Oracle® Communications
Offline Mediation Controller

Nortel GSM/UMTS AMA Cartridge Pack User Guide

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Oracle Communications Offline Mediation Controller Nortel GSM/UMTS AMA 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 Nortel GSM/UMTS AMA 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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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.

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Cartridge Pack Overview

This chapter contains an overview of Oracle Communications Offline Mediation Controller Nortel GSM/UMTS AMA cartridge pack.

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

New Features

This section lists the new features.

AMA 6.0.0

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

AMA 3.5.8

The following feature was added in this version of the AMA cartridge pack:

The NPL rule files for the JDBC and ASCII distribution cartridges are enhanced to provide a more targeted range of warnings for date stamps from a device. The NPL function changes from str2int to str2decimal.

AMA 3.5.7

The following feature was added in this version of the AMA cartridge pack:

- The JDBC DC now checks for partition locking before trying to insert data into a table. A retry period has been added to the functionality, which prevents the JDBC DC from halting its operations.

AMA 3.5.6

The following feature was added in this version of the AMA cartridge pack:

- The "File Retention" feature will delete or archive the files in the compressed folder when a "compression" option is selected.

AMA 3.5.5

The following feature was added in this version of the AMA cartridge pack:

- 1:1 input/output file matching support for GSM18

AMA 3.5.4

The following feature was added in this version of the AMA cartridge pack:

- Enhanced the filename capability of Parameter (PAR) script to include a timestamp
- Additional GSM support: GSM16 in -> GSM16 out (ASCII and Database), GSM16 in -> GSM15 out (Database),GSM18 in -> GSM16 out (Database).
- 1:1 input/output file matching support for G-CDR collection with AMA DIRP file distribution. The file matching support includes multiple characters in the configurable File Prefix parameters.

AMA 3.5.3

The following feature was added in this version of the AMA cartridge pack:

- Ability to support the creation and archiving of multiple database tables, such as support for DMS 100 MMP and AMA.

The following change was made in this version of the AMA cartridge pack user guide:

- Updated the procedures for the various supported upgrade options.

AMA 3.5.2

On the DMS-MSC AMADIRP DC, if the option "Keep Empty File" is unchecked and there is no CDR data, the file sequence number is erroneously incremented when the cartridge is stopped and restarted.

AMA 3.5.1

Previously, when the DMS-MSC AMADIRP DC was not configured to "Keep Empty Files" and the "Generate FTOR" option was selected, if there was no CDR processed during the rotation time, an empty CDR file was generated that contained only the FTIR and FTOR. The file sequence number was incremented.

The new behavior is the file will not be generated and the file sequence number will not be incremented.

AMA 3.5.0

The following feature was added and enhancement made to the DMS MSC AMA CC and the NRTT CC nodes in this version of the AMA cartridge pack:

- The recovery files can now be deleted at user-configured intervals.
- The value of the "Keep processed files duration" parameter is increased to 60 days.

The following fix was made in this version of the AMA cartridge pack:

- The DMS-MSC AMA DIRP node can generate empty files even if the "Keep empty files" box is not selected. This issue has been fixed.

AMA 3.4.0

The AMA 3.4.0 cartridge pack was updated in conjunction with Offline Mediation Controller 6.0.

AMA 3.2.3

The following feature was propagated from a previous cartridge pack version:

- Version hiding for GSM 18 to GSM 16/15: If the GSM 18 field "MS-Classmark" has the default value "FFF0FFFFFFFFFFC", it will be mapped to "FFF0FF0C" instead of "FFF0FFFC" in the GSM 16/15 output.

AMA 3.2.2

The following fix was made in this version of the AMA cartridge pack:

- The DMS-MSC AMA CC can lead to too many files being left open at the OS level. This problem only occurred when the FTP Push transport is used. This issue has been fixed.

AMA 3.2.1

The following feature was added in this version of the AMA cartridge pack:

- The DMS-MSC CC and the NRTT CC now support processed file retention of up to 48 days.

AMA 3.2.0

The following feature was added in this version of the AMA cartridge pack:

- DMS MSC AMA DIRP DC: The "Generate FTOR" checkbox was added to optionally enable the File Transfer Out Record parameter. The FTOR parameter contains the following fields, as per the GSM 16 Specification:
  - Record Header
  - Auxiliary Record Header
  - Date and Time
  - Generic Identity
  - File Transfer Type
  - File Sequence Number
  - Record Count
  - Block Count
  - Record Number

AMA 3.1.5

The following fix was made in this version of the AMA cartridge pack:

- Version hiding for GSM 18 to GSM 16/15: If the GSM 18 field "MS-Classmark" has the default value "FFF0FFFFFFFFFFC", it will be mapped to "FFF0FF0C" instead of "FFF0FFFC" in the GSM 16/15 output

AMA 3.1.4

The following feature was added in this version of the AMA cartridge pack:

- DMS MSC CC: Keep/Delete recovery file tracking was added for the FTP Push transport parameter, to prevent the processing of duplicate input files.

AMA 3.1.3

The following fixes were made in this version of the AMA cartridge pack:

Fix:

- Version hiding for GSM 18 to GSM 16/15: The GSM 18 field "MSC/MGW Number" in the record "Common Equipment Usage" (Structure Code 0019) is mapped to the GSM 16/15 field "MSC-Number".
- Version hiding for GSM 18 to GSM 16: National Use-Values in Calling/Called Subscriber Category for MOC and MTC will be converted correctly to "000" for new values in GSM 18.
- Version hiding for GSM 18 to GSM 15: Data Rate Character (Char 4) value "8" is mapped to value "0" if Character 3 is equal to "0" and Character 1 is equal to "2".

AMA 3.1.2

The Crystal Reports templates for the following call/service records have been updated to include the Data Service module code:

- Incoming Gateway Call Attempt
- Outgoing Gateway Call Attempt
- Incoming Intra-PLMN Trunk Record
- Outgoing Intra-PLMN Trunk Record
- Roaming Call Attempt

AMA 3.1.1

The following fixes were made in this version of the cartridge pack:

- Version hiding for GSM18 to GSM16 or GSM15:
  - Module Code 028 Field "Patch Identity" will be deleted
  - Module Code 09 will be deleted for records with Structure Code 0013, 0014, 0015 and 0016
  - Characters 'Channel Rate and Type' and 'Data Rate' of the Field Channel Type in MC03 will be mapped according to the version hiding tables in this document
  - Field "SMS Result" Protocol Value "01" will be changed to "00"
- Version hiding for GSM16 to GSM15:
  - National Use-Values in Calling/Called Subscriber Category for MOC and MTC will default to "000"

AMA 3.1.0

The AMA 3.1.0 cartridge pack includes Input Stream Monitoring on the DMS-MSC CC, NRTT CC and on all DCs. Input stream monitoring is enabled on a per-cartridge basis to detect whether any records have been received for an operator-defined period of time. The cartridge raises an alarm when it does not receive any new records within a specified time period, and clears the alarm when it begins to receive records again.

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.

Architecture diagrams

Figure 2–1, Figure 2–2, and Figure 2–3 show the supported node chains for the AMA cartridge pack, and how the node chains collect, process and distribute data.

Figure 2–1 AMA Architecture with G-CDR Collection in AMA DIRP File Format

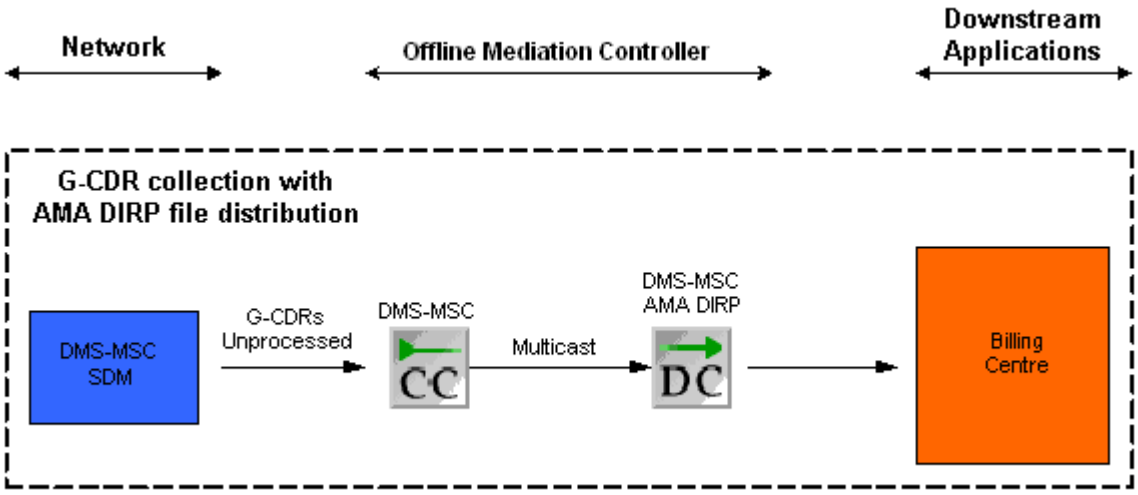


Figure 2–2 AMA Architecture with G-CDR Collection in NRTT Distribution

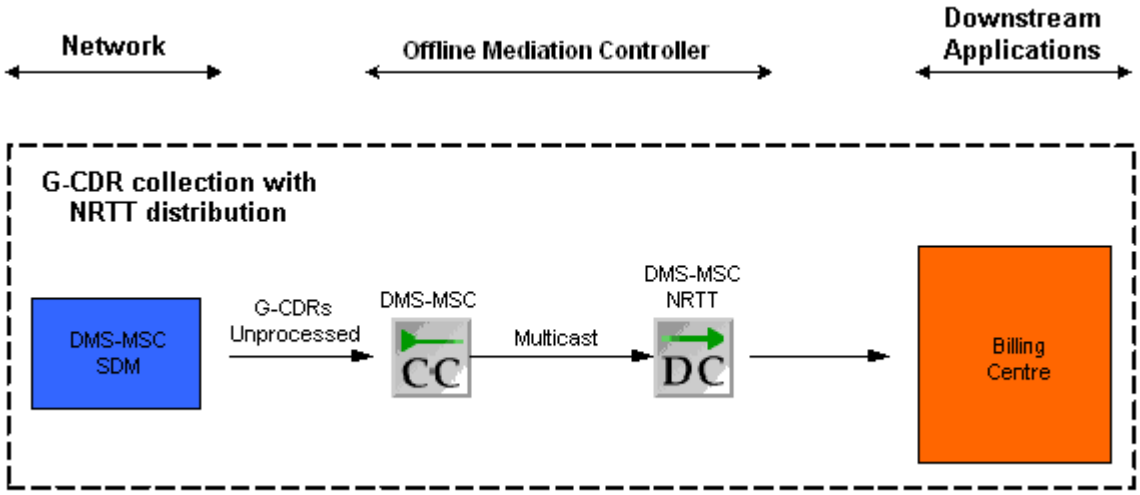
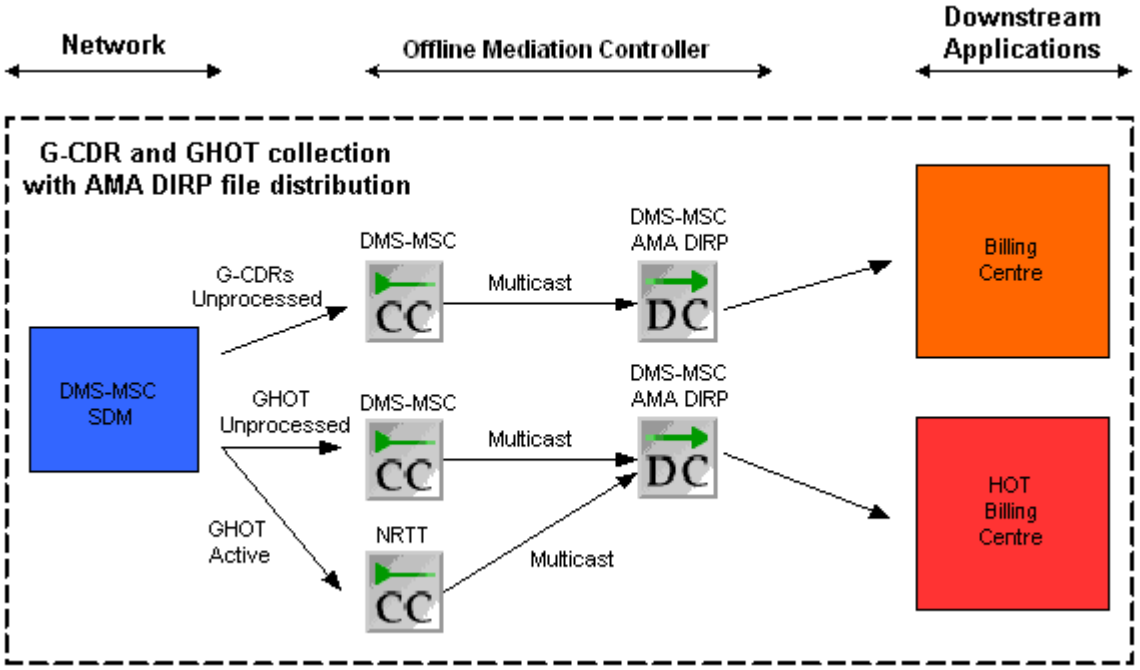


Figure 2–3 AMA Architecture with G-CDR and GHOT Collection in AMA DIRP File Format



3

Supported GSM Releases and Version Hiding

This chapter contains an overview of the GSM releases and version hiding support for Oracle Communications Offline Mediation Controller Nortel GSM/UMTS AMA cartridge pack.

This release supports GSM 13, 15, 16, 17, 18, and 19. Also, 1:1 input/output file matching is supported for:

- GSM18 in -> GSM18 out
- GSM18 in -> GSM16 out
- GSM16 in -> GSM16 out
- GSM16 in -> GSM15 out
- GSM15 in -> GSM15 out

Table 3–1 lists the instances that support version hiding.

Table 3–1 Version Hiding Instances

In: AMA DIRP	Out: AMA DIRP and NRTT
GSM 19	GSM 19
GSM 19	GSM 18
GSM 19	GSM 17
GSM 18	GSM 18
GSM 18	GSM 17
GSM 18	GSM 16
GSM 18	GSM 15
GSM 17	GSM 17
GSM 17	GSM 16
GSM 17	GSM 15
GSM 16	GSM 16
GSM 16	GSM 15
GSM 15	GSM 15
GSM 13	GSM 13
GSM 18	GSM 18
GSM 18	GSM 17

Table 3–1 (Cont.) Version Hiding Instances

In: AMA DIRP	Out: AMA DIRP and NRTT
GSM 18	GSM 16
GSM 18	GSM 15
GSM 17	GSM 17
GSM 17	GSM 15
GSM 16	GSM 16
GSM 16	GSM 15
GSM 15	GSM 15

Note: GSM18 in -> GSM16 out and GSM16 in -> GSM15 out are supported only for Database.

Table 3–2 lists the instances that support version hiding.

Table 3–2 Version Hiding Instances

In: AMA DIRP	Out: ASN.1
GSM 18	GSM 18
GSM 17	GSM 17
GSM 16	GSM 16
GSM 15	GSM 15
GSM 13	GSM 13

Version Hiding For GSM 19 Data Fields

Table 3–3 lists the GSM 19 data fields that support version hiding.

Table 3–3 Version Hiding for GSM 19 Data Fields

Data Field	GSM 19	GSM 18	Version hiding GSM 19 to GSM 18	Version hiding GSM 19 to GSM 17
Called Equipment (or Served Equipment)	New Combination are supported 1-5 Values FFFFF 6-19 Values {0,1,2…9,A,B…F} 20-21 Values {0,1,2…9,A,B…F} 22 Value C	BCD/Hex string with 22 characters. There is no encoding	Contents are mapped directly (no version hiding).	Contents are mapped directly (no version hiding).
Called IMSI Number	New field in module MNP	Field is dropped	Field is dropped	Field is dropped
Calling Equipment (or Served Equipment)	New Combination are supported 1-5 Values FFFFF 6-19 Values {0,1,2…9,A,B…F} 20-21 Values {0,1,2…9,A,B…F} 22 Value C	BCD/Hex string with 22 character . There is no encoding	Contents are mapped directly (no version hiding)	Contents are mapped directly (no version hiding)
Post -Translated Called Party Number	New field in module GA	Field is dropped	Field is dropped	Field is dropped
Served IMEI	Character size is increased from 16 to 22. 1-5 Values FFFFF 6-19 Values {0,1,2…9,A,B…F} 20-21 Values {0,1,2…9,A,B…F} 22 Value C	BCD/Hex string with 16 characters. There is no encoding 15 values {0,1,2…9,A,B…F} 16 value C	Characters 1-4 and 20-21 are dropped	Field is dropped
SS Code (Supplementary Service Code)	New combinations are supported. New Value: Character 3 is F	This Combination is not introduced	If the value of SS Code is 0A1C , No action required. If the value of SS Code is 0FFC , Drop the module	If the value of SS Code is 0A1C , No action required. If the value of SS Code is 0FFC , Drop the module
Result Indicator	New combinations are supported. New Value: Character 2 - 3 is 59	This Combination is not introduced	Combination that is not supported mapped to '00'	Combination that is not supported mapped to '00'

Version Hiding For GSM 18 Data Fields

Table 3–4 lists the GSM 18 data fields that support version hiding.

Table 3–4 Version Hiding for GSM 18 Data Fields

Data Field	Change	Version hiding GSM 18 to GSM 17	Version hiding GSM 18 to GSM 16	Version hiding GSM 18 to GSM 15
Calling / Called Subscriber Category	New combinations are supported. New values: 017-223,225,227, 229,231,233,235, 237,239,241,243, 245,247,249,251, 253,255	Combinations that are not supported are mapped to '000'.	Combinations that are not supported are mapped to '000'.	Combinations that are not supported are mapped to '000'.
Call Duration	Now contains 14 characters to capture additional information.	Characters 1 to 3 and 12 to 13 are dropped. Characters 4 to 10 map to characters 1 to 7, if character "1" has a value of "1". Otherwise, characters 5 to 11 map to characters 1 to 7.	Characters 1 to 3 and 12 to 13 are dropped. Characters 4 to 10 map to characters 1 to 7, if character "1" has a value of "1". Otherwise, characters 5 to 11 map to characters 1 to 7.	Characters 1 to 3 and 12 to 13 are dropped. Characters 4 to 10 map to characters 1 to 7, if character "1" has a value of "1". Otherwise, characters 5 to 11 map to characters 1 to 7.
Diagnostic / SMS Result	Character 0-1: value '01' is dropped.	Contents are mapped directly (no version hiding).	Protocol-Value "01" will be changed to "00".	Protocol-Value "01" will be changed to "00".
Equipment Identity	Only captures '00001' and '00002'. Otherwise set to 'FFFFF'.	Contents are mapped directly (no version hiding).	Contents are mapped directly (no version hiding).	Contents are mapped directly (no version hiding).
MSC/MGW Number	New mapping.	Field is mapped to MSC Number.	Field is mapped to MSC Number.	Field is mapped to MSC Number.
LCS Record Type	New values: '2' and '5'	Contents are mapped directly (no version hiding).	Record is dropped if field value is not equal to 1, 2, 3 or 4.	Record is dropped if field value is not equal to 1, 2, 3 or 4.
MSC Number	New field in structure code 0021. Composed of two field types: Numbering Plan Identifier and BCD or Full Hex String	Field is dropped in structure code 0021.	Field is dropped in structure code 0021.	Field is dropped in structure code 0021.
Identity Of Target UE	Field is dropped.	No change.	No change.	No change.
Served Party	New field in structure code.	Field maps to "Identity Of Target UE" field.	Field maps to "Identity Of Target UE" field.	Field maps to "Identity Of Target UE" field.
Served MSISDN	New field in structure code 0021. Composed of two field types: Numbering Plan Identifier and BCD or Full Hex String	Field is dropped in structure code 0021.	Field is dropped in structure code 0021.	Field is dropped in structure code 0021.

Table 3–4 (Cont.) Version Hiding for GSM 18 Data Fields

Data Field	Change	Version hiding GSM 18 to GSM 17	Version hiding GSM 18 to GSM 16	Version hiding GSM 18 to GSM 15
Requesting Mobile Location Centre (MLC)	New field in structure code. Composed of two field types: Numbering Plan Identifier and BCD or Full Hex String	Field is dropped.	Field is dropped.	Field is dropped.
Privacy Notification	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
Privacy Override	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
Positioning Data	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
LCS Diagnostic	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
System Type	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
Served IMEI	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
Emergency Service Routing Digits (ESRD-Digits)	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
Emergency Service Routing Key (ESRK-Key)	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
LCS Priority Level	New field in structure code.	Field is dropped.	Field is dropped.	Field is dropped.
RNC ID	New field in module code.	Field is dropped.	Field is dropped.	Field is dropped.
Supplementary Services/ AoC Parameter/ Supplementary Service Code	New values: 'b0'	Value 'b0' mapped to default value '00'.	Value 'b0' mapped to default value '00'.	Value 'b0' mapped to default value '00'.
Operation Indication	New value: '6'	Value '6' mapped to default value '0'.	Value '6' mapped to default value '0'.	Value '6' mapped to default value '0'.
Patch Identity	New field in module code.	Field is dropped.	Field is dropped.	Field is dropped since module 28 is not supported.
Bearer Independent Core Network	New module.	Module is dropped.	Module is dropped.	Module is dropped.
BICN ModuleCode	New field in new module code.	Field is dropped.	Field is dropped.	Field is dropped.
BICN MGW Number	New field in new module code.	Field is dropped.	Field is dropped.	Field is dropped.
BICN MGW Seizure Time	New field in new module code.	Field is dropped.	Field is dropped.	Field is dropped.

Table 3–4 (Cont.) Version Hiding for GSM 18 Data Fields

Data Field	Change	Version hiding GSM 18 to GSM 17	Version hiding GSM 18 to GSM 16	Version hiding GSM 18 to GSM 15
BICN Backbone Media Type	New field in new module code.	Field is dropped.	Field is dropped.	Field is dropped.
BICN Access Media Type	New field in new module code.	Field is dropped.	Field is dropped.	Field is dropped.
Ms Class Mark	Character 4: only captures value 0 to 4, and value '7' is dropped. Character 8,9,10,14 always set to 'F'.	Contents are mapped directly (no version hiding).	Characters 8 to 15 are dropped. If the character "2" has a value of "2", it is mapped to a value of "1". If the character "3" has a value of "1", it is mapped to a value of "0". If the character "4" has a value of "7", it is mapped to a value of "0". If the character "1" has a value of "1", then characters 5 and 6 are mapped to a value of "0". If the character "1" has a value of "2", then characters 5 and 6 are mapped as is. The character "7" is always mapped to a value of "0".	Characters 8 to 15 are dropped. If the character "2" has a value of "2", it is mapped to a value of "1". If the character "3" has a value of "1", it is mapped to a value of "0". If the character "4" has a value of "7", it is mapped to a value of "0". If the character "1" has a value of "1", then characters 5 and 6 are mapped to a value of "0". If the character "1" has a value of "2", then characters 5 and 6 are mapped as is. The character "7" is always mapped to a value of "0".

Table 3–4 (Cont.) Version Hiding for GSM 18 Data Fields

Data Field	Change	Version hiding GSM 18 to GSM 17	Version hiding GSM 18 to GSM 16	Version hiding GSM 18 to GSM 15
Supplementary Service Action	Captures value from '0' to '5'. Value '6' is dropped.	Contents are mapped directly (no version hiding).	Contents are mapped directly (no version hiding).	Contents are mapped directly (no version hiding).
Channel Type	No Change.	Contents are mapped directly (no version hiding).	If Character 3 is equal to "0" and Character 1 is equal to "2" then the Data Rate Character (Character 4) value of "8" is mapped to value "0".	Channel Rate and Type Character (Character 2) values are mapped. If Character 1 has a value of "1", then the Character 2 values of 0, 1, 5, 6, 7, and 8 are mapped to "3". If Character 1 has a value of "2", then the Character 2 values of 0, 1, 5, 6, 7, and 8 are mapped to "4". If Character 1 has a value of "2", then the Character 2 values of 0, 1 and 5 are mapped to "3". If Character 1 has a value of "2" or "6" then the Character 2 values of 0, 1 and 5 are mapped to "4". If Character 3 has a value of "0" and Character 1 has a value of "2" then the Character 4 value of 8 is mapped to "0".
Module Code 9	No Change.	Contents are mapped directly (no version hiding).	Module Code is dropped for Structure Code 13, 14, 15 and 16.	Module Code is dropped for Structure Code 13, 14, 15 and 16.

Version Hiding For GSM 17 Data Fields

Table 3–5 lists the GSM 17 data fields that support version hiding.

Table 3–5 Version Hiding for GSM 17 Data Fields

Data field	Change	Version hiding GSM 17 to GSM 16	Version hiding GSM 17 to GSM 15
Access Network	If the field is not present, the default value is now 0C.	Contents are mapped directly (no version hiding).	Contents are mapped directly.
Answer Time	Encoded using the new format for Date and Time field.	See Date and Time.	See Date and Time.
Call Type Code	Now includes value 003 - Location Update Call.	Structure codes with Call Type Code = 3 are dropped.	Structure codes with Call Type Code = 3 are dropped.
Carrier Connect Timestamp	Encoded using the new format for Date and Time field.	See Date and Time.	See Date and Time
Channel Allocation Time	Encoded using the new format for Date and Time field.	See Date and Time.	See Date and Time.
Correlation ID / ETC Parm2	New field.	Field is dropped.	Field is dropped.
CSI	CSI field can now capture a value for M-CSI information (value 7).	Contents are mapped directly (no version hiding).	Field is dropped.
Date and Time	Can now contain a time zone offset value: characters 14-15 hold the time zone offset.	Characters 14 and 15 set to 00.	Characters 14 and 15 set to 00.
Delivery Timestamp	Encoded using new format for Date and Time field.	See Date and Time.	See Date and Time.
Disconnect Time	Encoded using the new format for Date and Time field	See Date and Time.	See Date and Time.
Geographical Location of UE 1	Replaces Geographical Location of UE	This field maps to the Geographical Location of UE.	This field maps to the Geographical Location of UE.
Geographical Location of UE 2	New field	Field is dropped.	Field is dropped.
Geographical Location of UE 3	New field	Field is dropped.	Field is dropped.
Geographical Location of UE 4	New field	Field is dropped.	Field is dropped.
Geographical Location of UE 5	New field	Field is dropped.	Field is dropped.
IN Timestamp 1	Encoded using the new format for Date and Time field	See Date and Time.	See Date and Time.
IN Timestamp 2	Encoded using the new format for Date and Time field	See Date and Time.	See Date and Time.

Table 3–5 (Cont.) Version Hiding for GSM 17 Data Fields

Data field	Change	Version hiding GSM 17 to GSM 16	Version hiding GSM 17 to GSM 15
Incoming/Outgoing Trunk Release Time	Encoded using the new format for Date and Time field	See Date and Time.	See Date and Time.
IC/INC Prefix	Now contains 10 characters to capture the carrier identification codes (CICs) for the Chinese market	Characters 1-8 map to characters 1-4 (truncation on left). Character 9 maps to character 5. Character 10 maps to character 6.	Characters 1-8 map to characters 1-4 (truncation on left). Character 9 maps to character 5. Character 10 maps to character 6.
IWF Activation Timestamp	Encoded using the new format for Date and Time field	See Date and Time.	See Date and Time.
LCS Client Identity	Composed of two field types: Numbering Plan Identifier and BCD or Full Hex String	Numbering Plan Identifier (first 6 characters) removed and replaced with default characters to make the field look like the 32 character field used in GSM 16. Characters 1-6 map to value 'FFFFFF' Characters 7 -32 map directly from GSM 17 characters 7-32.	Numbering Plan Identifier (first 6 characters) removed and replaced with default characters to make the field look like the 32 character field used in GSM 15. Characters 1-6 map to value 'FFFFFF' Characters 7-32 map directly from GSM 17 characters 7-32.
LCS Record Type	New supported value 5 represents MO-LR: Autonomous Self Location for Assistance Data	Value '5' mapped to default value 'F'.	Value '5' mapped to default value 'F'.
MM Event	New field	Field is dropped.	Field is dropped.
MS Classmark	Now contains 16 char to capture additional info	Character 7 set to '0'. Characters 8-15 dropped.	Char 7 always set to '0'. Char 8-15 dropped.
New AN	New field	Field is dropped.	Field is dropped.
New Cell - SAC Id	New field	Field is dropped.	Field is dropped.
New LAC	New field	Field is dropped.	Field is dropped.
New MSC Id	New field	Field is dropped.	Field is dropped.
Old AN	New field	Field is dropped.	Field is dropped.
Old Cell - SAC Id	New field	Field is dropped.	Field is dropped.
Old LAC	New field	Field is dropped.	Field is dropped.
Old MSC Id	New field	Field is dropped.	Field is dropped.
Record Count	New maximum value is 000065535.	Contents are mapped directly (no version hiding).	Field is dropped.

Table 3–5 (Cont.) Version Hiding for GSM 17 Data Fields

Data field	Change	Version hiding GSM 17 to GSM 16	Version hiding GSM 17 to GSM 15
Record Header	Contains the new Release Id field, structure code 001 and call type code 003 for the location update record.	Release Id field dropped. Structure Code 0001 dropped. Call Type Code 003 dropped.	Release Id field dropped. Structure Code 0001 dropped. Call Type Code 003 dropped.
Recording Entity	New field.	Field is dropped.	Field is dropped.
Release Id	New field.	Field is dropped.	Field is dropped.
Release Time	Encoded using new format for Date and Time field.	See Date and Time.	See Date and Time.
SCF ID/ETC Parm1	New field.	Field is dropped.	Field is dropped.
Served MSISDN	New field.	Field is dropped.	Field is dropped.
Served IMSI	New field.	Field is dropped.	Field is dropped.
SMS Start Stamp	Encoded using new format for Date and Time field.	See Date and Time	See Date and Time.
SMS Stop Stamp	Encoded using new format for Date and Time field.	See Date and Time	See Date and Time.
SMS Time Stamp	Encoded using new format for Date and Time field.	See Date and Time	See Date and Time.
Structure Code	Contains new Location Update record.	Structure code 0001 is dropped.	Structure code 0001 is dropped.
SS Parameters field	Now 32 characters.	Truncation occurs from the left.	Same as GSM 17 - no change.
Unused Timestamp 1	Encoded using new format for Date and Time field.	See Date and Time.	See Date and Time.
Unused Timestamp 2	Encoded using new format for Date and Time field.	See Date and Time.	See Date and Time.
Update Result	New field.	Field is dropped.	Field is dropped.
Update Time	New field.	Field is dropped.	Field is dropped.

Version Hiding For GSM 16 Data Fields

Table 3–6 lists the GSM 16 data fields that support version hiding.

Table 3–6 Version Hiding for GSM 16 Data Fields

Data field	Change	Version hiding GSM 16 to GSM 15
Called Number	New field in structure code.	Field is dropped.
Calling Number	New field in structure code.	Field is dropped.

Table 3–6 (Cont.) Version Hiding for GSM 16 Data Fields

Data field	Change	Version hiding GSM 16 to GSM 15
Called/Calling Subscriber Category	New combinations are supported. New values: 224, 226, 228, 230, 234, 236, 238, 242, 246, 248, 250, 252, 254	Combinations that are not supported are mapped to '000'.
CAMEL Charging	Now allowed on structure code 4.	Module is dropped from illegal structures.
CAMEL SMS Info Module	New module.	Module is dropped.
CAMEL Subscriber Info	New field in module.	Field is dropped.
Channel Type	New combinations allowed.	If the 'Channel Rate and Type' field does not have a value of 3 or 4, this field will be set to 3.
CSI	New field.	Field is dropped.
Data Rate	Increased from two characters to four. Allowable range changed from 0-7 to 0-15.	Out of range values replaced with "007".
Free Format Data	Now 8 free-form fields with total payload of 336 characters. This is an increase from one field with 84 characters.	First and second field are mapped to accommodate 84-character field length.
Generic Address	Now allowed on structure codes 2, 3, 14, 16 and 18.	Module is dropped from illegal structures.
Generic Identity	New value=01600	GSM version specific value is substituted (i.e. 01500).
GSM Assisting SSP Info Module	New module.	Module is dropped.
IN Protocol	New field in module.	Field is dropped.
Local Ref Num	New field in module.	Field is dropped.
Patching Info Module	New module.	Module is dropped.
Rate Adaption	New field.	Field is dropped.
SMS Message Type	New field in structure code.	Field is dropped.
SMS Validity Period	New field in structure code.	Field is dropped.
SS Code	New value: 46	If SS Code = '046', entire Module Code 05 is dropped.

Version Hiding For GSM 15 Data Fields

Table 3–7 lists the GSM 15 data fields that support version hiding.

Table 3–7 Version Hiding for GSM 15 Data Fields

Data field	Change	Version hiding GSM 15 to GSM 13
Access Network	New field.	Field is dropped.
Advice of Charge	New values: 02 and 03	Field is set to "00".
Call Reference	New range: 0-262143. (Old range was 0-65535).	Field is wrapped.
Call Type Code	New value: 17	Record is dropped.
Destination Routing Address	Increased from 22 to 32 characters.	Truncated from left.
Generic ID	New value: 01500	Version-specific value is substituted.
IAC	New structure code.	Record is dropped.
Location Services	New structure code.	Record is dropped.
Operation Indication	New value: 5	Field is set to "00".
Record Number	New range: 1-4294967295. (Old range was 1-9994239).	Field is wrapped.
SS Code	New values: 81 and A1.	Field is set to "00".

Behaviors

This cartridge pack contains the following behaviors:

- Any input or output directory settings in the node configuration windows must be within the same disk partition where Offline Mediation Controller is installed. Failure to do so can result in errors, alarms, and potentially, loss of data.
- On the DMS-MSC AMA DIRP DC, Office Identification tab, the **Generate FTOR** checkbox (File Transfer Out Record) is supported for GSM 16 only. If you wish to enable this checkbox, ensure a GSM 16 rule file is selected for the node.
- On the DMS-MSC AMA DIRP DC, File Matching tab, the **Generate File based on input file** checkbox is supported for GSM 18, GSM 16 and GSM 15. If you wish to enable this checkbox, ensure File Matching supported NPL rule file (1TO1_GSM18, 1TO1_GSM16, 1TO1_GSM15) is selected for the node. The following configurations are supported for 1:1 file matching:
  - GSM18 in -> GSM18 out
  - GSM18 in -> GSM16 out
  - GSM16 in -> GSM16 out
  - GSM16 in -> GSM15 out
  - GSM15 in -> GSM15 out

4

Installing the Cartridge Pack

This chapter contains information on the requirements for installing and setting up Oracle Communications Offline Mediation Controller Nortel GSM/UMTS AMA cartridge pack.

Pre-Installation Tasks

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 ama_cdk cartridge **.jar** files 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 and Administration Server.

Installing on a Solaris or Linux Workstation

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

1. Download the **ama_r6_0_0.jar** to the *OMC_Home*/**cartridges** directory.
2. Go to the *OMC_Home* directory and create a **db_scripts** directory where *OMC_Home* is the directory in which you installed Offline Mediation Controller.
3. Copy the **ama_r6_0_0.jar** file to *OMC_Home*/**dbscripts** and un-zip the file.
4. 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 Nodes

This chapter contains information on the requirements for creating and configuring the Oracle Communications Offline Mediation Controller Nortel GSM/UMTS AMA nodes.

Creating and Configuring the DMS-MSC CC

This section contains the information on the requirements for creating and configuring the DMS-MSC Collection Cartridge (CC).

Input Stream Monitoring

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

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

To create and configure a DMS-MSC CC:

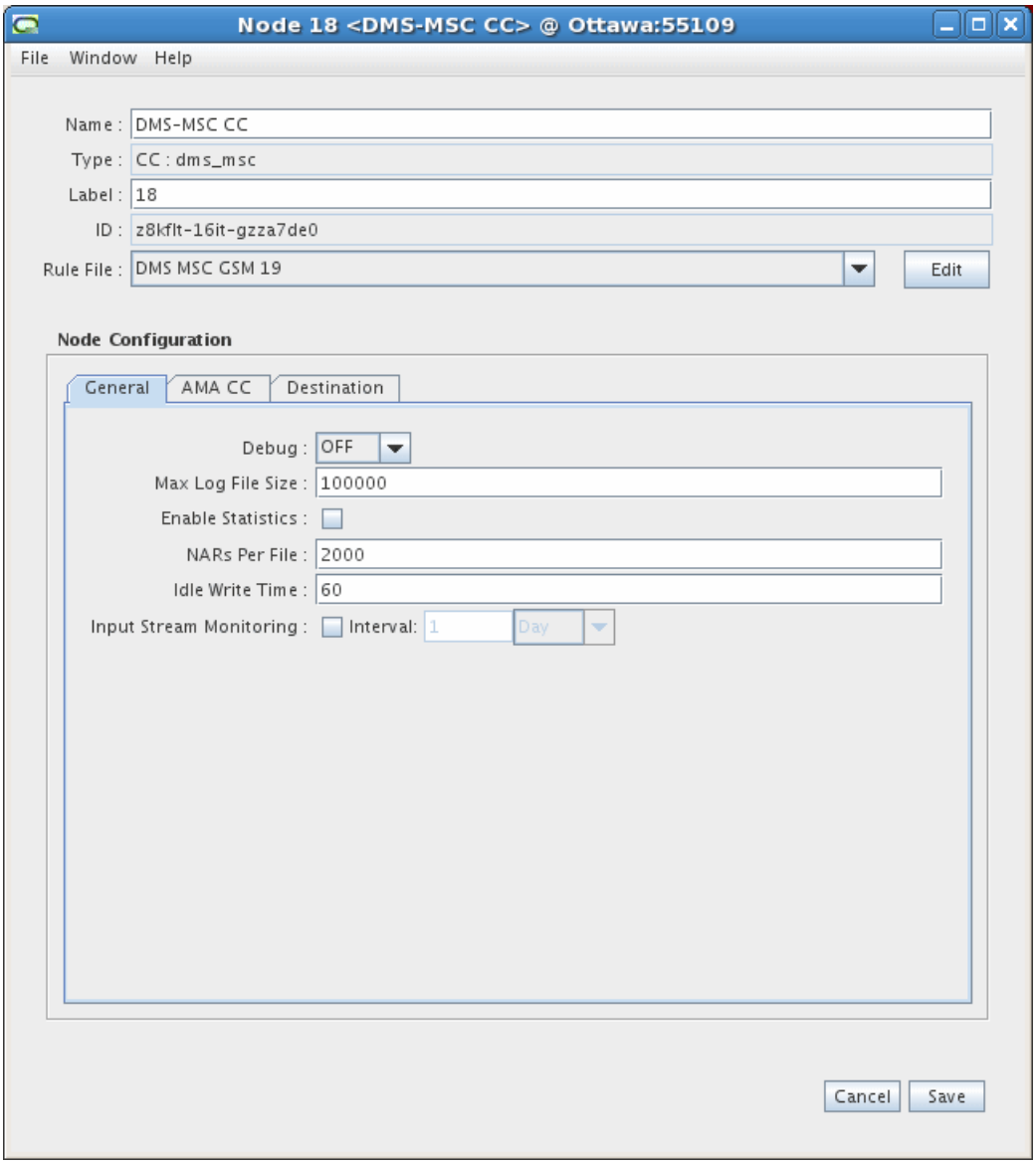
1. Log on to Offline Mediation Controller Administration Client.

   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 **Wireless** and click **Next**.
5. Select **Collection Cartridge (CC)** and click **Next**.
6. Select **DMS-MSC** and click **Finish**.
7. In the node configuration window, type a name for the node in the **Name** field.
8. In the **Rule File** drop-down list, select the file that matches the incoming version of the GSM data.
9. On the **General** tab, refer to the online help for field definitions. The default field settings are shown in the sample below:



10. On the AMA CC tab, configure the settings to match the settings on the MSC SDM. An example is shown below. Here are the field definitions:

    - For **Select the Transport**, you can select either **FTP Push** or **Open FTP**.
    - For the **Input directory**, you must enter the directory the DMS-MSC SDM is sending CDRs to on the Offline Mediation Controller machine.
    - The **Bad File directory** is the user-specified directory to hold the AMA DIRP files that contain errors. When the CC detects a bad AMA DIRP file, it moves the file to this directory and creates an error report file that it writes to this directory. The CC raises an alarm in the GUI and writes an error log to the node log file.

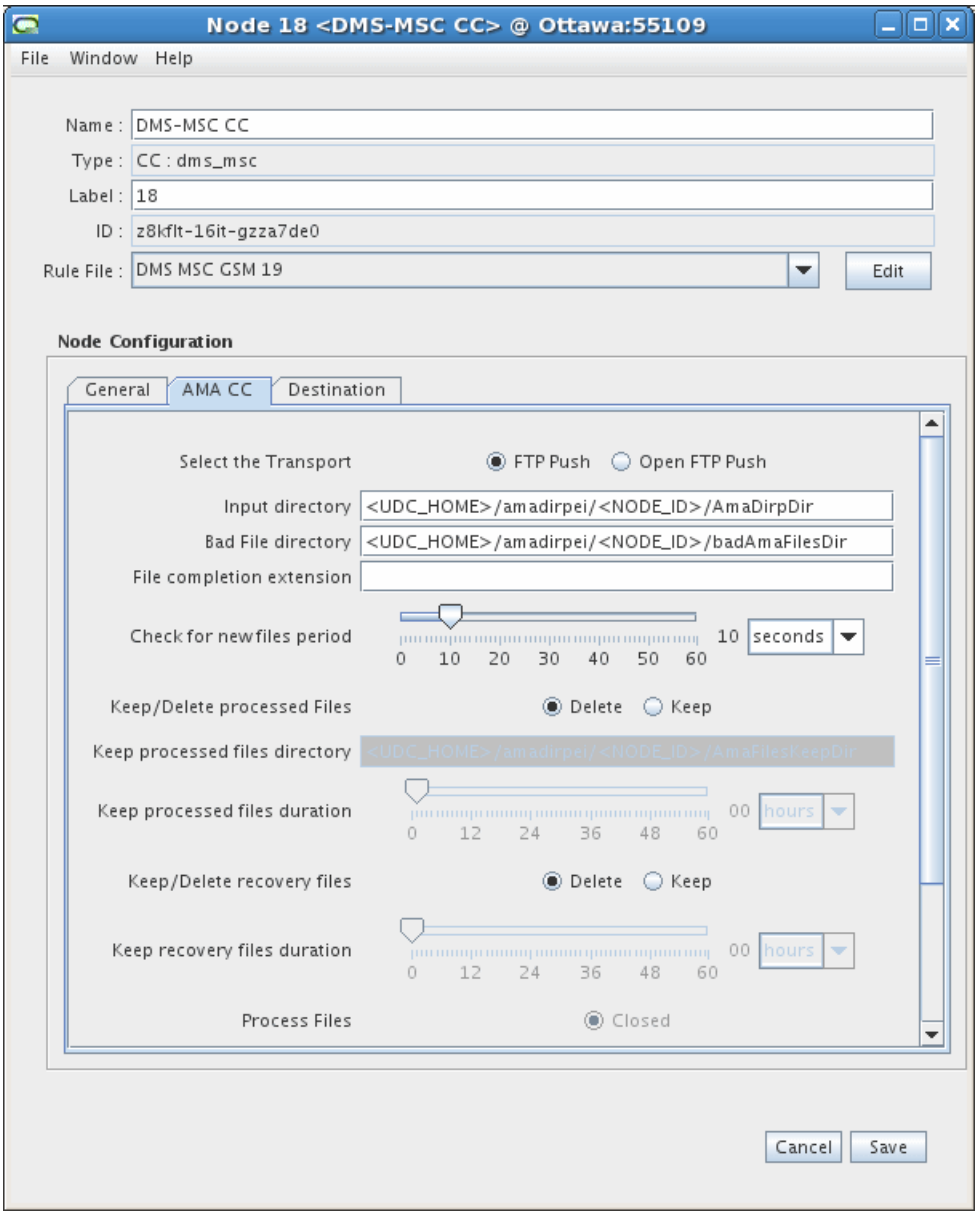
      The AMA DIRP file that the node moves to this directory retains its original name. The name of the error report file is in the format <*AMA DIRP filename*>_**error_report.txt**.

      There are two types of errors:

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

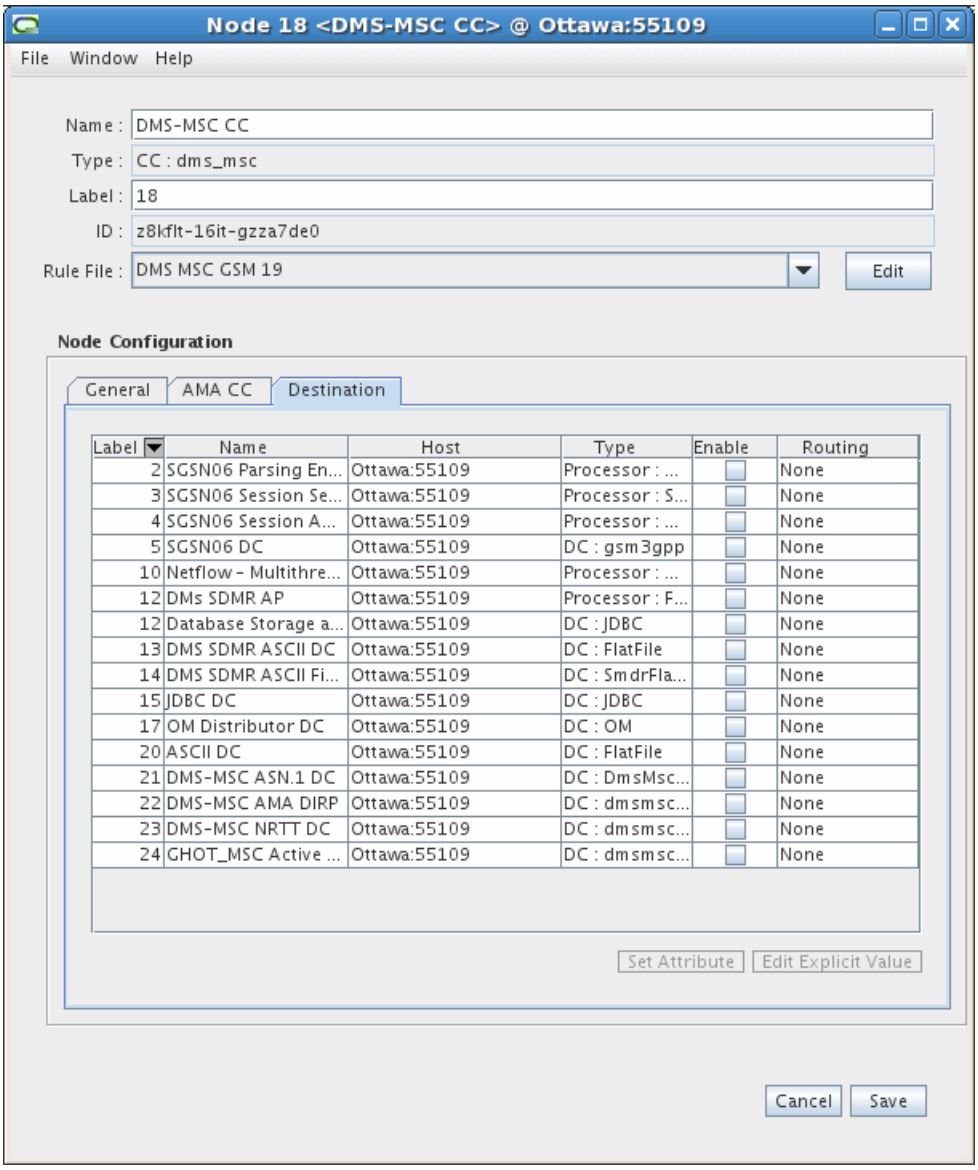
    The error report identifies the position of the processed and unprocessed AMA records.

- The **File completion extension** is the expected file extension that the DMS-MSC SDM adds to the AMA DIRP file when the FTP is complete. There is no default extension. If the field is left blank, the transferring SDM does not add an extension when the file transfer is complete.
- The **Check for new files period** defines the period that the node waits before checking the input directory for a new AMA DIRP file. The range is 1 second to 60 minutes.
- The **Keep/Delete processed files** controls whether the node deletes the processed AMA DIRP file or keeps the processed file for a user-defined period of time.
- The **Keep processed files directory** becomes active if you configure the node to keep the processed files. You must specify the directory where the node will store the processed files. The processed files will be prefixed with "P".
- The **Keep processed files duration** becomes active if you configure the node to keep the processed files. You must specify how long the node will keep the processed files. The range is 1 hour to 60 days.
- The **Keep/Delete recovery files** option indicates whether to track previously processed files. To prevent duplicate record processing, select "Keep".
- The **Keep recovery files duration** becomes active if you configure the node to keep the recovery files. You must specify how long the node will keep the recovery files. The range is 1 hour to 60 days.
- The **Process Files** button indicates the file types that are being processed. In FTP Push mode, all input files are processed. In Open FTP Push mode, only closed files are processed.
- The **Active file prefix** is active if you select Open FTP transport. It is the prefix of the active AMA DIRP files. This prefix should match the prefix setting on the MSC SDM.
- The **Active file suffix** is active if you select Open FTP Push. It is the suffix of the active AMA DIRP files. This suffix should match the suffix setting on the MSC SDM.
- The **Closed file prefix** is active if you select Open FTP Push. It is the prefix of the closed AMA DIRP files. This prefix should match the prefix setting on the MSC SDM.



- The **Maximum time awaiting data** is the time the node waits when it reaches the end of the active file. If new data is appended to this active file within this period, the node will read it. If there is no new data within this period, the node will wait until the next "Check for new files period" length of time before reading the next set of files.

11. The **Destinations** tab displays the other nodes in the system and shows which node the current node is connected to, and the type of routing used. You do not need to configure any settings on this tab. An example is shown below. See the Online Help for more information on this tab.



Creating and Configuring the NRTT CC

This section contains the information on the requirements for creating and configuring the NRTT CC

Input Stream Monitoring

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

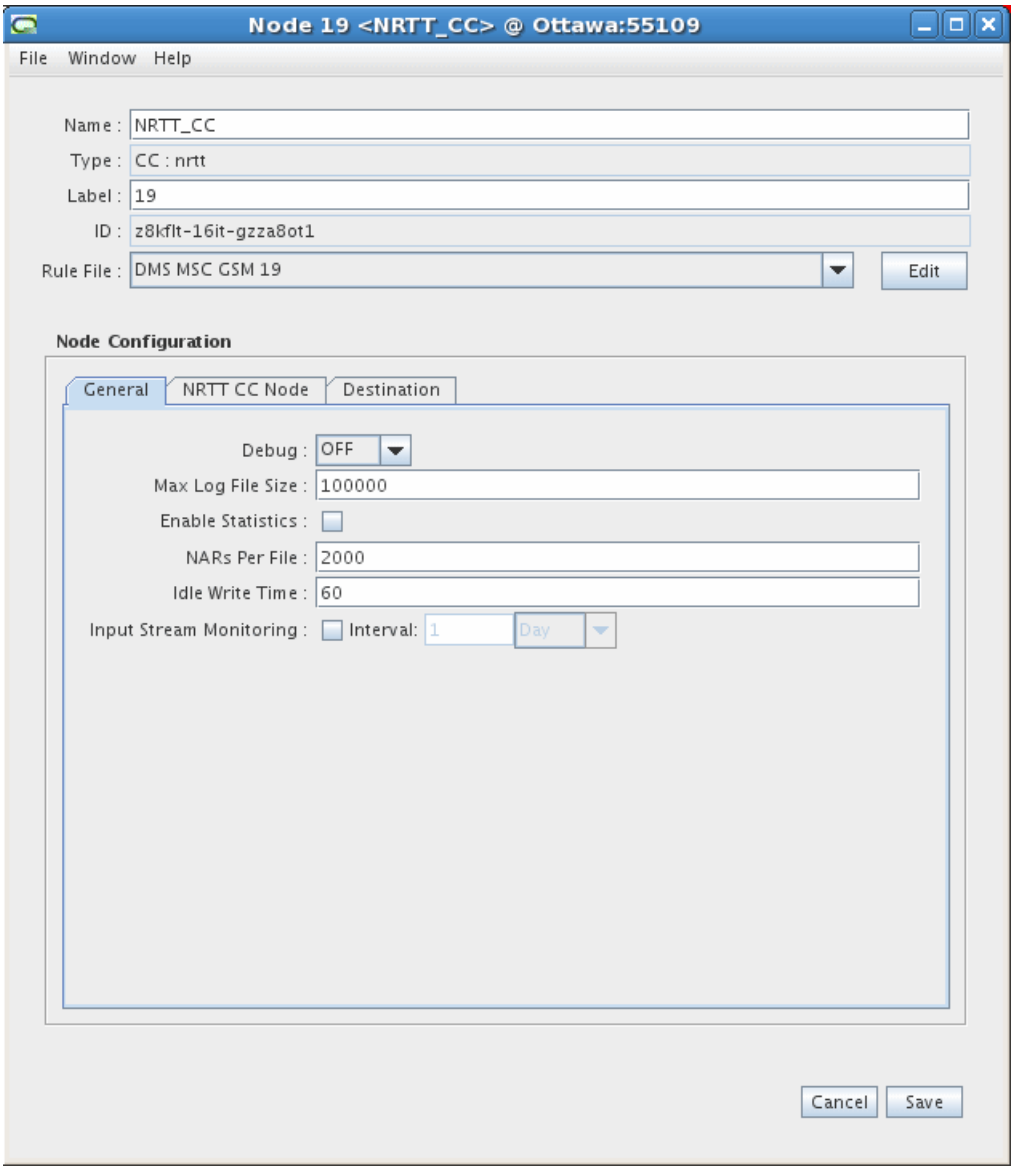
To create and configure the NRTT CC:

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 **Wireless** and click **Next**.
5. Select **Collection Cartridge (CC)** and click **Next**.
6. Select **NRTT** and click **Finish**.
7. In the node configuration window, type a name for the node in the **Name** field.
8. In the **Rule File** drop-down list, select the file the matches the GSM version of the incoming data.
9. On the **General** tab, refer to the online help for field definitions. The default field settings are shown in the sample below.



10. On the **NRTT CC Node** tab, configure the settings to match the settings on the MSC SDM. An example is shown below. Here are the field definitions:

- For the **Input directory**, you must enter the directory the DMS-MSC SDM is sending CDRs to on the Offline Mediation Controller machine.
- The Bad File directory is the user-specified directory to hold the AMA DIRP files that contain errors. When the CC detects a bad AMA DIRP file, it moves the file to this directory and creates an error report file that it writes to this directory. The CC raises an alarm in the GUI and writes an error log to the node log file.

  The AMA DIRP file that the node moves to this directory retains its original name. The name of the error report file is in the format <*AMA DIRP filename*>_ error_report.txt.

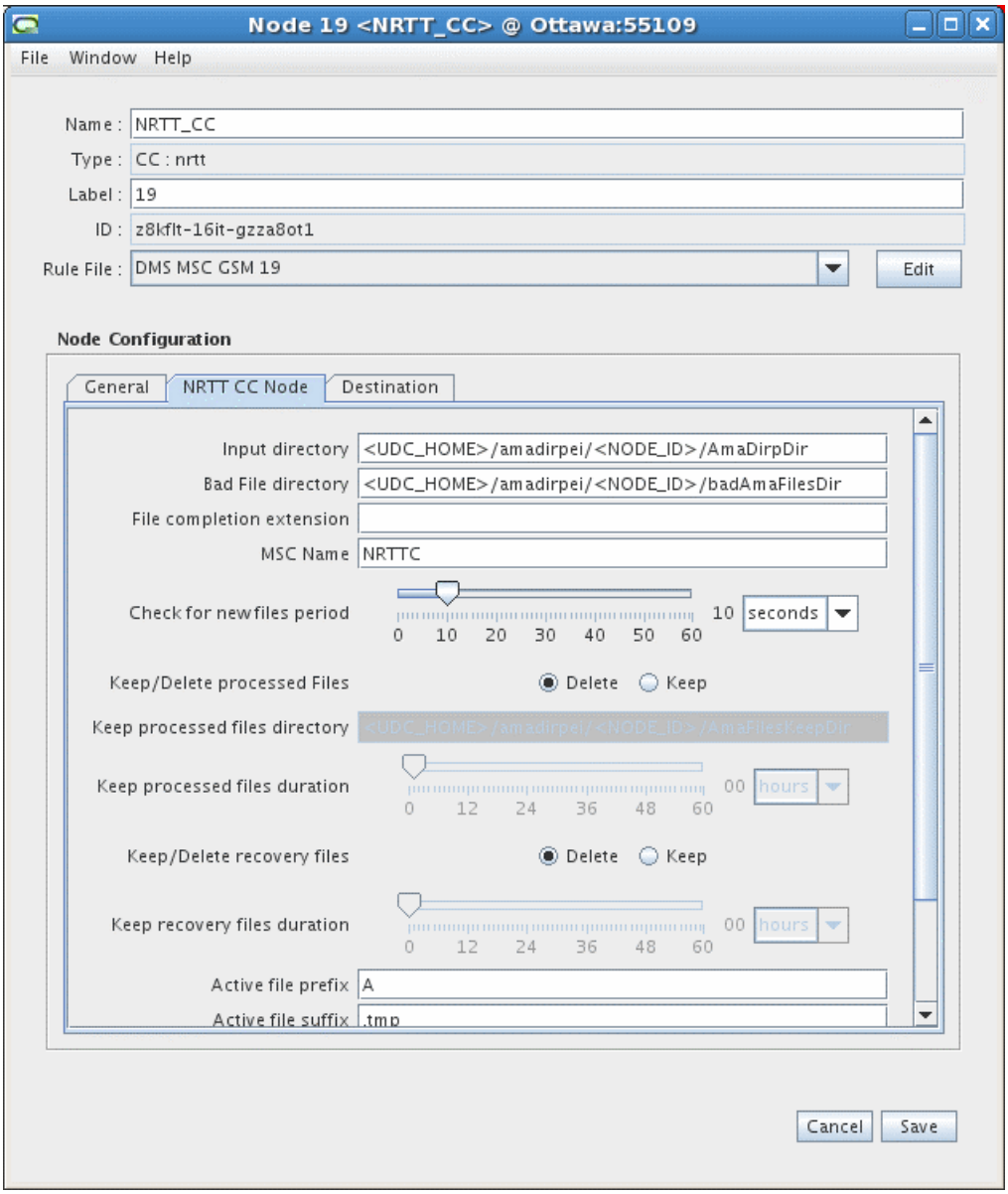
  There are two types of errors:

  – An error in the DIRP file structure. For example, the size of the record is corrupted. When the CC detects this error, the remaining information in the file is no longer readable. In this case, the CC processes the AMA DIRP file up to the position where the error was detected. The CC cannot process the remainder of the file.

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

    The error report identifies the position of the processed and unprocessed AMA records.
- The **File completion extension** is the expected file extension that the DMS-MSC SDM adds to the AMA DIRP file when the FTP is complete. There is no default extension. If the field is left blank then the transferring SDM is not expected to add an extension when the file transfer is complete.
- The **MSC Name** is the name of the MSC device. This field value is five characters long and must be the same in the NRTT CC, DMS-MSC NRTT DC and DMS-MSC Active GHOT NRTT DC configurations. Contact your Billing Centre administrator to determine the field value expected by the billing system.
- The **Check for new files period** defines the period that the node waits before checking the input directory for a new AMA DIRP file. The closed files are checked first, and this node will complete the processing of the records in the closed file that corresponds to the previous active file (this is to handle the normal SDM renaming case). For loss of connectivity case, since the SDM does not rename the active file to closed file, the node will delete the previous active file and leave the closed file for the DMS MSC AMA CC node to process. The node will then process all the active files. The range is 1 second to 60 minutes.
- The **Keep/Delete processed files** controls whether the node deletes the processed AMA DIRP file or keeps the processed file for a user-defined period of time.
- The **Keep processed files directory** becomes active if you configure the node to keep the processed files. You must specify the directory where the node will store the processed files. The processed files will be prefixed with "P".
- The **Keep processed files duration** becomes active if you configure the node to keep the processed files. You must specify how long the node will keep the processed files. The range is 1 hour to 60 days.

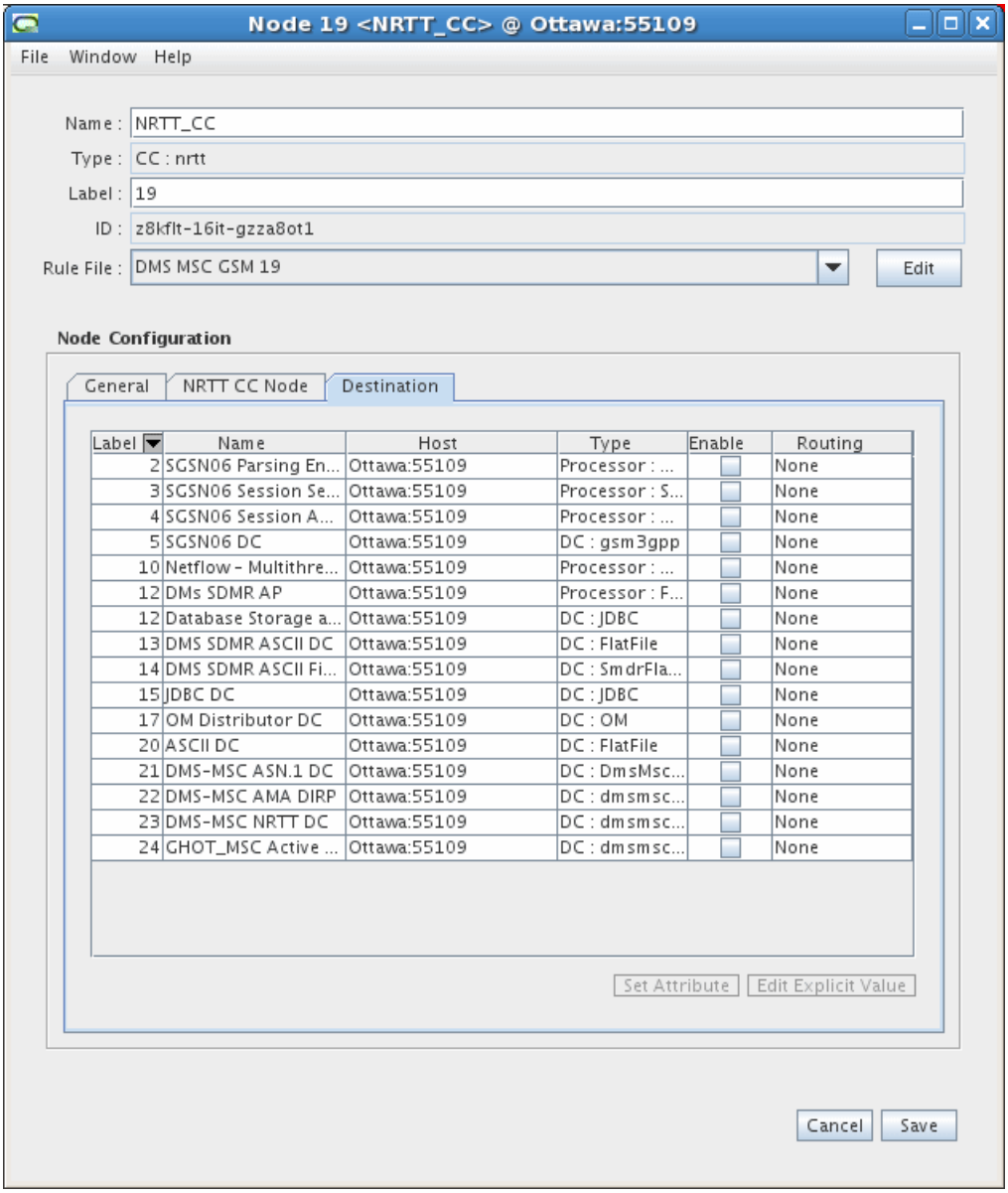
- The **Keep/Delete recovery files** option is available to prevent the processing of duplicate input AMA files. If you select "Keep", duplicate records will not be processed.
- The **Keep recovery files duration** becomes active if you configure the node to keep the recovery files. You must specify how long the node will keep the recovery files. The range is 1 hour to 60 days.
- The **Active file prefix** is the prefix of the active AMA DIRP files. The default value is **A**. This prefix should match the prefix setting on the MSC SDM.



- The **Active file suffix** is the suffix of the active AMA DIRP files. This suffix should match the suffix setting on the MSC SDM.
- The **Closed file prefix** is the prefix of the closed AMA DIRP files. This prefix should match the prefix setting on the MSC SDM.
- The **Maximum time awaiting data** is the time the node waits when it reaches the end of the active file. If new data is appended to this active file within this

period of time, the node will read it. If there is no new data within this period of time, the node will wait until the next "Check for new files period" length of time before reading the next set of files.

11. The **Destinations** tab displays the other nodes in the system and shows which node the current node is connected to, and the type of routing used. You do not need to configure any settings on this tab. An example is shown below. See the Online Help for more information on this tab.



ASCII DC Output Files

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

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

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

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

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

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

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

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

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

ASCII DC Sample Output

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

```
'GsmRecordHeader_
GsmCallTypeCode','FileName','TimeStamp','AdditionalInformation','AccessNetwork','A
nswerTime','CallDuration','CalledEquipment','CalledNumber_
BcdOrHexString','CalledNumber_DmsMscNumberType','CalledNumber_NPI_
SpareField','CalledNumber_NPI_ExtendedField','CalledNumber_NPI_
TypeOfNumber','CalledNumber_NumberingPlanIndicator','CalledParty_
BcdOrHexString','CalledParty_DmsMscNumberType','CalledParty_NPI_
SpareField','CalledParty_NPI_ExtendedField','CalledParty_NPI_
TypeOfNumber','CalledParty_
NumberingPlanIndicator','CalledSubscriberCategory','CallIndicator','CallingEquipme
nt','CallingNumber_BcdOrHexString','CallingNumber_
DmsMscNumberType','CallingNumber_NPI_SpareField','CallingNumber_NPI_
ExtendedField','CallingNumber_NPI_TypeOfNumber','CallingNumber_
NumberingPlanIndicator','CallingParty_BcdOrHexString','CallingParty_
DmsMscNumberType','CallingParty_NPI_SpareField','CallingParty_NPI_
ExtendedField','CallingParty_NPI_TypeOfNumber','CallingParty_
NumberingPlanIndicator','CallingSubscriberCategory','CallForwardIndicator','CallRe
ference','CauseForTermination','CellIdentity','ChannelAllocationTime','ClassmarkTi
meStamp','DateAndTime','DateAndTimeRelease','DateAndTimeSeizure','DeliveryTimestam
p','Diagnostic','DialedDigits_BcdOrHexString','DialedDigits_
DmsMscNumberType','DisconnectTime','EquipmentIdentity','EquipmentType','GsmRecordH
eader_DmsMscStructureCode','GsmRecordHeader_
HexadecimalId','HalfRateInUse','HotBillingIndicator','IncomingMeteringClass','Inco
mingRouteGroup','IncomingTrunkGroup','IncomingTrunkMember','LocationAreaCode','Log
icalNetwork','MessageReference','MeteringZone','MsClassmark','MscNumber_
BcdOrHexString','MscNumber_NPI_SpareField','MscNumber_NPI_
ExtendedField','MscNumber_NPI_TypeOfNumber','MscNumber_
NumberingPlanIndicator','OffAirCallSetup','OutgoingMeteringClass','OutgoingRouteGr
oup','OutgoingTrunkGroup','OutgoingTrunkMember','RecordNumber','ReleaseTime','Resu
ltIndicator','RoamingNumber_BcdOrHexString','RoamingNumber_
DmsMscNumberType','RoamingNumber_NPI_SpareField','RoamingNumber_NPI_
ExtendedField','RoamingNumber_NPI_TypeOfNumber','RoamingNumber_
NumberingPlanIndicator','ServiceCenter_BcdOrHexString','ServiceCenter_NPI_
SpareField','ServiceCenter_NPI_ExtendedField','ServiceCenter_NPI_
TypeOfNumber','ServiceCenter_
NumberingPlanIndicator','SmsResult','SmsTimestamp','StudyIndicator','Supplementary
```

```
ServiceAction','SupplementaryServiceCode','SupplementaryServiceParameter','TrunkRe
leaseTime','TrunkSeizureIncoming','TrunkSeizureOutgoing','AuxiliaryRecordHeader_
RecordingOfficeIdentity','AuxiliaryRecordHeader_
RecordingOfficeType','AuxiliaryRecordHeader_
SensorIdentity','AuxiliaryRecordHeader_
SensorType','BlockCount','BlockNumber','DateAndTimeNew','DateAndTimeOld','Emergenc
yFsn','FileSequenceNumber','FileTransferType','GenericIdentity','RecordCount','Swi
tchRestartType','AgeOfLocation','GeographicalLocationOfTargetUE','IdentityOfTarget
UE','LCSClientExternalID','LCSClientType','LCSRecordType','LCSResult','LCSInitiati
onTime','LCSTerminationTime','RequestedQualityOfService','RecordTime','PriorityCal
lTag','GroupCallReference','FunctionalNumber','PriorityLevel','PriorityCallCause',
'PriorityCallDuration','PriorityReleaseTime','EOM_ModuleCode','BS_ModuleCode','BS_
BearerService','BS_DateAndTime','LC_ModuleCode','LC_RoamingNumber_
DmsMscNumberType','LC_RoamingNumber__NPI_SpareField','LC_RoamingNumber__NPI_
ExtendedField','LC_RoamingNumber__NPI_TypeOfNumber','LC_RoamingNumber_
NumberingPlanIndicator','LC_RoamingNumber_BcdOrHexString','LC_MscNumber_NPI_
SpareField','LC_MscNumber_NPI_ExtendedField','LC_MscNumber_NPI_TypeOfNumber','LC_
MscNumber_NumberingPlanIndicator','LC_MscNumber_BcdOrHexString','LC_
IncomingTrunkGroup','LC_IncomingTrunkMember','LC_LocationAreaCode','LC_
CellIdentity','LC_ChannelType','LC_ChannelDescription','LC_DateAndTime','LC_
AccessNetwork','SS_ModuleCode','SS_SsCode','SS_SsAction','SS_DateAndTime','SS_
SsParameters','SS_ResultIndicator','T_ModuleCode','T_Teleservice','T_
DateAndTime','AP_ModuleCode','AP_SsCode','AP_DateAndTime','AP_EParameter1','AP_
EParameter2','AP_EParameter3','AP_EParameter4','AP_EParameter5','AP_
EParameter6','AP_EParameter7','AP_AocParmReason','TC_ModuleCode','TC_
ChargeZone','TC_SubscriberService','TC_TariffClass','DS_ModuleCode','DS_
IwfTrunkGroupMsSide','DS_IwfTrunkMemberMsSide','DS_IwfTrunkGroupNetworkSide','DS_
IwfTrunkMemberNetworkSide','DS_DataVolume','DS_DataRate','DS_
ConnectionElement','DS_InformationTransferCapability','DS_DataCompression','DS_
NumberOfFaxPages','DS_IwfDiagnosticCode','DS_IwfActivationTimestamp','OA_
ModuleCode','OA_TerminatingLocation','LO_ModuleCode','LO_MscNumber_NPI_
SpareField','LO_MscNumber_NPI_ExtendedField','LO_MscNumber_NPI_TypeOfNumber','LO_
MscNumber_NumberingPlanIndicator','LO_MscNumber_BcdOrHexString','LO_
LocationAreaCode','LO_CellIdentity','LO_AccessNetwork','P_ModuleCode','P_
PartialRecordSequenceNumber','P_PartialRecordEventCode','P_
PartialRecordReason','P_PartialRecordReferenceNumber','TU_ModuleCode','TU_
TrunkUsageReason','GI_ModuleCode','GI_DetectionPoint','GI_ServiceKey','GI_
DestinationRoutingAddress','GI_ScpAddress','GI_OffBoardInServiceIdentifier','GI_
OffBoardInServiceIndicator','GI_ChargeNumber_DmsMscNumberType','GI_ChargeNumber_
BcdOrHexString','GI_TimeStamp1','GI_TimeStamp2','GI_OperationIndication','GIC_
ModuleCode','GIC_FciFreeform1','GIC_FciFreeform2','GIC_FciFreeform3','GA_
ModuleCode','GA_PreTranslatedCalledPartyNumber_DmsMscNumberType','GA_
PreTranslatedCalledPartyNumber_NPI_SpareField','GA_PreTranslatedCalledPartyNumber_
NPI_ExtendedField','GA_PreTranslatedCalledPartyNumber_NPI_TypeOfNumber','GA_
PreTranslatedCalledPartyNumber_NumberingPlanIndicator','GA_
PreTranslatedCalledPartyNumber_BcdOrHexString','GA_OriginalCallingNumber_
DmsMscNumberType','GA_OriginalCallingNumber_NPI_SpareField','GA_
OriginalCallingNumber_NPI_ExtendedField','GA_OriginalCallingNumber_NPI_
TypeOfNumber','GA_OriginalCallingNumber_NumberingPlanIndicator','GA_
OriginalCallingNumber_BcdOrHexString','GCR_ModuleCode','GCR_
NetworkCallReferenceNumber','GCR_MscAddress_NPI_SpareField','GCR_MscAddress_NPI_
ExtendedField','GCR_MscAddress_NPI_TypeOfNumber','GCR_MscAddress_
NumberingPlanIndicator','GCR_MscAddress_BcdOrHexString','GCC_ModuleCode','GCC_
FreeFormatData','GCC_PartyToCharge','MNP_ModuleCode','MNP_RoutingNumber','MNP_
QueryMethod','MNP_PortedStatus','OT_ModuleCode','OT_ChargeNumberANI_
DmsMscNumberType','OT_ChargeNumberANI_NPI_SpareField','OT_ChargeNumberANI_NPI_
ExtendedField','OT_ChargeNumberANI_NPI_TypeOfNumber','OT_ChargeNumberANI_
NumberingPlanIndicator','OT_ChargeNumberANI_BcdOrHexString','OT_
OriginatingLineInformation','OT_OriginatingNumberingPlanArea','OT_
AutomaticNumberIdentificationIndicator','OT_TerminatingNumberingPlanArea','OT_
```

GenericAddressParameter','EA_ModuleCode','EA_
InterExchangeInternationalCarrierPrefix','EA_TypeOfCarrierIdentificationCode','EA_
CarrierConnectTimestamp','EA_
InterExchangeInternationalCarrierPrefixCallEventStatus','TF_ModuleCode','TF_
TollFreeCallTypeCode','TF_CalledPartyOffHookIndicator','TF_
ServiceFeatureCode','TF_ScpDeterminedTerminatedNumber','TF_OverseasIndicator','TF_
Lata','TF_InterExchangeInternationalCarrierRoutingIndicator','LNP_
ModuleCode','LNP_PartyIdentifier','LNP_LocationRoutingNumber','LNP_
ServiceProviderIdentity','LNP_Location','LNP_SupportingInformation','SING_
ModuleCode','SING_XcliIndicator','SING_NationalInternationalIndicator','SING_
OtherSubscriberCustgrp','SING_OtherSubscriberNcos','SING_
CallingPartyCategory','SING_CityWideCentrex','CSC_ModuleCode','CSC_
SelectedCarrierIdentificationCode','CSC_DefaultCarrierIdentificationCode','CSC_
SubscriberCustomerGroup'
'011','u030915094268gcdr','1086060297590','','','20030310061651','0000003','','121
41215034','0','0','1','1','01','','','','','','','','','','','0','0','1','0','00',
'','','','','','','','','0020511','000','','','','','','','','04016','','','','','
','00013','aa','','','001','112','00601','00011','','000','','000','','12148020000
','0','1','1','01','','','','','','00000000032','','','','','','','','','','','','
','','','','0','','','','20030310061654','030310061649900','','','','','','','',''
,'','','','','01500','
',''
,'',
'','
',''
,'',
'',''
'002','u030915094268gcdr','1086060297625','','','20030310061653','0000002','','121
41215034','2','0','1','1','01','310022141215034','1','','','','','000','0000000','
','','0','0','1','0','00','','','','','','','','0','0020511','000','','','','','',
'','','04016','','','','','','10003','aa','0','','','112','00601','00011','','',''
,'','fff0ff0','12148020000','0','1','1','01','0','','','','','00000000033','200303
10061654','','','','','','','','','','','','','','','0','','','','','0303100616499
00','','','','','','','','','','','','','01500','','','','','','','','','','','','
','','','','','','','','','000','','','','','','','','','','','','','','','','',''
,'','','','','','','','','','','','','006','011','20030310061650','','','','','','
',''
,'','','','','','','','','','','','','','018_018','012_012','00000000000_
00000000000','_','197260200000_197260200000','_','_','0_0','_','20030310061651_
','20030310061652_','4_
0','019','acac00000000000000000000000000000000000000000','','','','','','','','','
','011_011','0_0','0_
0','1_1','0_0','00_00','_','_','0214800_0214800','_','214_
214','25508100003ffffffffffffffffff_
25508100003ffffffffffffffffff','','','','','','','','','','','','','','','','','',
'','','','','','','','','','','','',''
'001','u030915094268gcdr','1086060297649','','','20030310061651','0000003','','121
41215034','2','0','1','1','01','','','','','','','','0000002','','','0','0','1','0
','00','310022141215034','1','','','','','000','0','0102415','000','','','','','',
'','','04016','12141215034','6','','','','10002','aa','0','','','','','','','','',
'','fff0ff0','12148020000','0','1','1','01','0','','','','','00000000034','2003031
0061654','','','','','','','','','','','','','','','0','','','','','','03031006165
1500','','','','','','','','','','','','01500','','','','','','','','','','','',''
,'','','','','','','','','000','','','','003','3','0','1','1','01','ffffffffff1214
4030150','0','1','0','00','','','','00000000000','','FFFFF','','','0','','','','',
'','','006','011','20030310061650','','','','','','','','','','','','','','','',''
,'',
'','','','018','000','00000000000','','','','','0','','','','3','','','','','','',
'','011','
0','0','1','0','00','','062','','','214','25508100003ffffffffffffffffff','','','',

'',''
'002','u030915094268gcdr','1086060297668','','','20030310061651','0000003','100000
000000034','12141215034','2','0','1','1','01','310022141215034','1','','','','','0
10','0000000','','','0','0','1','0','00','','','','','','','','0','0102415','000',
'','20030310061651','20030310061651','','','','','04016','','','20030310061654',''
,'','10003','aa','0','','','','','','','','','','2100000','12148020000','0','1','1
','01','0','','','','','00000000035','20030310061654','','','','','','','','','','
','','','','0','','','','','','','','','','','','','','','','','','','01500','',''
,'','','','','','','','','','','','','','','','','','','000','','','','003','3','0
','1','1','01','ffffffffff12144030150','0','1','1','01','ffffffffff12148020000','0
0622','00001','03100200401','00002','FFFFF','','20030310061651','0','','','','',''
,'','006','011','20030310061651','','','','','','','','','','','','','','','','','
',''
,'',
'','','','','022','f0000000000000001','0','1','1','01','ffffffffff12148020000','',
'','','','','','','011','0','0','1','0','00','','062','0214800','','214','25508100
003ffffffffffffffffff',''
,'','','','','','','','','',''
'012','u030915094971gcdr','1086060297864','','','20030310062416','0000003','','101
022214050325001','0','0','1','2','01','','','','','','','','','','2141215031','2',
'0','1','2','01','','','','','','','','','0086078','000','','','','','','','','','
','','','','','00014','aa','','','','','','','','','','','','12148020000','0','1',
'1','01','','001','113','00603','00001','00000000044','','','','','','','','','','
','','','','','','0','','','','20030310062418','','030310062416400','','','','',''
,'','','','','','','01500','','','','','','','','','','','','','','','','','','','
',''
,'',
'','
',''
,'',
'','
',''
'001','u030915094971gcdr','1086060297928','','','20030310062420','0000004','','121
41215032','2','0','1','1','01','','','','','','','','0000002','100000000000031','1
2141215031','2','0','1','1','01','310022141215031','1','','','','','010','0','0086
078','000','','20030310062416','20030310062415','','','','','00016','1010333121412
15032','6','20030310062423','','','10002','aa','0','','','','','','','','','','210
0000','12148020000','0','1','1','01','0','','113','00603','00001','00000000045','2
0030310062423','','','','','','','','','','','','','','','0','','','','','','03031
0062420000','','','','','','','','','','','','01500','','','','','','','','','',''
,'','','','','','','','','','','000','','','','003','3','0','1','1','01','ffffffff
ff12144030149','0','1','1','01','ffffffffff12148020000','00622','00004','031002004
01','00007','FFFFF','','20030310062416','0','','','','','','','006','011','2003031
0062415','
','018_018','002_
002','00000000000_00000000000','12141215032_14050325001','19726022001_
19726022001','_','_','0_0','_','_20030310062416','_20030310062418','0_
2','','','','','','','','','','','','','','','','','','022','f0000000000000007','0
','1','1','01','ffffffffff12148020000','','','','','','','','011_011','7_7','0_
0','1_1','2_0','00_00','fffffffffffffffffffff2141215031_
fffffffffffffffffffff1412150600','062_062','0214702_0214702','_','214_
405','25508100003ffffffffffffffffff_
25508100003ffffffffffffffffff','012','02221','0','','','','','','','','','','','',
'','','','','','','','','','','','','','','',''
'002','u030915094971gcdr','1086060297946','','','20030310062420','0000004','100000
000000032','12141215032','2','0','1','1','01','310022141215032','1','','','','','0
10','0000000','','2141215031','0','0','1','2','01','','','','','','','','0','00860
78','000','','20030310062420','20030310062419','','','','','00016','','','20030310
062423','','','10003','aa','0','','','','','','','','','','2100000','12148020000',
'0','1','1','01','0','','','','','00000000046','20030310062423','','','','','','',

```
'','','','','','','','','0','','','','','030310062419300','','','','','','','','',
'','','','','01500','','','','','','','','','','','','','','','','','','','','','0
00','','','','003','3','0','1','1','01','fffffffff12144030149','0','1','1','01','
fffffffff12148020000','00622','00005','03100200401','00007','FFFFF','','200303100
62420','0','','','','','','','006','011','20030310062419','','','','','','','','',
'','','','','','','','','','','','','','','','','','','','','','','','','','','','
',','','','','','','','','','','','','','','','','','','','','','','','','','','',''
,'','','','','','','','','','','','','','022','f0000000000000008','0','1','1','01','f
fffffffff12148020000','','','','','','','','011','7','0','1','2','00','fffffffffff
fffffffff2141215031','062','0214702','','214','25508100003fffffffffffffffff','',
'','','','','','','','','','','','','','','','','','','','','','','','','','','','
',''
'001','u030915095472gcdr','1086060298322','','','','0000000','','12140325001','0',
'0','1','1','01','','','','','','','','0000002','','12141215071','2','0','1','1','
01','310022141215071','1','','','','','010','1','0000031','000','','','','','','',
'','00016','992141215072','6','','','','10002','aa','0','','','','','','','','',''
,'fff0ff0','12148020000','0','1','1','01','0','','113','00603','00001','0000000004
7','20030310062927','','','','','','','','','','','','','','','','0','','','','','','
030310062926300','','','','','','','','','','','','01500','','','','','','','','','',
'','','','','','','','','','','','','','000','','','','','','','','','','','','','','
',','','','','','','','','','','005','029','5','20030310062925','fffffffff9921412150
72','001','006','011','20030310062925','','','','','','','','','','','','','','','
',','','','','','','','','','','','','','','','','','','','','','','','','','','','',''
,'','','','','018','003','00000000000','12140325001','19726023001','','','0','','2
0030310062926','20030310062927','2','','','','','','','','','','','','','','','','
',','','','','','','','','','','','','','','','','','','','011_011','0_0','0_0','1_1','0_
0','00_00','_','062_062','_','_','214_992','25508100003fffffffffffffffff_
25508100003fffffffffffffffff','','','','','','','','','','','','','','','','','','',
'','','','','','','','','','','','','',''
```

Creating and Configuring the ASCII DC

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

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

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

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

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

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

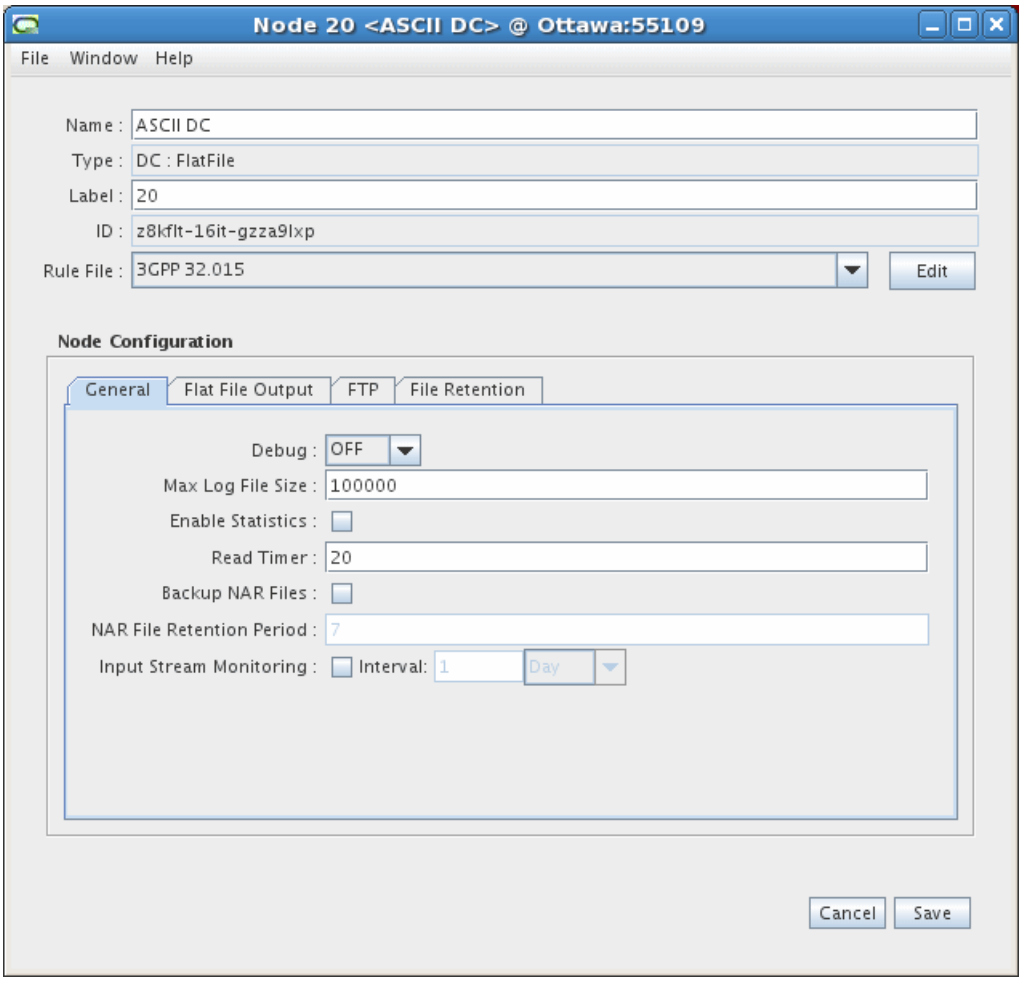
    For example, if the Numbering_Plan_Identifier field appears as "01201" then "0" = spare field, "1" = extension fields, "2" = TON and "01" = number plan indicator.

To create and configure the ASCII DC:

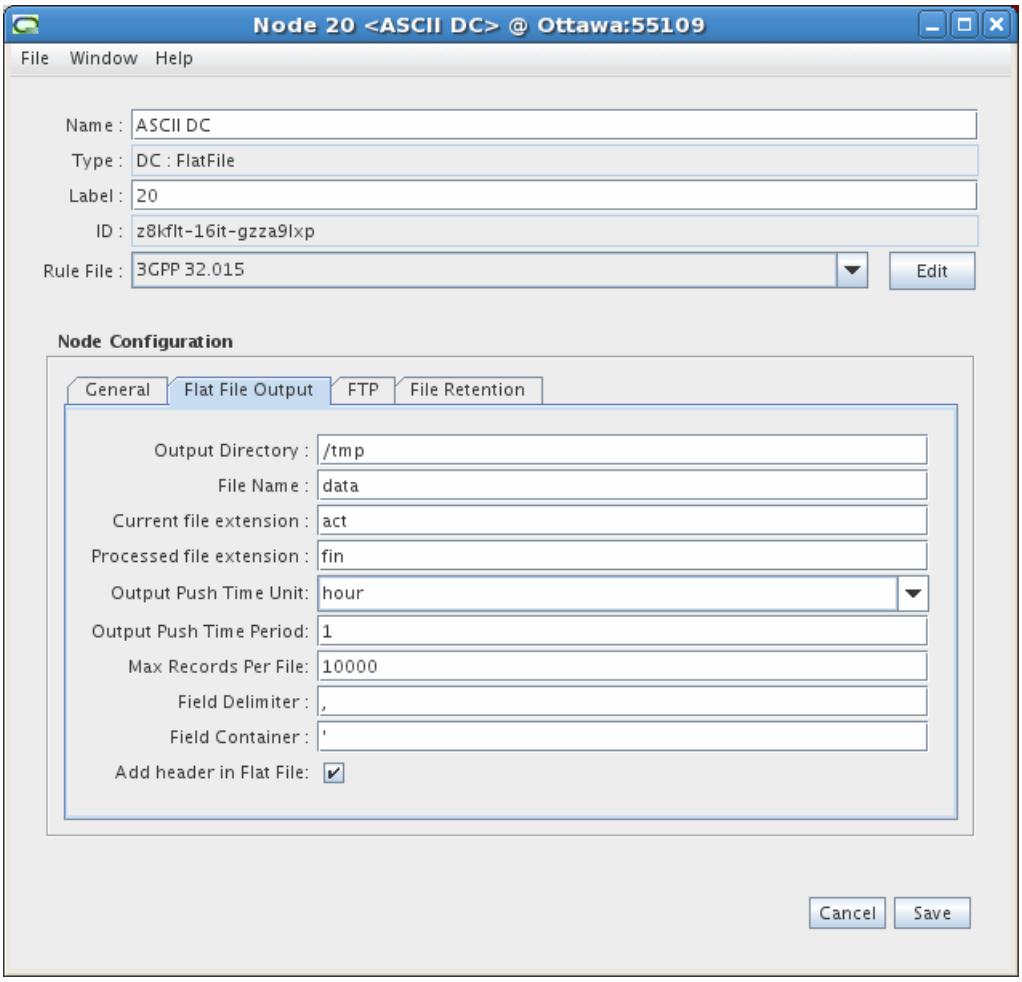
1. Log on to Offline Mediation Controller Administration Client.

   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**.

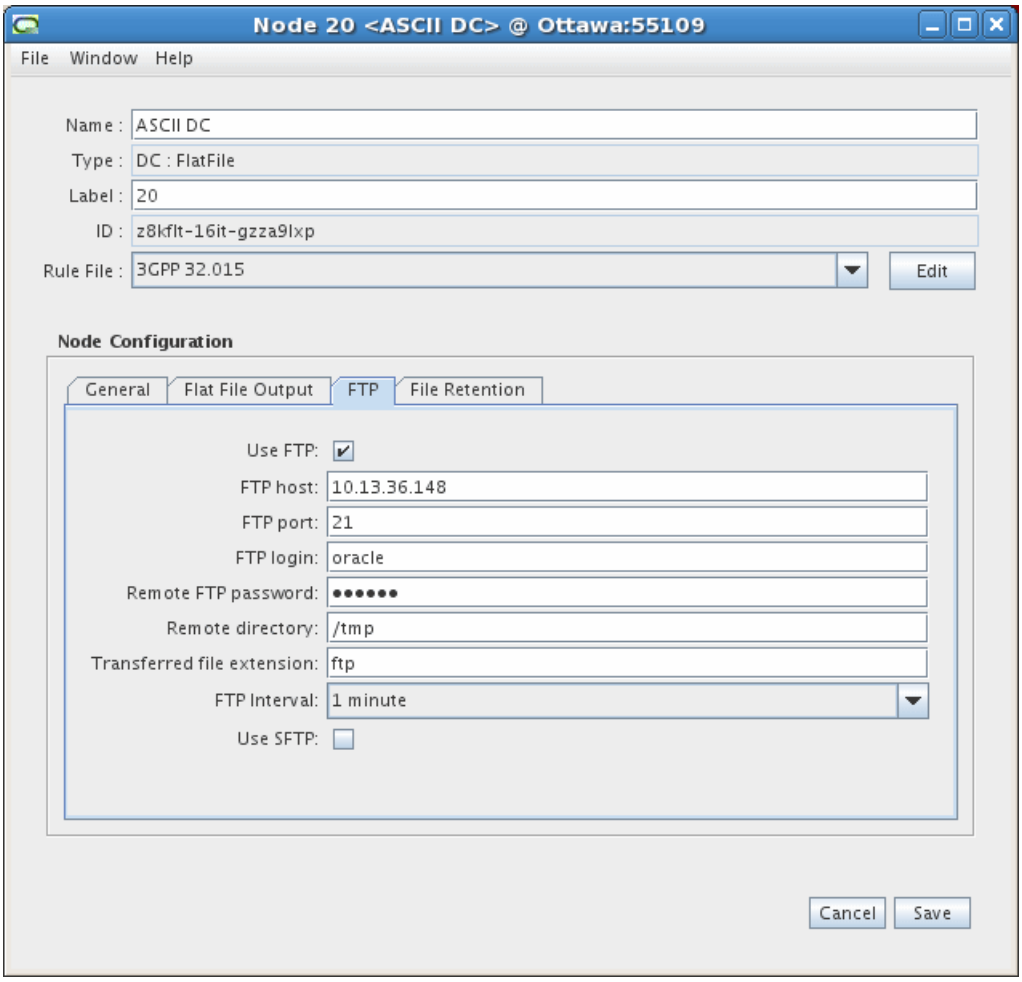
   The Create a Node dialog box appears.
4. Select **Wireless** and click **Next**.
5. Select **Distribution Cartridge (DC)** and click **Next**.
6. Select **ASCII Delimited** and click **Finish**.
7. In the node configuration window, type a name for the node in the **Name** field.
8. In the **Rule File** drop-down list, selectthe desired NPL rule file.
9. On the **General** tab, refer to the online help for field definitions. The default field settings are shown in the sample below.



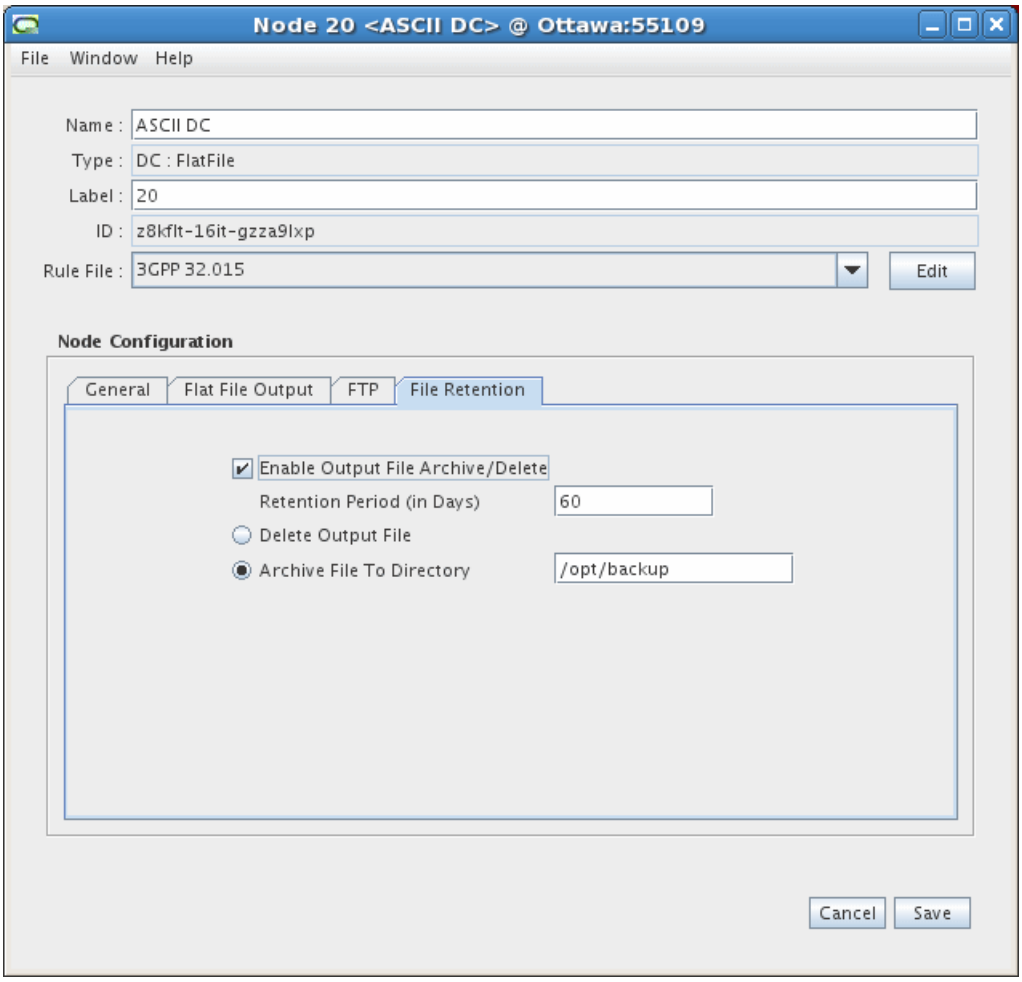
10. On the **Flat File Output** tab, configure the settings as desired. The default settings are shown below:



11. On the **FTP** tab, configure the settings as desired. An example is shown below:



12. 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.



13. Click **Save**.

Creating and Configuring the DMS-MSC ASN.1 DC

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

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

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

To create and configure the DMS-MSC ASN.1 DC:

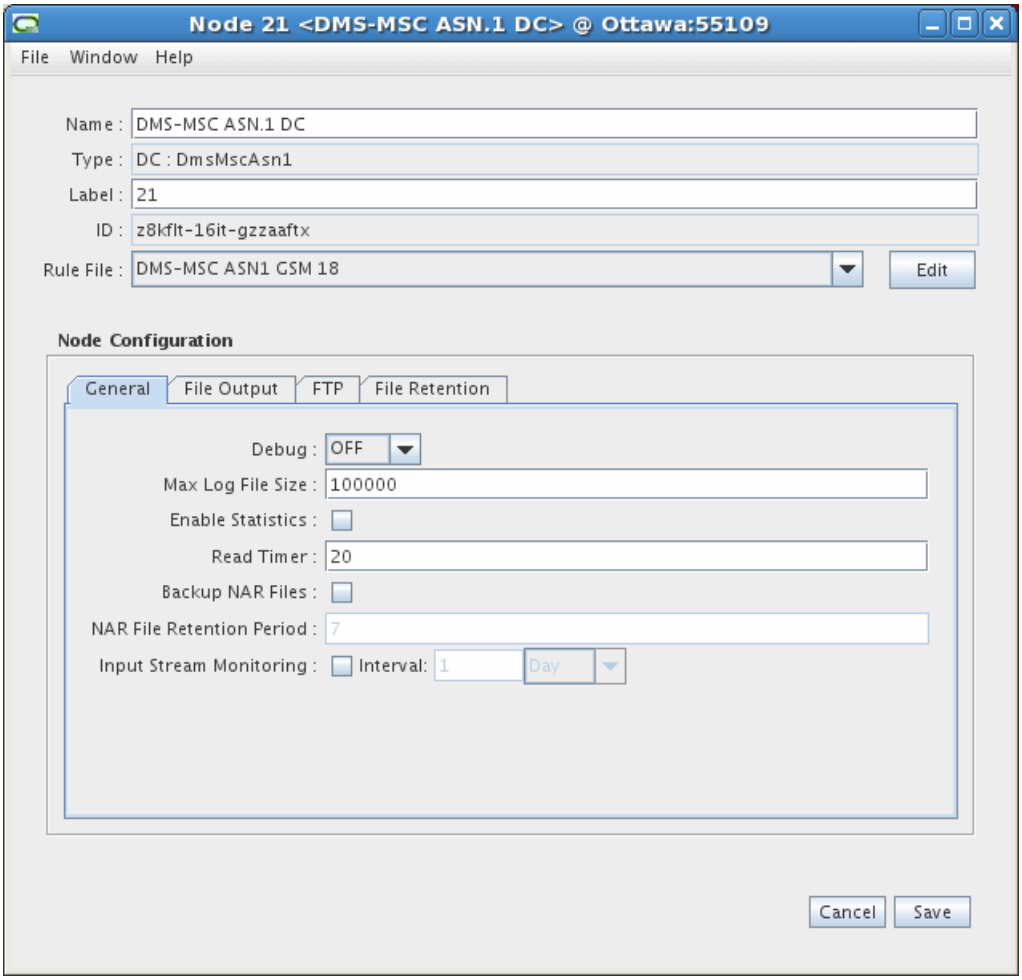
1. Log on to Offline Mediation Controller Administration Client.

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

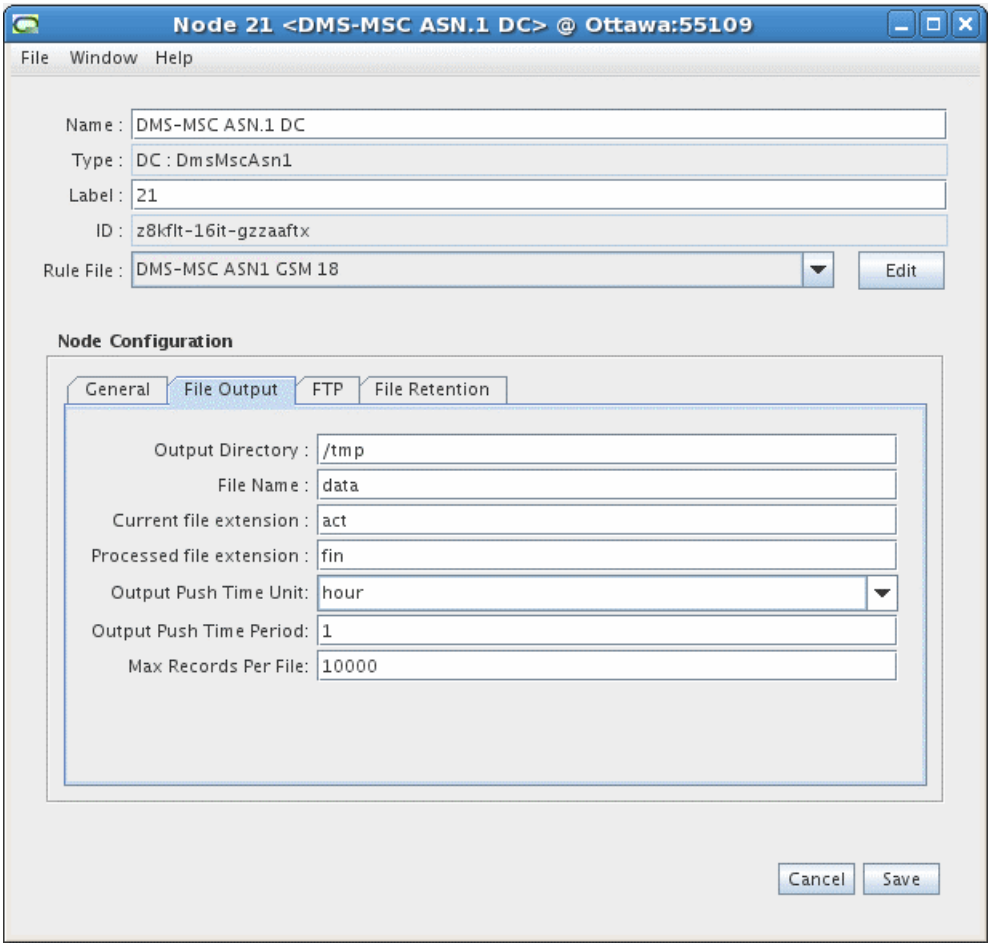
2. In the **Mediation Hosts** table, select a host.
3. In the **Nodes on Mediation Host** section, click **New**.

The Create a Node dialog box appears.

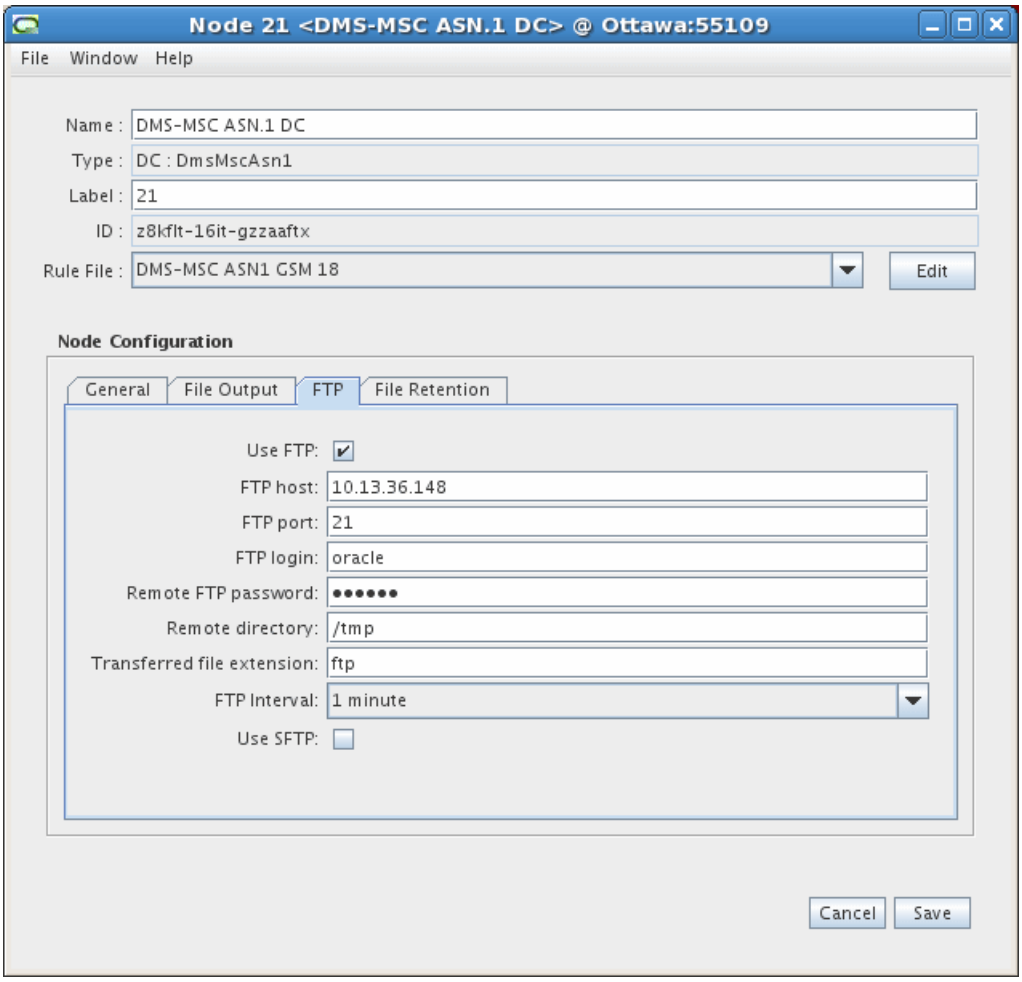
4. Select **Wireless** and click **Next**.
5. Select **Distribution Cartridge (DC)** and click **Next**.
6. Select **DMS-MSC ASN.1** and click **Finish**.
7. In the node configuration window, type a name for the node in the **Name** field.
8. In the **Rule File** drop-down list, select **DMS MSC ASN1 GSM 13**, **DMS MSC ASN1 GSM 15**, **DMS MSC ASN1 GSM 16**, **DMS MSC ASN1 GSM 17** or **DMS MSC ASN1 GSM 18**, depending on the version of the incoming GSM data.
9. On the **General** tab, refer to the online help for field definitions. The default field settings are shown in the sample below.



10. On the **File Output** tab, configure the settings as necessary. The default settings are shown below.



11. On the **FTP** tab, if you are using FTP, select the **Use FTP** checkbox and configure the settings as necessary.



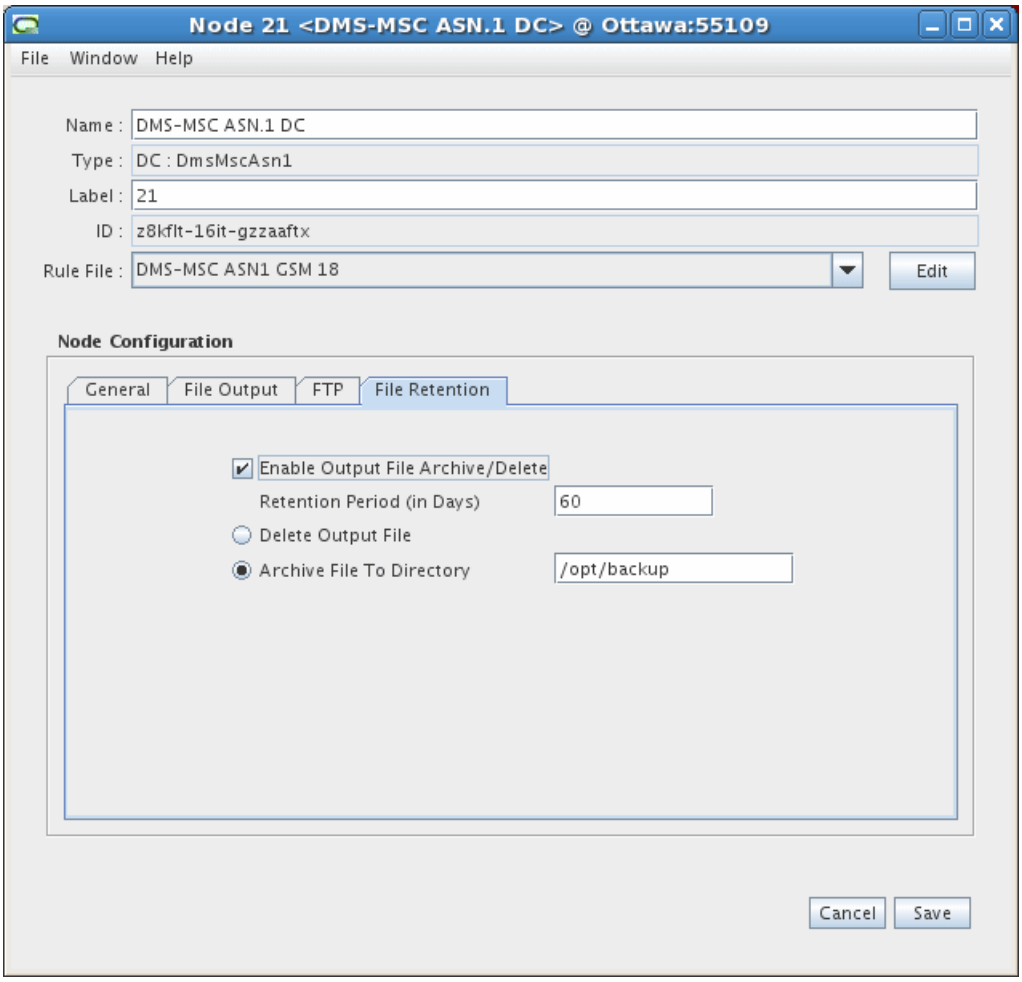
12. On the **File Retention** tab, configure the desired settings:

    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.



13. Click **Save**.

DMS-MSC ASN.1 Sample Output

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

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

```
* * * * * * * Record 2 * * * * * * *

DMS MSC (32.005 v3.6.0)
-----------------
value CallEventRecord ::= mtCallRecord : {
  recordType mtCallRecord,
  servedIMSI '13002241215130F4'H,
  servedMSISDN '912141215130F4'H,
  recordingEntity '912141080200F0'H,
  mscIncomingTKGP tkgpName : "00601",
  basicService teleservice : '11'H,
  seizureTime '0303100616492B0000'H,
  answerTime '0303100616532B0000'H,
  releaseTime '0303100616552B0000'H,
  callDuration 2,
  causeForTerm normalRelease,
  diagnostics manufacturerSpecificCause : {
    identifier { 0 1 2 3 },
    information -- OCTET STRING : '020110'H --
  },
  callReference 20511
}
* * * * * * * Record 3 * * * * * * *

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

Creating and Configuring the JDBC DC

Notes:

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

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

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

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

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

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

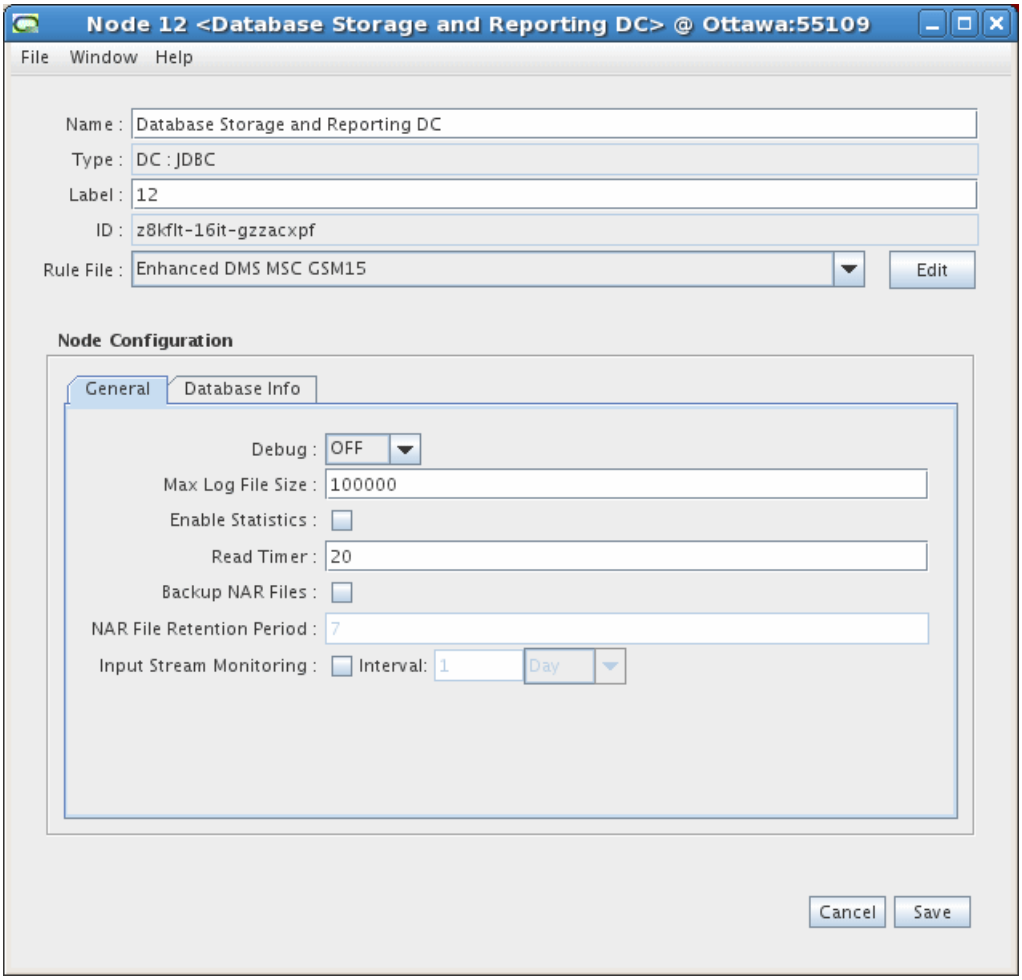
To create and configure the Database Storage and Reporting DC:

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 **Wireless** and click **Next**.
5. Select **Distribution Cartridge (DC)** and click **Next**.
6. Select **Database Storage and Reporting DC** and click **Finish**.
7. In the node configuration window, type a name for the node in the **Name** field.
8. In the **Rule File** drop-down list, selectthe desired NPL rule file.
9. On the **General** tab, refer to the online help for field definitions. The default field settings are shown in the sample below.



10. On the **Database Info** tab, use the following guidelines to configure the settings:

    Batch Size - number of records to transmit in one batch to the database

    User - user name to connect to the database to which the node sends data

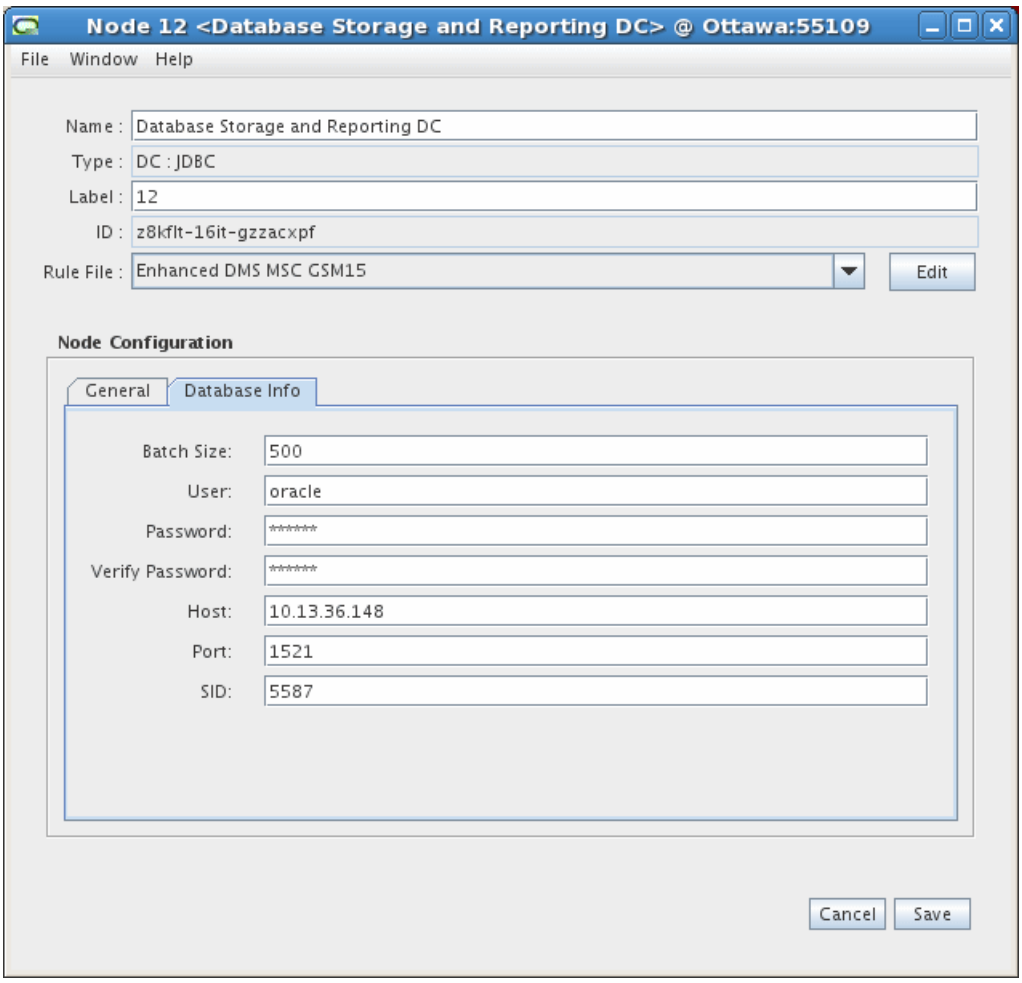
    Password - alphanumeric string to log in to the database

    Verify Password - type the password again to verify the accuracy

Host - IP Address of the database

Port - port number used to communicate with the database

SID - service instance of the database - the identification number for the database



11. Click **Save**.

    For more information on Database Storage and Reporting functionality, see "Database Storage and Reporting"

Creating and configuring the DMS-MSC AMA DIRP DC

To create and configure the DMS-MSC AMA DIRP DC:

1. Log on to Offline Mediation Controller Administration Client.

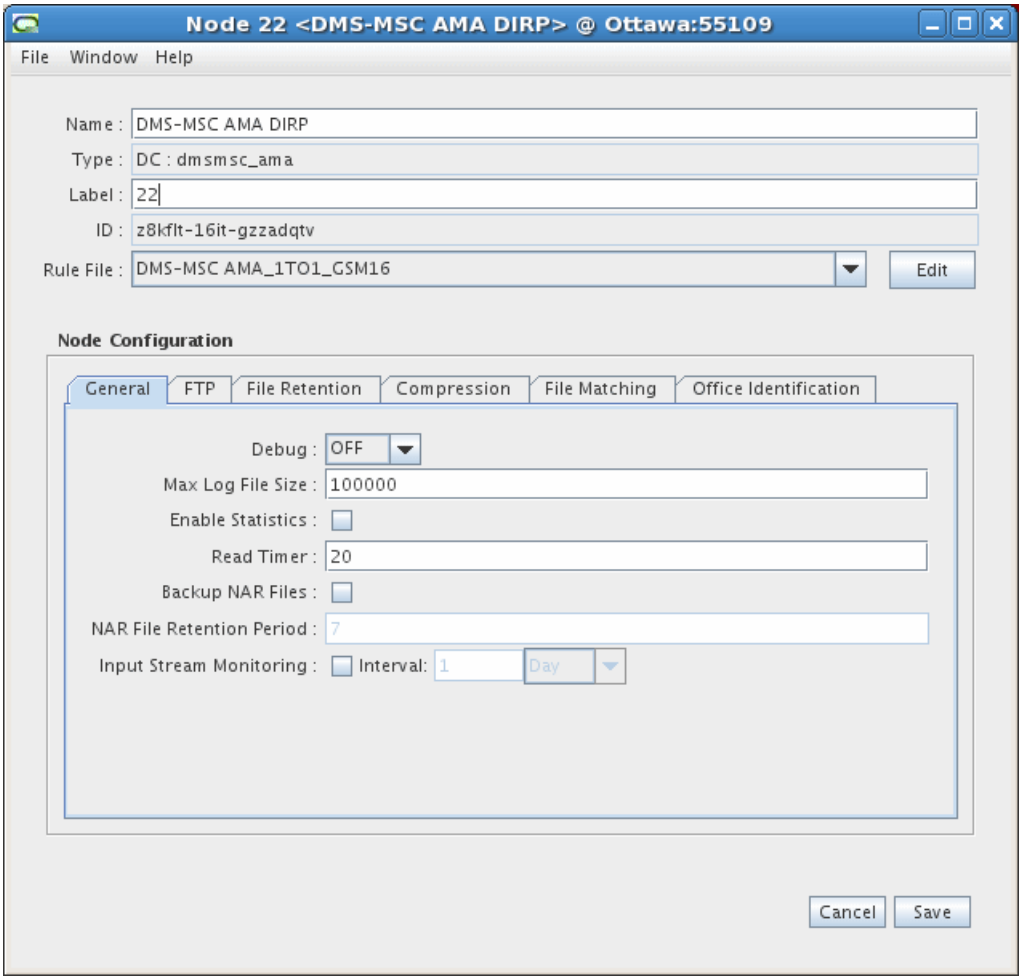
   The Node Hosts & Nodes (logical view) screen appears.

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

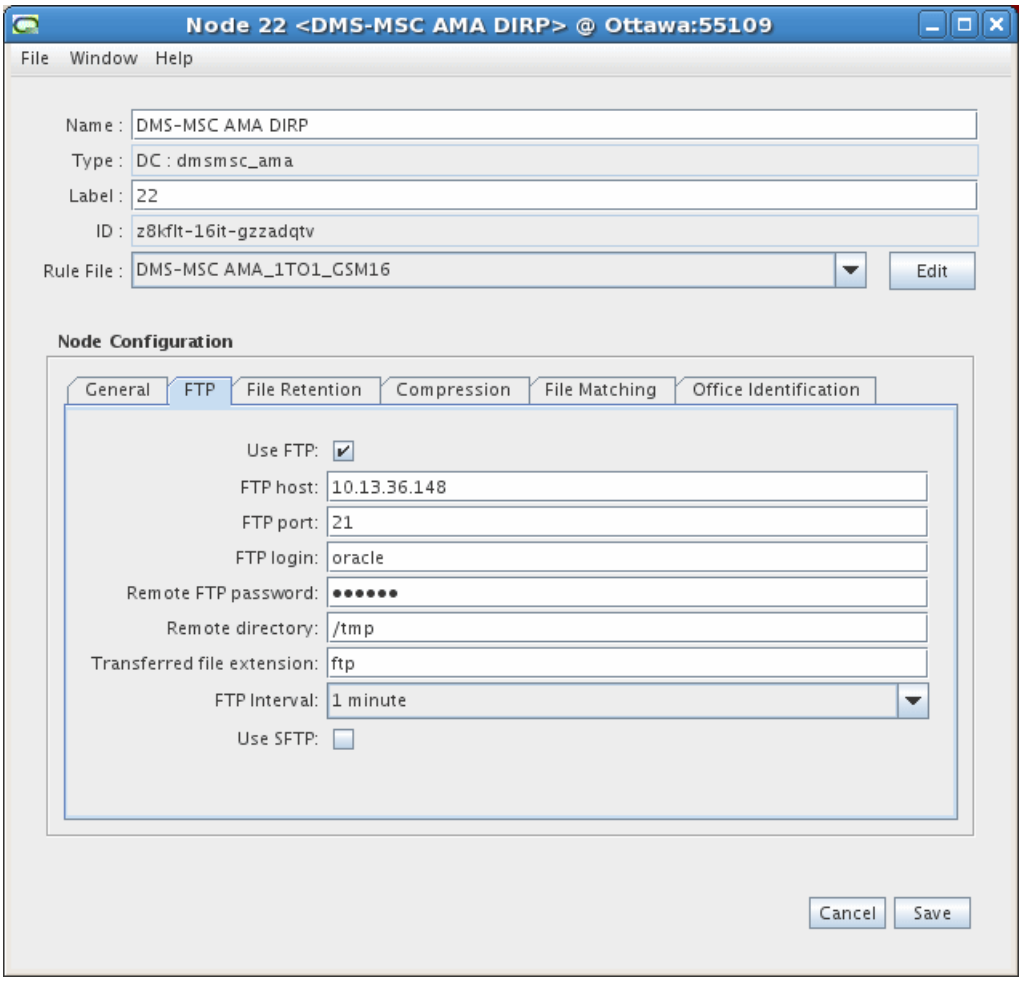
   The Create a Node dialog box appears.

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

6. Select **DMS-MSC AMA DIRP** and click **Finish**.
7. In the node configuration window, type a name for the node in the **Name** field.
8. In the **Rule File** drop-down list, select the file with the GSM version you want for the output data.
9. On the **General** tab, refer to the online help for field definitions. The default field settings are shown in the sample below.



10. On the **FTP** tab, configure the settings as desired. An example is shown below:



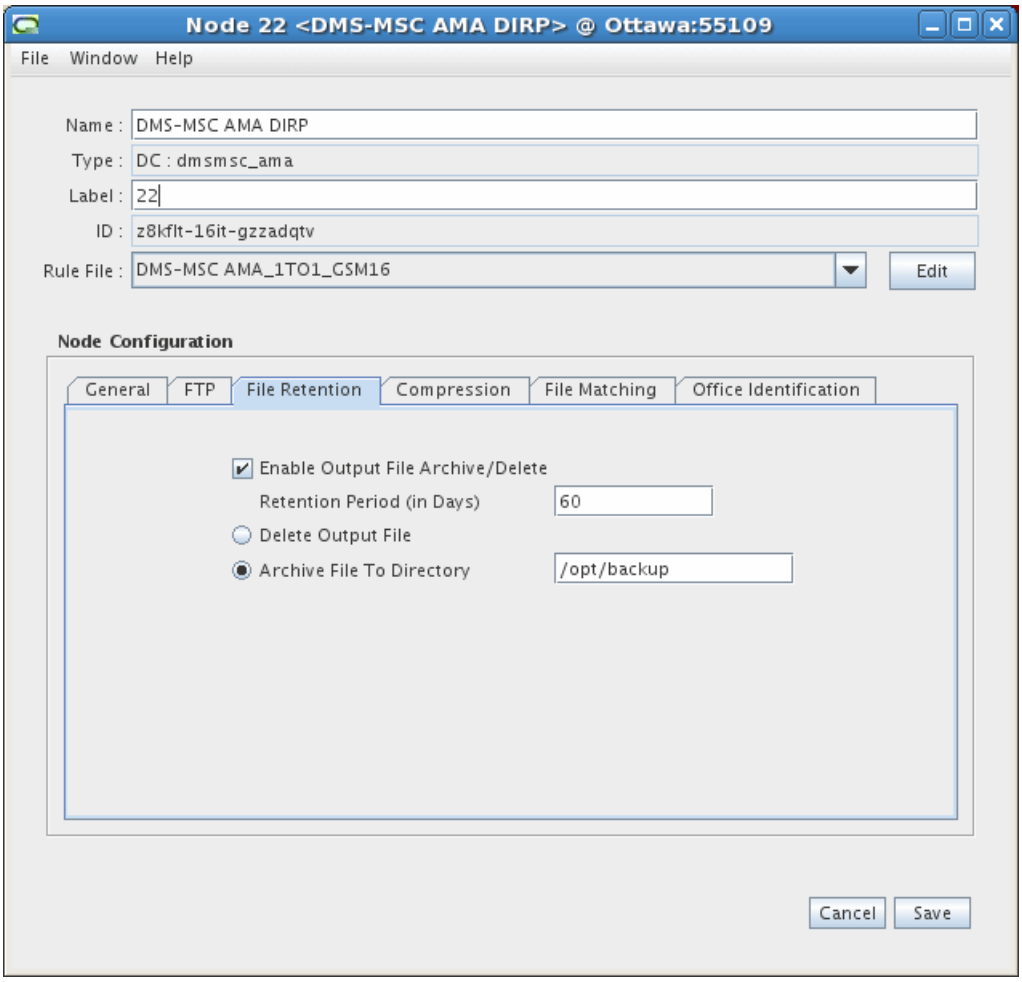
11. On the **File Retention** tab, configure the desired settings:

    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.



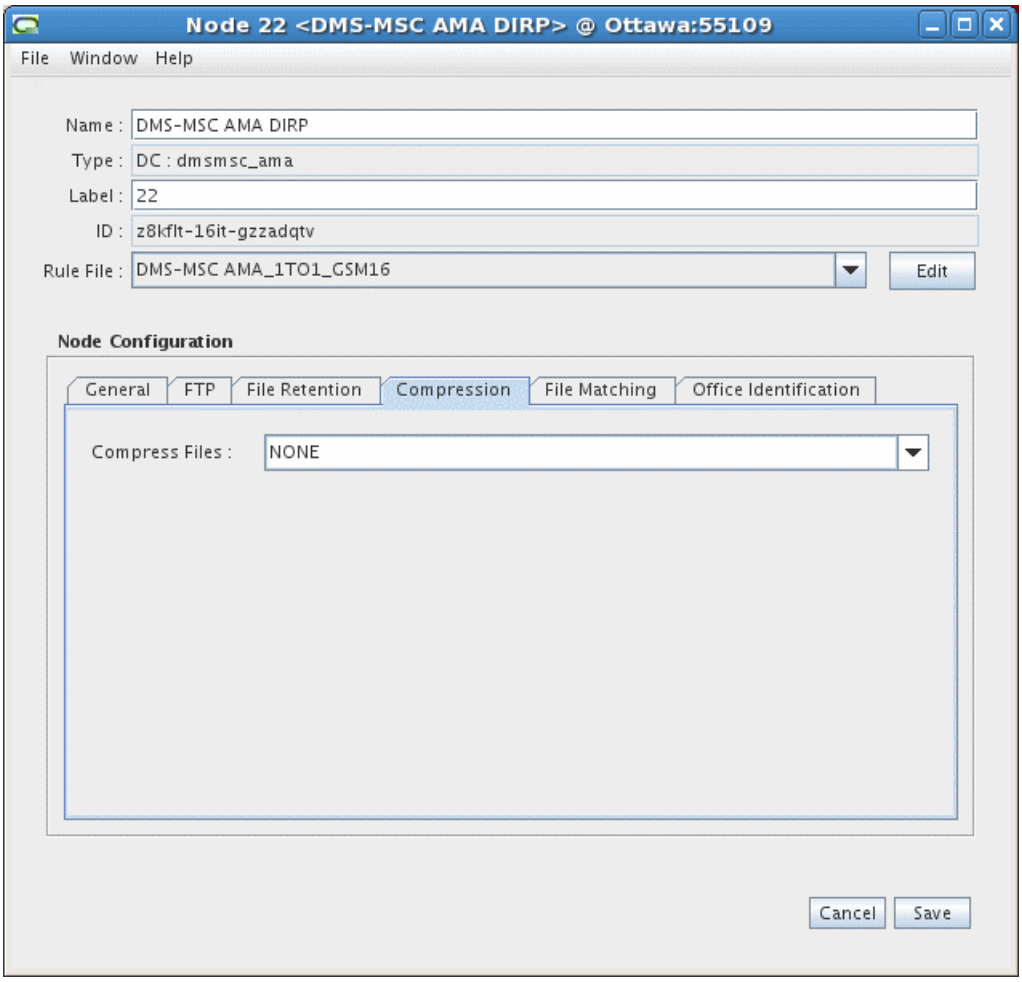
12. On the **Compression** tab, select an item from the drop-down list. Select **NONE** for no compression, or **zip** or **gzip** for compression.

    When **zip** or **gzip** is chosen from the "Compress Files" drop-down list, the output files will be compressed and moved to the <*output*>/compressedfolder. Selecting the "Enable Output File Archive/Delete" box under the **File Retention** tab, will manage the compressed files as follows:

    - If the "Delete Output File" option is selected under the **File Retention** tab, the files in the <*output*>/compressed folder will be deleted after the specified retention period.
    - If the "Archive File To Directory" option is selected under the **File Retention** tab, the files in the <*output*>/compressed folder will be moved to the <*archive*>/compressed folder after the specified retention period.

    Note: Existing files in the Output folder will not be archived or deleted after a compression option is selected; as a result, they should be archived or deleted manually.

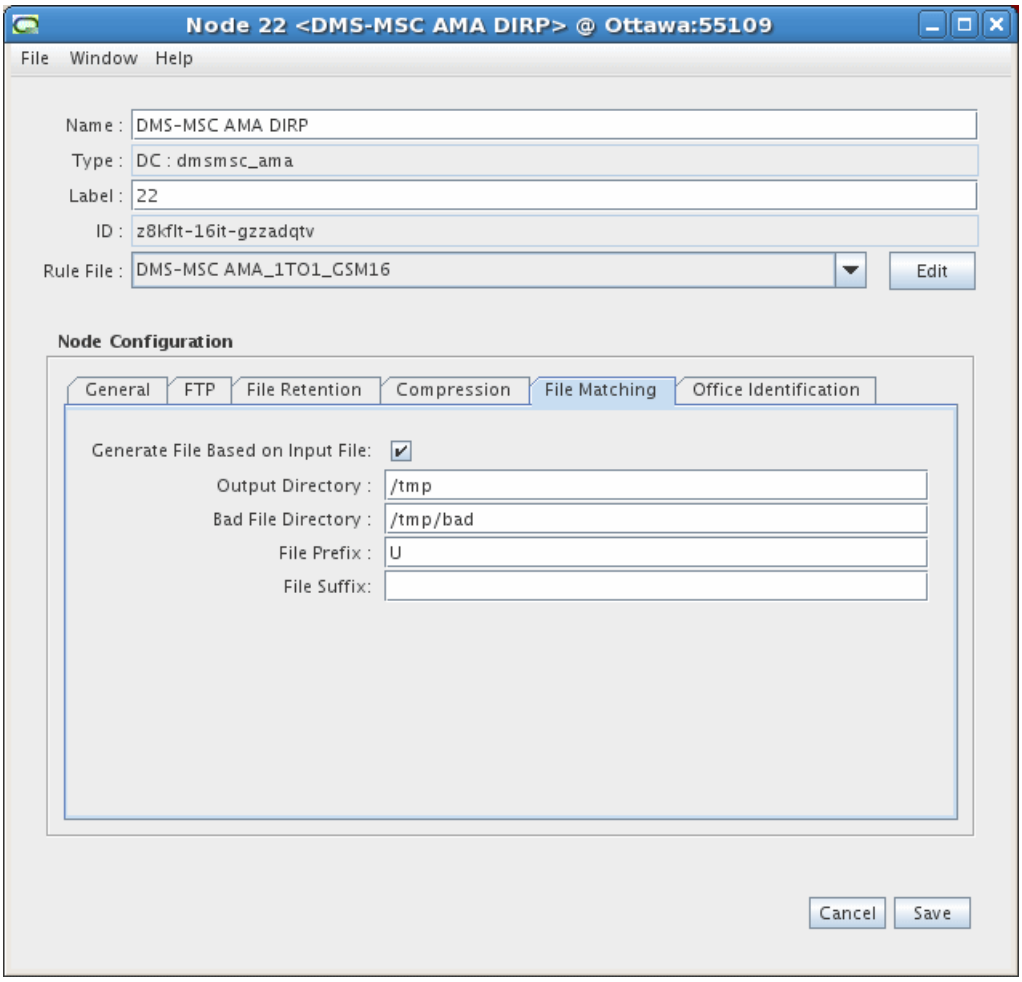
    An example of a **Compression** tab selection is shown below:



13. On the **File Matching** tab, configure the settings

Configuration Parameters

- The **Generate File Based on Input file** box is checked when you want to create only one output file for one AMA file received by the CC
- The **Output Directory** for the created output file.
- The **Bad File Directory** will hold the DC generated files containing errors.
- The **File Prefix** is configurable and the default value is "U". Multiple characters can be used in the prefix. "A" cannot be used as a prefix since it is reserved for currently written files.
- The **File Suffix** should match the suffix setting on the MSC SDM.



14. On the **Office Identification** tab, configure the settings to match the incoming device settings. An example is shown below.

    Configuration Parameters

    - **Sensor Type**: Type of switching equipment from which record information is received.

      Options:

      001 = MSC

      008 = 5ESS (OSPS)

      011 = TSPS-SPC

      029 = DMS-10

      031 = TSPS-3B

      036 = DMS-100F (DMS-200/TOPS)

    - **Sensor Identification**: Individual switch type. The ID is assigned by the operating company. Default is 0000000.

    - **Recording Office Type**: Type of recording machine that produced this record.

      Options:

      001 = MSC

008 = 5ESS (OSPS)

011 = TSPS-SPC

029 = DMS-10

031 = TSPS-3B

032 = AT&T KS (IBM Series 1) AMATPS collector

036 = DMS-100F (DMS-200/TOPS)

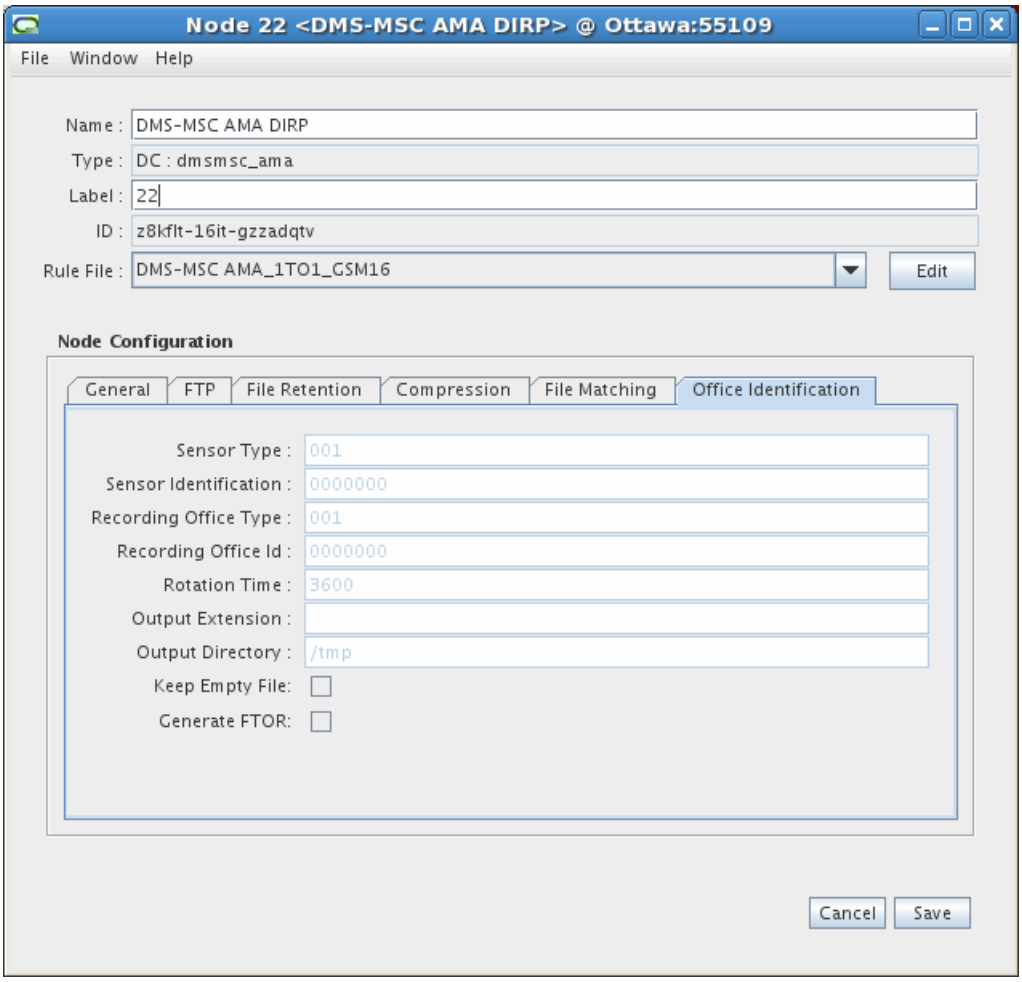
200 = Telescience collector

220 = Teltone AMATPS collector

270 = AT&T Billdats 3B20 AMATPS collector

271 = AT&T Billdats 3B5 AMATPS collector

- **Recording Office ID**: Individual recording machine. The ID is assigned by the operating company. Default is 0000000.
- **Rotation Time**: Time, in seconds, for the AMA DC to close an output file and open a new output file. Rotation time is 60 seconds (1 min) by default, which means the DC closes the file within a minute. If there is no data for this period, the DC does not keep the output file unless the **Keep Empty File** checkbox is selected.
- **Output Extension**: Suffix applied to the file produced by the AMA DC.
- **Output Directory**: Directory path to the location where Offline Mediation Controller stores the files produced by the DC. Default is **/tmp**.
- **Keep Empty File**: Select this checkbox if you want the node to keep the empty file.
- **Generate FTOR**: Select this checkbox if you want the node to add the File Transfer Out Record parameter to the AMA output file.



15. Click **Save**.

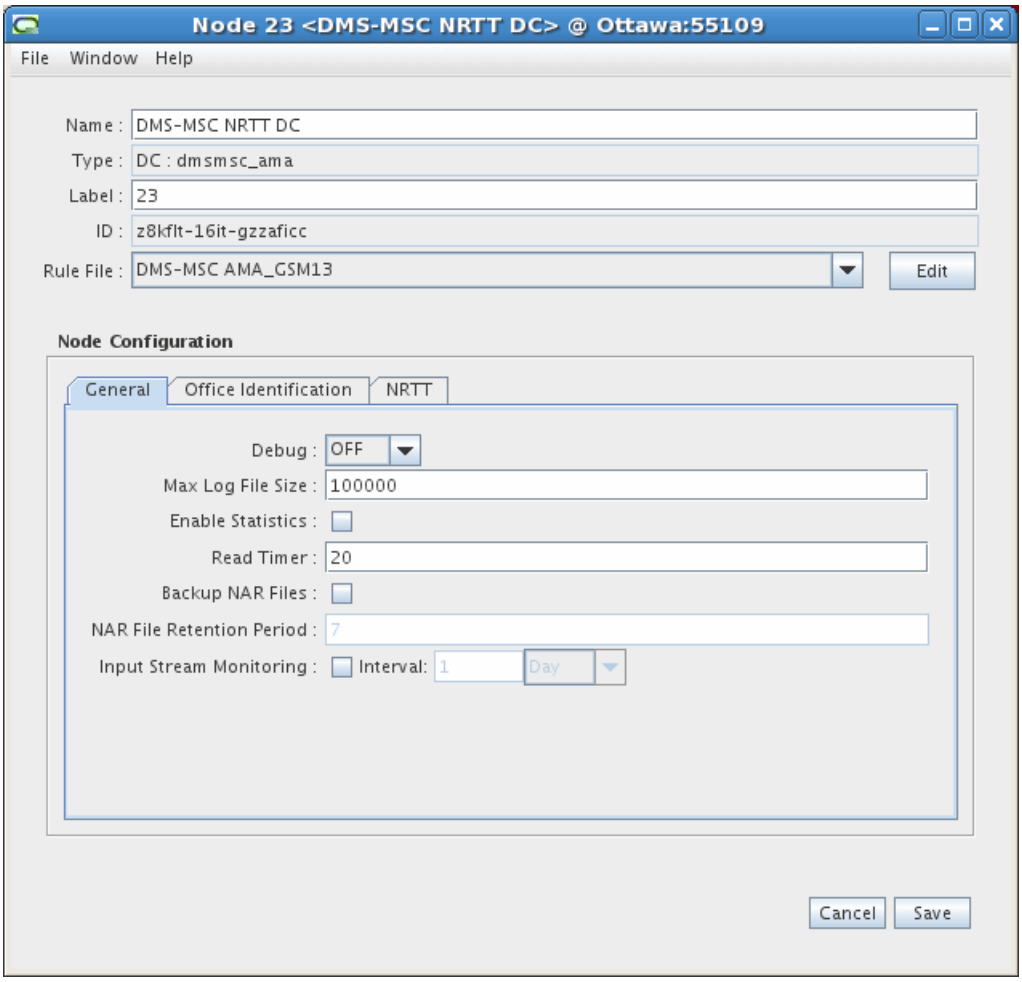
Creating and Configuring the DMS-MSC NRTT DC

To create and configure the DMS-MSC NRTT 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 **Wireless** and click **Next**.
5. Select **Distribution Cartridge (DC)** and click **Next**.
6. Select **DMS-MSC NRTT** and click **Finish**.
7. In the node configuration window, type a name for the node in the **Name** field.
8. In the **Rule File** drop-down list, select the file with the GSM version you want for the output data.
9. On the **General** tab, refer to the online help for field definitions. The default field settings are shown in the sample below.



10. On the **Office Identification** tab, configure the settings to match the incoming device settings. An example is shown below.

    Configuration Parameters

    - **Sensor Type**: Type of switching equipment from which record information is received.

      Options:

      001 = MSC

      008 = 5ESS (OSPS)

      011 = TSPS-SPC

      029 = DMS-10

      031 = TSPS-3B

      036 = DMS-100F (DMS-200/TOPS)

    - **Sensor Identification**: Individual switch type. The ID is assigned by the operating company. Default is 0000000.

    - **Recording Office Type**: Type of recording machine that produced this record.

      Options:

      001 = MSC

008 = 5ESS (OSPS)

011 = TSPS-SPC

029 = DMS-10

031 = TSPS-3B

032 = AT&T KS (IBM Series 1) AMATPS collector

036 = DMS-100F (DMS-200/TOPS)

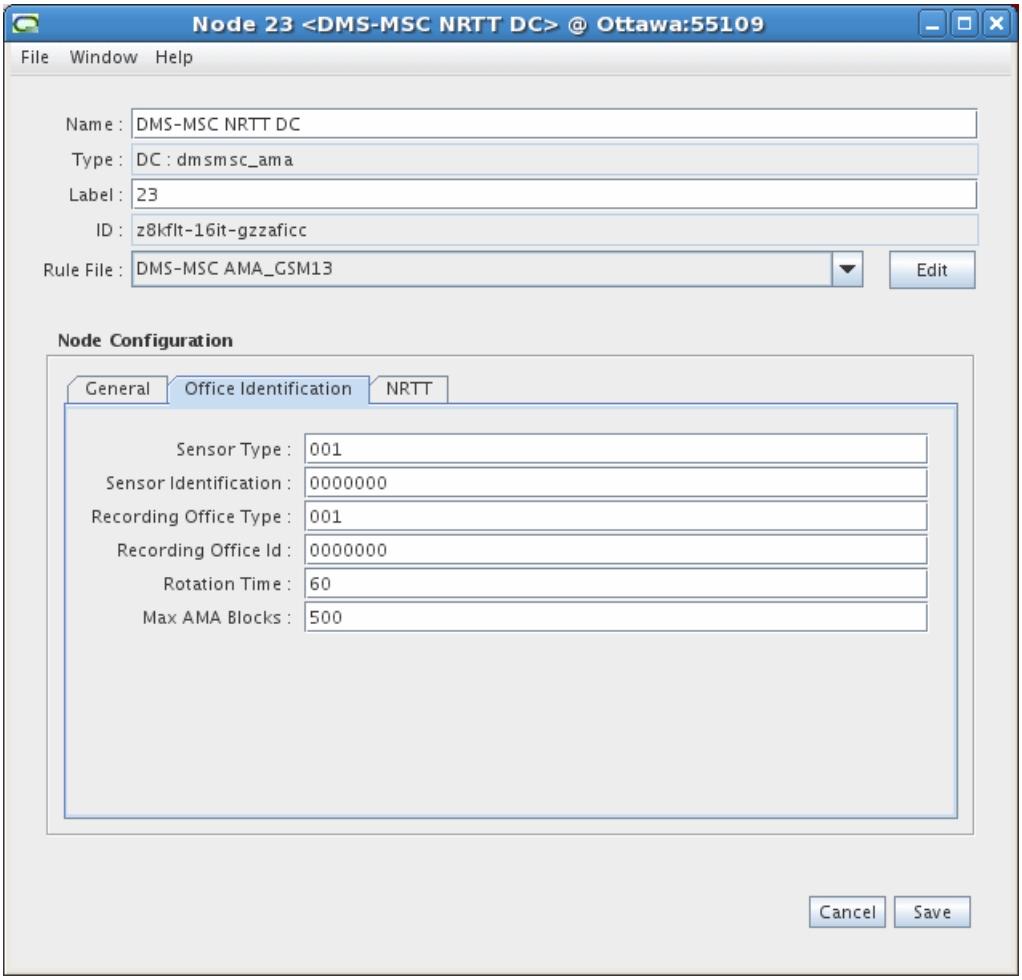
200 = Telescience collector

220 = Teltone AMATPS collector

270 = AT&T Billdats 3B20 AMATPS collector

271 = AT&T Billdats 3B5 AMATPS collector

- · **Recording Office ID**: Individual recording machine. The ID is assigned by the operating company. Default is 0000000.
- **Rotation Time**: Time, in seconds, for the NRTT DC to close an output file and open a new output file. Rotation time is 60 seconds (1 minute) by default, which means the DC closes the file within a minute.
- **Maximum AMA Blocks**: maximum number of AMA blocks in one file - minimum of two blocks.

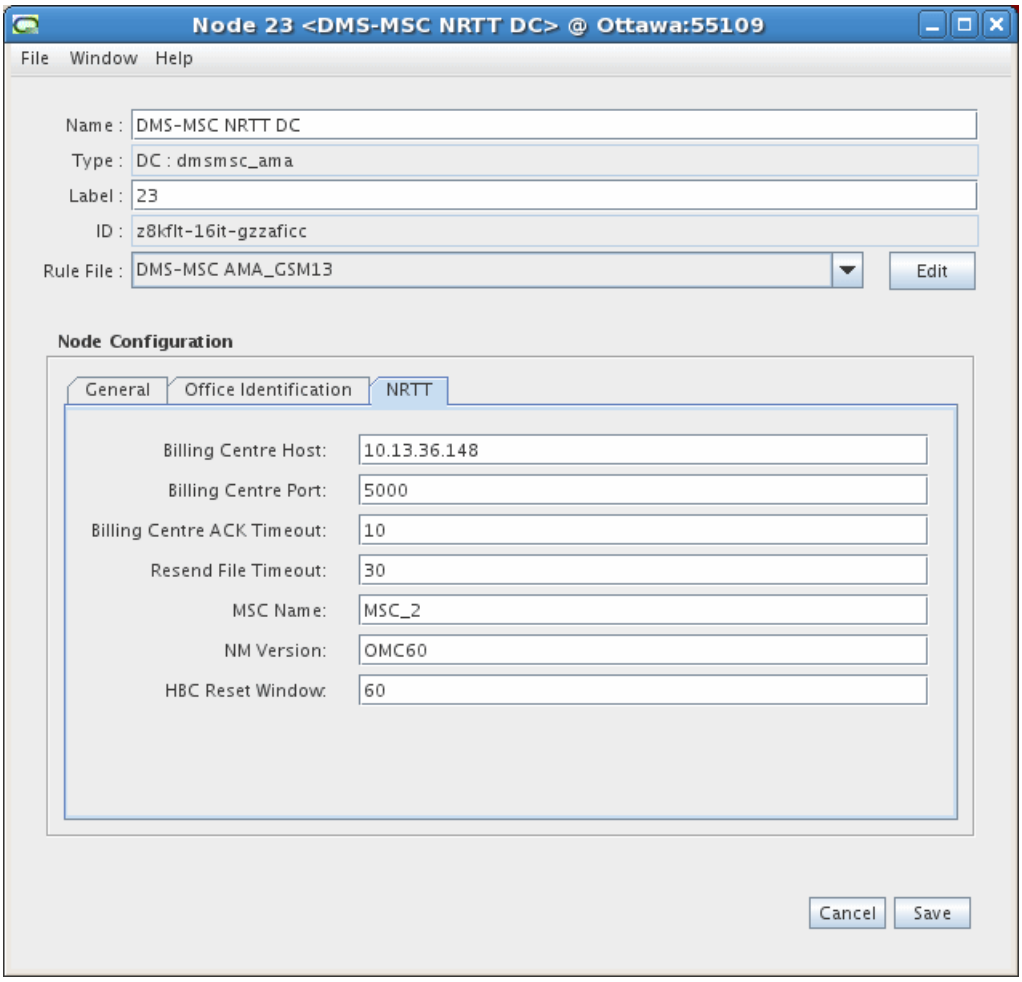


11. On the **NRTT** tab, configure the settings as required by the billing system. Contact your billing system administrator for the correct values. An example is shown below.

    Configuration Parameters

    - The **Billing Centre Host** is the name or IP address of the billing centre server the node sends data to.
    - The **Billing Centre Port** is the port on the billing centre server that the node uses to communicate with the server.
    - The **Billing Centre ACK Timeout** is the time, in seconds, the DC waits for the Billing Centre to acknowledge it has received the end of the file.

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



12. Click **Save**.

6

Creating and Configuring the DMS-MSC Active GHOT NRTT DC

This chapter contains information on the requirements for creating and configuring the DMS-MSC Active GHOT NRTT DC.

To create and configure the DMS-MSC Active GHOT NRTT DC:

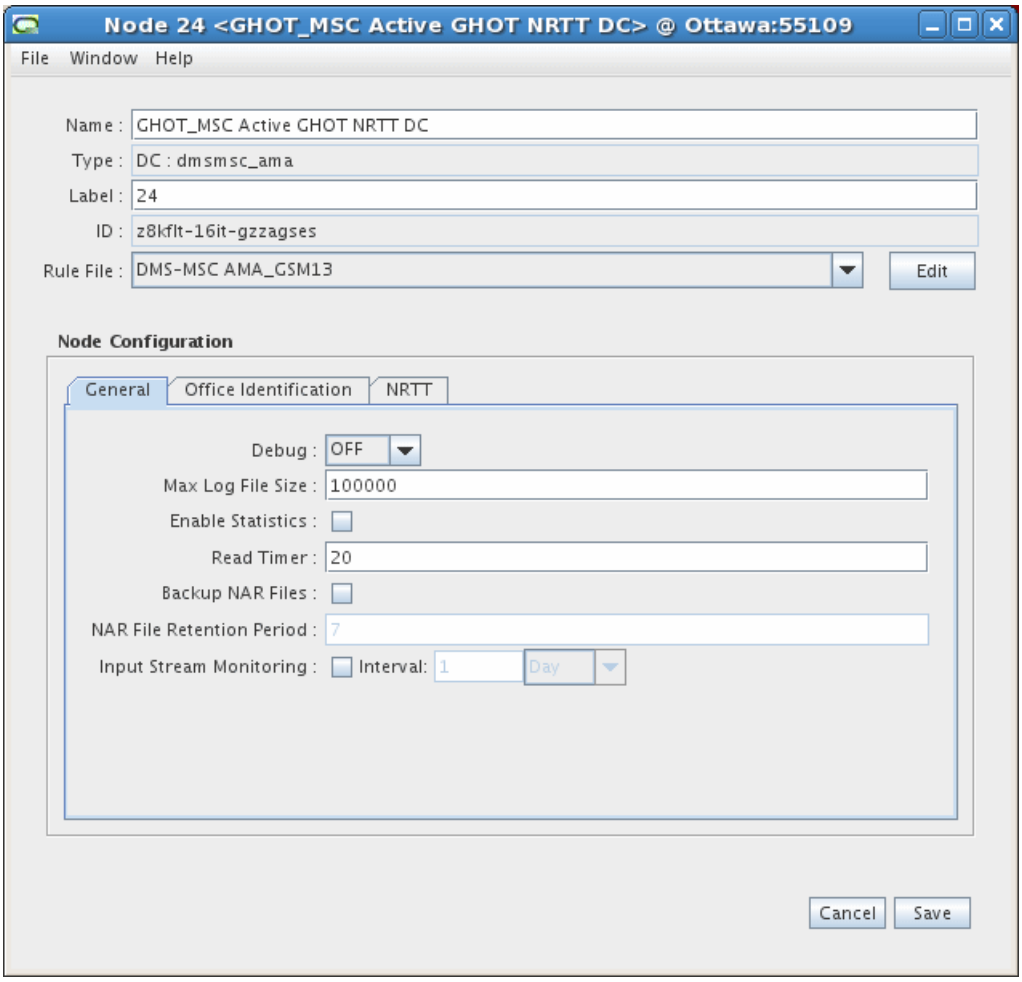
1. Log on to Offline Mediation Controller Administration Client.

   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 **Wireless** and click **Next**.
5. Select **Distribution Cartridge (DC)** and click **Next**.
6. Select **DMS-MSC Active GHOT NRTT** and click **Finish**.
7. In the node configuration window, type a name for the node in the **Name** field.
8. In the **Rule File** drop-down list, select the file with the GSM version you want for the output data.
9. On the **General** tab, accept the default values, as shown below:



10. On the **Office Identification** tab, configure the settings as required by the downstream billing system. An example is shown below.

    Configuration Parameters

    - **Sensor Type**: Type of switching equipment from which record information is received.

      Options:

      001 = MSC

      008 = 5ESS (OSPS)

      011 = TSPS-SPC

      029 = DMS-10

      031 = TSPS-3B

      036 = DMS-100F (DMS-200/TOPS)

    - **Sensor Identification**: Individual switch type. The ID is assigned by the operating company. Default is 0000000.

    - **Recording Office Type**: Type of recording machine that produced this record.

      Options:

      001 = MSC

008 = 5ESS (OSPS)

011 = TSPS-SPC

029 = DMS-10

031 = TSPS-3B

032 = AT&T KS (IBM Series 1) AMATPS collector

036 = DMS-100F (DMS-200/TOPS)

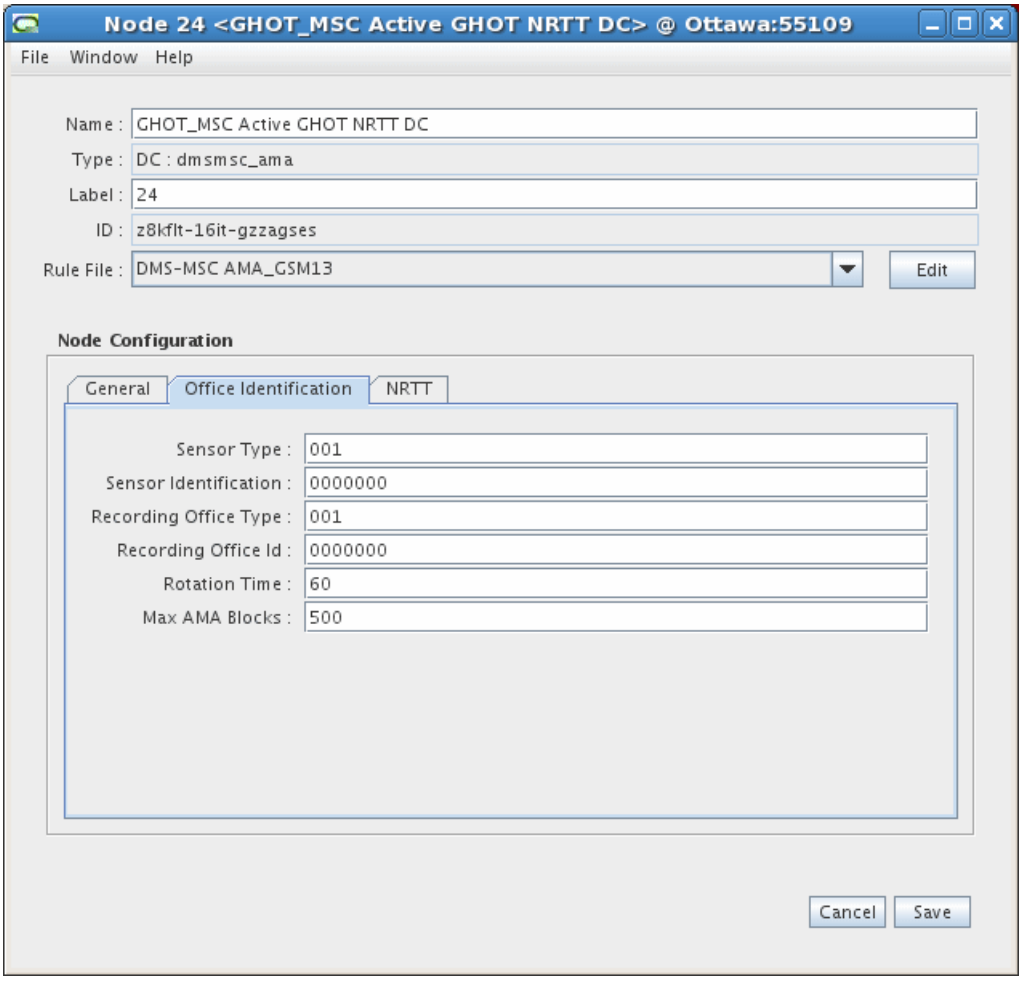
200 = Telescience collector

220 = Teltone AMATPS collector

270 = AT&T Billdats 3B20 AMATPS collector

271 = AT&T Billdats 3B5 AMATPS collector

- **Recording Office ID**: Individual recording machine. The ID is assigned by the operating company. Default is 0000000.
- **Rotation Time**: Time, in seconds, for the Active GHOT NRTT DC to close an output file and open a new output file. Rotation time is 60 seconds (1 minute) by default, which means the DC closes the file within a minute.
- **Maximum AMA Blocks**: maximum number of AMA blocks in one file - minimum of two blocks

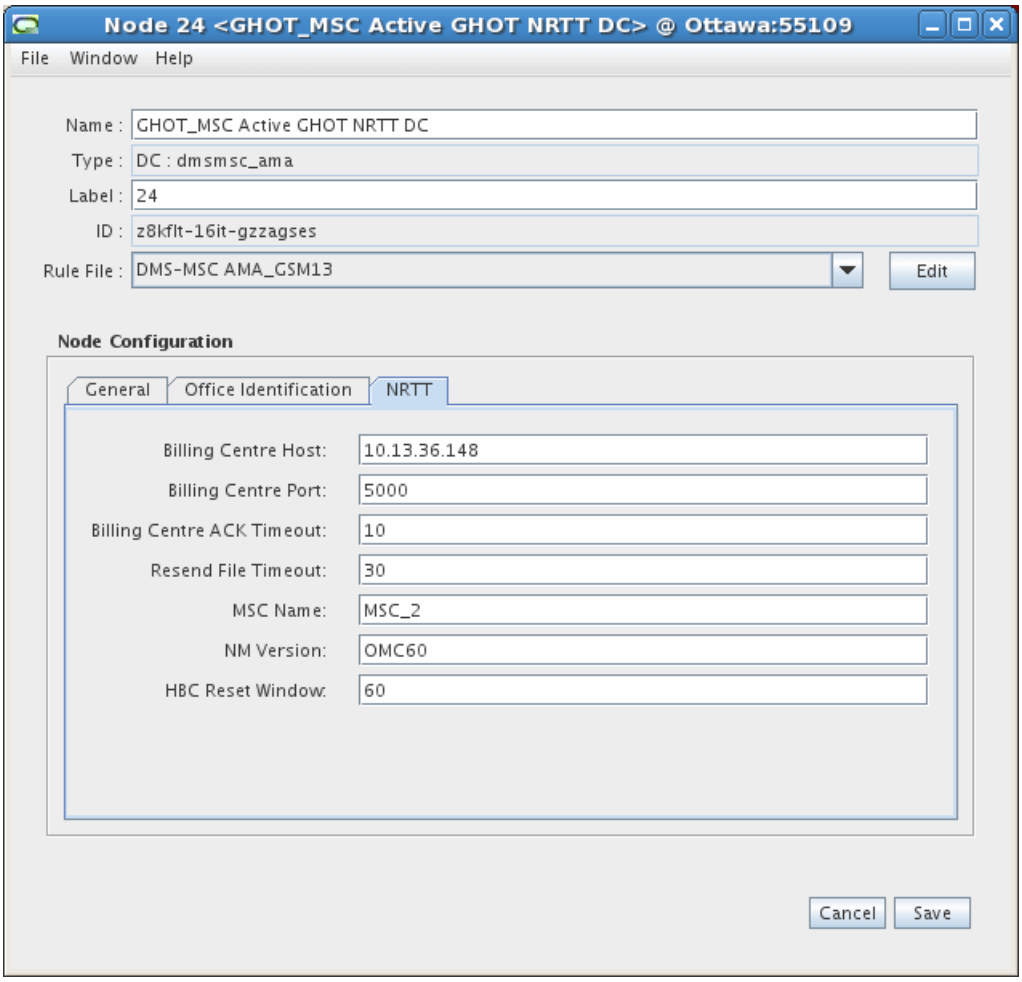


11. On the **NRTT** tab, configure the settings as required by the billing system. Contact your billing system administrator for the correct values. An example is shown below.

    Configuration Parameters

    - The **Billing Centre Host** is the name or IP address of the billing centre server the node sends data to.
    - The **Billing Centre Port** is the port on the billing centre server that the node uses to communicate with the server.
    - The **Billing Centre ACK Timeout** is the time, in seconds, the DC waits for the Billing Centre to acknowledge it has received the end of the file.

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



12. Click **Save**.

7

Configuring the Node Chains

This chapter contains information for configuring the supported node chains for Oracle Communications Offline Mediation Controller Nortel GSM/UMTS AMA cartridge pack. To view diagrams of the supported node chains, see "Architecture diagrams".

G-CDR Collection with AMA DIRP File Distribution

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

Configuring the DMS-MSC CC

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

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

Configuring the DMS-MSC AMA DIRP DC

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

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

Table 7–1 lists the instances where 1-to-1 file matching is supported when the appropriate 1:1 NPL rule file is chosen:

Table 7–1 Instances Supporting 1-to-1 File Matching

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

Table 7–1 (Cont.) Instances Supporting 1-to-1 File Matching

In: AMA DIRP	Out: AMA DIRP
GSM 15	GSM 15

G-CDR Collection With NRTT Distribution

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

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

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

G-CDR and GHOT Collection With AMA DIRP File Distribution

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

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

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

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

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

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

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

the DMS-MSC SDM. On the DMS-MSC CC node configuration window, on the AMA CC tab, select **FTP Push**.

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

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

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

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

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

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

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

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

Configuration rules for the GHOT streams

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

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

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

3. Use **Multicast** routing to connect the NRTT CC to the DMS-MSC Active GHOT NRTT DC.
4. When starting the **GHOT** streams, start both DCs first, then start the CCs. When stopping the GHOT streams, stop the CCs first, then stop the DCs.

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

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

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

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

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

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

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

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

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

8

Error Handling Behavior

This chapter contains information on error handling behavior for the NRTT CC and DMS-MSC Collection Cartridge for Offline Mediation Controller Nortel GSM/UMTS AMA cartridge pack.

Invalid AMA Input File

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

There are three types of invalid data:

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

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

   "Critical; Invalid Data; Invalid input data; An error occurred while processing file <*filename*>, a copy of this file has been placed in *OMC_ Home/amadirpei/2s4dgk-99f-e00sohaf/badAmaFilesDir*: Error detected in the AMA DIRP file structure at offset**:**<*0(block no: 1 , record no: 0)*> Invalid Block Descriptor Word"

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

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

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

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

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

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

   The CC outputs the following alarm:

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

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

Error Reports and "Bad File" Directories

When the NRTT CC and the DMS MSC CC point to different "bad file" directories, then if the NRTT CC encounters an error while processing the active file, it creates an error report in its configured "bad file" directory. If there is a loss of communication between the DMS SDM device and Offline Mediation Controller, and if the SDM rotates the active file to a closed state, the DMS MSC CC will process the closed file. If the DMS MSC CC encounters an error, it will write an error report in its configured "bad file" directory. So in this case there will be one error report file in each directory with the same "closed" file name prefix.

If the "bad file" directory is the same for both the NRTT CC and the DMS MSC CC, then if the NRTT CC encounters an error while processing the active file, it creates an error report with the name of the "closed" file in its configured "bad file" directory. If there is a loss of communication between the DMS SDM device and Offline Mediation Controller, and if the SDM rotates the active file to a closed state, the DMS MSC CC will process the closed file. If the DMS MSC CC encounters an error, it appends the error log in the report created by the NRTT CC. In this case there will be a single error report file with all the errors in it.

In all cases, occasionally there may be duplicate log entries in the error report file, which can be safely ignored. This situation can occur when there is a BDW or RDW error in the active file.

Error Handling in 1:1 File Matching Situations

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

Scenario 1 - Input AMA file is corrupted

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

   The DC will:

   a. generate an output file

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

c. raise an alarm

Major

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

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

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

The DC will:

a. generate an output file

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

c. raise an alarm

Major

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

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

a. generate an output file

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

c. raise an alarm:

Major

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

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

a. generate an output file

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

c. raise an alarm:

Major

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

Scenario 2 - NAR data corruption within the cartridge chain

If the NAR data is corrupted:

1. NAR are written to the .badarch file in the scratch directory of that cartridge.
2. All valid NARs prior to the corrupted NAR will be transmitted to the DC.

   In this instance, the DC will:

   a. Generate an output file

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

   c. Raise an alarm:

      Major

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

9

Database Storage and Reporting

This chapter contains information on the Database Storage and Reporting functionality for Offline Mediation Controller Nortel GSM/UMTS AMA cartridge pack.

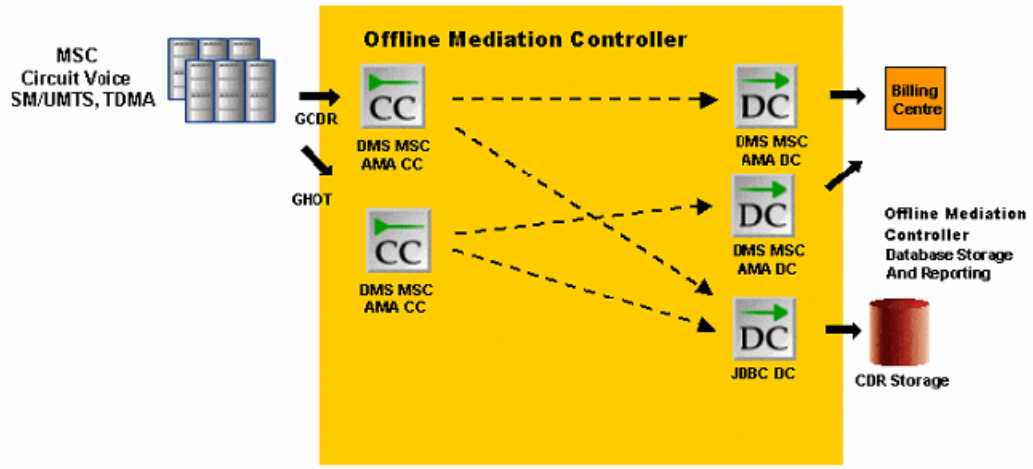
The Database Storage and Reporting functionality allows you to configure DMS-MSC node chains that can process and distribute data to both a billing system and an Oracle 11*g* database.

Database Storage Architecture

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

Figure 9–1 shows the recommended configuration of the Database Storage node chain. The DMS-MSC CC collects data from DMS-MSC network devices and passes the data to both the DMS-MSC AMA DIRP DC and the JDBC DC. The DMS-MSC AMA DIRP DC sends the data to a billing system. The JDBC DC sends the data to an Oracle 11*g* database.

Figure 9–1 Database Storage Architecture



Repository Manager

The Repository Manager is a Offline Mediation Controller tool that runs on an Oracle server and can import and export CDRs from an Oracle 11g Enterprise database. You

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

Installing and Configuring Oracle Database Components

The Database Storage tasks are as follows:

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

Oracle Database

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

Requirements

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

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

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

Oracle Database Installation Summary

To install Oracle database, you need to:

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

1. Run the Oracle database installation tool, select components and install. See Oracle 11*g* documentation.
2. Verify the Oracle database installation. See Oracle 11*g* documentation.
3. Load the Offline Mediation Controller schema files.

4. Install the Oracle Client.
5. Download and install the Oracle JDBC driver.

   See the Oracle database documentation for more information.

Upgrading the Oracle Database Components

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

Upgrading If AMA 1.4.x Cartridge Packs Were Installed

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

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

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

   ```
   EXEC NMUSER1.MSLV_STOP_REPOMAN
   ```

9. Navigate to the *OMC_Home*/**db_scripts/dbstorage/Oracle9i/Upgrade/** directory where you un-jarred the AMA jar file.
10. If you have a GSM 1.0.4 cartridge pack installed, go to next step; otherwise, go to Step 12.
11. Load **Upgrade_From_AMA14_GSMR104.sql**.
12. Load **Upgrade_From_AMA14.sql**.
13. Navigate to the *OMC_Home*/**db_scripts/dbstorage/Oracle9i/Repoman/** directory where you un-jarred the AMA jar file.
14. Load **PLSQL_NMCDRS_PKG.sql**.
15. Load **PLSQL_LOGTOFILE.sql**.
16. Load **JAVA_UTIL.sql**.
17. Load **PLSQL_RUN_CMD.sql**.
18. Load **PLSQL_RC.sql**.
19. Load **PLSQL_PARFILEWRITER.sql**.
20. Load **PLSQL_BUILD_EXCHANGE.sql**.
21. Load **PLSQL_DROP_PARTITIONS.sql**.
22. Load **PLSQL_BUILD_PARTITIONS.sql**.

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

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

26. Start the Repository Manager using the following command.

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

    where *N* is the config_num configured in REPOMAN_CONFIGURATION

Upgrading If AMA 4.0.0 to 4.0.7 Cartridge Packs Were Installed

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

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

   You are now connected to the NMCDRS schema.

8. Stop the Repository Manager using the command:

   ```
   EXEC NMUSER1.MSLV_STOP_REPOMAN
   ```

9. Navigate to the *OMC_Home***/db_scripts/dbstorage/Oracle9i/Upgrade/** directory where you un-jarred the AMA jar file.
10. Load **Upgrade_From_AMA40.sql**.
11. Navigate to the *OMC_Home***/db_scripts/dbstorage/Oracle9i/Repoman/** directory where you un-jarred the AMA jar file.
12. Load **PLSQL_NMCDRS_PKG.sql**.

13. Load **PLSQL_LOGTOFILE.sql**.
14. Load **JAVA_UTIL.sql**.
15. Load **PLSQL_RUN_CMD.sql**.
16. Load **PLSQL_RC.sql**.
17. Load **PLSQL_PARFILEWRITER.sql**.
18. Load **PLSQL_BUILD_EXCHANGE.sql**.
19. Load **PLSQL_DROP_PARTITIONS.sql**.
20. Load **PLSQL_BUILD_PARTITIONS.sql**.
21. Load **PLSQL_MSLV_START_REPOMAN.sql**.
22. Load **PLSQL_MSLV_STOP_REPOMAN.sql**.
23. The repoman_configuration table has three new columns. Change the values of the fields in these columns to the appropriate values. These columns are as follows:
    a. TABLENAME - 1 to 24 bytes. This is the name of the base table (for example 'MSLV_ENHCDR_STORAGE').
    b. NO_DATAFILES_PER_TS -1 to *n*. This is the number of data files that the tablespace will deploy and should always be set to 1 (unless you desire more as in the case of CHT).
    c. TBLSPC_NAME - 1 to 10 bytes. This is the base portion of the tablespace name (for example 'MSLV_'). The rest will be filled in by appending a datestamp to the end (for example 'MSLV_20061219')

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

24. Start the Repository Manager using the following command.

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

    where N is the config_num configured in REPOMAN_CONFIGURATION

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

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

1. Stop the Repository Manager using the command:

   ```
   EXEC NMUSER1.MSLV_STOP_REPOMAN
   ```

2. Navigate to the <CARTRIDGE PACK>/dbstorage/Oracle9i/Upgrade/ directory where you un-jarred the AMA jar file.
3. Navigate to the <CARTRIDGE PACK>/dbstorage/Oracle9i/Repoman/ directory where you un-jarred the AMA jar file.
4. Load **PLSQL_PARFILEWRITER.sql**.
5. Load **PLSQL_DROP_PARTITIONS.sql**.

6. Start the Repository Manager using the below command after verifying configuration values in REPOMAN_CONFIGURATION table.

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

   where *N* is the config_num configured in REPOMAN_CONFIGURATION table

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

Loading the Offline Mediation Controller Schema

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

To load the schema:

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

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

   DDL_create_tblspc_ENHNMCDRS_MAIN.sql

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

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

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

    DDL_create_usr_NMUSER1.sql

    If you run the schema file **NMUSER1.sql** from the AMA jar file, then you do not need to run this sql again.
12. Disconnect as the SYSTEM user and connect as NMUSER1. The default password is NMUSER1.
13. Navigate to the *OMC_Home*/**db_scripts/ dbstorage/Oracle9i/** directory where you un-jarred the AMA jar file.
14. Load **DDL_create_tbl_MSLV_ENHCDR_STORAGE.sql**.
15. Navigate to the *OMC_Home*/**db_scripts/ dbstorage/Oracle9i/** directory where you un-jarred the AMA jar file and then to **/RepoMan**.

16. Load **DDL_create_tbl_REPOMAN_CONFIGURATION.sql**.
17. Load **PLSQL_NMCDRS_PKG.sql**.
18. Load **PLSQL_LOGTOFILE.sql**.
19. Load **JAVA_UTIL.sql**.
20. Load **PLSQL_RUN_CMD.sql**.
21. Load **PLSQL_RC.sql**.
22. Load **PLSQL_PARFILEWRITER.sql**.
23. Load **PLSQL_BUILD_EXCHANGE.sql**.
24. Load **PLSQL_DROP_PARTITIONS.sql**.
25. Load **PLSQL_BUILD_PARTITIONS.sql**.
26. Load **PLSQL_MSLV_START_REPOMAN.sql**.
27. Load **PLSQL_MSLV_STOP_REPOMAN.sql**.

    All required Oracle objects are now loaded into Oracle database.

Changing the Default Oracle Username And Password

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

To change the user name and password in the script:

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

Configuring Oracle Database

You must configure Oracle database to run the Repository Manager.

To configure Oracle database:

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

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

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

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

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

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

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

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

   This is the directory where the Repository Manager stores its log files. Ensure the oracle user can access this directory.
7. Click **Apply** to save the changes and then exit the application.
8. Restart the database when the DBA Studio prompts you.
9. Change your connection back to SYSTEM.

Configuring UNIX Executable

To configure the UNIX executable for the Database Storage system:

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

   ```
   which cp
   ```

   The system responds with a path such as **/usr/bin/cp**.
2. Determine the path of the oracle user for the UNIX exp program (export utility) by logging on to a UNIX session as oracle and run the following command:

   ```
   which exp
   ```

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

Configuring and Using the Repository Manager

These sections explain how to configure the Repository Manager.

Adding Entries to the Configuration Table

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

You can use the table data editor in the Oracle DBA Studio tool to edit the Repository Manager configuration table. Each row in the table represents a configuration and only

one configuration is used at a time. You can keep many configurations in the table for testing purposes.

Parameters

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

CONFIG_NUM

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

DESCRIPTION

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

RUN_MODE

Set to DELETE or ARCHIVE.

NEXT_PRTN_INTERVAL

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

Table 9–1 lists some examples of the settings and their values.

NEXT_PRTN_INTERVAL Parameter Values

Table 9–1 Example Settings

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

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

DAYS_TO_KEEP

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

TBLSPC_DIRECTORY

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

TBLSPC_SIZE

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

START_PRTN

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

Note: The time value is not used.

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

START_AT

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

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

ARCHIVE_OUT_DIRECTORY

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

ORACLE_EXP_PATH and **UNIX_CP_PATH**

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

Starting the Repository Manager

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

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

Stopping the Repository Manager

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

```
exec nmuser1.MSLV_STOP_REPOMAN
```

Importing Records with the Repository Manager

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

To import an archive partition, do the following:

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

   Here is an example of an import parameter file:

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

   where:

   - In the USERID field, you can specify any user with SYSDBA privileges. By default, the oracle SYS user has SYSDBA privileges.
   - In the DATAFILES field, specify the path to the .dbf file and the .dmp file.
3. Save the file. For example, you can save the file as:

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

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

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

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

Deleting Records with the Repository Manager

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

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

Archiving Records with the Repository Manager

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

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

The Repository Manager creates a pair of files for each partition, and stores them in the ARCHIVE_OUT_DIRECTORY as specified in the REPOMAN_CONFIGURATION

table. For example, for an archive partition from January 21, 2006, the Manager generates two files:

- MSLV_20060121_TS.dbf
- MSLV_DBSR_ARCHIVE_20060121.dmp

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

Installing the Oracle Client

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

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

Installing the Oracle JDBC Driver

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

To install the Oracle JDBC driver:

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

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

2. On the Offline Mediation Controller server where the Node Manager is running, place the file in the *OMC_Home*/**3rdparty_jars** directory.

3. To configure the JDBC-DC node for RAC environment, use the following URL when you define a new NPL for JDBC-DC node:

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

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

Configuring Oracle Database for Automatic Restart

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

To configure Oracle database to automatically restart:

1. As root, copy the *OMC_Home*/**db_scripts/dbstorage/Oracle9i/dbora.sh** file and paste the **dbora.sh** file on the Oracle database server, in the **/etc/init.d** directory.

2. Ensure the ORA_Home is set to the same value as the ORACLE_Home setting.

3. Enable NMCDRS in the **oratab** file by changing the setting of the **/var/opt/oracle/oratab** directory from **N** to **Y**.

4. As root, in the **/etc** directory, edit the services file.

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

```
listener   1521/tcp    #oracle listener
```

```
ln -s /etc/init.d/dbora /etc/rc2.d/S99dbora
```

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

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

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

7. In the new **initNMCDRS.ora** file, add the following line:

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

8. To set the Oracle profile, as the Oracle user, navigate to the *Oracle_Home* directory.

9. Create a file called **.profile** and add:

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

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

Verifying the Oracle Database Automatic Restart

To verify the Oracle database automatic restart:

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

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

2. As the root user, go to the **/etc/init.d** directory.

3. Run the following command to stop the listener and oracle processes:

```
./dbora stop
```

   The listener and oracle processes stop.

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

```
./dbora start
```

   The listener and oracle processes start.

10

Uninstalling the Cartridge Pack

This chapter contains information on the requirements for uninstalling Offline Mediation Controller Nortel GSM/UMTS AMA cartridge pack.

Uninstalling the Cartridge Pack from a Solaris or Linux Workstation

To uninstall the Real-Time ASCII File Collection CDK 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 ama_r6_0_0.jar
   ```

3. Go to *OMC_Home*/ directory where *OMC_Home* is the directory in which you installed Offline Mediation Controller and remove the **db_scripts** directory with the following command:

Removing scripts from the database

Perform the following steps to remove the scripts from the Oracle database:

1. Run the following command:

   ORACLE_HOME`/bin/oemapp dbastudio&`

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

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

   user: system

   password: oracle

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

- Packages
- Procedures
- Functions
- Java Sources
- Java Classes

  For each of the sub-directories mentioned above there are files related to the schema.

5. Right-click on each file and select **Remove**.
6. Expand the **Storage** directory.
7. Expand the **TableSpace** directory.

   The **TableSpace** directory lists the following information related to the AMA cartridge:

   - ENHNMCDRS_MAIN
   - <TBLSPC_NAME>_<YYYYMMDD> (if partition table was created) Where TBLSPC_NAME is configured in REPOMAN_CONFIGURATION table.

     Right-click on each item and select **Remove**.