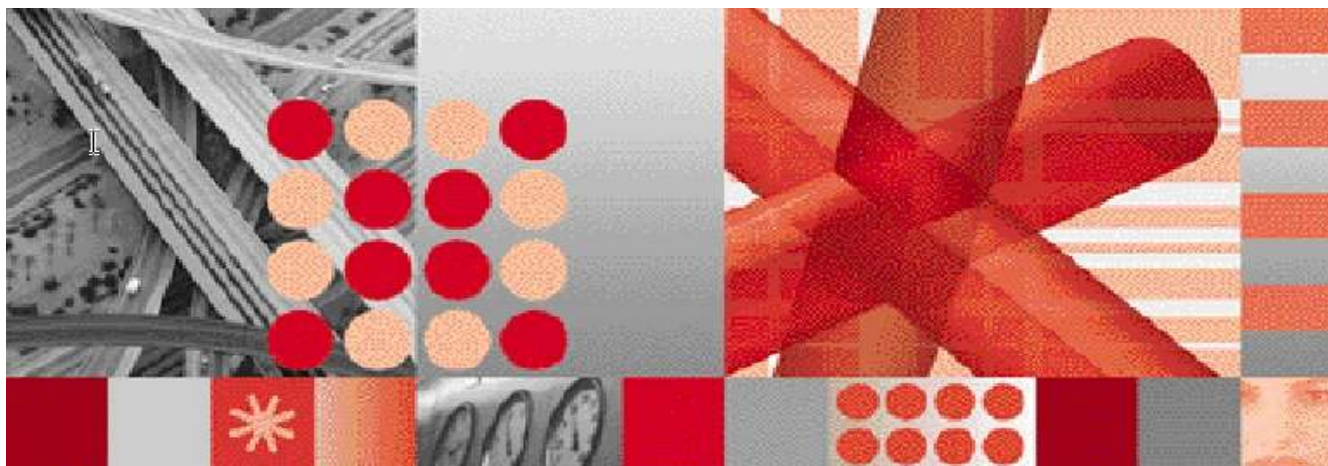**Tivoli.** **Netcool Service Quality Manager GSM Radio Access Network PM Service Solution**

Version 1.4.2

IBM

Interface Control Guide

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

Note: Before using this information and the product it supports, read the information in "Notices" on page 22.

This edition applies to version 1, release 4, modification 21 of IBM Tivoli Netcool Service Quality Manager GSM End to End AT 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 Solution Interface Control Guide* details the GSM (Global System for Mobile Communications) RAN (Radio Access Network) PM (Performance Management) service solution input interface i.e. CSV (Comma Separated Value) input files in terms of:

- File naming conventions

- Data file format, structure, and semantics

- Supported delivery and 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 topics:

- General IT (Information Technology) principles

- IP (Internet Protocol) networking

- UNIX® operating systems

- GSM RAN service solution

1.3 Guide conventions

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

- # (hash): This prompt will be displayed if the user is logged in as user root.

- $ (dollar): This prompt will be 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 guide uses the typographical conventions shown in the following table:

Table 1: General guide conventions

Format	*Examples*	*Description*
ALL UPPERCASE	GPS NULL MYWEBSERVER	Acronyms, device names, logical operators, registry keys, and some data structures.
Link	See www.ibm.com	For links within a guide or to the Internet.
Bold	**Note**: 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.
Italic	A *busy hour* is... A web server *must* be installed... See the *User Guide*	New terms, emphasis, and book titles.

Monospace	`./wminstall`
	`$ cd /cdrom/cdrom0`
	`/xml/dict`
	`addmsc.sh`
	`core.spec`
	`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.

Monospace Bold	**[root] # pkginfo | grep -i perl** 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.
\<Monospace italics>	# cd *\<oracle_setup>*	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]	log-archiver.sh [-i][-w][-t]	Used in code examples: indicates options.

1.4 Guide structure

This guide is organized into the following chapters:

Table 2: Guide structure

Chapter	*Description*
Interface specifications	Provides interface specification and file naming conventions.
Enumerations and definitions	Describes the call types.
Glossary	Provides a description of product acronyms.

1.5 User publications

The following user publications are provided with the GSM RAN PM Service Quality Manager service solution:

Table 3 : GSM service solution user documentation

Document	*Description*
Tivoli Netcool Service Quality Manager Service Solutions Installation Guide	Details the generic steps required to install any Service Quality Manager service solution including GSM RAN PM.

Tivoli Netcool Service Quality Manager GSM RAN PM Service Solution Interface Control Guide	Details the GSM RAN PM service solution input interface.
Tivoli Netcool Service Quality Manager GSM End to End AT Service Solution Interface Control Guide	Details the GSM End to End AT service solution input interface.
Tivoli Netcool Service Quality Manager GSM MSC PM Service Solution Interface Control Guide	Details the GSM MSC PM service solution input interface.
Tivoli Netcool Service Quality Manager GSM SS7 Service Solution Interface Control Guide	Details the GSM SS7 service solution input interface.
Tivoli Netcool Service Quality Manager GSM RAN PM Service Solution Release Notes	Provides information on the GSM RAN PM Service Solution release contents, platform requirements, installation and upgrade procedures, and known issues.

The following user publications are provided with the Service Quality Manager core software as Adobe® PDFs (Portable Document Format). Online help is available in HTML format.

Table 4: Service Quality Manager user documentation

Guide title	*Description*
Release Notes	Provides information on the Service Quality Manager release contents, platform requirements, installation and upgrade procedures, and known issues.
Configuration Guide	Describes SLA (Service Level Agreement) provisioning (Parties, SLAs, and SLA templates applications) and Service Quality Manager provisioning (services tesources, KQI (Key Quality Indicators) models and service models applications) in Service Quality Manager.
Monitoring Guide	Describes Monitoring (SLA Monitor, KQI Analyzer, Alarm Monitor, Audit Manager and SLA Web Monitor applications) in Service Quality Manager.

Customer Experience Manager Monitoring Guide	Describes how to use and monitor the Customer Experience Manager feature in Service Quality Manager.
Customer Experience Manager Provisioning Guide	Reference guide containing information for provisioning the Customer Experience Manager system.
Solaris Server Installation Guide	Describes how to install the Service Quality Manager server system on Solaris 10g.
Client Installation Guide	Describes how to install the Service Quality Manager client.
AIX Installation Guide	Describes how to install the Tivoli Netcool Service Quality Manager server system on IBM AIX® 5.3L.
Solaris System Administration Guide	Provides an overview of the Service Quality Manager administrative tasks including instructions on how to complete these tasks: - Starting and stopping Service Quality Manager. - Running batch processes such as archiving trace files and log files. - Backing up and restoring the system.
AIX System Administration Guide	Provides an overview of the AIX Service Quality Manager administrative tasks including instructions on how to complete these tasks: - Starting and stopping Service Quality Manager. - Running batch processes such as archiving trace files and log files. - Backing up and restoring the system.
Upgrade Guide	Details how to upgrade from one Service Quality Manager version to another.
BusinessObjects Installation and Configuration Guide	Provides information on the steps required to install and configure the BusinessObjects (v 6.5 or XI) server and client for use with Service Quality Manager.

Service Quality Manager Core Online Help	Provides information and procedures for using Service Quality Manager client applications.
Customer Experience Manager Online Help	Describes how to use and monitor the Customer Experience Manager feature in the Service Quality Manager.
SLA Webview Online Help	Describes how to use and monitor the SLA Webview feature in the Service Quality Manager.

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 the IBM Tivoli Netcool Service Quality Manager GSM RAN PM service solution.

GSM RAN PM requires two types of mediation files:

- A metric CSV file which contains the data

- A data enrichment mapping file (custom resource mapping file)

2.1.1 Custom resource mapping

The CRM (Custom Resource Mapping) is an external mapping which provides a method for IBM Tivoli Netcool Service Quality Manager customers to define external relationships between objects managed directly within the system and others outside it. For GSM RAN PM, the CRM defines CGI (Cell Global Identity) -> CellArea relationships and the CRM is accessed via the default IBM Tivoli Netcool Service Quality Manager CRM implementation.

Note: A CGI can only be defined in one Cell Area.

2.2 Supported version
This guide refers to IBM GSM RAN-PM service solution v1.4.21.

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 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 will be recommended in situations where the deployed solution has multiple mediation points.

Metric CSV file examples

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

        Filename: A20080212.0000-20080212.0100_GSMRAN1_GSMRANPM.csv

        Filename: A20080213.0100-20080213.0200_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 below. The file is expected to contain a standard metric CSV header using the field names listed in the table below.

Table 5: File format

Field name	Field description	Constraints	Example	Nullable
CGI	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: 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)	LAC values 0000 and FFFE are reserved.	78941084D7F99F	N

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	N
SourceVendor	0 - Ericsson 1 - Alcatel Lucent 2 - Nortel 3 - Nokia 4 - Huawei 5 - Motorola	ENUM referenced in GOM ver 1.1.4 and later. This field is useful for troubleshooting e.g. determining which vendors are not supplying the expected counters.	0	N
VendorVersion	The version of the interface of equipment supplier whose systems supplied the metrics provided in this vendor-independent data file, for example: "R10".	Text String (16 characters)	E6	N
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	>=0, INTEGER	30	Y

	from the occupied channel 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 which end up loosing 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 related adjacent CELLs controlled by the same BSC.	>=0, INTEGER	127	Y

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 Traffic Channels (TCHs) which are simultaneously in use for circuit switched traffic.	>=0, FLOAT	115.5	Y
goodUplinkVoiceQuality	This measurement provides the uplink received signal quality (based on BER).	>=0, FLOAT	245	Y
goodDownlinkVoiceQuality	This measurement provides a downlink received signal quality (based on BER).	>=0, FLOAT	145	Y

totalUplinkVoiceQuality	This measurement is an aggregated uplink RXQUAL measurements across eight bins (0..7).	>=0, FLOAT	401	Y
totalDownlinkVoiceQuality	This measurement is an aggregated downlink RXQUAL measurements across eight bins (0..7).	>=0, FLOAT	222	Y
DropSDCCH	This measurement provides the number of SDCCH connections-dropped during the procedures (authentication, cipheringetc.) performed on SDCCH	>=0, INTEGER	232	Y
SuccSDCCH	This measurement provides the number of successful SDCCH connections during the procedures (authentication, ciphering etc.) performed on SDCCH	>=0, INTEGER	987401	Y
SuccRateRACH	Percentage of RACH Requests which were serviced	>=0, FLOAT	87.5	Y
SuccRateWtRACH	Weighting factor used when aggregating	>=0, INTEGER	222	Y

Example data

The following is example data showing header and fields:

```
CGI,BSSNAME,SOURCEVENDOR,VENDORVERSION,NBROFLOSTRADIOLINKSTCH,SUCCTCHSEIZURES,UNSUCCIN
TLHDOSIN-
TRACELL,UNSUCCHDOSRECONN,UNSUCCHDOSLOSSOFCONN,SUCCINTLHDOSINTRACELL,SUCCININTLINTERCEL
LHDOS,SUCCOUTINTLINTERCELLHDOS,ATTOUTINTLINTERCELLHDOS,ATTTCHSEIZURES,ATTSDCCHSEIZURES
,ATTSDCCHSEIZALLBLOCKEDSTATE,SUCCIMMEDIATEASSIGNPROCS,ATTTCHSEIZALLBLOCKEDSTATE,MEANNB
ROF-
```

```
BUSYTCHS,GOODUPLINKVOICEQUALITY,GOODDOWNLINKVOICEQUALITY,TOTALUPLINKVOICEQUALITY,TOTAL
DOWNLINKVOICEQUALITY,DROPSDCCH,SUCCSDCCH,SUCCRATERACH,SUCCRATEWTRACH


4055222629661,DHREAD3,3,r12,0,408,120,0,0,4,33,14,14,0,0,0,0,0,526,23788,23714.8,23812
,23734,0,0,0,0

4055222664661,KEDALOPA23,3,r12,3,1036,0,0,0,41,421,294,298,1526,1947,0,1947,0,3485,130
090.2,129399.1,131304,131227,4,1913,0,2014

405522261481,MANAPANI1,3,r12,0,302,58,0,0,43,16,22,23,0,0,0,0,0,446,16220,16152.6,1627
5,16243,0,0,0,0
```

Note: Headers can be uppercase (capitals) or lower case, 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 is expected to be that only 1 CSV row exists per CGI value.

2.4.3 Service Quality Manager delivery and 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 where the adapter is configured.

Data directory

The data directory is configurable by 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 need to ensure that mediation can deliver files to the configured location.

File interval

The metric CSV file interval is 60 minutes and must be on 60 minute boundaries, for example: 1600 to 1700.

Transfer latency

The transfer latency of the CSV file is configurable by IBM Tivoli Netcool Service Quality Manager customers. The default value is 60 minutes. The value of this parameter represents the maximum delay allowed for data presentation at the data directory.

The CRM (Custom Resource Mapping) file is expected to be present at startup of the adapter.

Files per interval

The service solution expects 1 metric CSV file per 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
```

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

2.6 CRM data specification

2.6.1 GSM RAN PM CRM file format

The data file must provide the fields in the top down order as shown in table below. The file does not contain a CSV header.

Table 6: File format

Field Name	Field Description	Constraints	Example
CGI	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: 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).	LAC values 0000 and FFFE are reserved.	78941084D7F99F
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)	Cell Area 0

Example data

The following is example data showing fields, please note there is no header.

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

Note: The zeros in the third column have no meaning but are required as part of the file format expected by Tivoli Netcool Service Quality Manager. In a scenario where there is a requirement to reassign a CGI to another Cell Area, this file should then be modified to reflect the change and the adapter will automatically reload the contents of the new map file when it processes the next batch of CSV data files.

2.6.2 Service Quality Manager delivery and collection mechanism

The CRM mapping file is 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 expected 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 configured location.

File interval

The CRM file is expected to be present at startup of the adapter. Subsequently, if there is a change in the CRM file (timestamp), the adapter will automatically reload it before processing the next batch of incoming CSV data files.

Transfer latency

The CRM file is expected to be present at startup of the adapter.

3 Enumerations and definitions

3.1 SourceVendor

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

Table 7: Source Vendor

Id	Source Vendor
0	Ericsson
1	Alcatel Lucent
2	Nortel
3	Nokia
4	Huawei
5	Motorola

Appendix A Glossary

Table 8: Description of product acronyms

Acronym	Description
BER	Bit Error Rate
BSC	Base Station Controller
BSS	Business Station Subsystem
BTS	Base Transceiver Station
CGI	Cell Global Identity
CI	Cell Identifier
CRM	Custom Resource Mapping
CSV	Comma Separated Values
DoS	Denial Of Service
GSM	Global System for Mobile Communications
IP	Internet Protocol
IT	Information Technology
KPI	Key Performance Indicator
KQI	Key Quality Indicator
LAC	Location Area Code
MCC	Mobile Country Code
MMS	Multimedia Messaging Service
MNC	Mobile Network Code
MSC	Mobile Switching Centre
OMC-R	Operation and Maintenance Center Radio

PM	Performance Management
RACH	Random Access Channel
RAN	Radio Access Network
RF	Radio Frequency
RNC	Radio Network Controller
SDCCH	Standalone Dedicated Control Channel
SLA	Service Level Agreement
TCH	Traffic Channels
TS	Timeslot

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