Oracle® Communications Offline Mediation Controller

IMS CDF/CGF Cartridge Pack User Guide

Release 6.0

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Oracle Communications Offline Mediation Controller IMS CDF/CGF Cartridge Pack User Guide, Release 6.0

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Preface

This document contains guidelines for installing and setting up Oracle Communications Offline Mediation Controller IMS CDF/CGF cartridge pack.

Audience

This document is intended for 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 administrating Oracle Communications Offline Mediation Controller.

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1

About this Guide

This chapter contains an overview about Oracle Communications Offline Mediation Controller cartridges.

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.

About the Cartridges

Offline Mediation Controller cartridge packs are discrete software components that are developed for the Offline Mediation Controller product. An Offline Mediation Controller cartridge pack offers specific domain behavior on top of the core Offline Mediation Controller software.

An Offline Mediation Controller cartridge pack is not a standalone component; it operates in conjunction with the Offline Mediation Controller core product. Offline Mediation Controller cartridge packs offer the following benefits:

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

> **Note:** Cartridges are designed for a specific technology, software load, and service.

For more information on creating and extending a cartridge, refer to the following documents:

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

Cartridge Pack Content

An Offline Mediation Controller cartridge contains the following:

- **JAR file**: Contains the cartridge software.
- **Cartridge Pack User Guide**: Contains a description of cartridge pack functionality and installation and configuration instructions.

2

Cartridge Pack Overview

This chapter contains an overview of Oracle Communications Offline Mediation Controller IMS CDF/CGF cartridge pack.

New Features

This section lists the new features.

Version 6.0.0

This cartridge pack now works with Oracle Communications Offline Mediation Controller 6.0.

The following enhancement and updates to standards compliance were added in this version of the IMS CDF/CGF cartridge pack:

- 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

Version 3.3.0

The IMS 3.3.0 Cartridge Pack was updated in conjunction with Network Mediation 5.1.1.

Version 3.2.0

The IMS 3.2.0 Cartridge Pack was updated in conjunction with Network Mediation 5.1.0.

Also, Node-Functionality AVP is now used to determine the CDR record type.

Version 3.0.0

The following enhancement and updates to standards compliance were added in this version of the IMS CDF/CGF cartridge pack:

- Support for Cause-Code AVP value of -4.
- Compliance with 3GPP Technical Specification 32.298 v6.3.0.
- Compliance with 3GPP Technical Specification 32.260 v6.5.0.
- Compliance with 3GPP Technical Specification 32.299 v6.6.0.

Version 2.0.0

Fix: The ASN.1 fields "RecordOpeningTime" and "RecordClosingTime" in partial CDRs are now calculated correctly, based on when each CDR is opened and closed.

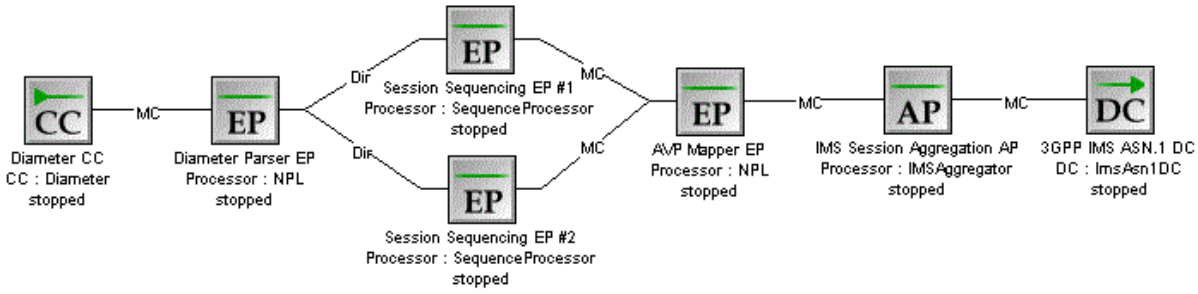
3

Architecture

This chapter contains an overview of Oracle Communications Offline Mediation Controller IMS CDF/CGF cartridge architecture.

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 3–1.

Figure 3–1 Cartridge Architecture



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.

4

Installing the Cartridge Pack

This chapter contains information on the requirements for installing and setting up Oracle Communications Offline Mediation Controller IMS CDF/CGF cartridge pack.

Installing the Cartridge Pack

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

1. Ensure Offline Mediation Controller 6.0 is installed.
2. Stop Node Manager, Administration Server, and Administration Client.
3. Delete any existing IMS cartridge JAR file from the *OMC_Home*/**cartridges** directory, where *OMC_Home* is the directory in which Offline Mediation Controller is installed.

Installation Instructions

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

Installing on a Solaris or Linux Workstation

To install the cartridge pack on a Solaris or Linux workstation:

1. Download the **IMS_R6_0_0.jar** file to the *OMC_Home*/**cartridges** directory.
2. Restart Node Manager, Administration Server, and Administration Client.

Post Installation Instructions

After the Cartridge Pack has been installed, restart Node Manager, Administration Server, and Administration Client.

Testing the Cartridge Pack Installation

Verify that the Cartridge Pack has been properly installed by viewing **Version Info** from the **Help** menu in Administration Client. The Cartridge Pack name and version information should appear, along with the information about Node Manager, Administration Server, and Administration Client.

5

Creating and Configuring the Cartridges

This chapter contains information on the requirements for creating and configuring the Oracle Communications Offline Mediation Controller IMS CDF/CGF cartridges.

Creating and Configuring the Diameter CC

The Diameter CC collects raw diameter data from IMS devices and passes that data to the next node in the chain, the Diameter Parser EP.

To create and configure the Diameter CC:

1. Log on to Offline Mediation Controller Administration Client.

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

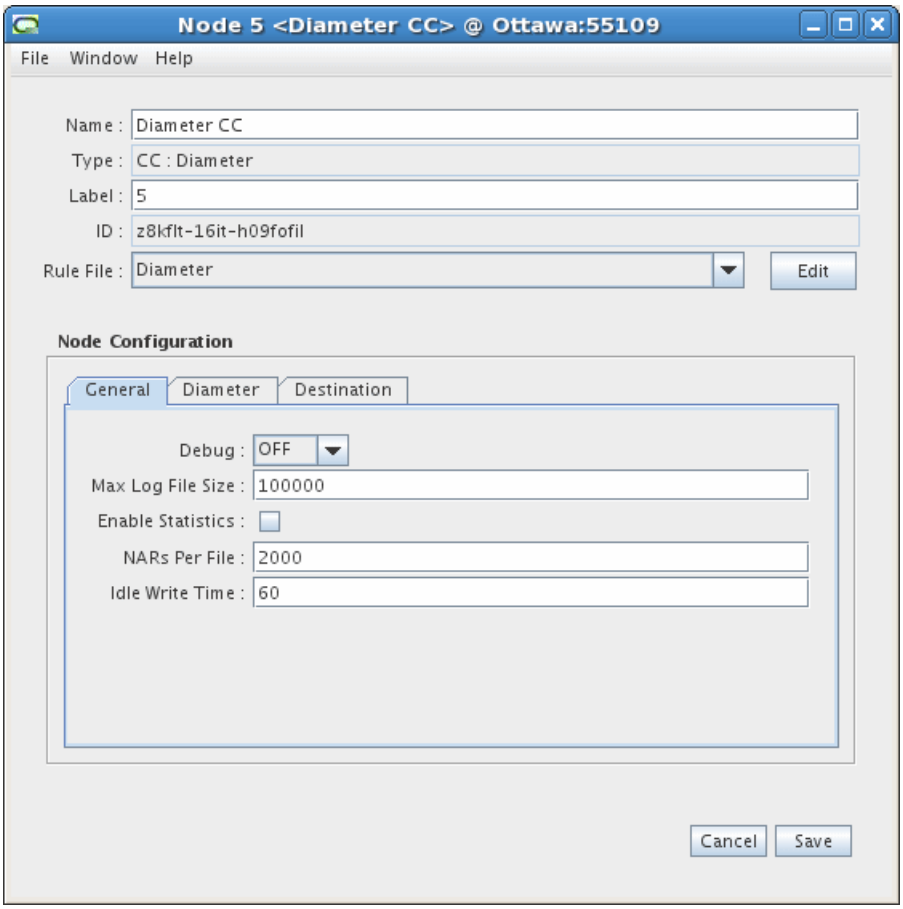
2. In the **Mediation Hosts** table, select a host.
3. In the **Nodes on Mediation Host** section, click **New**.

   The Create a Node dialog box appears.

4. Select the **Wireless** service solution and click **Next**.
5. Select **Collection Cartridge (CC)** and click **Next**.
6. Select **Diameter** and click **Finish**.
7. In the node configuration window, enter a name for the node and accept the default rule file.
8. On the **General** tab, accept the default field values or make changes where necessary. The **General** tab contains generic settings that are applicable to all collection cartridges in Offline Mediation Controller. The field definitions are as follows:

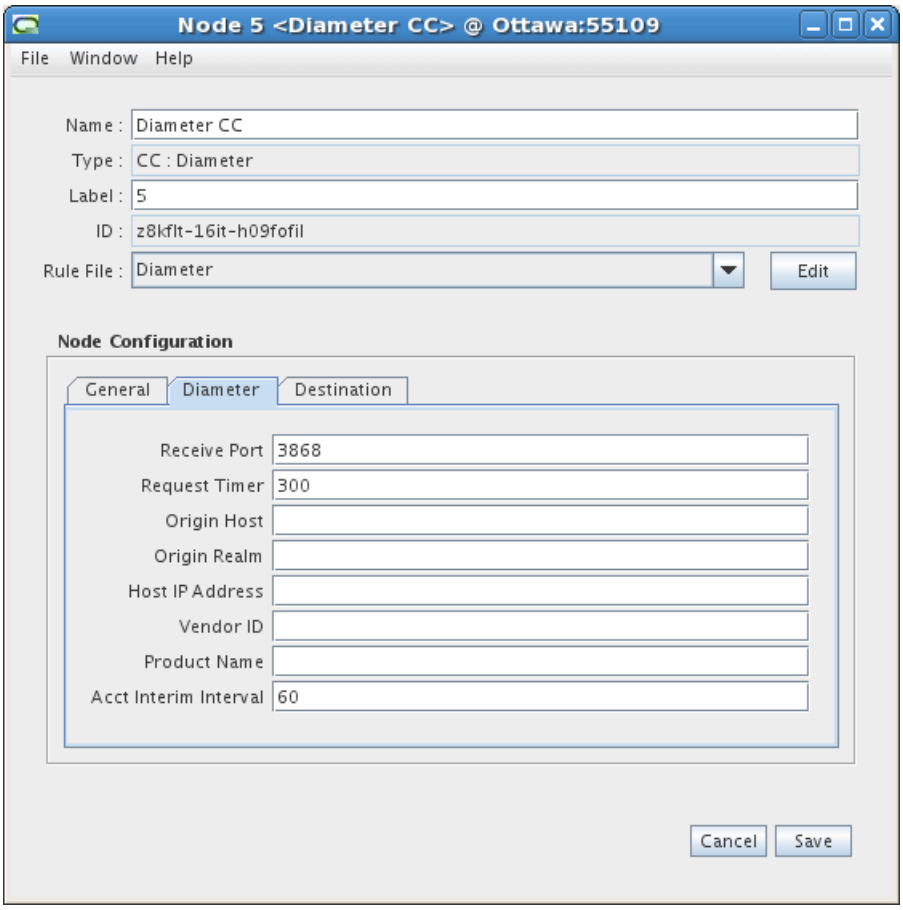
   - **Debug Level** - Each cartridge produces a separate log file in addition to the administration server and node manager log files. This setting allows the user to control the verbosity of the debug messages generated and logged by the cartridge.
   - **Max Log File Size** - This field allows you to control how large each log file ill get before the node closes the file and opens a new one.
   - **NARs per File** - Controls how many Network Accounting Records (NARs) the CC groups before transmitting the files to the next node in the chain. In this case, one Diameter CC NAR corresponds to one ACR (Diameter Accounting Request).

- **Idle Write Time** - If a cartridge has been idle for the amount of time specified here (in seconds), it will automatically transmit any NARs previously generated.

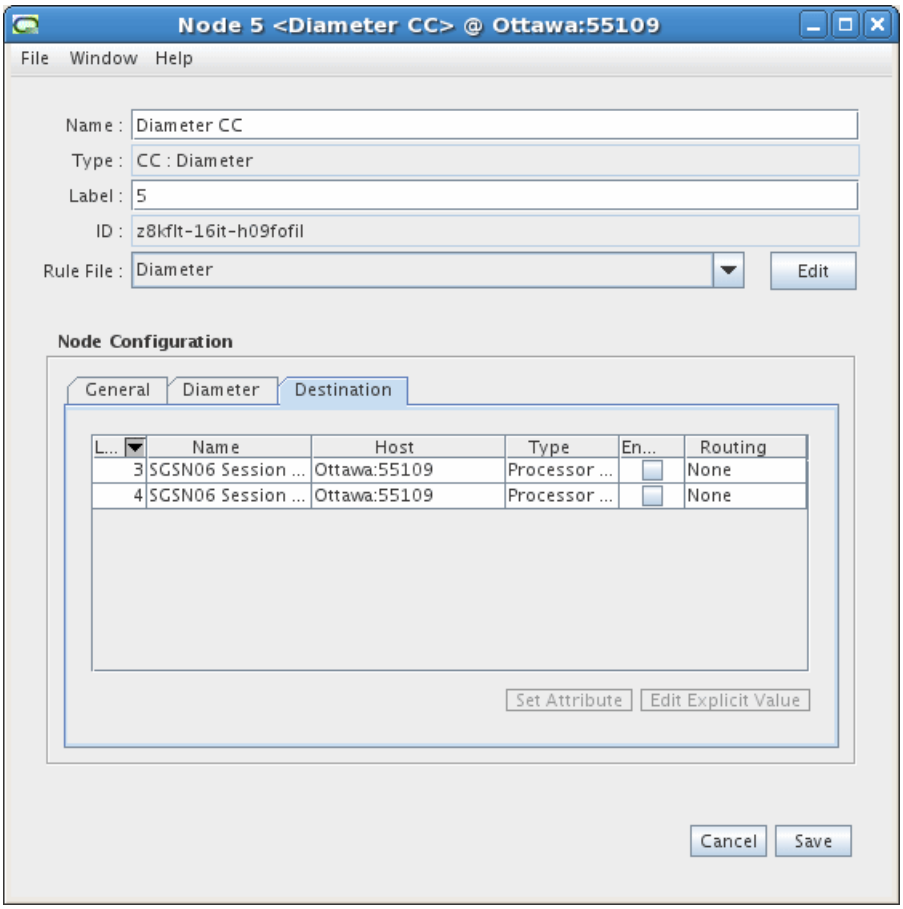


9. On the **Diameter** tab, accept the default field values or make changes where necessary. The field definitions are as follows:

   - **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.



10. You do not need to configure any settings on the **Destinations** tab.



11. Click **Save**.

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, the Session Sequencing EP.

To create and configure the Diameter Parser EP:

1. Log on to Offline Mediation Controller Administration Client.

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

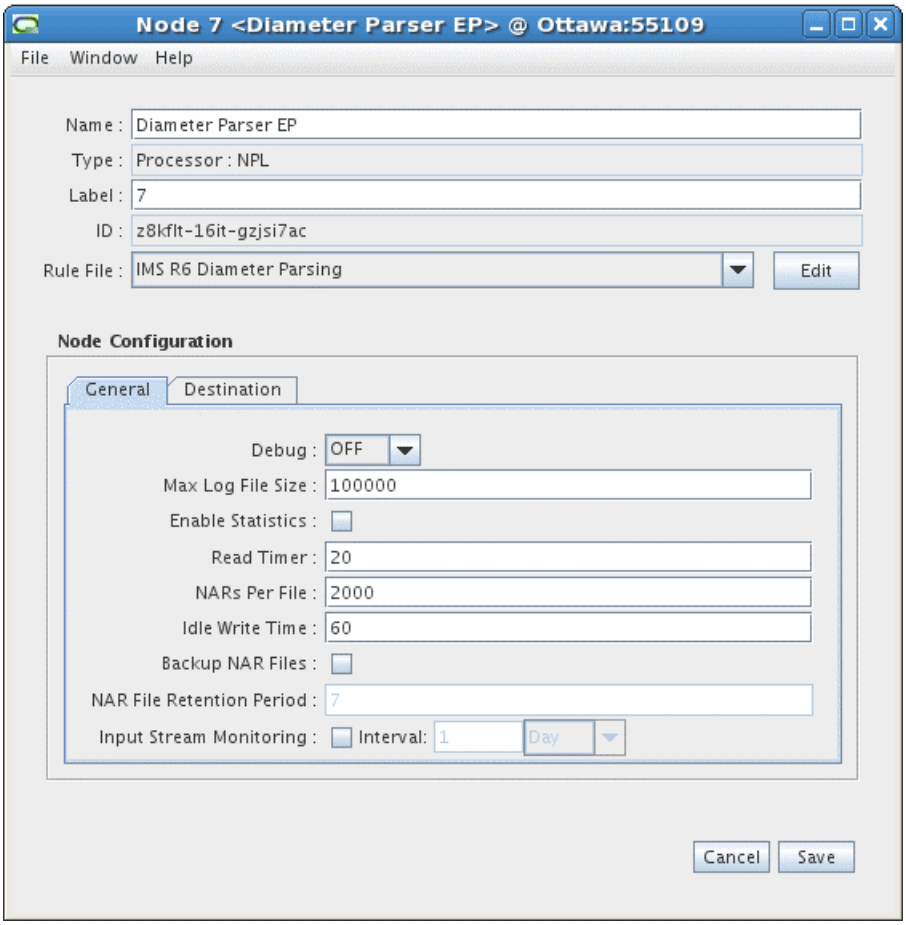
2. In the **Mediation Hosts** table, select a host.
3. In the **Nodes on Mediation Host** section, click **New**.

   The Create a Node dialog box appears.

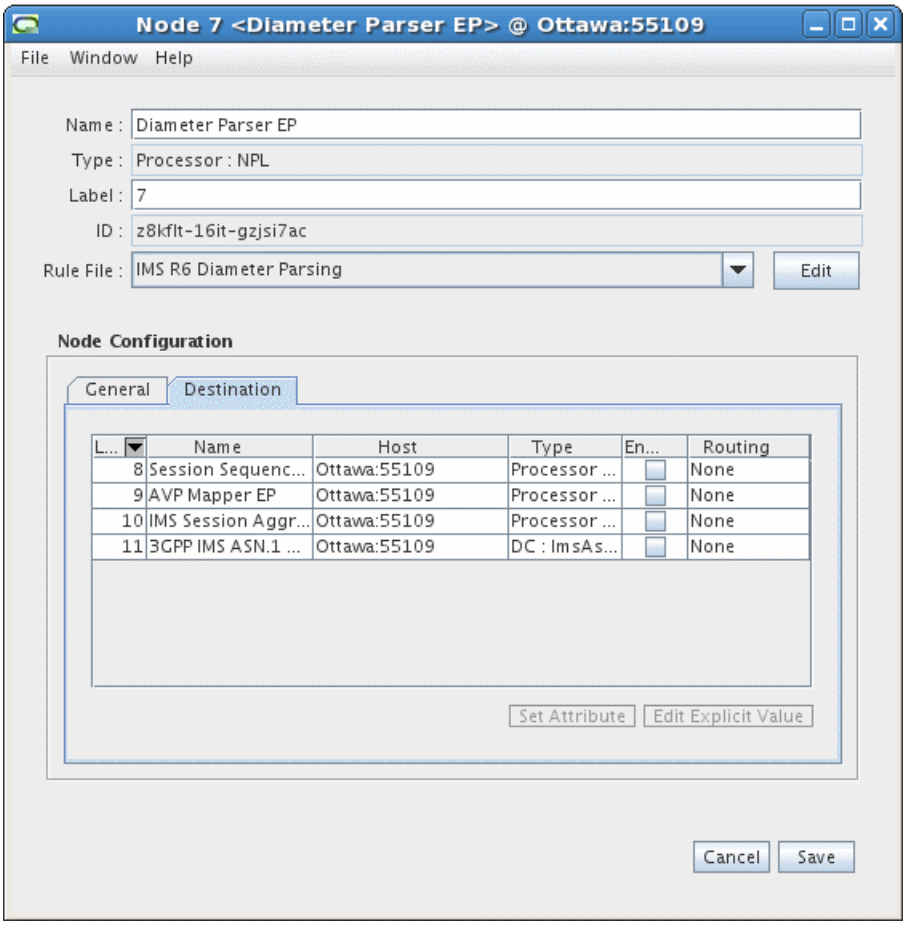
4. Select the **Wireless** service solution and click **Next**.
5. Select **Enhancement Processor (EP)** and click **Next**.
6. Select **Diameter Parser** and click **Finish**.
7. In the node configuration window, enter a name for the node and accept the default rule file.
8. On the **General** tab, accept the default field values or make changes where necessary. The **General** tab contains generic settings that are applicable to all

collection cartridges in Offline Mediation Controller. The field definitions are as follows:

- **Debug Level** - Each node produces a separate log file in addition to the administration server and node manager log files. This setting allows you to control the verbosity of the debug messages generated and logged by the node.
- **Max Log File Size** - This field allows you to control how large each log file will get before the node closes the file and opens a new one.
- **Read Timer** - The amount of time, in seconds, that the node waits before checking for incoming data. The minimum value is 1 and the maximum value is 3600.
- **NARs per File** - This setting determines how many Network Accounting Records (NARs) the node collects before sending the files to the next node in the chain.
- **Idle Write Time** - If a cartridge has been idle for the amount of time (in seconds) specified here, it will automatically transmit any NARs that it has previously generated.
- **Backup NAR Files** - If you select this checkbox, the cartridge will backup each NAR it has processed.
- **NAR File Retention Period** - If you select the **Backup NAR Files** checkbox, then this field becomes active and you can enter the number of days to retain the backed up NAR files.



9. You do not need to configure any settings on the **Destinations** tab.



10. Click **Save**.

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 - follow the procedure below, and 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.

To create and configure the Session Sequencing EP:

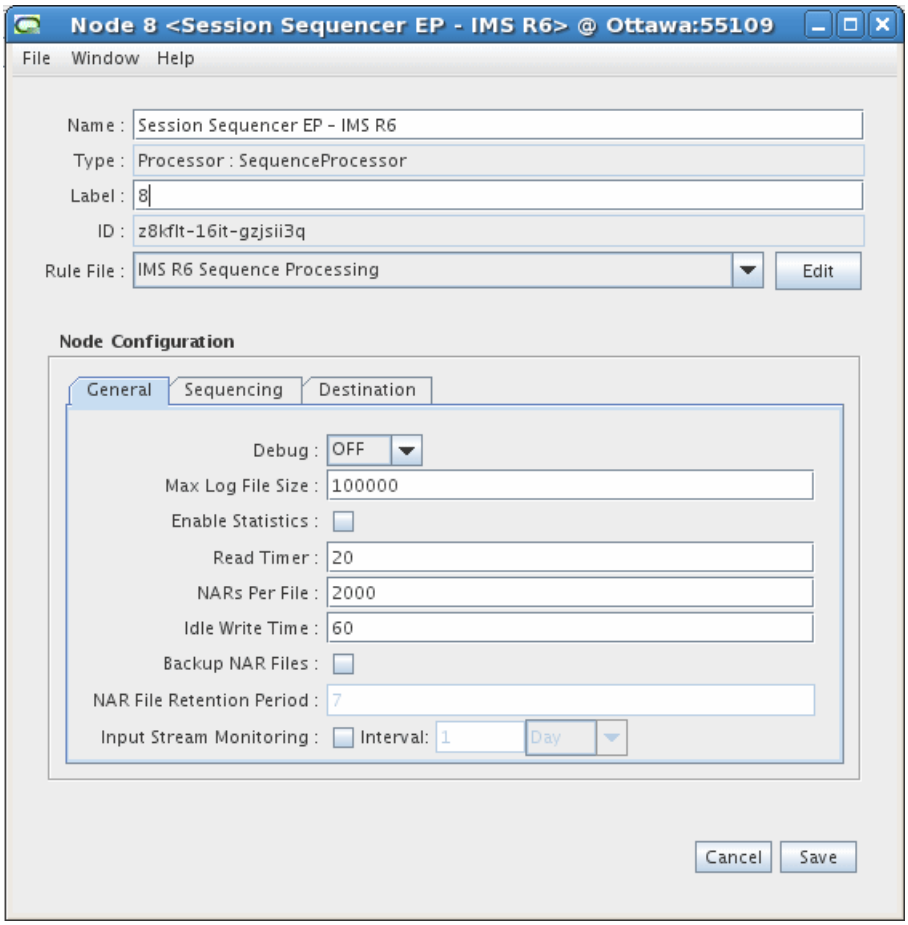
1. Log on to Offline Mediation Controller Administration Client.

   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**.

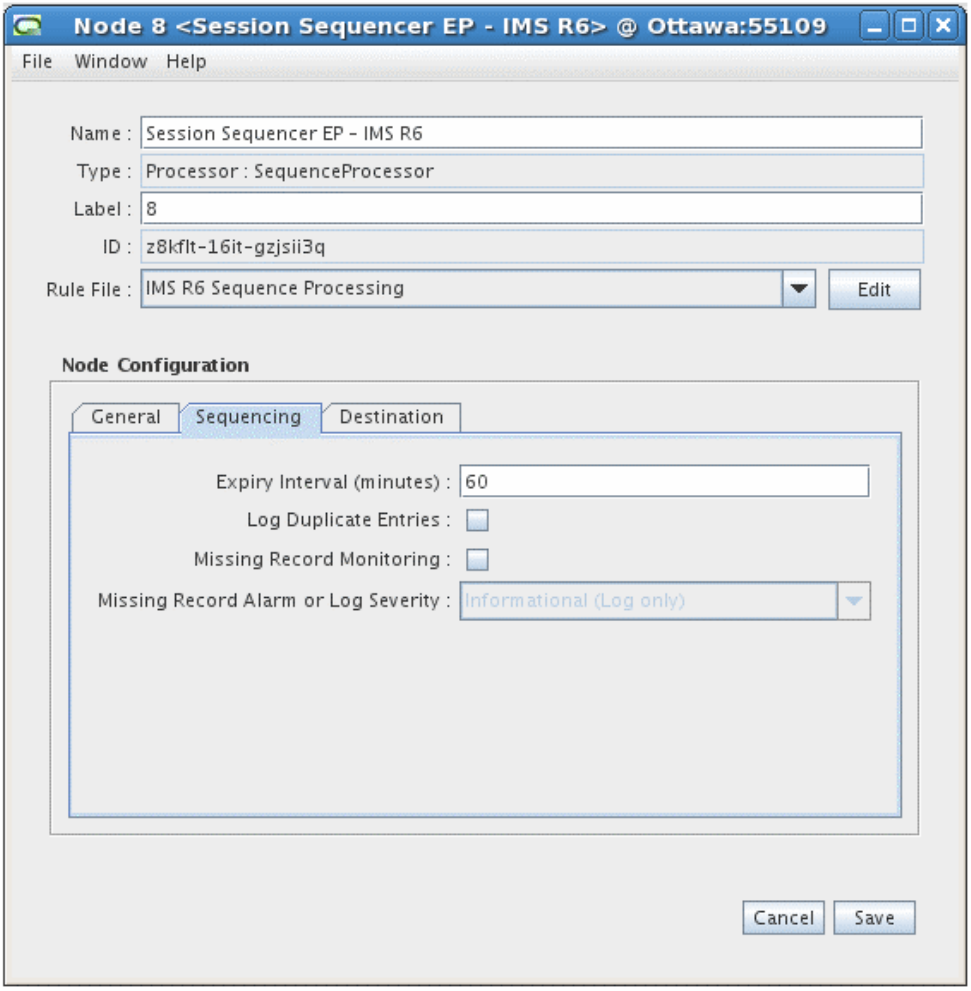
   The Create a Node dialog box appears.

4. Select the **Wireless** service solution and click **Next**.
5. Select **Enhancement Processor (EP)** and click **Next**.
6. Select **Session Sequencing** and click **Finish**.
7. In the node configuration window, enter a name for the node and select the **IMS R6 Event De-Duplication** or the **IMS R6 Sequence Processing** rule file, depending on whether this is the first EP or the second one you are creating.
8. On the **General** tab, accept the default field values or make changes where necessary. The **General** tab contains generic settings that are applicable to all collection cartridges in Offline Mediation Controller. The field definitions are as follows:
   - **Debug Level** - Each node produces a separate log file in addition to the administration server and node manager log files. This setting allows you to control the verbosity of the debug messages generated and logged by the node.
   - **Max Log File Size** - This field allows you to control how large each log file will get before the node closes the file and opens a new one.
   - **Read Timer** - The amount of time, in seconds, that the node waits before checking for incoming data. The minimum value is 1 and the maximum value is 3600.
   - **NARs per File** - This setting determines how many Network Accounting Records (NARs) the node collects before sending the files to the next node in the chain.
   - **Idle Write Time** - If a cartridge has been idle for a specified amount of time (in seconds), it will automatically transmit any NARs previously generated.
   - **Backup NAR Files** - If you select this checkbox, the cartridge will backup each NAR it has processed.
   - **NAR File Retention Period** - If you select the **Backup NAR Files** checkbox, then this field becomes active and you can enter the number of days to retain the backed up NAR files.

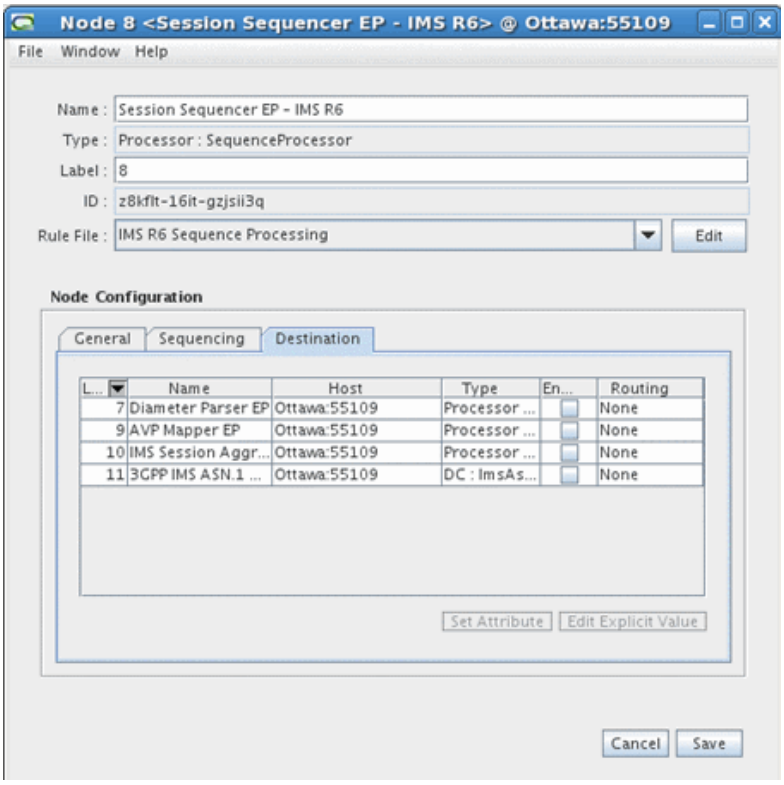


9. On the **Sequencing** tab, accept the default field values or make changes where necessary. The field definitions are as follows:

   - **Expiry Interval (minutes)** - The amount of time, in minutes, the node waits for out-of-sequence records before sending any received records to the next node in the chain.
   - **Log Duplicate Entries** - Select this optional checkbox if you want the node to create a log entry for each duplicate record.



10. You do not need to configure any settings on the **Destinations** tab.



11. Click **Save**.

Creating and Configuring the AVP Mapper EP

The AVP Mapper EP is responsible for converting the incoming Diameter AVPs into their equivalent 32.298 ASN.1 format. See "Output Specification" for the exact mapping of Diameter AVP to ASN.1 fields.

To create and configure the AVP Mapper EP:

1. Log on to Offline Mediation Controller Administration Client.

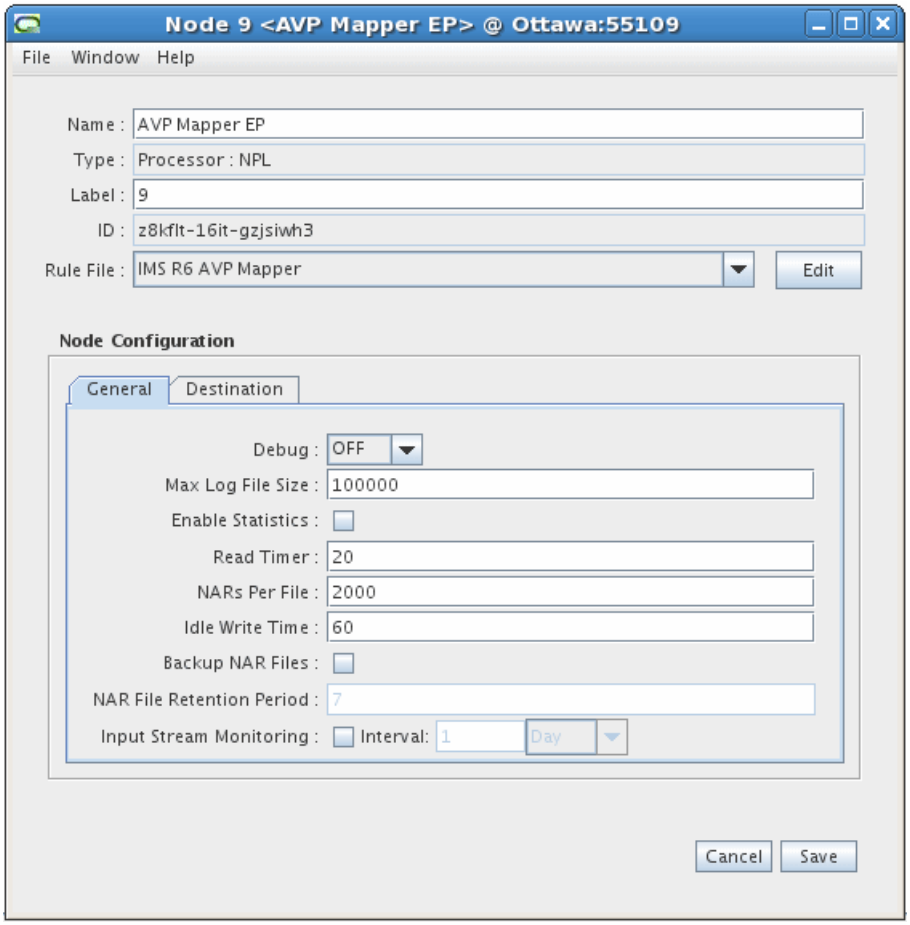
   The Node Hosts & Nodes (logical view) screen appears.

2. In the **Mediation Hosts** table, select a host.
3. In the **Nodes on Mediation Host** section, click **New**.

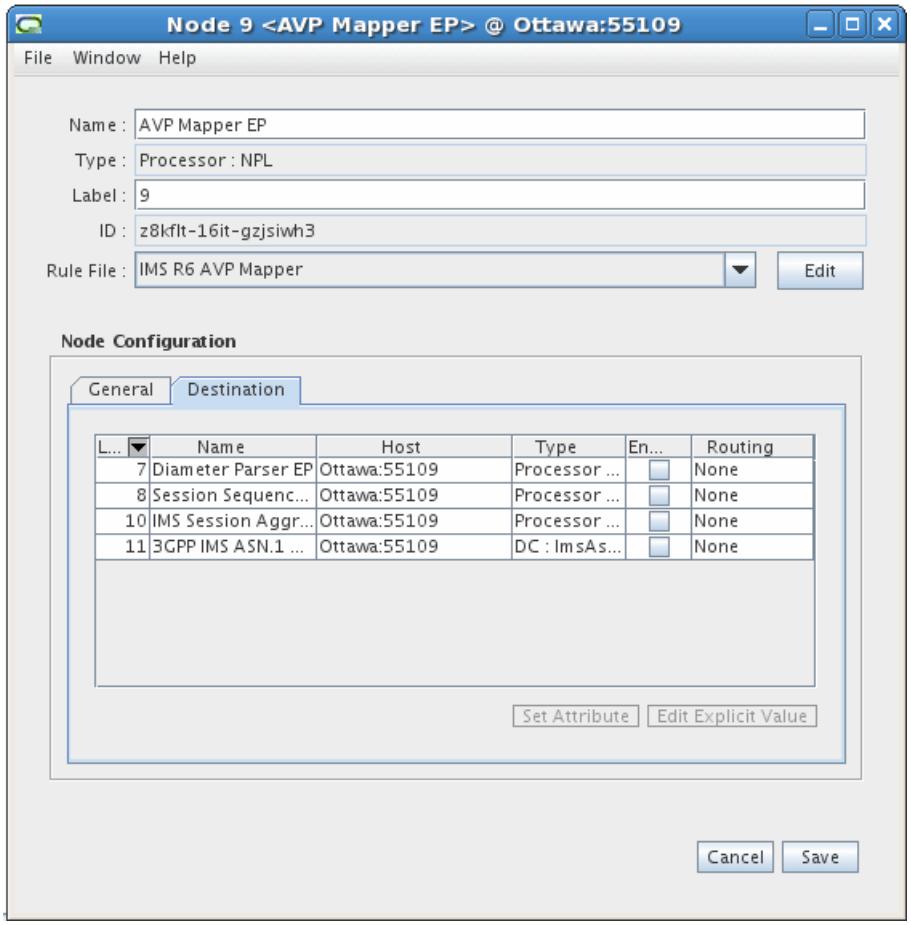
   The Create a Node dialog box appears.

4. Select the **Wireless** service solution and click **Next**.
5. Select **Enhancement Processor (EP)** and click **Next**.
6. Select **AVP Mapper** and click **Finish**.
7. In the node configuration window, enter a name for the node and accept the default rule file.
8. On the **General** tab, accept the default field values or make changes where necessary. The **General** tab contains generic settings that are applicable to all collection cartridges in Offline Mediation Controller. The field definitions are as follows:

- **Debug Level** - Each node produces a separate log file in addition to the administration server and node manager log files. This setting allows you to control the verbosity of the debug messages generated and logged by the node.
- **Max Log File Size** - This field allows you to control how large each log file will get before the node closes the file and opens a new one.
- **Read Timer** - The amount of time, in seconds, that the node waits before checking for incoming data. The minimum value is 1 and the maximum value is 3600.
- **NARs per File** - This setting determines how many Network Accounting Records (NARs) the node collects before sending the files to the next node in the chain.
- **Idle Write Time** - If a cartridge has been idle for the amount of time specified here (in seconds), it will automatically transmit the NARs previously generated.
- **Backup NAR Files** - If you select this checkbox, the cartridge will backup each NAR it has processed.
- **NAR File Retention Period** - If you select the **Backup NAR Files** checkbox, then this field becomes active and you can enter the number of days to retain the backed up NAR files.



9. You do not need to configure any settings on the **Destinations** tab.



10. Click **Save**.

Creating and Configuring the IMS Session Aggregation AP

The IMS Session Aggregation AP is responsible for compiling record sessions, and passing these files on to the 3GPP IMS ASN.1 DC.

To create and configure the IMS Session Aggregation AP:

1. Log on to Offline Mediation Controller Administration Client.

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

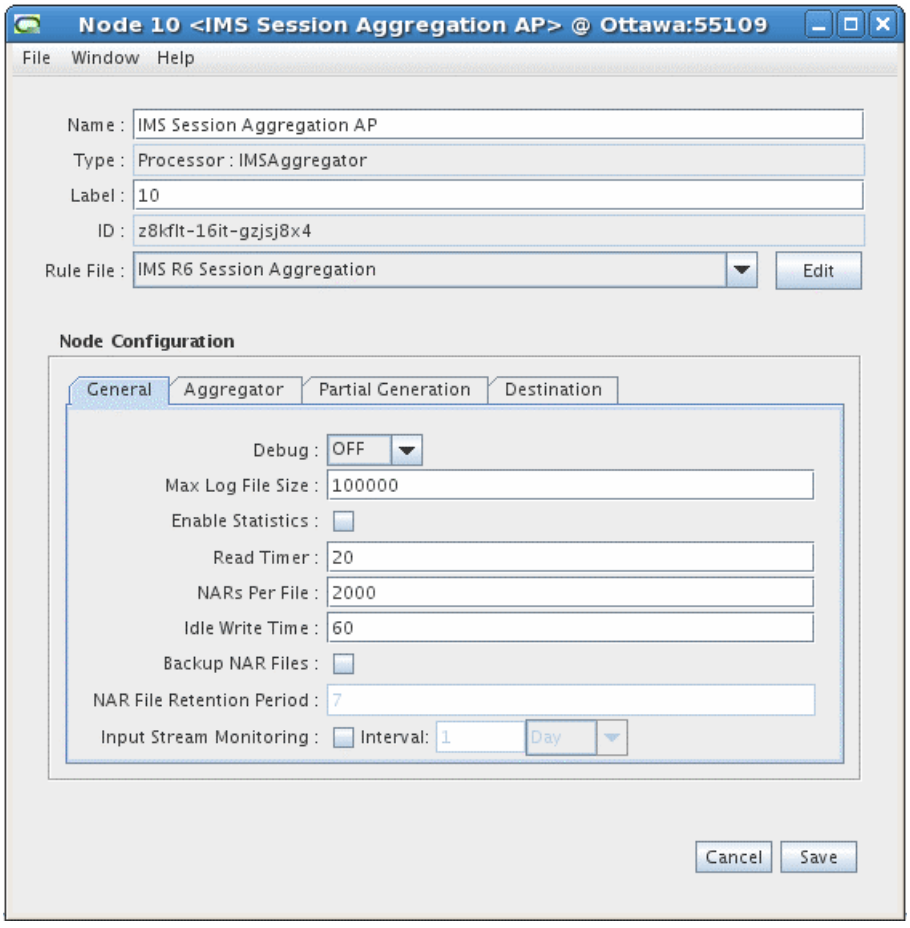
2. In the **Mediation Hosts** table, select a host.
3. In the **Nodes on Mediation Host** section, click **New**.

   The Create a Node dialog box appears.

4. Select the **Wireless** service solution and click **Next**.
5. Select **Aggregation Processor (AP)** and click **Next**.
6. Select **Session Aggregation for IMS** and click **Finish**.
7. In the node configuration window, enter a name for the node and accept the default rule file.
8. On the **General** tab, accept the default field values or make changes where necessary. The **General** tab contains generic settings that are applicable to all

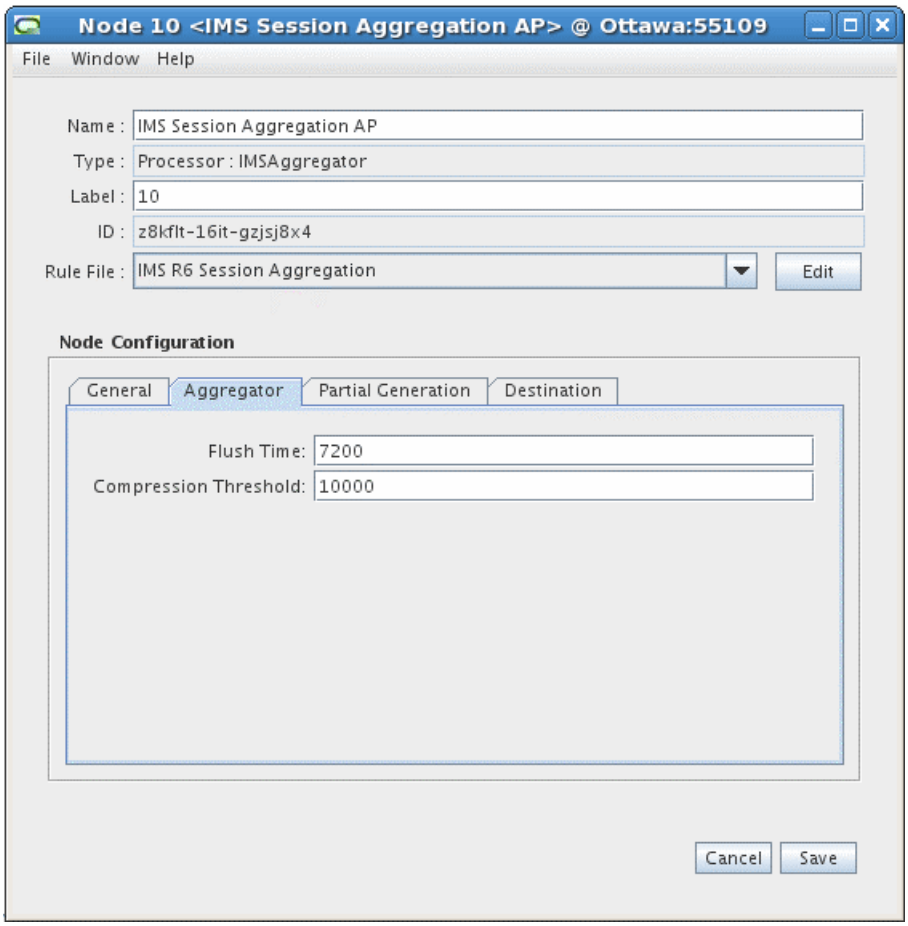
collection cartridges in Offline Mediation Controller. The field definitions are as follows:

- **Debug Level** - Each node produces a separate log file in addition to the administration server and node manager log files. This setting allows you to control the verbosity of the debug messages generated and logged by the node.
- **Max Log File Size** - This field allows you to control how large each log file will get before the node closes the file and opens a new one.
- **Read Timer** - The amount of time, in seconds, that the node waits before checking for incoming data. The minimum value is 1 and the maximum value is 3600.
- **NARs per File** - This setting determines how many Network Accounting Records (NARs) the node collects before sending the files to the next node in the chain.
- **Idle Write Time** - If a cartridge has been idle for a specific amount of time (in seconds), it will automatically transmit any NARs previously generated.
- **Backup NAR Files** - If you select this checkbox, the cartridge will backup each NAR it has processed.
- **NAR File Retention Period** - If you select the **Backup NAR Files** checkbox, then this field becomes active and you can enter the number of days to retain the backed up NAR files.

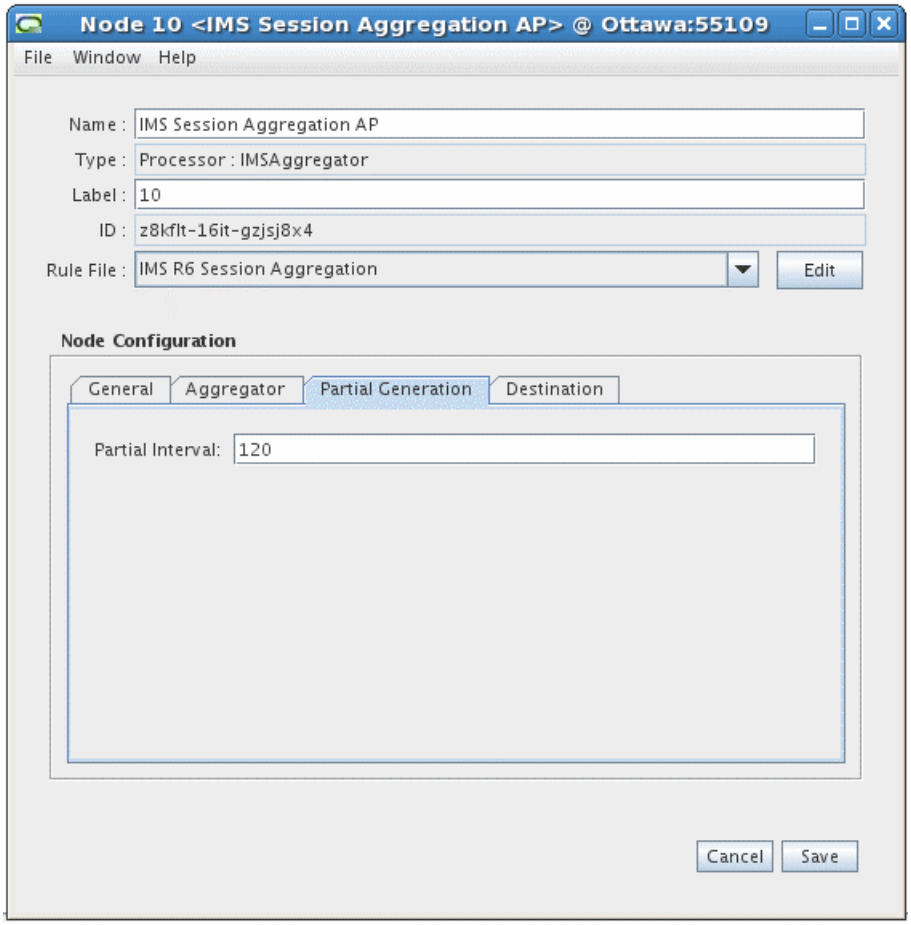


9. On the **Aggregator** tab, accept the default field values or make changes where necessary. The field definitions are as follows:

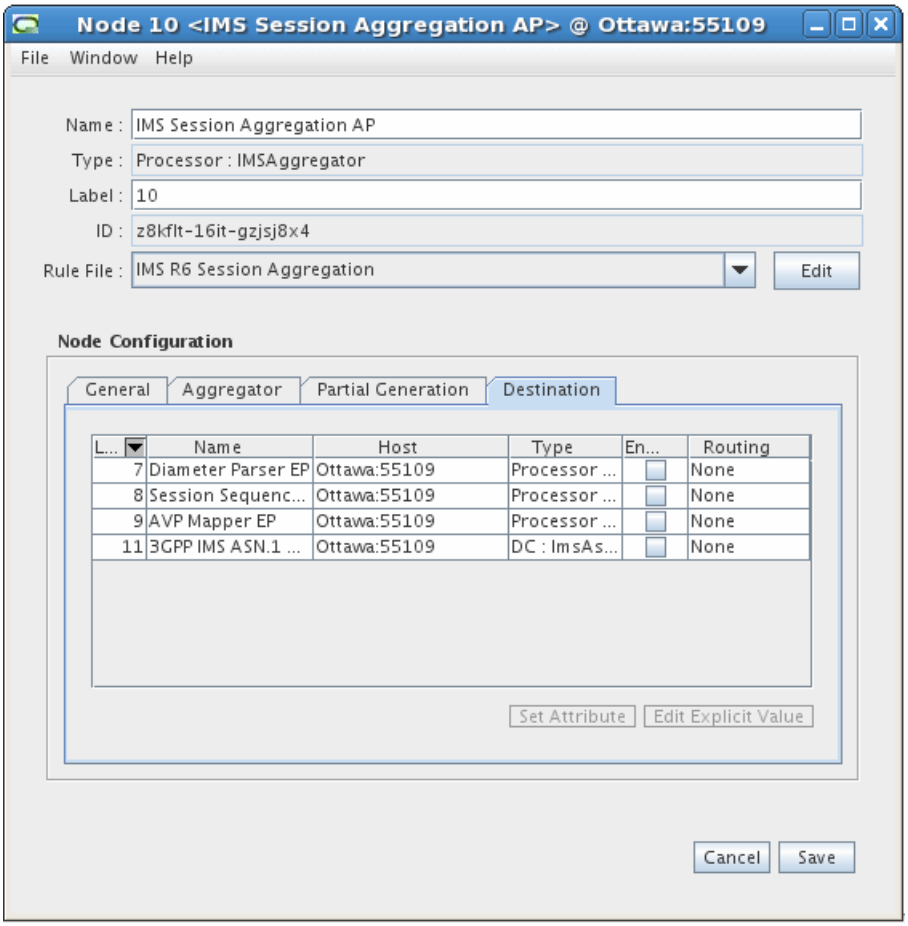
   - **Flush Time** - The interval, in seconds, at which the node sends aggregated NARs to the next node in the chain. The recommended configuration for the Flush Time is twice the configured Expiry Interval on the Session Sequencing EP. In addition, the Flush Time value should be higher than the configured Interim Accounting value on the CSCF as to avoid premature generation of CDRs.
   - **Compression Threshold** - The number of stale records the node allows before compressing the aggregation table.



10. On the **Partial Generation** tab, you can modify or accept the default field value for the **Partial Interval** field, which is the time in minutes the node waits before generating a partial CDR.



11. You do not need to configure any settings on the **Destinations** tab.



12. Click **Save**.

Creating and Configuring the 3GPP IMS ASN.1 DC

The 3GPP IMS ASN.1 DC converts the files it receives to ASN.1 format and then outputs the files to a downstream system.

To create and configure the 3GPP IMS ASN.1 DC:

1. Log on to Offline Mediation Controller Administration Client.

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

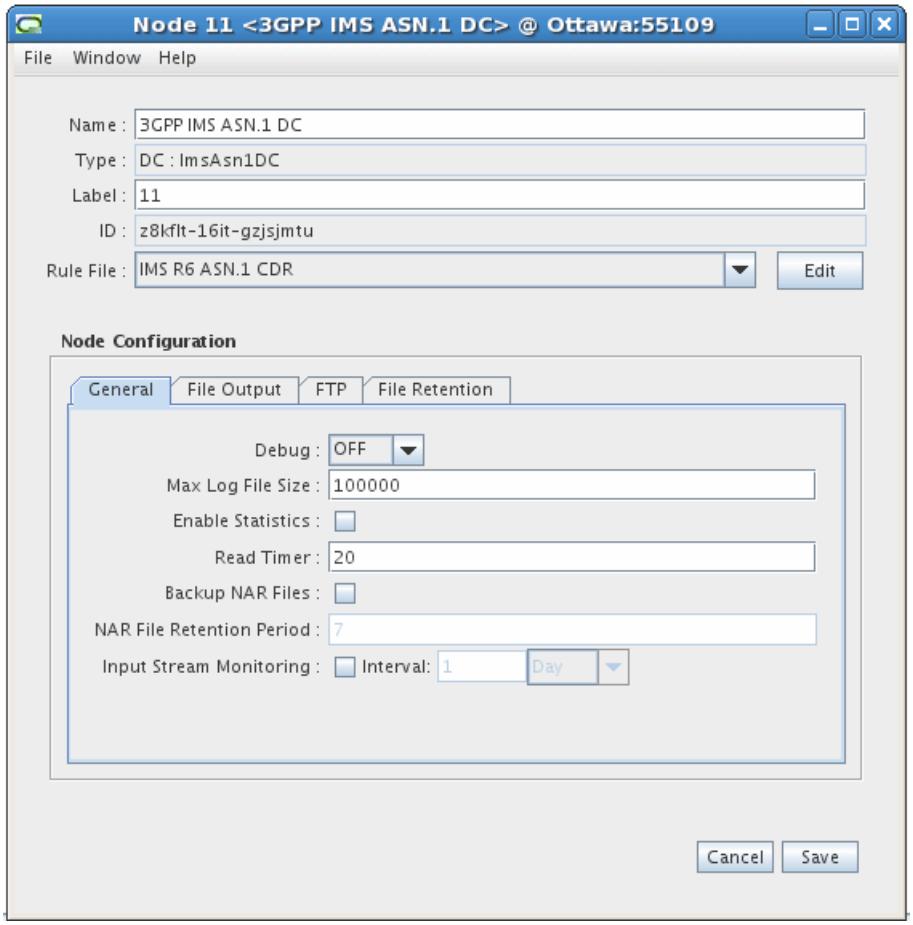
2. In the **Mediation Hosts** table, select a host.
3. In the **Nodes on Mediation Host** section, click **New**.

   The Create a Node dialog box appears.

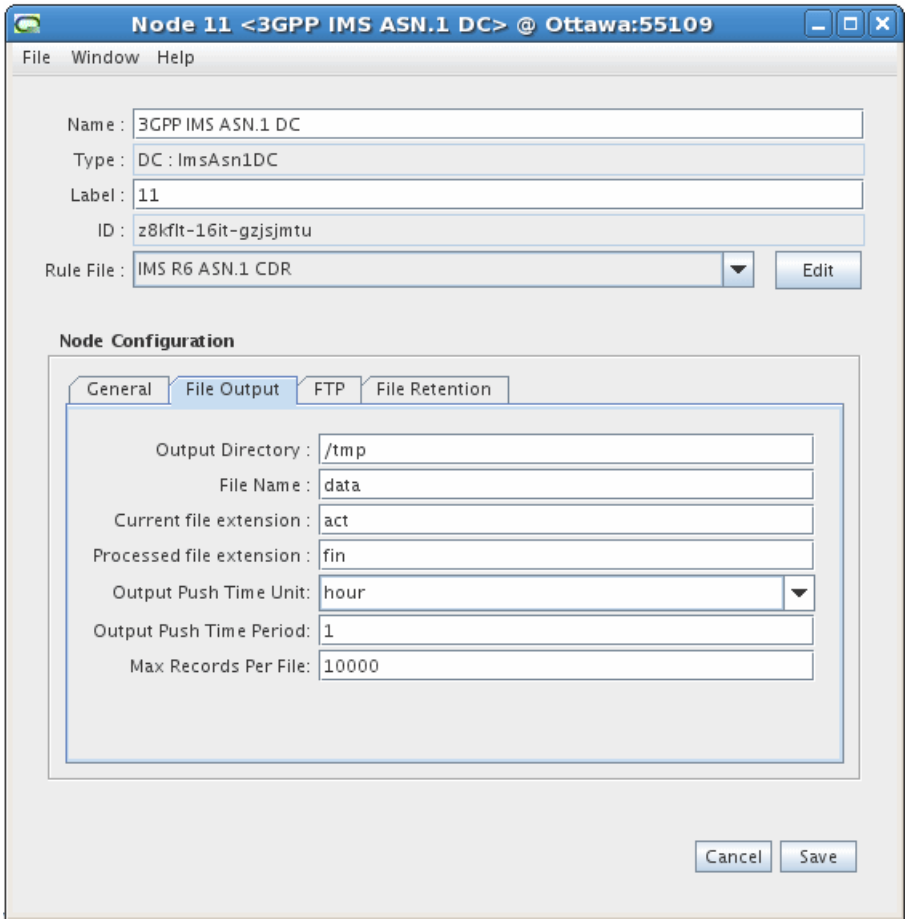
4. Select the **Wireless** service solution and click **Next**.
5. Select **Distribution Cartridge (DC)** and click **Next**.
6. Select **3GPP IMS ASN.1** and click **Finish**.
7. In the node configuration window, enter a name for the node and select **IMS R10.5 ASN.1 CDR** for 3GPP TS V32.298 10.5.0 or **IMS R6 ASN.1 CDR** for 3GPP TS V32.298 6.3.0 from the **Rule File** list.

8. On the **General** tab, accept the default field values or make changes where necessary. The **General** tab contains generic settings that are applicable to all collection cartridges in Offline Mediation Controller. The field definitions are as follows:

   - **Debug Level** - Each node produces a separate log file in addition to the administration server and node manager log files. This setting allows you to control the verbosity of the debug messages generated and logged by the node.
   - **Max Log File Size** - This field allows you to control how large each log file will get before the node closes the file and opens a new one.
   - **Read Timer** - The amount of time, in seconds, that the node waits before checking for incoming data. The minimum value is 1 and the maximum value is 3600.
   - **NARs per File** - This setting determines how many Network Accounting Records (NARs) the node collects before sending the files to the next node in the chain.
   - **Idle Write Time** - If a cartridge has been idle for the amount of time (in seconds) specified it will automatically transmit the NARs previously generated.
   - **Backup NAR Files** - If you select this checkbox, the cartridge will backup each NAR it has processed.
   - **NAR File Retention Period** - If you select the **Backup NAR Files** checkbox, then this field becomes active and you can enter the number of days to retain the backed up NAR files.

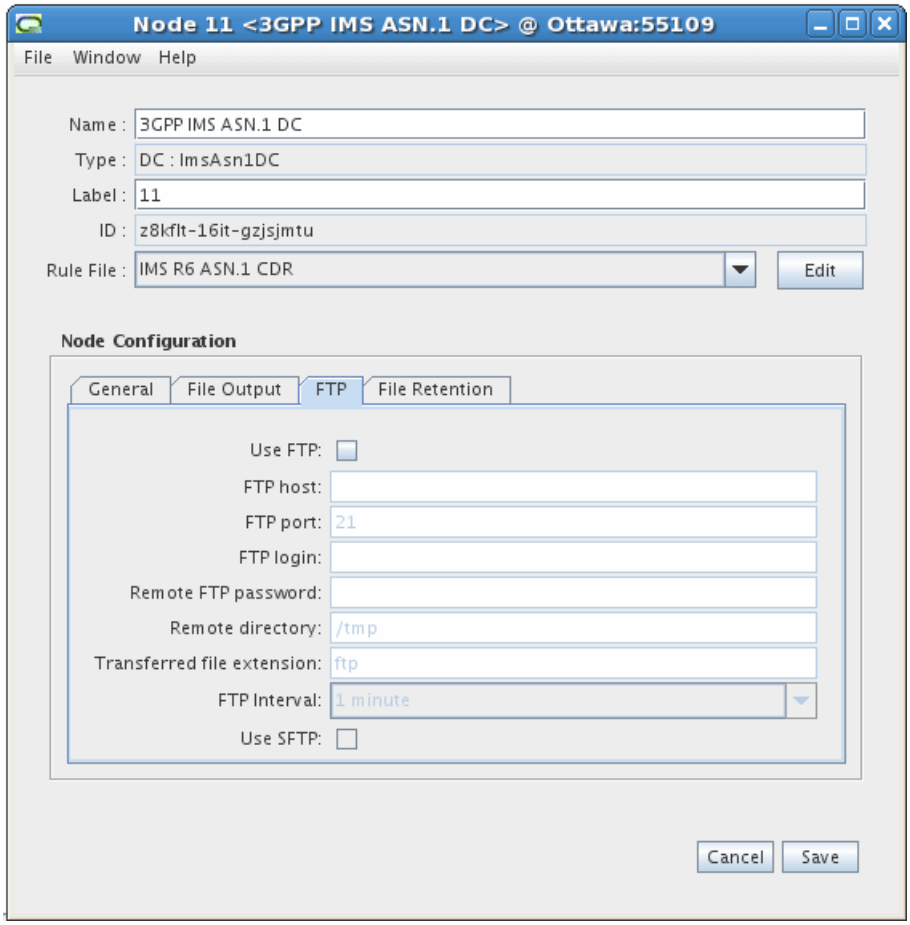


9. On the **File Output** tab, accept the default field values or make changes where necessary. The field definitions are as follows:
   - **Output Directory** - Directory path to the location where Offline Mediation Controller stores the files produced by the DC.
   - **File Name** - The output file name.
   - **Current File Extension** - The file extension of the active file the node is currently processing.
   - **Processed File Extension** - The file extension of the file the node has finished processing.
   - **Output Push Time Unit** - The time unit the node uses to output processed files. Select a value from the drop-down list.
   - **Output Push Time Period** - Enter a numerical value that determines the time period the node uses to output processed files.
   - **Max Records Per File** - The maximum number of records per output file.

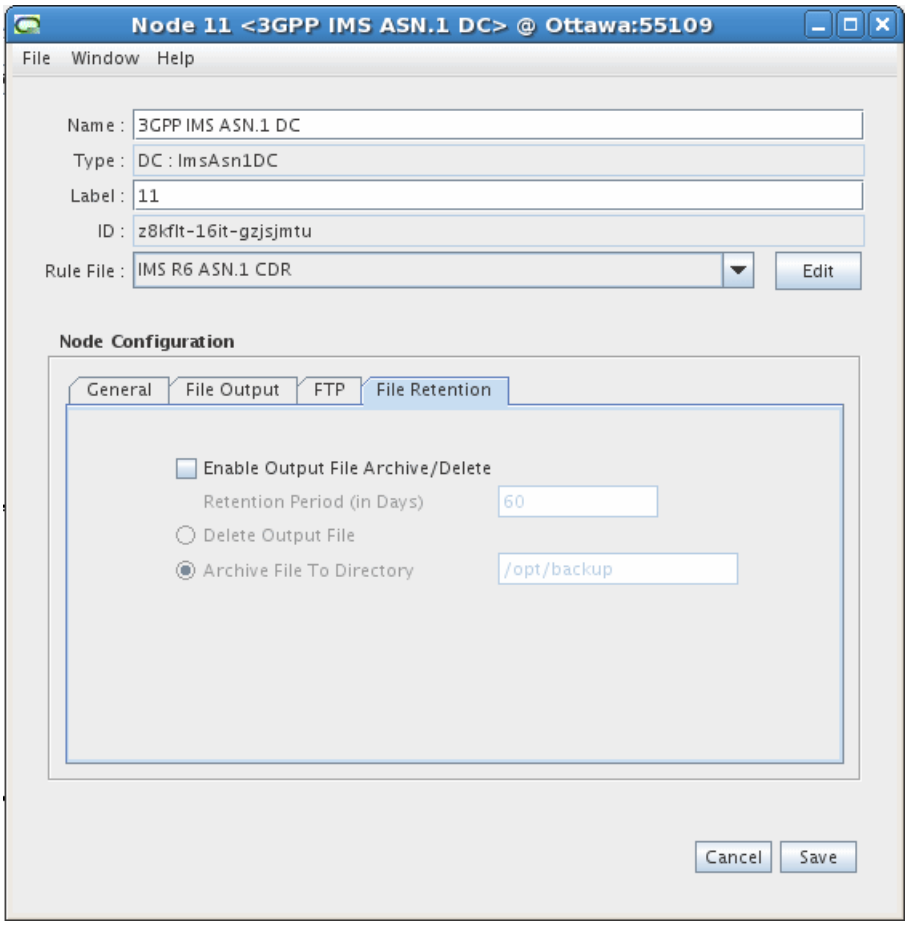


10. On the **FTP** tab, accept the default field settings or make changes where necessary. The **FTP** tab allows you to specify the details of the destination application that the node transfers files to. The field definitions are as follows:

    - **Use FTP** - Select this checkbox if you want the node to use FTP to transfer files to the remote device.
    - **FTP Host** - Enter the IP address of the remote device.
    - *FTP Port* - Enter the port number on the remote device that the node will use to establish a connection.
    - **FTP Login** - Enter the login name for the remote device.
    - **Remote FTP Password** - Enter the password for the remote device.
    - **Remote Directory** - The directory on the remote device the node will transfer files to.
    - **Transferred File Extension** - The file extension the node applies to the processed files in the local storage directory after it successfully transfers the files to the remote device.
    - **FTP Interval** - The amount of time the node waits between file transfers to the remote device.
    - **Use SFTP** - Select this checkbox if you want the node to use secure FTP when transferring files.



11. On the **File Retention** tab, configure the desired settings:
    - **Enable Output File Archive/Delete** - Select this box to enable the capability to archive or delete the AMA data after it has been retrieved by the downstream billing software.
    - **Retention Period (in Days)** - The delete or archive actions are done after a defined number of days. The allowable range is 1 to 60 days.
    - **Delete Output File** - Select this option to delete the output file after the configured number of days.
    - **Archive File to Directory** - Select this option to archive the output file after the configured number of days. Accept the default directory location or type in a different directory location.



12. Click **Save**.

IMS Sample Output

This section lists the IMS sample outputs.

Sample 1

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
'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,
  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 2

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
'3133355F313130363933323333537343436403437 2E3234382E36372E3433'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
}
```

6

Configuring Node Chain Routing

This chapter contains information on the requirements for configuring the node chain routing for Oracle Communications Offline Mediation Controller IMS CDF/CGF cartridge pack.

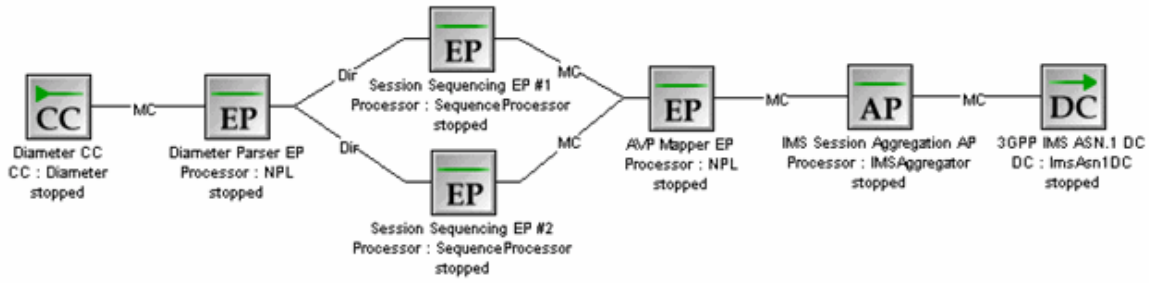
This section explains the supported routing configurations for the IMS node chain. Both Multicast and Directed routing are supported in specific parts of the IMS node chain. The purpose for using Directed routing is to route records with particular attributes to one node or node stream, and route records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

Default Configuration

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 6–1 shows the default configuration for the node chain routing.

Figure 6–1 Node Chain Routing - Default Configuration



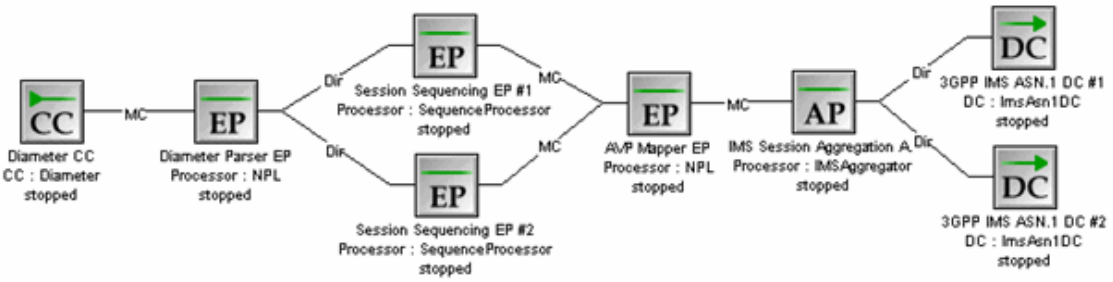
Alternate Configuration

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 6–2 shows the alternate configuration for the node chain routing.

Figure 6–2 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

7

Uninstalling the Cartridge Pack

This chapter contains information on the requirements for uninstalling Oracle Communications Offline Mediation Controller IMS CDF/CGF cartridge pack.

Uninstalling the Cartridge Pack from a Solaris or Linux Workstation

To uninstall the IMS CDF/CGF cartridge pack from a Solaris or Linux Workstation:

1. Go to the *OMC_Home*/**cartridges** directory, where *OMC_Home* is the directory in which Offline Mediation Controller is installed.
2. Run the following command, which removes the cartridge pack:

```
rm IMS_R6_0_0.jar
```

8

Behaviors

This chapter contains information on the different behaviors and workarounds for the Oracle Communications Offline Mediation Controller IMS CDF/CGF cartridge pack.

The following are the known behaviors for this cartridge pack.

- **Behavior**: 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.

  Work-around:

  1. Stop the Session Sequencing EP
  2. Wait for all records to propagate though the Session Aggregation AP and the 3GPP IMS ASN.1 DC (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.

- **Behavior**: Changing the Expiry Interval setting on the Session Sequencing EP will affect new input records only. The EP will still flush any records waiting to be sequenced according to the pre-configured setting.

  Work-around: Not applicable.

- **Behavior**: When the Diameter CC 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.

  Work-around: None.

- **Behavior**: 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.

A

Output Specification

This appendix provides reference information for the Oracle Communications Offline Mediation Controller out of the box 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 A–1:

Table A–1 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 A–2 lists the value definitions for AVP Mapper EP Mapping.

Table A–2 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 A–2 (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 A–2 (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 A–3 lists the Media-Component-List items.

Table A–3 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 A–3 (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 A–4 lists the List-of-Message-Bodies items.

Table A–4 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 A–5 lists the Early-SDP-Media-Description-List items.

Table A–5 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 A–5 (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 A–6 lists the Real-Time-Tariff-Information items.

Table A–6 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