Oracle® Communications Offline Mediation Controller

Cartridge Packs

Release 12.0

E91426-01

December 2017

ORACLE®

Oracle Communications Offline Mediation Controller Cartridge Packs, Release 12.0

E91426-01

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Preface

This guide provides instructions for using cartridge packs to configure mediation and pre-rating processing in Oracle Communications Offline Mediation Controller.

Audience

This guide is intended for charging experts and developers who configure Offline Mediation Controller node chains.

Downloading Oracle Communications Documentation

Product documentation is available from Oracle Help Center:

http://docs.oracle.com

Additional Oracle Communications documentation is available from the Oracle software delivery Web site:

https://edelivery.oracle.com

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About Cartridge Packs

This document describes how to configure Oracle Communications Offline Mediation Controller cartridge packs.

About Cartridge Packs

Cartridge packs are optional Offline Mediation Controller components that provide functionality for specific mediation or pre-charging functions. Table 1–1 lists the cartridge packs.

Table 1–1 Cartridge Packs

Cartridge Pack	Description
AMA CDK Cartridge Pack	Provides the functionality to collect and process AMA data.
ECE Cartridge Pack	Enables Offline Mediation Controller to submit offline charging requests to ECE.
IMS CDF/CGF Cartridge Pack	Collects raw diameter data from IMS devices, converts that data into 32.298 ASN.1 format, and outputs the data to downstream applications
IPDRv2 Distribution Cartridge Pack	Processes IP detail records (IPDRs).
NetFlow Collection and Processing Cartridge Pack	Processes Netflow records
Nortel CS 2000 AMADNS Collection Cartridge Pack	Supports the collection of Nortel CS 2000 SN09 AMADNS records.
Nortel DMS-100 MMP AMA Collection Cartridge Pack	Supports the collection of Nortel DMS-100 MMP AMA (I) SN09 records generated by Nortel DMS-100 switches.
Nortel DMS Operational Metrics Cartridge Pack	Provides functionality to retrieve files containing OM records from various telecom switches and send them to external systems. The OM node chain does not modify OM records; there are no EP or AP nodes.
Nortel DMS SMDR Cartridge Pack	Provides the ability to collect SMDR records from DMS-100 switches.
Nortel GSM/UMTS AMA Cartridge Pack	Provides the functionality to collect AMA data from DMS-MSC SDMs, process that data and send it to downstream applications such as billing systems and/or databases.

Table 1–1 (Cont.) Cartridge Packs

Cartridge Pack	Description
Real-Time ASCII File Collection CDK Cartridge Pack	Collects ASCII records from files in real-time.
SGSN06 Cartridge Pack	Supports 3GPP TS 32.298 V6.4.1, 3GPP TS 32.298 7.3.0, and 3GPP TS 32.298 V10.5.0 for SGSN call data records (CDR).
Syslog Collection Cartridge Pack	Collects syslog files from multiple devices.

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Installing Cartridge Packs

This chapter contains information on the requirements for installing and setting up Oracle Communications Offline Mediation Controller cartridge packs.

Software Requirements

Offline Mediation Controller cartridge packs requires Offline Mediation Controller 12.0.

Before installing the Nortel CS 2000 AMADNS Collection Cartridge Pack or the Nortel DMS-100 MMP AMA Collection Cartridge Pack, install the AMA CDK Cartridge Pack.

Installing Cartridge Packs

To install cartridge kits:

1. Stop all node managers, administration servers, and Administration clients on the system where you are installing the cartridge kit.
2. If already installed, delete any existing JAR file of the type you are installing from the *OMC_home*/**cartridges** directory, where *OMC_home* is the directory in which Offline Mediation Controller is installed.

   Table 2–1 lists the cartridge pack names and jar file names.
3. Download the cartridge kit from the Oracle software delivery Web site:

   `http://edelivery.oracle.com`
4. Unzip the cartridge kit JAR file to the *OMC_home*/**cartridges** directory.
5. For these cartridges only, copy the JAR file to *OMC_home*/**dbscripts**:
   - Nortel DMS SMDR Cartridge Pack
   - Nortel GSM/UMTS AMA Cartridge Pack
6. Start all node managers, administration servers, and Administration clients.
7. Verify that the cartridge pack has been properly installed by viewing **Version Info** from the **Help** menu in Administration Client.

Uninstalling Cartridge Pack

To uninstall a cartridge pack:

1. Go to the *OMC_home*/**cartridges** directory, where *OMC_home* is the directory in which Offline Mediation Controller is installed.

2. Delete the JAR file for the cartridge. See Table 2–1.
3. For these cartridges only, delete the JAR file from the *OMC_home*/**dbscripts** directory:
   - Nortel DMS SMDR Cartridge Pack
   - Nortel GSM/UMTS AMA Cartridge Pack

   When uninstalling those cartridges, you must also remove the scripts from the Oracle Database. See "Removing Scripts From the Database."

Removing Scripts From the Database

The following cartridge packs include scripts that you must remove from the Oracle database when you uninstall them:

- Nortel GSM/UMTS AMA Cartridge Pack
- Nortel DMS SMDR Cartridge Pack

To remove the scripts from the Oracle database:

1. Run the following command:

   ```
   ORracle_home/bin/oemapp dbastudio&
   ```

   Where *Oracle_home* is the directory where you installed Oracle Database software.

   The **Oracle Enterprise Console** appears.
2. Log on using the following information:

   user: system

   password: oracle

   service: NMCDRS
3. In the left frame expand the **schema** directory, and then expand the NMUSER1 directory, which lists the subdirectories.
4. Expand the sub-directories item by item as follows:
   - Tables
   - Source Types
     - Packages
     - Procedures
     - Functions
     - Java Sources
     - Java Classes

       For each of the sub-directories mentioned above there are files related to the schema.
5. Right-click on each file and select **Remove**.
6. Expand the **Storage** directory.
7. Expand the **TableSpace** directory.
8. Right-click on each item and select **Remove** the following tables:

Cartridge Pack	Tables
Nortel GSM/UMTS AMA Cartridge Pack	▪ ENHNMCDRS_MAIN ▪ *TBLSPC_NAME_YYYYMMDD* (if a partition table was created) Where *TBLSPC_NAME* is configured in REPOMAN_CONFIGURATION table.
Nortel DMS SMDR Cartridge Pack	▪ SMDR_MAIN ▪ MSLV_*YYYYMMDD* (if a partition table was created)

9. (Nortel DMS SMDR Cartridge Pack only) Execute the following command as the system user:

```
drop user nmuser1 cascade
```

List of Cartridge Packs and JAR Files

Table 2–1 shows cartridge packs and their JAR file names.

Table 2–1 Cartridge Packs and Their JAR Files

Cartridge Pack	JAR File
AMA CDK Cartridge Pack	ama_cdk_r12_0_0.jar
ECE Cartridge Pack	ocece_r12_0_0.jar
IMS CDF/CGF Cartridge Pack	IMS_R12_0_0.jar
IPDRv2 Distribution Cartridge Pack	ipdr_v2_r12_0_0.jar
NetFlow Collection and Processing Cartridge Pack	netflow_r12_0_0.jar
Nortel CS 2000 AMADNS Collection Cartridge Pack	cs2k_amadns_r12_0_0.jar
Nortel DMS-100 MMP AMA Collection Cartridge Pack	DMS_100_MMP_Collection_R12_0_0.jar
Nortel DMS Operational Metrics Cartridge Pack	om_r12_0_0.jar
Nortel DMS SMDR Cartridge Pack	smdr_r12_0_0.jar
Nortel GSM/UMTS AMA Cartridge Pack	ama_r12_0_0.jar
Real-Time ASCII File Collection CDK Cartridge Pack	realtime_ascii_r12__0_0.jar
SGSN06 Cartridge Pack	sgsn06_r12_0_0.jar
Syslog Collection Cartridge Pack	syslog_r12_0_0.jar

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AMA CDK Cartridge Pack

This chapter describes how to configure the nodes included in the Oracle Communications Offline Mediation Controller AMA CDK Cartridge Pack.

About the AMA CDK Cartridge Pack

The AMA CDK cartridge pack provides the functionality to collect and process AMA data. The cartridge pack includes these features:

- **AMAViewer**-converts AMA files to human-readable XML files.
- The AMA cartridge pack supports incrementing Block Count across output files and Distribution Cartridge (DC) node restarts, for CDMA services.

The AMA DNS XML schema allows you to customize the cartridge pack functionality. The schema is packaged inside the cartridge jar file.

To access the schema, you must un-jar the file by executing the command:

```
jar xvf amadns_r2_1_3.jar
```

and navigating to:

```
com/metasolv/nm/amadns/AMADNSSchema.xsd
<?xml version="1.0" encoding="ISO-8859-1" ?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">
 <xsd:annotation>
  <xsd:documentation xml:lang="en">
    AMA DNS Schema. Copyright 2004 MetaSolv Software Inc. All rights reserved.
   </xsd:documentation>
</xsd:annotation>
<xsd:element name="definition" type="amaDefType"/>
```

Using the AMA CDK Cartridge for CDMA Services

The AMA cartridge pack supports CDMA services. The AMA DNS XML schema allows you to configure the type of supported service as either GSM or CDMA.

The following field definition should be added in the XML file:

```
<xsd:attribute name="hexStructCode" type="xsd:boolean"/>
<definition name="dms_mtx_15_ama"
xmlns:xsd="http://www.w3.org/2001/XMLSchema-instance"
xsd:noNamespaceSchemaLocation="AMADNSSchema.xsd">
```

To specify CDMA or GSM set the hexadecimal structure code to true or false respectively.

Sample **amaBlock** in XML file:

```
<?xml version="1.0" standalone="yes"?>
    <amaStructure>
        <amaBlock BDW="false" RDW="false" blockSize="2048" hexStructCode="true">
            <blockHeaderRec>
                <structureCode>193</structureCode>
            </blockHeaderRec>
        </amaBlock>
```

Maintaining the Fixed Block Size

The AMA DNS XML schema allows you to customize the block filler character used to maintain the fixed block size if the block size is not variable. Using the defined block filler character, the block will be filled. You can specify the block filler character as a regular hexadecimal value or by default the block filler is zero.

Sample **amaBlock** in XML file:

```
<amaBlock BDW="false" RDW="true" blockSize="2048" blockFiller="E">
<xsd:sequence>
```

</amaBlock>

XML Schema

The following is the XML schema for the AMA DNS DC. To access the schema, see "About the AMA CDK Cartridge Pack."

The XML definition file you create must conform to this schema.

```
<xsd:complexType name="amaDefType">
        <xsd:element name="amaStructure" type="amaStructureType"/>
        <xsd:sequence>
            <xsd:element name="structure" minOccurs="1" maxOccurs="unbounded"
type="structure_module_Type"/>
        </xsd:sequence>
        <xsd:sequence>
            <xsd:element name="module" minOccurs="0" maxOccurs="unbounded"
type="structure_module_Type"/>
        </xsd:sequence>
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string"/>
</xsd:complexType>
<xsd:complexType name="amaStructureType">

<xsd:sequence>
<xsd:element name="fileHeader" type="fileHeaderType" minOccurs="0" maxOccurs="1"/>
        <!-- File header block, headerBlock should be the first block in the AMA
file and contains no data block -->
        <xsd:element name="headerBlock" type="amaBlockType" minOccurs="0"
maxOccurs="1"/>
        <!-- AMA data block -->
        <xsd:element name="amaBlock" type="amaBlockType"/>
        <!-- File footer block, footerBlock should be the last block in the AMA
file and contains no data block -->
        <xsd:element name="footerBlock" type="amaBlockType" minOccurs="0"
```

```
maxOccurs="1"/>
        <xsd:element name="operationsInFooterRecordOnly" type="operationsType"/>
        <xsd:sequence>
            <xsd:element name="counterInfo" type = "counterInfoType" minOccurs="0"
maxOccurs="2"/>
        </xsd:sequence>
        <xsd:element name="structureCodeField" type="xsd:string"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="fileHeaderType">

<xsd:sequence>
<xsd:element name="field" type="fieldType" minOccurs="1" maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="counterInfoType">

<xsd:sequence>
<xsd:element name="max" type="counter"/>
        <xsd:element name="min" type="counter"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="counterNameType"/>
</xsd:complexType>
<xsd:simpleType name="counterNameType">

<xsd:restriction base="xsd:string">
<xsd:enumeration value="FileCounter"/>
        <xsd:enumeration value="BlockCounter"/>
    </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="counter">

<xsd:restriction base="xsd:int">
<xsd:minInclusive value="0"/>
    </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="operationsType">

<xsd:restriction base="xsd:string">
<xsd:enumeration
value="getTotalRecordsInFile,getTotalDataRecordsInFile,getTotalBlocksInFile,getTot
alRecordsInBlock,getTotalDataRecordsInBlock,getTimeStampFromBlockHeader,getTimeFro
mBlockHeader,getDateFromBlockHeader,getTimeStampFromFileHeader,getTimeFromFileHead
er,getDateFromFileHeader"/>
    </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="amaBlockType">

<xsd:sequence>
<!-- Block Header Record -->
        <xsd:element name="blockHeaderRec" type="recordType" minOccurs="0"
maxOccurs="1"/>
        <!--    Special header record in this block    -->
        <xsd:element name="headerRec" type="recordType" minOccurs="0"
maxOccurs="1"/>
        <!--    Special footer record in this block    -->
        <xsd:element name="footerRec" type="recordType" minOccurs="0"
maxOccurs="1"/>
    </xsd:sequence>
    <!--  Block Descriptor Word is presented or not  -->
```

```
    <xsd:attribute name="BDW" type="xsd:boolean"/>
    <!--  Record Descriptor Word is presented or not  -->
    <xsd:attribute name="RDW" type="xsd:boolean"/>
    <!--  The size of a block  -->
    <xsd:attribute name="blockSize" type="blockSizeType"/>
    <xsd:attribute name="blockFiller" type="blockFillerType"/>
</xsd:complexType>
<xsd:complexType name="recordType">

<xsd:sequence>
<!-- The structure code of a record, should match the "id" in "structure_module_
Type". -->
        <xsd:element name="structureCode" type="xsd:string"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:simpleType name="blockSizeType">

<xsd:restriction base="xsd:string">
<xsd:enumeration value="2048"/>
        <xsd:enumeration value="variable"/>
    </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="blockFillerType">

<xsd:restriction base="xsd:string">
<xsd:pattern value="[0-9a-fA-F]{1}"/>
  </xsd:restriction>
</xsd:simpleType>
<xsd:complexType name="structure_module_Type">

<xsd:sequence>
<!-- Structure code or module code -->
        <xsd:element name="id" type="xsd:string"/>
        <xsd:sequence>
            <!--      This element is for Module only.      -->
            <xsd:element name="allowedstruct" type="xsd:string" minOccurs="0"
maxOccurs="unbounded"/>
        </xsd:sequence>
        <xsd:sequence>
            <xsd:element name="field" type="fieldType" minOccurs="1"
maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string"/>
    <xsd:attribute name="multivalued" type="xsd:boolean"/>
</xsd:complexType>
<xsd:complexType name="fieldType">

<xsd:sequence>
<xsd:element name="length" type="xsd:int"/>
        <xsd:element name="narid" type="xsd:string"/>
        <xsd:element name="pattern" type="xsd:string" minOccurs="0"
maxOccurs="1"/>
        <xsd:element name="default" type="xsd:string" minOccurs="0"
maxOccurs="1"/>
        <xsd:element name="const" type="xsd:string" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string"/>
    <xsd:attribute name="signdelimited" type="xsd:boolean"/>
    <xsd:attribute name="signCharacterInRegularValue" type="signCharType"/>
```

```
    <xsd:attribute name="signCharacterInNullValue" type="signCharType"/>
    <xsd:attribute name="max" type="xsd:int"/>
    <xsd:attribute name="min" type="xsd:int"/>
    <xsd:attribute name="operation" type="operationType"/>
    <xsd:attribute name="spacePrefix" type="xsd:boolean"/>
    <xsd:attribute name="encoding" type="encodingType"/>
</xsd:complexType>
<!--  Define field encoding type.   -->

<!--  By default (if not defined in XML), encoding type is BCD.  -->
<xsd:simpleType name="encodingType">
    <xsd:restriction base="xsd:string">
        <xsd:enumeration value="BCD"/>
        <xsd:enumeration value="EBCDIC"/>
    </xsd:restriction>
</xsd:simpleType>
<!--  Define sign character if a field is sign delimited.   -->

<!--  By default (if not defined in XML), sign character is "c" in regular value,
for example, "03dc".    -->
<!-- By default (if not defined in XML), sign character is "f" in null value, for
example, "ffff". -->
<xsd:simpleType name="signCharType">
    <xsd:restriction base="xsd:string">
        <xsd:enumeration value="f"/>
        <xsd:enumeration value="c"/>
    </xsd:restriction>
</xsd:simpleType>
<xsd:simpleType name="operationType">

<xsd:restriction base="xsd:string">
<!-- Get total number of records in the file, only available in File Footer -->
        <xsd:enumeration value="getTotalRecordsInFile"/>
        <!--  Get total number of data records (excluding header/footer records)
in the file, only available in File Footer  -->
        <xsd:enumeration value="getTotalDataRecordsInFile"/>
        <!--  Get file name      -->
        <xsd:enumeration value="getFileName"/>
        <!--  Get DMS MSC AMA (GSM 13, 15, and 16) time stamp      -->
        <xsd:enumeration value="getDmsMscTimeStamp"/>
        <!--  Get DMS MSC AMA GSM 17 time stamp      -->
        <xsd:enumeration value="getDmsMscGsm17TimeStamp"/>
        <!--  Get AMA DNS time stamp (includes date and time)      -->
        <xsd:enumeration value="getAmaDnsTimeStamp"/>
        <!--  Get AMA DNS time of day      -->
        <xsd:enumeration value="getAmaDnsTime"/>
        <!--  Get AMA DNS date      -->
        <xsd:enumeration value="getAmaDnsDate"/>
        <!--  Get file sequence number      -->
        <xsd:enumeration value="getFileSequenceNumber"/>
       <!--  Get total number of blocks in a file, only available in File Footer
-->
        <xsd:enumeration value="getTotalBlocksInFile"/>
        <!--  Get block identifier, for multiple switch system      -->
        <xsd:enumeration value="getBlockIdentifier"/>
        <!--  Get block sequence number      -->
        <xsd:enumeration value="getBlockSequenceNumber"/>
        <!--  Get total number of records in a block, only available in Block
Footer      -->
        <xsd:enumeration value="getTotalRecordsInBlock"/>
```

```
        <!--  Get total number of data records (excluding header/footer records)
in a block, only available in Block Footer  -->
        <xsd:enumeration value="getTotalDataRecordsInBlock"/>
        <!--  Use this operation if the field value is presented in the input NAR
-->
        <xsd:enumeration value="getValueFromFieldContainer:Key"/>
        <!--  These are for block footer only, use them if you want the timestamp
in the block footer is the same as the one in the block header.   -->
        <xsd:enumeration value="getTimeStampFromBlockHeader"/>
        <xsd:enumeration value="getTimeFromBlockHeader"/>
        <xsd:enumeration value="getDateFromBlockHeader"/>
        <!--  These are for footer only, use them if you want the timestamp in the
footer is the same as the one in the file header.  -->
        <xsd:enumeration value="getTimeStampFromFileHeader"/>
        <xsd:enumeration value="getTimeFromFileHeader"/>
        <xsd:enumeration value="getDateFromFileHeader"/>
        <!--   Ignore this field  -->
        <xsd:enumeration value="ignore"/>
    </xsd:restriction>
</xsd:simpleType>
</xsd:schema>
```

4

Elastic Charging Engine Cartridge Pack

This chapter describes how to configure and use the Oracle Communications Offline Mediation Controller Elastic Charging Engine Cartridge Pack.

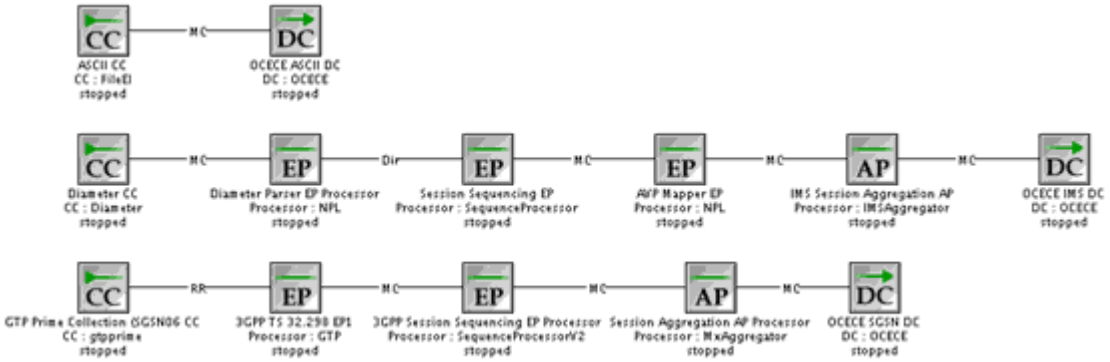
About the ECE Cartridge Pack

The ECE cartridge includes the ECE DC node that enables Offline Mediation Controller to submit offline charging requests to ECE.

The ECE cartridge pack is used with the following existing cartridge packs to process the input records:

- Simple ASCII
- IMS
- SGSN

Figure 4–1 ECE DC Node Configuration Architecture



Integrating ECE and Offline Mediation Controller

Before using the ECE Cartridge Pack to create node chains, you need to configure ECE and Offline Mediation Controller to work together. The procedures are different depending if ECE and Offline Mediation Controller are installed on the same system or not.

Configuring Offline Mediation Controller to Support ECE When Offline Mediation Controller and ECE are Installed on the Same System

To configure Offline Mediation Controller to support ECE:

1. Open the *OMC_Home*/**bin/UDCEnvironment** file in a text editor.
2. Search for the following entry:

   ```
   IS_OCECE_REQUIRED=false
   ```

3. Change the value to **true**, which enables Offline Mediation Controller to interface with ECE.

   ```
   IS_OCECE_REQUIRED=true
   ```

4. Search for the following entry:

   ```
   OCECE_HOME_PATH=/home/opt/charging
   ```

5. Change the value to the directory in which ECE is installed.

   For example:

   ```
   OCECE_HOME_PATH=/home/opt/OracleCommunications/ECE
   ```

6. Save and close the file.
7. Start Offline Mediation Controller. See the discussion about starting Offline Mediation Controller in *Offline Mediation Controller Installation Guide*.

Configuring ECE and Offline Mediation Controller When ECE and Offline Mediation Controller are Installed on Different Systems

To configure ECE and Offline Mediation Controller when ECE and Offline Mediation Controller are installed on different systems:

> **Important:** Ensure that ECE is installed on a system within the same sub-network as the system on which Offline Mediation Controller is installed.

1. On the system where ECE is installed, open the *ECE_Home*/**oceceserver/config/charging-coherence-override-dev.xml** file in a text editor, where *ECE_Home* is the directory in which ECE is installed.
2. Uncomment the following element:

   ```
   <well-known-addresses>
       <socket-address id="1">
      <address system-property="tangosol.coherence.wka">localhost</address>
      <port system-property="tangosol.coherence.wka.port">18088</port>
       </socket-address>
   </well-known-addresses>
   ```

3. In the **address** element, replace **localhost** with the IP address of the system on which ECE is installed:

   ```
   <address system-property="tangosol.coherence.wka">ip_address</address>
   ```

4. In the **time-to-live** element, set the value to **1**:

```
<time-to-live system-property="tangosol.coherence.ttl">1</time-to-live>
```

5. In the **cluster-name** element, set the value to the ECE cluster name.

   For example:

   ```
   <cluster-name system-property="tangosol.coherence.cluster">BRM</cluster-name>
   ```

6. Save and close the file.
7. Copy the *ECE_Home* directory to the system where Offline Mediation Controller is installed.
8. On the system where Offline Mediation Controller is installed, open the *OMC_Home***/bin/UDCEnvironment** file in a text editor.
9. Search for the following entry:

   ```
   IS_OCECE_REQUIRED=false
   ```

10. Change the value to **true**, which enables Offline Mediation Controller to interface with ECE.

    ```
    IS_OCECE_REQUIRED=true
    ```

11. Search for the following entry:

    ```
    OCECE_HOME_PATH=/home/opt/charging
    ```

12. Change the value to the *ECE_Home* directory that you have copied in step 7.

    For example:

    ```
    OCECE_HOME_PATH=/home/opt/OracleCommunications/ECE
    ```

13. Save and close the file.
14. Start ECE in the system where ECE is installed.
15. Start Offline Mediation Controller. See the discussion about starting Offline Mediation Controller in *Offline Mediation Controller Installation Guide*.

Configuring the ECE DC Node

Use the ECE DC node to send output to BRM Elastic Charging Engine (ECE).

Configure these options in the **OCECE Configuration** tab:

Field	Description
Batch size	Number of records per batch.
Max records per suspense/success file	Maximum number of records per file written in the *OMC_home***/ocomc/suspense** or the *OMC_home***/ocomc/success** directory. The minimum value is 1 and the maximum value is 50000.
Waiting time per batch	Time in milliseconds the node waits for the batch to be processed. The minimum value is 1 and the maximum value is 1800000.
Output bad records as NAR	Generates a NAR for the bad records.

Field	Description
Log success records	Enables writing the records successfully processed by ECE to the file in the *OMC_home*/**ocomc/success** directory. The ECE DC node logs successfully processed ECE records to the success file when the advice of charge notification in ECE is set to include events such as an in-session notification on the usage response message (PIGGYBACK). See the ECE documentation for more information about configuring advice of charge notifications.

Edting the ECE DC Rule File

When creating and configuring the ECE Distribution Cartridge (DC) node, you configure a rule file containing the mapping data from the network accounting record (NAR) format to an output format for use by ECE. For more information about editing rule files, see *Offline Mediation Controller Cartridge Development Kit NPL Reference Guide*.

When configuring the ECE DC node, define the following in the rule file:

- Configuration Block
- Input Record Block
- Output Record Block
- Expose Block for PAYLOAD
- Expose Block for Payload Data Type
- Expose Block for Usage Object

Configuration Block

A configuration block is used to set configuration values that are needed by the node. You can define only one configuration block in an NPL rule file.

Syntax

```
Config {
PRODUCTTYPES "product_type[, ...]";
PAYLOAD "payload_type[, ...]";
PAYLOADDATATYPE "datatype";
USAGEOBJECTS "usage_object";
EVENT "event_type[, ...]";
VERSION "version_number[, ...]";
MODE "usage_request_mode";
TIME_ZONE "time_zone";
DATE_FORMAT "date_format";
USAGE_REQUEST_BUILDER "request_format";
}
```

Configuration Settings

PRODUCTTYPES "*product_type*[**,** ...]**";**

where *product_type* is a product type defined in ECE. This parameter is specific to the product types the ECE DC processes.

PAYLOAD "*payload_type*[**,** ...]**";**

where *payload_type* is the payload type defined in ECE.

PAYLOADDATATYPE "*datatype***";**

where *datatype* specifies the data type used in payloads.

USAGEOBJECTS "*usage_object***";**

where *usage_object* specifies the usage objects type. The default value is **USAGEBUILDER**.

EVENT "*event_type*[, ...]**";**

where *event_type* specifies the types of events. Add the *event_type* values separated by commas.

VERSION "*version_number*[, ...]**";**

where *version_number* specifies the version for each record corresponding to the product type. Add the *version_number* values separated by commas.

MODE "*usage_request_mode***";**

where *usage_request_mode* specifies the mode in which Offline Mediation Controller sends usage requests to ECE. Set the parameter to one of the following values:

- **CUMULATIVE**: Specifies that the balance impact in ECE is cumulative.
- **INCREMENTAL** Specifies that the balance impact in ECE is incremental.

TIME_ZONE "*time_zone***";**

where *time_zone* specifies the time zone used by the ECE DC to send the session start time and the session end time to ECE. The default value is **UTC**. The time zone is set at record level or at cartridge level:

- Record level: If the NPL output record block contains the **timeZone** field, the time zone is set at record level. For record level time zone, each call detail record (CDR) can have a different time zone defined by the **timeZone** field in the CDR.
- Cartridge level: If the configuration block contains **TIME_ZONE** field, the time zone is set at cartridge level. All the CDRs processed by the cartridge will contain the same time zone as defined by the **TIME_ZONE** field.

> **Note:** If the time zone is defined at record level and at cartridge level, the record level time zone is used.

DATE_FORMAT "*date_format***";**

where *date_format* specifies the date format used by ECE DC to send the session start time and the session end time to ECE. The default value is **yyyy-MM-dd HH:mm:ss**.

USAGE_REQUEST_BUILDER "*request_format***";**

where *request_format* defines the usage request builders. This parameter is used to create the builders for the corresponding product type, event, and version.

For example:

```
Config {
PRODUCTTYPES "VOICE,DATA,SMS";
PAYLOAD "VOICE_USAGE_Terminate_PAYLOAD,VOICE_USAGE_Update_PAYLOAD,
VOICE_USAGE_Debit_unit_PAYLOAD,VOICE_USAGE_Refund_unit_PAYLOAD,
VOICE_USAGE_Refund_amount_PAYLOAD,VOICE_USAGE_Debit_amount_PAYLOAD,
DATA_DATA_USAGE_Terminate_PAYLOAD,DATA_DATA_USAGE_Update_PAYLOAD,
DATA_DATA_USAGE_Debit_unit_PAYLOAD,DATA_DATA_USAGE_Refund_unit_PAYLOAD,
DATA_DATA_USAGE_Refund_amount_PAYLOAD,DATA_USAGE_Debit_amount_PAYLOAD,
```

```
SMS_SMS_USAGE_Terminate_PAYLOAD,SMS_SMS_USAGE_Debit_unit_PAYLOAD,
SMS_SMS_USAGE_Refund_unit_PAYLOAD,SMS_SMS_USAGE_Refund_amount_PAYLOAD,
SMS_SMS_USAGE_Debit_amount_PAYLOAD";
PAYLOADDATATYPE "PAYLOADDATATYPE";
USAGEOBJECTS "USAGEBUILDER";
EVENT "USAGE,DATA_USAGE,SMS_USAGE";
VERSION "1.0";
MODE "CUMULATIVE";
TIME_ZONE "UTC";
DATE_FORMAT "yyyy-MM-dd HH:mm:ss";
USAGE_REQUEST_BUILDER "VOICE@USAGE@1.0,DATA@DATA_USAGE@1.0,SMS@SMS_USAGE@1.0";
}
```

Input Record Block

An input record block defines the fields in the input data record passed into the node.

Syntax

```
InputRec {
datatype parameter;
} in;
```

Where:

datatype is the data type of the input field; for example, **String**.

parameter is the input field name.

For example:

```
InputRec {
                String calling_number;
                Integer seq_no;
                Integer duration;
                String start_time;
                String product_type;
                String session_id;
                String CalledId;
                String end_time;
                String cell_id;
                String requestedInputVolume;
                String requestedOutputVolume;
                String requestedTotalVolume;
                String usedUnitsInputVolume;
                String usedUnitsOutputVolume;
                String usedUitsTotalVolume;
                String operationType;
                String correlation_identifier;
                String balance_element_id;
                String amount;
              //  String timeZone;
} in;
```

Output Record Block

An output record block is used to define the format of an output data record of the node.

Syntax

```
OutputRec {
datatype parameter;
} out;
```

Where:

datatype is the data type of the output field; for example, **String**.

parameter is the output field name.

For example:

```
OutputRec {
                String calling_number;
                Integer seq_no;
                String duration;
                String start_time;
                String end_time;
                String product_type;
                String session_id;
                String CalledId;
                String npl_type;
                String cdr_service;
                String cell_id;
                String requestedInputVolume;
                String requestedOutputVolume;
                String requestedTotalVolume;
                String usedUnitsInputVolume;
                String usedUnitsOutputVolume;
                String usedUitsTotalVolume;
                Integer usedUnitsSpecificUnit;
                String eventType;
                String version;
                String operationType;
                String correlation_identifier;
                Integer balance_element_id;
                Double amount;
                //  String timeZone;
} out;
```

Expose Block for PAYLOAD

For every payload type in the configuration block, define an Expose block. In the Expose block, map the NPL fields to the ECE Payload fields defined in the ECE request specifications.

For example:

```
Expose for VOICE_PAYLOAD{out.CalledId "CALLED_ID";out.duration "REQUESTED_
UNITS[0].DURATION";}
Expose for DATA_PAYLOAD{out.cell_id "CELL_ID";
out.requestedInputVolume "REQUESTED_UNITS[0].INPUT_VOLUME";
out.requestedOutputVolume "REQUESTED_UNITS[0].OUTPUT_VOLUME";
out.requestedTotalVolume "REQUESTED_UNITS[0].TOTAL_VOLUME";
out.usedUnitsInputVolume "USED_UNITS[0].INPUT_VOLUME";
out.usedUnitsOutputVolume "USED_UNITS[0].OUTPUT_VOLUME";
out.usedUitsTotalVolume "USED_UNITS[0].TOTAL_VOLUME";}
```

Expose Block for Payload Data Type

For every payload data type in the configuration block, define an Expose block. In the Expose block, define the data type for the fields that are passed in payload data type.

For example:

```
Expose for PAYLOADDATATYPE{out.duration "SECONDS";
out.requestedInputVolume "VOLUME";
out.requestedOutputVolume "VOLUME";
out.requestedTotalVolume "VOLUME";
out.usedUnitsInputVolume "VOLUME";
out.usedUnitsOutputVolume "VOLUME";
out.usedUitsTotalVolume "VOLUME";}
```

Expose Block for Usage Object

For every usage objects type in the configuration block, define an Expose block. In the Expose block, map the NPL fields that are sent as parameters in the create usage objects method.

For example:

```
Expose for USAGEBUILDER{
out.calling_number "PARAM1";
out.session_id "PARAM2";
out.start_time "PARAM3";
out.end_time "PARAM4";
out.seq_no "PARAM5";
}
```

Mapping the Input Record Attribute to the Output Record Attribute

When mapping the input record attribute to the output record attribute, set the following output fields based on the specific product type for which the CDR is received:

- **cdr_service**: Set this field to the product types for each CDR record.
- **eventType**: Set this field to the event type for each CDR record corresponding to the product type.
- **version**: Set this field to the version for each CDR record corresponding to the product type.
- **operationType**: Set this field to the usage type for each CDR record corresponding to the product type.

  See the sample mapping for the ECE cartridge pack in *Offline Mediation Controller Cartridge Development Kit NPL Reference Guide* for more information about the supported usage types.

For example:

```
out.cdr_service="VOICE"out.eventType="USAGE"out.version="1.0"out.operationType=
"Terminate"
```

5

IMS CDF/CGF Cartridge Pack

This chapter describes how to configure the nodes included in the Oracle Communications Offline Mediation Controller IMS CDF/CGF Cartridge Pack.

About the IMS CDF/CGF Cartridge Pack

The IMS node chain collects raw diameter data from IMS devices, converts that data into 32.298 ASN.1 format, and outputs the data to downstream applications as shown in Figure 5–1.

Figure 5–1 Architecture

This cartridge supports the following:

- Support for Cause-Code AVP value of -4.
- Compliance with 3GPP Technical Specification 32.298 V10.5
- Compliance with 3GPP Technical Specification 32.260 V10.4
- Compliance with 3GPP Technical Specification 32.299 V10.2

Configuring the Diameter CC

To receive data from Diameter network elements you use the Diameter CC node.

Configure these options in the Diameter tab:

Field	Description
Receive Port	The port that the node monitors for incoming Diameter connections.
Request Timer	The amount of time, in seconds, the node waits for Diameter records to be transferred during an established connection before disconnecting from the remote device.

Creating and Configuring the Diameter Parser EP

The Diameter Parser EP receives raw diameter data from the CC and converts that data into diameter types, then sends the data to the next node in the chain, usually the Session Sequencing EP. There are no specialized tabs in the Diameter Parse EP configuration.

Creating and Configuring the Session Sequencing EP

The Session Sequencing EP organizes CDRs into the correct chronological sequence and removes duplicate records. The EP then passes the files to the next node in the chain, the AVP Mapper EP.

> **Note:** You must configure two Session Sequencing EPs. For the first EP, select the **IMS R6 Event De-Duplication** rule file, and for the second EP, select the **IMS R6 Sequence Processing** rule file.

Configure these options in the **Sequencing** tab:

Option	Description
Expiry Interval (minutes)	Enter the time the node to waits, before the sequence records output are sent to the next node in the chain.
Log Duplicate Entries	Select this check box to enable the node to create a log entry for each duplicate record.
Missing Record Monitoring	Select this check box to enable the node to generate alarms or logs for any missing records it detects.
Missing Record Alarm or Log Severity	Select the alarm severity level or log option that the node will generate for a missing record.

Configuring the AVP Mapper EP Node

The AVP Mapper EP is responsible for converting the incoming Diameter AVPs into their equivalent 32.298 ASN.1 format. There are no specialized tabs in the AVP Mapper EP configuration.

For the exact mapping of Diameter AVP to ASN.1 fields, see "IMS CDF/CGF Cartridge Pack Output Specification."

Configuring the IMS Session Aggregation AP Node

The IMS Session Aggregation AP is responsible for compiling record sessions, and passing these files on to the 3GPP IMS ASN.1 DC. in addition to the standard configuration tabs, you can configure the node to create partial records. To do so, enter a value in minutes in the **Partial Generation** tab.

Creating and Configuring the 3GPP IMS ASN.1 DC Node

The 3GPP IMS ASN.1 DC node converts files to ASN.1 format and then outputs the files to a downstream system. To configure the node you enter file output, FTP connections, and file retention.

IMS Sample Output

This section lists the IMS sample outputs.

Sample Output From an S-CSCF Record in 32.298 ASN.1 Format

The following is IMS sample output from an S-CSCF record in 32.298 ASN.1 format, converted to readable text.

```
* * * * * * * Record 1 * * * * * * *
32.298 v 10.5.0 IMS CDR
-----------------
value IMSRecord ::= sCSCFRecord : {
  recordType sCSCFRecord,
  role-of-Node terminating,
  nodeAddress domainName : "cscf.nn.com",
  session-Id "5e5e-0884-39f4-bb1e6e62@47.129.74.198",
  list-Of-Calling-Party-Address {
    sIP-URI : "sip:004nigelfull@di.com"
  },
  called-Party-Address tEL-URI : "10.13.4.3",
  privateUserID "004nigelfullprv@di.com",
  serviceRequestTimeStamp '0501280850512B0000'H,
  serviceDeliveryStartTimeStamp '0501280850542B0000'H,
  recordOpeningTime '1203190334362B0000'H,
  recordClosureTime '1203190334362B0000'H,
  interOperatorIdentifiers {
    {
      originatingIOI "nigel.com",
      terminatingIOI "nigel.com"
    }
  },
  localRecordSequenceNumber 0,
  causeForRecordClosing timeLimit,
  incomplete-CDR-Indication {
    aCRStartLost FALSE,
    aCRInterimLost unknown,
    aCRStopLost TRUE
  },
  iMS-Charging-Identifier
'3133355F3131303639333233353734343640343 72E3234382E36372E3433'H,
  list-Of-SDP-Media-Components {
    {
      sIP-Request-Timestamp '0501280850512B0000'H,
      sIP-Response-Timestamp '0501280850542B0000'H,
      sDP-Media-Components {
        {
          sDP-Media-Name "Video Conference",
          sDP-Media-Descriptions {
            "a=video conference"
          },
          authorized-QoS "Gold"
        }
      },
      mediaInitiatorFlag NULL,
      sDP-Session-Description {
        "a=Video Conference"
      },
      sIP-Request-Timestamp-Fraction 123456,
      sIP-Response-Timestamp-Fraction 234567,
```

```
    sDP-Type sDP-offer,
    localGWInsertedIndication TRUE,
    iPRealmDefaultIndication TRUE,
    transcoderInsertedIndication TRUE
  }
},
gGSNaddress iPAddress : iPBinaryAddress : iPBinV4Address : '0A0D05E0'H,
serviceReasonReturnCode "-302",
list-Of-Message-Bodies {
  {
    content-Type "application/sdp",
    content-Disposition "Disposition",
    content-Length 3420720,
    originator sIP-URI : "2"
  }
},
expiresInformation 12345,
accessNetworkInformation '4163636573734E6574776F726B496E666F726D6174696F6E'H,
serviceContextID "MNC.MCC.11.32260@3gpp.org",
list-of-subscription-ID {
  {
    subscriptionIDType eND-USER-IMSI,
    subscriptionIDData "SubscriptionIdData1"
  }
},
list-Of-Early-SDP-Media-Components {
  {
    sDP-Media-Components {
      {
        sDP-Media-Name "Video Conference 1",
        sDP-Media-Descriptions {
          "sdp media description- video conference"
        },
        authorized-QoS "Gold"
  }
   },
    mediaInitiatorFlag NULL,
    sDP-Session-Description {
      "a=my sdp session description 1"
    },
    sDP-Type sDP-offer
  }
},
iMSCommunicationServiceIdentifier '496D73436F6D6D5376634964'H,
numberPortabilityRouting "DataForNPRI",
carrierSelectRouting "DataForCSRI",
sessionPriority pRIORITY-1,
serviceRequestTimeStampFraction 123456,
serviceDeliveryStartTimeStampFraction 234567,
applicationServersInformation {
  {
    applicationServersInvolved domainName : "sip:47.135.114.225:5060",
    applicationProvidedCalledParties {
      sIP-URI : "10.13.5.91"
    }
  }
},
requested-Party-Address tEL-URI : "RequestedPartyAddress",
list-Of-Called-Asserted-Identity {
  sIP-URI : "sip:Called-Asserted-Identity-1"
```

```
  },
  online-charging-flag NULL,
  realTimeTariffInformation {
    tariffInformation : {
      currencyCode 840,
      scaleFactor { mantissa 3075, base 2, exponent 2 },
      rateElements {
        {
          unitType 1,
          unitValue { mantissa 3075, base 2, exponent 2 },
          unitCost { mantissa 3075, base 2, exponent 2 },
          unitQuotaThreshold { mantissa 105, base 2, exponent 1 }
        }
      }
    }
  }
}
```

Sample Output From a P-CSCF Record in 32.298 ASN.1 Format

The following is IMS sample output from a P-CSCF record in 32.298 ASN.1 format, converted to readable text.

```
* * * * * * * Record 1 * * * * * * *
32.298 v 10.5.0 IMS CDR
------------------
value IMSRecord ::= pCSCFRecord : {
  recordType pCSCFRecord,
  role-of-Node terminating,
  nodeAddress domainName : "cscf.nn.com",
  session-Id "5e5e-0884-39f4-bb1e6e62@47.129.74.198",
  list-Of-Calling-Party-Address {
    sIP-URI : "sip:004nigelfull@di.com"
  },
  called-Party-Address tEL-URI : "10.13.4.3",
  serviceRequestTimeStamp '0501280850512B0000'H,
  serviceDeliveryStartTimeStamp '0501280850542B0000'H,
  recordOpeningTime '1203210136242B0000'H,
  recordClosureTime '1203210136242B0000'H,
  interOperatorIdentifiers {
    originatingIOI "nigel.com",
    terminatingIOI "nigel.com"
  },
  localRecordSequenceNumber 1,
  causeForRecordClosing timeLimit,
  incomplete-CDR-Indication {
    aCRStartLost FALSE,
    aCRInterimLost unknown,
    aCRStopLost TRUE
  },
  iMS-Charging-Identifier
'3133355F313130363933323335373434364034372E3234382E36372E3433'H,
  list-Of-SDP-Media-Components {
    {
      sIP-Request-Timestamp '0501280850512B0000'H,
      sIP-Response-Timestamp '0501280850542B0000'H,
      sDP-Media-Components {
        {
          sDP-Media-Name "Video Conference",
```

```
        sDP-Media-Descriptions {
          "a=video conference"
        },
        authorized-QoS "Gold"
      }
    },
    mediaInitiatorFlag NULL,
    sDP-Session-Description {
      "a=Video Conference"
    },
    sIP-Request-Timestamp-Fraction 123456,
    sIP-Response-Timestamp-Fraction 234567,
    sDP-Type sDP-offer,
    localGWInsertedIndication TRUE,
    iPRealmDefaultIndication TRUE,
    transcoderInsertedIndication TRUE
  }
},
gGSNaddress iPAddress : iPBinaryAddress : iPBinV4Address : '0A0D05E0'H,
serviceReasonReturnCode "-302",
list-Of-Message-Bodies {
  {
    content-Type "application/sdp",
    content-Disposition "Disposition",
    content-Length 3420720,
    originator sIP-URI : "2"
  }
},
expiresInformation 12345,
accessNetworkInformation '4163636573734E6574776F726B496E666F726D6174696F6E'H,
list-of-subscription-ID {
  {
    subscriptionIDType eND-USER-SIP-URI,
    subscriptionIDData "SubscriptionIdData"
  }
},
list-Of-Early-SDP-Media-Components {
  {
    sDP-Media-Components {
      {
        sDP-Media-Name "Video Conference 1",
        sDP-Media-Descriptions {
          "sdp media description- video conference"
        },
        authorized-QoS "Gold"
      }
    },
    mediaInitiatorFlag NULL,
    sDP-Session-Description {
   },
    sDP-Type sDP-offer
  }
},
iMSCommunicationServiceIdentifier '496D73436F6D6D5376634964'H,
sessionPriority pRIORITY-1,
serviceRequestTimeStampFraction 123456,
serviceDeliveryStartTimeStampFraction 234567,
list-Of-Called-Asserted-Identity {
  tEL-URI : "CalledAsserterQuantity1"
},
```

```
  iMSApplicationReferenceIdentifer '496D734170705265664964'H
}
```

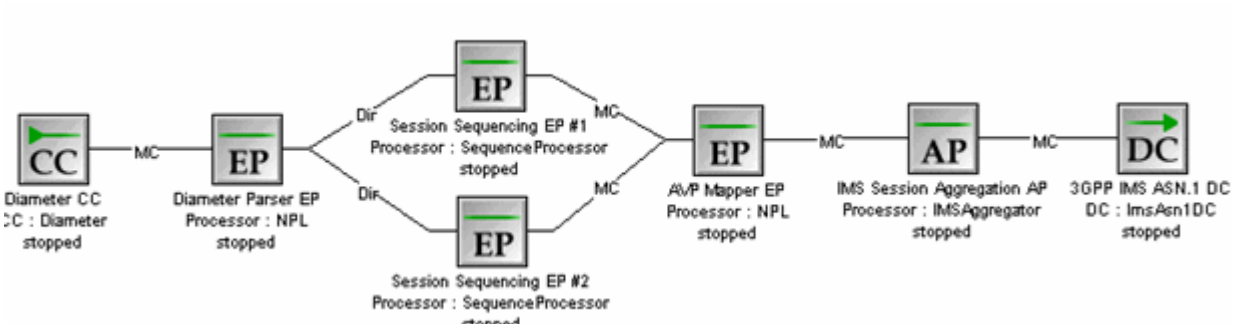
Configuring Node Chain Routing

Both multicast and directed routing are supported in specific parts of the IMS node chain. The purpose for using directed routing is to route records with particular attributes to one node or node stream, and route records with other specific attributes to a different node or node stream.

Directed routing is supported between the Diameter Parser EP and the two Session Sequencing EPs. For the directed routing connection between the Diameter Parser EP and the first Session Sequencing EP (with the **IMS R6 Event De-Duplication** rule file), select the **Accounting-Record-Type** attribute and set the value equal to one. For the directed routing connection between the Diameter Parser EP and the second Session Sequencing EP (with the **IMS R6 Sequence Processing** rule file), select the **Accounting-Record-Type** attribute and set the value **not** equal to one.

Figure 5–2 shows the default configuration for the node chain routing.

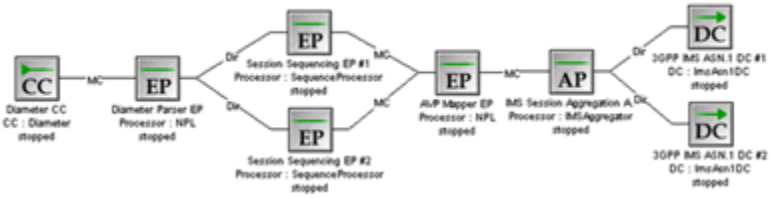
Figure 5–2 Node Chain Routing - Default Configuration



In addition to the default node chain configuration, you can add another 3GPP IMS ASN.1 DC, and use directed routing from the IMS Session Aggregation AP to each DC. For example, you can configure directed routing on the **RecordType** attribute, and send S-CSCF records to one DC and P-CSCF records to the other DC. When configuring directed routing for the S-CSCF record stream, select the **RecordType** attribute, and set the value equal to 63. When configuring directed routing for the P-CSCF record stream, select the "RecordType" attribute, and set the value **not** equal to 63.

Figure 5–3 shows the alternate configuration for the node chain routing.

Figure 5–3 Node Chain Routing - Alternate Configuration



Supported Routing Attributes

The supported routing attributes between the Diameter Parser EP and the Session Sequencing EP are:

- Session-Id
- Origin-Host
- Origin-Realm
- Destination-Realm
- Accounting-Record-Type
- Accounting-Record-Number
- Acct-Application-Id
- User-Name
- Acct-Interim-Interval
- Origin-State-Id
- Role-of-Node
- User-Session-Id
- Calling-Party-Address
- Called-Party-Address
- Application-server
- Application-provided-called-party-address
- IMS-Charging-Identifier
- Authorized-QoS
- Service-Id
- Node-Functionality
- Retransmitted

The supported routing attributes between the Session Aggregation AP and the 3GPP IMS ASN.1 DC are:

- Accounting-Record-Number
- TimeStamp
- RecordType
- Retransmission
- SIP_Method
- Role_of_Node
- Session_Id
- PrivateUserID
- LocalRecordSequenceNumber
- RecordSequenceNumber
- CauseForRecordClosing

- ServiceDeliveryFailureReason

Known Problems

The following are the known problems for the IMS CDF/CGF Cartridge Pack.

Stopping the Session Aggregation AP Nodeand the 3GPP IMS ASN.1 DC Node

Editing or stopping and starting the Session Aggregation AP and the 3GPP IMS ASN.1 DC while they are processing data can result in Offline Mediation Controller generating the following warning alarm:

```
Configuration; NPL originated Critical log; A record contains an incorrect value
in the field/AVP Accounting-Record-Type. This record will be processed as an
ACR-Stop.
```

There is also the possibility of duplicate record generation.

To work around this issue:

1. Stop the Session Sequencing EP node.
2. Wait for all records to propagate though the Session Aggregation AP node and the 3GPP IMS ASN.1 DC. All records are propagated when Current NARs = 0 for more than 5 seconds in the Node Performance view of the Administration window.
3. Proceed with the stop or edit operation
4. Save or start the node
5. Start the Session Sequencing EP

Note: If the Session Sequencing EP is stopped for a period longer than its flush timer setting, duplicate records may appear.

Changing the Expiry Interval Setting on the Session Sequencing EP

Changing the Expiry Interval setting on the Session Sequencing EP affects new input records only. The EP still flushes any records waiting to be sequenced according to the pre-configured setting. There is no work around.

CDF/CGF host is not Uniquely Identified by the Diameter CC Node

When the Diameter CC node constructs the ACA (Accounting-Answer) in response to the ACR (Accounting-Request) the values for Origin-Host and Origin-Realm are obtained from the values in the ACR and therefore do not uniquely identify the CDF/CGF host. There is no work around.

Diameter AVP (GPRS-Charging-Id) Must Contain an Integer

According to the 3G Technical Specification, the GPRS-Charging-Id field is declared as type INTEGER and therefore the CCF requires that the associated Diameter AVP (GPRS-Charging-Id) contain an integer and not a string . Otherwise the node will skip the field and raise the following warning alarm:

```
Configuration; Error occurred in NPL; Exception occurred in the NPL assignment
statement on line 150. Exception is java.lang.ClassCastException: For input
```

```
string: "GPRS #1" NPL execution continuing with next statement.
```

6

IPDRv2 Distribution Cartridge Pack

This chapter describes how to configure the nodes included in the Oracle Communications Offline Mediation Controller IPDRv2 Distribution Cartridge Pack.

About the IPDRv2 Distribution Cartridge Pack

This cartridge processes IP detail records (IPDRs).

7

NetFlow Collection and Processing Cartridge Pack

This chapter describes how to use the Oracle Communications Offline Mediation Controller NetFlow Collection and Processing Cartridge Pack.

About the NetFlow Collection and Processing Cartridge Pack

This cartridge pack is for NetFlow collection and processing:

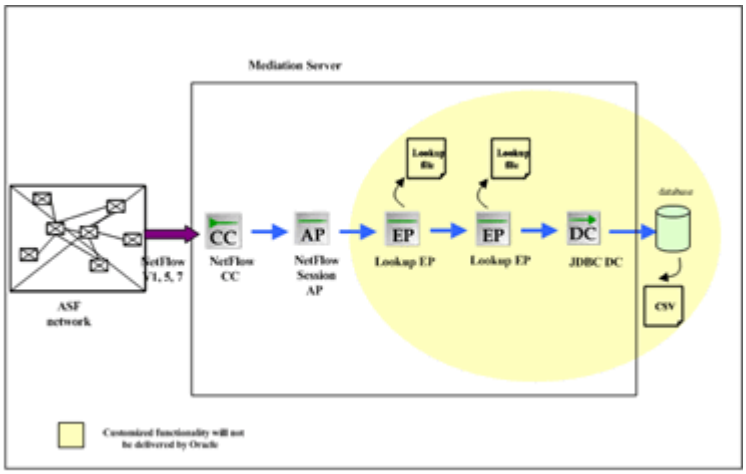
- The NetFlow Collection Cartridge (CC) collects the Cisco NetFlow v1, v5, and v7 records.
- The NetFlow Session Aggregation Processor (AP) aggregates Cisco NetFlow (V1, V5, and V7) records which have the following attributes:
  - Source IP addresses
  - Destination IP addresses
  - Source port number
  - Destination port number
  - IP protocol type
  - Day of year and hour

  Each aggregated NetFlow session record contains the above information as well as total bytes, and total packets.

The NetFlow Collection and Processing cartridge pack will aggregate, into a single record on an hourly basis, NetFlow records belonging to the same NetFlow session. The aggregated records will be output by the AP after the user-configured flush timer has expired.

Figure 7–1 displays the architecture of the solution.

Figure 7–1 Netflow Architecture



Configuring the NetFlow CC Node

The NetFlow Collection Cartridge (CC) collects the Cisco NetFlow v1, v5, and v7 records.

Configure these options in the **NetFlow** tab:

Field	Description
NetFlow Port	Port number that NetFlow uses to report mediation data. Default is 9995.
Socket Buffer Size	UDP receiving socket buffer size. Value recommended is 65 536

Configuring the NetFlow Session AP Node

The NetFlow Session Aggregation Processor (AP) aggregates Cisco NetFlow (V1, V5, and V7) records. This node uses the standard aggregation node configuration options. See *Offline Mediation Controller Online Help*.

8

Configuring the Nortel CS 2000 AMADNS Cartridge Pack

This chapter describes how to configure the nodes included in the Oracle Communications Offline Mediation Controller Nortel CS 2000 AMADNS Cartridge Pack.

About the Nortel CS 2000 AMADNS Collection Cartridge Pack

The Nortel CS 2000 AMADNS Collection cartridge pack supports the collection of Nortel CS 2000 SN09 AMADNS records. The AMADNS files produced by the Nortel Communication Server 2000 (CS 2000) will be either FTP pushed to the CS 2000 CC or FTP pulled from the Nortel CS 2000 Carrier Voice over IP softswitch through an intermediate FTP server.

The CS 2000 AMADNS records are sent from the Nortel CS 2000 AMADNS CC node to the Nortel CS 2000 AMADNS DC node.

Configuring the Nortel CS 2000 AMADNS CC Node

The Nortel CS 2000 AMADNS CC node receives Nortel CS 2000 SN09 AMADNS records.

To configure the Nortel CS 2000 AMADNS CC node, you configure standard parameters, include FTP connection configurations.

There are two rule files you can use:

- Nortel CS 2000 SN09 AMADNS. This is the default.
- Reprocess - Nortel CS 2000 SN09 AMADNS. Use this rule file when there is no match with the Service Provider Lookup file. This can be used in a separate instance of the node, placed after the default implementation in the node chain.

9

Configuring the Nortel DMS-100 MMP AMA Cartridge Pack

This chapter describes how to use the Oracle Communications Offline Mediation Controller Nortel DMS-100 MMP AMA Cartridge Pack.

Nortel DMS-100 MMP AMA Collection Cartridge Pack

The Nortel DMS-100 MMP AMA Collection Cartridge (CC) pack supports the collection of Nortel DMS-100 MMP AMA (I) SN09 records generated by Nortel DMS-100 switches.

The CC supports FTP pushing AMA files from the Nortel SDM to the NM server. Collection of G-CDR is supported.

Creating and Configuring the DMS-100 MMP AMA CC

To configure the DMS-100 MMP AMA CC node, you configure standard parameters, include FTP connection configurations.

10

Nortel DMS Operational Metrics Cartridge Pack

This chapter describes how to configure the nodes included in the Oracle Communications Offline Mediation Controller Nortel DMS Operational Metrics Cartridge Pack.

About the Nortel DMS Operational Metrics Cartridge Pack

The Nortel DMS Operational Metrics (OM) cartridge pack provides functionality to retrieve files containing OM records from various telecom switches and send them to external systems. The OM node chain does not modify OM records; there are no EP or AP nodes.

The OM node chain includes two nodes, OM Collector CC node and the OM Distributor DC node.

The OM Collector CC node receives OM files from DMS-100 switches. The node uses FTP to periodically connect and pull files from each switch. A single node can retrieve files from multiple switches. The polling period is a single value used for all switches that are assigned to the node. On a single switch, OM files can be found on multiple volumes, so the node polls multiple directories on each switch.

The OM Collector CC node retrieves files from one or more DMS switches, re-names the files and transfers them to a local directory. The node does not parse or process the individual OM records. Therefore, the node does not produce a NAR file and Offline Mediation Controller is unaware of the contents of the OM records.

The OM Collector CC node re-names the files in the following way:

- DMS file name: R040625145027OM
- OM CC file name: **AAA**_R040625145027OM**.done**

The node adds a three letter prefix, underscore and appends **.done** to the incoming file name. The three letters range in the following way: [A-Z][A-Z][A-Za-z]. The prefix differentiates input files from different IP addresses, port numbers and disk volume combinations. Note that the prefix can change if the device configuration is modified.

In the event that the OM Collector CC node cannot communicate with a DMS-100, it attempts to re-establish a connection after a configurable delay. You can also configure the number of times the node attempts to re-establish the connection before raising a critical alarm. The node raises the alarm in both the GUI and via SNMP and logs the incident to the cartridges log file. At this point, the node considers the poll to have failed and does not attempt to re-establish a connection with the switch until the next scheduled poll.

You can provision a backup OM Collector CC node as a means to recover from a polling failure rather than wait for the next scheduled poll. For example, if the log file

of the primary node indicates a polling failure, you can manually configure the backup node to have a short polling interval, such as 5 minutes, for a specific switch. The backup node will collect the files the primary node failed to capture. After the files have been transferred successfully, you can stop the backup node. This backup method can be used to manually initiate polls to switches instead of waiting a longer period for the primary node to attempt to re-establish the connection.

The OM Distributor DC node receives DIRP encoded OM files from the OM Collector CC node and transfers these files to downstream applications using FTP.

Important: Note the following:

- You must deploy the OM CC and DC nodes on the same server.
- Input stream monitoring is not supported.
- In the Node Performance window, there are no counts associated with the nodes.

Configuring the OM Collector CC Node

To configure the OM Collector CC node you set file management options and device access options.

Configure these options in the **Settings** tab:

Field	Description
Directory for Unprocessed Files	Directory where files are copied to from the device. The OM Collector CC node retrieves the file.
Unprocessed File Prefix	File prefix of unprocessed data files received from the remote device.
Rename Unprocessed to Processed	If enabled, the OM Collector CC node renames the files after a successful FTP transfer.
Processed File Prefix	File prefix of processed files.
Retries per poll	Number of additional FTP attempts for each polling interval.
Polling interval	Time interval between FTP polls; for example, 1 hour.
Process daily at fixed time	If enabled, the OM Collector CC node aligns its polling schedule to a specific time of day.
Interrupt timer delay	For example, 1 minute

You add devices to the **Device List** tab. When you add a device, you configure these options:

Field	Description
Name	Name of the device.
IP Address	IP address of the device.
Port	Port to connect to on the device.
FTP User ID	User or account ID of the device.
Password/Confirm Password	Password of the device.

Field	Description
Disk Volumes	The disk volume name. The disk volumes are non-delimited location names for files. Multiple disk volumes can be added per device.

Configuring the OM Distributor DC Node

The OM Distributor DC node receives DIRP encoded OM files from the OM Collector CC node and transfers these files to downstream applications using FTP Push or Pull. To configure the OM Distributor DC node you configure standard FTP and file retention options. See Offline Mediation Controller Online Help.

11

Nortel DMS SMDR Cartridge Pack

This chapter describes how to configure the nodes included in the Oracle Communications Offline Mediation Controller Nortel DMS SMDR Cartridge Pack.

About the Nortel DMS SMDR Cartridge Pack

The Nortel DMS SMDR Cartridge Pack provides the ability to collect SMDR records from DMS-100 switches.

Switches according to the specification DMS100 Family North American DMS-100 Station Message Detail Recording Reference Guide, DMSCCM12 Standard 19.03 October 2000. The cartridge pack also filters, enhances and distributes SMDR records to multiple destinations, including a Billing Centre and an Oracle database.

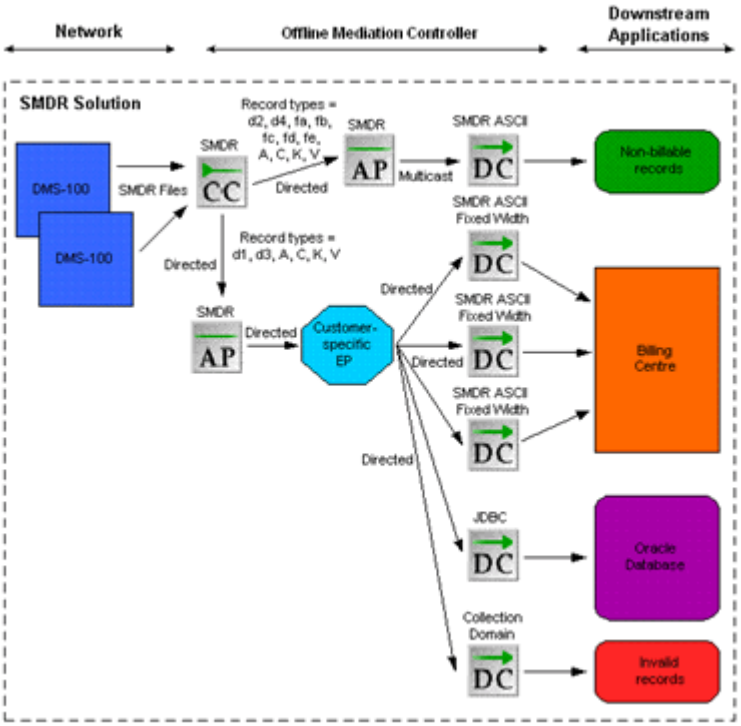
The cartridge pack includes the following nodes:

- DMS SMDR CC
- DMS SMDR AP
- DMS SMDR ASCII DC
- DMS SMDR ASCII Fixed Width File DC

In addition, the Nortel DMS SMDR node chains include a JDBC DC node, and a custom EP node that you create.

Figure 11–1 displays the architecture of the SMDR solution.

Figure 11–1 SMDR Solution



Configuring the DMS SMDR CC Node

The DMS SMDR CC node is responsible for collecting SMDR files from DMS-100 switches. The CC node uses FTP to periodically transfer SMDR/DIRP-encoded files from each switch. One DMS SMDR CC node can poll and transfer files from many switches. The CC node makes the Record Code attribute available for routing, which enables records to be separated into billable and non-billable streams.

To create and configure the DMS SMDR CC node, you configure standard options, file management options, and connection options.

Configure these options in the **Settings** tab:

Field	Description
Directory for unprocessed files	Local directory to store unprocessed files from the device.
Directory for bad data files	Local directory to store bad or invalid data files.
Delete or Keep processed files	Select a button to delete or keep processed files.
Directory for processed files	Local directory to store files that have been processed by the CC.
Duration to keep each file	Amount of time the processed files are kept in the local directory. Enter a numeric value and select Days or Hours from the drop-down list.
Unprocessed file prefix	File prefix of unprocessed files on the remote device.
Rename Unprocessed to Processed	Select this checkbox if you want the CC to rename the files on the remote device after successful transfer via FTP.

Field	Description
Processed file prefix	File prefix of processed files on the remote device.
Retries per poll	Number of additional FTP attempts for each polling interval. If the node is unable to retrieve the files, it raises an alarm and will not attempt to re-poll the device until the next scheduled poll interval.
Polling interval	Time interval between FTP polls.
Process daily at fixed time	Select this checkbox if you want the CC to align its polling schedule to a specific time of day. Set the time of day using the drop-down lists.

You add devices to the **Device List** tab. When you add a device, you configure these options:

Field	Description
Name	Name of the device.
IP Address	IP address of the device.
Port	Port to connect to on the device.
FTP User ID	User or account ID of the device.
Password/Confirm Password	Password of the device.
Disk Volumes	The disk volume name. The disk volumes are non-delimited location names for files. Multiple disk volumes can be added per device.

Creating and Configuring the DMS SMDR AP Node

The DMS SMDR AP node allows the hexadecimal value of the following fields to be mapped to the corresponding text name:

- Console-Number = Attendant Console Name (from A records)
- Customer-Group-Number = Customer Group Name (from C records)
- Origination ID = Trunk Group CLLI (from K records) or Virtual Facility Group Name (from V records)

The DMS SMDR AP node maps the customer-group translation records (C records), attendant console records (A records), virtual facility group name records (V records) and trunk-group-CLLI records (K records) for each DMS-100 switch. The AP tags SMDR records with the text names for each hexadecimal identifier. This allows you to direct records to specific locations based on the text names instead of the changeable hexadecimal identifier. The AP node makes the following attributes available for routing: Office ID, Attendant Console Name, Customer Group Name, Trunk Group CLLI and Virtual Facility Group Name.

To configure the DMS SMDR AP node you configure standard options and aggregation options. See *Offline Mediation Controller Online Help*.

Configuring a Custom EP Node

You must create and configure an EP node that enhances the NAR with the customer name. The customer name must be stored in the NAR using the NAR attribute ID 140157. The customer name value is used by the DMS SMDR ASCII Fixed Width File DC to populate the header and footer records.

Creating and Configuring the DMS SMDR ASCII DC

The DMS SMDR ASCII DC node outputs all incoming fields for each record. These records can be used internally as non-billable information whereas the ASCII Fixed Width records can be used for billing purposes.

To configure the DMS SMDR ASCII DC node, configure standard file management and FTP connection options. See *Offline Mediation Controller Online Help*.

The following example shows non-billable data output from the DMS SMDR ASCII DC node.

```
RecordCode,OfficeId,CustomerGroupNumber,OriginationType,OriginationIdentification,
DataCallIdentification,InformationDigit1And2,ConsoleNumber,SubGroup,TerminationTyp
e,TerminationIdentification,RouteInformationDigit,StartTime,ElapsedTime,Originatin
gFeatureCode,TerminatingFeatureCode,CalledNumber,Spare,RotationTime,NANI2,NANI,NON
I2,NONI,NANIF2,NANIF,NANOF2,NANOF,NLNI2,NLNI,NLOI2,NLOI,NLIF2,NLIF,RestartType,Old
Time,NewTime,RecordCode_D5,DigitsOutpulsed,DigitsMissing,RecordCode_D6_
A,RecordType_A,NumOfAuthDigsInComb_A,Digits_A,RecordCode_D6_B,RecordType_
B,NumOfAuthDigsInComb_B,Digits_B,RecordCode_DA,TrunkGroupId,Spare_
DA,TrunkNumberId,NetworkCLID,RecordCode_
DB,MSNOriginationType,MSNN00CallType,InformationDigits,ANINumber,ANISuffix,Carrier
AccessCode,AccessDirectoryNumber,MSNANIMapping,Spare_DB,OriginationTime_
DB,Treatment,Reorigination,BillingDigits,RecordCode_
DC,PINOrTCNNumber,Description,Spare_DC,RecordCode_DD,BCType,BandWidth,RecordCode_
DE,OriginationTime_
DE,BillingNumber,MessageArea,LMNNumber,TreatmentCode,PayPhone,MobilePhone,NetworkI
dentification,NetworkClassOfService,ContractSubscriberNumber,NotificationOfTimeAnd
Charge,CallbackAnswerTime,NoCharge,ISDNAccessIndicator,RecordCode_DF01,SMDRITC_
CALLID,SMDRITC_TIME,RecordCode_
DF02,SignalingType,MessageType,LengthCount,Information,RecordCode_
DF03,AltBillingBumber_DF03,BusinessCustomerId_DF03,SignificantDigitsInNextField_
DF03,AdditionalDigitsDialed_DF03,RecordCode_
DF04,OriginalCallingNumber,AltBillingBumber_DF04,BusinessCustomerId_
DF04,SignificantDigitsInNextField_DF04,AdditionalDigitsDialed_DF04,RecordCode_
DF05,CarrierType,ATCValue,MessageDirection,DeferredCharge,CarrierId,AssociatedChar
geArea,RecordCode_DF06,UnitChargeIndicator,ChargeInformationType,MessageDirection_
DF06,DeferredCharge_DF06,MNA_L_Digits,RecordCode_
DF07,AdditionalUserTypeName,MessageTypeCode,UserTypeValue,RecordCode_
DF09,ClassFeatureCode,BillDN,EventYear,EventMonth,EventDay,EventHour,EventMinute,E
ventSecond,NumberAvailable,NumberUnavailable,NameAvailable,NameUnavailable,Confere
ncePegs,SCFListSize,SCAListSize,SCRJListSize,DRCWListSize,Spare1_DF09,Spare2_
DF09,AttendantConsoleName,CustomerGroupName,TrunkGroupCLLI,VirtualFacilityGroupNam
e
'd2','905509','003','0','4166608127a','a','00','ff','0','3','09ba0002aaa0','0','04
5142844','000006','0','0','6133358234aa','','','','','','','','','','','','','',''
,'','','','','','','','','','','','','','','','','','','','','','','','','','','','',
'','','','','','','','','','','','','','','','','','','','','','','','','','','','','','','
','','','','','','','','','','','','','','','','','','','','','','','','','','','','','','','
,'','','','','','','','','','','','','','','','','','','','','','','','','','','','','','','',
'','','','','','','','
'd2','905509','003','3','09ca0002aaa','a','00','ff','0','5','04aa0000aaaa','0','04
8151712','000004','0','0','84162911000a','','','','','','','','','','','','','',''
```

```
,'','','','','','','','','','','','','','','','','','','','','','','','','','','',
'','','','','','','','','','','','','','','','','','','','','','','','','','','','
','','','','','','','','','','','','','','','','','','','','','','','','','','',''
,'','','','','','','','','','','','','','','','','','','','','','','','','','','',
'','','','','','','',''
'd2','905509','003','5','04aa0000aaa','a','00','ff','0','3','0c6a0005aaa0','0','04
8151712','000004','0','0','14162911000a','','','','','','','','','','','','','',''
,'','','','','','','','','','','','','','','','','','','','','','','','','','','',
'','','','','','','','','','','','','','','','','','','','','','','','','','','','
','','','','','','','','','','','','','','','','','','','','','','','','','','',''
,'','','','','','','','','','','','','','','','','','','','','','','','','','','',
'','','','','','','',''
'd2','905509','003','3','09ca0001aaa','a','00','ff','0','5','04aa0000aaaa','0','04
8151904','000005','0','0','84162911000a','','','','','','','','','','','','','',''
,'','','','','','','','','','','','','','','','','','','','','','','','','','','',
'','','','','','','','','','','','','','','','','','','','','','','','','','','','
','','','','','','','','','','','','','','','','','','','','','','','','','','',''
,'','','','','','','','','','','','','','','','','','','','','','','','','','','',
'','','','','','','',''
```

Configuring the DMS SMDR ASCII Fixed Width File DC

The DMS SMDR ASCII Fixed Width File DC node outputs records in a fixed width format for billing purposes. The files are generated based on a customer name and office ID combination.

To create and configure the DMS SMDR ASCII Fixed Width File DC node, configure standard file management and FTP connection options. See *Offline Mediation Controller Online Help*.

The following example shows billable data output from the DMS SMDR ASCII Fixed Width DC node.

```
a141616902014040109040109
d1416169020143138a0074 4000015037a000b 00091133340003360099057755286 9999999999
d14161690201409058368721 4000003138a0079aaa0 00091138230000532099058580988
9999999999
d14161690201409058361846 4000003138a006caaa0 00091138230000602099058572240
9999999999
d1416169020143138a007b  4000015037a000c  00091139340000140099058953222
9999999999
d14161690201409058361846 4000003138a006faaa0 00091138540000562099054777575
9999999999
d1416169020143138a0072  4100015037a0001  00091138580000830099058536611
9999999999
d1416169020143138a0079  4000013061a0068aaa0 00091139440000410097057264153
9999999999
d1416169020143138a0077  4100015037a0013  00091138510001090099054765507
9999999999
d1416169020143138a006e  4000015037a0000  00091138090001530099058536611
9999999999
d14161690201409058368721 4000003138a0069aaa0 00091140060000362099058963333
9999999999
d14161690201409058366584 4000003138a0065aaa0 00091138350001292094162596328
9999999999
d1416169020143138a0073  4100015037a0005  00091139230000960099054761792
9999999999
d14161690201409058362214 4000003138a0074aaa0 00091140180000442099057903737
9999999999
```

```
d1416169020140905836485 7 4000003138a0076aaa0 0009114050000034209905470317 9
9999999999
d1416169020140905836221 4 4000003138a0072aaa0 0009114226000016209905470317 9
9999999999
d1416169020140905836872 1 4000003138a0075aaa0 0009114132000085209905470701 1
9999999999
d141616902014314 3a0070  4100013061a0069aaa0 0009114219000142009705726415 3
9999999999
d141616902014314 3a006   4000015037a0006   0009113833000381009905898465 7
9999999999
d1416169020140905836872 1 4000003138a0068aaa0 0009114445000010209905729482 5
9999999999
d141616902014314 3a0076  4000015037a0004   0009114154000192009905895033 7
9999999999
d141616902014314 3a0069  4100015037a0007   0009114245000140009905836098 8
9999999999
d141616902014314 3a007c  4000015037a0010   0009113714000489009905898465 7
9999999999
d1416169020140905836658 4 4000003138a006daaa0 0009114455000028209905796543 6
9999999999
d1416169020140905836485 7 4000003138a007baaa0 0009114400000088209905829540 4
9999999999
d141616902014314 3a006c  4100015037a0008   0009114502000033009905476550 7
9999999999
t1416169020140401090401 9                                  0000000250000000000000000000
```

Configuring the JDBC DC Node

The SMDR AP sends a copy of all SMDR records to the JDBC DC node for storage in the database. The original file name of the SMDR file from which a CDR originated is stored in the database. For information about configuring the JDBC DC node, see *Offline Mediation Controller Online Help*.

Configuring the Node Chains

The most common node chains are:

- SMDR Collection With ASCII Distribution
- SMDR Collection With ASCII Fixed Width File Distribution
- SMDR Collection With Database Distribution
- SMDR Collection With NAR Distribution

SMDR Collection With ASCII Distribution

To configure the node chain for SMDR collection with ASCII distribution, you must create and configure a DMS SMDR CC node, DMS SMDR AP node and a DMS SMDR ASCII DC node. Connect the CC node to the AP node by using directed routing with the Record Code attribute. You can connect the AP node to the DC node by using Multicast routing. The DMS SMDR ASCII DC node outputs all incoming fields for each record. These records can be used internally and not for billing since they are not in the fixed width format.

SMDR Collection With ASCII Fixed Width File Distribution

To configure the node chain for SMDR collection with ASCII fixed width file distribution, use the DMS SMDR CC node you created for the previous chain, then create and configure an additional DMS SMDR AP node and one or more DMS SMDR ASCII Fixed Width File DC nodes. Connect the CC node to the AP node by using directed routing with the Record Code attribute. You can connect the Customer specific EP node to the DC node by using Multicast routing if you want the files to be output based on a customer and switch combination. You can connect the Customer specific EP to multiple DC nodes by using directed routing based on the available fields for routing. The DMS SMDR ASCII Fixed Width DC node outputs records in a fixed width format for billing purposes.

SMDR Collection With Database Distribution

To configure the node chain for SMDR collection with database distribution, you must use the DMS SMDR CC node and the EP node you created previously, and create and configure a Database Storage and Reporting DC node . Connect the EP node to the DC node by using Multicast routing. The DC node outputs records to the Oracle database for storage.

SMDR Collection With NAR Distribution

To configure the node chain for SMDR collection with NAR distribution, you must use the DMS SMDR CC node and the EP node you created previously, and create and configure a DC node. Connect the EP node to the DC node using Multicast routing. This DC node outputs records using the Offline Mediation Controller internal NAR format. At this point, you can use the Oracle Communications Offline Mediation Controller Record Editor tool to correct any invalid records and then reintroduce them to the DMS SMDR CC node for processing.

Database Storage and Reporting

The Database Storage and Reporting functionality allows you to configure DMS-MSC node chains that can process and distribute data to both a billing system and an Oracle database.

Installing and Configuring

To install and configure the database components, see *Offline Mediation Controller Installation Guide*.

The Database Storage tasks are as follows:

- Creating an Oracle user and dba group
- Installing Oracle
- Verifying the Oracle installation
- Loading the Offline Mediation Controller schema
- Configuring Oracle
- Configuring UNIX executables
- Configuring and using the Repository Manager
- Installing the Oracle Client

- Modifying tnsnames.ora
- Installing the Oracle JDBC driver
- Configuring Oracle for automatic restart
- Verifying the Oracle automatic restart

Loading the Offline Mediation Controller Schema

Use the following procedure to load the Offline Mediation Controller schema.

To load the schema:

1. As the oracle user, run the Oracle Enterprise Manager by typing **oemapp worksheet** and pressing **Enter**.
2. Select **connect directly to database**.
3. For Username, type **system**.
4. For Password, type **Oracle**.
5. For Service, type **NMCDRS**.
6. For Connect, type **normal**.
7. Click **OK**.

   You are now connected to the NMCDRS schema.
8. Navigate to the directory where the SMDR jar file was un-jarred.

   For example: **/opt/test/dbstorage/Oracle11g**
9. As the oracle SYSTEM user, load the following tablespace: **DDL_create_tblspc_SMDRS_MAIN**

   This is a default tablespace, and does not store daily CDRs.
10. After loading this script, modify the DATAFILE to match the directory structure on the machine where you installed Oracle

    For example: *Oracle_Home***/oradata/***dbf.filename*
11. Set the SIZE parameter to a minimum of **10M** (ten megabytes).
12. As the oracle SYSTEM user, load **DDL_create_usr_NMUSER1.sql**.
13. Disconnect as the SYSTEM user and connect as NMUSER1. The default password is NMUSER1.
14. Ensure you are in the directory where the SMDR jar file was un-jarred.

    For example: **/opt/test/dbstorage/Oracle11g**
15. Load **DDL_create_tbl_MSLV_SMDR_STORAGE.sql**.
16. Go to: <*directory where you un-jarred the SMDR jar file*>**/dbstorage/Oracle11g/RepoMan**.
17. Load **DDL_create_tbl_SMDR_REPOMAN_CONFIGURATION.sql**.
18. Load **PLSQL_SMDR_PKG.sql**.
19. Load **PLSQL_SMDR_LOGTOFILE.sql**.
20. Load **JAVA_UTIL.sql**.
21. Load **PLSQL_RUN_CMD.sql**.

22. Load **PLSQL_RC.sql**.
23. Load **PLSQL_SMDR_PARFILEWRITER.sql**.
24. Load **PLSQL_BUILD_SMDR_EXCHANGE.sql**.
25. Load **PLSQL_DROP_SMDR_PARTITIONS.sql**.
26. Load **PLSQL_BUILD_SMDR_PARTITIONS.sql**.
27. Load **PLSQL_MSLV_START_SMDR_REPOMAN.sql**.
28. Load **PLSQL_MSLV_STOP_SMDR_REPOMAN.sql**.

All required Oracle objects are now loaded into Oracle database.

Known Problems

The following are known problems for this cartridge pack:

- The DMS SMDR CC node raises a major alarm when it receives a file with a name longer than 30 characters.
- The SMDR discard count parameter does not appear in the Offline Mediation Controller statistics report file.

12

Nortel GSM/UMTS AMA Cartridge Pack

This chapter describes how to configure the Oracle Communications Offline Mediation Controller Nortel GSM/UMTS AMA Cartridge Pack.

About the Nortel GSM/UMTS AMA Cartridge Pack

The AMA cartridge pack provides the functionality to collect AMA data from DMS-MSC SDMs, process that data and send it to downstream applications such as billing systems and/or databases. The cartridge pack includes nodes that are responsible for collecting, processing and distributing the data. The DMS-MSC CC node collects G-CDR and GHOT records from DMS-MSC SDMs and these records are distributed in AMA DIRP, ASCII or ASN.1 format to downstream billing systems and to databases for storage and search capabilities.

The cartridge pack includes Input Stream Monitoring on the DMS-MSC CC node, NRTT CC node and on all DC nodes. Input stream monitoring is enabled on a per-cartridge basis to detect whether any records have been received for an operator-defined period of time. The nodes raise an alarm when they do not receive any new records within a specified time period, and clear the alarm when it begins to receive records again.

Figure 12–1 shows the G-CDR collection of AMA DIRP files.

Figure 12–1 AMA Architecture with G-CDR Collection in AMA DIRP File Format

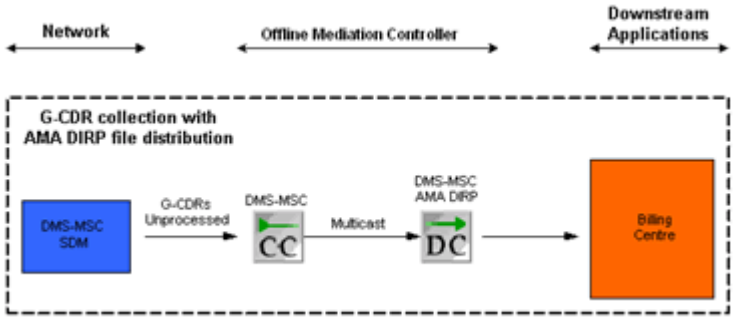


Figure 12–2 shows the G-CDR collection with NRTT distribution.

Figure 12–2 AMA Architecture with G-CDR Collection in NRTT Distribution

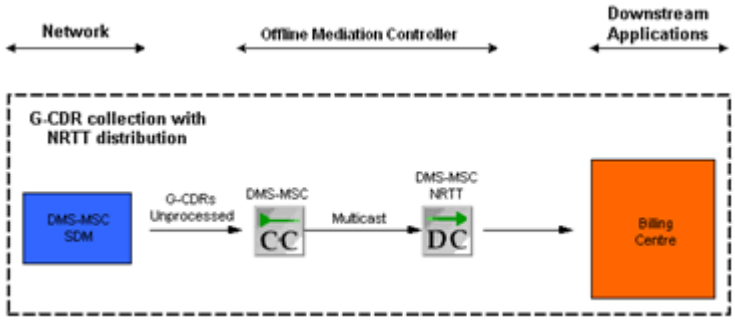
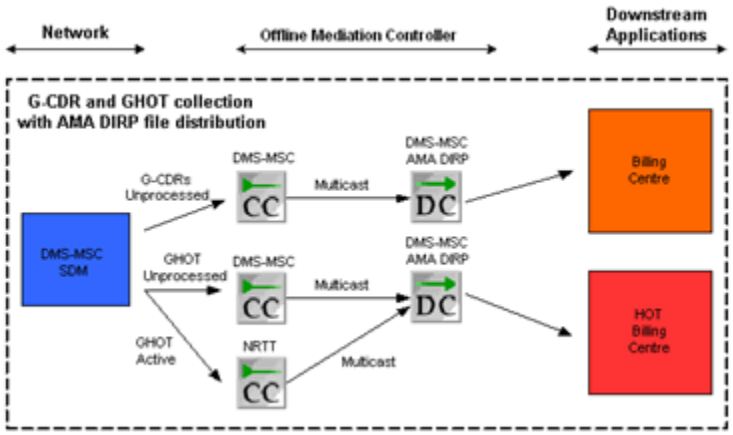


Figure 12–3 shows G-CDR and GHOT collection in AMA DIRP file format.

Figure 12–3 AMA Architecture with G-CDR and GHOT Collection in AMA DIRP File Format



File Errors

The AMA DIRP file that the nodes move to the bad file directory retains its original name. The name of the error report file is in the format <*AMA DIRP filename*>**_error_report.txt**.

There are two types of errors:

- An error in the DIRP file structure. For example, the size of the record is corrupted. When the DMS-MSC CC node detects this error, the remaining information in the file is no longer readable. In this case, the node processes the AMA DIRP file up to the position where the error was detected. The node cannot process the remainder of the file.
- An error within an AMA record. For example, an unknown module code index. When the DMS-MSC CC node detects this error, it stops processing the record. The remaining information in the AMA DIRP file is still reliable, so the node continues processing, starting with the next AMA record.

The error report identifies the position of the processed and unprocessed AMA records.

Configuring the DMS-MSC CC Node

This section contains the information on the requirements for creating and configuring the DMS-MSC CC node.

The DMS-MSC CC node will generate a warning alarm if it has not received any data files from a device for a period of time. The operator can configure a different time interval for each node. The DMS-MSC CC node will clear the alarm when it receives a new input file. The input stream monitoring functionality can be enabled or disabled via the node configuration window.

The input stream monitoring feature should only be used when the node is operating in FTP mode. In Open-FTP mode, the node should normally receive no records, and therefore this monitoring feature should be disabled. However, the node cannot automatically do this, and therefore the user must manually disable this feature when choosing Open-FTP mode.

To configure the DMS-MSC CC node, configure standard options and the options in the **AMA CC** tab:

Field	Description
Select the Transport	Select **FTP Push** or **Open FTP**.
Input directory	The directory the DMS-MSC SDM system sends CDRs to on the Offline Mediation Controller system.
Bad File directory	The directory to hold the AMA DIRP files that contain errors. When the DMS-MSC CC node detects a bad AMA DIRP file, it moves the file to this directory and creates an error report file that it writes to this directory. The node raises an alarm in the GUI and writes an error log to the node log file.
File completion extension	The expected file extension that the DMS-MSC CC node adds to the AMA DIRP file when the FTP is complete. There is no default extension. If the field is left blank, the transferring SDM does not add an extension when the file transfer is complete.
Check for new files period	defines the period that the node waits before checking the input directory for a new AMA DIRP file. The range is 1 second to 60 minutes.
Keep/Delete processed files	controls whether the node deletes the processed AMA DIRP file or keeps the processed file for a user-defined period of time.
Keep processed files directory	becomes active if you configure the node to keep the processed files. You must specify the directory where the node will store the processed files. The processed files will be prefixed with "P".
Keep processed files duration	becomes active if you configure the node to keep the processed files. You must specify how long the node will keep the processed files. The range is 1 hour to 60 days.
Keep/Delete recovery files	option indicates whether to track previously processed files. To prevent duplicate record processing, select "Keep".
Keep recovery files duration	becomes active if you configure the node to keep the recovery files. You must specify how long the node will keep the recovery files. The range is 1 hour to 60 days.

Field	Description
Process Files	button indicates the file types that are being processed. In FTP Push mode, all input files are processed. In Open FTP Push mode, only closed files are processed.
Active file prefix	active if you select Open FTP transport. It is the prefix of the active AMA DIRP files. This prefix should match the prefix setting on the MSC SDM.
Active file suffix	is active if you select Open FTP Push. It is the suffix of the active AMA DIRP files. This suffix should match the suffix setting on the MSC SDM.
Closed file prefix	is active if you select Open FTP Push. It is the prefix of the closed AMA DIRP files. This prefix should match the prefix setting on the MSC SDM.

Configuring the NRTT CC Node

The NRTT CC node receives GHOT files from DMS-MSC SDMs.

The NRTT CC node generates an alarm if it has not received any data files from a device for a period of time, or if it has not received any new records in the current active file within the configured period of time. The NRTT CC will clear the alarm when it receives a new input file or a new record. The input stream monitoring functionality can be enabled or disabled via the node configuration window.

To configure the DMS-MSC CC node, configure standard options and the options in the **NRTT CC Node** tab. The **NRTT CC Node** tab includes the same options as the **AMA CC** tab. See Configuring the DMS-MSC CC Node

Creating and Configuring the ASCII DC

Note: Before beginning this procedure, edit the NPL rule file that will be used for this DC. Replace the str2int NPL function with the str2decimal function in the code fragments with the following syntax:

```
yearInt = str2int(tmpValue);
DMS MSC (32.005 v3.6.0)
```

This change provides a more targeted range of warnings for date stamps from a device.

Important: This NPL rule file change only applies to customized NPL files and not the default files.

- The output includes information from the Billing Block Header Record, Billing File Transfer In Record and Billing File Transfer Out Record.
- The leading character "f" is deleted in the following fields:
  - Called number
  - Calling number
  - Calling equipment

  - Calling party
  - Called party
  - Dialed digits
  - MSC number
  - Destination routing address
  - SCP address
  - Group call
- The Numbering_Plan_Identifier field is split into four fields, as follows:
  - spare field
  - extension fields
  - type of number
  - number plan indicator

    For example, if the Numbering_Plan_Identifier field appears as "01201" then "0" = spare field, "1" = extension fields, "2" = TON and "01" = number plan indicator.

To create and configure the ASCII DC node, configure the standard file management, FTP, and file retention options. See *Offline Mediation Controller Online Help*.

ASCII DC Output Files

This section explains how multiple occurrences of modules are handled in ASCII output files.

For example, the **Supplementary Service Module** can appear multiple times and contains the following attributes: SS_ModuleCode, SS_SsCode, SS_SsAction, SS_DateAndTime, SS_SsParameters, SS_ResultIndicator.

If a CDR contains 3 SS modules, the output appears as:

Header: *regular preceding CDR attribute names...*, SS_ModuleCode, SS_SsCode, SS_SsAction, SS_DateAndTime, SS_SsParameters, SS_ResultIndicator, *regular following CDR attribute names...*

Fields: <*module code number*>, val1_val2_val3,val1__,val1__val3,_val2_val3,__val3

The field values are separated with an underscore "_" where the **val1** fields apply to the first SS module instance, the **val2** fields apply to the second SS module instance and the **val3** fields apply to the third SS module instance.

If there is no field value for a module, the output appears as two underscores. For example, **val1_ _val3**.

If there is no specific value for any of the modules, the output appears as "_ _".

This information applies to other modules, such as **Location and Channel Information** and **Supplementary Service Action**.

ASCII DC Sample Output

The following is sample output from the ASCII DC with version hiding from GSM 17 to GSM 15:

```
'GsmRecordHeader_
```

```
GsmCallTypeCode','FileName','TimeStamp','AdditionalInformation','AccessNetwork','A
nswerTime','CallDuration','CalledEquipment','CalledNumber_
BcdOrHexString','CalledNumber_DmsMscNumberType','CalledNumber_NPI_
SpareField','CalledNumber_NPI_ExtendedField','CalledNumber_NPI_
TypeOfNumber','CalledNumber_NumberingPlanIndicator','CalledParty_
BcdOrHexString','CalledParty_DmsMscNumberType','CalledParty_NPI_
SpareField','CalledParty_NPI_ExtendedField','CalledParty_NPI_
TypeOfNumber','CalledParty_
NumberingPlanIndicator','CalledSubscriberCategory','CallIndicator','CallingEquipme
nt','CallingNumber_BcdOrHexString','CallingNumber_
DmsMscNumberType','CallingNumber_NPI_SpareField','CallingNumber_NPI_
ExtendedField','CallingNumber_NPI_TypeOfNumber','CallingNumber_
NumberingPlanIndicator','CallingParty_BcdOrHexString','CallingParty_
DmsMscNumberType','CallingParty_NPI_SpareField','CallingParty_NPI_
ExtendedField','CallingParty_NPI_TypeOfNumber','CallingParty_
NumberingPlanIndicator','CallingSubscriberCategory','CallForwardIndicator','CallRe
ference','CauseForTermination','CellIdentity','ChannelAllocationTime','ClassmarkTi
meStamp','DateAndTime','DateAndTimeRelease','DateAndTimeSeizure','DeliveryTimestam
p','Diagnostic','DialedDigits_BcdOrHexString','DialedDigits_
DmsMscNumberType','DisconnectTime','EquipmentIdentity','EquipmentType','GsmRecordH
eader_DmsMscStructureCode','GsmRecordHeader_
HexadecimalId','HalfRateInUse','HotBillingIndicator','IncomingMeteringClass','Inco
mingRouteGroup','IncomingTrunkGroup','IncomingTrunkMember','LocationAreaCode','Log
icalNetwork','MessageReference','MeteringZone','MsClassmark','MscNumber_
BcdOrHexString','MscNumber_NPI_SpareField','MscNumber_NPI_
ExtendedField','MscNumber_NPI_TypeOfNumber','MscNumber_
NumberingPlanIndicator','OffAirCallSetup','OutgoingMeteringClass','OutgoingRouteGr
oup','OutgoingTrunkGroup','OutgoingTrunkMember','RecordNumber','ReleaseTime','Resu
ltIndicator','RoamingNumber_BcdOrHexString','RoamingNumber_
DmsMscNumberType','RoamingNumber_NPI_SpareField','RoamingNumber_NPI_
ExtendedField','RoamingNumber_NPI_TypeOfNumber','RoamingNumber_
NumberingPlanIndicator','ServiceCenter_BcdOrHexString','ServiceCenter_NPI_
SpareField','ServiceCenter_NPI_ExtendedField','ServiceCenter_NPI_
TypeOfNumber','ServiceCenter_
NumberingPlanIndicator','SmsResult','SmsTimestamp','StudyIndicator','Supplementary
ServiceAction','SupplementaryServiceCode','SupplementaryServiceParameter','TrunkRe
leaseTime','TrunkSeizureIncoming','TrunkSeizureOutgoing','AuxiliaryRecordHeader_
RecordingOfficeIdentity','AuxiliaryRecordHeader_
RecordingOfficeType','AuxiliaryRecordHeader_
SensorIdentity','AuxiliaryRecordHeader_
SensorType','BlockCount','BlockNumber','DateAndTimeNew','DateAndTimeOld','Emergenc
yFsn','FileSequenceNumber','FileTransferType','GenericIdentity','RecordCount','Swi
tchRestartType','AgeOfLocation','GeographicalLocationOfTargetUE','IdentityOfTarget
UE','LCSClientExternalID','LCSClientType','LCSRecordType','LCSResult','LCSInitiati
onTime','LCSTerminationTime','RequestedQualityOfService','RecordTime','PriorityCal
lTag','GroupCallReference','FunctionalNumber','PriorityLevel','PriorityCallCause',
'PriorityCallDuration','PriorityReleaseTime','EOM_ModuleCode','BS_ModuleCode','BS_
BearerService','BS_DateAndTime','LC_ModuleCode','LC_RoamingNumber_
DmsMscNumberType','LC_RoamingNumber__NPI_SpareField','LC_RoamingNumber__NPI_
ExtendedField','LC_RoamingNumber__NPI_TypeOfNumber','LC_RoamingNumber_
NumberingPlanIndicator','LC_RoamingNumber_BcdOrHexString','LC_MscNumber_NPI_
SpareField','LC_MscNumber_NPI_ExtendedField','LC_MscNumber_NPI_TypeOfNumber','LC_
MscNumber_NumberingPlanIndicator','LC_MscNumber_BcdOrHexString','LC_
IncomingTrunkGroup','LC_IncomingTrunkMember','LC_LocationAreaCode','LC_
CellIdentity','LC_ChannelType','LC_ChannelDescription','LC_DateAndTime','LC_
AccessNetwork','SS_ModuleCode','SS_SsCode','SS_SsAction','SS_DateAndTime','SS_
SsParameters','SS_ResultIndicator','T_ModuleCode','T_Teleservice','T_
DateAndTime','AP_ModuleCode','AP_SsCode','AP_DateAndTime','AP_EParameter1','AP_
EParameter2','AP_EParameter3','AP_EParameter4','AP_EParameter5','AP_
EParameter6','AP_EParameter7','AP_AocParmReason','TC_ModuleCode','TC_
```

```
ChargeZone','TC_SubscriberService','TC_TariffClass','DS_ModuleCode','DS_
IwfTrunkGroupMsSide','DS_IwfTrunkMemberMsSide','DS_IwfTrunkGroupNetworkSide','DS_
IwfTrunkMemberNetworkSide','DS_DataVolume','DS_DataRate','DS_
ConnectionElement','DS_InformationTransferCapability','DS_DataCompression','DS_
NumberOfFaxPages','DS_IwfDiagnosticCode','DS_IwfActivationTimestamp','OA_
ModuleCode','OA_TerminatingLocation','LO_ModuleCode','LO_MscNumber_NPI_
SpareField','LO_MscNumber_NPI_ExtendedField','LO_MscNumber_NPI_TypeOfNumber','LO_
MscNumber_NumberingPlanIndicator','LO_MscNumber_BcdOrHexString','LO_
LocationAreaCode','LO_CellIdentity','LO_AccessNetwork','P_ModuleCode','P_
PartialRecordSequenceNumber','P_PartialRecordEventCode','P_
PartialRecordReason','P_PartialRecordReferenceNumber','TU_ModuleCode','TU_
TrunkUsageReason','GI_ModuleCode','GI_DetectionPoint','GI_ServiceKey','GI_
DestinationRoutingAddress','GI_ScpAddress','GI_OffBoardInServiceIdentifier','GI_
OffBoardInServiceIndicator','GI_ChargeNumber_DmsMscNumberType','GI_ChargeNumber_
BcdOrHexString','GI_TimeStamp1','GI_TimeStamp2','GI_OperationIndication','GIC_
ModuleCode','GIC_FciFreeform1','GIC_FciFreeform2','GIC_FciFreeform3','GA_
ModuleCode','GA_PreTranslatedCalledPartyNumber_DmsMscNumberType','GA_
PreTranslatedCalledPartyNumber_NPI_SpareField','GA_PreTranslatedCalledPartyNumber_
NPI_ExtendedField','GA_PreTranslatedCalledPartyNumber_NPI_TypeOfNumber','GA_
PreTranslatedCalledPartyNumber_NumberingPlanIndicator','GA_
PreTranslatedCalledPartyNumber_BcdOrHexString','GA_OriginalCallingNumber_
DmsMscNumberType','GA_OriginalCallingNumber_NPI_SpareField','GA_
OriginalCallingNumber_NPI_ExtendedField','GA_OriginalCallingNumber_NPI_
TypeOfNumber','GA_OriginalCallingNumber_NumberingPlanIndicator','GA_
OriginalCallingNumber_BcdOrHexString','GCR_ModuleCode','GCR_
NetworkCallReferenceNumber','GCR_MscAddress_NPI_SpareField','GCR_MscAddress_NPI_
ExtendedField','GCR_MscAddress_NPI_TypeOfNumber','GCR_MscAddress_
NumberingPlanIndicator','GCR_MscAddress_BcdOrHexString','GCC_ModuleCode','GCC_
FreeFormatData','GCC_PartyToCharge','MNP_ModuleCode','MNP_RoutingNumber','MNP_
QueryMethod','MNP_PortedStatus','OT_ModuleCode','OT_ChargeNumberANI_
DmsMscNumberType','OT_ChargeNumberANI_NPI_SpareField','OT_ChargeNumberANI_NPI_
ExtendedField','OT_ChargeNumberANI_NPI_TypeOfNumber','OT_ChargeNumberANI_
NumberingPlanIndicator','OT_ChargeNumberANI_BcdOrHexString','OT_
OriginatingLineInformation','OT_OriginatingNumberingPlanArea','OT_
AutomaticNumberIdentificationIndicator','OT_TerminatingNumberingPlanArea','OT_
GenericAddressParameter','EA_ModuleCode','EA_
InterExchangeInternationalCarrierPrefix','EA_TypeOfCarrierIdentificationCode','EA_
CarrierConnectTimestamp','EA_
InterExchangeInternationalCarrierPrefixCallEventStatus','TF_ModuleCode','TF_
TollFreeCallTypeCode','TF_CalledPartyOffHookIndicator','TF_
ServiceFeatureCode','TF_ScpDeterminedTerminatedNumber','TF_OverseasIndicator','TF_
Lata','TF_InterExchangeInternationalCarrierRoutingIndicator','LNP_
ModuleCode','LNP_PartyIdentifier','LNP_LocationRoutingNumber','LNP_
ServiceProviderIdentity','LNP_Location','LNP_SupportingInformation','SING_
ModuleCode','SING_XcliIndicator','SING_NationalInternationalIndicator','SING_
OtherSubscriberCustgrp','SING_OtherSubscriberNcos','SING_
CallingPartyCategory','SING_CityWideCentrex','CSC_ModuleCode','CSC_
SelectedCarrierIdentificationCode','CSC_DefaultCarrierIdentificationCode','CSC_
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```

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2','','','','','','','','','','','','','','','','','','','022','f0000000000000007','0
','1','1','01','ffffffffff12148020000','','','','','','','','011_011','7_7','0_
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25508100003ffffffffffffffffff','012','02221','0','','','','','','','','','','','',
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ffffffffff12148020000','00622','00005','03100200401','00007','FFFFF','','200303100
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fffffffff12148020000','','','','','','','','011','7','0','1','2','00','fffffffffff
ffffffffff2141215031','062','0214702','','214','25508100003ffffffffffffffffff','',
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',''
'001','u030915095472gcdr','1086060298322','','','','0000000','','12140325001','0',
'0','1','1','01','','','','','','','','0000002','','12141215071','2','0','1','1','
01','310022141215071','1','','','','','010','1','0000031','000','','','','','','',
'','00016','992141215072','6','','','','10002','aa','0','','','','','','','','',''
,'fff0ff0','12148020000','0','1','1','01','0','','113','00603','00001','0000000004
7','20030310062927','','','','','','','','','','','','','','','0','','','','','','
030310062926300','','','','','','','','','','','','01500','','','','','','','','',
'','','','','','','','','','','','','000','','','','','','','','','','','','','','
','','','','','','','','','','005','029','5','20030310062925','fffffffff9921412150
72','001','006','011','20030310062925','','','','','','','','','','','','','','','
','','','','','','','','','','','','','','','','','','','','','','','','','','',''
,'','','','','018','003','00000000000','12140325001','19726023001','','','0','','2
0030310062926','20030310062927','2','','','','','','','','','','','','','','','','
```

```
',','','','','','','','','','','','','','','','011_011','0_0','0_0','1_1','0_
0','00_00','_','062_062','_','_','214_992','25508100003ffffffffffffffffff_
25508100003ffffffffffffffffff','','','','','','','','','','','','','','','',
'','','','','','','','','','','',''
```

Creating and Configuring the DMS-MSC ASN.1 DC

The DMS-MSC ASN.1 DC outputs data according to the 3GPP 32.005 version 3.6 specification.

Ensure the rule file selection corresponds to the incoming GSM data:

- For incoming GSM 18 data, select the rule file DMS MSC ASN1 GSM 18
- For incoming GSM 17 data, select the rule file DMS MSC ASN1 GSM 17
- For incoming GSM 16 data, select the rule file DMS MSC ASN1 GSM 16
- For incoming GSM 15 data, select the rule file DMS MSC ASN1 GSM 15
- For incoming GSM 13 data, select the rule file DMS MSC ASN1 GSM 13

To create and configure the DMS-MSC ASN.1 DC, configure the standard file management, FTP, and file retention options. See *Offline Mediation Controller Online Help*.

DMS-MSC ASN.1 Sample Output

The DMS-MSC ASN.1 DC outputs data according to the 3GPP 32.005 version 3.6 specification. Below is sample output that has been translated into a readable format.

```
* * * * * * * Record 1 * * * * * * *
------------------
value CallEventRecord ::= incGatewayRecord : {
  recordType incGatewayRecord,
  calledNumber '912141215130F4'H,
  recordingEntity '912141080200F0'H,
  mscIncomingTKGP tkgpName : "00601",
  seizureTime '0303100616492B0000'H,
  answerTime '0303100616512B0000'H,
  releaseTime '0303100616542B0000'H,
  callDuration 3,
  causeForTerm normalRelease,
  diagnostics manufacturerSpecificCause : {
    identifier { 0 1 2 3 },
    information -- OCTET STRING : '020110'H --
  },
  callReference 20511
}
* * * * * * * Record 2 * * * * * * *

DMS MSC (32.005 v3.6.0)
------------------
value CallEventRecord ::= mtCallRecord : {
  recordType mtCallRecord,
  servedIMSI '13002241215130F4'H,
  servedMSISDN '912141215130F4'H,
  recordingEntity '912141080200F0'H,
  mscIncomingTKGP tkgpName : "00601",
  basicService teleservice : '11'H,
  seizureTime '0303100616492B0000'H,
```

```
  answerTime '0303100616532B0000'H,
  releaseTime '0303100616552B0000'H,
  callDuration 2,
  causeForTerm normalRelease,
  diagnostics manufacturerSpecificCause : {
    identifier { 0 1 2 3 },
    information -- OCTET STRING : '020110'H --
  },
  callReference 20511
}
* * * * * * * Record 3 * * * * * * *

DMS MSC (32.005 v3.6.0)
-----------------
value CallEventRecord ::= moCallRecord : {
  recordType moCallRecord,
  servedIMSI '13002241215130F4'H,
  calledNumber '912141215130F4'H,
  translatedNumber '912141215130F4'H,
  roamingNumber '912141040351F0'H,
  recordingEntity '912141080200F0'H,
  location {
    locationAreaCode "00000",
    cellIdentifier '0000'H
  },
  basicService teleservice : '11'H,
  answerTime '0303100616512B0000'H,
  releaseTime '0303100616542B0000'H,
  callDuration 3,
  causeForTerm normalRelease,
  diagnostics manufacturerSpecificCause : {
    identifier { 0 1 2 3 },
    information -- OCTET STRING : '020110'H --
  },
  callReference 102415,
  additionalChgInfo {
    chargeIndicator charge
  },
  systemType unknown
}
```

Configuring the JDBC DC Node

Notes:

- Before beginning this procedure, edit the NPL rule file that will be used for this DC. Replace the str2int NPL function with the str2decimal function in the code fragments with the following syntax:

```
yearInt = str2int(tmpValue);
chown oracle /opt/mslvdblogs
```

This change provides a more targeted range of warnings for date stamps from a device.

Important This NPL rule file change only applies to customized NPL files and not the default files.

- The original file name of the binary MSC file that produces the CDR is stored in the database

- All date/time fields stored in the database are in the format: YYYYMMDDhhmmss (year/month/day/hour/minute/seconds)
- For incoming GSM data, the leading "f" character was removed for the following fields:
  - MSC Number field in the Location and Channel Information Module and the Location Only Information Module
  - PreTranslated Called Party Number field in the Generic Address Information Module
  - Original Calling Number field in the Generic Address Information Module
  - Timestamp format in fields TrunkSeizureOutgoing and TrunkSeizureIncoming
  - Called number
  - Calling number
  - Calling equipment
  - Calling party
  - Called party
  - Dialed digits
  - MSC number
  - Destination routing address
  - SCP address
  - Group call
- The Numbering_Plan_Identifier field is split into four fields, as follows:
  - spare field
  - extension fields
  - type of number
  - number plan indicator

    For example, if the Numbering_Plan_Identifier field appears as "01201" then "0" = spare field, "1" = extension fields, "2" = TON and "01" = number plan indicator.

For instructions on creating and configuring the JDBC DC Node, see Offline Mediation Controller online help.

Creating and configuring the DMS-MSC AMA DIRP DC

To create and configure the DMS-MSC AMA DIRP DC node, configure the standard file management and FTP options, and the nodes in the tabs described below.

On the **Compression** tab, select **NONE** for no compression, or **zip** or **gzip** for compression. If you archive or delete files, this option compresses them before archiving or deleting them.

Note: When you enable compression, existing files in the output folder will not be archived or deleted after a compression option is selected; as a result, they should be archived or deleted manually

---

Configure these options on the **File Matching** tab:

Field	Description
Generate File Based on Input file	Creates only one output file for one AMA file received by the CC node.
Output Directory	Location of the output files.
Bad File Directory	Location of files with errors output from the DC node.
File Prefix	Prefix of the output file. The default value is "U". Multiple characters can be used in the prefix. "A" cannot be used as a prefix since it is reserved for currently written files.
File Suffix	Should match the suffix setting on the MSC SDM.

Configure these options on the **Office Identification** tab:

Field	Description
Sensor Type	Type of switching equipment from which record information is received. ■ 001 = MSC ■ 008 = 5ESS (OSPS) ■ 011 = TSPS-SPC ■ 029 = DMS-10 ■ 031 = TSPS-3B ■ 036 = DMS-100F (DMS-200/TOPS)
Sensor Identification	Individual switch type. The ID is assigned by the operating company. Default is 0000000.
Recording Office Type	Type of recording machine that produced this record. ■ 001 = MSC ■ 008 = 5ESS (OSPS) ■ 011 = TSPS-SPC ■ 029 = DMS-10 ■ 031 = TSPS-3B ■ 32 = AT&T KS (IBM Series 1) AMATPS collector ■ 036 = DMS-100F (DMS-200/TOPS) ■ 200 = Telescience collector ■ 220 = Teltone AMATPS collector ■ 270 = AT&T Billdats 3B20 AMATPS collector ■ 271 = AT&T Billdats 3B5 AMATPS collector
Recording Office ID	Individual recording machine. The ID is assigned by the operating company. Default is 0000000.
Rotation Time	Time, in seconds, for the AMA DC to close an output file and open a new output file. Rotation time is 60 seconds (1 min) by default, which means the DC closes the file within a minute. If there is no data for this period, the DC does not keep the output file unless the Keep Empty File checkbox is selected.
Output Extension	Suffix applied to the file produced by the AMA DC.

Field	Description
Output Directory	Directory path to the location where Offline Mediation Controller stores the files produced by the DC. Default is /tmp.
Keep Empty File	Select this checkbox if you want the node to keep the empty file.
Generate FTOR	Select this checkbox if you want the node to add the File Transfer Out Record parameter to the AMA output file.

Configuring the DMS-MSC NRTT DC Node

To create and configure the DMS-MSC NRTT DC, configure standard options, and the options in the tabs described below.

Configure these options on the **Office Identification** tab:

Field	Description
Sensor Type	Type of switching equipment from which record information is received. ■ 001 = MSC ■ 008 = 5ESS (OSPS) ■ 011 = TSPS-SPC ■ 029 = DMS-10 ■ 031 = TSPS-3B ■ 036 = DMS-100F (DMS-200/TOPS)
Sensor Identification	Individual switch type. The ID is assigned by the operating company. Default is 0000000.
Recording Office Type	Type of recording machine that produced this record. ■ 001 = MSC ■ 008 = 5ESS (OSPS) ■ 011 = TSPS-SPC ■ 029 = DMS-10 ■ 031 = TSPS-3B ■ 32 = AT&T KS (IBM Series 1) AMATPS collector ■ 036 = DMS-100F (DMS-200/TOPS) ■ 200 = Telescience collector ■ 220 = Teltone AMATPS collector ■ 270 = AT&T Billdats 3B20 AMATPS collector ■ 271 = AT&T Billdats 3B5 AMATPS collector
Recording Office ID	Individual recording machine. The ID is assigned by the operating company. Default is 0000000.
Rotation Time	Time, in seconds, for the NRTT DC to close an output file and open a new output file. Rotation time is 60 seconds (1 minute) by default, which means the DC closes the file within a minute.
Maximum AMA Blocks	Maximum number of AMA blocks in one file - minimum of two blocks.

Configure these options on the **NRTT** tab:

Field	Description
Billing Centre Host	The name or IP address of the billing centre server the node sends data to.
Billing Centre Port	The port on the billing centre server that the node uses to communicate with the server.
Billing Centre ACK Timeout	The time, in seconds, the DC waits for the Billing Centre to acknowledge it has received the end of the file. If the DC does not receive an acknowledgment from the Billing Centre that it has received the end of the file, it attempts to resend the file after the interval set in **Resend File Timeout**.
Resend File Timeout	A timer that is needed to fix a limitation of the Sun Java socket class. The limitation is that when the process tries to send a packet but the network cable on the billing centre is disconnected, the sending method is blocked for several minutes before it realizes that loss of connection. In this case, the node will be blocked and will remain idle until the sending method is returned or until the timer expires - in this case the node will raise alarm to indicate a loss of connection to the billing centre. After that, the node will continue to process and store the data on the local disk. When the Rotation Time or the Max AMA Blocks value expires, whichever one occurs first, the node opens a new connection. It then attempts to resend the entire stored file. When configuring the timer, be aware that the node will automatically interrupt the current sending action if the billing centre does not receive the packet before the timer expires. Do not set the timer too low, otherwise the node will prematurely interrupt the sending of the current packets.
MSC Name	The name of the MSC device. This field value is five characters long and must be the same in the NRTT CC, DMS-MSC NRTT DC and DMS-MSC Active GHOT NRTT DC configurations. Contact your Billing Centre administrator to determine the field value expected by the billing system.
NM Version	The version of the Offline Mediation Controller software. This value must be five characters long.

Configuring the DMS-MSC Active GHOT NRTT DC Node

To configure the DMS-MSC Active GHOT NRTT DC node, configure the standard options, and the options in the **Office Identification** and **NRRT** tabs. For information, see "Configuring the DMS-MSC NRTT DC Node."

Configuring the Node Chains

You can configure the following node chains:

- G-CDR Collection with AMA DIRP File Distribution
- G-CDR Collection With NRTT Distribution
- G-CDR and GHOT Collection With AMA DIRP File Distribution
- G-CDR Collection With AMA DIRP Distribution, GHOT Collection With NRTT Distribution, No Recovery
- G-CDR and GHOT Collection With ASCII File and Database Distribution

- G-CDR Collection With AMA DIRP Distribution, GHOT Collection With NRTT Distribution, No Recovery
- G-CDR Collection With AMA DIRP Distribution, GHOT Collection With NRTT Distribution, Recovery
- G-CDR and GHOT Collection With ASCII File and Database Distribution

G-CDR Collection with AMA DIRP File Distribution

To configure a chain for **G-CDR** collection with **AMA DIRP** file distribution, you configure a DMS-MSC CC node and a DMS-MSC AMA DIRP DC node, and connect the two nodes using multicast routing.

You must configure the DMS-MSC SDM to send the unprocessed files to this CC. When configuring the **G-CDR** stream, ensure you configure the DMS-MSC SDM to send files to the configuration input directory on the DMS-MSC CC node for this stream. In the DMS-MSC CC node configuration, on the AMA CC tab, the **Input Directory** value should match the setting on the DMS-MSC SDM.

In the node configuration window, on the AMA CC tab, select **FTP Push**.

The AMA DIRP DC node can be configured to write all Network Accounting Records (NAR) from one input file to one output file. This one-to-one (1:1) matching applies to GSM version hiding as well.

To activate the file matching feature, click on the File Matching tab in the configuration window and check the **Generate File Based on Input File**.

Table 12–1 lists the instances where 1-to-1 file matching is supported when the appropriate 1:1 NPL rule file is chosen:

Table 12–1 Instances Supporting 1-to-1 File Matching

In: AMA DIRP	Out: AMA DIRP
GSM 18	GSM 18
GSM 18	GSM 16
GSM 16	GSM 16
GSM 16	GSM 15
GSM 15	GSM 15

G-CDR Collection With NRTT Distribution

To configure a chain for **G-CDR** collection with **NRTT** distribution, you must create and configure a DMS-MSC CC node and a DMS-MSC NRTT DC node, and connect the two nodes using multicast routing.

You must configure the DMS-MSC SDM to send the unprocessed files to this CC. When configuring the **G-CDR** stream, ensure you configure the DMS-MSC SDM to send files to the configuration input directory on the DMS-MSC CC node for this stream. In the DMS-MSC CC node configuration window, on the AMA CC tab, the **Input Directory** value should match the setting on the DMS-MSC SDM.

In the node configuration window, on the AMA CC tab, select **FTP Push**.

G-CDR and GHOT Collection With AMA DIRP File Distribution

This node chain contains three streams - one for processing **G-CDR** files, one for processing closed **GHOT** files and one for processing active GHOT files.

To configure a stream for **G-CDR** collection with **AMA DIRP** file distribution, you must configure the DMS-MSC SDM to send files to the configuration input directory on the DMS-MSC CC node for this stream. In the DMS-MSC CC node configuration window, on the AMA CC tab, the Input Directory value should match the setting on the DMS-MSC SDM. On the DMS-MSC CC node configuration window, on the AMA CC tab, select **FTP Push**.

To configure a stream for processing **GHOT** unprocessed files with **AMA DIRP** file distribution, you must configure the DMS-MSC SDM to send files to a different directory than the one provisioned for the G-CDR stream. In the DMS-MSC CC node configuration window, on the AMA CC tab, the Input Directory value should match the setting on the DMS-MSC SDM. On the DMS-MSC CC node configuration window, on the AMA CC tab, select **OpenFTP Push**. Connect the DMS-MSC CC to the DMS-MSC AMA DIRP DC using multicast routing.

To configure a stream for processing **GHOT** active files with **AMA DIRP** file distribution, on the NRTT CC node configuration window, on the NRTT CC Node tab, the **Input directory** value should match the setting on the DMS-MSC SDM. Configure the DMS-MSC SDM to send files to the same directory as the one provisioned for the stream to process closed GHOT files. Connect the NRTT CC node to the DMS-MSC AMA DIRP DC node using multicast routing.

G-CDR Collection With AMA DIRP Distribution, GHOT Collection With NRTT Distribution, No Recovery

This node chain contains three streams - one for processing **G-CDR** files, one for processing closed **GHOT** files and one for processing active GHOT files.

To configure a stream for **G-CDR** collection with **AMA DIRP** file distribution, you must configure the DMS-MSC SDM to send files to the configuration input directory on the DMS-MSC CC for this stream. In the DMS-MSC CC node configuration window, on the AMA CC tab, the Input Directory value should match the setting on the DMS-MSC SDM. On the DMS-MSC CC node configuration window, on the AMA CC tab, select **FTP Push**.

To configure a stream for processing **GHOT** unprocessed files with **NRTT** distribution, you must configure the DMS-MSC SDM to send files to a different directory than the one provisioned for the G-CDR stream. In the DMS-MSC CC node configuration window, on the AMA CC tab, the Input Directory value should match the setting on the DMS-MSC SDM. On the DMS-MSC CC node configuration window, on the AMA CC tab, select **OpenFTP Push**. Connect the DMS-MSC CC to the DMS-MSC NRTT DC node using multicast routing.

To configure a stream for processing **GHOT** active files with **NRTT** distribution, on the NRTT CC node configuration window, on the NRTT CC Node tab, the **Input directory** value should match the setting on the DMS-MSC SDM. Configure the DMS-MSC SDM to send files to the same directory as the one provisioned for the stream to process closed GHOT files. Connect the NRTT CC node to the DMS-MSC NRTT DC node by using multicast routing.

G-CDR Collection With AMA DIRP Distribution, GHOT Collection With NRTT Distribution, Recovery

This node chain contains three streams - one for processing G-CDR files, one for processing closed GHOT files and one for processing active GHOT files.

To configure a stream for **G-CDR** collection with **AMA DIRP** file distribution, you must configure the DMS-MSC SDM to send files to the configuration input directory on the DMS-MSC CC node for this stream. In the DMS-MSC CC node configuration window, on the AMA CC tab, the Input Directory value should match the setting on the DMS-MSC SDM. On the DMS-MSC CC node configuration window, on the AMA CC tab, select **FTP Push**.

The DMS-MSC CC node to DMS-MSC NRTT DC node portion of the node chain processes Closed GHOT files and sends the data to the **buffered** port of the Hot Billing Centre.

The NRTT CC node to DMS-MSC Active GHOT NRTT DC node portion of the node chain processes Active GHOT files and sends the data to the **active** port of the Hot Billing Centre.

You should configure the two **GHOT** streams if you want a stream to handle active data and a recovery stream to handle data when there is a loss of connectivity with the HOT Billing Centre. You can configure the two GHOT streams to output data to the same HOT Billing Centre server, or to different ones.

Configuration rules for the GHOT streams

1. In the **GHOT** streams, configure both the NRTT CC node and the DMS-MSC CC node to have the same input directory, to ensure the NRTT CC node only processes the active files and the DMS-MSC CC node only processes the closed files.

   Ensure you configure the DMS-MSC SDM to send files to a different directory than the one provisioned for the G-CDR stream. In the DMS-MSC CC node configuration window - on the AMA CC tab, and in the NRTT CC node configuration window - on the NRTT CC tab, the **Input Directory** value should match the setting on the DMS-MSC SDM.

2. To configure a recovery stream for **GHOT unprocessed** file collection, you must configure the DMS-MSC CC node to collect and process only the closed files. In the CC node configuration window, on the AMA CC tab, select **Open FTP Push**.

3. Use **Multicast** routing to connect the NRTT CC node to the DMS-MSC Active GHOT NRTT DC node.

4. When starting the **GHOT** streams, start both DC nodes first, then start the CC nodes. When stopping the GHOT streams, stop the CC nodes first, then stop the DC nodes.

G-CDR and GHOT Collection With ASCII File and Database Distribution

This node chain contains multiple streams to process **G-CDR** files, closed **GHOT** files and active **GHOT** files.

To configure a stream for **G-CDR** collection with **ASCII** file distribution, you must configure the DMS-MSC SDM to send files to the configuration input directory on the DMS-MSC CC node for this stream. In the DMS-MSC CC node configuration window, on the AMA CC tab, the Input Directory value should match the setting on the DMS-MSC SDM.

On the DMS-MSC CC node configuration window, on the AMA CC tab, select **FTP Push**. Connect the DMS-MSC CC node to the ASCII DC node using multicast routing.

To configure a stream for processing **GHOT** unprocessed files with **ASCII** distribution, you must configure the DMS-MSC SDM to send files to a different directory than the one provisioned for the **G-CDR** stream. In the DMS-MSC CC node configuration window, on the AMA CC tab, the Input Directory value should match the setting on the DMS-MSC SDM. On the DMS-MSC CC node configuration window, on the AMA CC tab, select **Open FTP Push**. Connect the DMS-MSC CC node to the ASCII DC node using multicast routing.

To configure a stream for processing **GHOT** active files with **ASCII** distribution, on the NRTT CC node configuration window, on the NRTT CC Node tab, the Input directory value should match the setting on the DMS-MSC SDM. Configure the DMS-MSC SDM to send files to the same directory as the one provisioned for the stream to process closed **GHOT** files. Connect the NRTT CC to the ASCII DC using multicast routing.

To configure a stream for **G-CDR** collection with **Database** distribution, you must configure the DMS-MSC SDM to send files to the configuration input directory on the DMS-MSC CC node for this stream. In the DMS-MSC CC node configuration window, on the AMA CC tab, the Input Directory value should match the setting on the DMS-MSC SDM. On the DMS-MSC CC node configuration window, on the AMA CC tab, select **FTP Push**. Connect the DMS-MSC CC node to the Database Storage and Reporting DC using multicast routing.

To configure a stream for processing **GHOT** unprocessed files with JDBC distribution, you must configure the DMS-MSC SDM to send files to a different directory than the one provisioned for the **G-CDR** stream. In the DMS-MSC CC node configuration window, on the AMA CC tab, the Input Directory value should match the setting on the DMS-MSC SDM. On the DMS-MSC CC node configuration window, on the AMA CC tab, select **Open FTP Push**. Connect the DMS-MSC CC node to the Database Storage and Reporting DC using multicast routing.

To configure a stream for processing **GHOT** active files with **Database** distribution, in the NRTT CC node configuration window, on the NRTT CC Node tab, the Input directory value should match the setting on the DMS-MSC SDM. Configure the DMS-MSC SDM to send files to the same directory as the one provisioned for the stream to process closed **GHOT** files. Connect the NRTT CC node to the Database Storage and Reporting DC using multicast routing.

Invalid AMA Input File

When there is invalid data in the AMA input file, the CC raises a critical alarm and information about the error type and location are written to an error file. The AMA input file is then moved to the configured "bad file" directory.

There are three types of invalid data:

1. **Invalid Block Descriptor Word (BDW)**: this error occurs when the block size does not match the content of the block. When the CC detects this error, the remaining information in the file is no longer readable. In this case, the CC processes the AMA DIRP file up to the position where the error was detected.

   The CC cannot process the remainder of the file and will output the following alarm:

   "Critical; Invalid Data; Invalid input data; An error occurred while processing file <*filename*>, a copy of this file has been placed in *OMC_*

Home/amadirpei/2s4dgk-99f-e00sohaf/badAmaFilesDir: Error detected in the AMA DIRP file structure at offset**:**<*0(block no: 1 , record no: 0)*> Invalid Block Descriptor Word"

An error report file will be created in the node's configured "bad file" directory. The name of the error report file has the format <*AMA DIRP closed filename*>_ error_report.txt. The error report identifies the position of the BDW error.

2. **Invalid Record Descriptor Word (RDW)**: this error occurs when the record size does not match the content of the record. When the CC detects this error, the remaining information in the file is no longer readable. In this case, the CC processes the AMA DIRP file up to the position where the error was detected.

   The CC cannot process the remainder of the file and will output the following alarm:

   "Critical; Invalid Data; Invalid input data; An error occurred while processing file <*filename*>, a copy of this file has been placed in **OMC_ Home/amadirpei/2s4dgk-99f-00sohaf/badAmaFilesDir**: Error detected in the AMA DIRP file structure at offset: <*offset number*>**(block no: <block number>, record no:<record number>)** Invalid Record Descriptor Word"

   An error report file will be created in the node's configured "bad file" directory. The name of the error report file has the format <*AMA DIRP closed filename*>_ error_report.txt. The error report identifies the position of the RDW error.

3. **An error within an AMA record**: for example, an unknown module code index. When the CC detects this error, it stops processing the record. The remaining information in the AMA DIRP file is still reliable, so the CC continues processing, starting with the next AMA record.

   The CC outputs the following alarm:

   "Critical; Invalid Data; Invalid input data; An error occurred while processing file <*filename*>, a copy of this file has been placed in *OMC_ Home/amadirpei/2s4dgk-99f-00sohaf/badAmaFilesDir*>: Unable to process the AMA record at block: <*block number*>, record number: <*record number*>, fileOffset: <*offset number*>, recordSize: <*record size*><*error specific information*>"

   An error report file will be created in the node's configured "bad file" directory. The name of the error report file has the format <*AMA DIRP closed filename*>_ error_report.txt. The error report identifies the position(s) of the invalid data error.

Error Handling in 1:1 File Matching Situations

The following behaviors explain how errors are handled in various 1:1 file matching situations.

Scenario 1 - Input AMA file is corrupted

1. If the FTIR is corrupted or missing from an input file, the CC will continue to process the rest of the file.

   The DC will:

   a. generate an output file

   b. create a copy of this file and place it in the Bad File directory (configured in the DC).

   c. raise an alarm

      Major

Invalid Data; Missing mandatory data; FTIR is missing in the file U021031154105gcdr. A copy of this file is created in badfile directory configured in the Node.

2. If the file header/first block descriptor word is corrupted, the CC will move the corrupted file to the Bad File directory (configured in the CC). An alarm will be raised by the CC and there will be no output from the DC for this corrupted file as there is no records received from CC. See Invalid AMA input file on page 80.

3. If any record other than the FTIR is corrupted, the CC will move the corrupted file to the Bad File directory (configured in the CC). An alarm will be raised. See Invalid AMA input file on page 80.

   The DC will:

   a. generate an output file

   b. create a copy of this file and place it in the Bad File directory (configured in the DC).

   c. raise an alarm

      Major

      Invalid Data; Missing mandatory data; There might be loss of data. Record Count is not matching with FTOR in the file U021031154105gcdr. A copy of this file is created in badfile directory configured in the Node.

4. If the AMA record count contained in the FTOR does not match the number of records received, the DC will:

   a. generate an output file

   b. create a copy of this file and place it in the Bad File directory (configured in the DC).

   c. raise an alarm:

      Major

      Invalid Data; Missing mandatory data; There might be loss of data. Record Count is not matching with FTOR in the file U021031154105gcdr. A copy of this file is created in badfile directory configured in the Node.

5. If the FTOR is not received for a particular file (it is decided if records of next input file is received when waiting for FTOR of current file), the DC will:

   a. generate an output file

   b. create a copy of this file and place it in the Bad File directory (configured in the DC).

   c. raise an alarm:

      Major

      Invalid Data; Missing mandatory data; FTOR is missing in the file U031118200303. A copy of this file is created in badfile directory configured in the Node.

Scenario 2 - NAR data corruption within the cartridge chain

If the NAR data is corrupted:

1. NAR are written to the .badarch file in the scratch directory of that cartridge.

2. All valid NARs prior to the corrupted NAR will be transmitted to the DC.

In this instance, the DC will:

a. Generate an output file

b. Create a copy of this file and place it in the Bad File directory (configured in the DC).

c. Raise an alarm:

Major

Invalid Data; Missing mandatory data; There might be loss of data. Record Count is not matching with FTOR in the file U021031154105gcdr. A copy of this file is created in badfile directory configured in the Node.

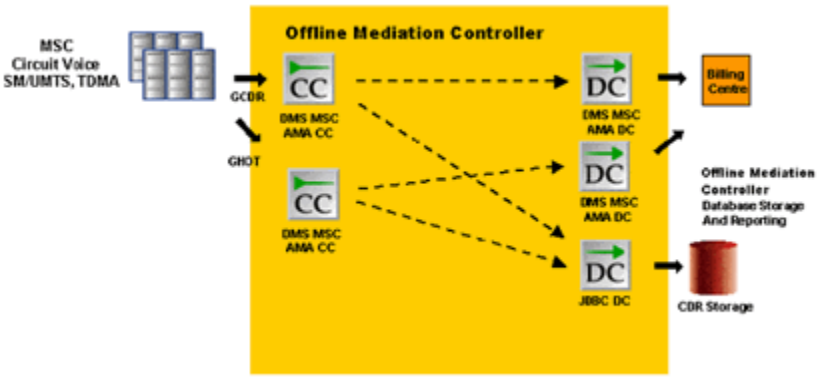
Database Storage and Reporting

The Database Storage and Reporting functionality allows you to configure DMS-MSC node chains that can process and distribute data to both a billing system and an Oracle 11*g* database.

The Database Storage solution lets you configure DMS-MSC node chains that process and distribute data to both a billing system and an Oracle 11g database.

Figure 12–4 shows the recommended configuration of the Database Storage node chain. The DMS-MSC CC collects data from DMS-MSC network devices and passes the data to both the DMS-MSC AMA DIRP DC and the JDBC DC. The DMS-MSC AMA DIRP DC sends the data to a billing system. The JDBC DC sends the data to an Oracle 11*g* database.

Figure 12–4 Database Storage Architecture



The Repository Manager is a Offline Mediation Controller tool that runs on an Oracle server and can import and export CDRs from an Oracle 11g Enterprise database. You can configure the Repository Manager to export CDRs at a specific time and store them in an accessible way, such as on Digital Audio Tape (DAT) or Digital Linear Tape (DLT). The Repository Manager can import the archived CDRs at a later date, if necessary. You can also configure the Repository Manager to delete CDRs from the database at the same time every day, if you do not wish to archive them.

The Oracle database stores call records it receives from the JDBC DC. The database stores each CDR it receives as a separate record in a table. You can access and modify the CDRs with standard SQL commands.

Offline Mediation Controller supports Oracle 11*g* Enterprise Edition and recommends installing the database on its own Oracle Solaris server.

For more information, see the following Oracle 11*g* documentation:

- *Oracle 11g Installation Guide*
- *Oracle 11g Administrator's Reference*
- *Oracle 11g Real Application Clusters Guard I Configuration Guide*

Installing and Configuring Oracle Database Components

The Database Storage tasks are as follows:

- Creating an Oracle user and dba group
- Installing Oracle
- Verifying the Oracle installation
- Loading the Offline Mediation Controller schema
- Configuring Oracle
- Configuring UNIX executables
- Configuring and using the Repository Manager
- Installing the Oracle Client
- Modifying tnsnames.ora
- Installing the Oracle JDBC driver
- Configuring Oracle for automatic restart
- Verifying the Oracle automatic restart

Oracle Database Installation Summary

To install Oracle database, you need to:

Create an Oracle user and dba group. See Oracle 11*g* documentation.

1. Run the Oracle database installation tool, select components and install. See Oracle 11*g* documentation.
2. Verify the Oracle database installation. See Oracle 11*g* documentation.
3. Load the Offline Mediation Controller schema files.
4. Install the Oracle Client.
5. Download and install the Oracle JDBC driver.

   See the Oracle database documentation for more information.

The Oracle database components require upgrading if the Database Storage and Reporting functionality is configured.

Upgrading If AMA 1.4.x Cartridge Packs Were Installed

Upgrade the database components if you were running an AMA 1.4.x cartridge pack before you installed the new AMA cartridge pack:

1. As the Oracle user, run the Oracle Enterprise Manager by typing **oemapp worksheet** and pressing **Enter**.

2. Select connect directly to database.
3. For Username, type **NMUSER1**.
4. For Password, type **NMUSER1**.
5. For Service, type **NMCDRS**.
6. For Connect, type **normal**.
7. Click **OK**.

   You are now connected to the NMCDRS schema.
8. Stop the Repository Manager using the command:

   ```
   EXEC NMUSER1.MSLV_STOP_REPOMAN
   ```
9. Navigate to the *OMC_Home***/db_scripts/dbstorage/Oracle9i/Upgrade/** directory where you un-jarred the AMA jar file.
10. If you have a GSM 1.0.4 cartridge pack installed, go to next step; otherwise, go to Step 12.
11. Load **Upgrade_From_AMA14_GSMR104.sql**.
12. Load **Upgrade_From_AMA14.sql**.
13. Navigate to the *OMC_Home***/db_scripts/dbstorage/Oracle9i/Repoman/** directory where you un-jarred the AMA jar file.
14. Load **PLSQL_NMCDRS_PKG.sql**.
15. Load **PLSQL_LOGTOFILE.sql**.
16. Load **JAVA_UTIL.sql**.
17. Load **PLSQL_RUN_CMD.sql**.
18. Load **PLSQL_RC.sql**.
19. Load **PLSQL_PARFILEWRITER.sql**.
20. Load **PLSQL_BUILD_EXCHANGE.sql**.
21. Load **PLSQL_DROP_PARTITIONS.sql**.
22. Load **PLSQL_BUILD_PARTITIONS.sql**.
23. Load **PLSQL_MSLV_START_REPOMAN.sql**.
24. Load **PLSQL_MSLV_STOP_REPOMAN.sql**.
25. The repoman_configuration table has three new columns. Change the values of the fields in these columns to the appropriate values. These columns are as follows:

    a. TABLENAME - 1 to 24 bytes. This is the name of the base table (for example 'MSLV_ENHCDR_STORAGE').

    b. NO_DATAFILES_PER_TS -1 to *n*. This is the number of data files that the tablespace will deploy and should always be set to 1 (unless you desire more as in the case of CHT).

    c. TBLSPC_NAME - 1 to 10 bytes. This is the base portion of the tablespace name (for example 'MSLV_'). The rest will be filled in by appending a datestamp to the end (for example 'MSLV_20061219')

Note: TBLSPC_SIZE has been renamed to DATAFILE_SIZE; as a result, the values for DATAFILE_SIZE have to be re-entered.

26. Start the Repository Manager using the following command.

```
EXEC NMUSER1.MSLV_START_REPOMAN(N);
```

where *N* is the config_num configured in REPOMAN_CONFIGURATION

Upgrading If AMA 4.0.0 to 4.0.7 Cartridge Packs Were Installed

Upgrade the database components if you were running an AMA 4.0.0 to AMA 4.0.7 cartridge pack before you installed the new AMA cartridge pack.

1. As the Oracle user, run the Oracle Enterprise Manager by typing **oemapp worksheet** and pressing **Enter**.
2. Select connect directly to database.
3. For Username, type **NMUSER1**.
4. For Password, type **NMUSER1**.
5. For Service, type **NMCDRS**.
6. For Connect, type **normal**.
7. Click **OK**.

   You are now connected to the NMCDRS schema.
8. Stop the Repository Manager using the command:

```
EXEC NMUSER1.MSLV_STOP_REPOMAN
```

9. Navigate to the *OMC_Home*/**db_scripts/dbstorage/Oracle9i/Upgrade/** directory where you un-jarred the AMA jar file.
10. Load **Upgrade_From_AMA40.sql**.
11. Navigate to the *OMC_Home*/**db_scripts/dbstorage/Oracle9i/Repoman/** directory where you un-jarred the AMA jar file.
12. Load **PLSQL_NMCDRS_PKG.sql**.
13. Load **PLSQL_LOGTOFILE.sql**.
14. Load **JAVA_UTIL.sql**.
15. Load **PLSQL_RUN_CMD.sql**.
16. Load **PLSQL_RC.sql**.
17. Load **PLSQL_PARFILEWRITER.sql**.
18. Load **PLSQL_BUILD_EXCHANGE.sql**.
19. Load **PLSQL_DROP_PARTITIONS.sql**.
20. Load **PLSQL_BUILD_PARTITIONS.sql**.
21. Load **PLSQL_MSLV_START_REPOMAN.sql**.
22. Load **PLSQL_MSLV_STOP_REPOMAN.sql**.

23. The repoman_configuration table has three new columns. Change the values of the fields in these columns to the appropriate values. These columns are as follows:
    a. TABLENAME - 1 to 24 bytes. This is the name of the base table (for example 'MSLV_ENHCDR_STORAGE').
    b. NO_DATAFILES_PER_TS -1 to *n*. This is the number of data files that the tablespace will deploy and should always be set to 1 (unless you desire more as in the case of CHT).
    c. TBLSPC_NAME - 1 to 10 bytes. This is the base portion of the tablespace name (for example 'MSLV_'). The rest will be filled in by appending a datestamp to the end (for example 'MSLV_20061219')

    Note: TBLSPC_SIZE has been renamed to DATAFILE_SIZE; as a result, the values for DATAFILE_SIZE have to be re-entered.

24. Start the Repository Manager using the following command.

    ```
    EXEC NMUSER1.MSLV_START_REPOMAN(N);
    ```

    where N is the config_num configured in REPOMAN_CONFIGURATION

Upgrade the Database Portion of AMA 3.5. to 3.5.5 For the Parameter (PAR) File Enhancement

Upgrading the database will allow timestamps to be added to the PAR script file name.

1. Stop the Repository Manager using the command:

   ```
   EXEC NMUSER1.MSLV_STOP_REPOMAN
   ```

2. Navigate to the <CARTRIDGE PACK>/dbstorage/Oracle9i/Upgrade/ directory where you un-jarred the AMA jar file.
3. Navigate to the <CARTRIDGE PACK>/dbstorage/Oracle9i/Repoman/ directory where you un-jarred the AMA jar file.
4. Load **PLSQL_PARFILEWRITER.sql**.
5. Load **PLSQL_DROP_PARTITIONS.sql**.
6. Start the Repository Manager using the below command after verifying configuration values in REPOMAN_CONFIGURATION table.

   ```
   EXEC NMUSER1.MSLV_START_REPOMAN(N);
   ```

   where *N* is the config_num configured in REPOMAN_CONFIGURATION table

   In order to manage disk space usage, you may want to delete the older PAR files at regular intervals. The PAR files are kept in the /opt/mslvdblogs directory. Ensure that the current PAR file is not deleted.

Loading the Offline Mediation Controller Schema

Use the following procedure to load the Offline Mediation Controller schema.

To load the schema:

1. As the Oracle user, run the Oracle Enterprise Manager by typing **oemapp worksheet** and pressing **Enter**.
2. Select connect directly to database.
3. For Username, type **system**.
4. For Password, type **oracle**.
5. For Service, type **NMCDRS**.
6. For Connect, type **normal**.
7. Click **OK**.

   You are now connected to the NMCDRS schema.
8. Navigate to the *OMC_Home*/**db_scripts/dbstorage/Oracle9i/** directory where you un-jarred the AMA jar file.
9. As the oracle SYSTEM user, load the following tablespace:

   DDL_create_tblspc_ENHNMCDRS_MAIN.sql

   This is a default tablespace, and does not store daily CDRs.
10. After loading this script, modify the DATAFILE to match the directory structure on the machine where you installed Oracle.

    For example: Oracle_Home**/oradata/**<dbf filename>

    Set the SIZE parameter to a minimum of **10M** - ten megabytes.
11. As the oracle SYSTEM user, load:

    DDL_create_usr_NMUSER1.sql

    If you run the schema file **NMUSER1.sql** from the AMA jar file, then you do not need to run this sql again.
12. Disconnect as the SYSTEM user and connect as NMUSER1. The default password is NMUSER1.
13. Navigate to the *OMC_Home*/**db_scripts/ dbstorage/Oracle9i/** directory where you un-jarred the AMA jar file.
14. Load **DDL_create_tbl_MSLV_ENHCDR_STORAGE.sql**.
15. Navigate to the *OMC_Home*/**db_scripts/ dbstorage/Oracle9i/** directory where you un-jarred the AMA jar file and then to **/RepoMan**.
16. Load **DDL_create_tbl_REPOMAN_CONFIGURATION.sql**.
17. Load **PLSQL_NMCDRS_PKG.sql**.
18. Load **PLSQL_LOGTOFILE.sql**.
19. Load **JAVA_UTIL.sql**.
20. Load **PLSQL_RUN_CMD.sql**.
21. Load **PLSQL_RC.sql**.
22. Load **PLSQL_PARFILEWRITER.sql**.
23. Load **PLSQL_BUILD_EXCHANGE.sql**.
24. Load **PLSQL_DROP_PARTITIONS.sql**.
25. Load **PLSQL_BUILD_PARTITIONS.sql**.

26. Load **PLSQL_MSLV_START_REPOMAN.sql**.
27. Load **PLSQL_MSLV_STOP_REPOMAN.sql**.

    All required Oracle objects are now loaded into Oracle database.

Changing the Default Oracle Username And Password

To change the default Oracle username and password, you must update the **PLSQL_PARFILEWRITER.sql** file. When you un-jar the file from the cartridge jar file, the script is located at: **/db_scripts/dbstorage/Oracle9i/Repoman**.

To change the user name and password in the script:

1. Open the file **PLSQL_PARFILEWRITER.sql** for editing.
2. Scroll down to line 44, which reads **v_LineUser:='USERID="system/oracle AS SYSDBA"';**
3. The line currently displays **system** as the username and **oracle** as the password.
4. Replace the user name and password with new information.
5. Save the file and close the editing window.

Configuring Oracle Database

You must configure Oracle database to run the Repository Manager.

To configure Oracle database:

1. From the UNIX command line, create a new directory that the oracle user can read and write to.

   For example, run the following commands in the order shown and press Enter:

   ```
   mkdir /opt/mslvdblogs
   chmod 777  /opt/mslvdblogs
   ```

   This directory stores the Repository Manager log files and the parameter file for the archive process.

2. You must edit an Oracle database initialization parameter in order for the Repository Manager to function correctly.

   Start the Oracle DBA Studio application by logging on to your Oracle server as the oracle user and run the following command:

   ```
   oemapp dbastudio &
   TRANSPORT_TABLESPACE=Y
   ```

3. Log on with the user ID sys and the password dba, then select SYSDBA from the drop-down list.
4. In the Oracle DBA Studio window, select the NMCDRS database, then select Instance and then Configuration.
5. In the Configuration window, go to the General tab and click All Initialization Parameters.
6. In the Initialization Parameters window, go to the util_file_dir entry and set it to **/opt/mslvdblogs**.

   This is the directory where the Repository Manager stores its log files. Ensure the oracle user can access this directory.

7. Click **Apply** to save the changes and then exit the application.
8. Restart the database when the DBA Studio prompts you.
9. Change your connection back to SYSTEM.

Configuring UNIX Executable

To configure the UNIX executable for the Database Storage system:

1. Determine the path of the oracle user for the UNIX cp program (file copy utility) by logging on to a UNIX session as oracle and run the following command:

   ```
   which cp
   ```

   The system responds with a path such as **/usr/bin/cp**.

2. Determine the path of the oracle user for the UNIX exp program (export utility) by logging on to a UNIX session as oracle and run the following command:

   ```
   which exp
   ```

3. The system responds with a path such as *Oracle_Home***/bin/exp**.
4. Locate DDL_Java_Permissions.sql and open the file in a text editor program. Then edit the cp and exp information to match the directory path for your system and save the file.
5. Log on to Oracle SQLPlus as the SYSTEM user.
6. Load and run the updated **DDL_Java_Permissions.sql** file.

Configuring and Using the Repository Manager

These sections explain how to configure the Repository Manager.

Adding Entries to the Configuration Table

The Repository Manager requires you to provide some configuration data before it can run. You must insert the data into the Repository Manager NMUSER1.REPOMAN_CONFIGURATION table.

You can use the table data editor in the Oracle DBA Studio tool to edit the Repository Manager configuration table. Each row in the table represents a configuration and only one configuration is used at a time. You can keep many configurations in the table for testing purposes.

Parameters

The following are the parameters you must configure in the NMUSER1.REPOMAN_CONFIGURATION table.

CONFIG_NUM

Set to an integer value such as 1, 2, 3, 4, 5 and so on.

DESCRIPTION

Enter a text description of the configuration up to 80 characters.

RUN_MODE

Set to DELETE or ARCHIVE.

NEXT_PRTN_INTERVAL

This setting controls when the Repository Manager creates the next partition, which is usually once a day.

Table 12–2 lists some examples of the settings and their values.

Table 12–2 Example Settings

Functional setting	NEXT_PRTN_INTERVAL parameter value
Everyday at midnight-12 am	TRUNC(SYSDATE + 1)
Everyday at 8 pm	TRUNC(SYSDATE + 1) + 8/24
Every Tuesday at noon-12 pm	NEXT_DAY(TRUNC(SYSDATE), "TUESDAY") + 12/24
First day of the month at midnight	TRUNC(LAST_DAY(SYSDATE) + 1)
Last day of the quarter at 11 pm	TRUNC(ADD_MONTHS(SYSDATE + 2/24,3), 'Q') - 1/24
Every Monday, Wednesday and Friday at 9 am	TRUNC(LEAST(NEXT_DAY(SYSDATE, "MONDAY"), NEXT_DAY(SYSDATE, "WEDNESDAY"), NEXT_DAY(SYSDATE, "FRIDAY"))) + 9/24

For testing purposes, you can configure the Repository Manager to automatically generate new partitions every minute or every five minutes. For every minute, use the value SYSDATE + 1/1440. For every five minutes, use the value SYSDATE + 5/1440.

DAYS_TO_KEEP

Set to the number of days to keep the CDRs in the database.

TBLSPC_DIRECTORY

This is the directory where Oracle database stores the tablespace data files. The oracle user must have full permissions to this directory. Set this value to the full directory path. For example: /opt/oradata/mydatadisk/

TBLSPC_SIZE

This is the size of each tablespace the Repository Manager generates. As a minimum, set the value to the maximum amount of data stored per day. Use an integer followed by M-megabytes. For example, for a 125 megabyte partition per day, use 125M.

START_PRTN

This is the date the Repository Manager generates the first partition. For example, to set the first partition on March 14, 2006, set the value to:14-Mar-2006 12:00:00 AM

Note: The time value is not used.

Before you insert data into the database, ensure a partition exists with a date that is equal to or ahead of the date on which you are inserting data. For example, if you insert data on October 22, 2006 and the existing partitions have dates previous to October 22, the CDRs are not inserted.

START_AT

This determines when the Repository Manager starts running. Set this value to a time beyond the current time of the UNIX system. To avoid setting times in the past, change

this value to a time slightly ahead of the current time whenever you run the Repository Manager.

For example, if you set the value to SYSDATE + 60/1440, you have one hour to start the Repository Manager.

ARCHIVE_OUT_DIRECTORY

This is the directory where the Repository Manager stores the archive partitions when it is running in archive mode. Ensure the oracle user has full permissions to this directory. Oracle recommends that you periodically send the archive files to a storage tape, such as DLT or DAT, and then delete the archive files from the database.

ORACLE_EXP_PATH and **UNIX_CP_PATH**

Set these parameters to the directory paths for the Oracle export utility and the UNIX file copy utility, as described in Configuring UNIX Executable. Enter the directory path but not the executable name. For example, for a UNIX file copy utility located in /usr/bin/, enter only /usr/bin/.

Starting the Repository Manager

From Oracle SQLPlus, log on to the database as nmuser1. Start the Repository Manager with the execute command and the number of the configuration you wish to use. For example, to use configuration 1, run the following command:

```
exec nmuser1.MSLV_START_REPOMAN(1)
```

Stopping the Repository Manager

From Oracle SQLPlus, log on to the database as nmuser1. Stop the Repository Manager with the following command:

```
exec nmuser1.MSLV_STOP_REPOMAN
```

Importing Records with the Repository Manager

You can import archive partitions into the Oracle database. If you import an archive partition into the database that you exported from, ensure the tablespace you are importing does not already exist in the database. This situation can occur if the partition was not exported correctly.

To import an archive partition, do the following:

1. Copy the archive file MSLV_date_TS.dbf to the ARCHIVE_OUT_DIRECTORY as specified in the REPOMAN_CONFIGURATION table.
2. Create an import parameter file and ensure the oracle user has read access to this file.

   Here is an example of an import parameter file:

   ```
   USERID='sys/TBD AS SYSDBA'
   TABLESPACES=(MSLV_20060123)
   DATAFILES=(/opt/Oracle902/oradata/NMCDRS/MSLV_20060127_TS.dbf)
   FILE='/opt/mslvout/MSLV_DBSR_ARCHIVE_20060127.dmp'
   ```

   where:

   - In the USERID field, you can specify any user with SYSDBA privileges. By default, the oracle SYS user has SYSDBA privileges.

- In the DATAFILES field, specify the path to the .dbf file and the .dmp file.

3. Save the file. For example, you can save the file as:

```
/my_importfiles/import_date.par
JDBCUrl
```

4. Import the file using the Oracle import utility by running the following command:

```
imp PARFILE = /my_importfiles/import_date.par
```

5. The import utility loads the file. The import appears as a table called XCHANGE_ date.

Deleting Records with the Repository Manager

The Repository Manager uses a separate Oracle partition in the MSLV_CDR_ STORAGE table to store all the CDRs for each day. The Repository Manager generates new partitions daily and deletes old partitions that have existed longer than the value set in the DAYS_TO_KEEP parameter. If you wish to archive the old partitions instead of deleting them, run the Repository Manager in archive mode.

To run the Repository Manager in delete mode, set the RUN_MODE parameter to DELETE in the REPOMAN_CONFIGURATION table.

Archiving Records with the Repository Manager

When the Repository Manager runs in archive mode, it sends old partitions to a storage disk before deleting them from the database.

To run the Repository Manager in archive mode, set the RUN_MODE parameter to ARCHIVE in the REPOMAN_CONFIGURATION table.

The Repository Manager creates a pair of files for each partition, and stores them in the ARCHIVE_OUT_DIRECTORY as specified in the REPOMAN_CONFIGURATION table. For example, for an archive partition from January 21, 2006, the Manager generates two files:

- MSLV_20060121_TS.dbf
- MSLV_DBSR_ARCHIVE_20060121.dmp

The .dbf file is an Oracle data file and the .dmp file is a metadata file that Oracle uses when importing archive partitions into the database. You can use the Oracle Import program, imp, to load archive partitions into the database. These files are only compatible with the Oracle Transportable Tablespaces export and import mode.

Installing the Oracle Client

You must install the Oracle 11*g* Client to query the database.

See the Oracle Installation Guide for instructions on installing the Oracle Client. Once you have installed the Oracle Client, you can install the Oracle JDBC driver.

Installing the Oracle JDBC Driver

To use the JDBC DC, you must download and install the Oracle JDBC driver.

To install the Oracle JDBC driver:

1. Download the **ojdbc6.jar** file from the following location:

   http://www.oracle.com/technetwork/index.html

2. On the Offline Mediation Controller server where the Node Manager is running, place the file in the *OMC_Home*/**3rdparty_jars** directory.
3. To configure the JDBC-DC node for RAC environment, use the following URL when you define a new NPL for JDBC-DC node:

```
JDBCDriver "oracle.jdbc.OracleDriver";
 "jdbc:oracle:thin:(DESCRIPTION=(LOAD_BALANCE=on)(ADDRESS=(PROTOCOL=TCP)(HOST=
Host1) (PORT=1521))(ADDRESS=(PROTOCOL=TCP)(HOST=Host2)
 (PORT=1521))(CONNECT_DATA=(SERVICE_NAME=service)))";
```

4. You can now start or restart the Offline Mediation Controller Administration Server, Node Manager, and JDBC DC.

Configuring Oracle Database for Automatic Restart

You can set up Oracle database to automatically restart after the server reboots.

To configure Oracle database to automatically restart:

1. As root, copy the *OMC_Home*/**db_scripts/dbstorage/Oracle9i/dbora.sh** file and paste the **dbora.sh** file on the Oracle database server, in the **/etc/init.d** directory.
2. Ensure the ORA_Home is set to the same value as the ORACLE_Home setting.
3. Enable NMCDRS in the **oratab** file by changing the setting of the **/var/opt/oracle/oratab** directory from **N** to **Y**.
4. As root, in the **/etc** directory, edit the services file.

   Use the **chmod** command to modify the file permissions. Add the following line for the Oracle listener:

```
listener   1521/tcp    #oracle listener
ln -s /etc/init.d/dbora /etc/rc2.d/S99dbora
```

5. To create symbolic links, run the following commands as root:

```
ln -s /etc/init.d/dbora /etc/rc0.d/K10dbora
```

6. Create a PFILE that Oracle reads upon start-up that points to a valid SPFILE. Navigate to the *Oracle_Home*/**dbs** directory. There is an SPFILE called **spfileNMCDRS.ora.** You must create a new file in this directory called **initNMCDRS.ora**.
7. In the new **initNMCDRS.ora** file, add the following line:

```
SPFILE = 'Oracle_Home/dbs/spfileNMCDRS.ora'
ORAENV_ASK=NO ; export ORAENV_ASK
```

8. To set the Oracle profile, as the Oracle user, navigate to the *Oracle_Home* directory.
9. Create a file called **.profile** and add:

```
PATH=$HOME/bin:$PATH
ORACLE_SID=NMCDRS ; export ORACLE_SID
. $HOME/bin/oraenv
```

   This allows the **dbora** script in **/etc/init.d** to access the correct environment to start the Oracle listener.

Verifying the Oracle Database Automatic Restart

To verify the Oracle database automatic restart:

1. To see the processes that are running, run the following command:

   ```
   ps -ef | grep ora
   ```

2. As the root user, go to the **/etc/init.d** directory.
3. Run the following command to stop the listener and oracle processes:

   ```
   ./dbora stop
   ```

   The listener and oracle processes stop.
4. Run the following command to start the listener and oracle processes:

   ```
   ./dbora start
   ```

   The listener and oracle processes start.

Known Problems

This cartridge pack contains the following known problems:

- On the DMS-MSC AMADIRP DC node, if the option "Keep Empty File" is unchecked and there is no CDR data, the file sequence number is erroneously incremented when the cartridge is stopped and restarted.
- Any input or output directory settings in the node configuration windows must be within the same disk partition where Offline Mediation Controller is installed. Failure to do so can result in errors, alarms, and potentially, loss of data.
- On the DMS-MSC AMA DIRP DC node, Office Identification tab, the **Generate FTOR** checkbox (File Transfer Out Record) is supported for GSM 16 only. If you wish to enable this checkbox, ensure a GSM 16 rule file is selected for the node.
- On the DMS-MSC AMA DIRP DC node, File Matching tab, the **Generate File based on input file** checkbox is supported for GSM 18, GSM 16 and GSM 15. If you wish to enable this checkbox, ensure File Matching supported NPL rule file (1TO1_GSM18, 1TO1_GSM16, 1TO1_GSM15) is selected for the node. The following configurations are supported for 1:1 file matching:
  - GSM18 in -> GSM18 out
  - GSM18 in -> GSM16 out
  - GSM16 in -> GSM16 out
  - GSM16 in -> GSM15 out
  - GSM15 in -> GSM15 out

13

Configuring the Real-Time ASCII File Collection CDK Cartridge Pack

This chapter describes how to configure the Oracle Communications Offline Mediation Controller Real-Time ASCII File Collection CDK Cartridge Pack.

About the Real-Time ASCII File Collection Cartridge Development Kit (CDK) Cartridge Pack

The Real-Time ASCII File Collection Cartridge Development Kit (CDK) cartridge pack collects ASCII records from files in real-time. This collection cartridge is ideal for collection records from servers which output records into a log file over a long period of time (several hours).

14

Configuring the SGSN06 Cartridge Pack

This chapter describes how to configure the nodes included in the Oracle Communications Offline Mediation Congtroller SGSN06 Cartridge Pack.

About the SGSN06 Cartridge Pack

The SGSN06 cartridge pack supports 3GPP TS 32.298 V6.4.1, 3GPP TS 32.298 7.3.0, and 3GPP TS 32.298 V10.5.0 for SGSN call data records (CDR).

This cartridge pack comprises the following nodes:

- GTP Prime CC
- 3GPP Parsing EP
- Session AP
- 3GPP ASN.1 DC

Figure 14–1 displays the architecture of the solution.

Figure 14–1 Architecture

Note: The capability to create the 3GPP Session Sequencing EP is available in the core Offline Mediation Controller product.

Configuring the GTP Prime CC Node

This section describes how to configure the GTP Prime CC Node.

Configuring Input From GPRS Tunneling Protocol

To get input from data sent by using the GPRS Tunneling Protocol (GTP) protocol, you use the GTP Prime CC node. In addition to the General and Destination tabs, you must configure the **GSN Monitor** tab and the **UDP** tab.

Configure these options in the **GSN Monitor** tab:

Field	Description
Enable GSN Monitoring	Select this check box to enable GSN monitoring for this node.
Send Port	Enter the port number the CC node uses to send GTP requests to the GSNs.
CGF IP Address	Select the Charging Gateway Function (CGF) IP Address.
Monitored GSN List	This table contains the GSN devices that send data to the CC node. Use the **Add** or **Delete** buttons to make GSN device changes to the table.
Add	Click to add a new GSN device.
Delete	Click to delete an existing GSN device.
IP Address	Enter the IP Address of the GSN device. **Note:** Internet Protocol version 4 and 6 (IPv4 and IPV6) are supported.
Port	Enter the GSN Port number that sends data to the CC node.
Request Interval (Sec.)	Enter the amount of time, in seconds, between GTP requests.
Response Timer (Sec.)	Enter the amount of time, in seconds, that the CC node waits for a response from the GSN, before re-sending the original request.
Use Node Alive Request	Select this check box to enable the GTP Prime CC node to send a node alive request to the GSN if it has not received any Call Detail Record's (CDR) in a specific interval. You configure this interval in the **Request Interval** field. If the CC node receives a response from the GSN before the interval expires, it will not generate a warning alarm. (This means that the GSN is functioning correctly and does not have any CDRs for this specific interval). If the CC node does not receive a response from the GSN before the interval expires, it will generate a warning alarm. The CC node will clear this warning alarm when it receives CDRs from the GSN or when the GSN responds to the node alive request.

Configure these options in the **UDP** tab:

Field	Description
Port	Enter the port number used to communicate with a database or device. The number must be a positive integer.
Maximum Packet Size	Enter the maximum size for the UDP packet that the CC node will accept.

Configuring the 3GPP Parsing EP Node

To configure the 3GPP Parsing EP Node node, you can specify which encoding rules are used for incoming records, Basic Encoding Rules (BER) or Aligned Packed Encoding Rules (PER). To do so, choose which rules to use in the 3GPP 32.015 Parsing Enhancer EP node **Encoder Type** tab.

Configuring the 3GPP Session Sequencing AP Node

To configure the 3GPP Session Sequencing AP node, you configure standard parameters, and the entires in the **Sequencing** tab.

Option	Description
Expiry Interval (minutes)	Enter the time the node to waits, before the sequence records output are sent to the next node in the chain.
Session Storage limiting	Select *for what? when checked enter the what value in the* **Limit** field.
Log Duplicate Entries	Select this check box to enable the node to create a log entry for each duplicate record.
Missing Record Monitoring	Select this check box to enable the node to generate alarms or logs for any missing records it detects.
Missing Record Alarm or Log Severity	Select the alarm severity level or log option that the node will generate for a missing record.
Retain Recent Records	Select this check box to enable the node to retain recent records.
Buffer Size	Enter the buffer size required to retain recent records.

Configuring the Session AP Node

To configure the Session AP node, you configure standard aggregation and file management tabs. See *Offline Mediation Controller Online Help*.

Configuring the 3GPP ASN.1 DC Node

To configure the 3GPP ASN.1 DC node, you configure standard parameters, include FTP connection configurations. Configure these options in the **GSM 3GPP Output** tab:

Field	Description
Output Directory	Enter the directory path and name where Offline Mediation Controller stores the files produced by the DC node.
File Name	Enter the prefix name of the output files.
Current File Extension	Enter the file extension of the preprocessed output file.
Processed File Extension	Enter the file extension of the processed files.
Output Push Time Unit	Select the unit of time in years, months, days, hours, minutes or seconds, that Offline Mediation Controller waits, before closing a file and creating a new file.

Field	Description
Output Push Time Period	Enter the duration of time that Offline Mediation Controller waits, before closing a file and creating a new file. The range is 1 to 2147483647.
Encoding Option	Select which encoding length option is required for the output data.

Alarms

All Offline Mediation Controller alarms are listed in the **alarms.txt** file located in the *OMC_home* directory (*OMC_home* is the directory in which you installed Offline Mediation Controller). No new alarms are introduced in this cartridge pack.

15

Configuring the Syslog Collection Cartridge Pack

This chapter describes how to configure the nodes included in the Oracle Communications Offline Mediation Controller Syslog Collection Cartridge Pack.

About the Syslog Collection Cartridge Pack

The Syslog Collection Cartridge Pack collects syslog files from multiple devices.

Configuring the Syslog CC Node

To configure the Syslog CC S CC node, you configure standard parameters, include file management and FTP connection configurations. See *Offline Mediation Controller Online Help*.

Syslog Configuration On Solaris 8, 9, and 10

The file /etc/syslog.conf contains information used by **syslogd**, the syslog daemon process, to forward a system message to appropriate log files and/or users. The syntax is explained below.

The configuration entry is composed of two tab-separated fields:

Syntax: <*selector*> <*action*>

Example 1:

```
mail.alert          /var/adm/messages
```

Example 2:

```
mail.alert          @10.13.3.28
```

Syslog Rotation On Solaris 8

The shell script **newsyslog** rotates the log file that is run by the cron job. This script is provided by Sun as part of the Solaris package. You can either edit this file or create your own script and add it to the cron tab. The file location is: **/usr/lib/newsyslog**.

Here is a sample **newsyslog** shell script:

```
#! /bin/sh
LOG=TestLog
EXT=complete
```

```
cd /var/adm
if test -s $LOG
then
        test -f $LOG"_2."$EXT && mv $LOG"_2."$EXT $LOG"_3."$EXT
        test -f $LOG"_1."$EXT && mv $LOG"_1."$EXT $LOG"_2."$EXT
        test -f $LOG"_0."$EXT && mv $LOG"_0."$EXT $LOG"_1."$EXT
        test -f $LOG && mv $LOG   $LOG"_0."$EXT
        cp /dev/null $LOG
        chmod 644    $LOG
fi
```

Syslog Rotation On Solaris 9

The **logadm** is a general log rotation tool that is run by the cron job. You need to specify the configuration options for the **logadm** in the **/etc/logadm.conf** file. Then you can configure the cron job to run the rotation tool every hour, or for another specified time period.

The syntax is: <*log name*> <*options*>

For example: /var/adm/messages -C 10 -t '/var/adm/messages_$N.complete'

The necessary rotation options for a log file are as follows:

- **-s** size: use **b** for bytes, **k** for kilobytes, **m** for megabytes, or **g** for gigabytes
- **-C** count
- **-t** template: specify the template to use when renaming log files:
  - $file - The full path name of the file to be rotated.
  - $n - The version number, 0 is most recent, 1 is next most recent, and so on.
  - $N - The same as $n, but starts at 1 instead of zero.

There are additional options but the above options are the only necessary ones for this cartridge pack.

If you are using the default configuration for the **logadm**, you need to configure the cron job as follows:

```
0 * * * *    /usr/sbin/logadm
```

If you are using your own configuration for the **logadm**, you need to configure the cron job as follows:

```
0 * * * *    /usr/sbin/logadm -f <config file name>
```

Using the example: **/var/adm/messages -C 10 -t '/var/adm/messages_$N.complete'**, the log file will be rotated and renamed every hour as follows:

```
/var/adm/messages_1.complete, /var/adm/messages_2.complete, /var/adm/messages_
3.complete
```

.....up to

```
/var/adm/messages_10.complete
```

Syslog Rotation On AIX 5.3

The **file /etc/syslog.conf** contains information used by syslogd and the syslog daemon process, to forward a system message to appropriate log files or users or both. Since AIX has no logrotate daemon running, you must adapt syslogd to do the syslog rotation. The format would be

Syntax: <*selector*> <*action*> <*rotate_info*>

Example 1:

```
mail.debug /var/log/mail rotate size 100k files 4  # 4 files, 100kB each
```

Example 2:

```
user.debug /var/log/user rotate files 12 time 1h # 12 files, hourly rotate
```

Rotation can be based on size or time or both.

Size: This keyword specifies that rotation is based on size. It is followed by a number and either a k (kilobytes) or m (megabytes).

Time: This keyword specifies that rotation is based on time. It is followed by a number and either a h(hour) or d(day) or w(week) or m(month) or y(year).

NAR Attributes and Error Scenarios

Table 15–1 details the Network Accounting Record (NAR) attributes, as well as potential error scenarios.

Table 15–1 Network Accounting Record Attributes and Potential Errors

NAR ID	Type	Value
facility	string	This field can be blank or contain any of the following values: user, kern, mail, daemon, auth, lpr or news.
messageId	string	This field can be blank or contain a numeric value.
filename	string	Input file name.
processName	string	This field can be blank or contain a string value such as sendmail or mountd.
processId	string	This field can be blank or contain a numeric value.
message	string	Syslog message.
date	string	The date as a string value in the format: "MMM d HH:mm:ss" For example: Dec 2 16:40:50
level	string	This field can be blank or contain any of the following values: emerg, alert, crit, err, warning, notice, info, debug, none.
host	string	This field can be an IP address or host name.

Table 15–1 (Cont.) Network Accounting Record Attributes and Potential Errors

NAR ID	Type	Value
nar_errorFlag	integer	A flag that indicates whether any problems were detected while parsing the CDR ("0" means that no problems were detected and "1" means that a problem was detected).

The following are potential error situations where the node will skip the record and create a log:

1. If **date** field is not in the format "MMM d HH:mm:ss".
2. If the **processId** is not a valid numeric value.
3. If there are any missing fields in the input data, such as **date**, **host** or **message**, for example.

The node will create a log as follows:

Invalid Data, File data not as expected, Invalid syslog record in `<file name>' file: '<syslog record >' This record cannot be processed

For example:

Invalid Data, File data not as expected, Invalid syslog record in 'message3.complete' file: '09 26 05:26:36 servcomnetdb25 mountd[5436]: [ID 882487 daemon.error] unable to create nfsauth service' This record cannot be processed

Known Problems

The following are known problems for this cartridge pack:

1. In the event of an FTP session failure, the CC node will attempt to re-establish the session every 5 seconds, instead of the configured FTP Interval value on the FTP Settings tab. The CC node will continue to attempt a re-connection until it successfully transfers the file. The CC node will generate a log message for each unsuccessful FTP attempt. If there is a problem with the network or the FTP server, you may want to stop the CC node, fix the problem, and then restart the CC node.
2. When provisioning the local directory where the CC node is to collect files, if the specified directory does not exist, the CC node will raise a critical alarm and will not start.
3. When configuring the prefix and suffix values for the CC node, non-alphanumeric characters, such as "." and "_" are supported but the "#" and "/" characters are **not** supported. Using these unsupported characters can result in the use of unexpected values when the data files are being renamed.

A

Sample Mapping for ECE Cartridge Pack

This appendix contains the sample mapping for the Oracle Communications Offline Mediation Controller Elastic Charging Engine (ECE) Distribution Cartridge (DC). The mapping includes:

- The input attribute-value pairs (AVPs) in the call detail records (CDRs)
- The values in the ECE payload specification files
- The ECE usage requests and payload parameters Offline Mediation Controller uses to build the usage request to send to ECE

Supported Usage Types

The ECE DC supports the following usage types for offline usage requests:

- Terminate
- Update
- Refund_Unit
- Refund_Amount
- Cancel
- Debit_unit
- Debit_amount

> **Note:** For refund usage types, the input CDR must contain the **correlation_identifier** value of the original debit request.

Mapping for ASCII

By default, the ECE DC supports the following ASCII product types:

- Voice
- Data
- SMS

Voice

Product Type = VOICE

Event Type = USAGE

Usage Type = Terminate

Table 15–2 shows the sample ASCII voice mappings for the Terminate usage type.

Table 15–2 Sample ASCII Voice Mapping for the Terminate Usage Type

ASCII NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
duration	USED_UNITS[0].DURATION	
CalledId		CALLED_ID
calling_number		UserIdentity
session_id		Session Id
start_time		Start time
end_time		End time
seq_no		Seq number

Product Type = VOICE

Event Type = USAGE

Usage Type = Update

Table 15–3 shows the sample ASCII voice mappings for the Update usage type.

Table 15–3 Sample ASCII Voice Mapping for the Update Usage Type

ASCII NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
Req_Duration	REQUESTED_UNITS[0].DURATION	
Used_Duration	USED_UNITS[0].DURATION	
CalledId		CALLED_ID
calling_number		UserIdentity
session_id		Session Id
start_time		Start time
end_time		End time
seq_no		Seq number

Product Type = VOICE

Event Type = USAGE

Usage Type = Refund_Unit

Table 15–4 shows the sample ASCII voice mappings for the Refund_Unit usage type.

Table 15–4 Sample ASCII Voice Mapping for Refund_Unit Usage Type

ASCII NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
Used_duration	USED_UNITS[0].DURATION	
CalledId		CALLED_ID
calling_number		UserIdentity
session_id		Session Id
start_time		Start time

Table 15–4 (Cont.) Sample ASCII Voice Mapping for Refund_Unit Usage Type

ASCII NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
end_time		End time
seq_no		Seq number
correlation_identifier	CORRELATION_IDENTIFIER	

Product Type = VOICE

Event Type = USAGE

Usage Type = Refund_Amount

Table 15–5 shows the sample ASCII voice mappings for the Refund_Amount usage type.

Table 15–5 Sample ASCII Voice Mapping for the Refund_Amount Usage Type

ASCII NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
CalledId		CALLED_ID
calling_number		UserIdentity
session_id		Session Id
start_time		Start time
end_time		End time
seq_no		Seq number
balance_element_id	IMPACT_AMOUNT[0].BALANCE_ELEMENT_ID	
amount	IMPACT_AMOUNT[0].AMOUNT	
correlation_identifier	CORRELATION_IDENTIFIER	

Data

Product Type = DATA

Event Type = USAGE

Usage Type = Terminate

Table 15–6 shows the sample ASCII data mappings for the Terminate usage type.

Table 15–6 Sample ASCII Data Mapping for the Terminate Usage Type

ASCII NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
cell_id	CELL_ID	
usedUnitsInputVolume	USED_UNITS[0].INPUT_VOLUME	
usedUnitsOutputVolume	USED_UNITS[0].OUTPUT_VOLUME	
usedUnitsTotalVolume	USED_UNITS[0].TOTAL_VOLUME	
CalledId		CALLED_ID
calling_number		UserIdentity
session_id		Session Id

Table 15–6 (Cont.) Sample ASCII Data Mapping for the Terminate Usage Type

ASCII NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
start_time		Start time
end_time		End time
seq_no		Seq number

Product Type = DATA

Event Type = USAGE

Usage Type = Update

Table 15–7 shows the sample ASCII data mappings for the Update usage type.

Table 15–7 Sample ASCII Data Mapping for the Update Usage Type

ASCII NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
cell_id	CELL_ID	
requestedInputVolume	REQUESTED_UNITS[0].INPUT_VOLUME	
requestedOutputVolume	REQUESTED_UNITS[0].OUTPUT_VOLUME	
requestedTotalVolume	REQUESTED_UNITS[0].TOTAL_VOLUME	
usedUnitsInputVolume	USED_UNITS[0].INPUT_VOLUME	
usedUnitsOutputVolume	USED_UNITS[0].OUTPUT_VOLUME	
usedUnitsTotalVolume	USED_UNITS[0].TOTAL_VOLUME	
CalledId		CALLED_ID
calling_number		UserIdentity
session_id		Session Id
start_time		Start time
end_time		End time
seq_no		Seq number

Product Type = DATA

Event Type = USAGE

Usage Type = Refund_Unit

Table 15–8 shows the sample ASCII data mappings for the Refund_Unit usage type.

Table 15–8 Sample ASCII Data Mapping for the Refund_Unit Usage Type

ASCII NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
cell_id	CELL_ID	
usedUnitsInputVolume	USED_UNITS[0].INPUT_VOLUME	
usedUnitsOutputVolume	USED_UNITS[0].OUTPUT_ VOLUME	
usedUnitsTotalVolume	USED_UNITS[0].TOTAL_VOLUME	
CalledId		CALLED_ID
calling_number		UserIdentity
session_id		Session Id
start_time		Start time
end_time		End time
seq_no		Seq number
correlation_identifier	CORRELATION_IDENTIFIER	

Product Type = DATA

Event Type = USAGE

Usage Type = Refund_Amount

Table 15–9 shows the sample ASCII data mappings for the Refund_Amount usage type.

Table 15–9 Sample ASCII Data Mapping for the Refund_Amount Usage Type

ASCII NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
cell_id	CELL_ID	
CalledId		CALLED_ID
calling_number		UserIdentity
session_id		Session Id
start_time		Start time
end_time		End time
seq_no		Seq number
balance_element_id	IMPACT_AMOUNT[0].BALANCE_ ELEMENT_ID	
amount	IMPACT_AMOUNT[0].AMOUNT	
correlation_identifier	CORRELATION_IDENTIFIER	

Mapping for SGSN

The ECE DC supports the following SGSN product types:

- Data
- SMS

Data

SGSN PDP Record

Table 15–10 shows the sample SGSN data mapping for the PDP record.

Table 15–10 Sample SGSN Data Mapping for the SGSN PDP Record

ASN 1 Fields	SGSN Cartridge NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
listOfTrafficVolumes.dataVolumeGPRSUplink	part of 20209	USED_ UNITS[0].OUTPUT_ VOLUME	
listOfTrafficVolumes.dataVolumeGPRSDownlink	part of 20209	USED_ UNITS[0].INPUT_ VOLUME	
cellIdentifier	20223(CellIdentifier)	CELL_ID	
servedIMSI	20234 (ServedIMSI)		UserIdentity
chargingID	20001(ChargingID)		Session id
recordOpeningTime			start time
duration	duration		end_time(calculated from the duration)
recordSequenceNumber	20005 (record sequence number)		sequence number

S-GW Record

Table 15–11 shows the sample SGSN data mapping for the S-GW record.

Table 15–11 Sample SGSN Data Mapping for the S-GW Record

ASN1 Fields	SGSN	USED_ UNITS[0].OUTPUT_ VOLUME	
listOfTrafficVolumes.data VolumeGPRSUplink	part of 20209	USED_ UNITS[0].OUTPUT_ VOLUME	
listOfTrafficVolumes.data VolumeGPRSDownlink	part of 20209	USED_UNITS[0].INPUT_ VOLUME	
servedIMSI	20234 (ServedIMSI)		UserIdentity
chargingID	20001(ChargingID)		Session id
startTime	20274(StartTime)		Start time
stopTime	20275(StopTime) if it exists, otherwise derived from duration(20004)		End time
recordSequenceNumber	20005 (record sequence number)		sequence number

P-GW Record

Table 15–12 shows the sample SGSN data mapping for the P-GW record.

Table 15–12 Sample SGSN Data Mapping for P-GW Record

ASN1 Fields	SGSN cartridge NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
listOfServiceData.datavolumeFBCUplink	part of 20267	USED_UNITS[0].OUTPUT_VOLUME	
listOfService.datavolumeFBCDownlink	part of 20267	USED_UNITS[0].INPUT_VOLUME	
servedIMSI	20234 (ServedIMSI)		UserIdentity
chargingID	20001(ChargingID)		Session id
startTime	20274		Start time
stopTime	20275(StopTime) if it exists, otherwise derived from duration(20004)		End time
recordSequenceNumber	20005 (record sequence number)		sequence number

SMS

The SGSNMMRecord (mobility management), SGSNMORecord (Mobile originated) and SGSNMTRecord (Mobile Terminated) record types are supported for Mobility management and SMS services.

20234 (ServedIMSI)

20219

Product Type = SMS

Event Type = USAGE

Usage Type = Terminate

Table 15–13 shows the sample SGSN SMS mapping for the Terminate usage type.

Table 15–13 Sample SGSN SMS Mapping for the Terminate Usage Type

ASN1 Fields	SGSN cartridge NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
cellIdentifier	20223(CellIdentifier)	CELL_ID	
destinationNumber	if SGSNMORecord 20303(DestinationNumber), if SGSNMTRecord same as 20234(servedIMSI)	CALLED_ID	
NA		USED_UNITS[0].SPECIFIC_UNIT	
servedMSISDN or servedIMSI			UserIdentity
chargingID	20001(ChargingID)		Session id
eventTimeStamp	20240(EventTimeStamp)		Start time
eventTimeStamp	20240(EventTimeStamp)		end time
localSequenceNumber			seq number

Product Type = SMS

Event Type = USAGE

Usage Type = Update

Table 15–14 shows the sample SGSN SMS mapping for the Update usage type.

Table 15–14 Sample SGSN SMS Mapping for the Update Usage Type

ASN1 Fields	SGSN cartridge NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
cellIdentifier	20223(CellIdentifier)	CELL_ID	
destinationNumber	if SGSNMORecord 20303(DestinationNumber), if SGSNMTRecord same as 20234(servedIMSI)	CALLED_ID	
NA		USED_ UNITS[0].SPECIFIC_ UNIT	
servedMSISDN or servedIMSI			UserIdentity
chargingID	20001(ChargingID)		Session id
eventTimeStamp	20240(EventTimeStamp)		Start time
eventTimeStamp	20240(EventTimeStamp)		end time
localSequenceNumber			seq number

Product Type = SMS

Event Type = USAGE

Usage Type = Refund_Unit

Table 15–15 shows the sample SGSN SMS mapping for the Refund_Unit usage type.

Table 15–15 Sample SGSN SMS Mapping for the Refund_Unit Usage Type

ASN1 Fields	SGSN cartridge NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
cellIdentifier	20223(CellIdentifier)	CELL_ID	
destinationNumber	if SGSNMORecord 20303(DestinationNumber), if SGSNMTRecord same as 20234(servedIMSI)	CALLED_ID	
NA		USED_ UNITS[0].SPECIFIC_ UNIT	
servedMSISDN or servedIMSI			UserIdentity
chargingID	20001(ChargingID)		Session id
eventTimeStamp	20240(EventTimeStamp)		Start time

Table 15–15 (Cont.) Sample SGSN SMS Mapping for the Refund_Unit Usage Type

ASN1 Fields	SGSN cartridge NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
eventTimeStamp	20240(EventTimeStamp)		end time
localSequenceNumber			seq number
correlation_identifier		CORRELATION_ IDENTIFIER	

Product Type = SMS

Event Type= USAGE

Usage Type = Refund_Amount

Table 15–16 shows the sample SGSN SMS mapping for the Refund_Amount usage type.

Table 15–16 Sample SGSN SMS Mapping for the Refund_Amount Usage Type

ASN1 Fields	SGSN cartridge NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
cellIdentifier	20223(CellIdentifier)	CELL_ID	
destinationNumber	if SGSNMORecord 20303(DestinationNumber), if SGSNMTRecord same as 20234(servedIMSI)	CALLED_ID	
NA		USED_ UNITS[0].SPECIFIC_ UNIT	
servedMSISDN or servedIMSI			UserIdentity
chargingID	20001(ChargingID)		Session id
eventTimeStamp	20240(EventTimeStamp)		Start time
eventTimeStamp	20240(EventTimeStamp)		end time
localSequenceNumber			seq number
balance_element_id		IMPACT_ AMOUNT[0].BALANCE_ ELEMENT_ID	
amount		IMPACT_ AMOUNT[0].AMOUNT	
correlation_identifier		CORRELATION_ IDENTIFIER	

Mapping for IMS

The ECE DC supports the following IMS product types:

- Voice

In case of IMS cartridge pack, the input is a Diameter ACR request, which the cartridge pack node chains convert into the 3GPP ASN1 format. The converted ASN1 format is the input to the ECE DC.

Voice

Table 15–17 shows the sample IMS voice mapping.

Table 15–17 Sample IMS Voice Mapping

ASN1 Fields	IMS cartridge NPL Fields	ECE Payload Fields
Called_Party_Address	Called_Party_Address	CALLED_ID
derived using service delivery start time stamp and end time stamp	Duration	REQUESTED_UNITS[0].DURATION
PrivateUserID	PrivateUserID	UserIdentity
ServiceDeliveryStartTimeStamp	ServiceDeliveryStartTimeStamp	start time
ServiceDeliveryEndTimeStamp	ServiceDeliveryEndTimeStamp	end time
Session_Id	Session_Id	session id
	seqNo	seq number

Mapping for Oracle CDR Format

The ECE DC supports the following Oracle CDR format product types:

- Voice
- Data
- SMS
- TelcoGsmTelephony
- TelcoGprs

Voice

Product Type = VOICE

Event Type = USAGE

Usage Type = Terminate

Table 15–18 shows the sample Oracle CDR format voice mappings for the Terminate usage type.

Table 15–18 Sample Oracle CDR Format Voice Mapping for the Terminate Usage Type

Oracle CDR Format NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
A_NUMBER		UserIdentity
		Seq number
		Session Id
CHARGING_START_TIMESTAMP		Start time
CHARGING_END_TIMESTAMP		End time
BASIC_SERVICE		cdr_service

Table 15–18 (Cont.) Sample Oracle CDR Format Voice Mapping for the Terminate Usage Type

Oracle CDR Format NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
DURATION	USED_UNITS[0].DURATION	
B_NUMBER	CALLED_ID	
CELL_ID	CELL_ID	
USAGE_DIRECTION	USAGE_DIRECTION	
CALL_COMPLETION_ INDICATOR	TERMINATION_CAUSE	
QOS_USED	QUALITY_OF_SERVICE	

Data

Product Type = DATA

Event Type = DATA_USAGE

Usage Type = Terminate

Table 15–19 shows the sample Oracle CDR format data mappings for the Terminate usage type.

Table 15–19 Sample Oracle CDR Format Data Mapping for the Terminate Usage Type

Oracle CDR Format NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
A_NUMBER		UserIdentity
		Seq number
		Session Id
CHARGING_START_TIMESTAMP		Start time
CHARGING_END_TIMESTAMP		End time
BASIC_SERVICE		cdr_service
VOLUME_SENT	USED_UNITS[0].INPUT_VOLUME	
VOLUME_SENT + VOLUME_ RECEIVED	USED_UNITS[0].TOTAL_VOLUME	
	USED_UNITS[0].CC_TIME	
CHARGING_START_TIMESTAMP	USED_UNITS[0].VALIDITY_START	
CHARGING_END_TIMESTAMP	USED_UNITS[0].VALIDITY_END	
B_NUMBER	CALLED_ID	
CELL_ID	CELL_ID	
CALL_COMPLETION_ INDICATOR	TERMINATION_CAUSE	

SMS

Product Type = SMS

Event Type = SMS_USAGE

Usage Type = Terminate

Table 15–20 shows the sample Oracle CDR format SMS mapping for the Terminate usage type.

Table 15–20 Sample Oracle CDR Format SMS Mapping for the Terminate Usage Type

Oracle CDR Format NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
A_NUMBER		UserIdentity
		Seq number
		Session Id
CHARGING_START_TIMESTAMP		Start time
CHARGING_END_TIMESTAMP		End time
BASIC_SERVICE		cdr_service
DURATION	USED_UNITS[0].SPECIFIC_UNIT	
CALL_COMPLETION_INDICATOR	TERMINATION_CAUSE	
B_NUMBER	CALLED_ID	
CELL_ID	CELL_ID	

TelcoGsmTelephony

Product Type = TelcoGsmTelephony

Event Type = ConvergentVoice

Usage Type = Terminate

Table 15–21 shows the sample Oracle CDR format TelcoGsmTelephony mapping for the Terminate usage type.

Table 15–21 Sample Oracle CDR Format TelcoGsmTelephony Mapping for the Terminate Usage Type

Oracle CDR Format NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
A_NUMBER		UserIdentity
		Seq number
		Session Id
CHARGING_START_TIMESTAMP		Start time
CHARGING_END_TIMESTAMP		End time
BASIC_SERVICE		cdr_service
CALL_COMPLETION_INDICATOR	TERMINATION_CAUSE	
	ZONE_ORIGIN	
	ZONE_DEST	
USAGE_TYPE	USAGE_TYPE	
B_NUMBER	CALLED_ID	
	TELCO_INFO[0].NETWORK_ SESSION_ID	

Table 15–21 (Cont.) Sample Oracle CDR Format TelcoGsmTelephony Mapping for the Terminate Usage

Oracle CDR Format NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
	TELCO_INFO[0].NETWORK_ SESSION_CORRELATION_ID	
DESTINATION_NETWORK	TELCO_INFO[0].DESTINATION_ NETWORK	
MSID	TELCO_INFO[0].PRIMARY_MSID	
	TELCO_INFO[0].SECONDARY_ MSID	
A_NUMBER	TELCO_INFO[0].CALLING_FROM	
B_NUMBER	TELCO_INFO[0].CALLED_TO	
	TELCO_INFO[0].SVC_TYPE	
	TELCO_INFO[0].SVC_CODE	
USAGE_CLASS	TELCO_INFO[0].USAGE_CLASS	
VOLUME_RECEIVED	TELCO_INFO[0].BYTES_ DOWNLINK	
VOLUME_SENT	TELCO_INFO[0].BYTES_UPLINK	
ACTION_CODE	SERVICE_CODES[0].SS_ACTION_ CODE	
SS_CODE	SERVICE_CODES[0].SS_CODE	
ESN_IMEI	GSM_INFO[0].IMEI	
B_MODIFICATION_INDICATOR	GSM_INFO[0].CALLED_NUM_ MODIF_MARK	
USAGE_DIRECTION or CALL_ DIRECTION	GSM_INFO[0].DIRECTION	
B_NUMBER	GSM_INFO[0].DIALED_NUMBER	
QOS_REQUESTED	GSM_INFO[0].QOS_REQUESTED	
QOS_USED	GSM_INFO[0].QOS_NEGOTIATED	
LONG_DURATION_INDICATOR	GSM_INFO[0].SUB_TRANS_ID	
HOME_CARRIER_SID	GSM_INFO[0].ORIGIN_SID	
HOME_CARRIER_SID	GSM_INFO[0].DESTINATION_SID	
LOCATION_AREA_INDICATOR	GSM_INFO[0].LOC_AREA_CODE	
CELL_ID	GSM_INFO[0].CELL_ID	
VOLUME_RECEIVED	GSM_INFO[0].BYTES_IN	
VOLUME_SENT	GSM_INFO[0].BYTES_OUT	
USAGE_CLASS	GSM_INFO[0].USAGE_CLASS	
NUMBER_OF_UNITS	GSM_INFO[0].NUMBER_OF_UNIT	
DURATION	USED_UNITS[0].DURATION	
	USED_UNITS[0].SPECIFIC_UNIT	

TelcoGprs

Product Type = TelcoGprs

Event Type = ConvergentData

Usage Type = Terminate

Table 15–22 shows the sample Oracle CDR format TelcoGprs mapping for the Terminate usage type.

Table 15–22 Sample Oracle CDR Format TelcoGprs Mapping for the Terminate Usage Type

Oracle CDR Format NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
A_NUMBER		UserIdentity
		Seq number
		Session Id
CHARGING_START_TIMESTAMP		Start time
CHARGING_END_TIMESTAMP		End time
BASIC_SERVICE		cdr_service
CALL_COMPLETION_INDICATOR	TERMINATION_CAUSE	
USAGE_TYPE	USAGE_TYPE	
B_NUMBER	CALLED_ID	
	TELCO_INFO[0].NETWORK_ SESSION_ID	
	TELCO_INFO[0].NETWORK_ SESSION_CORRELATION_ID	
DESTINATION_NETWORK	TELCO_INFO[0].DESTINATION_ NETWORK	
MSID	TELCO_INFO[0].PRIMARY_MSID	
PORT_NUMBER	TELCO_INFO[0].SECONDARY_ MSID	
A_NUMBER	TELCO_INFO[0].CALLING_FROM	
B_NUMBER	TELCO_INFO[0].CALLED_TO	
	TELCO_INFO[0].SVC_TYPE	
	TELCO_INFO[0].SVC_CODE	
USAGE_CLASS	TELCO_INFO[0].USAGE_CLASS	
VOLUME_RECEIVED	TELCO_INFO[0].BYTES_ DOWNLINK	
VOLUME_SENT	TELCO_INFO[0].BYTES_UPLINK	
ROUTING_AREA	GPRS_INFO[0].ROUTING_AREA	
LOCATION_AREA_INDICATOR	GPRS_INFO[0].LOC_AREA_CODE	
CELL_ID	GPRS_INFO[0].CELL_ID	
SESSION_ID	GPRS_INFO[0].SESSION_ID	
SGSN_ADDRESS	GPRS_INFO[0].SGSN_ADDRESS	
NODE_ID	GPRS_INFO[0].NODE_ID	
TRANS_ID	GPRS_INFO[0].TRANS_ID	
	GPRS_INFO[0].EXTENSIONS	

Table 15–22 (Cont.) Sample Oracle CDR Format TelcoGprs Mapping for the Terminate Usage Type

Oracle CDR Format NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
	GPRS_INFO[0].STATUS	
NETWORK_INITIATED_PDP	GPRS_INFO[0].NI_PDP	
CONNECT_TYPE	GPRS_INFO[0].ANONYMOUS_ LOGIN	
PDP_TYPE	GPRS_INFO[0].PDP_TYPE	
PDP_ADDRESS	GPRS_INFO[0].PDP_ADDRESS	
PDP_REMOTE_ADDRESS	GPRS_INFO[0].PDP_RADDRESS	
PDP_DYNAMIC_ADDRESS	GPRS_INFO[0].PDP_DYNADDR	
DIAGNOSTICS	GPRS_INFO[0].DIAGNOSTICS	
APN_ADDRESS	GPRS_INFO[0].APN	
NUMBER_OF_UNITS	GPRS_INFO[0].NUMBER_OF_UNITS	
NETWORK_CAPABILITY	GPRS_INFO[0].NETWORK_ CAPABILITY	
SGSN_CHANGE	GPRS_INFO[0].SGSN_CHANGE	
CHANGE_CONDITION	GPRS_INFO[0].CHANGE_ CONDITION	
QOS_REQUESTED_PRECEDENCE	GPRS_INFO[0].QOS_REQ_ PRECEDENCE	
QOS_REQUESTED_DELAY	GPRS_INFO[0].QOS_REQ_DELAY	
QOS_REQUESTED_RELIABILITY	GPRS_INFO[0].QOS_REQ_ RELIABILITY	
QOS_REQUESTED_PEAK_ THROUGHPUT	GPRS_INFO[0].QOS_REQ_PEAK_ THROUGH	
QOS_REQUESTED_MEAN_ THROUGHPUT	GPRS_INFO[0].QOS_REQ_MEAN_ THROUGH	
QOS_USED_PRECEDENCE	GPRS_INFO[0].QOS_NEGO_ PRECEDENCE	
QOS_USED_DELAY	GPRS_INFO[0].QOS_NEGO_DELAY	
QOS_USED_RELIABILITY	GPRS_INFO[0].QOS_NEGO_ RELIABILITY	
QOS_USED_PEAK_THROUGHPUT	GPRS_INFO[0].QOS_NEGO_PEAK_ THROUGH	
QOS_USED_MEAN_ THROUGHPUT	GPRS_INFO[0].QOS_NEGO_MEAN_ THROUGH	
	GPRS_INFO[0].SGSN_PLMN_ID	
	GPRS_INFO[0].MM_STATE	
	GPRS_INFO[0].PTMSI	
	GPRS_INFO[0].PTMSI_SIGNATURE	
	GPRS_INFO[0].SERVICE_AREA_ CODE	
	GPRS_INFO[0].EXT_CHARGING_ID	

Table 15–22 (Cont.) Sample Oracle CDR Format TelcoGprs Mapping for the Terminate Usage Type

Oracle CDR Format NPL Fields	ECE Payload Fields	ECE Usage Object Builder Parameter
	GPRS_INFO[0].PS_CHARGING_ DESCR	
VOLUME_SENT	USED_UNITS[0].INPUT_VOLUME	
VOLUME_RECEIVED	USED_UNITS[0].OUTPUT_VOLUME	
VOLUME_SENT + VOLUME_ RECEIVED	USED_UNITS[0].TOTAL_VOLUME	

B

SGSN06 Cartridge Pack Version Hiding Reference

This appendix describes version hiding for the Offline Mediation Controller SGSN06 cartridge pack.

Version Hiding

Version hiding is supported for:

- V10.5.0 to V7.3.0
- V10.5.0 to V6.4.1
- V7.3.0 to V6.4.1
- V7.3.0 to V3.6.0
- V6.4.1 to V3.6.0
- V6.4.1 to V3.2.0
- V3.6.0 to V3.2.0

S-GW Record

Table 15–23 lists the S-GW record versions and the compatibility.

Table 15–23 S-GW Record Versions and Compatibility

Version	Changes
v10.5.0	Supported.
v7.3.0	Not supported. Record will be ignored and message logged in log.
v6.4.1	Not supported. Record will be ignored and message logged in log.

P-GW Record

Table 15–24 lists the P-GW record versions and the compatibility.

Table 15–24 P-GW Record Version and Compatibility

Version	Changes
v10.5.0	Supported.

Table 15–24 (Cont.) P-GW Record Version and Compatibility

Version	Changes
v7.3.0	Not supported. Record will be ignored and message logged in log.
v6.4.1	Not supported. Record will be ignored and message logged in log.

AFChargingIdentifier Field

Table 15–25 lists the definitions for the AFCharginIdentifier field versions.

Table 15–25 AFChargingIdentifier Field Versions

Version	Definition
v10.5	OCTECT STRING {
v7.3.0	OCTECT STRING
v6.4.1	Not Present

Table 15–26 lists the versions that support version hiding.

Table 15–26 AFChargingIdentifier Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	The field is not present in 7.3.0 definition supported Out of Box.	The field will be omitted from the output record.
10.5 to 6.4.1	The field is not present in the specification.	The field will be omitted from the output record.

AFRecordInformation Field

Table 15–27 lists the definitions for the AFRecordInformation field versions.

Table 15–27 AFRecordInformation Field Versions

Version	Definition
v10.5	SEQUENCE aFChargingIdentifier [1] AFChargingIdentifier, flows [2] Flows OPTIONAL }

Table 15–28 lists the versions that support version hiding.

Table 15–28 AFRecordInformation Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	The field is not present in 7.3.0 definition supported Out of Box.	The field will be omitted from the output record.
10.5 to 6.4.1	The field is not present in the specification.	The field will be omitted from the output record.

MSNetworkCapability Field

Table 15–29 lists the definitions for MSNetworkCapability field versions.

Table 15–29 MSNetworkCapability Field Versions

Version	Definition
V7.3.0	`MSNetworkCapability ::= OCTET STRING (SIZE(1..8))-- See 3G TS 24.008`
V6.4.1	`MSNetworkCapability ::= OCTET STRING (SIZE(1..8))-- See 3G TS 24.008`
V3.6.0	`MSNetworkCapability ::= OCTET STRING (SIZE(1))`
V3.2.0	`MSNetworkCapability ::= OCTET STRING (SIZE(1))`

Table 15–30 lists the versions that support version hiding.

Table 15–30 MSNetworkCapability Field Version Hiding

Version hiding	Changed fields	Changes
7.3.0 to 6.4.1	None.	No changes.
7.3.0 to 3.6.0	The size of field is 8 octets in 7.3.0.	Only Octet 1 will be kept.
6.4.1 to 3.6.0	The size of field is 8 octets in 6.4.1.	Only Octet 1 will be kept.
6.4.1 to 3.2.0	The size of field is 8 octets in 6.4.1.	Only Octet 1 will be kept.

CauseForRecClosing Field

Table 15–31 lists the definitions for CauseForRecClosing field versions.

Table 15–31 CauseForRecClosing Field Versions

Version	Definition

v10.5	CauseForRecClosing ::= INTEGER
	{
	normalRelease (0),
	abnormalRelease (4),
	cAMELInitCallRelease (5),
	volumeLimit (16),
	timeLimit (17),
	servingNodeChange (18),
	maxChangeCond (19),
	managementIntervention (20),
	intraSGSNIntersystemChange (21),
	rATChange (22),
	mSTimeZoneChange (23),
	sGSNPLMNIDChange (24),
	unauthorizedRequestingNetwork (52),
	unauthorizedLCSClient (53),
	positionMethodFailure (54),
	unknownOrUnreachableLCSClient (58),
	listofDownstreamNodeChange (59)
	}

Table 15–31 (Cont.) CauseForRecClosing Field Versions

Version	Definition

V7.3.0	CauseForRecClosing ::= INTEGER
	{
	normalRelease (0),
	abnormalRelease (4),
	cAMELInitCallRelease (5),
	volumeLimit (16),
	timeLimit (17),
	sGSNChange (18),
	maxChangeCond (19),
	managementIntervention (20),
	intraSGSNIntersystemChange (21),
	rATChange (22),
	mSTimeZoneChange (23),
	unauthorizedRequestingNetwork (52),
	unauthorizedLCSClient (53),
	positionMethodFailure (54),
	unknownOrUnreachableLCSClient (58),
	listofDownstreamNodeChange (59)
	}

V6.4.1	CauseForRecClosing ::= INTEGER
	{
	normalRelease (0),
	abnormalRelease (4),
	cAMELInitCallRelease (5),
	volumeLimit (16),
	timeLimit (17),
	sGSNChange (18),
	maxChangeCond (19),
	managementIntervention (20),
	intraSGSNIntersystemChange (21),
	rATChange (22),
	mSTimeZoneChange (23),
	unauthorizedRequestingNetwork (52),
	unauthorizedLCSClient (53),
	positionMethodFailure (54),
	unknownOrUnreachableLCSClient (58),
	listofDownstreamNodeChange (59)
	}

Table 15–31 (Cont.) CauseForRecClosing Field Versions

Version	Definition

V3.6.0	CauseForRecClosing ::= INTEGER
	{
	normalRelease (0),
	abnormalRelease (4),
	cAMELInitCallRelease (5),
	volumeLimit (16),
	timeLimit (17),
	sGSNChange (18),
	maxChangeCond (19),
	managementIntervention (20)
	}

V3.2.0	CauseForRecClosing ::= INTEGER
	{
	normalRelease (0),
	abnormalRelease (4),
	cAMELInitCallRelease (5),
	volumeLimit (16),
	timeLimit (17),
	sGSNChange (18),
	maxChangeCond (19),
	managementIntervention (20)
	}

Table 15–32 lists the versions that support version hiding.

Table 15–32 CauseForRecClosing Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	New Values added in 10.5.	Do nothing. The new value defined in V10.5 will be output in V7.3.0.
10.5 to 6.4.1	New Values added in 10.5.	Do nothing. The new value defined in V10.5 will be output in V6.4.1.
7.3.0 to 6.4.1	None.	No changes.
7.3.0 to 3.6.0	None.	Do nothing. The new value defined in V7.3.0 will be output in V3.6.0.

Table 15–32 (Cont.) CauseForRecClosing Field Version Hiding

Version hiding	Changed fields	Changes
6.4.1 to 3.6.0	Do nothing. The new value defined in V6.4.1 will be output in V3.6.0.	N/A
6.4.1 to 3.2.0	Do nothing. The new value defined in V6.4.1 will be output in V3.2.0.	N/A

ChangeCondition Field

Table 15–33 lists the definitions for ChangeCondition field versions.

Table 15–33 ChangeCondition Field Versions

Version	Definition

v10.5	ChangeCondition ::= ENUMERATED
	{
	qoSChange
	(0),
	tariffTime
	(1),
	recordClosure
	(2),
	cGI-SAICHange
	(6), -- bearer modification. "CGI-SAI Change"
	rAIChange
	(7), -- bearer modification. "RAI Change"
	dT-Establishment
	(8),
	dT-Removal
	(9),
	eCGIChange
	(10), -- bearer modification. "ECGI Change"
	tAIChange
	(11), -- bearer modification. "TAI Change"
	userLocationChange
	(12), -- bearer modification. "User Location Change"
	}

V7.3.0	ChangeCondition ::= ENUMERATED
	{
	--
	-- Failure Handling values used in eGCDR only
	--
	qoSChange (0),
	tariffTime (1),
	recordClosure (2),
	failureHandlingContinueOngoing (3),
	failureHandlingRetryandTerminateOngoing (4),
	failureHandlingTerminateOngoing (5),
	cGI-SAICHange (6),
	rAIChange (7),
	dT-Establishment (8),
	dT-Removal (9)
	}

Table 15–33 (Cont.) ChangeCondition Field Versions

Version	Definition

v6.4.1	ChangeCondition ::= ENUMERATED
	{
	--
	-- Failure Handling values used in eGCDR only
	--
	qoSChange (0),
	tariffTime (1),
	recordClosure (2),
	failureHandlingContinueOngoing (3),
	failureHandlingRetryandTerminateOngoing (4),
	failureHandlingTerminateOngoing (5)
	}

Table 15–34 lists the versions that support version hiding.

Table 15–34 ChangeCondition Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	New Values added in 10.5.	Do nothing. The new value defined in V10.5 will be output in V7.3.0.
10.5 to 6.4.1	New Values added in 10.5.	Do nothing. The new value defined in V10.5 will be output in V6.4.1.

ChangeOfCharCondition Field

Table 15–35 lists the definitions for ChangeOfCharCondition field versions.

Table 15–35 ChangeOfCharCondition Field Versions

Version	Definition

v10.5	ChangeOfCharCondition ::= SEQUENCE
	{
	qosRequested
	[1] QoSInformation OPTIONAL,
	qosNegotiated
	[2] QoSInformation OPTIONAL,
	dataVolumeGPRSUplink
	[3] DataVolumeGPRS OPTIONAL,
	dataVolumeGPRSDownlink
	[4] DataVolumeGPRS OPTIONAL,
	changeCondition
	[5] ChangeCondition,
	changeTime
	[6] TimeStamp,
	userLocationInformation
	[8] OCTET STRING OPTIONAL,
	ePCQoSInformation
	[9] EPCQoSInformation OPTIONAL
	}

V7.3.0	ChangeOfCharCondition ::= SEQUENCE
	{
	qosRequested
	[1] QoSInformation OPTIONAL,
	qosNegotiated
	[2] QoSInformation OPTIONAL,
	dataVolumeGPRSUplink
	[3] DataVolumeGPRS OPTIONAL,
	dataVolumeGPRSDownlink
	[4] DataVolumeGPRS OPTIONAL,
	changeCondition
	[5] ChangeCondition,
	changeTime
	[6] TimeStamp,
	failureHandlingContinue
	[7] FailureHandlingContinue OPTIONAL,
	userLocationInformation
	[8] OCTET STRING OPTIONAL
	}

Table 15–35 (Cont.) ChangeOfCharCondition Field Versions

Version	Definition

v6.4.1	ChangeOfCharCondition ::= SEQUENCE
	{
	qosRequested
	[1] QoSInformation OPTIONAL,
	qosNegotiated
	[2] QoSInformation OPTIONAL,
	dataVolumeGPRSUplink
	[3] DataVolumeGPRS,
	dataVolumeGPRSDownlink
	[4] DataVolumeGPRS,
	changeCondition
	[5] ChangeCondition,
	changeTime
	[6] TimeStamp
	}

Table 15–36 lists the versions that support version hiding.

Table 15–36 ChangeOfCharCondition Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	New Values added in 10.5.	Do nothing. The new value defined in V10.5 will be output in V7.3.0.
10.5 to 6.4.1	New Values added in 10.5.	Do nothing. The new value defined in V10.5 will be output in V6.4.1.

ChangeOfServiceCondition Field

Table 15–37 lists the definitions for ChangeOfServiceCondition field versions.

Table 15–37 ChangeOfServiceCondition Field Versions

Version	Definition

v10.5	ChangeOfServiceCondition ::= SEQUENCE
	{
	ratingGroup
	[1] RatingGroupId,
	chargingRuleBaseName
	[2] ChargingRuleBaseName OPTIONAL,
	resultCode
	[3] ResultCode OPTIONAL,
	localSequenceNumber
	[4] LocalSequenceNumber OPTIONAL,
	timeOfFirstUsage
	[5] TimeStamp OPTIONAL,
	timeOfLastUsage
	[6] TimeStamp OPTIONAL,
	timeUsage
	[7] CallDuration OPTIONAL,
	serviceConditionChange
	[8] ServiceConditionChange,
	qoSInformationNeg
	[9] EPCQoSInformation OPTIONAL,
	servingNodeAddress
	[10] GSNAddress OPTIONAL,
	datavolumeFBCUplink
	[12] DataVolumeGPRS OPTIONAL,
	datavolumeFBCDownlink
	[13] DataVolumeGPRS OPTIONAL,
	timeOfReport
	[14] TimeStamp,
	failureHandlingContinue
	[16] FailureHandlingContinue OPTIONAL,
	serviceIdentifier
	[17] ServiceIdentifier OPTIONAL,
	pSFurnishChargingInformation
	[18] PSFurnishChargingInformation OPTIONAL,
	aFRecordInformation
	[19] SEQUENCE OF AFRecordInformation OPTIONAL,
	userLocationInformation
	[20] OCTER STRING OPTIONAL,
	eventBasedChargingInformation
	[21] EventBasedChargingInformation OPTIONAL,
	timeQuotaMechanism
	[22] TimeQuotaMechanism OPTIONAL,
	serviceSpecificInfo
	[23] SEQUENCE OF ServiceSpecificInfo OPTIONAL,
	threeGPP2UserLocationInformation
	[24] OCTET STRING OPTIONAL
	}

Table 15–37 (Cont.) ChangeOfServiceCondition Field Versions

Version	Definition

V7.3.0	ChangeOfServiceCondition ::= SEQUENCE
	{
	ratingGroup
	[1] RatingGroupId,
	chargingRuleBaseName
	[2] ChargingRuleBaseName OPTIONAL,
	resultCode
	[3] ResultCode OPTIONAL,
	localSequenceNumber
	[4] LocalSequenceNumber OPTIONAL,
	timeOfFirstUsage
	[5] TimeStamp OPTIONAL,
	timeOfLastUsage
	[6] TimeStamp OPTIONAL,
	timeUsage
	[7] CallDuration OPTIONAL,
	serviceConditionChange
	[8] ServiceConditionChange,
	qoSInformationNeg
	[9] QoSInformation OPTIONAL,
	sgsn-Address
	[10] GSNAddress OPTIONAL,
	sGSNPLMNIdentifier
	[11] SGSNPLMNIdentifier OPTIONAL,
	datavolumeFBCUplink
	[12] DataVolumeGPRS OPTIONAL,
	datavolumeFBCDownlink
	[13] DataVolumeGPRS OPTIONAL,
	timeOfReport
	[14] TimeStamp,
	rATType
	[15] RATType OPTIONAL,
	failureHandlingContinue
	[16] FailureHandlingContinue OPTIONAL,
	serviceIdentifier
	[17] ServiceIdentifier OPTIONAL,
	pSFurnishChargingInformation
	[18] PSFurnishChargingInformation OPTIONAL,
	aFRecordInformation
	[19] SEQUENCE OF AFRecordInformation OPTIONAL,
	userLocationInformation
	[20] OCTER STRING OPTIONAL,
	eventBasedChargingInformation
	[21] EventBasedChargingInformation OPTIONAL,
	timeQuotaMechanism
	[22] TimeQuotaMechanism OPTIONAL
	}

Table 15–37 (Cont.) ChangeOfServiceCondition Field Versions

Version	Definition

v6.4.1	ChangeOfServiceCondition ::= SEQUENCE
	{
	ratingGroup [1]
	RatingGroupId,
	chargingRuleBaseName
	[2] ChargingRuleBaseName OPTIONAL,
	resultCode
	[3] ResultCode OPTIONAL,
	localSequenceNumber
	[4] LocalSequenceNumber OPTIONAL,
	timeOfFirstUsage
	[5] TimeStamp OPTIONAL,
	timeOfLastUsage
	[6] TimeStamp OPTIONAL,
	timeUsage
	[7] CallDuration OPTIONAL,
	serviceConditionChange
	[8] ServiceConditionChange,
	qoSInformationNeg
	[9] QoSInformation OPTIONAL,
	sgsn-Address
	[10] GSNAddress OPTIONAL,
	sGSNPLMNIdentifier
	[11] SGSNPLMNIdentifier OPTIONAL,
	datavolumeFBCUplink
	[12] DataVolumeGPRS OPTIONAL,
	datavolumeFBCDownlink
	[13] DataVolumeGPRS OPTIONAL,
	timeOfReport
	[14] TimeStamp,
	rATType
	[15] RATType OPTIONAL,
	failureHandlingContinue
	[16] FailureHandlingContinue OPTIONAL,
	serviceIdentifier
	[17] ServiceIdentifier OPTIONAL,
	pSFurnishChargingInformation
	[18] PSFurnishChargingInformation OPTIONAL
	}

Table 15–38 lists the versions that support version hiding.

Table 15–38 ChangeOfServiceCondition Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	New Values added in 10.5.	Do nothing. The new value defined in V10.5 will be output in V7.3.0.
10.5 to 6.4.1	New Values added in 10.5.	Do nothing. The new value defined in V10.5 will be output in V6.4.1.

CSGAccessMode Field

Table 15–39 lists the definitions for CSGAccessMode field versions.

Table 15–39 CSGAccessMode Field Versions

Version	Definition

v10.5	`CSGAccessMode ::= ENUMERATED`
	`{`
	`ClosedMode (0),`
	`HybridMode (1)`
	`}`

V7.3.0	`Not Present` `Bit 0-3: Profile Index`
v6.4.1	`Not Present`

Table 15–40 lists the versions that support version hiding.

Table 15–40 CSGAccessMode Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	The field is not present in 7.3.0 definition.	The field will be omitted from the output record.
10.5 to 6.4.1	The field is not present in the 6.4.1 definition.	The field will be omitted from the output record.

CSGId Field

Table 15–41 lists the definitions for CSGId field versions.

Table 15–41 CSGId Field Versions

Version	Definition
v10.5	`CSGId ::= OCTET STRING (SIZE(4))`
V7.3.0	`OCTECT STRING`
v6.4.1	`Not Present`

Table 15–42 lists the versions that support version hiding.

Table 15–42 CSGId Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	The field is not present in 7.3.0 definition.	The field will be omitted from the output record.
10.5 to 6.4.1	The field is not present in 6.4.1 definition.	The field will be omitted from the output record.

ChargingCharacteristics Field

Table 15–43 lists the definitions for ChargingCharacteristics field versions.

Table 15–43 ChargingCharacteristics Field Versions

Version	Definition
V7.3.0	ChargingCharacteristics ::= OCTET STRING (SIZE(2)) Bit 4-15: For Behavior
V6.4.1	ChargingCharacteristics ::= OCTET STRING (SIZE(2)) Bit 0-3: Profile Index Bit 4-15: For Behavior
V3.6.0	ChargingCharacteristics ::= OCTET STRING (SIZE(2)) Descriptions for the bits of the flag set: Bit 1: H (Hot billing) := '00000001'B Bit 2: F (Flat rate) := '00000010'B Bit 3: P (Prepaid service) := '00000100'B Bit 4: N (Normal billing) := '00001000'B Bit 5: - (Reserved, set to 0) := '00010000'B Bit 6: - (Reserved, set to 0) := '00100000'B Bit 7: - (Reserved, set to 0) := '01000000'B Bit 8: - (Reserved, set to 0) := '10000000'B
V3.2.0	ChargingCharacteristics ::= OCTET STRING (SIZE(1)) Descriptions for the bits of the flag set: Bit 1: H (Hot billing) := '00000001'B Bit 2: F (Flat rate) := '00000010'B Bit 3: P (Prepaid service) := '00000100'B Bit 4: N (Normal billing) := '00001000'B Bit 5: - (Reserved, set to 0) := '00010000'B Bit 6: - (Reserved, set to 0) := '00100000'B Bit 7: - (Reserved, set to 0) := '01000000'B Bit 8: - (Reserved, set to 0) := '10000000'B

Table 15–44 lists the versions that support version hiding.

Table 15–44 ChargingCharacteristics Field Version Hiding

Version hiding	Changed fields	Changes
7.3.0 to 6.4.1	None.	No changes.
7.3.0 to 6.4.1	None.	No changes.
6.4.1 to 3.6.0	No change. The new values set for bits 4-15 for V6.4.1 will be output in V3.6.0. These will be ignored in V3.6.0.	
6.4.1 to 3.2.0	Only Octet 1 will be kept and output in V3.2.0.	

EventBasedChargingInformation Field

Table 15–45 lists the definitions for EventBasedChargingInformation field versions.

Table 15–45 EventBasedChargingInformation Field Versions

Version	Definition

v10.5	EventBasedChargingInformation ::= SEQUENCE
	{
	numberOfEvents [1] INTEGER,
	eventTimeStamps [2] SEQUENCE OF TimeStamp OPTIONAL
	}

V7.3.0	EventBasedChargingInformation ::= SEQUENCE
	{
	numberOfEvents [1] INTEGER,
	eventTimeStamps [2] SEQUENCE OF TimeStamp OPTIONAL
	}

v6.4.1	Not Present --

Table 15–46 lists the versions that support version hiding.

Table 15–46 EventBasedChargingInformation Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	No Change	Do nothing. The new value defined in V10.5 will be output in V7.3.0.
10.5 to 6.4.1	The field is not present in the definition.	The field will be omitted from the output record.

EPCQoSInformation Field

Table 15–47 lists the definitions for EPCQoSInformation field versions.

Table 15–47 EPCQoSInformation Field Versions

Version	Definition

v10.5	EPCQoSInformation ::= SEQUENCE
	-- See TS 29.212 [220] for more information
	--
	{
	qCI
	[1] INTEGER,
	maxRequestedBandwithUL
	[2] INTEGER OPTIONAL,
	maxRequestedBandwithDL
	[3] INTEGER OPTIONAL,
	guaranteedBitrateUL
	[4] INTEGER OPTIONAL,
	guaranteedBitrateDL
	[5] INTEGER OPTIONAL,
	aRP
	[6] INTEGER OPTIONAL,
	aPNAggregateMaxBitrateUL [7]
	INTEGER OPTIONAL,
	aPNAggregateMaxBitrateDL [8]
	INTEGER OPTIONAL
	}

V7.3.0	Not Present {
v6.4.1	Not Present

Table 15–48 lists the versions that support version hiding.

Table 15–48 EPCQoSInformation Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	The field is not present in 7.3.0 definition.	The field will be omitted from the output record.
10.5 to 6.4.1	The field is not present in 6.4.1 definition.	The field will be omitted from the output record.

QoSInformation Field

Table 15–49 lists the definitions for QoSInformation field versions.

Table 15–49 QoSInformation Field Versions

Version	Definition
V10.5	QoSInformation ::= OCTET STRING (SIZE (4..255))
V7.3.0	QoSInformation ::= OCTET STRING (SIZE (4..15))
V6.4.1	QoSInformation ::= OCTET STRING (SIZE (4..15))

Table 15–50 lists the versions that support version hiding.

Table 15–50 QoSInformation Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	The max size of field is 255 in 10.5 and 15 in 7.3.0.	Only upto 15 octets will be kept.
10.5 to 6.4.1	The max size of field is 255 in 10.5 and 15 in 6.4.1.	Only upto 15 octets will be kept.

ListOfTrafficVolumes Field

Table 15–51 lists the definitions for ListOfTrafficVolumes field versions.

Table 15–51 ListOfTrafficVolumes Field Versions

Version	Definition

V7.3.0	ChangeOfCharCondition ::= SEQUENCE
	Used in PDP context record only
	qosRequested [1] QoSInformation OPTIONAL,
	qosNegotiated [2] QoSInformation OPTIONAL,
	dataVolumeGPRSUplink [3] DataVolumeGPRSOPTIONAL,
	dataVolumeGPRSDownlink [4] DataVolumeGPRS OPTIONAL,
	changeCondition [5] ChangeCondition,
	changeTime [6] TimeStamp,
	failureHandlingContinue [7] FailureHandlingContinue
	OPTIONAL,
	userLocationInformation [8] OCTET STRING OPTIONAL
	}
	ChangeCondition ::= ENUMERATED
	
	{
	Failure Handling values used in eGCDR only
	qoSChange (0),
	tariffTime (1),
	recordClosure (2),
	failureHandlingContinueOngoing (3),
	failureHandlingRetryandTerminateOngoing(4),
	failureHandlingTerminateOngoing (5),
	cGI-SAICHange (6),
	rAIChange (7),
	dT-Establishment (8),
	dT-Removal (9)
	}

Table 15–51 (Cont.) ListOfTrafficVolumes Field Versions

Version	Definition

V6.4.1	ChangeOfCharCondition ::= SEQUENCE
	{
	Used in PDP context record only
	qosRequested [1] QoSInformation OPTIONAL,
	qosNegotiated [2] QoSInformation OPTIONAL,
	dataVolumeGPRSUplink [3] DataVolumeGPRS,
	dataVolumeGPRSDownlink [4] DataVolumeGPRS,
	changeCondition [5] ChangeCondition,
	changeTime [6] TimeStamp
	}
	ChangeCondition ::= ENUMERATED
	
	{
	Failure Handling values used in eGCDR only
	qoSChange (0),
	tariffTime (1),
	recordClosure (2),
	failureHandlingContinueOngoing (3),
	failureHandlingRetryandTerminateOngoing (4),
	failureHandlingTerminateOngoing (5)
	}
	QoSInformation ::= OCTET STRING (SIZE (4..15))

Table 15–51 (Cont.) ListOfTrafficVolumes Field Versions

Version	Definition

V3.6.0	ChangeOfCharCondition ::= SEQUENCE
	Used in PDP context record only
	{
	qosRequested [1]
	QoSInformation OPTIONAL,
	qosNegotiated [2]
	QoSInformation OPTIONAL,
	dataVolumeGPRSUplink
	[3] DataVolumeGPRS,
	dataVolumeGPRSDownlink [4]
	DataVolumeGPRS,
	changeCondition
	[5] ChangeCondition,
	changeTime
	[6] TimeStamp
	}
	ChangeCondition ::= ENUMERATED
	
	{
	qoSChange (0),
	tariffTime
	(1),
	recordClosure (2)
	}
	QoSInformation ::= CHOICE
	
	{
	gsmQosInformation [0] GSMQoSInformation,
	umtsQosInformation [1]
	OCTET STRING (SIZE (12))
	}
	GSMQoSInformation ::=SEQUENCE
	
	{
	reliability [0] QoSReliability,
	delay
	[1] QoSDelay,
	precedence
	[2] QoSPrecedence,
	peakThroughput
	[3] QoSPeakThroughput,
	meanThroughput
	[4] QoSMeanThroughput
	}

Table 15–51 (Cont.) ListOfTrafficVolumes Field Versions

Version	Definition

V3.2.0	ChangeOfCharCondition ::= SEQUENCE
	Used in PDP context record only
	{
	qosRequested [1] QoSInformation OPTIONAL,
	qosNegotiated [2] QoSInformation OPTIONAL,
	dataVolumeGPRSUplink [3] DataVolumeGPRS,
	dataVolumeGPRSDownlink [4] DataVolumeGPRS,
	changeCondition [5] ChangeCondition,
	changeTime [6] TimeStamp
	}
	ChangeCondition ::= ENUMERATED
	
	{
	qoSChange (0),
	tariffTime (1),
	recordClosure (2)
	}
	QoSInformation ::= CHOICE
	
	{
	gsmQosInformation [0] GSMQoSInformation,
	umtsQosInformation [1] UMTSQoSInformation
	}
	GSMQoSInformation ::=SEQUENCE
	
	{
	reliability [0] QoSReliability,
	delay [1] QoSDelay,
	precedence [2] QoSPrecedence,
	peakThroughput [3] QoSPeakThroughput,
	meanThroughput [4] QoSMeanThroughput
	}
	UMTSQoSInformation ::=SEQUENCE
	
	{
	trafficClass [0] QoSTrafficClass,
	maxBitRateUplink [1] QoSMaxBitRate,
	maxBitRateDownlink [2] QoSMaxBitRate,
	deliveryOrder [3] QoSDeliveryOrder,
	maxSDUsize [4] QoSMaxSDUsize,
	sduErrorRatio [6] QoSSDUErrorRatio,
	residualBER [7] QoSResidualBER,
	erroneousSDUs [8] QoSErroneousSDUs,
	transferDelay [9]

Table 15–52 lists the versions that support version hiding.

Table 15–52 ListOfTrafficVolumes Field Version Hiding

Version hiding	Changed fields	Changes
7.3.0 to 6.4.1	Two new values for ChangeCondition. DataVolumeGPRSUplink and dataVolumeGPRSDownlink are made optional.	For ChangeOfCharCondition: If the dataVolumeGPRSUplink or dataVolumeGPRSDownlink or both were empty, a value of '0 '(zero) would be populated. If the dataVolumeGPRSUplink or dataVolumeGPRSDownlink have any value, they will be sent as is. For ChangeCondition: Do nothing. The new value defined in V7.3.0 will be output in V6.4.1.
7.3.0 to 3.6.0	For ChangeOfCharCondition: If the dataVolumeGPRSUplink or dataVolumeGPRSDownlink or both were empty, a value of '0 '(zero) would be populated. If the dataVolumeGPRSUplink or dataVolumeGPRSDownlink have any value, they will be sent as is. For ChangeCondition: Do nothing. The new value defined in V7.3.0 will be output in V3.6.0. This is done over what has been already done from V6.4.1 to V3.6.0.	N/A

Table 15–52 (Cont.) ListOfTrafficVolumes Field Version Hiding

Version hiding	Changed fields	Changes
6.4.1 to 3.6.0	For ChangeCondition - The new values are supposed for eGCDR only. Those new values should not be presented in SCDR, MCDR, SMT, and SMO CDR. For QoSInformation: If the field value length is 4, octet 1 is Allocation/Retention Priority, octets 2 - 4 are coded according to 3GPP TS 24.008 [5] Quality of Service IE, octets 3 - 5 (i.e. according to the pre-Release '99 format). This will be converted into choice, GSMQoSInformation. If the field value length is 12, it will be converted into choice, umtsQosInformation. It will be 1:1 octet copy (input 12 octets, output is also 12 octets). If the field value length is more than 12 (less or equal to 15), it will be converted into choice, umtsQosInformation. Output value for choice umtsQosInformation will be the first 12 octets from the input.	N/A

Table 15–52 (Cont.) ListOfTrafficVolumes Field Version Hiding

Version hiding	Changed fields	Changes
6.4.1 to 3.2.0	For ChangeCondition - The new values are supposed for eGCDR only. Those new values should not be presented in SCDR, MCDR, SMT, and SMO CDR. For QoSInformation: If the field value length is 4, octet 1 is Allocation/Retention Priority, octets 2 - 4 are coded according to 3GPP TS 24.008 [5] Quality of Service IE, octets 3 - 5 (i.e. according to the pre-Release '99 format). This will be converted into choice, GSMQoSInformation. If the field value length is 12, it will be converted into choice, umtsQosInformation. It will be 1:1 octet copy (input 12 octets, output is also 12 octets). If the field value length is more than 12 (less or equal to 15), it will be converted into choice, umtsQosInformation. Output value for choice umtsQosInformation will be the first 12 octets from the input.	N/A

RATType Field

Table 15–53 lists the definitions for RATType field versions.

Table 15–53 RATType Field Versions

Version	Definition
V7.3.0	`RATType ::= INTEGER (0..255)` `{`
V6.4.1	`RATType ::= INTEGER (0..255)`

V3.6.0	This field is not defined in V3.6.0. Instead, a similar field is defined as the following:
	`SystemType ::= ENUMERATED`
	`unknown (0),`
	`iuUTRAN (1)`
	`}`

Table 15–53 (Cont.) RATType Field Versions

Version	Definition

V3.2.0	This field is not defined in V3.2.0. Instead, a similar field is defined as the following:
	`SystemType ::= ENUMERATED`
	`{`
	`umtsRel99 (1)`
	`}`

Table 15–54 lists the versions that support version hiding.

Table 15–54 RATType Field Version Hiding

Version hiding	Changed fields	Changes
7.3.0 to 6.4.1	None.	No changes.
7.3.0 to 3.6.0	None.	No changes.
6.4.1 to 3.6.0	If the input V6.4.1 value is not 1, it will be output as SystemType with the value 0. Otherwise, it will be output as SystemType with the value 1.	N/A
6.4.1 to 3.2.0	It will be dropped.	N/A

ChChSelectionMode Field

Table 15–55 lists the definitions for ChChSelectionMode field versions.

Table 15–55 ChChSelectionMode Field Versions

Version	Definition

V7.3.0	`ChChSelectionMode ::= ENUMERATED`
	`{`
	`sGSNSupplied (0), -- For GGSN only`
	`subscriptionSpecific (1), -- For SGSN only`
	`aPNSpecific (2), -- For SGSN only`
	`homeDefault (3), -- For SGSN and GGSN`
	`roamingDefault (4), -- For SGSN and GGSN`
	`visitingDefault (5) -- For SGSN and GGSN`
	`}`

V6.4.1	`ChChSelectionMode ::= ENUMERATED`
	`{`
	`sGSNSupplied (0), -- For GGSN only`
	`subscriptionSpecific (1), -- For SGSN only`
	`aPNSpecific (2), -- For SGSN only`
	`homeDefault (3), -- For SGSN and GGSN`
	`roamingDefault (4), -- For SGSN and GGSN`
	`visitingDefault (5) -- For SGSN and GGSN`
	`}`

V3.6.0	No such field defined for SGSNPDPRecord, SGSNMMRecord, SGSNSMORecord, and SGSNSMTRecord.

Table 15–55 (Cont.) ChChSelectionMode Field Versions

Version	Definition
V3.2.0	No such field defined for SGSNPDPRecord, SGSNMMRecord, SGSNSMORecord, and SGSNSMTRecord.

Table 15–56 lists the versions that support version hiding.

Table 15–56 ChChSelectionMode Field Version Hiding

Version hiding	Changed fields	Changes
7.3.0 to 6.4.1	None.	No changes.
7.3.0 to 3.6.0	None.	No changes.
6.4.1 to 3.6.0	Field will be dropped for SGSNPDPRecord, SGSNMMRecord, SGSNSMORecord, and SGSNSMTRecord.	N/A
6.4.1 to 3.2.0	Field will be dropped for SGSNPDPRecord, SGSNMMRecord, SGSNSMORecord, and SGSNSMTRecord.	N/A

DynamicAddressFlag Field

Table 15–57 lists the definitions for DynamicAddressFlag field versions.

Table 15–57 DynamicAddressFlag Field Versions

Version	Definition
V7.3.0	`DynamicAddressFlag ::= BOOLEAN` `{`
V6.4.1	`DynamicAddressFlag ::= BOOLEAN`
V3.6.0	No such field is defined for SGSNPDPRecord, SGSNSMORecord, and SGSNSMTRecord.
V3.2.0	No such field is defined for SGSNPDPRecord, SGSNSMORecord, and SGSNSMTRecord.

Table 15–58 lists the versions that support version hiding.

Table 15–58 DynamicAddressFlag Field Version Hiding

Version hiding	Changed fields	Changes
7.3.0 to 6.4.1	None.	No changes.
7.3.0 to 3.6.0	None.	No changes.
6.4.1 to 3.6.0	Field will be dropped for SGSNPDPRecord, SGSNMMRecord, SGSNSMORecord, and SGSNSMTRecord.	N/A

Table 15–58 (Cont.) DynamicAddressFlag Field Version Hiding

Version hiding	Changed fields	Changes
6.4.1 to 3.2.0	Field will be dropped for SGSNPDPRecord, SGSNMMRecord, SGSNSMORecord, and SGSNSMTRecord.	N/A

EventTimeStamp Field

Table 15–59 lists the definitions for EventTimeStamp field versions.

Table 15–59 EventTimeStamp Field Versions

Version	Definition
V7.3.0	Defined in SGSNSMORecord and SGSNSMTRecord as TimeStamp, replacing originationTime in V3.6.0 and V3.2.0.
V6.4.1	Defined in SGSNSMORecord and SGSNSMTRecord as TimeStamp, replacing originationTime in V3.6.0 and V3.2.0.
V3.6.0	No such field; instead, it has originationTime.
V3.2.0	No such field; instead, it has originationTime.

Table 15–60 lists the versions that support version hiding.

Table 15–60 EventTimeStamp Field Version Hiding

Version hiding	Changed fields	Changes
7.3.0 to 6.4.1	None.	No changes.
7.3.0 to 3.6.0	None.	No changes.
6.4.1 to 3.6.0	Output it as originationTime.	N/A
6.4.1 to 3.2.0	Output it as originationTime.	N/A

CAMELInformationSMS Field

Table 15–61 lists the definitions for CAMELInformationSMS field versions.

Table 15–61 CAMELInformationSMS Field Versions

Version	Definition
V7.3.0	CAMELInformationSMS ::= SET sCFAddress [1] SCFAddress OPTIONAL, serviceKey [2] ServiceKey OPTIONAL, defaultSMSHandling [3] DefaultSMS-Handling OPTIONAL, cAMELCallingPartyNumber [4] CallingNumber OPTIONAL, cAMELDestinationSubscriberNumber [5] SmsTpDestinationNumber OPTIONAL, cAMELSMSCAddress [6] AddressString OPTIONAL, freeFormatData [7] FreeFormatData OPTIONAL, smsReferenceNumber [8] CallReferenceNumber OPTIONAL }

V6.4.1	CAMELInformationSMS ::= SET
	{
	sCFAddress [1]
	SCFAddress OPTIONAL,
	serviceKey [2]
	ServiceKey OPTIONAL,
	defaultSMSHandling [3]
	DefaultSMS-Handling OPTIONAL,
	cAMELCallingPartyNumber [4] CallingNumber
	OPTIONAL,
	cAMELDestinationSubscriberNumber [5]
	SmsTpDestinationNumber OPTIONAL,
	cAMELSMSCAddress [6]
	AddressString OPTIONAL,
	freeFormatData [7]
	FreeFormatData OPTIONAL,
	smsReferenceNumber [8]
	CallReferenceNumber OPTIONAL
	}

Table 15–61 (Cont.) CAMELInformationSMS Field Versions

Version	Definition

V3.6.0	CAMELInformationSMS ::= SET
	{
	sCFAddress [1]
	SCFAddress OPTIONAL,
	serviceKey [2]
	ServiceKey OPTIONAL,
	defaultSMSHandling [3]
	DefaultSMS-Handling OPTIONAL,
	cAMELCallingPartyNumber [4]
	CallingNumber OPTIONAL,
	cAMELDestinationSubscriberNumber [5] CalledNumber
	OPTIONAL,
	cAMELSMSCAddress [6]
	AddressString OPTIONAL,
	freeFormatData [7]
	FreeFormatData OPTIONAL
	}

V3.2.0	CAMELInformationSMS ::= SET
	{
	sCFAddress [1]
	SCFAddress OPTIONAL,
	serviceKey [2]
	ServiceKey OPTIONAL,
	defaultSMSHandling [3]
	DefaultSMS-Handling OPTIONAL,
	cAMELCallingPartyNumber [4]
	CallingNumber OPTIONAL,
	cAMELDestinationSubscriberNumber [5] CalledNumber
	OPTIONAL,
	cAMELSMSCAddress [6]
	AddressString OPTIONAL,
	freeFormatData [7]
	FreeFormatData OPTIONAL
	}

Table 15–62 lists the versions that support version hiding.

Table 15–62 CAMELInformationSMS Field Version Hiding

Version hiding	Changed fields	Changes
7.3.0 to 6.4.1	None.	No changes.
7.3.0 to 3.6.0	None.	No changes.
6.4.1 to 3.6.0	Drop smsReferenceNumber.	N/A
6.4.1 to 3.2.0	Drop smsReferenceNumber.	N/A

SMSResult/Diagnostics Field

Table 15–63 lists the definitions for SMSResult/Diagnostics field versions.

Table 15–63 SMSResult/Diagnostics Field Versions

Version	Definition

V7.3.0	SMSResult ::= Diagnostics
	insufficientResources (1),
	Diagnostics ::= CHOICE
	{
	gsm0408Cause [0] INTEGER,
	-- See TS 24.008
	gsm0902MapErrorValue [1] INTEGER,
	itu-tQ767Cause [2] INTEGER,
	-- See ITU-T Q.767
	networkSpecificCause [3] ManagementExtension,
	-- To be defined by network operator
	manufacturerSpecificCause [4] ManagementExtension,
	-- To be defined by manufacturer
	positionMethodFailureCause [5]
	PositionMethodFailure-Diagnostic,
	-- See TS 29.002
	unauthorizedLCSClientCause [6]
	UnauthorizedLCSClient-Diagnostic
	-- See TS 29.002
	}
	PositionMethodFailure-Diagnostic ::= ENUMERATED {
	
	congestion (0),
	insufficientMeasurementData (2),
	inconsistentMeasurementData (3),
	locationProcedureNotCompleted (4),
	locationProcedureNotSupportedByTargetMS (5),
	qoSNotAttainable (6),
	positionMethodNotAvailableInNetwork (7),
	positionMethodNotAvailableInLocationArea (8),
	... }
	UnauthorizedLCSClient-Diagnostic ::= ENUMERATED {
	
	noAdditionalInformation (0),
	clientNotInMSPrivacyExceptionList (1),
	callToClientNotSetup (2),
	privacyOverrideNotApplicable (3),
	disallowedByLocalRegulatoryRequirements (4),
	... }

Table 15–63 (Cont.) SMSResult/Diagnostics Field Versions

Version	Definition

V6.4.1	SMSResult ::= Diagnostics
	itu-tQ767Cause [2] INTEGER,
	Diagnostics ::= CHOICE
	{
	gsm0408Cause [0] INTEGER,
	
	-- See TS 24.008
	gsm0902MapErrorValue [1] INTEGER,
	
	-- See ITU-T Q.767
	networkSpecificCause [3] ManagementExtension,
	clientNotInMSPrivacyExceptionList (1),
	manufacturerSpecificCause [4] ManagementExtension,
	
	-- To be defined by network operator
	-- To be defined by manufacturer
	positionMethodFailureCause [5]
	PositionMethodFailure-Diagnostic,
	unauthorizedLCSClientCause [6]
	UnauthorizedLCSClient-Diagnostic
	
	-- See TS 29.002
	-- See TS 29.002
	}
	PositionMethodFailure-Diagnostic ::= ENUMERATED {
	congestion (0),
	insufficientResources (1),
	insufficientMeasurementData (2),
	inconsistentMeasurementData (3),
	locationProcedureNotCompleted (4),
	locationProcedureNotSupportedByTargetMS (5),
	qoSNotAttainable (6),
	positionMethodNotAvailableInNetwork (7),
	positionMethodNotAvailableInLocationArea (8),
	... }
	UnauthorizedLCSClient-Diagnostic ::= ENUMERATED {
	
	noAdditionalInformation (0),
	callToClientNotSetup (2),
	privacyOverrideNotApplicable (3),
	disallowedByLocalRegulatoryRequirements (4),
	... }

Table 15–63 (Cont.) SMSResult/Diagnostics Field Versions

Version	Definition

V3.6.0	SMSResult ::= Diagnostics
	ccittQ767Cause [2] INTEGER,
	Diagnostics
	::= CHOICE
	{
	gsm0408Cause
	[0] INTEGER,
	
	-- See TS 24.008
	gsm0902MapErrorValue [1] INTEGER,
	
	-- See ITU-T Q.767
	networkSpecificCause [3]
	ManagementExtension,
	ccittQ767Cause [2] INTEGER,
	manufacturerSpecificCause [4]
	ManagementExtension
	
	-- To be defined by network operator
	-- To be defined by manufacturer
	}

V3.2.0	SMSResult ::= Diagnostics
	Diagnostics
	::= CHOICE
	{
	gsm0408Cause
	[0] INTEGER,
	
	-- See TS 24.008
	gsm0902MapErrorValue [1] INTEGER,
	
	-- See ITU-T Q.767
	networkSpecificCause [3]
	ManagementExtension,
	{
	manufacturerSpecificCause [4]
	ManagementExtension
	
	-- To be defined by network operator
	-- To be defined by manufacturer
	}

Table 15–64 lists the versions that support version hiding.

Table 15–64 SMSResult/Diagnostics Field Version Hiding

Version hiding	Changed fields	Changes
7.3.0 to 6.4.1	None.	No changes.

Table 15–64 (Cont.) SMSResult/Diagnostics Field Version Hiding

Version hiding	Changed fields	Changes
7.3.0 to 3.6.0	None.	No changes.
6.4.1 to 3.6.0	If the choice is itu-tQ767Cause, translate it into ccittQ767Cause. If the choice is either positionMethodFailureCause or unauthorizedLCSClientCause, drop the field (not supported in V3.6.0). Any other choices, output it as is.	N/A

RatingGroupId Field

Table 15–65 lists the definitions for RatingGroupId field versions.

Table 15–65 RatingGroupId Field Versions

Version	Definition
V10.5	`RatingGroupId ::= INTEGER`
V7.3.0	`RatingGroup ::= INTEGER`
V6.4.1	`RatingGroup ::= INTEGER`

Table 15–66 lists the versions that support version hiding.

Table 15–66 RatingGroupId Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	The field name is RatingGroup in 7.3.0.	Should be put out as RatingGroup in the record.
10.5 to 6.4.1	The field name is RatingGroup in 6.4.1.	Should be put out as RatingGroup in the record.

ServiceConditionChange Field

Table 15–67 lists the definitions for ServiceConditionChange field versions.

Table 15–67 ServiceConditionChange Field Versions

Version	Definition
V10.5	ServiceConditionChange ::= BIT STRING qoSChange (0), -- bearer modification sGSNChange (1), -- bearer modification sGSNPLMNIDChange (2), -- bearer modification tariffTimeSwitch (3), -- tariff time change pDPContextRelease (4), -- bearer release rATChange (5), -- bearer modification serviceIdledOut (6), -- IP flow idle out, DCCA QHT expiry reserved (7), -- old: QCTexpiry is no report event configurationChange (8), -- configuration change serviceStop (9), -- IP flow termination.From "Service Stop" in -- Change-Condition" AVP dCCATimeThresholdReached (10), -- DCCA quota reauthorization dCCAVolumeThresholdReached (11), -- DCCA quota reauthorization dCCAServiceSpecificUnitThresholdReached (12), -- DCCA quota reauthorization dCCATimeExhausted (13), -- DCCA quota reauthorization dCCAVolumeExhausted (14), -- DCCA quota reauthorization dCCAValidityTimeout (15), -- DCCA quota validity time (QVT expiry) reserved1 (16), -- reserved due to no use case, -- old: return Requested is covered by (17),(18) dCCAReauthorisationRequest (17), -- DCCA quota reauthorization request by OCS dCCAContinueOngoingSession (18), -- DCCA failure handling (CCFH), -- continue IP flow dCCARetryAndTerminateOngoingSession (19), -- DCCA failure handling (CCFH), -- terminate IP flow after DCCA retry dCCATerminateOngoingSession (20), -- DCCA failure handling, -- terminate IP flow cGI-SAIChange (21), -- bearer modification. "CGI-SAI Change" rAIChange (22), -- bearer modification. "RAI Change" dCCAServiceSpecificUnitExhausted (23), -- DCCA quota reauthorization recordClosure (24), -- PGW-CDR closure timeLimit

Table 15–67 (Cont.) ServiceConditionChange Field Versions

Version	Definition
V7.3.0	ServiceConditionChange ::= BIT STRING { qoSChange (0), -- PDP context modification sGSNChange (1), -- PDP context modification sGSNPLMNIDChange (2), -- PDP context modification tariffTimeSwitch (3), -- tariff time change pDPContextRelease (4), -- PDP context release rATChange (5), -- PDP context modification serviceIdledOut (6), -- IP flow idle out, DCCA QHT expiry reserved (7), -- old: QCTexpiry is no report event configurationChange (8), -- configuration change serviceStop (9), -- IP flow termination dCCATimeThresholdReached (10), -- DCCA quota reauthorization dCCAVolumeThresholdReached (11), -- DCCA quota reauthorization dCCAServiceSpecificUnitThresholdReached (12), -- DCCA quota reauthorization dCCATimeExhausted (13), -- DCCA quota reauthorization dCCAVolumeExhausted (14), -- DCCA quota reauthorization dCCAValidityTimeout (15), -- DCCA quota validity time (QVT expiry) reserved (16), -- reserved due to no use case, -- old: return Requested is covered by (17),(18) dCCAReauthorisationRequest (17), -- DCCA quota reauthorization request by OCS dCCAContinueOngoingSession (18), -- DCCA failure handling (CCFH), -- continue IP flow dCCARetryAndTerminateOngoingSession (19), -- DCCA failure handling (CCFH), -- terminate IP flow after DCCA retry dCCATerminateOngoingSession (20), -- DCCA failure handling, -- terminate IP flow cGI-SAIChange (21), -- PDP context modification rAIChange (22), -- PDP context modification dCCAServiceSpecificUnitExhausted (23), -- DCCA quota reauthorization recordClosure (24), -- eG-CDR closure timeLimit (25), -- intermediate recording volumeLimit

Table 15–67 (Cont.) ServiceConditionChange Field Versions

Version	Definition
V6.4.1	ServiceConditionChange ::= BIT STRING qoSChange (0), sGSNChange (1), sGSNPLMNIDChange (2), tariffTimeSwitch (3), pDPContextRelease (4), rATChange (5), serviceIdledOut (6), qCTExpiry (7), configurationChange (8), serviceStop (9), timeThresholdReached (10), volumeThresholdReached (11), timeExhausted (13), volumeExhausted (14), timeout (15), returnRequested (16), reauthorisationRequest (17), continueOngoingSession (18), retryAndTerminateOngoingSession (19), terminateOngoingSession (20) }

Table 15–68 lists the versions that support version hiding.

Table 15–68 ServiceConditionChange Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	New bit values added in 10.5.	Bits after 28 are set to zero.
10.5 to 6.4.1	New bit values added in 10.5.	Bits after 20 are set to zero.

ServingNodeType Field

Table 15–69 lists the definitions for ServingNodeType field versions.

Table 15–69 ServingNodeType Versions

Version	Definition

V10.5	ServingNodeType ::= ENUMERATED
	{
	sGSN (0),
	pMIPSGW (1),
	gTPSGW (2),
	ePDG (3),
	hSGW (4),
	mME (5)
	}

V7.3.0	Not Present
V6.4.1	Not Present

Table 15–70 lists the versions that support version hiding.

Table 15–70 ServingNodeType Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	The field is not present in 7.3.0 definition supported Out of Box.	The field will be omitted from the output record.
10.5 to 6.4.1	The field is not present in 6.4.1 specification.	The field will be omitted from the output record.

SGWChange Field

Table 15–71 lists the definitions for SGWChange field versions.

Table 15–71 SGWChange Field Versions

Version	Definition
V10.5	`SGWChange ::= BOOLEAN`
V7.3.0	`Not Present`
V6.4.1	`Not Present`

Table 15–72 lists the versions that support version hiding.

Table 15–72 SGWChange Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	The field is not present in 7.3.0 definition supported Out of Box.	The field will be omitted from the output record.
10.5 to 6.4.1	The field is not present in 6.4.1 specification.	The field will be omitted from the output record.

TimeQuotaMechanism Field

Table 15–73 lists the definitions for TimeQuotaMechanism field versions.

Table 15–73 TimeQuotaMechanism Field Versions

Version	Definition

V10.5	`TimeQuotaMechanism ::= SEQUENCE`
	`timeQuotaType`
	`[1] TimeQuotaType,`
	`baseTimeInterval`
	`[2] Integer`
	`}`

Table 15–73 (Cont.) TimeQuotaMechanism Field Versions

Version	Definition

V7.3.0	TimeQuotaMechanism ::= SEQUENCE
	{
	timeQuotaType
	[1] TimeQuotaType,
	baseTimeInterval
	[2] Integer
	}

V6.4.1	Not Present {

Table 15–74 lists the versions that support version hiding.

Table 15–74 TimeQuotaMechanism Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	No Change	Do nothing. The new value defined in V10.5 will be output in V7.3.0.
10.5 to 6.4.1	The field is not present in 6.4.1 specification.	The field will be omitted from the output record.

TimeQuotaType Field

Table 15–75 lists the definitions for TimeQuotaType field versions.

Table 15–75 TimeQuotaType Field Versions

Version	Definition

V10.5	TimeQuotaType ::= ENUMERATED
	{
	dISCRETETIMEPERIOD
	(0),
	cONTINUOUSTIMEPERIOD
	(1)
	}

V7.3.0	TimeQuotaType ::= ENUMERATED
	{
	dISCRETETIMEPERIOD
	(0),
	cONTINUOUSTIMEPERIOD
	(1)
	}

V6.4.1	Not Present {

Table 15–76 lists the versions that support version hiding.

Table 15–76 TimeQuotaType Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	No Change	Do nothing. The new value defined in V10.5 will be output in V7.3.0.
10.5 to 6.4.1	The field is not present in 6.4.1 specification.	The field will be omitted from the output record.

UserCSGInformation Field

Table 15–77 lists the definitions for UserCSGInformation field versions.

Table 15–77 UserCSGInformation Field Versions

Version	Definition

V10.5	`UserCSGInformation ::= SEQUENCE`
	`cSGId`
	`[0] CSGId,`
	`cSGAccessMode [1]`
	`CSGAccessMode,`
	`cSGMembershipIndication [2] NULL`
	`OPTIONAL`
	`}`

V7.3.0	`Not Present` `--`
V6.4.1	`Not Present`

Table 15–78 lists the versions that support version hiding.

Table 15–78 UserCSGInformation Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	The field is not present in 7.3.0 definition supported Out of Box.	The field will be omitted from the output record.
10.5 to 6.4.1	The field is not present in 6.4.1 specification.	The field will be omitted from the output record.

ChangeLocation Field

Table 15–79 lists the definitions for ChangeLocation field versions.

Table 15–79 ChangeLocation Field Versions

Version	Definition

V10.5	ChangeLocation ::= SEQUENCE
	-- used in SGSNMMRecord only
	--
	{
	locationAreaCode [0] LocationAreaCode,
	routingAreaCode [1] RoutingAreaCode,
	cellId [2] CellId OPTIONAL,
	changeTime [3] TimeStamp,
	mCC-MNC [4] PLMN-Id OPTIONAL
	}

V7.3.0	ChangeLocation ::= SEQUENCE
	{
	--
	-- used in SGSNMMRecord only
	--
	locationAreaCode [0] LocationAreaCode,
	routingAreaCode [1] RoutingAreaCode,
	cellId [2] CellId OPTIONAL,
	changeTime [3] TimeStamp,
	mCC-MNC [4] PLMN-Id OPTIONAL
	}

V6.4.1	ChangeLocation ::= SEQUENCE
	{
	--
	-- used in SGSNMMRecord only
	--
	locationAreaCode [0] LocationAreaCode,
	routingAreaCode [1] RoutingAreaCode,
	cellId [2] CellId OPTIONAL,
	changeTime [3] TimeStamp
	}

Table 15–80 lists the versions that support version hiding.

Table 15–80 ChangeLocation Field Version Hiding

Version hiding	Changed fields	Changes
10.5 to 7.3.0	No Changes.	Do nothing. The new value defined in V10.5 will be output in V7.3.0.
10.5 to 6.4.1	New Values added in 10.5.	Do nothing. The new value defined in V10.5 will be output in V6.4.1.

All Other Fields

There are no other changes between V10.5.0 and V7.3.0, V10.5.0 and V6.4.1, and V7.3.0 and V6.4.1.

V7.3.0 and V6.4.1 still need to apply the entire existing version hiding functions (between V6.4.1 and V3.6.0) for V3.6.0.

For the different versions of the Nortel CBB (recordExtensions), nothing will be done in terms of version hiding between V7.3.0, V6.4.1, V3.6.0, and V3.2.0. The field recordExtensions will be passed through and output as is.

C

Nortel GSM/UMTS AMA Cartridge Pack Supported GSM Releases and Version Hiding

Text

Heading

This release supports GSM 13, 15, 16, 17, 18, and 19. Also, 1:1 input/output file matching is supported for:

- GSM18 in -> GSM18 out
- GSM18 in -> GSM16 out
- GSM16 in -> GSM16 out
- GSM16 in -> GSM15 out
- GSM15 in -> GSM15 out

Table 15–81 lists the instances that support version hiding.

Table 15–81 Version Hiding Instances

In: AMA DIRP	Out: AMA DIRP and NRTT
GSM 19	GSM 19
GSM 19	GSM 18
GSM 19	GSM 17
GSM 18	GSM 18
GSM 18	GSM 17
GSM 18	GSM 16
GSM 18	GSM 15
GSM 17	GSM 17
GSM 17	GSM 16
GSM 17	GSM 15
GSM 16	GSM 16
GSM 16	GSM 15
GSM 15	GSM 15
GSM 13	GSM 13
GSM 18	GSM 18

Table 15–81 (Cont.) Version Hiding Instances

In: AMA DIRP	Out: AMA DIRP and NRTT
GSM 18	GSM 17
GSM 18	GSM 16
GSM 18	GSM 15
GSM 17	GSM 17
GSM 17	GSM 15
GSM 16	GSM 16
GSM 16	GSM 15
GSM 15	GSM 15

Note: GSM18 in -> GSM16 out and GSM16 in -> GSM15 out are supported only for Database.

Table 15–82 lists the instances that support version hiding.

Table 15–82 Version Hiding Instances

In: AMA DIRP	Out: ASN.1
GSM 18	GSM 18
GSM 17	GSM 17
GSM 16	GSM 16
GSM 15	GSM 15
GSM 13	GSM 13

Version Hiding For GSM 19 Data Fields

Table 15–83 lists the GSM 19 data fields that support version hiding.

Table 15–83 Version Hiding for GSM 19 Data Fields

Data Field	GSM 19	GSM 18	Version hiding GSM 19 to GSM 18	Version hiding GSM 19 to GSM 17
Called Equipment (or Served Equipment)	New Combination are supported 1-5 Values FFFFF 6-19 Values {0,1,2…9,A,B…F} 20-21 Values {0,1,2…9,A,B…F} 22 Value C	BCD/Hex string with 22 characters. There is no encoding	Contents are mapped directly (no version hiding).	Contents are mapped directly (no version hiding).
Called IMSI Number	New field in module MNP	Field is dropped	Field is dropped	Field is dropped
Calling Equipment (or Served Equipment)	New Combination are supported 1-5 Values FFFFF 6-19 Values {0,1,2…9,A,B…F} 20-21 Values {0,1,2…9,A,B…F} 22 Value C	BCD/Hex string with 22 character . There is no encoding	Contents are mapped directly (no version hiding)	Contents are mapped directly (no version hiding)
Post -Translated Called Party Number	New field in module GA	Field is dropped	Field is dropped	Field is dropped
Served IMEI	Character size is increased from 16 to 22. 1-5 Values FFFFF 6-19 Values {0,1,2…9,A,B…F} 20-21 Values {0,1,2…9,A,B…F} 22 Value C	BCD/Hex string with 16 characters. There is no encoding 15 values {0,1,2…9,A,B…F} 16 value C	Characters 1-4 and 20-21 are dropped	Field is dropped
SS Code (Supplementary Service Code)	New combinations are supported. New Value: Character 3 is F	This Combination is not introduced	If the value of SS Code is 0A1C , No action required. If the value of SS Code is 0FFC , Drop the module	If the value of SS Code is 0A1C , No action required. If the value of SS Code is 0FFC , Drop the module
Result Indicator	New combinations are supported. New Value: Character 2 - 3 is 59	This Combination is not introduced	Combination that is not supported mapped to '00'	Combination that is not supported mapped to '00'

Version Hiding For GSM 18 Data Fields

Table 15–84 lists the GSM 18 data fields that support version hiding.

Table 15–84 Version Hiding for GSM 18 Data Fields

Data Field	Change	Version hiding GSM 18 to GSM 17	Version hiding GSM 18 to GSM 16	Version hiding GSM 18 to GSM 15
Calling / Called Subscriber Category	New combinations are supported. New values: 017-223,225,227, 229,231,233,235, 237,239,241,243, 245,247,249,251, 253,255	Combinations that are not supported are mapped to '000'.	Combinations that are not supported are mapped to '000'.	Combinations that are not supported are mapped to '000'.
Call Duration	Now contains 14 characters to capture additional information.	Characters 1 to 3 and 12 to 13 are dropped. Characters 4 to 10 map to characters 1 to 7, if character "1" has a value of "1". Otherwise, characters 5 to 11 map to characters 1 to 7.	Characters 1 to 3 and 12 to 13 are dropped. Characters 4 to 10 map to characters 1 to 7, if character "1" has a value of "1". Otherwise, characters 5 to 11 map to characters 1 to 7.	Characters 1 to 3 and 12 to 13 are dropped. Characters 4 to 10 map to characters 1 to 7, if character "1" has a value of "1". Otherwise, characters 5 to 11 map to characters 1 to 7.
Diagnostic / SMS Result	Character 0-1: value '01' is dropped.	Contents are mapped directly (no version hiding).	Protocol-Value "01" will be changed to "00".	Protocol-Value "01" will be changed to "00".
Equipment Identity	Only captures '00001' and '00002'. Otherwise set to 'FFFFF'.	Contents are mapped directly (no version hiding).	Contents are mapped directly (no version hiding).	Contents are mapped directly (no version hiding).
MSC/MGW Number	New mapping.	Field is mapped to MSC Number.	Field is mapped to MSC Number.	Field is mapped to MSC Number.
LCS Record Type	New values: '2' and '5'	Contents are mapped directly (no version hiding).	Record is dropped if field value is not equal to 1, 2, 3 or 4.	Record is dropped if field value is not equal to 1, 2, 3 or 4.
MSC Number	New field in structure code 0021. Composed of two field types: Numbering Plan Identifier and BCD or Full Hex String	Field is dropped in structure code 0021.	Field is dropped in structure code 0021.	Field is dropped in structure code 0021.
Identity Of Target UE	Field is dropped.	No change.	No change.	No change.
Served Party	New field in structure code.	Field maps to "Identity Of Target UE" field.	Field maps to "Identity Of Target UE" field.	Field maps to "Identity Of Target UE" field.
Served MSISDN	New field in structure code 0021. Composed of two field types: Numbering Plan Identifier and BCD or Full Hex String	Field is dropped in structure code 0021.	Field is dropped in structure code 0021.	Field is dropped in structure code 0021.

Table 15–84 (Cont.) Version Hiding for GSM 18 Data Fields

Data Field	Change	Version hiding GSM 18 to GSM 17	Version hiding GSM 18 to GSM 16	Version hiding GSM 18 to GSM 15
Requesting Mobile Location Centre (MLC)	New field in structure code. Composed of two field types: Numbering Plan Identifier and BCD or Full Hex String	Field is dropped.	Field is dropped.	Field is dropped.
Privacy Notification	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
Privacy Override	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
Positioning Data	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
LCS Diagnostic	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
System Type	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
Served IMEI	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
Emergency Service Routing Digits (ESRD-Digits)	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
Emergency Service Routing Key (ESRK-Key)	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
LCS Priority Level	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
RNC ID	New field in module code.	Field is dropped.	Field is dropped.	Field is dropped.
Supplementary Services/ AoC Parameter/ Supplementary Service Code	New values: 'b0'	Value 'b0' mapped to default value '00'.	Value 'b0' mapped to default value '00'.	Value 'b0' mapped to default value '00'.
Operation Indication	New value: '6'	Value '6' mapped to default value '0'.	Value '6' mapped to default value '0'.	Value '6' mapped to default value '0'.
Patch Identity	New field in module code.	Field is dropped.	Field is dropped.	Field is dropped since module 28 is not supported.
Bearer Independent Core Network	New module.	Module is dropped.	Module is dropped.	Module is dropped.
BICN ModuleCode	New field in new module code.	Field is dropped.	Field is dropped.	Field is dropped.
BICN MGW Number	New field in new module code.	Field is dropped.	Field is dropped.	Field is dropped.
BICN MGW Seizure Time	New field in new module code.	Field is dropped.	Field is dropped.	Field is dropped.

Table 15–84 (Cont.) Version Hiding for GSM 18 Data Fields

Data Field	Change	Version hiding GSM 18 to GSM 17	Version hiding GSM 18 to GSM 16	Version hiding GSM 18 to GSM 15
BICN Backbone Media Type	New field in new module code.	Field is dropped.	Field is dropped.	Field is dropped.
BICN Access Media Type	New field in new module code.	Field is dropped.	Field is dropped.	Field is dropped.
Ms Class Mark	Character 4: only captures value 0 to 4, and value '7' is dropped. Character 8,9,10,14 always set to 'F'.	Contents are mapped directly (no version hiding).	Characters 8 to 15 are dropped. If the character "2" has a value of "2", it is mapped to a value of "1". If the character "3" has a value of "1", it is mapped to a value of "0". If the character "4" has a value of "7", it is mapped to a value of "0". If the character "1" has a value of "1", then characters 5 and 6 are mapped to a value of "0". If the character "1" has a value of "2", then characters 5 and 6 are mapped as is. The character "7" is always mapped to a value of "0".	Characters 8 to 15 are dropped. If the character "2" has a value of "2", it is mapped to a value of "1". If the character "3" has a value of "1", it is mapped to a value of "0". If the character "4" has a value of "7", it is mapped to a value of "0". If the character "1" has a value of "1", then characters 5 and 6 are mapped to a value of "0". If the character "1" has a value of "2", then characters 5 and 6 are mapped as is. The character "7" is always mapped to a value of "0".

Table 15–84 (Cont.) Version Hiding for GSM 18 Data Fields

Data Field	Change	Version hiding GSM 18 to GSM 17	Version hiding GSM 18 to GSM 16	Version hiding GSM 18 to GSM 15
Supplementary Service Action	Captures value from '0' to '5'. Value '6' is dropped.	Contents are mapped directly (no version hiding).	Contents are mapped directly (no version hiding).	Contents are mapped directly (no version hiding).
Channel Type	No Change.	Contents are mapped directly (no version hiding).	If Character 3 is equal to "0" and Character 1 is equal to "2" then the Data Rate Character (Character 4) value of "8" is mapped to value "0".	Channel Rate and Type Character (Character 2) values are mapped. If Character 1 has a value of "1", then the Character 2 values of 0, 1, 5, 6, 7, and 8 are mapped to "3". If Character 1 has a value of "2", then the Character 2 values of 0, 1, 5, 6, 7, and 8 are mapped to "4". If Character 1 has a value of "2", then the Character 2 values of 0, 1 and 5 are mapped to "3". If Character 1 has a value of "2" or "6" then the Character 2 values of 0, 1 and 5 are mapped to "4". If Character 3 has a value of "0" and Character 1 has a value of "2" then the Character 4 value of 8 is mapped to "0".
Module Code 9	No Change.	Contents are mapped directly (no version hiding).	Module Code is dropped for Structure Code 13, 14, 15 and 16.	Module Code is dropped for Structure Code 13, 14, 15 and 16.

Version Hiding For GSM 17 Data Fields

Table 15–85 lists the GSM 17 data fields that support version hiding.

Table 15–85 Version Hiding for GSM 17 Data Fields

Data field	Change	Version hiding GSM 17 to GSM 16	Version hiding GSM 17 to GSM 15
Access Network	If the field is not present, the default value is now 0C.	Contents are mapped directly (no version hiding).	Contents are mapped directly.
Answer Time	Encoded using the new format for Date and Time field.	See Date and Time.	See Date and Time.
Call Type Code	Now includes value 003 - Location Update Call.	Structure codes with Call Type Code = 3 are dropped.	Structure codes with Call Type Code = 3 are dropped.
Carrier Connect Timestamp	Encoded using the new format for Date and Time field.	See Date and Time.	See Date and Time
Channel Allocation Time	Encoded using the new format for Date and Time field.	See Date and Time.	See Date and Time.
Correlation ID / ETC Parm2	New field.	Field is dropped.	Field is dropped.
CSI	CSI field can now capture a value for M-CSI information (value 7).	Contents are mapped directly (no version hiding).	Field is dropped.
Date and Time	Can now contain a time zone offset value: characters 14-15 hold the time zone offset.	Characters 14 and 15 set to 00.	Characters 14 and 15 set to 00.
Delivery Timestamp	Encoded using new format for Date and Time field.	See Date and Time.	See Date and Time.
Disconnect Time	Encoded using the new format for Date and Time field	See Date and Time.	See Date and Time.
Geographical Location of UE 1	Replaces Geographical Location of UE	This field maps to the Geographical Location of UE.	This field maps to the Geographical Location of UE.
Geographical Location of UE 2	New field	Field is dropped.	Field is dropped.
Geographical Location of UE 3	New field	Field is dropped.	Field is dropped.
Geographical Location of UE 4	New field	Field is dropped.	Field is dropped.
Geographical Location of UE 5	New field	Field is dropped.	Field is dropped.
IN Timestamp 1	Encoded using the new format for Date and Time field	See Date and Time.	See Date and Time.
IN Timestamp 2	Encoded using the new format for Date and Time field	See Date and Time.	See Date and Time.

Table 15–85 (Cont.) Version Hiding for GSM 17 Data Fields

Data field	Change	Version hiding GSM 17 to GSM 16	Version hiding GSM 17 to GSM 15
Incoming/Outgoing Trunk Release Time	Encoded using the new format for Date and Time field	See Date and Time.	See Date and Time.
IC/INC Prefix	Now contains 10 characters to capture the carrier identification codes (CICs) for the Chinese market	Characters 1-8 map to characters 1-4 (truncation on left). Character 9 maps to character 5. Character 10 maps to character 6.	Characters 1-8 map to characters 1-4 (truncation on left). Character 9 maps to character 5. Character 10 maps to character 6.
IWF Activation Timestamp	Encoded using the new format for Date and Time field	See Date and Time.	See Date and Time.
LCS Client Identity	Composed of two field types: Numbering Plan Identifier and BCD or Full Hex String	Numbering Plan Identifier (first 6 characters) removed and replaced with default characters to make the field look like the 32 character field used in GSM 16. Characters 1-6 map to value 'FFFFFF' Characters 7 -32 map directly from GSM 17 characters 7-32.	Numbering Plan Identifier (first 6 characters) removed and replaced with default characters to make the field look like the 32 character field used in GSM 15. Characters 1-6 map to value 'FFFFFF' Characters 7-32 map directly from GSM 17 characters 7-32.
LCS Record Type	New supported value 5 represents MO-LR: Autonomous Self Location for Assistance Data	Value '5' mapped to default value 'F'.	Value '5' mapped to default value 'F'.
MM Event	New field	Field is dropped.	Field is dropped.
MS Classmark	Now contains 16 char to capture additional info	Character 7 set to '0'. Characters 8-15 dropped.	Char 7 always set to '0'. Char 8-15 dropped.
New AN	New field	Field is dropped.	Field is dropped.
New Cell - SAC Id	New field	Field is dropped.	Field is dropped.
New LAC	New field	Field is dropped.	Field is dropped.
New MSC Id	New field	Field is dropped.	Field is dropped.
Old AN	New field	Field is dropped.	Field is dropped.
Old Cell - SAC Id	New field	Field is dropped.	Field is dropped.
Old LAC	New field	Field is dropped.	Field is dropped.
Old MSC Id	New field	Field is dropped.	Field is dropped.
Record Count	New maximum value is 000065535.	Contents are mapped directly (no version hiding).	Field is dropped.

Table 15–85 (Cont.) Version Hiding for GSM 17 Data Fields

Data field	Change	Version hiding GSM 17 to GSM 16	Version hiding GSM 17 to GSM 15
Record Header	Contains the new Release Id field, structure code 001 and call type code 003 for the location update record.	Release Id field dropped. Structure Code 0001 dropped. Call Type Code 003 dropped.	Release Id field dropped. Structure Code 0001 dropped. Call Type Code 003 dropped.
Recording Entity	New field.	Field is dropped.	Field is dropped.
Release Id	New field.	Field is dropped.	Field is dropped.
Release Time	Encoded using new format for Date and Time field.	See Date and Time.	See Date and Time.
SCF ID/ETC Parm1	New field.	Field is dropped.	Field is dropped.
Served MSISDN	New field.	Field is dropped.	Field is dropped.
Served IMSI	New field.	Field is dropped.	Field is dropped.
SMS Start Stamp	Encoded using new format for Date and Time field.	See Date and Time	See Date and Time.
SMS Stop Stamp	Encoded using new format for Date and Time field.	See Date and Time	See Date and Time.
SMS Time Stamp	Encoded using new format for Date and Time field.	See Date and Time	See Date and Time.
Structure Code	Contains new Location Update record.	Structure code 0001 is dropped.	Structure code 0001 is dropped.
SS Parameters field	Now 32 characters.	Truncation occurs from the left.	Same as GSM 17 - no change.
Unused Timestamp 1	Encoded using new format for Date and Time field.	See Date and Time.	See Date and Time.
Unused Timestamp 2	Encoded using new format for Date and Time field.	See Date and Time.	See Date and Time.
Update Result	New field.	Field is dropped.	Field is dropped.
Update Time	New field.	Field is dropped.	Field is dropped.

Version Hiding For GSM 16 Data Fields

Table 15–86 lists the GSM 16 data fields that support version hiding.

Table 15–86 Version Hiding for GSM 16 Data Fields

Data field	Change	Version hiding GSM 16 to GSM 15
Called Number	New field in structure code.	Field is dropped.
Calling Number	New field in structure code.	Field is dropped.

Table 15–86 (Cont.) Version Hiding for GSM 16 Data Fields

Data field	Change	Version hiding GSM 16 to GSM 15
Called/Calling Subscriber Category	New combinations are supported. New values: 224, 226, 228, 230, 234, 236, 238, 242, 246, 248, 250, 252, 254	Combinations that are not supported are mapped to '000'.
CAMEL Charging	Now allowed on structure code 4.	Module is dropped from illegal structures.
CAMEL SMS Info Module	New module.	Module is dropped.
CAMEL Subscriber Info	New field in module.	Field is dropped.
Channel Type	New combinations allowed.	If the 'Channel Rate and Type' field does not have a value of 3 or 4, this field will be set to 3.
CSI	New field.	Field is dropped.
Data Rate	Increased from two characters to four. Allowable range changed from 0-7 to 0-15.	Out of range values replaced with "007".
Free Format Data	Now 8 free-form fields with total payload of 336 characters. This is an increase from one field with 84 characters.	First and second field are mapped to accommodate 84-character field length.
Generic Address	Now allowed on structure codes 2, 3, 14, 16 and 18.	Module is dropped from illegal structures.
Generic Identity	New value=01600	GSM version specific value is substituted (i.e. 01500).
GSM Assisting SSP Info Module	New module.	Module is dropped.
IN Protocol	New field in module.	Field is dropped.
Local Ref Num	New field in module.	Field is dropped.
Patching Info Module	New module.	Module is dropped.
Rate Adaption	New field.	Field is dropped.
SMS Message Type	New field in structure code.	Field is dropped.
SMS Validity Period	New field in structure code.	Field is dropped.
SS Code	New value: 46	If SS Code = '046', entire Module Code 05 is dropped.

Version Hiding For GSM 15 Data Fields

Table 15–87 lists the GSM 15 data fields that support version hiding.

Table 15–87 Version Hiding for GSM 15 Data Fields

Data field	Change	Version hiding GSM 15 to GSM 13
Access Network	New field.	Field is dropped.
Advice of Charge	New values: 02 and 03	Field is set to "00".
Call Reference	New range: 0-262143. (Old range was 0-65535).	Field is wrapped.
Call Type Code	New value: 17	Record is dropped.
Destination Routing Address	Increased from 22 to 32 characters.	Truncated from left.
Generic ID	New value: 01500	Version-specific value is substituted.
IAC	New structure code.	Record is dropped.
Location Services	New structure code.	Record is dropped.
Operation Indication	New value: 5	Field is set to "00".
Record Number	New range: 1-4294967295. (Old range was 1-9994239).	Field is wrapped.
SS Code	New values: 81 and A1.	Field is set to "00".

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IMS CDF/CGF Cartridge Pack Output Specification

This appendix describes the Oracle Communications Offline Mediation Controller mapping for IMS CDF/CGF ECE cartridge. The following tables display the mapping performed by the AVP Mapper EP, as it converts diameter types to 32.298 ASN.1 format.

Field Definition Notes

The **incomplete-CDR-Indication** ASN.1 field is only outputted in the following cases:

- when the Stop record is received and records are missing
- or when the AP has not received a record for a given session within the configured Flush Time

The value for the **causeForRecordClosing** ASN.1 field is set according to the scenarios in Table 15–88:

Table 15–88 causeForRecordClosing Values

Scenario	Field Value
Success case	serviceDeliveryEndSuccessfully
Error case 1 - AP Flush Time expires	timeLimit
Error case 2 - Stop or Event record received with a positive value for the Cause-Code	unSuccessfulServiceDelivery
Partial CDR generation	managementIntervention

Value Definitions for AVP Mapper EP Mapping Tables

- Assign - the value from each record received for a given session is used
- Assign last - the value from the last record received for a given session is used
- Assign first - the value from the first record received for a given session is used
- Append - the values from all records received for a given session are added to a list

Table 15–89 lists the value definitions for AVP Mapper EP Mapping.

Table 15–89 Value Definitions for AVP Mapper EP Mapping

ASN.1 IMSRecord	Diameter AVP [Code]	Aggregation Action	Translation Action
RecordType	Origin-Host [264]	Assign last	TBD
Retransmission	<Diameter Header> T-Flag	True if T-Flag received	Not Applicable
SIP-Method	Event-Type SIP-Method [824]	Assign last	Translate only for event records.
Role-of-Node	Role-of-Node [829]	Assign last	Assign
NodeAddress	Origin-Host [264]	Assign last	Assign to domainName choice of NodeAddress always
Session-Id	User-Session-ID [830]	Assign last	Assign
List-Of-Calling-Party-Address	Calling-Party-Address [831]	Append	Append without repeat
Called-Party-Address	Called-Party-Address [832]	Assign last	Assign by parsing URL.
PrivateUserID (S-CSCF only)	User-Name [1]	Assign last	Assign
ServiceRequestTimeStamp	SIP-Request-Timestamp [834] of ACR-Start	Assign first	Convert to binary 3GPP timestamp format
ServiceDeliveryStartTimeStamp	SIP-Response-Timestamp [835] of ACR-Start	Assign first	Convert to binary 3GPP timestamp format
ServiceDeliveryEndTimeStamp	SIP-Request-Timestamp [834] of ACR-Stop	Assign first	Convert to binary 3GPP timestamp format
RecordOpeningTime	---	AVP Mapper records time when first record was received	--
RecordClosingTime	---	AVP Mapper records time when record is last processed by AP	--
InterOperatorIdentifiers	Inter-Operator-Identifier [838] [839] [840]	Assign last	Assign
LocalRecordSequenceNumber	---	AP generates next serial number when record is first processed	--

Table 15–89 (Cont.) Value Definitions for AVP Mapper EP Mapping

ASN.1 IMSRecord	Diameter AVP [Code]	Aggregation Action	Translation Action
RecordSequenceNumber	---	AP generates for every record received for a given session	--
CauseForRecordClosing	---	AP generates based on various conditions	--
Incomplete-CDR-Indication	---	AP generates based on various conditions	--
IMS-Charging-Identifier	IMS-Charging-Identifier [841]	Assign last	Convert from string to octets.
SDP-Session-Description	SDP-Session-Description [842]	Append	Assign, only keep strings that begin with "a=" or "c="
List-Of-SDP-Media-Components	SDP-Media-Description [845], SDP-Media-Name [844], SDP-Media-Description [842],GPRS-Charging-ID [2], SIP-Request-Timestamp [834], SIP-Response-Timestamp [835], Authorised-QoS [849]	Append - see below for how each field is handled	Assign (Complex)
GGSNaddress	GGSN-Address [847]	Assign last	Assign
ServiceDeliveryFailureReason	SIP-Method (224) Cause-Code [861]	Assign last	Assign
List-Of-Message-Bodies	Content-Type [826], Content-Disposition [828], Content-Length [827]	Append - see below for how each field is handled	Assign (Complex)
RecordExtensions	Not supported	Not supported	Not supported
ApplicationServersInformation (S-CSCF only)	Application-Server [836], Application-Provided-Called-Party-Address [837]	Append	Assign (Complex)
expiresInformation	Event-Type -> Expires [888]	AssignLast	Assign
List of Called Asserted Identity	Called-Asserted-Identity [1250]	Append	Assign
Number Portability Routing	Number-Portability-Routing-Information [2024]	Assign last	Assign
CarrierSelectRouting	Carrier-Select-Routing-Information[2023]	Assign last	Assign

Table 15–89 (Cont.) Value Definitions for AVP Mapper EP Mapping

ASN.1 IMSRecord	Diameter AVP [Code]	Aggregation Action	Translation Action
List-Of-Associated-URI	Associated-URIs[856]	Appned	Append without repeat, Assign by parsing URL.
ServiceContextID	Service-Context-Id[461]	Assign last	Assign
AccessNetworkInformation	Access-Network-Information[1263]	Assign last	Convert from string to octets.
IMSCommunicationServiceIdentifier	IMS-Communication-Service-Identifier[1281]	Assign last	Convert from string to octets.
IMSApplicationReferenceIdentifier	IMS-Application-Reference-Identifier[2601]	Assign last	Convert from string to octets.
OnlineChargingFlag	Online-Charging-Flag[2303]	Assign last	NULL if present
SessionPriority	Session-Priority[650]	Assign last	Assign
List-Of-Early-SDP-Media-Components	Early-Media-Description[1272]	Append	Append without repeat
List-Of-RealTimeTariffInformation	Real-Time-Tariff-Information[2305]	Append	Append without repeat

Media-Component-List Items

Table 15–90 lists the Media-Component-List items.

Table 15–90 Media Component List

ASN.1 IMSRecord	Diameter AVP [Code]	Aggregation Action	Translation Action
SIP-Request-Timestamp	SIP-Request-Timestamp [834]	Assign	Convert to binary 3gpp timestamp format
SIP-Response-Timestamp	SIP-Response-Timestamp [835]	Assign	Convert to binary 3gpp timestamp format
SDP-Media-Components : SDP-Media-Name	SDP-Media-Name [844]	Assign	Assign
SDP-Media-Components : SDP-Media-Descriptions	SDP-Media-Description [845]	Assign	Assign
SDP-Media-Components : GPRS-Charging-Id	GPRS-Charging-ID [2]	Assign	Assign
MediaInitiatorFlag	Media-Initiator-Flag [882]	Assign	Assign
SDP-Session-Description	SDP-Session-Description [842]	Assign	Assign
MediaInitiatorParty	Media-Initiator-Party[1288]	Assign	Assign
SIP-Request-Timestamp-Fraction	SIP-Request-Timestamp-Fraction[2301]	Assign	Assign
SIP-Response-Timestamp-Fraction	SIP-Response-Timestamp-Fraction[2302]	Assign	Assign

Table 15–90 (Cont.) Media Component List

ASN.1 IMSRecord	Diameter AVP [Code]	Aggregation Action	Translation Action
SDP-Type	SDP-Type[2036]	Assign	Assign
LocalGWInsertedIndication	Local-GW-Inserted-Indication[2604]	Assign	Assign
IPRealmDefaultIndication	IP-Realm-Default-Indication[2603]	Assign	Assign

List-of-Message-Bodies Items

Table 15–91 lists the List-of-Message-Bodies items.

Table 15–91 List of Message

ASN.1 IMSRecord	Diameter AVP [Code]	Aggregation Action	Translation Action
Content-Type	Event-Type Content-Type [826]	Assign	Assign
Content-Disposition	Event-Type Content-Disposition [828]	Assign	Assign
Content-Length	Event-Type Content-Length [827]	Assign	Convert from string to integer
Originator	Event-Type Content-Length [827]	Assign	Assign

Early-SDP-Media-Description-List Items

Table 15–92 lists the Early-SDP-Media-Description-List items.

Table 15–92 Early SDP Media

ASN.1 IMSRecord	Diameter AVP [Code]	Aggregation Action	Translation Action
SDP-Offer-Timestamp	SDP-Timestamps: SDP-Offer-Timestamp[1274]	Assign	Assign
SDP-Answer-Timestamp	SDP-Timestamps: SDP-Answer-Timestamp[1275]	Assign	Assign
SDP-Media-Components : SDP-Media-Name	SDP-Media-Name [844]	Assign	Assign
SDP-Media-Components : SDP-Media-Descriptions	SDP-Media-Description [845]	Assign	Assign
SDP-Media-Components : GPRS-Charging-Id	GPRS-Charging-ID [2]	Assign	Assign

Table 15–92 (Cont.) Early SDP Media

ASN.1 IMSRecord	Diameter AVP [Code]	Aggregation Action	Translation Action
MediaInitiatorFlag	Media-Initiator-Flag [882]	Assign	Assign
SDP-Session-Description	SDP-Session-Description [842]	Assign	Assign
SDP-Type	SDP-Type[2036]	Assign	Assign

Real-Time-Tariff-Information Items

Table 15–93 lists the Real-Time-Tariff-Information items.

Table 15–93 Real-Time-Tariff

ASN.1 IMSRecord	Diameter AVP [Code]	Aggregation Action	Translation Action
TariffXML	Tariff-XML [2306]	Assign	Assign

TariffInformation {
CurrencyCode,
ScaleFactor,
RateElements
}
	Tariff-Information [2060]
	{
	Current-Tariff[2056],
	Tariff-Time-Change[451],
	Next-Tariff[2057]}
		Append to the List	Only Current Tariff information would be consumed from the Diameter Input.

TariffInformation: CurrencyCode	Tariff-Information:Current-Tariff:Currency-Code[425]	Assign	Assign
TariffInformation: ScaleFactor	Tariff-Information:Current-Tariff:Scale-Factor[2059]	Assign	Calculate the REAL value from the exponent and value-digits avps of Scale-Factor AVP.
TariffInformation: RateElement:UnitType	Tariff-Information:Current-Tariff:Rate-Element[2058]:CC-Unit-Type[454]	Assign	Assign
TariffInformation: RateElement:UnitValue	Tariff-Information:Current-Tariff:Rate-Element:Unit-Value[445]	Assign	Calculate the REAL value from the exponent and value-digits avps of Unit-Value AVP.
TariffInformation: RateElement:UnitCost	Tariff-Information:Current-Tariff:Rate-Element:Unit-Cost[2061]	Assign	Calculate the REAL value from the exponent and value-digits avps of Unit-Cost AVP.
TariffInformation: RateElement:UnitQuotaThreshold	Tariff-Information:Current-Tariff:Rate-Element:Unit-Quota-Threshold[1226]	Assign	Assign