriber's closed user group data	Retrieves the closed user group (CUG) data of the subscriber from the Visitor Location Register.
Query subscriber's operator determined barring data	Retrieves the Operator Determined Barring (ODB) data of the subscriber from the Visitor Location Register.
Query subscriber's supplementary service data	Retrieves the supplementary service of the subscriber from the Visitor Location Register.

Hardware and software requirements

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

- Network element (NE) interface
- ASAP version

Network element (NE) interface

This cartridge operates with the following:

- Nokia HLR NE with software load M12-ED1.

ASAP version

This cartridge was developed and tested using ASAP 4.6.4.

Operating environment

This version of ASAP operates in conjunction with the cartridge using the following operating environments:

- Operating System—Sun Solaris 2.8 or/and HP-UX 11.0i
- Database Management System—Oracle 9i
- Third-Party Software—Not applicable
- J2EE platform—BEA WebLogic 7.0.4

Connecting to the NE

The Nokia M12 ED1 VLR cartridge interfaces with Nokia HLR NEs using the telnet protocol over TCP/IP.

2

Installing and Testing the Cartridge

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

- Downloading the cartridge
- Installing the cartridge
- Uninstalling the cartridge
- Testing the cartridge installation

Starting ASAP

Before downloading 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.

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

   ```
   mkdir <repository dir>
   ```

2. Untar NokiaVLR_R1_0.b4.tar.

   ```
   tar xvf NokiaVLR_R1_0.b4.tar
   ```

3. Copy the resulting /Nokia directory and its contents to the repository directory.

   ```
   cp -rf /Nokia <repository_dir>
   ```

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>
   Nokia
      /README
      /installCartridge
      /uninstallCartridge
      /NOKIA_HLR_M12_ED1_VLR_SUB_1_0.sar
```

Installing the cartridge

Run the installation script installCartridge to install the cartridge. You will find this script under /Nokia. The script executes the following tasks:

- Configures the Nokia M12 ED1 VLR-specific NE using the SACT.
- Deploys the Nokia M12 ED1 VLR cartridge service model (only if the Nokia M12 ED1 VLR service model is not yet deployed) using the Service Activation Deployment Tool (SADT).
- Copies the Nokia M12 ED1 VLR-specific jar files and the cpp library file 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 from /Nokia. At the prompt, type:

   ```
   installCartridge NOKIA_HLR_M12_ED1_VLR_SUB_1_0.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. Restart ASAP to upload the cartridge configuration into ASAP.

Uninstalling the cartridge

Run the uninstallation script uninstallCartridge to uninstall the Nokia M12 ED1 VLR cartridge. This script is located under Nokia. The script executes the following tasks:

- Unconfigures Nokia M12 ED1 VLR-specific NEs using the SACT.
- Undeploys the Nokia M12 ED1 VLR cartridge service model (only if the Nokia M12 ED1 VLR service model is already deployed) using the Service Activation Deployment Tool (SADT).
- Removes the Nokia M12 ED1 VLR-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 from /Nokia. At the prompt, type

```
uninstallCartridge NOKIA_HLR_M12_ED1_VLR_SUB_1_0.<date>.<time>.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 ASAP 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

The following sections tell you which variables you must configure in ASAP.cfg to use the loopback and live testing modes.

Loopback mode

The following table details the parameters that you must set to test the cartridge in loopback mode.

Table 2: Loopback Mode Parameter Settings

Configuration Variable	Parameter Settings	Location in ASAP.cfg
LOOPBACK_ON	1 (default setting)	Global section (Loopback at the NEP)

The following table lists the parameters for the sample NE configuration XML used by SACT for loopback testing:

Table 3: NE configuration parameters

Parameters	Default Value	Description
NOK-HLR_M12-ED1_VLR	NOK-HLR_M12-ED1_VLR-HOST	Logical NE name.
HOST_IPADDR	172.28.159.130	The network IP address for the NE host.
PORT	23	Telnet port.
USER	Prosam	User name of the host NE.
PASSWORD	JEDISL	Password for the host NE.
OPEN_TIMEOUT	20	Connection timeout.
READ_TIMEOUT	30	Read timeout.
LOGIN_PROMPT	ENTER USERNAME <	Telnet login prompt.
PASSWORD_ PROMPT	ENTER PASSWORD <	Telnet password prompt.
PROMPT	<	Provisioning prompt.
USER_ERROR_ TYPES_FILE	/config/Nokia_M12_ED1_VLR_UserExitTypes.cfg	The user exit types file. This file is relative to the $ASAP_BASE directory.
RESPONSELOG	TRUE	Flag to turn on or off response logging.

Live mode

The following table details the parameters that you must set in ASAP.cfg to test the cartridge in live mode.

Table 4: Live Mode Parameter Settings

Configuration Variable	Parameter Settings	Location in ASAP.cfg
LOOPBACK_ON	0	Global section (Live)

Modifying nokia_m12_ed1_vlr_ne_config.xml

Use the following procedure to modify nokia_m12_ed1_vlr_ne_config.xml.

To modify nokia_m12_ed1_vlr_ne_config.xml

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

   ```
   mkdir <new_source_directory>
   ```

2. Copy NOKIA_HLR_M12_ED1_VLR_SUB_1_0.sar to this new source directory.

   ```
   cp NOKIA_HLR_M12_ED1_VLR_SUB_1_0.sar ./<new_source_directory>
   ```

3. Change directory to <new_source_directory>.

   ```
   cd <new_source_directory>
   ```

4. Un-jar NOKIA_HLR_M12_ED1_VLR_SUB_1_0.sar This extracts the contents of the sar file (see Figure 1 on page 11 for an example of the resulting file structure).

   ```
   jar xvf NOKIA_HLR_M12_ED1_VLR_SUB_1_0.sar
   ```

5. Edit <new_source_directory>/Nokia/common/application_config/ nokia_m12_ed1_vlr_ne_config.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 NOKIA_HLR_M12_ED1_VLR_SUB_1_0.sar in /Nokia (That is, use the original sar file that you copied in Step 2 above—see "Uninstalling the cartridge" on page 7 for uninstallation instructions).

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

9. Copy the new sar file from <new_source_directory> to /Nokia.

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

```
META-INF/activation-model.xml
Nokia/
   M12_ED1_VLR/
      common/
         application_config/
         control/
            PLSQL/
         cpp/
            lib/
         java/
            lib/
         nep/
            PLSQL/
         sarm/
            ne_progs/
            PLSQL/
         scripts/
         service_model/
      subscriber/
         control/
            PLSQL/
         cpp/
            lib/
         java/
            classes/
            lib/
            src/
         nep/
            PLSQL/
         sample_wo/
         sarm/
            ne_progs/
            PLSQL/
         service_model/{at least one .xml file}
```

Figure 1: File Structure of the Un-Jared .sar File

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 in /Nokia/sample_wo by typing:

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

   A list of all available suites appears.

   To see the sample work orders, refer to Viewing the sample work orders, below.

   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 return the 104 state.

   To view the sample work orders provided with this cartridge, refer to the Nokia M12 ED1 VLR cartridge source.

Viewing the sample work orders

You find the sample work orders under 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 /Nokia, copy the sar file to the new directory and un-jar the sar file, as described by Step 1 through Step 4 in "Modifying nokia_m12_ed1_vlr_ne_config.xml" on page 10.

2. Locate and view the sample work order files under Nokia/Nokia/M12_ED1_VLR/subscriber/sample_wo.

3

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's 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.*

VLR service pack

The Nokia M12 ED1 VLR cartridge provides the following ASDL commands to support VLR service on Nokia HLR NEs:

- A_NOK-HLR_M12-ED1_CREATE_VLR-SUBSCRIBER
- A_NOK-HLR_M12-ED1_DELETE_VLR-SUBSCRIBER
- A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER
- A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CAMEL
- A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CUG
- A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-IMEI
- A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-ODB
- A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-SUPPLEMENTARY-SERVICES
- A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-TOTAL

A_NOK-HLR_M12-ED1_CREATE_VLR-SUBSCRIBER

Create a subscriber in the VLR. The subscriber is created for limited testing purposes only. It is implemented by the Java method **com.metasolv.cartridge.oss.nk_hlr_m12_ed1_vlr.prov.VLRProvisioning.createSubscriber.**

Table 6: A_NOK-HLR_M12-ED1_CREATE_VLR-SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	NE logical ID.			S	R
IMSI	Subscriber IMSI.			S	R
MSISDN	Subscriber MSISDN.			S	R
LAC	Location area code of the IMSI.			S	R
CAT	Mobile station category.			S	O
BSERV	Service type.			S	O

Output parameters

CSDL label

```
NKVLR_ADD_ERR_CODE
```

MML commands

```
ZMVC:IMSI=<imsi>,MSISDN=<msisdn>,LAC=<lac>:[CAT=<cat> |[,] BSERV=<bserv>];
```

Table 7: MML command parameters

Field name	Description	Range	Default
<imsi>	International Mobile Subscriber Identity.	Maximum 15 digit decimal number.	-
<msisdn>	Mobile Subscriber International Isdn Number.	Maximum 15 digits decimal number.	-
<lac>	Location Area Code of IMSI.	Maximum hexadecimal number of 4 digits.	-
<cat>	Mobile station category.	◆ OR—Ordinary subscriber ◆ CB—payphone ◆ TP—Test phone ◆ PR—Subscriber with priority ◆ ONC—Oridinary no charge <option> ◆ PNC—priority no charge <option> ◆ TMS1—Telemetric Category 1 <option> ◆ TMS2—Telemetric Category 2 <option> ◆ TMS3—Telemetric Category 3 <option>	OR

Table 7: MML command parameters

Field name	Description	Range	Default
<bserv>	Basic Service Code.	Teleservices ◆ T11—Telephony ◆ TD1—Alternate line service ◆ T21—Short message MT/PP ◆ T22—Short message MO/PP ◆ T61—Facsimile group 3 and alter speech ◆ T62—Automatic facsimile group 3 Bearer services ◆ B11—Data c.d.a 300 bps ◆ B12—Data c.d.a 1200 bps ◆ B13—Data c.d.a 1200-75 bps ◆ B14—Data c.d.a 2400 bps ◆ B15—Data c.d.a 4800 bps ◆ B16—Data c.d.a 9600 bps ◆ B17—General data c.d.a ◆ B1A—Data c.d.s 1200 bps ◆ B1C—Data c.d.s 2400 bps ◆ B1D—Data c.d.s 4800 bps ◆ B1E—Data c.d.s 9600 bps ◆ B1F—General data c.d.s	T11 (Telephony)

If you do not provide values for the CAT and BSERV parameters, the system uses the default values.
If you provide both CAT and BSERV values, they are separated by comma in the MML command string.

Example

```
ZMVC:IMSI=2440512345,MSISDN=3585054321,LAC=EE55;
ZMVC:IMSI=2440512345,MSISDN=3585054321,LAC=ABCD:CAT=PR,BSERV=T11;
ZMVC:IMSI=1234567,MSISDN=1234567,LAC=1111:CAT=TMS1,BSERV=T22;
```

A_NOK-HLR_M12-ED1_DELETE_VLR-SUBSCRIBER

Deletes a subscriber from the VLR. The HLR of the subscriber is informed of the removal. It is implemented by the Java method **com.metasolv.cartridge.oss.nk_hlr_m12_ed1_vlr.prov.VLRProvisioning.deleteSubscriber.**

Table 8: A_NOK-HLR_M12-ED1_DELETE_VLR-SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	NE logical ID.			S	R
IMSI	Subscriber IMSI.			S	R
TERM	Traffic termination option. The options are: ◆ A—terminate all traffic. ◆ N—no termination of traffic.	A or N		S	O

MML commands

```
ZMVD:IMSI=<imsi>:[TERM=<term>];
```

Table 9: MML command parameters

Field name	Description	Range	Default
<imsi>	International Mobile Subscriber Identity.	Maximum 15 digits decimal number.	-
<term>	Traffic termination <option>	A—all traffic terminated. N—no traffic terminated.	N

Example

```
ZMVD:IMSI=2440512345:TERM=A;
```

A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER

Retrieves subscriber data from the Visitor Location Register. It is implemented by the Java method

com.metasolv.cartridge.oss.nk_hlr_m12_ed1_vlr.prov.VLRProvisioning.querySubscriber.

Table 10: A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	NE logical ID.			S	R
IMSI	Subscriber IMSI.			S	O
MSISDN	Subscriber MSISDN.			S	O

Output parameters—TBL_INFO_PARM labels

INTERNATIONAL MOBILE SUBSCRIBER IDENTITY

TEMPORARY MOBILE SUBSCRIBER IDENTITY

ACTIVATION STATUS

MOBILE STATION CATEGORY

ROUTING CATEGORY

ADDITIONAL ROUTING CATEGORY

MOBILE COUNTRY CODE

MOBILE NETWORK CODE

LOCATION AREA CODE OF IMSI

RADIO ACCESS INFO

MOBILE NOT REACHABLE FLAG

HLR FAILURE FLAG

FORWARDING SUPPLEMENTARY SERVICE CHECK FLAG

IMSI DETACH FLAG

LAST ACTIVATE DATE

LAST USED CELL ID

CAMEL CURRENT LSA

CAMEL SELECTED LSA

HLR-ADDRESS

INTELLIGENT NETWORK MOBILITY MANAGEMENT SCP ADDRESS

INTELLIGENT NETWORK MOBILITY MANAGEMENT DETECTION POINT NAME

INTELLIGENT NETWORK MOBILITY MANAGEMENT SERVICE KEY

TRANSACTION TYPE

INTELLIGENT NETWORK SHORT MESSAGE SERVICE SCP ADDRESS

```
INTELLIGENT NETWORK SHORT MESSAGE SERVICE DETECTION POINT NAME
INTELLIGENT NETWORK SHORT MESSAGE SERVICE SERVICE KEY
TRIGGERING ALL MULTIPLE MESSAGES
ORIGINATING CCBS
TERMINATING CCBS
CCBS MONITORED
NUMBER OF CALL TRANSFERS
NUMBER OF OBSERVATION ACTIVATIONS
NUMBER OF SAMPLING PERIOD
TIME LIMIT OF MO CALLS
ACTION PARAMETER FOR MO CALLS
TIME LIMIT OF CF CALLS
ACTION PARAMETER FOR CF CALLS
TIME LIMIT OF CT CALLS
ACTION PARAMETER FOR CT CALLS
MAX. NUMBER OF CT INVOCATIONS
ACTION PARAMETER FOR CT INVOCATIONS
SIMULTANEOUS CALL TRANSFER IN PROGRESS
ZONE CODES
SGSN ADDRESS
CONFIRMED RADIO CONTACT VIA SGSN
VLRU IDENTITY
MOBILE SUBSCRIBER INTERNATIONAL ISDN NUMBER
MOBILE SUBSCRIBER ALTERNATE LINE SERVICE MSISDN
BASIC SERVICES
ONLY ACCESS INDICATOR
UNIV LSA TYPE
UNIV LSA ID
UNIV PRI
UNIV PREF
UNIV ACT MODE
UNIV AM SUPPORT
PLMN LSA TYPE
PLMN LSA ID
PLMN PRI
PLMN PREF
```

PLMN ACT MODE

PLMN AM SUPPORT

UNIV LSA TYPE

UNIV LSA ID

UNIV PRI

UNIV PREF

UNIV ACT MODE

UNIV AM SUPPORT

Output parameters—CSDL labels

INTERNATIONAL_MOBILE_SUBSCRIBER IDENTITY

TEMPORARY_MOBILE_SUBSCRIBER IDENTITY

ACTIVATION_STATUS

MOBILE_STATION_CATEGORY

ROUTING_CATEGORY

ADDITIONAL_ROUTING_CATEGORY

MOBILE_COUNTRY_CODE

MOBILE_NETWORK_CODE

LOCATION_AREA_CODE_OF_IMSI

RADIO_ACCESS_INFO

MOBILE_NOT_REACHABLE_FLAG

HLR_FAILURE_FLAG

FORWARDING_SUPPLEMENTARY_SERVICE_CHECK_FLAG

IMSI_DETACH_FLAG

LAST_ACTIVATE_DATE

LAST_USED_CELL_ID

CAMEL_CURRENT_LSA

CAMEL_SELECTED_LSA

HLR_ADDRESS

INTELLIGENT_NETWORK_MOBILITY_MANAGEMENT_SCP_ADDRESS

INTELLIGENT_NETWORK_MOBILITY_MANAGEMENT_DETECTION_POINT_NAME

INTELLIGENT_NETWORK_MOBILITY_MANAGEMENT_SERVICE_KEY

TRANSACTION_TYPE

INTELLIGENT_NETWORK_SHORT_MESSAGE_SERVICE_SCP_ADDRESS

INTELLIGENT_NETWORK_SHORT_MESSAGE_SERVICE_DETECTION_POINT_NAME

INTELLIGENT_NETWORK_SHORT_MESSAGE_SERVICE_SERVICE_KEY

TRIGGERING_ALL_MULTIPLE_MESSAGES

ORIGINATING_CCBS

TERMINATING_CCBS

CCBS_MONITORED

NUMBER_OF_CALL_TRANSFERS

NUMBER_OF_OBSERVATION_ACTIVATIONS

NUMBER_OF_SAMPLING_PERIOD

TIME_LIMIT_OF_MO_CALLS

ACTION_PARAMETER_FOR_MO_CALLS

TIME_LIMIT_OF_CF_CALLS

ACTION_PARAMETER_FOR_CF_CALLS

TIME_LIMIT_OF_CT_CALLS

ACTION_PARAMETER_FOR_CT_CALLS

MAX._NUMBER_OF_CT_INVOCATIONS

ACTION_PARAMETER_FOR_CT_INVOCATIONS

SIMULTANEOUS_CALL_TRANSFER_IN_PROGRESS

ZONE_CODES

SGSN_ADDRESS

CONFIRMED_RADIO_CONTACT_VIA_SGSN

VLRU_IDENTITY

MOBILE_SUBSCRIBER_INTERNATIONAL_ISDN_NUMBER

MOBILE_SUBSCRIBER_ALTERNATE_LINE_SERVICE_MSISDN

BASIC_SERVICES

ONLY_ACCESS_INDICATOR

UNIV_LSA_TYPE

UNIV_LSA_ID

UNIV_PRI

UNIV_PREF

UNIV_ACT_MODE

UNIV_AM_SUPPORT

PLMN_LSA_TYPE

PLMN_LSA_ID

PLMN_PRI

PLMN_PREF

PLMN_ACT_MODE

PLMN_AM_SUPPORT

```
UNIV_LSA_TYPE
UNIV_LSA_ID
UNIV_PRI
UNIV_PREF
UNIV_ACT_MODE
UNIV_AM_SUPPORT
```

MML commands

```
ZMVO:(IMSI=<imsi>|MSISDN=<msisdn>);
```

Table 11: MML command parameters

Field name	Description	Range	Default
<imsi>	International Mobile Subscriber Identity.	Maximum 15 digits decimal number.	-
<msisdn>	Mobile Subscriber International ISDN Number.	Maximum 15 digits decimal number.	-

If both the parameters are set on the work order, then the IMSI is used and the MSISDN is discarded in building the MML. If none of the parameters are specified, the ASDL is failed with an appropriate error message.

Example

```
ZMVO:IMSI=2440512345;
ZMVO:MSISDN=358501234567;
```

A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CAMEL

Retrieves the CAMEL data that belongs to a specified subscriber from the Visitor Location Register. It is implemented by the Java method

com.metasolv.cartridge.oss.nk_hlr_m12_ed1_vlr.prov.VLRProvisioning.querySubscriberCamel.

Table 12: A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CAMEL

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	NE logical ID.			S	R
IMSI	Subscriber IMSI.			S	O
MSISDN	Subscriber MSISDN.			S	O
BSERV	Basic service code.			S	R
ALS	Alternate line service.	Y or N		S	O

Output parameters—TBL_INFO_PARM labels

```
O-CSI CAP
O-CSI DP 1
O-CSI SCP 1
O-CSI SKEY 1
O-CSI DEFCH 1
O-CSI DN 1
O-CSI DNL 1
O-CSI TRCR 1
O-CSI BSCCR 1
O-CSI FCCR 1
O-CSI REL 1
O-CSI DP 2
O-CSI SCP 2
O-CSI SKEY 2
O-CSI DEFCH 2
O-CSI DN 2
O-CSI DNL 2
O-CSI TRCR 2
O-CSI BSCCR 2
O-CSI FCCR 2
O-CSI REL 2
```

SS-CSI SSC

SS-CSI SSA

VT-CSI CAP

VT-CSI DP 1

VT-CSI SCP 1

VT-CSI SKEY 1

VT-CSI DEFCH 1

VT-CSI BSCCR 1

VT-CSI REL 1

VT-CSI DP 2

VT-CSI SCP 2

VT-CSI SKEY 2

VT-CSI DEFCH 2

VT-CSI BSCCR 2

VT-CSI REL 2

D-CSI CAP

D-CSI DN 1

D-CSI SCP 1

D-CSI SKEY 1

D-CSI DEFCH 1

D-CSI DN 2

D-CSI SCP 2

D-CSI SKEY 2

D-CSI DEFCH 3

SMS-CSI CAP

SMS-CSI DP 1

SMS-CSI SCP 1

SMS-CSI SKEY 1

SMS-CSI DSMS 1

M-CSI DP 1

M-CSI SCP 1

M-CSI SKEY 1

Output parameters—CSDL labels

O_CSI_CAP

O_CSI_DP_1

```
O_CSI_SCP_1
O_CSI_SKEY_1
O_CSI_DEFCH_1
O_CSI_DN_1
O_CSI_DNL_1
O_CSI_TRCR_1
O_CSI_BSCCR_1
O_CSI_FCCR_1
O_CSI_REL_1
O_CSI_DP_2
O_CSI_SCP_2
O_CSI_SKEY_2
O_CSI_DEFCH_2
O_CSI_DN_2
O_CSI_DNL_2
O_CSI_TRCR_2
O_CSI_BSCCR_2
O_CSI_FCCR_2
O_CSI_REL_2
SS_CSI_SSC
SS_CSI_SSA
VT_CSI_CAP
VT_CSI_DP_1
VT_CSI_SCP_1
VT_CSI_SKEY_1
VT_CSI_DEFCH_1
VT_CSI_BSCCR_1
VT_CSI_REL_1
VT_CSI_DP_2
VT_CSI_SCP_2
VT_CSI_SKEY_2
VT_CSI_DEFCH_2
VT_CSI_BSCCR_2
VT_CSI_REL_2
D_CSI_CAP
D_CSI_DN_1
```

D_CSI_SCP_1

D_CSI_SKEY_1

D_CSI_DEFCH_1

D_CSI_DN_2

D_CSI_SCP_2

D_CSI_SKEY_2

D_CSI_DEFCH_2

D_CSI_DN_3

D_CSI_SCP_3

D_CSI_SKEY_3

D_CSI_DEFCH_3

SMS_CSI_CAP

SMS_CSI_DP_1

SMS_CSI_SCP_1

SMS_CSI_SKEY_1

SMS_CSI_DSMS_1

M_CSI_DP_1

M_CSI_SCP_1

M_CSI_SKEY_1

MML commands

```
ZMVG:(IMSI = <imsi>|[,]MSISDN = <msisdn>):BSERV=<bserv>|ALS=<als>;
```

Table 13: MML command parameters

Field name	Description	Range	Default
<imsi>	International Mobile Subscriber Identity.	Maximum 15 digits decimal number.	-
<msisdn>	Mobile Subscriber International ISDN Number.	Maximum 15 digits decimal number.	-

Table 13: MML command parameters

Field name	Description	Range	Default
<bserv>	Basic Service Code	Teleservices ◆ T11—Telephony ◆ TD1—Alternate line service ◆ T21—Short message MT/PP ◆ T22—Short message MO/PP ◆ T61—Facsimile group 3 and alter speech ◆ T62—Automatic facsimile group 3 Bearer services ◆ B11—Data c.d.a 300 bps ◆ B12—Data c.d.a 1200 bps ◆ B13—Data c.d.a 1200-75 bps ◆ B14—Data c.d.a 2400 bps ◆ B15—Data c.d.a 4800 bps ◆ B16—Data c.d.a 9600 bps ◆ B17—General data c.d.a ◆ B1A—Data c.d.s 1200 bps ◆ B1C—Data c.d.s 2400 bps ◆ B1D—Data c.d.s 4800 bps ◆ B1E—Data c.d.s 9600 bps ◆ B1F—General data c.d.s	-
<als>	Alternate line service	Y or N	-

If both the IMSI and MSISDN parameters are set on the work order, then the IMSI is taken and MSISDN is discarded in building the MML.

- If none of the parameters are specified, the ASDL is failed with an appropriate error message.
- If the parameter ALS is specified with a value other than "Y" or "N", the ASDL fails with an appropriate error message.

Example

```
ZMVG:IMSI=26203521119:BSERV=T11;
```

A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CUG

Retrieves the closed user group (CUG) data of the subscriber from the Visitor Location Register. It is implemented by the Java method **com.metasolv.cartridge.oss.nk_hlr_m12_ed1_vlr.prov.VLRProvisioning.querySubscriberCUG.**

Table 14: A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CUG

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	NE logical ID.			S	R
IMSI	Subscriber IMSI.			S	O
MSISDN	Subscriber MSISDN.			S	O

Output parameters—TBL_INFO_PARM labels

```
INTERNATIONAL MOBILE SUBSCRIBER IDENTITY
CLOSED USER GROUP INTERLOCK CODE
CLOSED USER GROUP INDEX
INCOMING CALLS BARRED WITHIN CUG
OUTGOING CALLS BARRED WITHIN CUG
<Interlock Code>  <bserv> BASIC SERVICE
<Interlock Code>  <bserv>  PREF CUG INDEX
<Interlock Code>  <bserv>  INCOMING ACCESS
<Interlock Code>  <bserv>  OUTGOING ACCESS
```

Output parameters—CSDL labels

```
INTERNATIONAL_MOBILE_SUBSCRIBER_IDENTITY
CLOSED_USER_GROUP_INTERLOCK_CODE
CLOSED_USER_GROUP_INDEX
INCOMING_CALLS_BARRED_WITHIN_CUG
OUTGOING_CALLS_BARRED_WITHIN_CUG
<Interlock Code>_<bserv>_BASIC SERVICE
<Interlock Code>_<bserv>_PREF CUG INDEX
<Interlock Code>_<bserv>_INCOMING ACCESS
```

```
<Interlock Code> _<bserv> _OUTGOING ACCESS
```

<Interlock Code> is the Closed User Group Interlock Code value.
<bserv> is any one of the Basic Services.

MML commands

```
ZMVQ:(IMSI=<imsi>|MSISDN=<msisdn>);
```

Table 15: MML command parameters

Field name	Description	Range	Default
<imsi>	International Mobile Subscriber Identity.	Maximum 15 digits decimal number.	-
<msisdn>	Mobile Subscriber International ISDN Number.	Maximum 15 digits decimal number.	-

If both the IMSI and MSISDN parameters are set on the work order, then the IMSI is taken and MSISDN is discarded in building the MML. If none of the parameters are specified, the ASDL is failed with an appropriate error message.

Example

```
ZMVQ:IMSI=2440512345;
ZMVQ:MSISDN=35805012345;
```

A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-IMEI

Retrieves the international mobile station equipment identity (IMEI) of the subscriber from the Visitor Location Register. It is implemented by the Java method **com.metasolv.cartridge.oss.nk_hlr_m12_ed1_vlr.prov.VLRProvisioning.querySubscriberIMEI.**

Table 16: A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-IMEI

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	NE logical ID.			S	R
IMSI	Subscriber IMSI.			S	O
MSISDN	Subscriber MSISDN.			S	O

Output parameters—TBL_INFO_PARM labels

```
MSISDN
IMSI
IMEI (VLR)
IMEI (MOBILE)
```

Output parameters—CSDL labels

```
MSISDN
IMSI
IMEI_(VLR)
IMEI_(MOBILE)
```

MML commands

ZMVP:(IMSI=<imsi>|MSISDN=<msisdn>);

Table 17: MML command parameters

Field name	Description	Range	Default
<imsi>	International Mobile Subscriber Identity.	Maximum 15 digits decimal number.	-
<msisdn>	Mobile Subscriber International ISDN Number.	Maximum 15 digits decimal number.	-

If both the IMSI and MSISDN parameters are set on the work order, then the IMSI is taken and MSISDN is discarded in building the MML. If none of the parameters are specified, the ASDL is failed with an appropriate error message.

Example

```
ZMVP:IMSI=2440512345;
ZMVP:MSISDN=35805012345;
```

A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-ODB

Retrieves the Operator Determined Barring (ODB) data of the subscriber from the Visitor Location Register. It is implemented by the Java method

com.metasolv.cartridge.oss.nk_hlr_m12_ed1_vlr.prov.VLRProvisioning.querySubscriberODB.

Table 18: A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-ODB

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	NE logical ID.			S	R
IMSI	Subscriber IMSI.			S	O
MSISDN	Subscriber MSISDN.			S	O
SERVICE_IDENTIFICATION	Indicates the type of service for which the data is queried for.	NORM—normal service ALS—Alternate Line Service.		S	O

Output parameters—TBL_INFO_PARM labels

IMSI

BAOC

BOIC

BOIH

BOZ

BOZH

BOZIH

BAPRE

BAPRI

BOS1

BOS2

BOS3

BOS4

BASS

BI

BIC

BICI

BICZ

BICB

BIM

Output parameters—CSDL LABEL

IMSI

BAOC

BOIC

BOIH

BOZ

BOZH

BOZIH

BAPRE

BAPRI

BOS1

BOS2

BOS3

BOS4

BASS

BI

BIC

BICI

BICZ

BICB

BIM

MML commands

ZMVR:(IMSI=<imsi>|MSISDN=<msisdn>):[<service_identification>];

Table 19: MML command parameters

Field name	Description	Range	Default
<imsi>	International Mobile Subscriber Identity.	Maximum 15 digits decimal number	-
<msisdn>	Mobile Subscriber International ISDN Number.	Maximum 15 digits decimal number	-

Table 19: MML command parameters

Field name	Description	Range	Default
<service_ identification>	Service identification.	NORM—normal service ALS—Alternate Line Service.	NORM

If both the IMSI and MSISDN parameters are set on the work order, then the IMSI is taken and MSISDN is discarded in building the MML. If none of the parameters are specified, the ASDL is failed with an appropriate error message.

Example

```
ZMVR:IMSI=2440512345:;
ZMVR:MSISDN=35805012345:ALS;
```

A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-SUPPLEMENTARY-SERVICES

Retrieves the supplementary service of the subscriber from the Visitor Location Register. It is implemented by the Java method **com.metasolv.cartridge.oss.nk_hlr_m12_ed1_vlr.prov.VLRProvisioning.querySubscriberSupplementaryServices.**

Table 20: A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-SUPPLEMENTARY-SERVICES

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	NE logical ID.			S	R
IMSI	Subscriber IMSI.			S	O
MSISDN	Subscriber MSISDN.			S	O
BSERV	Service type.			S	R

Output parameters—TBL_INFO_PARM labels

```
INTERNATIONAL MOBILE SUBSCRIBER IDENTITY
BASIC SERVICE CODE
AOC
HOLD
```

CLIP

CLIR

CT

PNI

RDI

MPTY

ICK

SSET

CHC

CA

HB

PIC

PLOCK

UUS

COLP

COLR

BAOC PROV

BAOC ACT

BOIC PROV

BOIC ACT

BOIH PROV

BOIH ACT

CFU PROV

CFU ACT

CFB PROV

CFB ACT

CFB C-NUMBER

CFNR PROV

CFNR ACT

CFNA PROV

CFNA ACT

CW PROV

CW ACT

MC PROV

MC ACT

NBR_USER

NBR_SB

UNIC

EXTERNAL LCS CLIENT 1

RESTRICTION 1

NOTIFIC AND VERIFICATION 1

EXTERNAL LCS CLIENT 2

RESTRICTION 2

NOTIFIC AND VERIFICATION 2

EXTERNAL LCS CLIENT 3

RESTRICTION 3

NOTIFIC AND VERIFICATION 3

EXTERNAL LCS CLIENT 4

RESTRICTION 4

NOTIFIC AND VERIFICATION 4

GMLC LIST

BLOC

CHPLM

CVPLM

ALOC

TARG

BSLC

ASLC

TTPC

CRNV

CUNV

Output parameters—CSDL labels

INTERNATIONAL_MOBILE_SUBSCRIBER_IDENTITY

BASIC_SERVICE_CODE

AOC

HOLD

CLIP

CLIR

CT

PNI

RDI

MPTY

ICK

SSET

CHC

CA

HB

PIC

PLOCK

UUS

COLP

COLR

BAOC_PROV

BAOC_ACT

BOIC_PROV

BOIC_ACT

BOIH_PROV

BOIH_ACT

CFU_PROV

CFU_ACT

CFB_PROV

CFB_ACT

CFB_C_NUMBER

CFNR_PROV

CFNR_ACT

CFNA_PROV

CFNA_ACT

CW_PROV

CW_ACT

MC_PROV

MC_ACT

NBR_USER

NBR_SB

UNIC

EXTERNAL_LCS_CLIENT_1

RESTRICTION_1

NOTIFIC_AND_VERIFICATION_1

EXTERNAL_LCS_CLIENT_2

RESTRICTION_2

NOTIFIC_AND_VERIFICATION_2

EXTERNAL_LCS_CLIENT_3

RESTRICTION_3

NOTIFIC_AND_VERIFICATION_3

EXTERNAL_LCS_CLIENT_4

RESTRICTION_4

NOTIFIC_AND_VERIFICATION_4

GMLC_LIST

BLOC

CHPLM

CVPLM

ALOC

TARG

BSLC

ASLC

TTPC

CRNV

CUNV

MML commands

ZMVS:(IMSI=<imsi>|[,]MSISDN=<msisdn>):BSERV=<bserv>;

Table 21: MML command parameters

Field name	Description	Range	Default
<imsi>	International Mobile Subscriber Identity.	Maximum 15 digits decimal number.	-
<msisdn>	Mobile Subscriber International ISDN Number.	Maximum 15 digits decimal number.	-

Table 21: MML command parameters

Field name	Description	Range	Default
<bserv>	Basic Service Code.	Teleservices ◆ T11—Telephony ◆ TD1—Alternate line service ◆ T21—Short message MT/PP ◆ T22—Short message MO/PP ◆ T61—Facsimile group 3 and alter speech ◆ T62—Automatic facsimile group 3 Bearer services ◆ B11—Data c.d.a 300 bps ◆ B12—Data c.d.a 1200 bps ◆ B13—Data c.d.a 1200-75 bps ◆ B14—Data c.d.a 2400 bps ◆ B15—Data c.d.a 4800 bps ◆ B16—Data c.d.a 9600 bps ◆ B17—General data c.d.a ◆ B1A—Data c.d.s 1200 bps ◆ B1C—Data c.d.s 2400 bps ◆ B1D—Data c.d.s 4800 bps ◆ B1E—Data c.d.s 9600 bps ◆ B1F—General data c.d.s	-

If both the IMSI and MSISDN parameters are set on the work order, then the IMSI is used and the MSISDN is discarded in building the MML. If none of the parameters are specified, the ASDL is failed with an appropriate error message.

Example

```
ZMVS:IMSI=26203521119:BSERV=T11;
ZMVS:MSISDN=35805012345:BSERV=T21;
```

A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-TOTAL

Retrieves the total number of normal as well as telemetric subscribers from the Visitor Location Register. It is implemented by the Java method

com.metasolv.cartridge.oss.nk_hlr_m12_ed1_vlr.prov.VLRProvisioning.querySubscriberTotal.

Table 22: A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-TOTAL

Parameter Name	Description	Range	Default Value	Type	Class
MCLI	NE logical ID.			S	R

Output parameters—TBL_INFO_PARM labels

```
<vlr_id> NORMAL
<vlr_id> TELEMETRIC
<vlr_id> TOTAL
TOTAL NORMAL
TOTAL TELEMETRIC
TOTAL TOTAL
```

Output parameters—CSDL labels

```
<vlr_id>_NORMAL
<vlr_id>_TELEMETRIC
<vlr_id>_TOTAL
TOTAL_NORMAL
TOTAL_TELEMETRIC
TOTAL_TOTAL
```

 <vlr_id> is the VLR ID.

MML commands

```
ZMVI;
```

Example

```
ZMVI;
```

User-defined exit types

The user-defined exit types are placed in file Nokia_M12_ED1_VLR_UserExitTypes.cfg. The following table lists the contents of this file. You have full control of this file. Additional error

codes may be inserted into this file as and when they are discovered. The corresponding user exit type must exist in tbl_user_error and its respective ASAP exit type.

If this file is removed or its path is incorrect, the user exit type will use the default NK_VLR_NO_MATCH and will map to ASAP exit type FAIL.

Table 23: Contents of Nokia_M12_ED1_VLR_UserExitTypes.cfg

ERROR CODE	USER EXIT TYPE
COMMAND EXECUTED	NK_EXECUTED
SUCCESS	NK_SUCCEED
ADDITION NOT POSSIBLE	NK_ADD_FAILED
SYNTAX ERROR	NK_SYNTAX_ERROR
NOT IMPLEMENTED	NK_FUNC_NOT_IMPL
DX ERROR	NK_EXEC_ERROR
COMMAND IGNORED	NK_CMD_IGNORED
CONNECTION ERROR	NK_CONN_ERROR
COMMUNICATION ERROR	NK_MAINTENANCE
INCORRECT COMMAND	NK_INCORRECT_CMD
NO RESPONSE	NK_NO_RESPONSE
COMMAND BLOCKED	NK_CMD_BLOCKED
NO SUCH FILE	NK_NO_SUCH_FILE
MISSING SEMICOLON	NK_MISS_SEMICOL
INCORRECT PARAMETER IN TASK	NK_WRONG_PARAM
UNKNOWN COMMAND	NK_UNKNOWN_CMD
MML LENGTH ERROR	NK_MML_LEGTH_ERR
MODIFICATIONS NOT ALLOWED	NK_MOD_NOT_ALLOW
COMMAND NOT AUTHORIZED	NK_NOT_AUTHORIZED
RECEIVED MESSAGE IS OF WRONG LENGTH	NK_WRONG_LEN_MSG

Table 23: Contents of Nokia_M12_ED1_VLR_UserExitTypes.cfg

ERROR CODE	USER EXIT TYPE
MID ALREADY EXISTS	NK_VSUB_EXISTS
UNKNOWN VIRTUAL SUBSCRIBER	NK_VSUB_NOT_EXISTS
NOT ATTACHED IMSI	NK_NO_IMSI
ATTACHED IMSI NOT FOUND	NK_IMSI_NOT_FOUND
NO VIRTUAL SUBSCRIBERS FOUND	NK_NO_VSUB_IN_DB
BASIC OR SUPPLEMENTARY SERVICE NOT PROVIDED	NK_SRV_NOT_PROVIDED
SUPPLEMENTARY SERVICE NOT PROVIDED	NK_SUPP_NOT_PROVIDED
CAMEL SERVICE NOT PROVIDED	NK_CAML_NOT_PROVIDED
PRIMARY BASIC SERVICE	NK_WRONG_OP_ON_BSRV
NO PRIMARY MSISDN NUMBER	NK_NO_PRIMARY_MSISDN
SUBSCRIBER ALREADY HAS THIS KIND OF BASIC SERVICE	NK_ALREADY_HAS_BSRV
DELETION NOT ALLOWED	NK_DEL_NOT_ALLOWED
UNKNOWN SUBSCRIBER	NK_NO_SUCH_SUB_IN_DB
SUBSCRIBER ALREADY EXISTS	NK_SUB_EXISTS_IN_DB
UNKNOWN EQUIPMENT	NK_UNKNOWN_EQUIP
BASIC SERVICE CODE AND BASIC SERVICE CODE INDEX MISMATCH	NK_BSRV_MISMATCH
BASIC SERVICE NOT PROVIDED	NK_BSRV_NOT_PROVIDED
ILLEGAL SUPPLEMENTARY SERVICE OPERATION	NK_ILLEGAL_OPERATION

4

Service Definition

The Nokia M12 ED1 VLR 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 24: 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.

Table 24: CSDL parameter information

Item	Description
Type	Indicates one of the following parameter types: ◆ S—Scalar, specifies the parameter label transmitted on the CSDL command. Scalar parameters are conventional name-value pair parameters. ◆ C—Compound, specifies the base name of the compound parameter transmitted on the CSDL 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's 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.*

Common Service Description Layer (CSDL) commands

This cartridge provides the following CSDL commands:

- C_NOK-HLR_M12-ED1_CREATE_VLR-SUBSCRIBER
- C_NOK-HLR_M12-ED1_DELETE_VLR-SUBSCRIBER
- C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER
- C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CAMEL
- C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CUG
- C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-IMEI
- C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-ODB
- C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-SUPPLEMENTARY-SERVICES
- C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-TOTAL

C_NOK-HLR_M12-ED1_CREATE_VLR-SUBSCRIBER

Create a subscriber in the VLR. The subscriber is created for limited testing purposes only.

Table 25: C_NOK-HLR_M12-ED1_CREATE_VLR-SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
BSERV	Service type.			S	O
CAT	Mobile station category.			S	O
IMSI	Subscriber IMSI.			S	R
LAC	Location area code of the IMSI.			S	R
MSISDN	Subscriber MSISDN.			S	R
NOK-HLR_M12-ED1_VLR	NE logical ID.			S	R

Mapping to ASDLs

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

Table 26: CSDL to ASDL Mapping

CSDL	ASDL
C_NOK-HLR_M12-ED1_CREATE_VLR-SUBSCRIBER	A_NOK-HLR_M12-ED1_CREATE_VLR-SUBSCRIBER

C_NOK-HLR_M12-ED1_DELETE_VLR-SUBSCRIBER

Deletes a subscriber from the VLR. The HLR of the subscriber is informed of the removal.

Table 27: C_NOK-HLR_M12-ED1_DELETE_VLR-SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
IMSI	Subscriber IMSI.			S	R
NOK-HLR_M12-ED1_VLR	NE logical ID.			S	R
TERM	Traffic termination option.	A—terminate all traffic. N—no termination of traffic.		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_NOK-HLR_M12-ED1_DELETE_VLR-SUBSCRIBER	A_NOK-HLR_M12-ED1_DELETE_VLR-SUBSCRIBER

C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER

Retrieves the subscriber data from the Visitor Location Register.

Table 29: C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER

Parameter Name	Description	Range	Default Value	Type	Class
IMSI	Subscriber IMSI.			S	O
MSISDN	Subscriber MSISDN.			S	O
NOK-HLR_M12-ED1_VLR	NE logical ID.			S	R

Mapping to ASDLs

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

Table 30: CSDL to ASDL Mapping

CSDL	ASDL
C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER	A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER

C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CAMEL

Retrieves the CAMEL data that belongs to a specified subscriber from the Visitor Location Register.

Table 31: C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CAMEL

Parameter Name	Description	Range	Default Value	Type	Class
ALS	Alternate line service.	Y or N		S	O
BSERV	Basic service code.			S	R
IMSI	Subscriber IMSI.			S	O
MSISDN	Subscriber MSISDN.			S	O
NOK-HLR_M12-ED1_VLR	NE logical ID.			S	R

Mapping to ASDLs

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

Table 32: CSDL to ASDL Mapping

CSDL	ASDL
C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CAMEL	A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CAMEL

C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CUG

Retrieves the closed user group (CUG) data of the subscriber from the Visitor Location Register.

Table 33: C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CUG

Parameter Name	Description	Range	Default Value	Type	Class
IMSI	Subscriber IMSI.			S	O
MSISDN	Subscriber MSISDN.			S	O
NOK-HLR_M12-ED1_VLR	NE logical ID.			S	R

Mapping to ASDLs

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

Table 34: CSDL to ASDL Mapping

CSDL	ASDL
C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CUG	A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-CUG

C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-IMEI

Retrieves the international mobile station equipment identity (IMEI) of the subscriber from the Visitor Location Register.

Table 35: C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-IMEI

Parameter Name	Description	Range	Default Value	Type	Class
IMSI	Subscriber IMSI.			S	O
MSISDN	Subscriber MSISDN.			S	O
NOK-HLR_M12-ED1_VLR	NE logical ID.			S	R

Mapping to ASDLs

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

Table 36: CSDL to ASDL Mapping

CSDL	ASDL
C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-IMEI	A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-IMEI

C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-ODB

Retrieves the Operator Determined Barring (ODB) data of the subscriber from the Visitor Location Register.

Table 37: C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-ODB

Parameter Name	Description	Range	Default Value	Type	Class
IMSI	Subscriber IMSI.			S	O
MSISDN	Subscriber MSISDN.			S	O
NOK-HLR_M12-ED1_VLR	NE logical ID.			S	R

Table 37: C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-ODB

Parameter Name	Description	Range	Default Value	Type	Class
SERVICE_IDENTIFICATION	Indicates the type of service for which the data is queried for.	NORM—normal service ALS—alternate line service.		S	O

Mapping to ASDLs

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

Table 38: CSDL to ASDL Mapping

CSDL	ASDL
C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-ODB	A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-ODB

C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-SUPPLEMENTARY-SERVICES

Retrieves the supplementary service of the subscriber from the Visitor Location Register.

Table 39: C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-SUPPLEMENTARY-SERVICES

Parameter Name	Description	Range	Default Value	Type	Class
BSERV	Service type.			S	R
IMSI	Subscriber IMSI.			S	O
MSISDN	Subscriber MSISDN.			S	O
NOK-HLR_M12-ED1_VLR	NE logical ID.			S	R

Mapping to ASDLs

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

Table 40: CSDL to ASDL Mapping

CSDL	ASDL
C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-SUPPLEMENTARY-SERVICES	A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-SUPPLEMENTARY-SERVICES

C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-TOTAL

Retrieves the total number of normal as well as telemetric subscribers from the Visitor Location Register.

Table 41: C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-TOTAL

Parameter Name	Description	Range	Default Value	Type	Class
NOK-HLR_M12-ED1_VLR	NE logical ID.			S	R

Mapping to ASDLs

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

Table 42: CSDL to ASDL Mapping

CSDL	ASDL
C_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-TOTAL	A_NOK-HLR_M12-ED1_QRY_VLR-SUBSCRIBER-TOTAL

5

Configuring ASAP to Support Additional NE Instances

You can configure ASAP to support the Nokia HLR - 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 the Activation.Configuration.xml file for the Nokia M12 ED1 VLR cartridge.

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XML Spy v4.0 U(http://www.xmlspy.com)by Ovidiu Mu-
  cuceanu (Nortel Networks) -->
<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:\ASAP462\ActivationConfig.xsd">
   <connectionPoolname="NKVLRPOL">
      <devicename="nkvlrm12ed1_telnet_dev1">
         <environment>MY_ASAP_SYS</environment>
         <lineType>TELNET_CONNECTION</lineType>
      </device>
   </connectionPool>
   <element name="NOK-HLR_M12-ED1_VLR-HOST">
      <technology>NOK-HLR</technology>
      <softwareLoad>M12-ED1</softwareLoad>
      <nepServerName>$NEP</nepServerName>
      <primaryPool>NKVLRPOL</primaryPool>
      <maximumConnections>1</maximumConnections>
      <dropTimeout>2</dropTimeout>
      <spawnThreshold>10</spawnThreshold>
      <killThreshold>8</killThreshold>
      <routingElementname="NOK-HLR_M12-ED1_VLR-HOST">
         <atomicService/>
      </routingElement>
      <communicationParameter>
         <label>HOST_IPADDR</label>
         <value>
            <value>172.28.159.130</value>
         </value>
         <description>The network IP Address forthe NE host</descrip-
  tion>
         <deviceName>COMMON_DEVICE_CFG</deviceName>
         <lineType>TELNET_CONNECTION</lineType>
      </communicationParameter>
```

```
<communicationParameter>
   <label>PORT</label>
   <value>
      <value>23</value>
   </value>
   <description>Telnet port</description>
   <deviceName>COMMON_DEVICE_CFG</deviceName>
   <lineType>TELNET_CONNECTION</lineType>
</communicationParameter>
<communicationParameter>
   <label>USER</label>
   <value>
      <value>prosam</value>
   </value>
   <description>user</description>
   <deviceName>COMMON_DEVICE_CFG</deviceName>
   <lineType>TELNET_CONNECTION</lineType>
</communicationParameter>
<communicationParameter>
   <label>PASSWORD</label>
   <value>
      <value>JEDISL</value>
   </value>
   <description>password for login</description>
   <deviceName>COMMON_DEVICE_CFG</deviceName>
   <lineType>TELNET_CONNECTION</lineType>
</communicationParameter>
<communicationParameter>
   <label>OPEN_TIMEOUT</label>
   <value>
      <value>20</value>
   </value>
   <description>Connectiontimeout</description>
   <deviceName>COMMON_DEVICE_CFG</deviceName>
   <lineType>TELNET_CONNECTION</lineType>
</communicationParameter>
<communicationParameter>
   <label>READ_TIMEOUT</label>
   <value>
      <value>30</value>
   </value>
   <description>Read timeout</description>
   <deviceName>COMMON_DEVICE_CFG</deviceName>
   <lineType>TELNET_CONNECTION</lineType>
</communicationParameter>
<communicationParameter>
   <label>LOGIN_PROMPT</label>
   <value>
      <value>ENTER USERNAME &lt;</value>
   </value>
   <description>Telnet login prompt</description>
   <deviceName>COMMON_DEVICE_CFG</deviceName>
   <lineType>TELNET_CONNECTION</lineType>
</communicationParameter>
<communicationParameter>
   <label>PASSWORD_PROMPT</label>
   <value>
```

```
            <value>ENTER PASSWORD &lt;</value>
         </value>
         <description>Telnet password prompt</description>
         <deviceName>COMMON_DEVICE_CFG</deviceName>
         <lineType>TELNET_CONNECTION</lineType>
      </communicationParameter>
      <communicationParameter>
         <label>PROMPT</label>
         <value>
            <value>&lt;</value>
         </value>
         <description>Provisioning prompt</description>
         <deviceName>COMMON_DEVICE_CFG</deviceName>
         <lineType>TELNET_CONNECTION</lineType>
      </communicationParameter>
               <communicationParameter>
                       <label>USER_ERROR_TYPES_FILE</label>
                       <value>
                               <value>/config/
Nokia_M12_ED1_VLR_UserExitTypes.cfg</value>
                       </value>
                       <description>The User Exit types file. This
file is relative to  ASAP_BASE directory</description>
                       <deviceName>COMMON_DEVICE_CFG</deviceName>
                       <lineType>GENERIC_MESSAGE_BASED_CONNECTION</
lineType>
               </communicationParameter>
      <communicationParameter>
         <label>RESPONSELOG</label>
         <value>
            <value>TRUE</value>
         </value>
         <description>Flag to turn on oroff response logging</de-
scription>
         <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 /Nokia, copy the .sar file to the new directory and un-jar the sar file, as described by Step 2 through Step 4 in "Modifying nokia_m12_ed1_vlr_ne_config.xml" on page 10.
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 "Modifying nokia_m12_ed1_vlr_ne_config.xml" on page 10 for directions on how to load a new XML file.