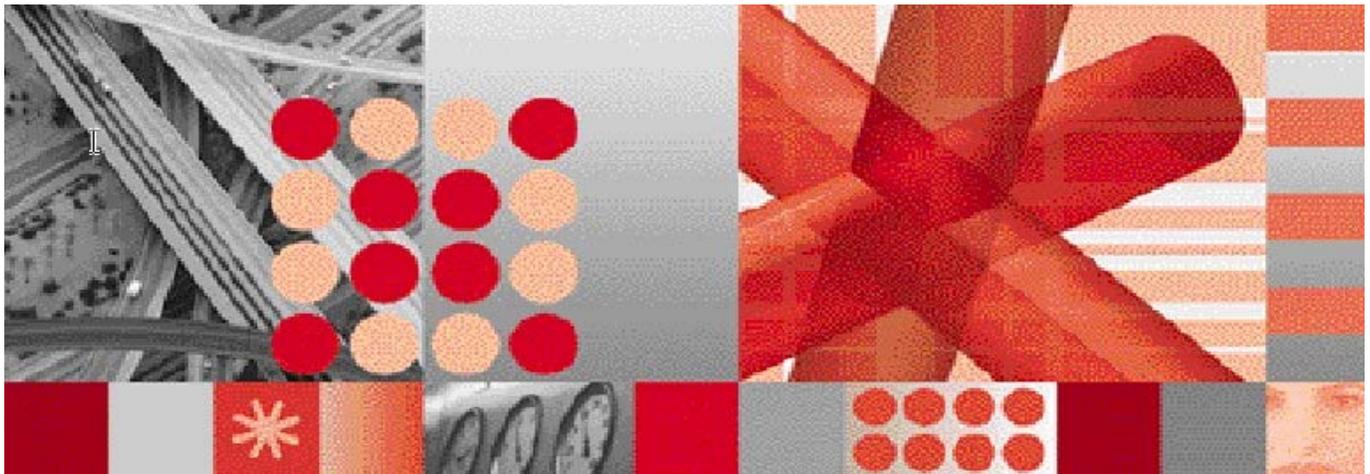




Version 1.5



## Interface Control Guide

**TIVOLI NETCOOL SERVICE QUALITY MANAGER GSM RADIO ACCESS NETWORK PM SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

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**Note:** Before using this information and the product it supports, read the information in Notices on page 25.

This edition applies to Version 1, release 5 of IBM Tivoli Netcool Service Quality Manager GSM Ran PM Service Solution and to all subsequent releases and modifications until otherwise indicated in new editions.

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# 1 About this Documentation

The *IBM® Tivoli® Netcool® Service Quality Manager GSM RAN PM Service Solutions Interface Control Guide* details the GSM RAN-PM Service Solution input interface, that is, the CSV input files in terms of:

- File naming conventions
- Data file format, structure, and semantics
- Supported delivery/Collection mechanism
- Data file input and output directory
- File granularity
- File latency
- Maximum latency tolerated

## 1.1 Audience

This guide is intended for parties wishing to provide mediated data to the IBM Tivoli Netcool Service Quality Manager GSM RAN PM Service Solution.

## 1.2 Required Skills and Knowledge

This guide assumes you are familiar with the following:

- General IT Principles
- IP Networking
- Unix® Operating Systems
- GSM RAN Service Solution

## 1.3 Document Conventions

The following command prompts can be seen throughout this document where the user has to enter commands at the command line:

- # (hash): This prompt is displayed if the user is logged in as user root.
- \$ (dollar): This prompt is displayed if the user is logged in as either the saserver or oracle user.

Please note the above prompts are not part of commands. All commands must be entered after these prompts.

This document uses the typographical conventions shown in the following table:

**Table 1: General Document Conventions**

<i>Format</i>	<i>Examples</i>	<i>Description</i>
ALL UPPERCASE	GPS NULL MYWEBSERVER	Acronyms, device names, logical operators, registry keys, and some data structures.
<u>Underscore</u>	See <a href="#">Document Conventions</a>	For links within a document or to the Internet. Note that TOC and index links are not underscored. Color of text is determined by browser settings.
<b>Bold</b>	<b>Note:</b> The busy hour determiner is...	Heading text for Notes, Tips, and Warnings.
SMALL CAPS	The STORED SQL dialog box... ...click VIEW... In the main GUI window, select the FILE menu, point to NEW, and then select TRAFFIC TEMPLATE.	Any text that appears on the GUI.
<i>Italic</i>	<i>A busy hour is...</i> <i>A web server must be installed...</i> See the <i>User Guide</i>	New terms, emphasis, and book titles.
Monospace	<code>./winstall</code> <code>\$ cd /cdrom/cdrom0</code> <code>/xml/dict</code> <code>addmsc.sh</code> <code>core.spec</code> Type OK to continue.	Code text, command line text, paths, scripts, and file names. Text written in the body of a paragraph that the user is expected to enter.

<b>Monospace Bold</b>	<code>[root] # pkginfo   grep -i perl</code> system Perl5 On-Line Manual Pages system Perl 5.005_03 (POD Documentation) system Perl 5.005_03	For contrast in a code example to show lines the user is expected to enter.
<i>&lt;Monospace italics&gt;</i>	<code># cd &lt;oracle_setup&gt;</code>	Used in code examples: command-line variables that you replace with a real name or value. These are always marked with arrow brackets.
[square bracket]	<code>log-archiver.sh [-i][-w][-t]</code>	Used in code examples: indicates options.

## 1.4 Document Structure

This guide is organized into the following chapters:

**Table 2: Document Structure**

<b>Chapter</b>	<b>Description</b>
<a href="#">Interface Specifications</a>	Provides interface specification and file naming conventions.
<a href="#">Enumerations and Definitions</a>	Describes the call types.
<a href="#">Glossary</a>	Glossary.

## 1.5 User Publications

The following publications are available:

- Tivoli Netcool Service Quality Manager version core library
- Tivoli Netcool Service Quality Manager Module for GSM RAN PM Service library

### 1.5.1 IBM Tivoli Netcool Service Quality Manager core library

The IBM Tivoli Netcool Service Quality Manager core library contains the following publications:

- *IBM Tivoli Netcool Service Quality Manager AIX Server Installation Guide*

Describes how to install the Tivoli Netcool Service Quality Manager server system on IBM AIX® systems.

- *IBM Tivoli Netcool Service Quality Manager Solaris Server Installation Guide*

Describes how to install the Tivoli Netcool Service Quality Manager server system on Solaris systems.

- *IBM Tivoli Netcool Service Quality Manager Client Installation Guide*

Describes how to install the Tivoli Netcool Service Quality Manager client.

- *IBM Tivoli Netcool Service Quality Manager Upgrade Guide*

Details how to upgrade from one Tivoli Netcool Service Quality Manager version to another.

- *IBM Tivoli Netcool Service Quality Manager AIX System Administration Guide*

Provides an overview of the IBM AIX Tivoli Netcool Service Quality Manager administrative tasks, including instructions on how to complete the following tasks:

- Starting and stopping the Tivoli Netcool Service Quality Manager application
- Running batch processes such as archiving trace files and log files
- Backing up and restoring the system

- *IBM Tivoli Netcool Service Quality Manager Solaris System Administration Guide*

Provides an overview of the Solaris Tivoli Netcool Service Quality Manager administrative tasks including instructions on how to complete the following tasks:

- Starting and stopping the Tivoli Netcool Service Quality Manager application
- Running batch processes such as archiving trace files and log files
- Backing up and restoring the system

- *IBM Tivoli Netcool Service Quality Manager Provisioning Service SI Guide*

Provides information about provisioning the Tivoli Netcool Service Quality Manager system.

- *IBM Tivoli Netcool Service Quality Manager Customer Experience Manager Provisioning Guide*

Provides information about provisioning the Tivoli Netcool Customer Experience Manager system.

- *IBM Tivoli Netcool Service Quality Manager Customer Experience Manager Monitoring Guide*

Describes how to use and monitor the Tivoli Netcool Customer Experience Manager feature in the Tivoli Netcool Service Quality Manager product.

- *IBM Tivoli Netcool Service Quality Manager Monitoring Guide*

Describes monitoring (service level agreement (SLA) monitor, key quality indicator (KQI) analyzer, alarm monitor, audit manager, and SLA Webview applications) in the Tivoli Netcool Service Quality Manager product.

- *IBM Tivoli Netcool Service Quality Manager Configuration Guide*

Describes SLA provisioning (parties, SLAs, and SLA templates applications) and Tivoli Netcool Service Quality Manager provisioning (services resources, KQI models, and service models applications) in the Tivoli Netcool Service Quality Manager product.

- *IBM Tivoli Netcool Service Quality Manager BusinessObjects Installation and Configuration Guide*  
Provides information about the steps required to install and configure the BusinessObjects server and client for use with the Tivoli Netcool Service Quality Manager product.
- *IBM Tivoli Netcool Customer Experience Manager Customer Relationship Management Development Guide*  
Provides an overview of the Customer Relationship Management (CRM) proxy server and the CRM plug-in module. The CRM plug-in modules, developed using Java code, mediate between the Tivoli Netcool Customer Experience Management framework and an external CRM system.
- *IBM Tivoli Netcool Service Quality Manager Release Notes*  
Provides information about the Tivoli Netcool Service Quality Manager release contents, platform requirements, installation and upgrade procedures, and known issues.

### **1.5.2 IBM Tivoli Netcool Service Quality Manager Module for GSM RAN PM Service library**

- *IBM Tivoli Netcool Service Quality Manager Module for GSM RAN PM Service Installation Guide*  
Provides the steps required to install the Tivoli Netcool Service Quality Manager Module for *GSM RAN PM Service* and its data sources.
- *IBM Tivoli Netcool Service Quality Manager Module for GSM RAN PM Service Overview Guide*  
Provides an overview of the Tivoli Netcool Service Quality Manager Module for *GSM RAN PM Service* product architecture and its entities.
- *IBM Tivoli Netcool Service Quality Manager Module for GSM RAN PM Interface Control Guide*  
Provides details about the Tivoli Netcool Service Quality Manager Module for *GSM RAN PM Service* input interface.
- *IBM Tivoli Netcool Service Quality Manager Module for GSM RAN PM Release Notes*  
Provides information on the Tivoli Netcool Service Quality Manager Module for *GSM RAN PM Service* release contents, platform requirements, installation procedures, and known issues.

## 2 Interface Specifications

### 2.1 Overview

This guide provides all the required information for parties intending to provide mediated PM data from GSM RAN service systems to IBM Tivoli Netcool Service Quality Manager GSM RAN PM Service Solution.

GSM RAN PM requires two types of mediation files:

- A metric CSV file that contains the data
- A data enrichment mapping file (custom resource mapping file)

#### 2.1.1 Custom Resource Mapping

The custom resource mapping (CRM) is an external mapping that provides a way for IBM Tivoli Netcool Service Quality Manager customers to define external relationships between objects that are managed directly within the system and for others outside it. For GSM RAN PM, the CRM defines CGI (Cell Global Identity) -> CellArea relationships and the CRM is accessed with the default IBM Tivoli Netcool Service Quality Manager CRM implementation. Note that a CGI can only be defined in one cell area.

### 2.2 Supported Version

This document refers to IBM GSM RAN-PM Service Solution 1.5.

### 2.3 Metric CSV Interface Definition

#### 2.3.1 Metric CSV File Naming Convention

The metric CSV file naming convention is as follows:

```
A<YYYYMMDD>.<hhmm>-<YYYYMMDD>.<hhmm>[_<UniqueID>]_GSMRANPM.csv
```

Where:

<YYYYMMDD>.<hhmm> elements correspond to the file interval start time and end time, respectively.

- `YYYY` is the year in four-digit notation.
- `MM` is the month in two-digit notation (01 - 12).
- `DD` is the day in two-digit notation (01 - 31).

- hh is the two-digit hour of the day (local time), based on a 24-hour clock (00 - 23).
- mm is the two-digit minute of the hour 00-59 (local time).

UniqueID is an optional element that can be used to, for instance, uniquely identify the GSM RAN System. This element is recommended in situations where the deployed solution has multiple mediation points.

**Metric CSV File Examples**

The following are example CSV files that show the naming convention:

Filename: A20080212.0000-20080212.0015\_GSMRAN1\_GSMRANPM.csv

Filename: A20080213.0000-20080213.0015\_GSMRAN5\_GSMRANPM.csv

**2.4 Metric CSV Data Specification**

**2.4.1 GSM RAN PM Metric CSV File Format**

The data file must provide the fields in the top down order as shown in table. The file must contain a standard metric CSV header using the field names listed in the table.

**Table 4: File Format**

<b>Field Name</b>	<b>Field Description</b>	<b>Constraints</b>	<b>Example</b>	<b>Nullable</b>
CGI	<p>The cell global identity for the current cell, logically consisting of                      MNC - Mobile Network Code                      MCC - Mobile Country Code                      LAC - Location Area Code                      CI - Cell identity                      The format of the CGI field is                      CCCNNNLLLLIIII                      where:</p> <p>CCC is the mobile country code (3 decimal digits).                      NNN is the mobile network code (2 or 3 decimal digits).                      LLLL is the location area code (4 hexadecimal</p>		78941084D7F99F	N

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	digits) III is the cell identifier (4 hexadecimal digits)			
BSSName	The name of the current BSS. This name (usually specified in OMC-R) is a collective name for the BSC, all its containing BTSs and, in turn, the CELLS under their control.  This field will be used in reports to group CELLS under their controlling BSS.	Text String (64 characters)	CBSKSCB0SM	Y
SourceVendor	The equipment supplier whose systems supplied the metrics provided in this vendor-independent data file.	ENUM referenced in Section 3.1	0	N
VendorVersion	The version of the interface of equipment supplier whose systems supplied the metrics provided in this vendor-independent data file, e.g. "R10"	Text String (16 characters)	E6	Y
nbrOfLostRadioLinksTCH	This measurement provides the number of calls terminated due to RF failure on the radio path.	>=0, INTEGER	25	Y
succTCHSeizures	This measurement provides the number of successful TCH seizures	>=0, INTEGER	231	Y
unsuccIntlHDOsIntraCell	This measurement provides the number of unsuccessful intra CELL Handovers, i.e. an attempt was made to move a call from the occupied channel	>=0, INTEGER	30	Y

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	of the CELL to another free channel of the same CELL.			
unsuccHDOsReconn	This measurement provides the number of unsuccessful Handovers (with reconnection to the original channels), for the observed CELL.	>=0, INTEGER	38	Y
unsuccHDOsLossOfConn	This measurement provides the number of unsuccessful Handovers that end in losing the speech channel, for the observed CELL.	>=0, INTEGER	30	Y
succIntlHDOsIntraCell	This measurement provides the number of times a call moves from the occupied channel of the CELL to another free channel of the same CELL	>=0, INTEGER	125	Y
succInIntlInterCellHDOs	This measurement provides the number of successful incoming Handovers into the observed CELL from the related adjacent CELLS controlled by the same BSC.	>=0, INTEGER	29	Y
succOutIntlInterCellHDOs	This measurement provides the number of successful outgoing Handovers from the observed CELL to the related adjacent CELLS controlled by the same BSC.	>=0, INTEGER	91	Y
attOutIntlInterCellHDOs	This measurement provides the number of attempted outgoing Handovers from the observed CELL to the	>=0, INTEGER	127	Y

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	related adjacent CELLS controlled by the same BSC			
attTCHSeizures	This measurement provides the number of attempted TS seizures	>=0, INTEGER	269	Y
attSDCCHSeizures	This measurement provides the number of attempted SDCCH seizures. This represents the number of CHANNEL REQUIRED messages received on RACH.	>=0, INTEGER	91	Y
attSDCCHSeizAllBlockedState	This measurement provides the number of attempted SDCCH seizures meeting all busy SDCCH state.	>=0, INTEGER	429	Y
succImmediateAssignProcs	This measurement provides the number of successful immediate assignment procedures	>=0, INTEGER	381	Y
attTCHSeizAllBlockedState	This measurement provides the number of attempted TCH seizures meeting all busy TCH state.	>=0, INTEGER	59	Y
meanNbrOfBusyTCHs	This KPI provides the arithmetic mean number of Time slots which are simultaneously in use for Circuit Switched traffic (TCHs)	>=0, FLOAT	115.5	Y
goodUplinkVoiceQuality	This measurement provides the uplink received signal quality (based on BER).	>=0, FLOAT	1.5	Y

Interface specifications

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goodDownlinkVoiceQuality	This measurement provides a downlink received signal quality (based on BER).	$\geq 0$ , FLOAT	1.5	Y
totalUplinkVoiceQuality	This measurement is an aggregated uplink RXQUAL measurements across eight bins (0..7)	$\geq 0$ , FLOAT	2.1	Y
totalDownlinkVoiceQuality	This measurement is an aggregated downlink RXQUAL measurements across eight bins (0..7)	$\geq 0$ , FLOAT	1.8	Y
DropSDCCH	This measurement provides the number of SDCCH connections dropped during the procedures (authentication, ciphering etc.) performed on SDCCH	$\geq 0$ , INTEGER	10	Y
SuccSDCCH	This measurement provides the number of successful SDCCH connections during the procedures (authentication, ciphering etc.) performed on SDCCH	$\geq 0$ , INTEGER	115	Y
SuccRateRACH	Percentage of RACH Requests which were serviced	$\geq 0$ , FLOAT	76.4	Y
SuccRateWtRACH	Weighting factor used when aggregating	$\geq 0$ , INTEGER	87	Y

### **Example Data**

The following is example data that shows header and fields:

```
CGI,BSSName,SourceVendor,VendorVersion,nbrOfLostRadioLinksTCH,succTCHSeizures,unsuccIn  
tLHDOsIntraCell,unsuccHDOsReconn,unsuccHDOsLossOfConn,succIntLHDOsIntraCell,succInIntL  
InterCellHDOs,succOutIntLInterCellHDOs,attOutIntLInterCellHDOs,attTCHSeizures,attSDCCH  
SeizAllBlockedState,attSDCCHSeizures,succImmediateAssignProcs,attTCHSeizAllBlockedStat  
e,meanNbrOfBusyTCHs,goodUplinkVoiceQuality,goodDownlinkVoiceQuality,totalUplinkVoiceQu  
ality,totalDownlinkVoiceQuality,DropSDCCH,SuccSDCCH,SuccRateRACH,SuccRateWtRACH
```

```
78941084D7F99F,CBSKSCB0SM,0,E6,25,0,30,38,30,0,0,50,0,0,429,450,381,5,115.5,245,145,0,  
0,33,0,0.5,0
```

```
78941085FCA47D,CBSKSCB0SM,0,E6,29,0,43,29,79,0,0,20,0,0,258,200,229,2,72.5,281,150,0,0  
,25,0,0.3,0
```

```
78941085FCB174,CBSKSCB0SM,0,E6,34,0,35,51,26,0,0,24,0,0,285,250,239,3,64,325,113,0,0,1  
6,0,0.14,0
```

---

**Note:** Headers can be uppercase (capitals) or lowercase, for consistency and readability it is recommended that they be uppercase in the incoming CSV data files.

---

### **2.4.2 Metric CSV File Granularity**

The granularity of the file must be one CSV row for each CGI value.

### **2.4.3 SQM Delivery/Collection Mechanism**

#### ***Transfer Mechanism***

The CSV data file is transferred by mediation to the data directory on the IBM Tivoli Netcool Service Quality Manager host platform on which the adapter is configured.

#### ***Data Directory***

The data directory is configurable by the IBM Tivoli Netcool Service Quality Manager customers. The default value for the adapter is `/appl/sa/var/adapter/gsm_ran_pm_loader`. IBM Tivoli Netcool Service Quality Manager customers must ensure that mediation can deliver files to the configured location.

#### ***File Interval***

The metric CSV file interval is 15 minutes and must be on 15 minute boundaries, for example: 1630 to 1645.

#### ***Transfer Latency***

The transfer latency of the CSV file is configurable by the IBM Tivoli Netcool Service Quality Manager customers. The default value is 15 minutes. The value of this parameter represents the maximum delay that is allowed for data presentation at the data directory.

The CRM file is expected to be present when the adapter starts.

### ***Files per Interval***

The service solution expects one metric CSV file for each CellArea system per interval.

## **2.5 CRM Interface Definition**

### **2.5.1 CRM File Naming Convention**

The CRM file naming convention as follows:

```
gsm_ran_pm_cellarea.map
gsm_ran_pm_market.map
gsm_ran_pm_bts.map
```

This is not configurable and is predefined in the adapter property files.

## **2.6 CRM Data Specification**

### **2.6.1 CELL to CellArea CRM mapping file**

**Table 5: CELL to CellArea CRM mapping file details**

<b><i>Field Name</i></b>	<b><i>Field Description</i></b>	<b><i>Constraints</i></b>
CGI	<p>The cell global identity for the current cell, logically consisting of  MNC - Mobile Network Code  MCC - Mobile Country Code  LAC - Location Area Code  CI - Cell identity</p> <p>The format of the CGI field is  CCCNNLLLLIIII where:</p> <p>CCC is the mobile country code (3 decimal digits).  NNN is the mobile network code (2 or 3 decimal digits).  LLLL is the location area code (4 hexadecimal digits)  IIII is the cell identifier (4 hexadecimal digits)</p>	LAC values 0000 and FFFE are reserved.

CellArea	The name of the CellArea. This is an arbitrary grouping of Cells obtained usually from a CRM system. It can be (a) groups of Cells from a marketing point of view or possibly (b) a group of Cells under the control of a BSC/RNC.	Text String (64 characters)
----------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------

**Example**

The following is example data that shows fields for CellArea CRM mapping:

```
78941084D7F99F,Cell Area 0
78941007E43150,Cell Area 0
78941007EF1600,Cell Area 2
```

### 2.6.2 CELL to Market CRM mapping file

**Table 6: CELL to Market CRM mapping file details**

Field Name	Description	Constraints
CGI	<p>The cell global identity for the current cell, logically consisting of  MNC - Mobile Network Code  MCC - Mobile Country Code  LAC - Location Area Code  CI - Cell identity</p> <p>The format of the CGI field is CCCNNNLLLLIIII where:</p> <p>CCC is the mobile country code (3 decimal digits).  NNN is the mobile network code (2 or 3 decimal digits).  LLLL is the location area code (4 hexadecimal digits)  IIII is the cell identifier (4 hexadecimal digits)</p>	
Market	<p>The MARKET of the SQM LOCATION hierarchy to which this cell belongs. This is the 3rd level component of the CEM LOCATION hierarchy (Nation-&gt;Region-&gt;Market-&gt;Area).</p>	Text String (64 characters)

**Example**

The following is example data that shows fields for the Market CRM mapping:

```
78941084D7F99F,Market2
78941085FCA47D,Market3
78941084D2A097,Market4
```

### 2.6.3 CELL to BTS CRM mapping file

**Table 7: CELL to BTS CRM mapping file details**

Field Name	Description	Constraints
CGI	<p>The cell global identity for the current cell, logically consisting of</p> <p>MNC - Mobile Network Code</p> <p>MCC - Mobile Country Code</p> <p>LAC - Location Area Code</p> <p>CI - Cell identity</p> <p>The format of the CGI field is CCCNNNLLLLIIII where:</p> <p>CCC is the mobile country code (3 decimal digits).</p> <p>NNN is the mobile network code (2 or 3 decimal digits).</p> <p>LLLL is the location area code (4 hexadecimal digits)</p> <p>IIII is the cell identifier (4 hexadecimal digits)</p>	
BTS	The name of the current BTS, i.e. the parent BTS for the current cell.	Text String (64 characters)

**Example**

The following is example data that shows fields for the BTS CRM mapping:

```
78941084D7F99F ,BTS1
78941085FCA47D ,BTS2
78941084D2A097 ,BTS3
```

#### **2.6.4 SQM Delivery/Collection Mechanism**

The CRM mapping files are transferred by data push to the data directory on the IBM Tivoli Netcool Service Quality Manager Host platform.

##### ***CRM Data Directory***

The CRM directory is not configurable and the location is `/appl/sa/var/adapter/mappings/resources`. IBM Tivoli Netcool Service Quality Manager Customers need to ensure that mediation can deliver files to the default location.

##### ***File Interval***

The CRM mapping files are reloaded at the beginning of every adapter data interval. By using map-file reloading, the map file can be updated at any time.

## 3 Enumerations and Definitions

### 3.1 Source Vendor

The data file must use the following table to identify Source Vendor.

**Table 8: Source Vendor**

ID	Description
0	Ericsson
1	Alcatel-Lucent
2	Nortel
3	Nokia
4	Huawei
5	Motorola
6	Juniper
7	UT Star
8	NSN

## Appendix A Glossary

Table 9: Glossary of Terms

<i>Acronym</i>	<i>Description</i>
AP	Access Point
APN	Access Point Name
BLER	Block Error Rate
BSS	Business Support System
C/I	Carrier over Interference ratio
CI	Cell Identifier
CSV	Comma Separated Values
DCN	Data Core Network
DoS	Denial Of Service
FTP	File Transfer Protocol
GGSN	Gateway GPRS Support Node
GPRS	General Packet Radio Service
GSN	GPRS Support Node
HTTP	Hyper-Text Transfer Protocol
IMSI	International Mobile Subscriber Identifier
ISDN	Integrated Services Digital Network
IP	Internet Protocol
KB	KiloBytes
KPI	Key Performance Indicator

KQI	Key Quality Indicator
LAC	Location Area Code
MCC	Mobile Country Code
MM	Multimedia Message
MMS	Multimedia Messaging Service
MNC	Mobile Network Code
MS	Mobile Station
MSC	Mobile Switching Centre
MS-ISDN	Mobile Subscriber ISDN Number
OSS	Operations Support Systems
PDP	Packet Data Protocol
PFC	Packet Flow Context
PPG	Pull Push Gateway
QoS	Quality of Service
RA	Routing Area
RAC	Routing Area Code
RAN	Radio Access Network
RAU	Routing Area Update
RTD	Round Trip Delay
SAP	Service Access Point
SDCCH	Standalone Dedicated Control CHannel
SGSN	Serving GPRS Support Node

SLA	Service Level Agreement
SLO	Service Level Objective (i.e. thresholds)
SMSC	Short Message Service Centre
TDR	Transaction Detail Record
UMTS	Universal Mobile Telecommunication System
URL	Uniform Resource Locator

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