Oracle® Communications
Offline Mediation Controller

Elastic Charging Engine Cartridge Pack User Guide

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Oracle Communications Offline Mediation Controller Elastic Charging Engine Cartridge Pack User Guide, Release 6.0

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Preface

This guide contains guidelines for installing and setting up the Oracle Communications Offline Mediation Controller Elastic Charging Engine cartridge pack. The scope of this guide includes Offline Mediation Controller as it pertains to the use of this cartridge pack. It is not intended to be a complete Offline Mediation Controller reference guide.

Audience

This document is intended for charging solution designers who configure Offline Mediation Controller cartridges.

Downloading Oracle Communications Documentation

Product documentation is located on Oracle Help Center:

http://docs.oracle.com

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

https://edelivery.oracle.com

Related Documents

For more information, see the following documents:

- *Offline Mediation Controller Cartridge Development Kit Developer's Guide*: For information about how to develop a cartridge.

- *Offline Mediation Controller Cartridge Development Kit NPL Reference Guide*: For information about how to use the Node Programming Language for developing or extending a cartridge.

- *Offline Mediation Controller System Administrator's Guide*: For information about administrating Offline Mediation Controller.

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Document Revision History

The following table lists the revision history for this book.

Version	Date	Description
E39429-01	June 2015	Initial release.
E39429-02	December 2015	■ Added the following sections: Configuring Offline Mediation Controller to Support ECE when Offline Mediation Controller and ECE Are Installed on the Same System Configuring ECE and Offline Mediation Controller when ECE and Offline Mediation Controller Are Installed on Different Systems
E39429-03	September 2016	■ Updated the following sections: Installing the ECE Cartridge Pack Configuring the ECE DC Node Configuration Block ■ Added the "Retrieving the usageResponseWrapper Object" section.

1

Cartridge Pack Overview

This chapter contains an overview of the Oracle Communications Offline Mediation Controller Elastic Charging Engine (ECE) 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 1–1   ECE DC Node Configuration Architecture

2
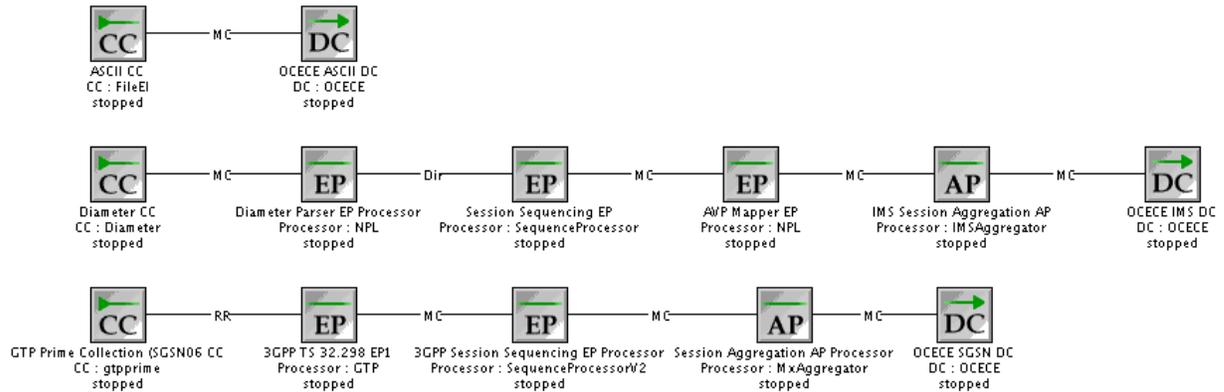
Installing the Cartridge Pack

This chapter contains information on installing and setting up the Oracle Communications Offline Mediation Controller Elastic Charging Engine cartridge pack.

Complete the following pre-installation tasks before installing the cartridge pack:

- Ensure Offline Mediation Controller 6.0 is installed.

- Stop the Node Manager, Administration Server, and Administration Client.

- Install the latest Oracle Communications Billing and Revenue Management Elastic Charging Engine (ECE) software. The ECE software contains the ECE-specific client libraries and configuration files required to connect to the ECE grid. Offline Mediation Controller does not provide any configurations to update ECE connection details. It uses the ECE-specific client libraries to connect to ECE.

Installing the ECE Cartridge Pack

> **Note:** In a Solaris or Linux environment, you must install the cartridge pack on every UNIX server running Node Manager or Administration Server.

To install the ECE cartridge pack:

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

2. If the **ocece_r***ExistingPatchVersion***.jar** file exists, where *ExistingPatchVersion* is the version of the Offline Mediation Controller patch set that is installed, remove it.

3. Create a temporary directory (*temp_dir*).

4. Go to the My Oracle Support Web site:

   http://support.oracle.com

5. Sign in with your user name and password.

6. Click the **Patches & Updates** tab.

7. From the list, select **Patch Name or Number**.

8. In the text field, enter **24486856** and click **Search**.

   The Patch Search Results page appears.

9. Click the patch name.

The patch details appear.

10. Click **Download**.

    The File Download dialog box appears.

11. Download the **p24486856_60_Generic.zip** software pack to *temp_dir*.

12. Unzip the **p24486856_60_Generic.zip** file.

13. Move the **ocece_r6_0_0_4_0.jar** file to the *OMC_home***/cartridges** directory,

14. Restart Node Manager, Administration Server, and Administration Client.

    See the discussion about starting and stopping Offline Mediation Controller in *Offline Mediation Controller System Administrator's Guide*.

    > **Note:** **ocece_r6_0_0_4_0.jar** is compatible with the ECE 11.3 release.

Verifying the Cartridge Pack Installation

You can verify that the ECE cartridge pack is installed by ensuring that the ECE Distribution Cartridge (DC) node is available in Administration Client.

To verify that the ECE cartridge pack is installed:

1. Log on to Offline Mediation Controller Administration Client.

2. From the **Administrative Function** list, select **Nodes (Logical view)**.

3. In the Available Node Types pane, expand the **Wireless** node type, and then expand the **Distribution Cartridge (DC)** node type.

    The ECE cartridge pack appears as the **OCECE** node type.

Post-Installation Tasks

This section provides instructions for the post-installation tasks.

- Depending on whether ECE and Offline Mediation Controller are installed on the same system or on different systems, do one of the following:

    - If ECE and Offline Mediation Controller are installed on the same system, you must configure Offline Mediation Controller to support ECE. See "Configuring Offline Mediation Controller to Support ECE when Offline Mediation Controller and ECE Are Installed on the Same System".

    - If ECE and Offline Mediation Controller are installed on different systems, you must configure ECE and then configure Offline Mediation Controller to support ECE. See "Configuring ECE and Offline Mediation Controller when ECE and Offline Mediation Controller Are Installed on Different Systems".

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.

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*.

Uninstalling the Cartridge Pack from a Solaris or Linux Workstation

To uninstall the ECE cartridge pack from a Solaris or Linux workstation:

1. Go to the *OMC_home*/**cartridges** directory.

2. Run the following command:

   ```
   rm ocece_r6_0_0_4_0.jar
   ```

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Creating and Configuring the Elastic Charging Engine Distribution Cartridge Node

This chapter contains information on the requirements for creating and configuring the Oracle Communications Offline Mediation Controller Elastic Charging Engine (ECE) Distribution Cartridge (DC) node.

Configuring the ECE DC Node

To configure the ECE DC node:

1. Log on to Offline Mediation Controller Administration Client.

   The Node Hosts & Nodes (logical view) screen appears.

2. In the **Mediation Hosts** table, select a host.

3. In the **Nodes on Mediation Host** section, click **New**.

   The Create a Node dialog box appears.

4. Select **Wireless** and click **Next**.

5. Select **Distribution Cartridge (DC)** and click **Next**.

6. Select **OCECE** and click **Finish**.

   The New Node dialog box appears.

7. In the **Name** field, enter a name for the node.

8. From the **Rule File** list, select the rule file that matches the type of input file processed by the DC node. See "NPL Rule File Configuration" for more information about NPL rule file configuration.

9. Click the **General** tab and do the following:

   a. From the **Debug** list, select one of the following:

      To log short debug messages in the node log file, select **OFF**.

      To log detailed debug messages in the node log file, select **ON**.

   b. In the **Max Log File Size** field, enter the maximum size in bytes for the log file. When the log file reaches its limit, the node closes the file and opens a new file. The minimum value is **50000** and the maximum value is **2000000000**.

   c. Select the **Enable Statistics** check box, which enables node statistics.

   d. Select the **Enable bulk read/write** check box, which enables the node to read or write files in bulk.

e. In the **Read Timer** field, enter the interval in seconds the node waits before checking for incoming data. The minimum value is **1** and the maximum value is **3600**.

f. Select the **Backup NAR Files** check box, which enables backing up each network accounting record (NAR) the cartridge processes.

g. In the **NAR File Retention Period** field, enter the number of days to retain the backed up NAR files.

h. Select the **Input Stream Monitoring** check box, which enables the cartridge to monitor the input stream and trigger an alarm if the node does not receive any input for the set interval.

i. In the **Interval** field, enter the time period to wait before an alarm is triggered when the node does not receive any input. You also select the time unit: days (**Day**), hours (**Hour**), or minutes (**Minute**).

10. Click the **OCECE Configuration** tab and do the following:

a. In the **Batch size** field, enter the number of records per batch.

b. In the **Max records per suspense/success file** field, enter the maximum number of records per file written in the *OMC_home*/**ocomc/suspense** or the *OMC_home*/**ocomc/success** directory, where *OMC_home* is the directory in which Offline Mediation Controller is installed. The minimum value is **1** and the maximum value is **50000**.

c. In the **Waiting time per batch** field, enter the time in milliseconds the node waits for the batch to be processed. The minimum value is **5000** and the maximum value is **1800000**.

d. In the **Timeout for Archiving NAR files** field, enter the time in milliseconds the node waits for archiving the NAR files from the *OMC_home*/**ocomc/scratch** directory into their respective folders. The minimum value is **300000** and the maximum value is **1800000**.

e. Select the **Output bad records as NAR** check box, which generates a NAR for the bad records.

f. Select the **Log success records** check box, which enables writing the records successfully processed by ECE to the file in the *OMC_home*/**ocomc/success** directory.

Note: The ECE DC node logs successfully processed ECE records to the success file when the advice of charge (AoC) notification in ECE is set to include events as an in-session notification on the usage response message (PIGGYBACK). See the ECE documentation for more information about configuring AoC notifications.

---

11. Click **Save**.

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NPL Rule File Configuration

This chapter describes the Oracle Communications Offline Mediation Controller Node Programming Language (NPL) rule file configuration for the Oracle Communications Offline Mediation Controller Elastic Charging Engine (ECE) cartridge pack.

NPL Rule File

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

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

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

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";
REQUEST_MODE_TYPE "usage_request_type";}
```

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 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 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 the ECE DC to send the session start time and the session end time to ECE. The default 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.

REQUEST_MODE_TYPE "*usage_request_type*"**;**

where *usage_request_type* specifies the type of usage request the Offline Mediation Controller sends to ECE. Set the parameter to one of the following values:

- **ONLINE**: Specifies that the online usage request is sent to ECE.

- **OFFLINE**: Specifies that the offline usage request is sent to ECE.

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";
REQUEST_MODE_TYPE "ONLINE";
}
```

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 Usage Object

For every usage object 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";
}
```

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";}
```

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"
```

Retrieving the usageResponseWrapper Object

You can use a Java hook to retrieve the usageResponseObject from the output NAR file of the ECE DC node. The following is a sample of a Java hook that retrieves the usageResponseWrapper object:

```
public interface InterfaceName extends IDCMethodHandler {
public UsageResponseWrapper methodName(ObjectField obj);
}
public class className implements InterfaceName {
@Override
public UsageResponseWrapper methodName(ObjectField obj){
UsageResponseWrapper usageResponseWrapper= new UsageResponseWrapper();
usageResponseWrapper.setOnlineusageResponseObj((OnlineUsageResponse)obj);
return usageResponseWrapper;
}
```

For more information on using Java hooks with NPL, see the discussion on Java hooks in *Offline Mediation Controller Cartridge Development Kit NPL Reference Guide*.

A

Sample Mapping for the 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 A–1 shows the sample ASCII voice mappings for the Terminate usage type.

Table A–1   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 A–2 shows the sample ASCII voice mappings for the Update usage type.

Table A–2   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 A–3 shows the sample ASCII voice mappings for the Refund_Unit usage type.

Table A–3   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 A–3   (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 A–4 shows the sample ASCII voice mappings for the Refund_Amount usage type.

Table A–4   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 A–5 shows the sample ASCII data mappings for the Terminate usage type.

Table A–5   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 A–5 (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 A–6 shows the sample ASCII data mappings for the Update usage type.

Table A–6 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 A–7 shows the sample ASCII data mappings for the Refund_Unit usage type.

Table A–7   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 A–8 shows the sample ASCII data mappings for the Refund_Amount usage type.

Table A–8   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 A–9 shows the sample SGSN data mapping for the PDP record.

Table A–9   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 A–10 shows the sample SGSN data mapping for the S-GW record.

Table A–10   Sample SGSN Data Mapping for the S-GW Record

ASN1 Fields	SGSN	USED_UNITS[0].OUTPUT_VOLUME	
listOfTrafficVolumes.dataVolumeGPRSUplink	part of 20209	USED_UNITS[0].OUTPUT_VOLUME	
listOfTrafficVolumes.dataVolumeGPRSDownlink	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 A–11 shows the sample SGSN data mapping for the P-GW record.

Table A–11   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 A–12 shows the sample SGSN SMS mapping for the Terminate usage type.

Table A–12   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 A–13 shows the sample SGSN SMS mapping for the Update usage type.

Table A–13   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 A–14 shows the sample SGSN SMS mapping for the Refund_Unit usage type.

Table A–14   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 A–14 (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 A–15 shows the sample SGSN SMS mapping for the Refund_Amount usage type.

Table A–15 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 the case of an 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 A–16 shows the sample IMS voice mapping.

Table A–16   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 A–17 shows the sample Oracle CDR format voice mappings for the Terminate usage type.

Table A–17   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 A–17 (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 A–18 shows the sample Oracle CDR format data mappings for the Terminate usage type.

Table A–18 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 A–19 shows the sample Oracle CDR format SMS mapping for the Terminate usage type.

Table A–19   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 A–20 shows the sample Oracle CDR format TelcoGsmTelephony mapping for the Terminate usage type.

Table A–20   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 A–20   (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 A–21 shows the sample Oracle CDR format TelcoGprs mapping for the Terminate usage type.

Table A–21   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 A–21 (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 A–21   (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	