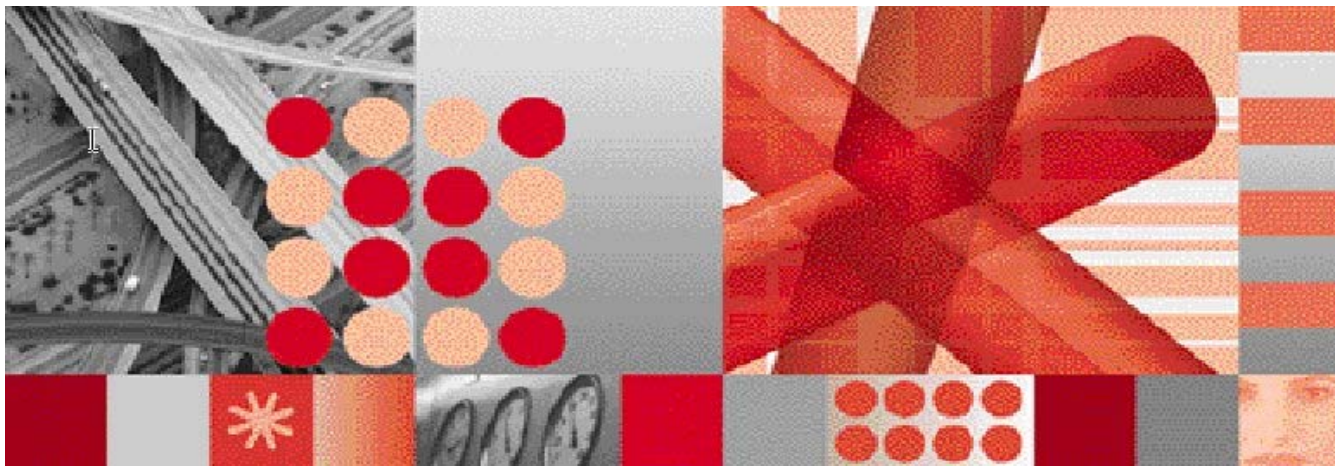




# Netcool Service Quality Manager Roaming Probe Service Solution

IBM

Version 1.2.1.1



Interface Control Guide

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

---

**Note:** Before using this information and the product it supports, read the information in  
Appendix B      Notices on page 34.

This edition applies to Version 1, release 2, modification 1.1 of IBM Tivoli Netcool Service Quality Manager Roaming Probe Service Solution and to all subsequent releases and modifications until otherwise indicated in new editions.

© Copyright International Business Machines Corporation 2002, 2008. All rights reserved.

US Government Users Restricted Rights - Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

# Table of Contents

|          |   |           |
|----------|---|-----------|
| <b>1</b> | <b>About this Documentation .....</b>         | <b>4</b>  |
| 1.1      | Audience .....                                | 4         |
| 1.2      | Required Skills and Knowledge .....           | 4         |
| 1.3      | Document Conventions.....                     | 5         |
| 1.4      | Document Structure .....                      | 6         |
| 1.5      | User Publications .....                       | 7         |
| <b>2</b> | <b>Interface Specifications .....</b>         | <b>10</b> |
| 2.1      | Overview .....                                | 10        |
| 2.2      | Supported Version .....                       | 10        |
| 2.3      | Interface Definition .....                    | 10        |
| 2.3.1    | Metrics File Naming Convention.....           | 10        |
| 2.3.2    | PLMN File Naming Convention .....             | 11        |
| 2.4      | Data Specification .....                      | 11        |
| 2.4.1    | Roaming Probe Metrics CSV File Format .....   | 11        |
| 2.4.2    | Roaming Probe PLMN CSV File Format .....      | 17        |
| 2.4.3    | CSV File Granularity .....                    | 19        |
| 2.4.4    | SQM Delivery/Collection Mechanism .....       | 19        |
| <b>3</b> | <b>Enumerations and Definitions.....</b>      | <b>21</b> |
| 3.1      | Roaming Type .....                            | 21        |
| 3.2      | Roaming Direction.....                        | 21        |
| 3.3      | Transaction Type .....                        | 21        |
| 3.4      | Cause Type .....                              | 22        |
| 3.5      | Transaction Termination Cause .....           | 22        |
| <b>4</b> | <b>Appendix A Glossary .....</b>              | <b>30</b> |
| <b>5</b> | <b>Appendix B Notices and Trademarks.....</b> | <b>32</b> |

# 1 About this Documentation

The *IBM® Tivoli® Netcool® Service Quality Manager Roaming Probe Service Solution Interface Control Guide* details the Roaming Probe Service Solution input interface i.e. 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 frequency
- 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 Roaming Probe Service Solutions.

## 1.2 Required Skills and Knowledge

This guide assumes you are familiar with the following:

- General IT Principles
- IP Networking
- Unix® Operating Systems
- Roaming 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 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 document uses the typographical conventions shown in the following table:

**Table 1: General Document Conventions**

| <i><b>Format</b></i> | <i><b>Examples</b></i>  | <i><b>Description</b></i>   |
|----------------------|---|---|
| ALL<br>UPPERCASE     | GPS<br>NULL<br>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...<br>...click VIEW...<br>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><br><i>A web server must be installed...</i><br><i>See the User Guide</i>   | New terms, emphasis, and book titles.   |
| Monospace            | <code>./wminstall</code><br><code>\$ cd /cdrom/cdrom0</code><br><code>/xml/dict</code><br><code>addmsc.sh</code><br><code>core.spec</code><br><code>Type OK to continue.</code> | Code text, command line text, paths, scripts, and file names.<br>Text written in the body of a paragraph that the user is expected to enter.        |

## TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION INTERFACE CONTROL GUIDE

---

|                                      |   |  |
|--------------------------------------|---|--|
| <b>Monospace<br/>Bold</b>            | <code>[root] # pkginfo   grep -i perl</code><br>system Perl5 On-Line Manual Pages<br>system Perl 5.005_03 (POD Documentation)<br>system Perl 5.005_03 | For contrast in a code example to show lines the user is expected to enter.  |
| <i>&lt;Monospace<br/>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<br>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 user publications are provided with the Roaming Probe Service Quality Manager Service Solution:

**Table 3: Roaming Probe Service Solution Documentation**

| <b>Document</b>   | <b>Description</b>   |
|---|--|
| <i>Tivoli Netcool Service Quality Manager Service Solutions Installation Guide</i>                          | Details the generic steps required to install any Service Quality Manager Service Solution including Roaming Probe.  |
| <i>Tivoli Netcool Service Quality Manager Roaming Probe Service Solution Overview Guide</i>                 | Provides an overview of the Roaming Probe Service Solution product architecture.   |
| <i>Tivoli Netcool Service Quality Manager Roaming Probe Service Solution Interface Control Guide</i>        | Details the Roaming Probe Service Solution input interface.  |
| <i>Tivoli Netcool Service Quality Manager Roaming Probe Service Solution Release Notes</i>                  | Provides information on the Roaming Probe Service Solution release contents, platform requirements, installation and upgrade procedures, and known issues. |
| <i>Tivoli Netcool Service Quality Manager Roaming Service Solution Version 1.2 to 1.2.1.1 Upgrade Guide</i> | Provides information on how to upgrade the Roaming Service Solution to Version 1.2.1.1 from Version 1.2  |

The following user publications are provided with the Service Quality Manager software in Adobe® Portable Document Format (PDF) and HTML formats.

**Table 4: Service Quality Manager User Documentation**

| <b>Document</b>            | <b>Description</b>   |
|----------------------------|--|
| <i>Release Notes</i>       | Provides information on the Service Quality Manager 4.1.1 release contents, platform requirements, installation and upgrade procedures, and known issues.                                    |
| <i>Configuration Guide</i> | Describes SLA Provisioning (Parties, SLAs, and SLA Templates applications) and SQM Provisioning (Services Resources, KQI Models and Service Models applications) in Service Quality Manager. |
| <i>Monitoring Guide</i>    | Describes Monitoring (SLA Monitor, KQI Analyzer, Alarm Monitor, Audit Manager and SLA Web Monitor applications) in Service Quality Manager.  |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

|  |   |
|--|---|
| <i>CEM Monitoring Guide</i>  | Describes how to use and monitor the CEM (Customer Experience Management) feature in Service Quality Manager.   |
| <i>CEM Provisioning Guide</i>                                      | Reference Guide containing information for provisioning the Customer Experience Management system.  |
| <i>Solaris Server Installation Guide</i>                           | Describes how to install the Service Quality Manager Server system on Solaris 10g.  |
| <i>Client Installation Guide</i>                                   | Describes how to install the Service Quality Manager Client.  |
| <i>AIX Server Installation Guide</i>                               | Describes how to install the Tivoli Netcool Service Quality Manager Server system on AIX 5.3L.  |
| <i>Solaris System Administration Guide</i>                         | Provides an overview of the Service Quality Manager administrative tasks including instructions on how to complete the following tasks:<br><ul style="list-style-type: none"> <li>- Starting and stopping Service Quality Manager.</li> <li>- Running batch processes such as archiving trace files and log files.</li> <li>- Backing up and restoring the system.</li> </ul>     |
| <i>AIX System Administration Guide</i>                             | Provides an overview of the AIX Service Quality Manager administrative tasks including instructions on how to complete the following tasks:<br><ul style="list-style-type: none"> <li>- Starting and stopping Service Quality Manager.</li> <li>- Running batch processes such as archiving trace files and log files.</li> <li>- Backing up and restoring the system.</li> </ul> |
| <i>Upgrade Guide</i>   | Details how to upgrade from one Service Quality Manager from v3.1.3 to v 4.1.1.   |
| <i>BusinessObjects Installation &amp; Configuration Guide</i>      | 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.   |
| <i>Service Quality Manager Service Solution Installation Guide</i> | Details the generic steps required to install any Service Quality Manager Service Solution including CEM GPRS.  |
| <i>CEM GPRS Service Solution Interface Control Guide</i>           | Details the CEM GPRS Service Solution input interface.  |
| <i>CEM GPRS Service Solution Overview Guide</i>                    | Provides an overview of the CEM GPRS Service Solution product architecture.   |
| <i>Service Quality Manager Core Online Help</i>                    | Provides information and procedures for using Service Quality Manager client applications.  |



**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

---

|   |   |
|---|---|
| <i>Customer Experience Management Online Help</i> | Describes how to use and monitor the Customer Experience Management feature in the Service Quality Manager. |
| <i>SLA Webview Online Help</i>                    | Describes how to use and monitor the SLA Webview feature in the Service Quality Manager.                    |

## 2 Interface Specifications

### 2.1 Overview

This document provides all the required information for parties intending to provide data from roaming service systems to IBM Tivoli Netcool Service Quality Manager Roaming Probe Service Solution.

The Service Solution expects to be supplied with data related to Roaming metrics and Roaming Public Land Mobile Networks in separate files which are detailed below.

### 2.2 Supported Version

This document refers to IBM Roaming Probe Service Solution 1.2.1.1.

### 2.3 Interface Definition

#### 2.3.1 Metrics File Naming Convention

The file naming convention is as follows:

```
A<YYYYMMDD>.<hhmm>-<YYYYMMDD>.<hhmm>[_<UniqueID>].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 Roaming System. This element is recommended in situations where the deployed solution has multiple mediation points.

#### ***File Examples***

The following are example files which show the naming convention:

- Filename: A20080314.0000-20080314.0015.csv
- Filename: A20080314.0015-20080314.0030.csv

## 2.3.2 PLMN File Naming Convention

The file naming convention for PLMN information is: `PLMN.map`

## 2.4 Data Specification

### 2.4.1 Roaming Probe Metrics CSV File Format

The data files must provide the fields in top down order as shown in the tables below. The files are expected to contain standard CSV header lines containing the field names shown below.

The Roaming Probe metrics file format is per the following table.

**Table 5: Roaming Probe Metrics File Format**

| <i>Field Name</i> | <i>Field Description</i>   | <i>Constraints</i>                                | <i>Example</i> |
|-------------------|--|---|----------------|
| IMSI              | <p>The International Mobile Subscriber Identity of the subscriber.</p> <p>The format of the IMSI is MCC-MNC-MSIN where:<br/> MCC is the mobile country code.<br/> MNC is the mobile network code.<br/> MSIN is the mobile subscriber identity number.</p> <p>NOTE: Depending on input data granularity this column may not be filled, e.g., if input data will be aggregated per PLMN-PLMN and Transaction Type there won't be specific subscriber data.</p> <p>The purpose of this column is to prepare model to the CEM approach</p> | Alphanumeric string, maximum length 15 characters |                |
| MSISDN            | <p>The Mobile Station ISDN number.</p> <p>This is the subscriber phone number in ITU-T E.164 format.</p> <p>The format of the MSISDN is CC-NDC-SN where;<br/> CC is the country code of the country where the MS is registered.</p>  | Alphanumeric string, maximum length 64 characters |                |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION**  
**INTERFACE CONTROL GUIDE**

|        |   |   |  |
|--------|---|---|--|
|        | <p>NDC is the national destination code.<br/> SN is the subscriber number.</p> <p>NOTE: Depends on the input data granularity this column may not be filled, e.g., if input data will be aggregated per PLMN-PLMN and Transaction Type there won't be specific subscriber data.<br/> The purpose of this column to prepare model to the CEM approach</p>  |   |  |
| MSRN   | <p>The Mobile Subscriber Roaming Number</p> <p>NOTE: Depending on the input data granularity this column may not be filled, e.g., if input data will be aggregated per PLMN-PLMN and Transaction Type there won't be specific subscriber data.<br/> The purpose of this column to prepare model to the CEM approach</p>   | Alphanumeric string, maximum length 64 characters |  |
| H_PLMN | <p>The identification of Home PLMN which normally is a party (operator) for whom TNSQM roaming model will provide the metrics, (in national roaming it needs to be decided on the customer case which network will be considered as a H_PLMN). H_PLMN shall be identified by the node addresses (e.g., HLRs or VLR/MSC) involved in the transactions call flow.</p> <p>Depending on the measurement/transaction type - SCCP, ISUP - different addressing schemas exists. For the SCCP addressing is based on MGT (Mobile Global Title) and for ISUP addressing is based on SPC (Signaling Point Codes).</p> | Alphanumeric string, maximum length 16 characters |  |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

|        |  |   |  |
|--------|--|---|--|
|        | <p>Network nodes identification shall have distinct pointing addressing schema (SCCP or ISUP).</p> <p>Expected format of H_PLMN column:</p> <p>S8101 - for SCCP addressing</p> <p>WHERE:<br/>S - SCCP prefix<br/>81 - Japan Country Code<br/>01 - sample of NTTDoCoMo Network Code</p> <p>OR</p> <p>I40073 - sample of Signaling Point Code for Bharti Delhi in India (ISUP addressing)</p>  |   |  |
| V_PLMN | <p>The identification of Visiting PLMN which normally is a party (operator) for whom TNSQM roaming model will provide the metrics, (in national roaming it needs to be decided on the customer case which network will be considered as a V_PLMN). V_PLMN shall be identified by the node addresses (e.g., HLRs or VLR/MSC) involved in the transactions call flow.</p> <p>Depending on the measurement/transaction type - SCCP, ISUP - different addressing schemas exists. For the SCCP addressing is based on MGT (Mobile Global Title) and for ISUP addressing is based on SPC (Signaling Point Codes). Network nodes identification shall have distinct pointing addressing schema (SCCP or ISUP).</p> <p>Expected format of V_PLMN</p> | Alphanumeric string, maximum length 16 characters |  |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

|            |  |   |  |
|------------|--|---|--|
|            | <p>column:</p> <p>S8101 - for SCCP addressing</p> <p>WHERE:<br/>S - SCCP prefix<br/>81 - Japan Country Code<br/>01 - sample of NTTDoCoMo Network Code</p> <p>OR</p> <p>I40073 - sample of Signaling Point Code for Bharti Delhi in India (ISUP addressing)</p>   |   |  |
| ORIG_NE_ID | <p>The identification of Origination Network Element which is originating party during roaming transactions call flow.</p> <p>ORIG_NE_ID shall be identified by addresses of it's node (for example, HLRs or VLR/MSC) involved in the transactions call flow</p> <p>Depends on the measurement/transaction type</p> <p>- SCCP, ISUP - different addressing schemas exist.</p> <p>For the SCCP addressing is based on MGT (Mobile Global Title) and for ISUP addressing is based on SPC (Signaling Point Codes).</p> <p>Network nodes identification shall have distinction pointing addressing schema (SCCP or ISUP).</p> <p>Expected format of ORIG_NE_ID column:</p> <p>810110 - for SCCP addressing</p> <p>WHERE:<br/>81 - Japan Country Code<br/>01 - sample NTTDoCoMo Network Code<br/>10 - sample Element ID</p> <p>OR</p> <p>40073 - Sample Dest.</p> | Alphanumeric string, maximum length 64 characters |  |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

|                   |  |   |   |
|-------------------|--|---|---|
|                   | Signaling Point Code for Bharti India (ISUP addressing)  |   |   |
| DEST_NE_ID        | <p>The identification of Destination Network Element which is originating party during roaming transactions call flow.<br/>DEST_NE_ID shall be identified by addresses of it's node (for example, HLRs or VLR/MSC) involved in the transactions call flow<br/>Depends on the measurement/transaction type<br/>- SCCP, ISUP - different addressing schemas exist.<br/>For the SCCP addressing is based on MGT (Mobile Global Title) and for ISUP addressing is based on SPC (Signaling Point Codes).<br/>Network nodes identification shall have distinction pointing addressing schema (SCCP or ISUP).<br/>Expected format of DEST_NE_ID column:</p> <p>810110 - for SCCP addressing<br/>WHERE:<br/>81 - Japan Country Code<br/>01 - sample NTTDoCoMo Network Code<br/>10 - sample Element ID<br/>OR</p> <p>40073 - Sample Dest. Signaling Point Code for Bharti India (ISUP addressing)</p> | Alphanumeric string, maximum length 64 characters |   |
| ROAMING_TYPE      | <p>Enumeration 1..2:</p> <p>1 = International<br/>2 = National</p>   | Integer 1 or 2                                    | 1 |
| ROAMING_DIRECTION | <p>Roaming direction depends on location of the roamer.</p> <p>Inbound Roaming is when the foreign network</p>   | Integer 1 or 2                                    | 2 |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION**  
**INTERFACE CONTROL GUIDE**

|                               |  |         |         |
|-------------------------------|--|---------|---------|
|                               | <p>subscriber is roaming in H_PLMN.</p> <p>Outbound Roaming is when H_PLMN subscriber is roaming in foreign V_PLMN.</p> <p>Enumeration 1..2:</p> <p>1 = Inbound<br/>2 = Outbound</p>   |         |         |
| TRANSACTION_TYPE              | <p>The type of transaction which the data set in this row applies to.</p> <p>There is a dependency between Transaction Type and addressing schema used in H_PLMN, V_PLMN, ORIG_NE_ID, DEST_NE_ID columns, see Roaming Transaction Types worksheet.</p> | Integer | 3020    |
| CAUSE_TYPE                    | <p>The protocol-specific cause code type that is required to interpret the transaction termination cause and/or transaction initiation cause fields correctly.</p>   | Integer | 12      |
| TRANSACTION_TERMINATION_CAUSE | <p>The protocol-specific cause code for that identifies the reason for the termination of the transaction.</p>   | Integer | 15      |
| TRANSACTION_COUNT             | <p>The number of transactions associated with the unique combination of PLMN, Roaming Type, Roaming Direction, Cause Type, Transaction Type and Transaction Outcome and Transaction Termination Cause.</p>   | Integer | 216     |
| TOTAL_TRANSACTION_DURATION    | <p>The total transaction time observed during the sample period for the set of transactions reported on in this row (seconds).</p>   | Float   | 2320.31 |



## 2.4.2 Roaming Probe PLMN CSV File Format

The data file must provide the fields in top down order shown in the tables below. The file must NOT contain standard CSV header lines showing the field names.

The Roaming Probe PLMN file format is per the following table:

**Table 6: Roaming Probe PLMN File Format**

| <i>Field Name</i> | <i>CSV Field Number</i> | <i>Field Description</i>  | <i>Constraints</i>                                | <i>Example</i>  |
|-------------------|-------------------------|---|---|-----------------|
| SPC or MGT        | 1                       | <p>For SCCP, the Signaling Point Code represented by the concatenation of:</p> <p>"I" - prefix, ISUP addressing prefix,<br/>(for this model's purposes SCPs are considered ISUP addresses - but normally in an SS7 protocol stack an SCP is an MTP layer address)</p> <p>SPC - Signaling Point Code</p> <p>Example:<br/>I40073</p> <p>Where:<br/>I - ISUP addressing prefix<br/>40074 - example of SPC of BhartiDelhi</p> <p>For ISUP: The SCCP Mobile Global Title address represented by concatenation of:</p> <p>"S" - prefix, SCCP addressing distinguisher<br/>- MGT address</p> <p>Example:<br/>S9198</p> <p>Where:<br/>S - SCCP addressing prefix<br/>91 - India Country Code (CC)<br/>98 - Bharti Network Code (NC)</p> | Alphanumeric string, maximum length 16 characters | I40073<br>S9198 |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION**  
**INTERFACE CONTROL GUIDE**

|                        |   |  |   |                         |
|------------------------|---|--|---|-------------------------|
| PLMN                   | 2 | <p>The name of the PLMN represented by the concatenation of country name abbreviation and PLMN name.</p> <p>Example:<br/>JPNTTDoCoMo</p> <p>Where:<br/>JP – Japan<br/>NTTDoCoMo – network name</p> | Alphanumeric string, maximum length 64 characters | JPNTTDoCoMo<br><br>IE02 |
| ADDITIONAL INFORMATION | 3 | Not used for Roaming Probe   | Alphanumeric string                               | Not used                |

### Example Data

The following are examples of data showing headers (where applicable) and fields:

#### Roaming Probe Metrics:

IMSI,MSISDN,MSRN,H\_PLMN,V\_PLMN,ORIG\_NE\_ID,DEST\_NE\_ID,ROAMING\_TYPE,ROAMING\_DIRECTION,TRANSACTION\_TYPE,CAUSE\_TYPE,TRANSACTION\_TERMINATION\_CAUSE,TRANSACTION\_COUNT,TOTAL\_TRANSACTION\_DURATION

```

,,,S9198,S8101,810110,919810,1,1,3010,11,-2,431,0
,,,S9198,S8101,810110,919810,1,1,3010,11,27,15,0
,,,S9198,S8101,810110,919810,1,1,3010,11,39,23,0
,,,S9198,S8101,919810,810110,1,2,3010,11,-2,122,0
,,,S9198,S8101,919810,810110,1,2,3010,11,27,2,0
,,,S9198,S8101,919810,810110,1,2,3010,11,39,4,0
,,,S9198,S8101,919810,810110,1,1,3020,11,-2,554,0
,,,S9198,S8101,919810,810110,1,1,3020,11,1,2,0
,,,S9198,S8101,919810,810110,1,2,3020,11,-2,156,0
,,,S9198,S8101,919810,810110,1,2,3020,11,8,3,0
,,,S9198,S8101,919810,810110,1,2,3030,11,-2,321,0
,,,S9198,S8101,919810,810110,1,2,3030,11,27,2,0
,,,S9198,S8101,919810,810110,1,2,3030,11,1,3,0
,,,S9198,S6107,610790,919810,1,2,3030,11,-2,190,0

```

#### Roaming Probe PLMNs:

```

S9198,INSampleNetwork1,
I40073,INSampleNetwork1,
I50160,AUSampleNetwork2,
S9199,INSampleNetwork5,

```

### **2.4.3 CSV File Granularity**

The granularity of the Roaming Probe metrics file is expected to be such that only 1 CSV row is specified per grouping of columns as follows:

- TRANSACTION\_TERMINATION\_CAUSE
- CAUSE\_TYPE
- TRANSACTION\_TYPE
- ROAMING\_DIRECTION
- ROAMING\_TYPE
- H\_PLMN
- V\_PLMN

The columns below are expected to contain the following data in each row based on the above grouping:

- TRANSACTION\_COUNT
- TOTAL\_TRANSACTION\_DURATION

### **2.4.4 SQM Delivery/Collection Mechanism**

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

The data files are transferred by Data Push to the data directory on the IBM Tivoli Netcool Service Quality Manager host platform.

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

The data directory is configurable by the IBM Tivoli Netcool Service Quality Manager customer. The default value for the roaming probe metrics file is `/appl/sa/var/adapter/roaming_probe_loader`. The IBM Tivoli Netcool Service Quality Manager customer needs to ensure that mediation can deliver files to the configured location.

The default value for the roaming probe PLMN file is

`${SAVARDIR}/adapter/mappings/resources/PLMN.map`. The IBM Tivoli Netcool Service Quality Manager customer needs to ensure that mediation can deliver files to the configured location.

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

The interval for the metrics file is 15 minutes and must be on 15 minute boundaries, for example: 1615 to 1630.

Changes to the PLMN file are presented on an as-needed basis. The PLMN mapping file is used by the adapter until a new file is presented.

## TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION INTERFACE CONTROL GUIDE

---

---

**Note:** A PLMN mapping file must be present for the adapter to process metrics correctly. If metrics are presented with an unmapped H\_PLMN or V\_PLMN, they will not be processed correctly by the adapter, and errors will be created in the adapter log.

---

### ***Transfer Latency***

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

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

The service solution expects 1 file per Roaming Probe system per interval.

## 3 Enumerations and Definitions

### 3.1 Roaming Type

The data file must use the following table to identify ROAMING\_TYPE.type.

**Table 7: Roaming Probe ROAMING\_TYPE Type**

| <i>Id</i> | <i>ROAMING_TYPE Type</i> |
|-----------|--------------------------|
| 1         | International            |
| 2         | National                 |

### 3.2 Roaming Direction

The data file must use the following table to identify ROAMING\_DIRECTION.type.

**Table 8: Roaming Probe ROAMING\_DIRECTION Type**

| <i>Id</i> | <i>ROAMING_DIRECTION Type</i> |
|-----------|-------------------------------|
| 1         | Inbound                       |
| 2         | Outbound                      |

### 3.3 Transaction Type

The data file must use the following table to identify TRANSACTION\_TYPE.type.

**Table 9: Roaming Probe TRANSACTION\_TYPE Type**

| <i>Id</i> | <i>TRANSACTION_TYPE Type</i> |
|-----------|------------------------------|
| 3010      | PRN                          |
| 3020      | LU                           |
| 3030      | SRISM                        |
| 3040      | MT_FSM                       |

|      |         |
|------|---------|
| 3050 | MO_FSM  |
| 3060 | SAI     |
| 3070 | GPRS_LU |
| 3080 | CS      |
| 3090 | CA      |

### 3.4 Cause Type

The data file must use the following table to identify CAUSE\_TYPE.type.

**Table 10: Roaming Probe CAUSE\_TYPE Type**

| <i>Id</i> | <i>CAUSE_TYPE Type</i> |
|-----------|------------------------|
| 9         | Protocol Violation     |
| 10        | Timeout                |
| 11        | MAPCause               |
| 12        | ISUPCause              |
| 13        | SCCPReturnCause        |
| 14        | SCCPResetCause         |
| 15        | SCCPReleaseCause       |
| 16        | SCCPRefusalCause       |
| 253       | TCAPCustomCause        |
| 254       | ISUPCustomCause        |

### 3.5 Transaction Termination Cause

The data file must use the following table to identify TRANSACTION\_TERMINATION\_CAUSE.type.

**Table 11: Roaming Probe TRANSACTION\_TERMINATION\_CAUSE Type, MAP Causes**

| <i>Id</i> | <i>TRANSACTION_TERMINATION_CAUSE Type</i> |
|-----------|---|
| 1         | UnknownSubscriber                         |
| 2         | UnknownBaseStation                        |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

|    |                                |
|----|--------------------------------|
| 3  | UnknownMSC                     |
| 4  | UnknownLocalArea               |
| 5  | UnidentifiedSubscriber         |
| 6  | UnallocatedRoamingNumber       |
| 7  | UnknownEquipment               |
| 8  | RoamingNotAlloowed             |
| 9  | IllegalMS                      |
| 10 | BearerServiceNotProvisioned    |
| 11 | TeleServiceNotProvisioned      |
| 12 | InsufficientBearerCapabilities |
| 13 | CallBarred                     |
| 14 | ForwardingViolation            |
| 15 | CUG-Reject                     |
| 16 | IllegalSS-Operation            |
| 17 | SS-ErrorStatus                 |
| 18 | SS-NotAvailable                |
| 19 | SS-SubscriptionViolation       |
| 20 | SS-Incompatibility             |
| 21 | FacilityNotSupported           |
| 23 | InvalidTargetBaseStation       |
| 24 | NoRadioResourcesAvailable      |
| 25 | NoHandoverNumberAvailable      |
| 26 | SubsequentHandoverFailure      |
| 27 | AbsentSubscriber               |
| 28 | BusySubscriber                 |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

|    |                             |
|----|-----------------------------|
| 29 | NoSubscriberReply           |
| 30 | RadioCongestion             |
| 31 | ImpossibleCallCompletion    |
| 32 | SM-DeliveryFailure          |
| 33 | MessageWaitingListFull      |
| 34 | SystemFailure               |
| 35 | DataMissing                 |
| 36 | UnexpectedDataValue         |
| 37 | PasswordRegistrationFailure |
| 38 | NegativePasswordCheck       |
| 39 | NoRoamingNumberAvailable    |
| 40 | TracingBufferFull           |

**Table 12: Roaming Probe TRANSACTION\_TERMINATION\_CAUSE Type, ISUP Causes**

| <i>Id</i> | <i>TRANSACTION_TERMINATION_CAUSE Type</i> |
|-----------|---|
| 1         | Unallocated (unassigned) number           |
| 3         | No route to destination                   |
| 4         | Send special information tone             |
| 16        | Normal call clearing                      |
| 17        | User busy                                 |
| 18        | No user responding                        |
| 19        | No answer from user (user alerted)        |
| 20        | Subscriber absent                         |
| 21        | Call rejected                             |
| 22        | Number changed                            |
| 27        | Destination out of order                  |



**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

|    |  |
|----|--|
| 28 | Invalid number format (address incomplete)                                   |
| 29 | Facility rejected  |
| 31 | Normal, unspecified  |
| 34 | No circuit/channel available   |
| 38 | Network out of order   |
| 41 | Temporary failure  |
| 42 | Switching equipment congestion   |
| 43 | Access information discarded   |
| 44 | Requested circuit/channel not available                                      |
| 46 | Precedence call blocked  |
| 47 | Resource unavailable, unspecified  |
| 50 | Requested facility not subscribed  |
| 53 | Outgoing calls barred within CUG   |
| 55 | Incoming calls barred within CUG   |
| 57 | Bearer capability not authorized   |
| 58 | Bearer capability not presently available                                    |
| 62 | Inconsistency in designated outgoing access information and subscriber class |
| 63 | Service or option not available, unspecified                                 |
| 65 | Bearer capability not implemented  |
| 69 | Requested facility not implemented   |
| 79 | Service or option not implemented, unspecified                               |
| 87 | User not member of CUG   |
| 88 | Incompatible destination   |
| 90 | Non-existent CUG   |
| 95 | Invalid message, unspecified   |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION**  
**INTERFACE CONTROL GUIDE**

|     |  |
|-----|--|
| 96  | Mandatory information element is missing   |
| 97  | Message type non-existent or not implemented   |
| 98  | Message not compatible with call state or message type non-existent or not implemented |
| 99  | Information element /parameter nonexistent or not implemented                          |
| 100 | Invalid information element contents   |
| 101 | Message not compatible with call state   |
| 102 | Recovery on timer expiry   |
| 103 | Parameter non-existent or not implemented, passed on                                   |
| 110 | Message with unrecognized parameter, discarded   |
| 111 | Protocol error, unspecified  |
| 127 | Interworking, unspecified  |
| 99  | Information element /parameter nonexistent or not implemented                          |
| 100 | Invalid information element contents   |
| 101 | Message not compatible with call state   |
| 102 | Recovery on timer expiry   |
| 103 | Parameter non-existent or not implemented, passed on                                   |
| 110 | Message with unrecognized parameter, discarded   |
| 111 | Protocol error, unspecified  |
| 127 | Interworking, unspecified  |

**Table 13: Roaming Probe TRANSACTION\_TERMINATION\_CAUSE Type, SCCP Return Causes**

| <i>Id</i> | <i>TRANSACTION_TERMINATION_CAUSE Type</i>    |
|-----------|--|
| 0         | no translation for an address of such nature |
| 1         | no translation for this specific address     |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

|    |  |
|----|--|
| 2  | subsystem congestion                         |
| 3  | subsystem failure                            |
| 4  | unequipped user                              |
| 5  | MTP failure                                  |
| 6  | network congestion                           |
| 7  | unqualified                                  |
| 8  | error in message transport (Note)            |
| 9  | error in local processing (Note)             |
| 10 | destination cannot perform reassembly (Note) |
| 11 | SCCP failure                                 |
| 12 | hop counter violation                        |
| 13 | segmentation not supported                   |
| 14 | segmentation failure                         |

**Table 14: Roaming Probe TRANSACTION\_TERMINATION\_CAUSE Type, SCCP Reset Causes**

| <i>Id</i> | <i>TRANSACTION_TERMINATION_CAUSE Type</i>                        |
|-----------|--|
| 0         | end user originated  |
| 1         | SCCP user originated   |
| 2         | message out of order – incorrect P(S)                            |
| 3         | message out of order – incorrect P(R)                            |
| 4         | remote procedure error – message out of window                   |
| 5         | remote procedure error – incorrect P(S) after (re)initialization |
| 6         | remote procedure error – general                                 |
| 7         | remote end user operational                                      |
| 8         | network operational  |
| 9         | access operational   |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

|    |                    |
|----|--------------------|
| 10 | network congestion |
| 11 | reserved           |
| 12 | unqualified        |

**Table 15: Roaming Probe TRANSACTION\_TERMINATION\_CAUSE Type, SCCP Release Causes**

| <i>Id</i> | <i>TRANSACTION_TERMINATION_CAUSE Type</i>                        |
|-----------|--|
| 0         | end user originated  |
| 1         | SCCP user originated   |
| 2         | message out of order – incorrect P(S)                            |
| 3         | message out of order – incorrect P(R)                            |
| 4         | remote procedure error – message out of window                   |
| 5         | remote procedure error – incorrect P(S) after (re)initialization |
| 6         | remote procedure error – general                                 |
| 7         | remote end user operational                                      |
| 8         | network operational  |
| 9         | access operational   |
| 10        | network congestion   |
| 11        | reserved   |
| 12        | unqualified  |

**Table 16: Roaming Probe TRANSACTION\_TERMINATION\_CAUSE Type, SCCP Refusal Causes**

| <i>Id</i> | <i>TRANSACTION_TERMINATION_CAUSE Type</i> |
|-----------|---|
| 0         | end user originated                       |
| 1         | end user congestion                       |
| 2         | end user failure                          |
| 3         | SCCP user originated                      |
| 4         | destination address unknown               |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

|    |  |
|----|--|
| 5  | destination inaccessible                           |
| 6  | network resource – QoS not available/non-transient |
| 7  | network resource – QoS not available/transient     |
| 8  | access failure                                     |
| 9  | access congestion                                  |
| 10 | subsystemfailure                                   |
| 11 | subsystemcongestion                                |
| 12 | expiration of the connection establishment timer   |
| 13 | incompatible user data                             |
| 14 | reserved   |
| 15 | unqualified  |
| 16 | hop counter violation                              |
| 17 | SCCP failure                                       |
| 18 | no translation for an address of such nature       |
| 19 | unequipped user                                    |

**Table 17: Roaming Probe TRANSACTION\_TERMINATION\_CAUSE Type, TCAP Custom Causes**

| <i>Id</i> | <i>TRANSACTION_TERMINATION_CAUSE Type</i> |
|-----------|---|
| 0         | TCAP_Err_V1                               |
| 1         | TCAP_Err_V2                               |
| 2         | TCAP_Err_V3                               |
| 3         | TCAP_Err_ACN_Not_Spp                      |

**Table 18: Roaming Probe TRANSACTION\_TERMINATION\_CAUSE Type, ISUP Custom Causes**

| <i>Id</i> | <i>TRANSACTION_TERMINATION_CAUSE Type</i> |
|-----------|---|
| 1         | Number of call seizure attempts           |

## 4 Appendix A Glossary

**Table 19: Glossary of Terms**

| <b><i>Acronym</i></b> | <b><i>Description</i></b>                   |
|-----------------------|---|
| CEM                   | Customer Experience Management              |
| CSV                   | Comma Separated Values                      |
| HTML                  | Hyper Text Markup Language                  |
| HLR                   | Home Location Register                      |
| IMSI                  | International Mobile Subscriber Identity    |
| IP                    | Internet Protocol                           |
| ISDN                  | Integrated Services Digital Network         |
| IT                    | Information Technology                      |
| ISUP                  | Integrated Service User Part                |
| KQI                   | Key Quality Indicator                       |
| MCC                   | Mobile Country Code                         |
| MGT                   | Mobile Global Title                         |
| MNC                   | Mobile Network Code                         |
| MSC                   | Mobile Switching Center                     |
| MSIN                  | Mobile Subscriber International Number      |
| MSISDN                | Mobile Subscriber International ISDN Number |
| MSRN                  | Mobile Subscriber Roaming Number            |
| NDC                   | National Destination Code                   |
| PLMN                  | Public Land Mobile Network                  |

**TIVOLI NETCOOL SERVICE QUALITY MANAGER ROAMING PROBE SERVICE SOLUTION  
INTERFACE CONTROL GUIDE**

---

|       |   |
|-------|---|
| QoS   | Quality of Service                        |
| SCCP  | Signaling Connection Control Part         |
| SPC   | Signaling Point Code                      |
| SLA   | Service Level Agreement                   |
| TCAP  | Transaction Capabilities Application Part |
| TNSQM | Tivoli Netcool Service Quality Manager    |
| VLR   | Visitor Location Register                 |

## 5 Appendix B Notices

IBM may not offer the products, services, or features discussed in this document in all countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing  
IBM Corporation  
North Castle Drive  
Armonk NY 10504-1785  
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation  
Licensing  
2-31 Roppongi 3-chome  
Minato-ku  
Tokyo 106-0032  
Japan.

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.



IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation  
5300 Cork Airport Business Park  
Kinsale Road  
Cork  
Ireland.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

***Trademarks***

IBM, IBM logo, Tivoli, and Netcool are trademarks of International Business Machines Corporation in the United States, other countries or both.

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product or service names may be trademarks or service marks of others

IBM®

Printed in the Republic of Ireland