A MITEL
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GUIDE

Unify OpenScape 4000

Gateways HG 3500 and HG 3575

Administrator Documentation
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Mitel

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Contents

1 Introduction

This document describes the configuration of the HG 3500/3575 gateways and the tools available for this configuration.

This chapter gives an overview of the manual. It describes:

- The target audience for this manual (see Section 1.1, "Target Audience")
- The contents of the chapters in this manual (see Section 1.2, "Contents of this Manual")
- Important note for Internet Explorer (see Section 1.3, "Note for Internet Explorer")
- The typographical conventions used (see Section 1.4, "Conventions Used")

1.1 Target Audience

This manual is aimed at administrators responsible for configuring the HG 3500/3575 gateways. They should have experience in LAN administration and be familiar with the following areas:

- Hardware for data communication
- WAN (Wide Area Network) concepts and terms)
- LAN (Local Area Network) concepts and terms)
- Internet concepts and terms

They should have received instruction on the following:

- Installation and start-up of the HG 3500/3575 gateways
- Configuring VoIP functions for the HG 3500/3575 gateways
- Setting up and customized configuration of the data communication parameters on the HG 3500/3575 gateways.

1.2 Contents of this Manual

This manual offers a full description of administration options for the HG 3500/3575 gateways and also contains background information on selected topics.

It explains how the HG 3500/3575 gateways is to be administered after being installed in a subrack.

Initial setup must be performed at the start of administration. The necessary pre-administration steps are described in Chapter 2, "Preparing the Board".

Further information on HG 3500/3575 may be found in the OpenScape 4000 V10 Service Manual.

Subsequent chapters provide a systematic description of the WBM interface for configuring and administering the HG 3500/3575 gateways.

1.3 Note for Internet Explorer

IMPORTANT: After changing any Internet Explorer security settings for a WBM page (like adding the page in Trusted

Sites) it is recommended to restart the browser in order to work correctly with the new settings.

1.4 Conventions Used

The following display conventions are used in this manual:

Table 1: Typographic Conventions

Convention	Example
`Courier`	Input and output Example: Enter `LOCAL` as the file name. `Command not found`
Italics	Variable Example: *Name* can contain up to eight characters.
Italics	Indicates user interface elements Example: Click *OK* Select *Exit* from the *File menu.*
Bold	Special emphasis Example: This name must **not** be deleted.
`<Courier>`	Keyboard shortcuts Example: `<CTRL>+<ALT>+<ESC>`
>	Menu sequence Example: Close file **>**.
Conventions Used	Cross-reference or hyperlink Additional information

2 Preparing the Board

All configuration data configured via the WBM of the board must be backed up by using the backup server. Otherwise all configuration data would be lost following a board swap out or loadware upgrade and the IP trunking connection could not be reestablished automatically. It is important to ensure that the backup server can be reached. If the backup server cannot be reached, the configuration data is also backed up in the boardâs flash.

3 WBM

WBM stands for **W**eb **B**ased **M**anagement. WBM is the default administration interface for the HG 3500/3575 gateways.

All PCs with TCP/IP-supported network connections running a compatible Web browser can access WBM if logged in to OpenScape 4000 Assistant. WBM has an integrated Web server, and can thus be accessed via a HTTPS URL.

Once WBM has been enabled on the gateway by the Root administrator, it is available via every TCP/IP connection, both via the LAN and the WAN.

The WBM user interface is available only in English.

Hardware requirements:

You need a standard PC or laptop with left and right button mouse for operating WBM.

Software requirements:

WBM is composed of HTML/XSL pages with frames. To use it, the following must be installed:

- Windows
- Microsoft Internet Explorer
- The following settings must be made in Microsoft Internet Explorer:
- – Activate the following option: *Tools -> Internet Options -> Advanced -> Empty Temporary Internet Files folder when browser is closed*
  – The connection from the administration PC to the gateway must not be routed over a proxy server. The following option should therefore be activated: *Tools -> Internet Options -> Connections -> LAN Settings: Settings... -> Proxy server: Bypass proxy server for local address*

  Other browsers that support frames and JavaScript may also be compatible with WBM. Browsers that do not support frames cannot be used with WBM.

Initial configuration

This chapter describes initial configuration of the gateway.

The gateway must be installed as described in the Installation Manual before configuration can be started.

The basic configuration of the gateway involves four steps:

1) Preparatory work (see Section 3.1, "Preparing for Configuration").
2) Opening the WBM (see Section 3.2, "Starting and Finishing WBM").
3) Exiting the WBM session.

The WBM guides you through the configuration process step by step. The WBM session can be terminated once configuration is complete.

3.1 Preparing for Configuration

Appropriate preparations should be made before starting the configuration of the HG 3500/3575 gateways to avoid unnecessary interruptions.

IMPORTANT: Ensure that the gateway was assigned the correct IP address before connecting it to the network.

3.2 Starting and Finishing WBM

Access options

There are two ways to start WBM for the HG 3500/3575 gateways. It can be started via OpenScape 4000 Assistant, or directly from a Web browser using the WBM URL. Access via OpenScape 4000 Assistant is the most common method used.

Topics in this chapter

1) Section 3.2.1, "Starting via OpenScape 4000 Assistant" Section 3.2.2, "Starting via Web Browser" Section 3.2.3, "Finishing a WBM Session"

3.2.1 Starting via OpenScape 4000 Assistant

To start the WBM session, take the following steps:

1) Log in to OpenScape 4000 Assistant using your username and password.
2) In the tree structure, select *OpenScape 4000 Assistant* **>** *Expert Mode* **>** *Gateway Dashboard*. The *Gateway Dashboard* window is displayed with the existing boards:
3) In the line for the required STMI/NCUI board in the "Remote access" column, click *[WBM] [N/A]*. The Web server for the HG 3500/3575 gateways is contacted. Since the server only works with HTTPS (secure data transmission), it sends a certificate.

NOTICE: You may see a message in the browser to the effect that there is a problem with the security certificate for the website. In this case, click *Continue to this website*.

4) Confirm the browser dialog with the certificate information. The WBM homepage is displayed:
5) In the *Configuration* and *Maintenance* modules, you can administer the HG 3500/3575 gateways.

3.2.2 Starting via Web Browser

User Account

The user account "Administrator" is available for WBM. This account provides access to configuration settings.

The default user name is **TRM** and the default password is **HICOM** (as configured in AMO STMIB). You should modify these defaults in AMO STMIB.

Starting a WBM session

To start the WBM session, take the following steps:

1) Open your Web browser.
2) In the address bar of your Web browser, enter the WBM URL. The Web server for the HG 3500/3575 gateways is contacted. Since the server only works with HTTPS (secure data transmission), it sends a certificate.
3) Confirm the browser dialog with the certificate information. The login window for the HG 3500/3575 gateways:
4) Enter the username and password. Click *Login*. The homepage of WBM for HG 3500/3575 is displayed:
5) In the *Configuration* and *Maintenance* modules, you can administer the HG 3500/3575 gateways.

3.2.3 Finishing a WBM Session

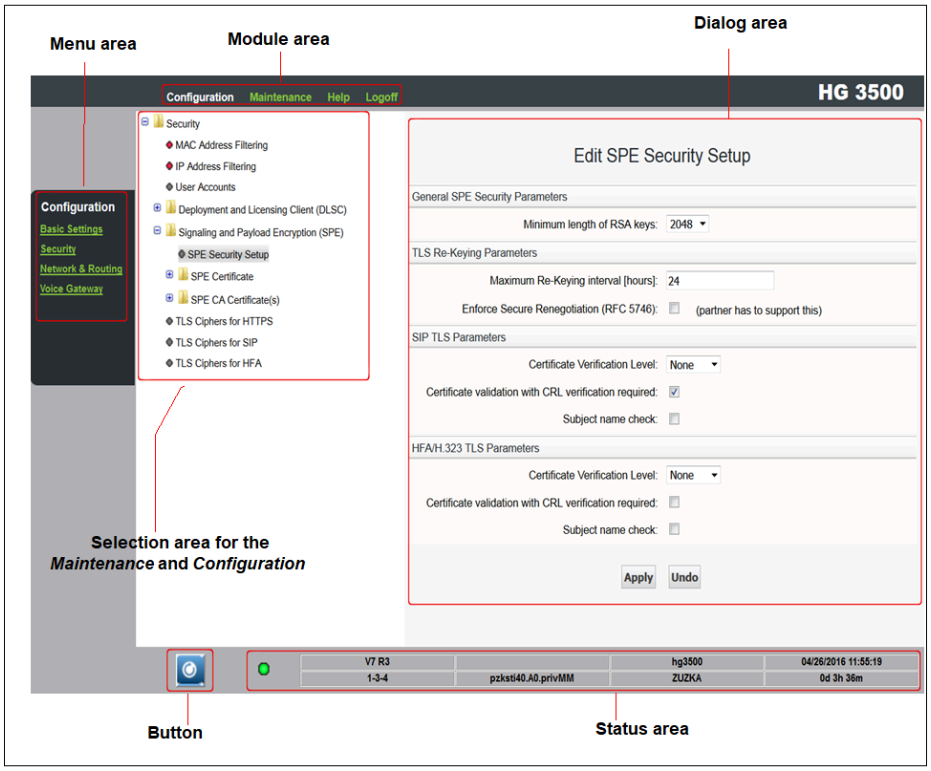
To finish the WBM session, take the following steps:

Click the *Logoff* module. The connection to the HG 3500/3575 gateways is ended and the WBM session is closed.

For more information on closing the WBM session, refer to Section 3.3.1.4, "Logoff".

3.3 WBM Application Interface

The main window in WBM consists of the following areas:



Module area:

The area under the banner displays the modules available. You can select the required module by clicking its name. See Section 3.3.1, "Modules".

Menu area:

The area at the left is used for navigating within a module. The menus that are displayed here vary depending on the module selected.

Buttons and Status area:

The icons for controlling WBM and the status information that is constantly displayed are located at the bottom. For information on the meaning of the icons, see Section 3.3.2, "Icons in the WBM Window's Status Area".

Selection area for the *Maintenance* and *Configuration modules*

This area displays a Configuration-type tree structure where you can select individual functions.

3.3.1 Modules

The area under the banner displays the modules available. You can select the required module by clicking its name.

The moduleâs name is displayed in *red italics* when activated and module-specific options appear in the menu area.

Modules available:

1) *Configuration Maintenance Help Logoff*

3.3.1.1 *Configuration*

The Configuration module features the necessary functions for configuring the gateway.

WBM path:

WBM **>** *Configuration*

The *Configuration* moduleâs options are displayed on the left.

For a detailed description of the functions of the Configuration module, see Chapter 5, "Configuration".

3.3.1.2 Maintenance

This module contains all the functions necessary for gateway maintenance and administration.

WBM path:

WBM **>** *Maintenance*

The *Maintenance* moduleâs options are displayed on the left.

For a detailed description of the functions of the *Maintenance* module, see Chapter 6, "Maintenance".

3.3.1.3 Help

WBM path:

WBM **>** *Help* > *Product Docu*

The following menu items are displayed:

- *About WBM*: The title of the WBM, for example `Web-Based Management for HG 3575`, is displayed.
- *Product Docu*: Single-click *Product Docu* in order to be redirected to the OpenScape 4000 Assistant V8 login page.

3.3.1.4 Logoff

The gateway connection is cleared down when you click *Logoff* and the WBM session is ended. (see Section 3.3.2, "Icons in the WBM Windowâs Status Area").

WBM path:

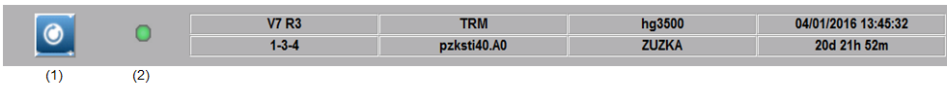
WBM **>** *Logoff*

Automatic logoff:

If you close the browser without first saving your configuration changes, you are automatically logged off. The following message then appears: `You have left the WBM page without logoff. You will be logged out automatically from the telephone system.`

3.3.2 Icons in the WBM Windowâs Status Area

The control area is an applet that constantly provides control and status information. The figure below shows an example:



The following control icons are used:

Reset Icon (1)

This icon triggers a gateway restart.

	Blue: Data input is reset.

Action Icon (2)

The icon turns green to indicate a connection to the gateway Web server. The icon flashes red when there is no connection set up.

The following status information is also displayed:

- System version of OpenScape 4000 and installation location
- User access category and loadware version
- Board name and gateway location

- System date and time as well as time since last restart

3.3.3 Icons in the WBM Tree Representations

The functions available in the *Configuration* and *Maintenance* modules are displayed in the contents area in a tree representation similar to Windows Explorer. This tree representation has the following icons:

- Directories

	Any directory that contains hidden functions is characterized by a plus sign (+). A single-click will display these functions. The functions in this open directory are displayed. A single-click will hide these functions.

- Bullet points

	Gray: This function can be activated but does not have status information. **Green:** This function is active and can be deactivated via an option on the WBM. **Red:** This function is inactive and can be activated via an option in the WBM.

- Context menus
- Context menus are no longer displayed in the WBM.

3.3.4 Dialogs and Dialog Elements

Inputs and modifications in the WBM are displayed in the browser window as dimmed dialogs within the browser window. Separate dialog windows can also be displayed, for example, to confirm a delete request.

The dialogs contain the following typical elements:12

Input fields

	For entering numeric or alphanumeric values. The relevant field label is displayed before, after or over the field. For security purposes, characters are exclusively displayed as unambiguous symbols, such as stars, in password fields. Characters unavailable on the keyboard can be inserted using the "Charmap" character table, for example, under MS Windows.

Dropdown lists

	Click the arrow to open or close the list. Select an entry with a left-click.

Check boxes

	(Here, the upper checkbox is disabled while the lower one is enabled): The relevant field label is displayed before, after or over the field. Click to enable or disable the relevant option.

Radio buttons

	(Here, the left check box is disabled while the right one is enabled): Radio buttons are combined in groups where one element is always selected. The relevant field label is displayed before, after or above the field. Click to enable or disable the relevant function.

Buttons

	Click to perform the action described by the buttonâs label text. The texts are self-explanatory, for example *Undo* or *Apply*.

The following buttons are used:

- *Apply*: Data or changes entered are buffered in the RAM and, where applicable, verified.
- *Undo*: Data or changes entered in the dialog are discarded. The original status of the dialog is restored.
- *Add*: Add a new entry to a table.
- *OK*: Positive acknowledgment of separate dialog windows. The selected action is performed if you click this button (no undo available).
- *Load:* A previously selected file, for example for configuration data, is loaded.
- *Cancel*: Negative acknowledgment of separate dialog windows. The selected action is canceled if you click this button.
- *Delete*: The configured settings are deleted.
- *Back*: Change to the previous Web page within a multi-page dialog. This button is currently only used in wizards.

Sort sequence

	The sort sequence of a column can be changed, for example in ascending or descending alphabetical order, by clicking the triangle next to the title in a table header.

3.4 OpenScape 4000 Manager

OpenScape 4000 Manager is an administration tool for managing a OpenScape 4000 V10 and the OpenScape 4000 V10 nodes. The relevant parts of the OpenScape 4000 V10 network are displayed as a virtual OpenScape 4000 V10 system.

The IP address of the Management Client as well as the beginning and end of the session are logged at each session. The modified data continues to be logged in the OpenScape 4000 V10 nodes.

In the OpenScape 4000 V10 system, OpenScape 4000 Manager takes priority over other applications that are running. This means that the modified data is stored in the OpenScape 4000 V10 database and the application is alerted of the change.

A description of the OpenScape 4000 Manager may be found in the corresponding documentation.

4 Front Panel

See section Section 5.4.1.4, "Front Panel" for information about the Front Panel.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Network Interfaces* > *Front Panel*

5 Configuration

This module features the necessary functions for configuring the HG 3500/3575 gateways.

WBM path:

WBM **>** *Configuration*

Before starting the configuration, the gateway must have been installed according to the descriptions in the installation manual.

The *Configuration* module options are displayed on the left.

Options in the *Configuration* module:

1) *Basic Settings Security Network & Routing Voice Gateway*

5.1 Basic Settings

The Basic Settings tab in the HG 3500/3575 gateways contains visible hardware data and editable basic data for the gateway functions.

WBM path:

WBM **>** *Configuration* **>** *Basic Settings*

The tree structure for *Basic Settings* is displayed.

Entries under *Basic Settings*:

1) *System Gateway Quality of Service Timezone Settings*

5.1.1 System

The "System" folder provides information on the current status or the current configuration of key system components.

WBM path:

WBM **>** *Configuration* **>** *Basic Settings* **>** *System* **>** *Gateway Properties*

Single-click the plus sign (+) next to *System* to display the following:

1) *Hardware Configuration*

Software Build

CPU

Task Monitor

Memory

Flash

Net Stack Resources

The *Gateway Properties* mask is displayed. For more information about the individual fields, see Section 5.1.3, "Gateway".

5.1.1.1 Hardware Configuration

This entry allows you to view detailed information about the HG 3500/3575 hardware.

WBM path:

WBM > Configuration > Basic Settings > System > *Hardware Configuration*

The *Hardware Configuration* dialog is displayed. It offers the following information:

- *Hardware ID:* Hardware ID (board ID in the OpenScape 4000 V10 system, for example 0x007D)
- *Serial Number:* system serial number (corresponds to the sticker on the board, e.g. SPU34030530131)
- *Parts List:* (parts list version, for example -04)
- *Boot ROM Version:*
- *FPGA CID Version:* (Field Programmable Gate Array version data). FPGA CID Version is the chip version, for example 2.
- *FPGA FW Version:* (Field Programmable Gate Array version data). FPGA FW Version is the version for the FPGA code of the EEPROM, for example 1.5.

5.1.1.2 Software Build

WBM path:

WBM > *Configuration* > *Basic Settings* > *System* > *Software Build* > *Software Build Version*

The *Software Build Version* dialog is displayed. The following information is displayed:

Currently active gateway image:

- *Software build version* (precise version of active software)
- *Loadware version*
- *Loadware info*

Alternative gateway image (only for HG 3575):

- *Software build version* (precise version of active software)
- *Loadware version*
- *Loadware info*

If another software image has been loaded but not yet activated, the version and file size of the software image awaiting installation are displayed.

OpenScape system:

- *OpenScape system version:* Version of OpenScape 4000 system

Third party and Open Source Software

5.1.1.3 CPU

This entry allows you to display the configuration of the main processor.

WBM path:

WBM > *Configuration* > *Basic Settings* > *System* > *CPU* > *CPU Configuration*

The *CPU Configuration* dialog is displayed. The dialog contains information on the processor type and the processor speed.

5.1.1.4 Task Monitor

NOTICE: This function may only be used by developers.

WBM path:

WBM > Configuration > Basic Settings > System > *Task Monitor*

The *Task Monitor* table is displayed. This table contains information on the currently active tasks: *Task ID*, *task name*, *priority*, *status*, *stack size*, *current stack usage*, *previous max. stack usage*, *stack margin*, *error number*, *current delay*.

5.1.2 Memory

This entry allows you to display details on memory usage.

WBM path:

WBM > *Configuration* > *Basic Settings* > *System* > *Memory*

Single-click the plus sign (+) next to *Memory* to display the following entries:

1) *Display Memory State Display System Memory Usage Display DMA Memory Usage*

5.1.2.1 Display Memory State

This option allows you to check if memory monitoring is active and what time cycle is set.

WBM path:

WBM > *Configuration* > *Basic Settings* > *System* > *Memory* > *Memory State*

The *Memory State* mask appears. It displays if memory monitoring is active or inactive. *Monitoring Timer (sec)* indicates the length of time (in seconds) during which the measured usage is compared with the threshold value. *Monitoring Logging Timer (sec)* indicates the length of time (in seconds) before an event is logged in the log file.

5.1.2.2 Display System Memory Usage

This option allows you to display the current system memory usage.

WBM path:

WBM > *Configuration* > *Basic Settings* > *System* > *Memory* > Display System Memory Usage > *System Memory Usage*

The *System Memory Usage* mask is displayed. The following parameters are displayed:

- *Absolute Memory Size (free/used)*: Number of total, free and allocated bytes, number of free and allocated blocks, size of the largest free block.
- *Memory Used (in %)*: Current system memory usage as a percentage and maximum system memory usage until the information is displayed.

5.1.2.3 Display DMA Memory Usage

This option allows you to display the current DMA memory usage.

WBM path:

WBM > *Configuration* > *Basic Settings* > *System* > *Memory* > Display DMA Memory Usage >*DMA Memory Usage*

The *DMA Memory Usage* mask is displayed. The following parameters are displayed:

- *Absolute Memory Size (free/used)*: Number of total, free and allocated bytes, number of free and allocated blocks, size of the largest free block.
- *Memory Used (in %)*: Current system memory usage as a percentage and maximum system memory usage until the information is displayed.

5.1.2.4 Flash

This entry allows you to display details on flash memory usage.

WBM path:

WBM > *Configuration* > *Basic Settings* > *System* > *Flash*

Single-click the plus sign (+) next to *Flash* to display the following entries:

1) *Display Flash State Display Flash Usage*

5.1.2.5 Display Flash State

This option allows you to check if the temperature sensor is active and what time cycle is set.

WBM path:

WBM > *Configuration* > *Basic Settings* > *System* > *Flash* > Display Flash State > *Flash Memory State*

The *Flash Memory State* mask is displayed. It indicates if flash monitoring is active. *Monitoring Timer (sec)* indicates the length of time (in seconds) during which the measured usage is compared with the threshold value. *Monitoring Logging Timer (sec)* indicates the length of time (in seconds) before an event is logged in the log file.

5.1.2.6 Display Flash Usage

This option allows you to display the current system memory usage.

WBM path:

WBM **>** *Configuration* **>** *Basic Settings* **>** *System* **>** *Flash* **>** *Display Flash Usage* **>** *Flash Memory Usage*

The *Flash Memory Usage* mask is displayed. The following parameters are displayed:

- *Flash Memory Size*: Size of the total memory and the size of the used and free areas in bytes.
- *Flash Memory Used (in %)*: Current system memory usage as a percentage and maximum system memory usage until the information is displayed.

5.1.2.7 Net Stack Resources

You can display the available resources as well as the state of the net stack memory.

WBM path:

WBM **>** *Configuration* **>** *Basic Settings* **>** *System* **>** *Net Stack Resources*

Single-click the plus sign (+) next to *Net Stack Resources* to display a menu containing the following entries:

1) *Display Net Pool State Display System Pools Display Data Pools*

5.1.2.8 Display Net Pool State

This option allows you to check if memory monitoring is active and what time cycle is set.

WBM path:

WBM **>** *Configuration* **>** *Basic Settings* **>** *System* **>** *Net Stack Resources* **>** *Display Net Pool State* **>** *Net Stack Pool State*

The *Net Stack Pool Status* mask is displayed. It indicates if net stack monitoring is active. *Monitoring Timer (sec)* indicates the length of time (in seconds) during which the measured usage is compared with the threshold value. *Monitoring Logging Timer (sec)* indicates the length of time (in seconds) before an event is logged in the log file.

5.1.2.9 Display System Pools

This option allows you to display the net stack resources for system pools.

WBM path:

WBM **>** *Configuration* **>** *Basic Settings* **>** *System* **>** *Net Stack Resources* **>** *Display System Pools* **>** *Net Stack Resources for System Pools*

The *Net Stack Resources for System Pools* mask is displayed. It displays the number of allocated and available blocks in the net stack memory system pool in block sizes of 64 bytes, 128 bytes, 256 bytes and 512 bytes. You can find information on the occupied and free elements as well as the current and previous maximum usage.

5.1.2.10 Display Data Pools

This option allows you to display the net stack resources for data pools.

WBM path:

WBM **>** *Configuration* **>** *Basic Settings* **>** *System* **>** *Net Stack Resources* **>** *Display Data Pools* **>** *Net Stack Resources for Data Pools*

The *Net Stack Resources for Data Pools* mask is displayed. It displays the number of allocated and available blocks in the net stack memory data pool in block sizes of 64 bytes, 128 bytes, 256 bytes, 512 bytes, 1024 bytes and 2048 bytes. The mask also provides information on used and free elements, the current use and the maximum use so far.

5.1.3 Gateway

This entry displays gateway properties and settings.

WBM path:

WBM **>** *Configuration* **>** *Basic Settings* **>** *Gateway* **>** *Gateway Properties*

This option allows you to display and edit the gateway properties and settings.

The *Gateway Properties* mask is displayed. You can display and edit the following data:

General:

- *Board Name*: This field contains the name of the system. Enter a character string in this field.
- *Physical Node Number (4K)*: Unique identification number of the gateway. Format: 0-0-0
- *Gateway Location*: This field contains information about the installation site of the SoftGate. This information helps service technicians to locate the gateway when the device has to be physically accessed. The value of this field is taken from AMO UCSU and cannot be changed via WBM.
- *Contact Address*: This field contains information about the person to be contacted if problems arise with the gateway. Enter a character string in this field.
- *System Country Code*: The country code set during installation and the relevant country are displayed for information purposes. This entry cannot be modified here (for HG 3500 only).
- *Gateway IP Address*: The gatewayâs IP address is displayed for information purposes. This entry cannot be modified here.
- *Gateway Subnet Mask*: The gatewayâs subnet mask is displayed for information purposes. This entry cannot be modified here.

Additional features: (not for HG 3575)

- *QoS â“ Fallback to SCN:* Check this option if calls that fail to reach their IP destinations are to be automatically switched from IP to SCN (see Section 5.5.8, "Fallback to SCN Parameters").
- *Conference Improvement:* During a conference, targeted fallback is performed on the G.711 encoding.
- *Support for Dispatch Application* - only for native SIP trunking GW
- *Allow SIP Register for Trunking*- only for native SIP trunking with profile.
- *Enable Instant DMC* - only for Native SIP Trunking and SIP Endpoints.
- *Use Early Media for Disconnect to SIP* - only for Native SIP Trunking GW.
-

  NOTICE: Only Basic Call is currently supported. For more information please refer to the Remote Agent Server Solution documentation.

- *Signaling Protocol for IP Networking:* SIP. This setting cannot be changed and is thus only displayed.
- *Display Name Character Code Set*: Support for Cyrillic display names. The character coding is configured at the gateway for this purpose based on the input of a character string:
- – Default: Blank string
  – The string is a sequence of the icons {'*', '1', '5', 'R', 'D'}: '*' = default, '1' = ISO8859-1, '5' = ISO-8859-5, 'R' = CorNet-TS (RUSSKYR), 'D' = H4000-GERMAN.

  The coding for the Downstream Subscriber (DS) translation occurs at the first position in the string, following by the coding for the Upstream Subscriber (US) translation, followed by DS/US Trunking and HFAviaSIP-DS/US.

  The default (= '*') is used for unavailable positions in the string (translation points).

  The default is ISO-8859-1 Latin-1 (='1') for DS/US Subscriber and DS/US Trunking and CorNet-TS (='R') for HFAviaSIP.

  If a specific translation is only defined for one of the two twin parameters (-DS and -US) and the other is defined by default, then the corresponding coding is also defined for the other parameter, i.e. assumed as the default.

  The gateway has to be restarted to accept the setting.

  Click *Apply* followed by *OK* in the confirmation dialog. Click *Undo t*o discard the changes entered. Restart the gateway.

5.1.4 Quality of Service

In HG 3500/3575, "Quality of Service " is supported by IP packet prioritization. Prioritization is performed on the basis of information in the IP header. For this to work, the relevant transmission partner must use the same "Quality of Service" procedure. You can display and edit this procedure.

In the case of IP data traffic, packets produced by HG 3500/3575 are split into various groups.

Background information:

See Section 7.3, "Quality of Service (QoS)"

WBM path:

WBM > *Configuration* > *Basic Settings* > *Quality of Service*

The *Quality of Service* window is displayed. This option allows you to edit the current gateway settings for quality of service.

You can edit the following data:

- *Priority Class for Signaling Data*:Priority class for the connection setup. Cannot be modified.
- *Priority Class for Fax/Modem Payload (IP Networking only)*:Select the relevant priority class for the fax and modem data of the IP connection.
- The following can be selected:
  - *AF:* Assured Forwarding (under fixed conditions). Data traffic is assigned classes and intercept priorities. This means that data forwarding can be assured as long as a certain data volume is not exceeded. If the data volume threshold is exceeded, data packets are intercepted according to their intercept priorities.
  - – *AF11, AF12, AF13:* Class 1 data volume with intercept priorities low (AF11), medium(AF12) and high (AF13)
    - *AF21, AF22, AF23:* Class 2 data volume with intercept priorities low (AF21), medium(AF22) and high (AF23)
    - *AF31, AF32, AF33:* Class 3 data volume with intercept priorities low (AF31), medium(AF32) and high (AF33)
    - *AF41, AF42, AF43:* Class 4 data volume with intercept priorities low (AF41), medium(AF42) and high (AF43)
  - *EF:* Expedited Forwarding. Aimed at data traffic that is only permitted to have low loss and low latency.
  - *Best effort / DF:* This priority is designed for typical router behavior.
  - *CS1, CS2, CS3, CS4, CS5, CS6, CS7:* Class Selector. This prioritization is used for Network Control Packets (e.g. SNMP).
  - *DSCP1, DSCP2, DSCP3, DSCP4, DSCP5, DSCP6, DSCP7, DSCP9, DSCP11, DSCP13, DSCP15, DSCP17, DSCP19, DSCP21, DSCP23, DSCP25, DSCP27, DSCP29, DSCP31, DSCP33, DSCP35, DSCP37, DSCP39, DSCP41, DSCP42, DSCP43, DSCP44, DSCP45, DSCP47, DSCP49, DSCP50, DSCP51, DSCP52, DSCP53, DSCP54, DSCP55, DSCP57, DSCP58, DSCP59, DSCP60, DSCP61, DSCP62, DSCP63:* Differentiated Services Code Point; used to prioritize IP packets.
- *Priority Class for Network Control*: Priority class for network control data, such as SNMP trap transmission). Cannot be modified.
- *Priority Class for Voice Payload*:Priority class for voice data on the IP connection.

Click *Apply* followed by *OK* in the confirmation mask. Click *Undo t*o discard the changes entered.

IMPORTANT: The default values do not usually need to be modified.

5.1.5 Timezone Settings

WBM path:

WBM > Configuration > Basic Settings > *Timezone Settings*

The *Timezone Settings* window with the time difference with respect to Greenwich Mean Time (UTC) is displayed.

NOTICE: The timezone setting is sent via the OpenScape system and cannot be changed via WBM.

5.2 Statistics

Statistics can be used to monitor the gateway performance and status.

The call statistics provide statistical information on voice, TSC, DMC, and data calls.

WBM path:

WBM **>** *Configuration* **>** *Basic Settings* **>** *Statistics*

Statistics can be used to monitor the gateway performance and status.

Single-click the plus sign (+) next to *Statistics* to display the following entries:

Entries under *Statistics*:

1) *Device Statistics MSC Statistics Call Statistics*

5.2.1 Device Statistics

This folder contains statistics on LAN usage and SCN.

WBM path:

WBM **>** *Configuration* **>** *Basic Settings* **>** *Device Statistics*

Single-click the plus sign (+) next to *Device Statistics* to display the following entries:

1) *LAN Statistics SCN Statistics*

5.2.1.1 LAN Statistics

The LAN statistics provide information on the channels configured and used by individual LAN devices.

WBM path:

WBM **>** *Configuration* **>** *Statistics* **>** *Device Statistics* **>** *LAN Statistics* **>** *Resource Statistics for Devices on LAN Side*

You can view the current LAN statistics.

The *Resource Statistics for Devices on LAN Side* mask is displayed. It contains a table that displays the resources currently used by each device type. Please note the advisory under the table indicating that the front panel (see Section

5.4.1.4, "Front Panel") also provides information on resource assignment by devices.

5.2.1.2 SCN Statistics

The SCN statistics provide information on the channels configured and used by individual SCN devices.

WBM path:

WBM **>** *Configuration* **>** *Statistics* **>** *Device Statistics* **>** *SCN Statistics* **>** *SCN Device Statistics*

You can view the current LAN statistics.

The *SCN Device Statistics* mask is displayed. It contains a table that specifies the number of resources currently seized for each device type as well as the percentage of licensed channels. It also shows how many channels are licensed. Please note the advisory under the table indicating that the front panel (see Section 5.4.1.4, "Front Panel") also provides information on resource assignment by devices.

5.2.2 MSC Statistics

This folder contains statistics on Media Stream Control â“ MSC.

WBM path:

WBM **>** *Configuration* **>** *Statistics* **>** *MSC Statistics* **>** *MSC Statistics*

Single-click the plus sign (+) next to *MSC Statistics* to display the following entries:

1) *Overall Statistics Per-Call Statistics*

5.2.2.1 Overall Statistics

The MSC overall statistics offer an overview of the statistical data for all registered calls.

WBM path:

WBM **>** *Configuration* **>** *Statistics* **>** *MSC Statistics* **>** Overall Statistics **>***MSC Overall Statistics*

You can open the current MSC overall statistics.

The *MSC Overall Statistics* mask is displayed. It provides information on RTP/TCP packets sent and not sent, packets received and not received and the number of bytes sent and received.

5.2.2.2 Per-Call Statistics

The MSC per-call statistics provides a table listing connection data for every registered call.

WBM path:

WBM > *Configuration* > *Statistics* > *MSC Statistics* > Per-Call Statistics > *MSC Per-Call Statistics*

You can display the current MSC statistics with connection data for individual calls.

The *MSC Per-Call Statistics* mask is displayed. The table displayed lists the relevant IP addresses, the connection setup time, codec information, the number of bytes and packets sent and received as well as information on connection quality and jitter for every call.

5.2.3 Call Statistics

WBM path:

WBM > *Configuration* > *Statistics* > *Call Statistics*

Single-click the plus sign (+) next to *Call Statistics* to display the following entries:

1) *Delete Statistics*

Call Statistics (1 h) Call Statistics (24 h) Call Statistics (Total) Call Statistics (Maximum Parallel) LAN Call Statistics PBX Call Statistics Current Connections MCP IPDA Call Statistics (not for vHG 3500) DMC IPDA Call Statistics (not for vHG 3500)

5.2.3.1 Delete Statistics

Deletes all statistics (apart from the counters from the last reboot).

WBM path:

WBM > *Configuration* > Statistics >*Call Statistics* > *Delete Statistics*

The *Delete Statistics* mask is displayed. Click *Delete* to reset the counters. Click *Cancel to* exit the dialog without making any changes.

5.2.3.2 Call Statistics (1 h)

These statistics list the totals for voice, TSC, DMC, and data calls during the last hour.

WBM path:

WBM > *Configuration* > *Statistics* > *Call Statistics* > *Call Statistics (Last Hour)*

You can view the totals for voice, TSC, DMC and data calls during the last hour.

The *Call Statistics (Last Hour)* mask is displayed. The totals displayed can be split into four categories:

- Voice calls
- TSC calls (**T**emporary **S**ignaling **C**all)
- DMC calls (**D**irect **M**edia **C**onnection)
- Data calls

via LAN or PBX. In all four categories, the display indicates

- the number of successful connections (... *Connected*) and
- the number of calls successfully accepted (... *Received*).

In addition, the total duration of all connections is displayed in seconds.

5.2.3.3 Call Statistics (24 h)

These statistics list the totals for voice, TSC, DMC, and data calls during the last 24 hours.

WBM path:

WBM **>** *Configuration* **>** Statistics **>** *Call Statistics* **>** *Call Statistics (Last 24 Hours)*

You can view the totals for voice, TSC, DMC, and data calls for the LAN and PBX during the last 24 hours.

The *Call Statistics (Last 24 Hours)* mask is displayed. For a brief description of the data, see Section 5.2.3.2, "Call Statistics (1 h)".

5.2.3.4 Call Statistics (Total)

These statistics list the totals for voice, TSC, DMC, and data calls for the LAN and PBX since the last reboot.

WBM path:

WBM **>** *Configuration* **>** Statistics **>** *Call Statistics* **>** *Call Statistics (Total)* **>** *Call Statistics (Total since last reboot)*

You can view the totals for voice, TSC, DMC, and data calls for the LAN and PBX since the last reboot.

The *Call Statistics (Total)* mask is displayed. For a brief description of the data, see Section 5.2.3.2, "Call Statistics (1 h)".

5.2.3.5 Call Statistics (Maximum Parallel)

These statistics list the totals for voice, TSC, DMC, and data calls for the LAN and PBX processed simultaneously by the gateway during peak load.

WBM path:

WBM **>** *Configuration* **>** Statistics **>** *Call Statistics* **>** *Call Statistics (Maximum Parallel)* **>** *Call Statistics (Maximum concurring events since last reboot)*

These statistics list the totals for voice, TSC, DMC, and data calls for the LAN and PBX processed simultaneously by the gateway during peak load.

The *Call Statistics (Maximum Parallel)* mask is displayed. For a brief description of the data, see Section 5.2.3.2, "Call Statistics (1 h)".

5.2.3.6 LAN Call Statistics

LAN calls are connections with other OpenScape 4000 V10 nodes (IP trunking) and VCAPI.

These statistics list the voice, TSC, DMC, and data calls received via LAN during the last hour, the last 24 hours, since the last reboot, and all calls processed by the gateway during peak load.

WBM path:

WBM **>** *Configuration* **>** Statistics **>** *Call Statistics* **>** *LAN Call Statistics* **>** *LAN Call Statistics Initiated*

The *LAN Call Statistics Initiated* mask is displayed.

The totals displayed can be split into four categories: one for the past hour, one for the past 24 hours, one for all calls received since the last reboot, and one for calls assigned the property "Maximum Parallel." The number of successful connections (*... Connected*) and the number of calls successfully accepted (*... Received*) are displayed for all categories. In addition, the total duration of all connections is displayed in seconds. All figures apply exclusively to connections conducted over LAN.

5.2.3.7 PBX Call Statistics

PBX calls are calls with system clients.

These statistics list the voice, TSC, DMC, and data calls routed via PBX during the last hour, the last 24 hours, since the last reboot, and all calls processed by the gateway during peak load.

WBM path:

WBM **>** *Configuration* **>** Statistics **>** *Call Statistics* **>** *PBX Call Statistics* **>** *PBX Call Statistics Initiated*

You can view the total number of voice, TSC, DMC, and data calls routed via PBX during the last hour, the last 24 hours, since the last reboot, and all calls processed by the gateway during peak load.

The *PBX Call Statistics Initiated* mask is displayed. For a brief description of the data, see Section 5.2.3.6, "LAN Call Statistics". All figures from these statistics, however, apply exclusively to connections conducted over PBX.

5.2.3.8 Current Connections

Number of currently connected and attempted calls without distinction between call type or origin.

WBM path:

WBM **>** *Configuration* **>** Statistics **>** *Call Statistics* **>** *Current Connections*

You can view the number of currently connected and attempted calls.

The *Current Connections* mask is displayed. The total displayed is the result of the number of currently connected and attempted calls without distinction between call type or origin.

5.2.3.9 MCP IPDA Call Statistics (not for vHG 3500)

The *MCP IPDA Call Statistics* table shows MCP (Multimedia Call Processing) calls in the OpenScape 4000 V10 IPDA (IP Distributed Architecture).

WBM path:

WBM **>** *Configuration* **>** Statistics **>** *Call Statistics* **>***MCP IPDA Call Statistics (not for vHG 3500)*

This displays MCP calls since the last update (60 seconds).

The *MCP IPDA Call Statistics* table is displayed. It includes the following columns: *NPCI*, *Party A*, *Party B*, *Switch Attributes*, *Codec*, *Source Port*, *Destination Port*, *IP Address* and *Index*.

5.2.3.10 DMC IPDA Call Statistics (not for vHG 3500)

The *DMC IPDA Call Statistics* table shows DMC (Direct Media Connection) calls in the OpenScape 4000 V10 IPDA.

WBM path:

WBM **>** *Configuration* **>** Statistics **>** *Call Statistics* **>** *DMC IPDA Call Statistics (not for vHG 3500)*

This displays DMC calls since the last update (60 seconds).

The *DMC IPDA Call Statistics* table is displayed. It includes the following columns: *NPCI*, *Correlation ID*, *Forward Codec*, *Reverse Codec*, *Source Port*, *Destination Port* and *IP Address*.

5.3 Security

The security-relevant permissions on HG 3500/3575 include filters for devices and ports with access rights and access administration for managing the gateways.

WBM path:

WBM > Configuration > *Security*

The *Security* tree structure is displayed.

Entries under *Security* tree structure:

1) *MEK for IPDA (for HG 3575 only)*

MAC Address Filtering

IP Address Filtering

User Accounts

Deployment and Licensing Client (DLSC) Signaling and Payload Encryption (SPE)

TLS Ciphers for HTTPS

TLS Ciphers for SIP

TLS Ciphers for HFA

5.3.1 MEK for IPDA (for HG 3575 only)

In this mask, you can set or delete MEKs (Master Encryption Keys) for IPDA (IP Distributed Architecture). An MEK is a special symmetrical key required for establishing an IP connection. It consists of precisely 16 alphanumeric characters.

WBM path:

WBM > Configuration > Security > *MEK for IPDA (for HG 3575 only)*

Single-click the plus sign (+) next to *MEK for IPDA* to display a context menu containing the following items:

1) *Set a new MEK Remove All MEKs*

5.3.1.1 Set a new MEK

WBM path:

WBM > Configuration > Security > *MEK for IPDA (for HG 3575 only)* > *Set a new MEK*

The *Set a new MEK* mask appears. The input fields *New MEK* and *Confirmation of new MEK* are displayed.

5.3.1.2 Remove All MEKs

WBM path:

WBM > Configuration > Security > *MEK for IPDA (for HG 3575 only)* > *Remove All MEKs*

The *Remove all MEKs* mask appears. The *Remove all MEKs* button is displayed.

5.3.2 MAC Address Filtering

MAC address filtering protects HG 3500/3575 against unauthorized access (for example via an external PC). Only PCs with IP addresses that are released in combination with the relevant unique MAC address via this security function are assigned access authorization. If the IP and MAC addresses do not match those of the specified combination, access is denied.

WBM path:

WBM **>** *Configuration* **>** *Security* **>** *MAC Address Filtering* **>** *MAC Address Filtering Table Editor*

The "MAC Address Filtering Table Editor" dialog allows you to edit all existing and new MAC address filtering rules at once.

If you have already added MAC address filtering rules, *MAC Address Filtering* is displayed as a list. In this case, single-click *MAC Address Filtering* in the tree structure to view the defined MAC filter rules.

Each line in the table represents a MAC address filtering rule.

- Button *Add*: The settings listed below must first be made before clicking this button. These settings are checked automatically after clicking this button and the new rule is added if they are correct. An error message is issued if the settings are not correct.
- Button *Delete*: If rules for MAC address filtering have been defined, you can delete individual MAC address filtering rules.
- Button *Apply*: This button will apply the changes.
- Button Undo: This button will undo the changes.
- *Rule Name*: Enter a unique name for the new filter rule in this field.
- *Rule Activated*: If you tick this option, the newly defined filter rule will be activated after clicking *Apply*.
- *IP Address*: In this field, enter the IP address from which IP packets should be accepted. Please note that the filter will only accept packets from this IP address if the MAC address also matches.
- *MAC Address*: In this field, enter the MAC address of the device from which packets should be accepted. If the device is connected via a router and not directly to the board, you must specify the MAC address of the router. In this case, you must create another MAC filter rule consisting of both the IP address and MAC address of the router. This process is necessary because the router exchanges MAC addresses (i.e. it uses its own MAC address) when transporting the packets.
- *For PPPoE Connection*: If you tick this option, the PPPoE protocol is activated for the connection based on this rule.

Click *Apply* followed by *OK* in the confirmation dialog.

IMPORTANT: You cannot delete all of the MAC filter rules if the MAC filter is enabled. If there is only one filter rule left, it cannot be deleted. This ensures that at least one PC can continue to access the gateway when the MAC filter is enabled.

5.3.3 IP Address Filtering

IP address filtering protects the HG 3500/3575 from unauthorized access (e.g. via enabled external call power or external call PC). If IP address filtering has been activated, access to the released IP addresses via an unprotected network is restricted.

WBM path:

WBM **>** *Configuration* **>** *Security* **>** *IP Address Filtering* **>** *IP Address Filtering Table Editor*

The *IP Address Filtering* mask is displayed. The table contains detailed data on every IP address filtering rule defined (for information on the meaning of the column headings.

The IP Address Filtering Table Editor allows you to edit all existing and new IP address filtering rules at once.

Each line in the table represents an IP address filtering rule.

- Button *Add*: The settings listed below must first be made before clicking this button. These settings are checked automatically after clicking this button and the new rule is added if they are correct. An error message is issued if the settings are not correct.
- Button *Delete*: If rules for MAC address filtering have been defined, you can delete individual MAC address filtering rules.
- Button *Apply*: This button will apply the changes.
- Button Undo: This button will undo the changes.
- *Rule Name*: Enter a rule name here. This rule name is displayed after the rule has been added to the tree structure.
- *Rule Activated*: If you tick this option, the newly defined filter rule will be activated after clicking *Apply*.
- *IP Protocol*: Indicate which protocol is to be allowed (*TCP*, *UDP*, *ICMP* or *All*). If you select *ICMP*, the check boxes *All types allowed* and *All codecs allowed* are activated for ICMP.
- **Explanations of the protocols:**
  - TCP: The Transmission Control Protocol (TCP) is a connection-based, packet-switching Internet protocol for transmitting data. Data can be transmitted in both directions.
  - UDP: The User Datagram Protocol (UDP) is a simple, connectionless Internet protocol. It is used to deliver data transmitted over the Internet to the correct application. Data can only be transmitted in one direction.
  - ICMP: The Internet Control Message Protocol (ICMP) is used for exchanging information and error messages via the IPv4. A similar protocol exists for IPv6, called ICMPv6.
- *ICMP Type*: The input field is activated if the entry *ICMP* was previously selected in the *IP Protocol* dropdown list and the check box *All types allowed* was disabled.
- You can enter the allowed ICMP packet types in this input field, whereby a value between 0 and 255 is permitted. The defined packet types are as follows: 0, 3 to 18, 30 to 41, the remaining values are only reserved.

  If you want to allow all ICMP packet types, enable the check box *All types allowed*.

- *ICMP Code Number*: The input field is activated if the entry *ICMP* was previously selected in the *IP Protocol* dropdown list and the check box *All codecs allowed* was disabled.
- You can enter the allowed ICMP code numbers in this input field, whereby a value between 0 and 255 is permitted. The defined code numbers are as follows: 0 to 5 and 13.

  If you want to allow all ICMP code numbers, enable the check box *All codes allowed*.
- *Lower Limit of Source IP Address Range*: The filter rule only permits IP addresses with sender addresses that originate in a defined area. In this field, enter the lower limit of the permitted address range from which packets should be accepted.
- *Upper Limit of Source IP Address Range*: In this field, enter the upper limit of the permitted address range from which packets should be accepted.
- *IP Port Numbers ([v]=All)*: Input field and check boxes
- *Lower Limit of Destination IP Address Range*: The filter rule permits an IP range to which packets can be sent. In this field, enter the lower limit of the permitted address range to which packets should be allowed to be sent.
- *Upper Limit of Destination IP Address Range*: In this field, enter the upper limit of the permitted address range to which packets should be allowed to be sent.

IMPORTANT: To let packets be sent to random IP addresses, for the *Lower Limit of Destination IP Address Range* enter `0.0.0.0` and for the *Upper Limit of Destination IP Address Range* enter `255.255.255.255`. The source and destination address label refers to who set up the connection. If the HG 3500/3575 is to be able to set up the connection, for example, then the board is the source and the remote end of the connection is the destination. If a connection was set up successfully, the packets for this connection are transmitted in both directions, even if a filter rule has only been specified for one direction.

- *Port* and *All ports allowed*: The check box *All ports allowed* is activated if the *TCP* or *UDP* protocol was previously selected in the *IP Protocol* dropdown list.
- When *All ports allowed* is disabled, a protocol port can be entered for the specified address range. This allows you to further refine the filter range. If you want to allow all ports to be used, enable the check box *All ports allowed*.

Activate Rule

If rules for IP address filtering have been defined, you can enable individual IP address filtering rules that are currently disabled (red icon).

A warning is displayed. Confirm this message with *OK*.

Deactivate Rule

If rules for IP address filtering have been defined, you can disable individual IP address filtering rules that are currently enabled (green icon).

A warning is displayed. Confirm this message with *OK*.

5.3.4 User Accounts

All user accounts defined with the AMO CGWB are displayed in a table.

WBM path:

WBM **>** *Configuration* **>** *Security* **>** *User Accounts*

The *User Accounts* mask is displayed. The table indicates the *Name* and the *Authorization* for each user account.

User Accounts are displayed as a list. Single-clicking *User Accounts* opens a tree structure where you can view the user accounts configured. *Name* and *Authorization* are displayed for the relevant user account.

Name

Name of the user account

Authorization

Authorization for the user account

5.3.5 Deployment and Licensing Client (DLSC)

The Deployment and Licensing Client (DLSC) is used to administer PKI data and the QDC configuration (PKI: **P**ublic **K**ey **I**nfrastructure, QDC: **Q**uality of Service **D**ata **C**ollection, DLS: **D**ep**l**oyment **S**ervice or **D**eployment and **L**icensing **S**erver).

WBM path:

WBM > Configuration > Security > *Deployment- and Licensing-Client (DLSC)*

Single-click the plus sign (+) next to *Deployment- and Licensing-Client (DLSC)* to display the following entries:

1) *Show DLSC Configuration*

Edit DLSC Basic Configuration

Enter Pin

Reset Bootstrapping

Contact DLSC

DLSC Client Certificate DLSC CA-Certificates

Certificate generation and distribution for communication between the DLS client and DLS server:

All certificates and private keys for encrypted communication between the DLS client and DLS server are generated by the DLS serverâs self-signed certification authority (CA) and sent by the DLS server in bootstrap mode to the DLS client.

The PKCS#12 file sent from the DLS server to the DLS client contains the DLSC certificate, the private key, and the certificates of the DLS serverâs certification authority (DLSC CA certificate). The DLS server can read all certificates it delivers apart from the private key.

Certificate generation and distribution for secure connection between WBM and the DLS server:

The administrator manually sends the WBM certificate containing the private key generated by the customerâs PKI certification authority to OpenScape 4000 Assistant. OpenScape 4000 Assistant then automatically sends its WBM certificate to all gateways. The DLS client uses this certificate for identification at the DLS server.

5.3.5.1 Show DLSC Configuration

The *DLS Client Basic Setup* mask shows parameters for setting up communication between the deployment and licensing client (referred to throughout as DLS client) and the deployment and licensing server (referred to throughout as DLS server).

The DLS client is in bootstrap mode when communication starts with the DLS server. Bootstrap mode is used to register the DLS client at the DLS server. Once registration is complete, the DLS client automatically switches to secure mode.

Secure mode is the normal operating mode for the DLS client. The port for secure connection and the individual certificates that were configured in bootstrap mode are used in secure mode.

WBM path:

WBM > Configuration > Security > Deployment and Licensing Client (DLSC) > *Show DLSC Configuration* > *Show DLS Client Basic Setup*

Data in the *DLSC Basic Setup* mask:

Current DLS Client Basic Configuration:

- *Time interval for ContactMe-Response:*
- The DLS client waits for a specified length of time for the DLS server to send a ContactMe message to the devices found after a network scan. Under "Current DLSC basic setup" see the parameter *Time interval for ContactMe-Response*. The ContactMe message contains the IP address and the port of the DLS server for bootstrap mode. The DLS client accepts this data and then sends periodical startup request messages to the IP address found and the port of the DLS server until the requests are accepted by the DLS server.

  The length of time the DLS client waits to receive ContactMe messages from the DLS server is, for example, "0". The wait time must be restricted so that ContactMe messages cannot be intercepted by malicious DLS servers.
- *PIN required for DLS Bootstrapping:*

The DSL client uses certificates in bootstrap mode. If the *PIN required for DLS bootstrap* parameter is set to "No", the default certificates are used. To prevent attacks from malicious DLS servers, do not use default certificates; instead, use certificates with individual passphrases (passphrase: a password that consists of multiple words).

- *Secure Communication with DLS Client:*

- If the DLS client is in secure mode, the parameter "Secure Communication with DLS Client" is enabled in the *Show DLSC Basic Setup* mask.

  Current DLS Client Server Configuration:

  Each operating mode requires a separate port on the DLS server. Under "Current DLSC server basic setup," the following data is displayed for this:
- *IP Address of DLS Server:* Used for bootstrap mode.
- *Port of DLS Server:* Used for bootstrap mode, e.g.: 18443
- *Secure Port of DLS Server:* Used for bootstrap mode, e.g.: 18444

5.3.5.2 Edit DLSC Basic Configuration

Apart from automatic registration of the DLS client at the DLS server with the ContactMe response, manual registration can also be performed for the DLS client. To do this, you need the IP address and port of the DLS server for bootstrap mode.

The IP address and the port of the DLS server can be configured via AMOs. These changes will be available after a reboot of the gateway.

After the configuration of the IP address and the port of the DLS server, a startup request message is sent once during the reboot (and with each reboot) to initialize the bootstrapping.

You can also manually establish a connection by using the WBM menu item âContact DLSâ. If no bootstrapping has been performed before, it will now automatically initialized, otherwise there will only be a check of the DLS availability.

WBM path:

WBM > Configuration > Security > Deployment and Licensing Client (DLSC) > *Edit DLSC Basic Configuration* > *Edit DLS Client Basic Setup*

The *Edit DLS Client Basic Setup* mask appears, in which you can modify the following:

1) *Time interval for ContactMe-Response*: for example, "0". Length of time the DLS client waits to receive ContactMe messages from the DLS server. The wait time must be restricted so that ContactMe messages cannot be intercepted by malicious DLS servers.

Click *Apply* followed by *OK* in the confirmation mask.The modified data is accepted into the configuration.

5.3.5.3 Enter Pin

WBM path:

WBM > Configuration > Security > Deployment and Licensing Client (DLSC) > *Enter Pin* > *Enter the Bootstrap PIN*

The Enter the Bootstrap Pin mask appears. You can enter the bootstrap pin.

Click Apply to submit the changes.

5.3.5.4 Reset Bootstrapping

WBM path:

WBM > Configuration > Security > Deployment and Licensing Client (DLSC) > *Reset Bootstrapping* > Reset DLS Client Bootstrapping

The *Reset Bootstrapping* mask appears. You can reset the Bootstrapping of the DLS Client.

Click *Reset Bootstrapping.*

5.3.5.5 Contact DLSC

WBM path:

WBM > Configuration > Security > Deployment and Licensing Client (DLSC) > *Contact DLSC*

The *Contact DLSC* mask appears. Click *Contact t*o see if the DLS client still available.

5.3.5.6 DLSC Client Certificate

This folder contains the DLSC client certificate with the private key. The DLS client uses this certificate for identification at the DLS server. This folder is empty by default. The DLS client receives the certificate from the DLS server in bootstrap mode.

WBM path:

WBM > Configuration > Security > Deployment and Licensing Client (DLSC) > *DLSC Client Certificate*

Show Certificate

WBM path:

WBM > Configuration > Security > Deployment and Licensing Client (DLSC) > *DLSC Client Certificate* > *DLSC Client Certificate*

The *Certificate Information* mask is displayed. It displays the following information:

- General data: *Certificate Name*, *Certificate Type*, *Serial Number of Certificate*, *Serial Number of Certificate (hex)*, *Type of Signature Algorithm*, *Start Time of Validity Period (GMT)*, *End Time of Validity Period (GMT)*, *CRL Distribution Point*
- *Issued by CA*: *Country (C)*, *Organization (O)*, *Organization Unit (OU)*, *Common Name: (CN)*
- *Subject Name*: *Country (C)*, *Organization (O)*, *Organization Unit (OU)*, *Common Name: (CN)*
- *Subject Alternative Name*
- *Public Key Encryption Data*: *Public Key Length*, *Public Key*, *Fingerprint*

5.3.5.7 DLSC CA-Certificates

This folder contains the DLSC CA certificates delivered by the DLS server in bootstrap mode.

WBM path:

WBM > Configuration > Security > Deployment and Licensing Client (DLSC) > *DLSC CA-Certificates*

Show Certificate

WBM path:

WBM > Configuration > Security > Deployment and Licensing Client (DLSC) > *DLSC CA-Certificates* > *DLSC CA-Certificate*

The *Certificate Information* mask is displayed. It displays the following information:

- General data: *Certificate Name*, *Certificate Type*, *Serial Number of Certificate*, *Serial Number of Certificate (hex)*, *Type of Signature Algorithm*, *Start Time of Validity Period (GMT)*, *End Time of Validity Period (GMT)*, *CRL Distribution Point*
- *Issued by CA*: *Country (C)*, *Organization (O)*, *Organization Unit (OU)*, *Common Name: (CN)*
- *Subject Name*: *Country (C)*, *Organization (O)*, *Organization Unit (OU)*, *Common Name: (CN)*
- *Alternative Subject Name*
- *Public Key Encryption Data*: *Public Key Length*, *Public Key*, *Fingerprint*

5.3.6 Signaling and Payload Encryption (SPE)

The Signaling and Payload Encryption (SPE) function encrypts VoIP user and signaling data streams to and from the gateway. For this feature a PKI (Public Key Infrastructure) is needed.

The needed certificates are generated either by a customer PKI certification authority (RA/CA) or the internal certification authority of the DLS server (CA). The DLS server then sends the files containing these certificates to the DLS client of the gateway.

Depending on the customerâs requirements, security settings can be configured, activated or deactivated for certificate evaluation and signaling and payload encryption. This increases or decreases the security.

WBM path:

WBM **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)*

For HG 3500: Single-click the plus sign (+) next to *Signaling and Payload Encryption (SPE)* to display the following entries:

1) *SPE Security Setup (not for HG 3575)*

SPE Certificate (not for HG 3575) SPE CA Certificate(s) (not for HG 3575)

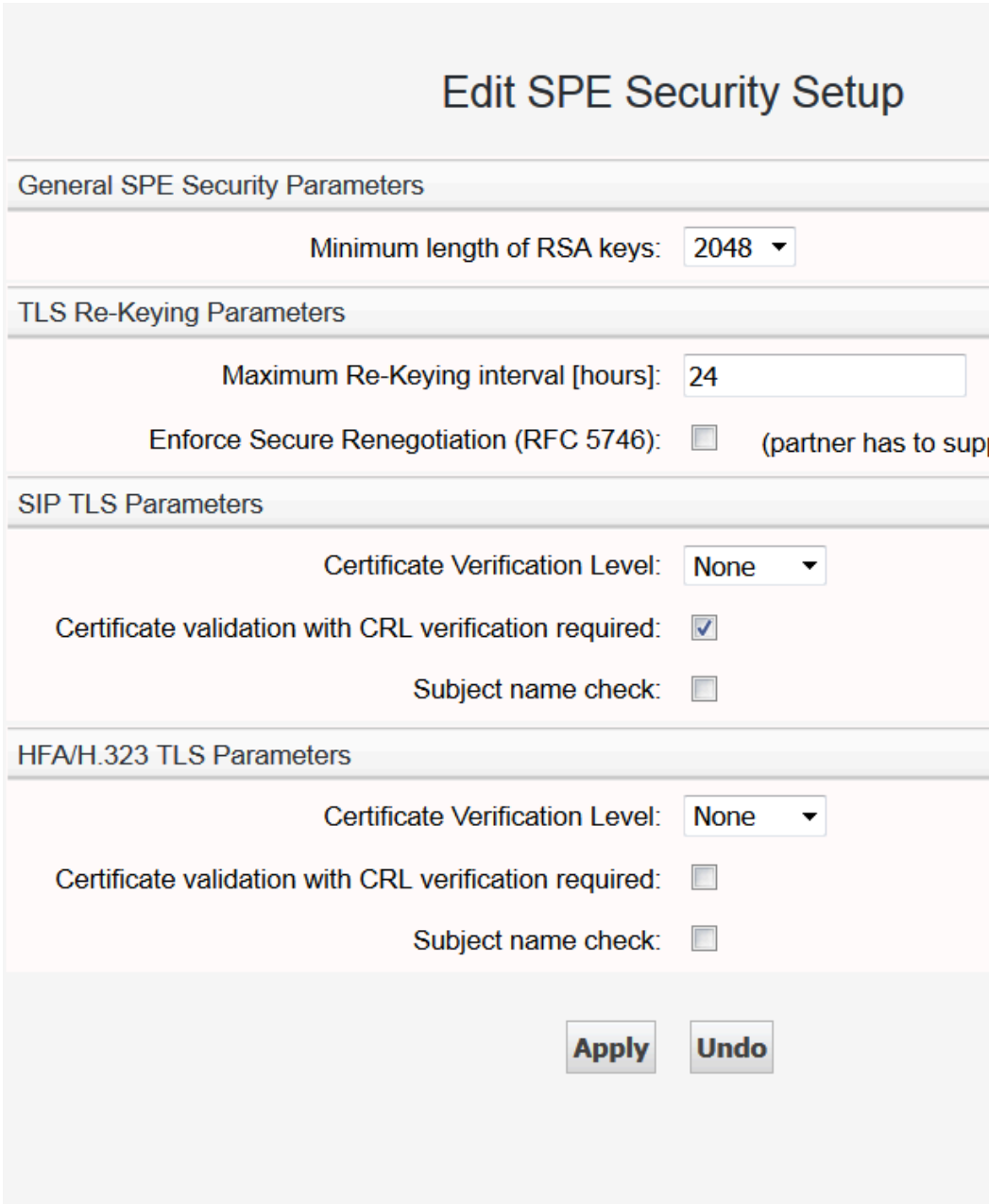
5.3.6.1 SPE Security Setup (not for HG 3575)

The *SPE Security Setup* mask shows the security settings for Signaling and Payload Encryption (SPE), for the encryption of signaling and payload between the gateways and VoIP clients as well as between two gateways.

Procedure:

Proceed as follows to display the SPE security configuration:

1) Select: *WBM* **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Security Setup.* The *Edit SPE Security Setup* dialog is displayed containing the following data:



5.3.6.2 Certificate Verification Level

During session setup of TLS (Transport Layer Security) the product needs to check the presented identity (certificate) of the opposite side of the communication channel. This checking needs to be done on client side of the TLS session regarding the identity of the server side or on both the client and server side if MTLS (Mutual TLS) is being used.

IMPORTANT: If on the TLS server side Trusted or Full is configured, the certificate from the TLS client is requested (Mutual TLS). If on the gateway subscribers are configured, but do not have a certificate, then select on the gateway (which is on this interface TLS server) as Certificate Verification Level None, the client is not allowed to choose the verification level. SPE can only be enabled or disabled (the server certificate is either selected or unselected).

IMPORTANT: For SIP-Q trunks the Certificate Verification Level None is not allowed, because Mutual TLS is mandatory.

IMPORTANT: If for native SIP trunks the gateway has a certificate the Certificate Verification Level should not be None in order to check the received certificate.

IMPORTANT: For all SIP interfaces on a gateway the Certificate Verification Level is the same. Thus it is not possible to have on one gateway SIP-Q trunking and SIP subscribers without certificates configured.

For the certificate verification three different levels are defined which can be selected:

WBM path:

Configuration **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Security Setup (not for HG 3575)* **>** *Edit SPE Security Setup* **>** SIP TLS Parameters

- None â“ no authentication of the remote entity performed
- The certificate of remote entity is not requested and not checked.
- Trusted â“ the certificate (including certificate chain) provided by the remote entity is requested and checked for integrity
- This means that the chain of trust for the digital signature provided by the remote entity ends up in one of the (root) CA-certificates, which are preconfigured for that interface on the product. And that all certificates in the chain are not expired (i.e. current date/time is within the certificate's given validity period).
- Full â“ the certificate (including certificate chain) provided by the remote entity is requested and checked against the same criteria as in Trusted mode, plus: the correct use of all extensions is checked. If an extension is marked critical and is not recognized, the certificate must be rejected. And

the correct use of known extensions is checked (e.g. Basic constraints, Key Usage, Extended Key Usage).

- Subject name check: The end entity's identity is verified by its alternate name or common name. This behavior can be changed by checkbox.
- There are optional checks:

  In level Trusted and Full:
- Certification validation with CRL verification required:
- The certificate revocation list (CRL) is used to specify whether and why a certificate should be blocked/revoked. If a certificate or certification authority (CA) declares a certificate invalid, it enters the certificateâs serial number in its list. This list can be downloaded from the certification authorityâs Internet site for certificate inspection.

  Check that none certificate in the chain is revoked. This behavior can be changed by checkbox:

  WBM path:

  Configuration **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Security Setup (not for HG 3575)* **>** *Edit SPE Security Setup* **>** HFA/H.323 TLS Parameters **>** Certification validation with CRL verification required.

  In level Full:
- Subject name check: The end entity's identity is verified by its alternate name or common name. This behavior can be changed by checkbox:

WBM path:

Configuration **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Security Setup (not for HG 3575)* **>** *Edit SPE Security Setup* **>** HFA/H.323 TLS Parameters **>** Subject name check.

5.3.6.3 Minimum Length of RSA Keys

Define the minimum length of RSA key in the certificate received from the remote entity. The greater the value, the more secure the key.

The minimum length of RSA keys set in the WBM:

- 512 bits

The maximum length:

- 2048 bits

WBM path:

Configuration > *Security* > *Signaling and Payload Encryption (SPE)* > *SPE Security Setup (not for HG 3575)* **>** *Edit SPE Security Setup* **>** Minimum Length of RSA Keys

5.3.6.4 Maximum Re-Keying Interval

The TLS/SSL connections remain permanently active and are renewed at regular intervals. The time interval for renegotiation is set in the WBM:

- Maximum value 72 hours
- Minimum 6 hours

- Disabled 0 (NOT RECOMMENDED)

WBM path:

Configuration **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Security Setup (not for HG 3575)* **>** *Edit SPE Security Setup* **>** *TLS Re-Keying Parameters > TLS Re-Keying Interval [hours] > Maximum Re-Keying Interval*

5.3.6.5 Enforce Secure Renegotiation (RFC 5746)

TLS is vulnerable to situations where a malicious server establishes a connection to a target server, injects it with its own rogue data and then splices in the new TLS connection from a client. The target server treats the client's initial TLS handshake as a renegotiation of an existing connection that the malicious server has previously established and thus believes that the initial data transmitted by the attacker is from the same entity as the subsequent client data. This problem can be avoided with secure renegotiation based on RFC 5746.

Only if all remote entities, which are connected over TLS, support secure renegotiation (RFC 5746), enable this feature. If a remote entity does not support RFC the renegotiation fails, even the establishment of the TLS connection fails in some scenarios.

This behavior can be changed by checkbox:

WBM path:

Configuration **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Security Setup (not for HG 3575)* **>** *Edit SPE Security Setup* **>***TLS Re-Keying Parameters* **>** *Enforce Secure Renegotiation (RFC 5746)*

5.3.6.6 SPE Certificate (not for HG 3575)

This folder contains the SPE client certificate with the private key and is empty by default. The certificate must first be imported. You can view and replace this imported certificate as required. The file containing the certificate must be available in PEM or PKCS#12 format. This file originates in a customer PKI certification authority (RA/CA) or the DLS server's internal certification authority (CA).

WBM path:

WBM **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Certificate*

***SPE Certificate* folder:**

Import SPE certificate plus private key (PEM or PKCS#12)

NOTICE:

The supported Public Key Algorithm for SPE certificates is RSA with a minimum key length of 2048 bit for HFA and SIP.

ECDSA is not supported for STMI or NCUI boards.

Import SPE certificate plus private key (PEM or PKCS#12)

A PEM or PKCS#12 file contains the data for a certificate and the associated private key. You can import the relevant PEM or PKCS#12 file to use this certificate.

WBM path:

WBM **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Certificate (not for HG 3575)* **>** *Import SPE certificate plus private key (PEM or PKCS#12)* **>** *Load SPE Key Certificate via HTTP*

Procedure:

Proceed as follows to import the SPE certificate:

1) Select: *WBM* **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Certificate (not for HG 3575)* **>** *Import SPE certificate and private key (PEM or PKCS#12).* The *Load a SPE Key Certificate via HTTP* mask is displayed. You can edit the following fields:

- *Passphrase for decryption*: In this field, enter the password which was used for creating the PEM or PKCS#12 file.
- *File with Certificate and Private Key (PEM or PKCS#12)*: Specify the path and name of the file which contains the certificate data to be imported. Click *Browse...* to open a dialog to search for the file.

NOTICE: If you are installing a certificate for the first time when SPE is enabled, an automatic reset is performed afterwards.

---

2) Click *View Fingerprint of Certificate*. A window showing the fingerprint of the certificate to be imported is displayed:

Check the fingerprint (= hexadecimal numeral). The fingerprint always changes if a certificate has been changed. An unchanged fingerprint is the only guarantee that the certificate is authentic. If the two fingerprints are not identical, an attempted attack has probably occurred. If this happens, you must destroy the key and take appropriate measures.

Click *OK* to close the window with the fingerprint.

1) Click *Import Certificate from File* if you are satisfied with the fingerprint check. Do not import the certificate if the fingerprint does not meet your expectations.

Show SPE Certificate

You can display an SPE certificate, for example, if you want to check it.

WBM path:

WBM **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Certificate (not for HG 3575)* **>** *SPE Certificate (not for HG 3575)* **>** *(left-click) SPE Certificate*

Procedure:

1) Select: *WBM* **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Certificate (not for HG 3575)* **>** *SPE Certificate (not for HG 3575)* **>** *(left-click) SPE Certificate*. The *Certificate Information* mask is

displayed. This displays general certificate data (such as the name, type and serial number), information on the issuer and the subject name as well as encryption data. The public key used and the fingerprint are displayed in hexadecimal format.

2) Click *OK*. The mask is closed.

Delete SPE Certificate

You can remove an SPE certificate, for example, if you need a new one.

WBM path:

WBM **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Certificate (not for HG 3575)* **>** D*elete SPE Certificate*

Procedure:

1) Select: *WBM* **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE Certificate (not for HG 3575)* **>** *Delete SPE Certificate*.

2) A warning appears. The name of the certificate is also specified for verification purposes.

3) Click *Delete* followed by *OK* in the confirmation mask.

5.3.6.7 SPE CA Certificate(s) (not for HG 3575)

This folder contains trusted SPE CA certificates. You can import new trusted SPE CA certificates and display or delete existing ones.

HG 3500 SIP and vHG 3500 SIP support multi-level CA certificate hierarchies. You can therefore also import multi-level CA certificate hierarchies. Upon receipt of a certificate chain from a TLS partner the entire received certificate chain will now be verified.

When using multi-level certificate hierarchies you need to

1) Import into the "SPE CA Certificates" folder the CA certificates of all intermediate certification authorities of the hierarchy of the own SPE certificate. Optionally, you may import the certificate of the Root Certification Authority (RootCA). When establishing the TLS connection the own certificate is then sent together with the chain of CA certificates.

In addition, you need to import into the âSPE CA Certificatesâ folder the CA certificates of all the Root Certificate Authorities that shall be considered as âtrustedâ. During verification of a received certificate chain the Root CA certificates in the âSPE CA Certificatesâ folder are used.

The import sequence of certificates is arbitrary.

WBM path:

WBM **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE CA Certificate(s)*

Single-click the plus sign (+) next to *SPE CA Certificate(s)* folder to display the following:

1) Import Trusted CA Certificate (PEM or Binary)

   Import trusted CA Certificate (PEM or Binary)

   The PEM or binary file sent by the DLS server and generated by a PKI certification authority (RA/CA) or the DLS serverâs internal certification authority (CA) can contain up to 16 trusted CA certificates in addition to the SPE certificate.

WBM path:

WBM **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE CA Certificate(s) (not for HG 3575)* **>** *Import trusted CA Certificate (PEM or Binary)*

Procedure:

Proceed as follows to import a trusted CA certificate:

1) Select: *WBM* **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE CA Certificate(s) (not for HG 3575)* **>** *Import trusted CA Certificate (PEM or Binary)*. The *Load a SPE CA Certificate via HTTP* mask is displayed. You can edit the following fields:
2) • *File with Certificate (PEM or Binary)*: Enter the path and file name of the PEM or binary file you want to import. Click *Browse...* to open a dialog to search for the file.
   • *CRL Distribution Point (CDP) Protocol:* Activate either the *LDAP* or *HTTP* protocols for the CDP. A CDP is an optional certificate extension. An imported certificate is only checked against the CRLs for which the CDP was configured.
   • *CDP (without e.g. ldap://):* Enter the CDP.
3) Click *View Fingerprint of Certificate*. A window showing the fingerprint of the certificate to be imported is displayed:

Check the fingerprint (= hexadecimal numeral). The fingerprint always changes if a certificate has been changed. An unchanged fingerprint is the only guarantee that the certificate is authentic. If the two fingerprints are not identical, an attempted attack has probably occurred. If this happens, you must destroy the key and take appropriate measures.

Click *OK* to close the window with the fingerprint.

1) Click *Import Certificate from File* if you are satisfied with the fingerprint check. Do not import the certificate if the fingerprint does not meet your expectations.

Single-click SPE CA Certificate to display.

Display SPE CA Certificate

You can display an SPE CA certificate, for example, if you want to check it.

WBM path:

WBM **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE CA Certificate(s) (not for HG 3575)* **>** SPE CA Certificate(s) **>** *(left-click) SPE CA Certificate*

Procedure:

1) Select: *WBM* **>** *Configuration* **>** *Security* **>** *Signaling and Payload Encryption (SPE)* **>** *SPE CA Certificate(s) (not for HG 3575)* **>** SPE CA Certificate(s)

> *Show SPE CA Certificate*. The *Certificate Information* mask is displayed. This displays general certificate data (such as the name, type and serial number), information on the issuer and the subject name as well as encryption data. The public key used and the fingerprint are displayed in hexadecimal format.

2) Click *OK*. The mask is closed.

Show CDP and CRL

With this function you can display the CRL Distribution Point (CDP) of a Certificate Revocation List (CRL).

Already issued certificates can be declared to be invalid, because they have become insecure, for example.

The CDP is an URI or an URL. With this URI / URL you can find a CRL to a certificate (e.g.: ldap://ldapserver.de/cdps/â¦).

WBM path:

WBM > *Configuration* > *Security* > *Signaling and Payload Encryption (SPE)* > *SPE CA Certificate(s) (not for HG 3575)* > SPE CA certificate > *Certificate Information*

Procedure:

1) Select: *WBM* > *Configuration* > *Security* > *Signaling and Payload Encryption (SPE)*>*SPE CA Certificate(s) (not for HG 3575)* > SPE CA certificate > *Certificate Information*. The *Certificate Information* mask is displayed. This displays general certificate data (such as the name, type and serial number), information on the issuer and the subject name as well as encryption data. The public key used and the fingerprint are displayed in hexadecimal format.
2) Click *OK*. The mask is closed.

Delete SPE CA Certificate

You can delete an imported SPE CA certificate, for example, if you need a new one.

WBM path:

WBM > *Configuration* > *Security* > *Signaling and Payload Encryption (SPE)* > *SPE CA Certificate(s) (not for HG 3575)* > SPE CA Certificate(s) > *Delete SPE CA Certificate*

Procedure:

1) *WBM* > *Configuration* > *Security* > *Signaling and Payload Encryption (SPE)* > *SPE CA Certificate(s) (not for HG 3575)* > SPE CA Certificate(s) > *Delete SPE CA Certificate*. A warning appears. The name of the certificate is also specified for verification purposes.
2) Click *Delete* followed by *OK* in the confirmation mask.

5.3.7 TLS Ciphers for HTTPS

WBM path:

WBM > *Configuration* > *Security* > TLS Ciphers for HTTPS

Protocol TLSv1.3 with fallback to TLSv1.2 is supported from V10 onwards, SSLv2 and SSLv3 are not permitted due to security issues.

TLSv1.0 is no longer supported.

The TLS version can be configured in WBM menu. It is offered and supported by the web server of the HG 3500 / 3575.

The default TLS configuration is TLS 1.3 with fallback to1.2.

For the TLS version and for TLSv1.3 also the key agreement method, encryption algorithm and AES operation mode can be configured. (see https://www.ietf.org rfc/rfc5246.txt for more information about TLSv1.3).

IMPORTANT: After changing and saving TLS settings, the gateway must be rebooted for the changes to take effect.

5.3.8 TLS Ciphers for SIP

WBM path:

WBM **>** *Configuration* **>** *Security* **>** TLS Ciphers for SIP

5.3.9 TLS Ciphers for HFA

WBM path:

WBM **>** *Configuration* **>** *Security* **>***TLS Ciphers for HFA*

5.4 Network & Routing

The gateway has two LAN interfaces. Both interfaces can be configured separately.

The second LAN interface is disabled by default on the HG 3500. If you want to use the second LAN interface, you must activate the function and specify the interfaceâs operation mode.

The second interface is used exclusively as redundancy for LAN1 for signaling survivability in the case of the HG 3575.

WBM path:

WBM > Configuration > *Network & Routing*

The *Network & Routing* tree structure is displayed:

1) *Network Interfaces*

Routing

5.4.1 Network Interfaces

WBM path:

WBM > Configuration > *Network & Routing* > *Network Interfaces*

Entries under *Network Interfaces*:

1) *LAN1 (LAN1) LAN2 (Redundancy LAN1) [for HG 3500 only] LAN2 (Redundancy for LAN1 (mirroring LAN1)) [only for HG 3575]*

Front Panel

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Network Interfaces*

5.4.1.1 LAN1 (LAN1)

With this option, you can configure LAN1 interface details. The function of the first LAN interface is predefined: The LAN1 interface is used for connecting the HG 3500/3575 to the LAN.

Background information:

See Section 7.1, "Environment Requirements for VoIP" See Section 7.2, "Bandwidth Requirements in LAN/WAN Environments" See Section 7.3, "Quality of Service (QoS)"

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Network Interfaces* **>** *LAN1 (LAN1)* **>** *LAN1/Customer LAN*

Click *LAN1 (LAN1)* to display LAN1 Interface

You can display detailed information on using the LAN1 interface.

The *LAN1/Customer LAN* mask is displayed.

This option allows you to edit the settings for using the LAN1 interface.

You can edit the following fields:

- *Interface Is Active*: Select this option if you want to activate this interface.
- *IP Address*: This field displays the IP address of the interface. It cannot be modified.
- *Subnet Mask*: The subnet mask is displayed in this field. It cannot be modified.
- MAC Address: The MAC address of the LAN1 interface is displayed here for information purposes.
- *Ethernet Link Mode*: This field shows Ethernet Link Mode. The following displays are possible:
- – *Auto*: Automatic switching between 10 and 100 Mbps and half duplex and full duplex mode
  – *10HDX*: 10 Mbps, half duplex
  – *10FDX*: 10 Mbps, full duplex
  – *100HDX*: 100 Mbps, half duplex
  – *100FDX*: 100 Mbps, full duplex

  IMPORTANT: The interface partners must be identically configured to guarantee LAN functionality.
- *Maximum Data Packet Size (Byte)*: The maximum packet length is specified as 1500 bytes in this field. It can be modified via WBM.

- *IEEE802.1p/q Tagging*: It is possible with IEEE802.1p/q for several virtual LANs to share a common physical network. The virtual LAN is packet-based in contrast to older port-based LANs. A tag is contained in the data area of the Ethernet packet that defines the VLAN to which the Ethernet packet belongs as well as the priority of the data packet.
- *IEEE802.1p/q VLAN ID*: Every VLAN is assigned a unique number, referred to as the VLAN ID. All devices that have the same VLAN ID can communicate with one another.
- As the VLAN ID, enter a value other than the default "0" if the switch used has a problem with the default "0".

  This field is only visible when *IEEE802.1p/q Tagging* is checked.

  Layer 2 QoS Class:

  – *Signaling Data*: Enter a value for the priority of the Layer 2 QoS class "*signaling data*". Values between 0 and 7 are permitted. Default = 3.
  – *Fax/Modem Payload***:** Enter a value for the priority of the Layer 2 QoS class "*fax/modem payload"*. Values between 0 and 7 are permitted. Default = 5.
  – *Network Control*: Enter a value for the priority of the Layer 2 QoS class "network control". Values between 0 and 7 are permitted. Default = 0.
  – Voice Payload: Enter a value for the priority of the Layer 2 QoS class "*voice payload*". Values between 0 and 7 are permitted. Default = 5.

  Access Point Signaling Communication:
- *IP Address of Access Point for Signaling Communication*: This field displays the IP address of the access point. It cannot be modified.
- *Subnet Mask of Access Point for Signaling Communication*: The subnet mask is displayed in this field. It cannot be modified.
- *Router of Access Point for Signaling Communication*: This field displays the IP address of the router. It cannot be modified.

Click *Apply* followed by *OK* in the confirmation dialog.

5.4.1.2 *LAN2 (Redundancy LAN1) [for HG 3500 only]*

This option allows you to display detailed information on how to use the LAN2 interface.

The *LAN2/Atlantic LAN* mask is displayed. The display and the available fields depend on the current setting in the first field *Use the Second LAN as*. For this reason, first select the required function of the LAN2 interface in this field. The following entries are available for selection:

- *Not configured or deactivated*: Do not use the LAN2 interface.
- *PPTP*: Use the LAN2 interface with a PPTP connection. (see Subsection *Selected connection type: PPTP*)
- *Redundancy for LAN1*: If LAN1 fails, LAN2 takes over its function including its MAC and IP address.
- *Management LAN*: It is chosen automatically if the management IP is configured by AMO CGWB.

Selected connection type: PPTP

If you have selected the entry *PPTP* in the field *Use the second LAN as,* you can edit the following fields:

IP parameters

- *Remote IP Address of the PPP Connection*: Enter the IP address of the remote end of the PPP connection in this field. If this PPP connection is used for Internet access, this entry is only necessary if the Internet Service Provider uses a static IP address. Otherwise do not change the preset value 0.0.0.0.
- *Local IP Address of the PPP Connection*: Enter the IP address of the local HG 35xx board in this field. If the preset value `0.0.0.0` is left unchanged, the IP address is taken from the IP stack (IP address of the LAN1 interface). If this PPP connection is used for Internet access, this entry is only necessary if the Internet Service Provider assigned you a static IP address. Otherwise do not change the preset value `0.0.0.0`.
- *Maximum Data Packet Size (Byte)*: Enter the maximum packet length in bytes for the IP protocol. The permitted range of values goes from 576 to 1500 bytes.
- *IP address negotiatio*n: Select how the connection partners should negotiate the IP address at connection setup.
- – use the configured IP address: only the specified IP address will be used.
  – accept any IP address: any IP address offered will be used, even if this differs from that specified.
  – request a new IP address: a new IP address will be requested from the connection partner.

PPTP Parameter

- Local IP address of the control connection: Enter the IP address of the HG 3500/3575 used for PPTP connections. The default value is 192.0.2.4. The addresses 0.0.0.0 and 255.255.255.255 are not allowed.
- Remote IP address of the control connection: Enter the IP address of the host computer to which the PPTP connection should be established. The default value is 192.0.2.4. The addresses 0.0.0.0 and 255.255.255.255 are not allowed.
- Remote netmask for the control connection: Enter the netmask for the PPTP connection in this field.

Authentication

- PPP authentication: Specify whether authentication should be performed. The parameter mask is extended if this check box is selected:
- – PPP User Name: Enter a user name of your choice that should be used for authentication via PAP or CHAP.
  – PAP Authentication Mode: Specify which type of authentication should be used for the PPP connection (PAP Client, PAP Host, not used).
  – PAP Password: Specify the password to be entered by the user for identification in the case of PAP authentication. Data cannot be entered in the field if PAP authentication is not used.
  – CHAP Authentication Mode: Specify which type of authentication should be used for the PPP connection (CHAP Client, CHAP Host, CHAP Client and Host, not used).
  – CHAP Password: Specify the password to be entered by the user for identification in the case of CHAP authentication. Data cannot be entered in the field if CHAP authentication is not used.

5.4.1.3 LAN2 (Redundancy for LAN1 (mirroring LAN1)) [only for HG 3575]

WBM > *Configuration* > *Network & Routing* > *Network Interfaces* > LAN2 (Redundancy for LAN1 (mirroring LAN1)) [only for HG 3575] >

The second interface is used exclusively as redundancy for LAN1 for signaling survivability in the case of the HG 3575.

The following settings are displayed for the LAN2 interface:

- *IP Address*: IP address
- *IP Subnet Mask*: Subnet mask
- *MAC Address*: MAC address
- *Management LAN*: It is chosen automatically if the management IP is configured by AMO CGWB.
- *IEEE802.1p/q Tagging*: It is possible with IEEE802.1p/q for several virtual LANs to share a common physical network. The virtual LAN is packet-based in contrast to older port-based LANs. A tag is contained in the data area of the Ethernet packet that defines the VLAN to which the Ethernet packet belongs as well as the priority of the data packet.
- *IEEE802.1p/q VLAN ID*: Every VLAN is assigned a unique number, referred to as the VLAN ID. All devices that have the same VLAN ID can communicate with one another.

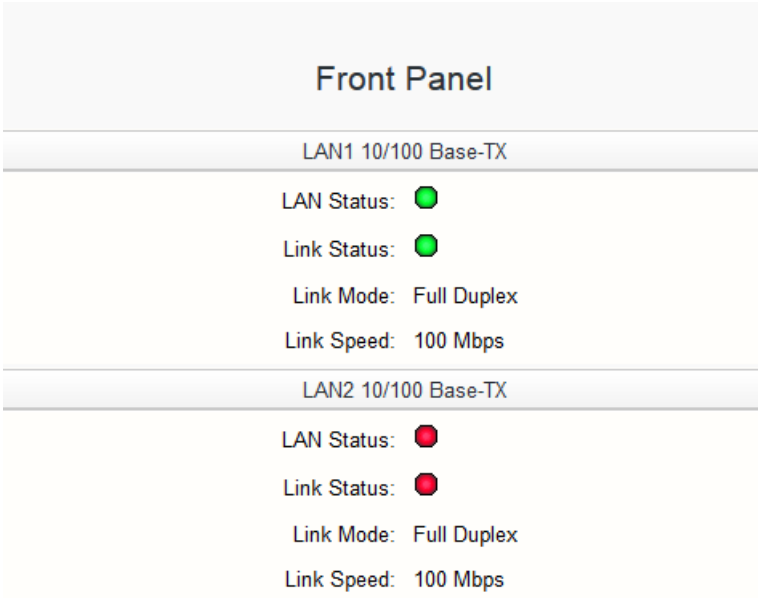
5.4.1.4 Front Panel

The connection field view contains icons that give direct access to the current status of important hardware elements and logical units.

WBM path:

WBM > *Configuration* > *Network & Routing* > *Network Interfaces* > *Front Panel*

A dialog such as the following is displayed:



The individual elements of the connection field are described below.

LAN (10/100 Base-TX)

The icon displays the operating status of LAN interfaces 1 and 2 (top field: LAN1 interface, bottom field: LAN2 interface).

Table 2: Status of LAN interfaces

Icon	Status
Green	LAN is active
Red	LAN is inactive

Table 3: Communication status of LAN interfaces

	Status
Link status	Connection cable is plugged in Connection cable is unplugged.
Link mode	Full/Half Duplex operation
Link speed	100/10 Mbps transfer rate

5.4.2 Routing

In small networks, a routing table can be set up manually on every router by the network administrator. In larger networks, this task is automated with the help of a protocol that distributes routing information in the network.

An IP packet can transit many routers before it reaches its destination. The route it takes is not defined centrally, but by the routing tables in the individual routers along the way. Each router only establishes the next step on the path and relies on the next router to forward the packet correctly.

In HG 3500/3575, you can configure IP routing, IP mapping, NAT, PSTN routing and SCN routing.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing*

The *Routing* tree structure is displayed.

Entries under *Routing*:

1) *IP Routing PSTN (for HG 3500 only)*

Dialing Parameters

5.4.3 IP Routing

In HG 3500/3575, both static routes and a default router can be configured. Diagnostic and monitoring tools are also available for routing.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *IP Routing*

The following entries are listed:

1) *Static Routes Default Router DNS Server (not for HG 3575) Address Resolution Protocol Routing Table ICMP Request*

5.4.3.1 Static Routes

HG 3500/3575 supports static routes only. Static routes connect two devices with each other. They are created manually.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *IP Routing* **>** *Static Routes* **>** *Static Route Table*

Click the plus sign (+) next to *Static Routes* to display the following entry

1) *Add Static Route*

Static Routes:

If you have already added static routes (see Section 5.4.3.4, "Add Static Route"), *Static Routes* is displayed in the Static Route Table. In this case, click *Static Routes* in the tree structure to view the configured static routes.

5.4.3.2 Automatic Static Routes

Static routes will automatically be created when the Management LAN is already configured and then MGNTIP or BUSIP are configured via the AMO CHANGE-CGWB TYPE=MGNTDATA.

If the IP addresses are configured as MGNTIP=0.0.0.0 or BUSIP=0.0.0.0. the static routes will automatically be deleted.

The created static routes are assigned a fixed index of 1001 or 1002. The route name associated with the fixed index 1001 is Assistant_IP. The route name for the fixed index of 1002 is Backup_Server_IP.

NOTICE: Any modifications of the automatic static routes in the WBM are overwritten via the AMO CHANGE-CGWB TYPE=MGNTDATA

The automatic static routes are displayed in the WBM.

WBM path:

WBM **>** *Configuration* **>** *Routing* **>** *IP Routing* **>** *Static Routes* **>** *Static Route Table*

5.4.3.3 Static Route Table

You can view a table containing all static routes created.

WBM path:

WBM > *Configuration* > *Routing* > *IP Routing* > *Static Routes* > *Static Route Table*

The *Static Route Table* mask is displayed. For descriptions of the individual fields, see Section 5.4.3.4, "Add Static Route".

5.4.3.4 Add Static Route

You can create a new static route between two IP devices.

WBM path:

WBM > *Configuration* > *Routing* > *IP Routing* > *Static Routes* > *Add Static Route*

The *Add Static Route* mask is displayed. The serial number of the route is shown under *Route Index*. You can edit the following fields:

- *Route Name*: The name of the static route. Enter a character string.
- *Destination Network/Host*: The IP address of the destination network.
- *Subnet Mask*: The subnet mask of the destination network.
- *Route Gateway*: The IP address of the next router on this route or the IP address of the local or remote interface of a PSTN peer.

The route index is automatically assigned and only displayed for information purposes. It cannot be modified.

When all settings are complete, click *Apply* followed by *OK* in the confirmation mask. Changes will automatically be saved.

You can delete existing static routes. The data associated with the static route to be deleted is displayed for verification purposes.

5.4.3.5 Default Router

To ensure that the gateway reaches destinations that are not explicitly listed in the route table, a gateway must be specified for forwarding packets of this kind (Default Router).

WBM path:

WBM > *Configuration* > *Network & Routing* > *Routing* > *IP Routing* > *Default Router*

You can view the current default router settings.

The *Default Router* mask appears The current default router settings are displayed:

- *Default Routing via:* Displays via which network, for example LAN, the default router is reachable.
- *IP Address of Default Router:* The IP address of the default router is displayed.

5.4.3.6 DNS Server (not for HG 3575)

You can view the IP addresses for the preferred and alternative DNS server (Domain Name System). DNS servers are used for name resolution, i. e. to transform alphanumeric IP addresses into numeric IPv4 or IPv6 addresses that can be processed by a computer.

WBM path:

WBM > Configuration > *Network & Routing* > Routing > IP Routing > DNS Server (not for HG 3575) > *DNS Settings*

The *DNS Settings* appears. The current DNS server settings are displayed:

- *IP Address of primary DNS Server:* This shows the IP address of the preferred DNS server.
- *IP Address of secondary DNS Server:* This shows the IP address of the alternative DNS server.

5.4.3.7 Address Resolution Protocol

For verification purposes, you can display the Address Resolution Protocol (ARP) data.

WBM path:

WBM > *Configuration* > *Network & Routing* > *Routing* > *IP Routing* > *Address Resolution Protocol* > *Address Resolution Protocol*

You can display the Address Resolution Protocol (ARP) data in a table.

The *Address Resolution Protocol* mask appears. A table with the columns "IP Address", "MAC Address", "Type", and "Interface" is displayed.

5.4.3.8 Routing Table

This function displays the routing table of the operation system.

WBM path:

WBM > Configuration >*Network & Routing* > Routing > IP Routing > Routing Table > *Display Routing Table*

The *Display Routing Table* window is displayed. Click *Send* or *Send (in a separate window)* to display the operating systemâs route table.

5.4.3.9 ICMP Request

For verification purposes, you can execute ping and traceroute commands to check the routing function.

WBM path:

WBM > Configuration > *Network & Routing* > Routing > IP Routing > *ICMP Request*

Single-click the plus sign (+) next to *ICMP Request* to display the following entries in the tree structure:

1) *Ping Traceroute*

5.4.3.10 Ping

You can execute ping command for verification purposes to check the routing function between the HG 3500/3575 and a random destination address.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *IP Routing* **>** *ICMP Request* **>** *Ping*

Network connection between HG 3500/3575 and the destination address of the host being tested is checked. To do this, an ICMP "Echo Request" packet is sent to the destination address. The recipient must return the ICMP "Echo Reply" packet if they support the protocol. This response packet is displayed, together with the round trip delay.

The *Ping* mask is displayed.You can edit the following fields:

- *Destination Address*: Address to which a request is to be sent with a ping.
- *Number of Echo Requests to Send*: Specify how many packet requests should be exchanged. The usual values are 3 or 4.

Click *Send* or *Send (in a separate window)*.

The result of the ping request is displayed.

The following buttons are provided in the output area: *Smaller* reduces the font size in the output. *Bigger* increases the font size in the output. *Reload* repeats the ping request.

5.4.3.11 Traceroute

For verification purposes, you can execute traceroute commands to check the routing function. The traceroute tests the network connection between HG 3500/3575 and the destination address using ICMP "Echo Request" packets. ICMP Echo Request Packets are sent with incremental TTL (Time-To-Live) values. The response receipts are displayed, together with the round trip delay.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *IP Routing* **>** *ICMP Request* **>** *Traceroute*

You can start the Traceroute command to test the routing function.

The *Traceroute* mask is displayed. You can edit the following fields:

- *Destination Address*: Enter the IP address of the destination. The traceroute between the HG 3500/3575 and this destination address is determined.
- *TOS Byte*: Specify whether TOS bytes (TOS = Type of Service) are to be sent. TOS bytes provide information on the quality of a service.

Click *Send* or *Send (in a separate window)*.

The result of the traceroute request is displayed.

The following buttons are provided in the output area: *Smaller* reduces the font size in the output. *Bigger* increases the font size in the output. *Reload* repeats the traceroute request.

5.4.4 PSTN (for HG 3500 only)

PSTN stands for **P**ublic **S**witched **T**elephone **N**etwork, in other words, for the public telephone network.

Partners that you want to reach via analog or ISDN connections must be configured as PSTN peers. A router call number is generally used to dial into the corporate network. The peer is identified via the station number transferred. A unique MSN must be configured for every peer who does not transfer a station number and this MSN must be dialed instead of the router call number.

HG 3500/3575 uses the point-to-point protocol (PPP) for transporting IP packets via analog or ISDN connections.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *PSTN (for HG 3500 only)*

Single-click the plus sign (+) next to PSTN to display the following entries:

1) *Edit Global PSTN Data*

PPP Log (Load via HTTP)

Clear PPP Log PSTN Peers

5.4.4.1 Edit Global PSTN Data

You can view the HG 3500/3575 basic PSTN configuration data for station number, redial, and scripting.

You can edit the HG 3500/3575 basic PSTN configuration data for station number, redial, and scripting.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *PSTN (for HG 3500 only)* **>** Edit Global PSTN Data **>** *PSTN Global Data*

The *PSTN Global Data* mask is displayed. You can edit the following fields:

- *Router Call Number*: Select the OpenScape 4000 V10 system DID from the pop-up menu. All applications that use the router function can be reached from an external location via this DID number. External routing partners that do not transfer a station number must each use different call numbers. These station numbers are configured as MSNs.
- *Number of Redial Attempts*: Enter the number of redial attempts that should be made by HG 3500/3575 to set up a connection.
- *Pause between Redial Attempts (sec)*: Enter the times between redial attempts in seconds.

5.4.4.2 PPP Log (Load via HTTP)

You can load the PPP log file of the gateway via HTTP and delete it on the gateway. The log file contains data on PAP or CHAP authentication errors. If the log file was deleted, it is automatically recreated and described.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *PSTN (for HG 3500 only)* **>** PPP Log (Load via HTTP)

You can load the gatewayâs PPP log file via HTTP.

You must confirm the advisory message that appears with *OK*. Depending on your browser settings, another dialog may now appear in which you can decide if you want to save the downloaded log file or open it directly in the default editor.

5.4.4.3 Clear PPP Log

You can delete the PPP log file from the gateway machine.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *PSTN (for HG 3500 only)* **>** *Clear PPP Log*

An important warning is displayed.

Click *Delete Log* followed by *OK* in the confirmation mask.

5.4.4.4 PSTN Peers

Up to 70 peers can be configured. Each setting describes a PSTN peer that dials into the corporate network via the OpenScape 4000 V10 or can be reached from the corporate network. The router call number is generally used to dial into the corporate network. The station number transferred is checked during this operation. If a station number is not transferred, an MSN can be configured for a PSTN peer as the dial-in number.

A default PSTN peer is preconfigured. These default settings appear in the input mask whenever a new peer is configured. By changing the factory settings of the default PSTN peer, you can create your own customized template for data records.

The icons for the default PSTN peer and its station number are displayed in blue.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *PSTN (for HG 3500 only)* **>** *PSTN Peers*

Single-click the plus sign (+) next to PSTN Peers to display the following entry:

1) *Add PSTN Peer*

You can manage individual PSTN peers and the default PSTN peer. Every entry under *PSTN Peer* refers to a configured PSTN peer.

If a station number has already been added (see also Section 5.4.4.6, "Add Station Number") for a PSTN peer that you have configured yourself the PSTN Peers entry will be displayed as a folder. Single-click the PSTN peer name to display. Every entry under the open folder refers to a station number assigned to the PSTN peer.

5.4.4.5 Add PSTN Peer

You can create a new PSTN peer.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *PSTN (for HG 3500 only)* **>** PSTN Peers **>** *Add PSTN Peer*

The *Add PSTN Peer* mask is displayed. You can edit the following fields:

- *Peer Name*: Enter a name of your choice for the PSTN peer. The field can contain up to 14 characters.
- *PSTN Connection Type*: Select whether the PSTN connection is to be used (option *Active*). You can preconfigure the PSTN peer if you select *Not configured*. However, this setting prevents a connection being set up over this PSTN peer.

IMPORTANT: The options *Default Router*, *Internet Access with DNS Request* and *NAT (*see further below for descriptions) can only be activated for **one** active PSTN peer.

IP Parameters:

- *IP Address of PSTN Peer*: Enter the IP address of the PSTN peer in this field. If this PPP connection is used for Internet access, this entry is only necessary if the Internet Service Provider uses a static IP address.
- *IP Address of Local PSTN Interface*: Enter the IP address of the local PSTN interface in this field. If this PPP connection is used for Internet access, this entry is only necessary if the Internet Service Provider assigned you a static IP address.
- *Maximum Data Packet Size (Byte)*: Enter the maximum packet length in bytes for the IP protocol. The value range lies between 576 and 1500 bytes.
- *IP Address Negotiation*: Select how the HG 3500/3575 and PSTN peer should negotiate the IP address at connection setup. The following options are available:
- – *use the configured IP address*
  – *accept any IP address*
  – *request new IP address*

General PPP Parameters:

- *MSN/DID*: You can configure an MSN number in this field.

IMPORTANT: A station number transferred by the partner must be configured, as otherwise the call is rejected. If, on the other hand, the partner has configured call numbers but does not transfer any, a connection will be set up anyway.

- *B Channels*: Enter the number of B channels used.
- *Callback*: Specify whether a call should be rejected and followed immediately by a callback. This prevents unauthorized peers from dialing in. The calling station must use the ISDN connectionâs D channel to transfer the station number and must permit dial-in via HG 3500/3575. This station number must be configured for the outgoing direction at the PSTN peer.

IMPORTANT: If callback is enabled, only outgoing connections from this peer are accepted. A connection cannot be set up if the peer is also a gateway and if callback is also enabled for this connection because neither of the peers accept incoming connection setup. In the case of a faulty configuration where only callback without redial is enabled, this can be detected and continuous connection setup can be suppressed. However, the problem is not detected if redial is enabled.

- *Send LCP Echo Request*: Specify if an LCP echo request should be sent. This function is used to check if the connection is still active.

Short Hold:

- *Short Hold*: Specify if the "Short-Hold" operational function should be activated or deactivated for the PPP connection. The following entries are only possible when short-hold mode is active:
- – *Short Hold Time (sec)*: Enter the length of time during which no data is transmitted after which the PPP connection should be cleared down. The permitted value range lies between 10 and 9999 seconds. The short-hold timer is only triggered by outgoing packets (HG 3500/3575 to the PSTN peer). In order to avoid hanging connections the SHORT HOLD functionality should be activated with Short Hold Time of 120 sec.

Authentication:

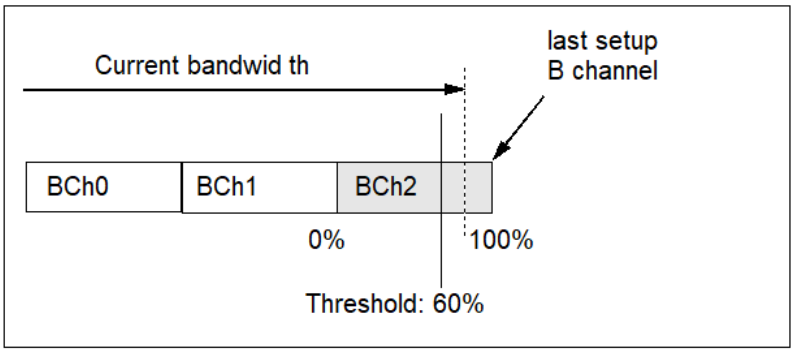
- *PPP Authentication*: Specify whether authentication should be performed. The parameter mask is extended if this check box is selected:
- – *PPP User Name*: Enter a user name of your choice that should be used for authentication via PAP or CHAP.
  – *PAP Authentication Mode*: Specify which type of authentication should be used for the PPP connection (*PAP Client*, *PAP Host*, *not used*).
  – *CHAP Authentication Mode*: Specify which type of authentication should be used for the PPP connection (*CHAP Client*, *CHAP Host*, *CHAP* Client and Host, *Not used*).

Multi-Link:

- *Multi-Link*: Specify whether channel bundling should be enabled on this PPP connection. The following inputs can only be made when multi-link is activated:
- – *Channel Allocation Mode*: Specify whether channel allocation should be static or dynamic for this PPP connection. In the case of static channel allocation, the required number of channels is established at the start of the connection (see General PPP Parameters: B Channels).

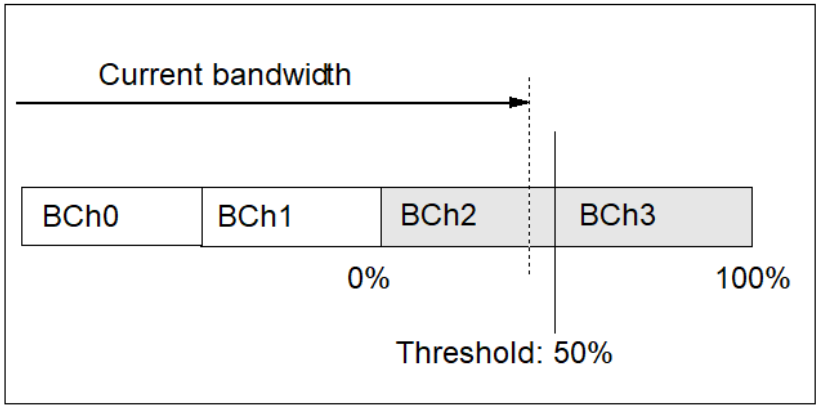
If the required number of system-routed B Channels is not available (for example, because seized by calls), only the maximum available number of B channels is established. B channels that subsequently become free can no longer be added to this multi-link connection. A completely new connection must be established for this. In the case of dynamic channel allocation, additional B channels are established or allocated B channels are cleared down depending on the bandwidth used. The maximum number of B channels required for this multi-link connection is set in the "B Channels" field under General PPP Parameters. As in the case of static multi-link, the number of B channels available may also be less than required here. In contrast to static multi-link, however, B channels that become free can be used for the multi-link connection if the current bandwidth requirement is high enough. B channel establishment and cleardown can be controlled by setting the upper and lower multi-link threshold and the upper and lower multi-link time limit. The number of B Channels currently seized can be checked under Device Statistics.

– *Segmentation*: If you enable this option, IP packets are split into multiple fragments. The fragments are transmitted over various B channels in a multi-link connection and reassembled into the original IP packets on the receive side. The activation of segmentation leads to shorter transmission times for IP packets and more consistent B channel utilization. Segmentation should be enabled for voice data transmission in multi-link connections to reduce jitter and therefore improve voice quality.
– *Upper Multi-Link Threshold (%)*: This value specifies the upper threshold above which an extra B channel is added. The threshold is based on the calculated utilization of the last B channel established. The permitted value range lies between 51% and 100%.



– *Upper Multi-Link Time Limit (sec)*: Specify the length of time for which the transmission rate must exceed the highest level before another B channel will be added (channel bundling). The permitted value range lies between 10 and 60 seconds.
– *Lower Multi-Link Threshold (%)*: This value specifies the lower threshold below which a B channel is cleared down. The threshold is based on

the calculated utilization of the last two B channels cleared down. The permitted value range lies between 20% and 80%.



– *Lower Multi-Link Time Limit (sec)*: Specify the length of time for which the transmission rate must fail to reach the lowest level before an additionally switched B channel will be deactivated. The permitted value range lies between 10 and 60 seconds.

5.4.4.6 Add Station Number

Up to five call numbers can be configured for each PSTN peer. A station number is checked as it is being transferred, and calls are only accepted if a PSTN peer is assigned appropriate call authorization for the incoming station number.

If general dialing parameters are configured (see Section 5.4.5, "Dialing Parameters"), these are evaluated during configuration and station number checking. All call numbers are converted into the lowest implicit format.

Example:

The following general Dialing Parameters are used:

International prefix= 000	Country code = 49
National prefix = 00	Prefix = 89
Prefix for trunk access = 0	Connection number = 722

Irrespective of the format of the station number transferred ("0722 123" or "0089722123" or "000 49 89 722 123"), all are changed to "123" as the lowest implicit format.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *PSTN (for HG 3500 only)* **>** *PSTN Peers* **>** selected PSTN peer **>** *Add Station Number*

The *Add PSTN Station Number* mask is displayed. You can edit the following entries:

- *Station Number*: Enter the station number at which a PSTN peer can be reached. It must be unique within the entire configuration and can comprise up to 22 decimal digits (0 to 9). Hyphens are permitted.

- *Direction*: Enter the type of connection that can be set up using this station number.
- – *Blocked*: The number cannot be used.
  – *Incoming*: The peer may make calls but may not be called.
  – *Outgoing*: The peer may be called but may not make calls.
  – *Incoming and Outgoing*: The peer may make calls and be called.

  Click *Apply*. You must confirm the advisory message that appears with *OK*. You must also click *OK* in the confirmation mask.

5.4.4.7 Display Call Address

You can check the call address associated with a PSTN peer and its direction.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *PSTN (for HG 3500 only)* **>** *PSTN Peers* **>** selected PSTN peer **>** selected station number **>** *PSTN Station Number*

The *PSTN Station Number* mask is displayed. For descriptions of the individual fields, see Section 5.4.4.6, "Add Station Number".

You can edit a call address associated with a PSTN peer and its direction.

You can delete the assignment of a call address to a PSTN peer.

Click *Apply*. You must confirm the advisory message that appears with *OK*. You must also click *OK* in the confirmation mask.

You can delete the assignment of a call address to a PSTN peer.

The *Delete PSTN Station Number* mask is displayed. The call address is displayed for verification.

Click *Delete* followed by *OK* in the confirmation mask.

5.4.4.8 Reset to Factory Default

You can reset the default PSTN peer settings. However, this does not affect the assigned station number. You can reset these separately to the factory defaults â“ see Section 5.4.4.10, "Reset to Factory Default".

WBM path:

WBM **>** *Configuration* **>** *Routing* **>** *PSTN (for HG 3500 only)* **>** *PSTN Peers* **>** *Add PSTN Peer* **>** *Reset to Factory Default*

Please note the warning displayed. Finally, click *Reset to Factory Default* and *OK* in the confirmation mask.

5.4.4.9 Default Station Number

This option allows you to manage the default station number of the default PSTN peer.

You can edit the default station number and the assigned direction of the default PSTN peer.

The *Default PSTN Station Number* mask is displayed. For descriptions of the individual fields, see Section 5.4.4.6, "Add Station Number".

WBM path:

WBM > *Configuration* > *Network & Routing* > *Routing* > *PSTN (for HG 3500 only)* > *PSTN Peers* > *Add PSTN Peer* > *Default Station Number*

5.4.4.10 Reset to Factory Default

You can reset the default station number settings for the default PSTN peer. However, this only affects the assigned station number. You can reset the basic settings for the default PSTN peer separately to the factory defaults â“ see Section 5.4.4.8, "Reset to Factory Default".

Please note the warning displayed. Finally, click *Reset to Factory Default* and *OK* in the confirmation mask

5.4.5 Dialing Parameters

The extension numbers configured as S0 stations in OpenScape 4000 V10 using OpenScape 4000 Manager can be assigned a VCAPI client, the MSN/DID number of a PSTN peer or the router call number in HG 3500/3575. The dialing parameters can be configured via WBM. Configured subscribers and IP addresses can also be viewed.

WBM path:

WBM > *Configuration* > *Network & Routing* > *Routing* > *Dialing Parameters*

Single-click the plus sign (+) next to *Dialing Parameters* to display the following entries:

1) *Edit General Dialing Parameters*

Configured Subscribers Configured IP Addresses

5.4.5.1 Edit General Dialing Parameters

You can display or edit the basic settings. Configuration is optional.

WBM path:

WBM > *Configuration* > *Network & Routing* > *Routing* > *Dialing Parameters* > *Edit General Dialing Parameters*

The *General Dialing Parameters* mask is displayed. You can edit the following fields:

- *Confirm CLIR*:This is a security function. Select this checkbox to prevent a caller number marked as private from being forwarded to the LAN. The background to this option is that the CLIR functionality is not explicitly

defined for IP routing in LANs because the terminal interface to the public network does not match the type found in classic telephony.

E.164

- *International Prefix*: The prefix for international numbers (including the trunk access digit).
- *National Prefix*: The prefix for national calls (including the trunk access digit).
- *Subscriber Prefix*: The trunk access digit or the prefix for calls to the public telephone network.
- *Country Code*: The country ID for the location of HG 3500/3575.
- *Area Code*: The area code for the location of HG 3500/3575.
- *Location Code*: The location code for HG 3500/3575 (if available).

Example:

In OpenScape 4000 V10, 0 is configured as the trunk access digit. The system is located in Munich and its connection number is 722:

International prefix= 000	Country code = 49
National prefix = 00	Area code = 89
Subscriber prefix = 0	Location code = 722

In HG 3500/3575, station number analysis is performed exclusively on the basis of the dialing parameters configured here and independent of any other corresponding OpenScape 4000 V10 parameters. You must ensure that the numbering scheme used for HG 3500/3575 is set up in accordance with the relevant configuration in OpenScape 4000 V10. Based on the above example, this means: If OpenScape 4000 V10 signals HG 3500/3575 using the implicit station number format with exchange code 0, the prefix for trunk access must also be set to 0 in the dialing parameters. In the example, the national prefix is set to 00 and the international prefix is 000. In both cases, the first 0 stands for the trunk access code.

Private numbering plan

- *Level 0 prefix*: Subscriber prefix
- *Level 1 prefix*: National prefix
- *Level 2 prefix*: International prefix
- *Level 0 code*: Location code
- *Level 1 code*: Area code
- *Level 2 code*: Country code

Click *Apply* followed by *OK* in the confirmation mask.

5.4.5.2 Configured Subscribers

These are configured S0 subscribers.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *Dialing Parameters* **>** *Configured Subscribers*

You can display a list of configured subscribers.

The *Configured Subscribers* mask is displayed. The station numbers and subscriber types are listed in a table. Subscriber types are, for example, HFA system clients or PSTN peers.

5.4.5.3 Configured IP Addresses

These addresses are the IP addresses of, for example, the LAN interfaces, the individual subscribers or the PSTN peers.

WBM path:

WBM **>** *Configuration* **>** *Network & Routing* **>** *Routing* **>** *Dialing Parameters* **>** *Configured IP Addresses*

You can display a list of the relevant IP addresses.

The *Configured IP Addresses* mask is displayed. The IP addresses and subscriber types are listed in a table. Subscriber types are, for example, LAN interfaces or PSTN peers.

The entries can be sorted. An arrow after a column name indicates the sort criterion. If you wish to sort the table by another column, click the respective column name.

5.5 Voice Gateway

By supporting Voice over IP (VoIP), HG 3500/3575 facilitates the use of OpenScape 4000 V10 features via IP networks.

WBM path:

WBM > *Configuration* > *Voice Gateway*

The *Voice Gateway* tree structure is displayed.

Entries under *Voice Gateway*:

1) H.323 Parameters SIP Parameters (not for HG 3575) Codec Parameters IP Networking Mode (not for HG3575) SIP Trunk Profile Parameter (not for HG 3575)

SIP Trunk Profiles

Destination Codec Parameters Fallback to SCN Parameters

DARs for MLPP (not for HG 3575) Clients ISDN Classmarks (not for HG 3575)

5.5.1 H.323 Parameters

This option allows you to view and configure settings for the H.323 protocol for voice transmission via the IP network.

WBM path:

WBM **>** *Configuration* **>** *Voice Gateway* **>** *H.323 Stack Parameters*

The *H.323 Stack Parameters* mask is displayed.

You can edit the following fields:

- *Basic User Input String for Outband Signaling* This field activates and deactivates the function for "Outband Signaling (postdialing)" with H.245 user inband "String for Outbound" signaling.
- *User Input for DTMF Outband Signaling*: This field activates and deactivates the function for "Outband Signaling (postdialing)" with H.245 user inband "DTMF Outbound" signaling.

Click *Apply* followed by *OK* in the confirmation mask.

5.5.2 SIP Parameters (not for HG 3575)

This option allows you to view and in some cases set SIP parameters for the IP network.

WBM path:

WBM **>** *Configuration* **>** *Voice Gateway* **>** *SIP Parameters*

The *SIP Parameters* window is displayed. You can display the following fields:

SIP User Agent

- *Use SIP Registrar*: The SIP registrar is a server in an SIP (**S**ession **I**nitiation **P**rotocol) network that accepts and processes SIP REGISTER requests. To be reachable, each SIP subscriber must log in to an SIP registrar. Possible displays: Yes/No
- *SIP Registrar IP Address*: IP address of the SIP registrar.
- *SIP Registrar TLS Port Number*: Number of the TLS port on the SIP registrar. TLS (**T**ransport **L**ayer **S**ecurity) is a protocol for encrypting data transmissions via Internet.
- *SIP Registrar TCP/UDP Port Number*: Number of the TCP/UDP port on the SIP registrar. TCP (**T**ransmission **C**ontrol **P**rotocol) and UDP (**U**ser **D**atagram **P**rotocol) are protocols for IP communication.
- *Alternative SIP Registrar IP Address*: IP address of the second SIP registrar, which should be used when the first SIP registrar is unavailable.
- *Alternative SIP Registrar TLS Port Number*: Number of the TLS port on the second SIP registrar.
- *Alternative SIP Registrar TCP/UDP Port Number*: Number of the TCP/UDP port on the second SIP registrar.
- *Period of registration (sec)*: When this registration period has elapsed, SIP subscribers must re-register.

SIP Server (Registrar / Redirect)

- *SIP Server IP Address*: IP address of the SIP server.
- *SIP Server TCP/UDP Port Number*: Number of the TCP/UDP Port on the SIP server.
- *SIP Server TLS Port Number*: Port number of the SIP server for TLS.
- *Default Registration Period (sec):* 600 (used when no âExpiresâ value received)
- *Range used for Randomized Registration (%)*: 25 (0 means: donât use Randomization).

RFC 3261 Timer Values

Transaction Timeout (msec): The SIP Timer is defined in RFC 3261.

SIP Transport Protocol

- *SIP via TCP*: (Abbreviation for **T**ransmission **C**ontrol **P**rotocol). Alongside IP, this is the most important Internet protocol. It provides a connection-based, reliable, full-duplex service in the form of a data channel.
- *SIP via UDP*: (Abbreviation for **U**ser **D**atagram **P**rotocol). This protocol can be used as an alternative to TCP if reliability is not important. UDP does not guarantee packet delivery or a specific sequence of receipt.
- *SIP via TLS*: (Abbreviation for Transport Layer â“ Security). TLS is a hybrid encryption protocol on the Internet and successor to SSL (Secure Socket Layer).

SIP Session Timer:

- *RFC 4028 support*: In RFC 4028, sessions timers are defined as an extension of SIP. This enables periodic updates off SIP sessions.
- *Session Expires (sec)*: Time after which a session expires.
- *Minimal SE (sec)*: Minimum time after which a session expires.

DNS-SRV Records

- *Blocking time for unreachable destination (sec)*: Time for which non-reachable destinations are locked out. DNS: **D**omain **N**ame **S**ystem, SRV: **Serv**ice

Trunking Parameter

- *Interval for Sending SIP OPTIONS ping (sec)*: Interval in seconds when the "SIP OPTIONS ping" message is sent for polling the operational readiness of the receiving device. The value "0" means that the message is not sent. Value range of 2 to 720 seconds

Call Supervision

- *MakeCallReq Timeout (sec)*: Timeout time spent waiting for a MakeCallReq message.
- SIP Connect Timeout (sec): 300

Buttons

Click *Apply* followed by *OK* in the confirmation mask. Click *Undo* to discard the changes entered.

5.5.3 Codec Parameters

You can set and view the settings for the G.711-A-law, G.711-Âµ-law, G.723 (for HG 3500 only), G.729, G.729A, G.729B, and G.729AB codecs and for the T.38 Fax protocol.

Background information:

See Section 7.2, "Bandwidth Requirements in LAN/WAN Environments"

WBM path:

WBM > *Configuration* > *Voice Gateway* > *Codec Parameters*

For descriptions of the individual fields, see below.

The *Codec Parameters* mask is displayed. In the "Codec" table you can edit the following parameters for the G.711 A-law, G.711 Âµ-law, G.723, G.729, G.729A, G.729B, G.729AB, and protocols:

- *Priority:*This field contains the priority for using the codec. The priority can be set from 1 (high) to 7 (low). Assign different priorities to the codecs. In the default configuration, G.711 A law has priority 1, G.711 Âµ law has priority 2, G.723 has priority 5, G.729A has priority 4, and G.729AB has priority 3. G.729B, G.729, have the status "not used".
- *Voice Activity Detection (VAD)*:This field defines whether or not Voice Activity Detection (VAD) should be used for the relevant codec.
- *Frame Size*:You can set the sampling rate in this field. The adjustable values depend on the codecs.

T.38 Fax

- *T.38 Fax*: This field defines whether or not the T.38 Fax protocol is to be used.
- *Max. UDP Datagram Size for T.38 Fax*: Maximum size of a T.38 UDP datagram in bytes.
- *Error Correction Used for T.38 Fax (UDP)*: Defines the methods for error correction that should be used (t38UDPRedundancy and t38UDPFEC).

IMPORTANT: The G.729 codec is identical to the G.729A codec and the G729B codec is identical to the Codec G.729AB codec (no "payload" difference). Thus, the G.729 and G.729B codecs are deactivated by default.

IMPORTANT: In H.323 signaling, the G.729 and G.729A codecs, and the G.729B and G.729AB codecs do differ.

IMPORTANT: Some non-OpenScape H.323 endpoints (Cisco GK) use the codec names G.729 or G.729B in "H.323 signalling". In this case, the G.729 and G.729B codecs must be used in HG 3500/3575 as well.

IMPORTANT: In a pure OpenScape network, the G.729 and G.729B codecs can remain deactivated.

Miscellaneous:

- *ClearMode (ClearChannelData)*: This field defines whether or not the ClearChannel function is to be enabled.
- *Frame size*:You can set the sampling rate in this field. Possible settings are 10, 20, 30, 40, 50, and 60 milliseconds (msec). The default setting is 20 msec.

RFC2833:

- *Transmission of Fax/Modem Tones according to RFC2833*: Events supported: 32 to 36 and 49. For a detailed description of the standard see http:///www.faqs.org/rfcs/rfc2833.html.
- *Transmission of Dtmf Tones according to RFC2833*: Events supported: 0 to 15. For a detailed description of the standard see http:///www.faqs.org/rfcs/rfc2833.html
- *Payload type for ClearChannel*: Default: 96, payload type for the ClearChannel codec.
- *Payload type for RFC2833*: Default: 98
- *Payload type for RFC2198*: Default: 99, corresponds to "Payload type for RFC2833" +1
- Redundant Transmission of RFC2833 Tones according to RFC2198: All tones transmitted by RFC2833 are secured according to RFC2198, provided that RFC2198 is active. For a detailed description of the standard see http:///www.faqs.org/rfcs/rfc2833.html and http:///www.faqs.org/rfcs/rfc2198.html

Click *Apply* followed by *OK* in the confirmation mask.

5.5.4 IP Networking Mode (not for HG3575)

WBM path:

WBM > *Configuration* > *Voice Gateway* > *IP Networking Mode (not for HG3575)*

The *IP Networking Mode* window is displayed. It contains the *Signaling Protocol for IP Networking (SIP)* and the *SIP Protocol Variant for IP Networking (SIP-Q)*, as well as a table containing *IP-Networking Circuits* with the information *Circuit* number, *Number of configured b channels* and *is Locked*.

The *IP Networking Mode* window is displayed. It contains the following information:

- *SSIP protocol variant for IP networking: SIP-Q*
- *SIP protocol variant for IP networking: Native SIP*
- *Max. Number of B-channels for SIP-Q: This is the value from the AMO CGWB, e.g. B. 0.*
- *SIP protocol variant for native SIP: This is the value from the AMO CGWB, e.g. B. 30.*
- *SIP DNS-SRV survivability mode: Yes / No (DNS: Domain Name System, SRV: Service)*
- *Number of Circuits Configured for IP Networking*: e.g. 0, 2

The window contains a table with the following information in the *IP Networking Circuits* area:

- *Port Number (circuit)*
- DMC verwenden: Bei einer IP-Vernetzung zwischen HiPath 3000/ OpenScape Business und OpenScape 4000 werden Gateway-Verbindungen Ã¼ber sogenannte DMC-KanÃ¤le realisiert (DMC: Direct Media Connection).
- Instant-DMC verwenden: DMC (Direct Media Connection) wird verwendet, um zwischen zwei SIP-Endpunkten im IP-Netz die Nutzdaten direkt auszutauschen. Default: Ja.
- *Use DMC: Enabled/Disabled*
- *Use Instant DMC: Enabled/Disabled*

- *Is Locked: Yes/No*

5.5.5 SIP Trunk Profile Parameter (not for HG 3575)

To enable SIP trunking, the SIP trunking settings must be adapted to the requirements of the relevant SIP provider. To do this, profiles for trunks via SIP-Q and profiles for trunks via native SIP can be activated or deactivated.

WBM path:

WBM > *Configuration* > *Voice Gateway* > *SIP Trunk Profile Parameter*

The *SIP Trunk Profile Parameter* mask is displayed. For field descriptions see below.

This option allows you to edit the settings for *SIP Trunk Profile Parameter*.

The *SIP Trunk Profile Parameter* mask is displayed. It contains:

- *SIP Protocol Variant for IP Networking: SIP-Q* (cannot be edited)
- *SIP Protocol Variant for IP Networking:* Native *SIP* (cannot be edited)
- *Use Profiles for Trunks via SIP-Q*: Can be activated/deactivated. Default setting: deactivated. This setting must be activated if you wish to use SIP Load Balancing (not for HG 3575).
- *Use Profiles for Trunks via Native SIP*: Can be activated/deactivated. Default setting: activated.
- *Enable SIP Peer Filtering*: Can be activated/deactivated. Default setting: deactivated. If this feature/checkbox is enabled, only requests from âknownâ peers are answered. All requests from âunknownâ peers are ignored.
- *Participate at SIP load balancing:* Can be activated/deactivated. Default setting: deactivated.

5.5.6 SIP Trunk Profiles

NOTICE: The *SIP Trunk Profiles* folder is only displayed if the *Use profile for trunks via SIP-Q* option was activated under *SIP Trunk Profile Parameter (not for HG 3575)*.

WBM path:

WBM > *Configuration* > *Voice Gateway* > *SIP Trunk Profiles*

The following sub-folders with the names of SIP providers are displayed in the *SIP Trunk Profiles* tree structure. Each sub-folder contains the settings for that SIP provider. The settings can be displayed, modified or enabled.

The SIP trunk profile for the selected SIP provider is displayed. The following settings can be made:

- *Profile Name*: cannot be changed
- Enable Trunk Profile: can be activated/ deactivated
- *Account/Authentication required*: can be activated/deactivated.
- *Remote Domain Name*: Enter the name for a remote domain.

- *SIP Transport Protocol*: *UDP* or *TCP* can be selected in the option field. Both of these protocols belong to the transport layer in the TCP/IP reference model (UDP: User Datagram Protocol, TCP: Transmission Control Protocol).

Security:

- Released Security Level: This cannot be changed.
- TLS used: not configurable
- RTP Security Mode:
- Payload Encr. used: not configurable

Registrar:

- *Use Registrar*: Can be activated/deactivated. Determine whether a domain name registrar is to be used.
- *IP Address/Host Name*: Enter the IP address or host name of the domain name registrar.
- *Specify Port*: Can be activated/deactivated. Define Port for the Domain Name Registrar.
- *Reregistration Interval (s)*: Determine the intervals at which re-registration is required.

Proxy:

- *IP Address/Host Name*: Enter the IP address or host name of the proxy server. This is the provider's SIP server.
- *Define Port*: Can be activated/deactivated. Define the port for the proxy server.

Outbound Proxy:

- *Use Outbound Proxy*: Can be activated/deactivated. This is the proxy server used to access the provider's SIP server. For outbound data traffic for the SIP provider.
- *IP Address/Host Name*: Enter the IP address or host name of the outbound proxy server.
- *Specify Port*: Can be activated/deactivated. Define the port for the outbound proxy server.

Inbound Proxy:

- *Use Inbound Proxy*: Can be activated/deactivated. This is the proxy server used to access the provider's SIP server. For inbound data traffic for the SIP provider.
- *IP Address/Host Name*: Enter the IP address or host name of the inbound proxy server.
- *Specify Port*: Can be activated/deactivated. Define the port for the inbound proxy server.

Buttons

Click the button *Apply* in order to update the data, *Undo* in order to restore the previous values, Delete, to remove the changes.

5.5.7 Destination Codec Parameters

You can add, change or delete the codecs G.711 A law, G.711 Âµ law, G.723, G.729A and G.729B for a specific IP address.

Background information:

See Section 7.2, "Bandwidth Requirements in LAN/WAN Environments"

WBM path:

WBM > *Configuration* > *Voice Gateway* > *Destination Codec Parameters*

5.5.7.1 Add Destination Codec Parameters

You can add destination codec parameters for a specified IP address.

If you have added a destination codec parameter for a specified IP address, you can also edit it.

You can delete destination codec parameters for a specified IP address.

WBM path:

WBM > *Configuration* > *Voice Gateway* > *Destination Codec Parameters* > *Add Destination Codec Parameters* > *Destination Codec Parameters*

The Destination *Codec Parameters* mask is displayed. In the "Codec" table you can enter the following parameters for the "G.711 A-law", "G.711 Âµ-law", "G.723" (for HG 3500 only), "G.729", "G.729A", "G.729B" and "G.729AB"protocols:

- *Priority:*This field contains the priority for using the codec. The priority can be set from 1 (high) to 7 (low). Assign different priorities to the codecs. In the default configuration, G.711 A law has priority 1 (in HG 3500, 3 in HG 3575), G.711 Âµ law has priority 2 (in HG 3500, 4 in HG 3575), G.723 has priority 5 (in HG 3500), G.729A has priority 4 (in HG 3500, 3 in HG 3575) and G.729AB has priority 3 (in HG 3500, 1 in HG 3575). G.729B and G.729 have the status "not used".
- *Voice Activity Detection (VAD)*:This field defines whether or not Voice Activity Detection (VAD) should be used for the relevant codec.
- *Frame Size*:You can set the sampling rate in this field. The adjustable values depend on the codecs.

Destination

- *Destination Address Type*: Select the *host*, *subnet* or *area*.
- *IP address*: Enter the associated IP address for the entry.

Buttons

Use the Apply button to apply changes. *Undo* in order to restore the previous values. Use the *Delete* button to confirm that you want to delete the entry.

5.5.8 Fallback to SCN Parameters

You can display and edit Fallback to SCN parameters. You can also enable and disable Fallback to SCN, or display blocked IP addresses.

Single-click the plus sign (+) next to Fallback to SCN Parameters to display the following:

Displaying Blocked IP Addresses

WBM path:

WBM > *Configuration* > *Voice Gateway* > *Fallback to SCN Parameters* > *QoS - Fallback to SCN*

This option allows you to adapt the list of parameters for Fallback to SCN parameters.

The *QoS â“ Fallback to SCN* mask is displayed. You can edit the following fields

- *Fallback to SCN enabled*: Check this option if you want Fallback to SCN to take place when one of the conditions below is fulfilled.
- *Activate (Packet Loss)*: Check this option if the loss of packets can lead to a fallback.
- *Activate (Round Trip Delay)*: Check this option if long delays between sending requests and receiving responses over the network can lead to a fallback.
- *Activate (Jitter)*:Check this option if unstable clock signals can lead to a fallback.
- *Threshold (Packet Loss)*: If "Activate (Packet Loss)" has been checked, you can use this field to enter at what percentage of packet loss a fallback should be triggered.
- *Threshold (Round Trip Delay)*: If "Activate (Round Trip Delay)" has been checked, you can use this field to define the response time in milliseconds after which a fallback should be triggered.
- *Threshold (Jitter)*:If "Activate (Jitter)" has been checked, you can use this field to define the deviation in milliseconds for clock signals after which a fallback should be triggered.
- *Blocking Timer Duration (min.)*:In this field you enter the fallback duration in minutes before IP routing is attempted again.
- *Reaction of Evaluation Algorithm*: Select how fast the evaluation algorithm should react. The possible choices are "slow" and "fast".

Buttons

Click the *Apply* button in order to update the data, or *Undo* in order to re-enter the previous values.

5.5.8.1 Displaying Blocked IP Addresses

You can display the list of blocked IP addresses.

WBM path:

WBM > *Configuration* > *Voice Gateway* > *Fallback to SCN Parameters* > *Displaying Blocked IP Addresses* > *List of blocked IP addresses*

The table *List of blocked IP addresses* is displayed

5.5.8.2 DARs for MLPP (not for HG 3575)

You can display and edit the digit analysis results (DARs) for MLPP.

WBM path:

WBM > *Configuration* > *Voice Gateway* > *DARs for MLPP (not for HG 3575)* > *DARs for MLPP*

The *DARs for MLPP (not for HG 3575)* table is displayed. It contains the digit analysis results for calls.

The digit analysis results can be changed. The maximum number of characters permitted is 16. These are: 0 to 9, *, #.

The following digit analysis results can be changed:

- Routine Call (DSNR)
- Priority Call (PRTY)
- Immediate Call (IMMED)
- Flash Call (FLASH)
- Flash_Override (FLASHOV)

Click *Apply* button in order to update the data. *Click Undo* to discard the changes entered.

5.5.9 Clients

You can display client settings. Client settings are made using OpenScape 4000 Manager. WBM can only display these settings.

WBM path:

WBM **>** *Configuration* **>** *Voice Gateway* **>** *Clients*

Clients (folder):

Single-click the plus sign (+) next to *Clients* in the tree structure to display the following entries:

1) *HFA UFIP SIP*

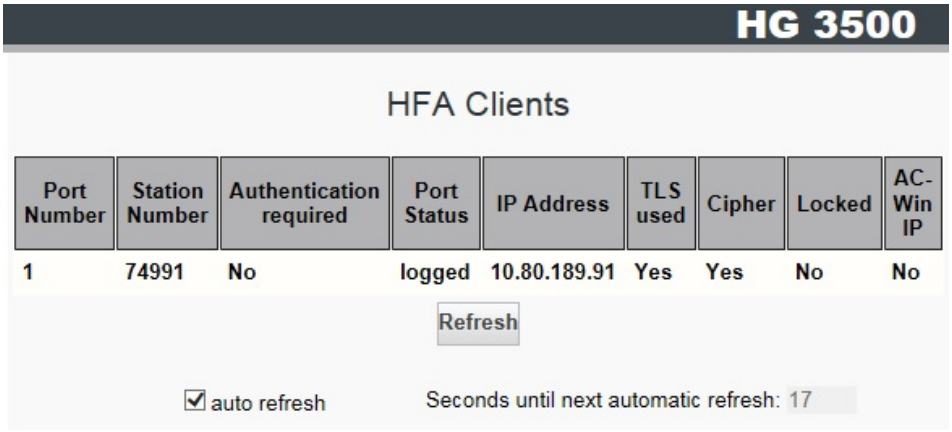
Classic SIP

5.5.9.1 HFA

You can view HFA clients installed in the OpenScape 4000 network.

WBM path:

WBM > *Configuration* > *Voice Gateway* > *Clients* > *HFA* > *HFA Clients*



This option allows you to view the settings for an individual HFA client.

The HFA System Client dialog is displayed. You can view the following fields:

- *Port number: Displays the internal OpenScape 4000 device identifier of the SIP client.*
- *Station Number:*Displays the internal DID of the SIP client.
- *Authentication required*: Indicates that the user requires authentication to log on to the SIP client (user name and password).
- *Port Status:* logged
- *IP address*: IP address of HFA client
- *TLS used*: Transport Layer Security yes/no
- *Cipher:* Configuration parameter in OpenScape 4000 (AMO SDAT parameter CLASSEC) of the SIP client.
- *Locked:*
- *AC-Win IP*: Whether or not the HFA client is an AC-Win IP application

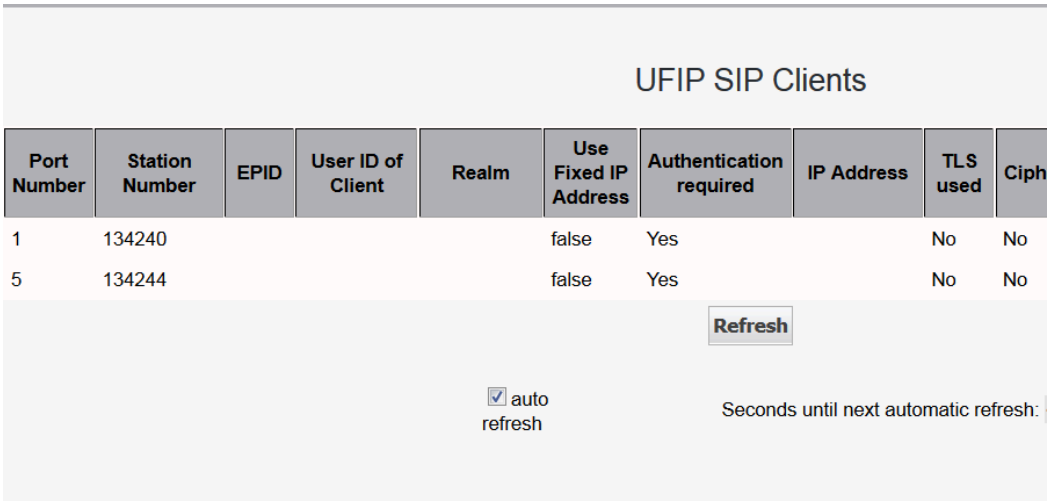
5.5.9.2 UFIP SIP

This option allows you to view the UFIP SIP clients configured in the IP network

You can view the settings for all UFIP SIP clients in a table.

WBM path:

WBM > *Configuration* > *Voice Gateway* > *Clients* > *UFIP SIP* > *UFIP SIP Clients*



A bold line indicates that the SIP client registered successfully.

The *SIP Clients* table is displayed. You can view the following fields:

- *Port number: Displays the internal OpenScape 4000 device identifier of the SIP client.*
- *Station number*: Displays the internal DID of the SIP client.
- EPID: Displays the endpoint identifier (physical device identifier) of the SIP client.
- *User-Id of Client*: Displays the user name for SIP client access. *Authentication Required* must be activated.
- *Realm*: Displays the area (security zone) for confidential authentication to the SIP client. *Authentication Required* must be activated.
- *Authentication Required*: Configuration parameter in OpenScape 4000, which indicates that authentication (user name and password) is required from the SIP client.
- IP Address: Displays the IP address or host name assigned to the SIP client.
- TLs used: Displays if the SIP client used TLS to register.
- Cipher: Configuration parameter in OpenScape 4000 (AMO SDAT parameter CLASSEC) of the SIP client.
- *Use DMC:*DMC (Direct Media Connection) is used to exchange payload directly between two SIP endpoints in the IP network. Default: Yes.
- *Use Instant DMC*
- *Locked: OpenScape 4000 parameter of the SIP client.*
- Use DMC: OpenScape 4000 parameter of the SIP client.
- Group Pickup DAR (Digit Analysis Result): OpenScape 4000 paremeter of the SIP client.
- Central Conference DAR (Digit Analysis Result): OpenScape 4000 parameter of the SIP client.

Button

Refresh: Click this button to refresh the table.

Check box

Refresh: Can be activated/deactivated. If the check box is enabled, the "SIP Clients" table is refreshed at regular intervals as specified in the input field *(Seconds to next refresh)*.

5.5.9.3 Classic SIP

WBM path:

WBM > Configuration > Voice Gateway > Clients > *Classic SIP* > *Classic SIP Clients (S0PP via SBDSS1)*

You can view the settings for all Classic SIP clients in a table.

5.5.10 ISDN Classmarks (not for HG 3575)

This option allows you to view or change the settings for the ISDN classmarks for CorNet-N transport.

WBM path:

WBM > *Configuration* > *Voice Gateway* > *ISDN Classmarks (not for HG 3575)*

This option allows you to view the settings for ISDN classmarks.

The *ISDN Classmarks for CorNet-N Transport* dialog is displayed.

You can change the following fields:

- *External connection*: Mark this field in order to allow external connections. If the field is not marked, only internal connections are allowed.
- *Hold/transfer*: Mark this field in order to allow functions for holding and transferring calls.
- *Call forwarding*: Mark this field in order to allow call forwarding.
- *Callback*: Mark this field in order to allow callbacks.

Click *Apply* button in order to update the data. *Click Undo* to discard the changes entered.

5.6 Payload

Payload allows you to display and configure connection types and protocols in the gateway, Media Stream Control (MSC) and gateway expansion modules.

WBM path:

WBM **>** *Configuration* **>** *Payload*

The *Payload* tree structure is displayed.

Entries under *Payload*:

1) *Devices Protocols QoS Data Collection Media Stream Control (MSC) HW Modules Fax/Modem Tone Handling*

   Mikey

5.6.1 Devices

"Devices" is a collective name for subscribers, features and functions that require channels.

WBM path:

WBM **>** *Configuration* **>** *Voice Gateway* **>** *Payload* **>** *Devices*

Single-click the plus sign (+) next to *Devices* to display a menu containing the following entries:

1) *Global Device Settings Reset to Factory Settings*

IMPORTANT: In the tree structure as many B channels are assigned to each device as available for this device.

5.6.1.1 Global Device Settings

You can display the settings that apply to all devices:

WBM > Configuration > Payload > Voice Gateway **>** Devices > *Global Device Settings*

The *Global Device Settings* mask is displayed. This shows the codec type of the global gateway, the maximum number of available and licensed B channels and the maximum number of LAN clients per music-on-hold channel (calls received when all lines are busy are not through-connected).

5.6.1.2 Reset to Factory Settings

You can reset the original settings globally for all device settings.

WBM > Configuration > Voice Gateway **>** Payload > Devices > *Reset to Factory Settings* **>** *Reset Device Settings to Factory Settings*

The *Reset Device Settings to Factory Settings* mask is displayed and contains a warning.

Click *Reset to Factory Defaults* and *OK* in the confirmation mask.

5.6.1.3 Devices List

You can display the settings for a device.

WBM path:

WBM > Configuration > Voice Gateway **>** Payload > Devices > *Devices List* **>** *selected device* > *Device Settings*

The *Device Settings* mask is displayed. The name of the device (device type), the current operating mode, the maximum number of B channels available for this device and, if applicable, the communication protocol assigned are displayed for information purposes.

Icon	Meaning
	Green dot: The device can be used (up).
	Red dot: The device cannot be used (down).
	Gray dot: The device is in an undefined status or is being tested.

5.6.2 Protocols

NOTICE: This function may only be used by developers.

WBM path:

WBM > *Configuration* > *Voice Gateway* **>** *Payload* > *Protocols*

Single-click the plus sign (+) next to Protocols to display the following entries:

1) *DSS1 CNQ*

5.6.2.1 DSS1

WBM path:

WBM > *Configuration* > *Voice Gateway* **>** *Payload* > *Protocols* > *DSS1* > *Edit Protocol Variant Parameters*

Display Parameters

The *Protocol Variant Parameters* window for the DSS1 (**D**igital **S**ubscriber Signaling **S**ystem No. 1) signaling protocol is displayed. It contains the following areas: *General*, *Parameters*, *Character String Parameter* and *Timer*.

Modify Parameters

The *Modify Protocol Variant Parameters* window for the DSS1 signaling protocol is displayed.

5.6.2.2 CNQ

WBM path:

WBM > *Configuration* > *Voice Gateway* **>** *Payload* > *Protocols* > *CNQ* > *Edit Protocol Variant Parameters*

Display Parameters

The *Protocol Variant Parameters* window for the CNQ signaling protocol is displayed. It contains the following areas: *General*, *Parameters*, *Character String Parameter* and *Timer*.

Modify Parameters

The *Modify Protocol Variant Parameters* window for the CNQ signaling protocol is displayed.

5.6.3 QoS Data Collection

Quality of Service Data Collection (QDC) â“ tasks and functions:

The OpenScape IP service "QoS Data Collection" is a tool which collects data on OpenScape products. This data is used to analyze the voice and network quality of the products.

With its range of features, the QoS Data Collection service aims to:

- reduce general expenses for QoS problem analysis
- increase the remote clearance rate
- detect network malfunctions in good time in order to prevent voice quality problems

This results in:

- reduced service outlay
- competitive maintenance contracts
- quick and qualified responses to customer problems
- increased general customer satisfaction with products and technologies
- the possibility to identify changes in the customer network environment and to align the marketing activities of OpenScape services accordingly

By using QDC, key improvements can be achieved in the entire service (break/fix) process.

Background information:

See Section 7.3, "Quality of Service (QoS)"

WBM path:

WBM **>** Configuration **>** *Voice Gateway* **>** *Payload* **>** *QoS Data Collection* **>** *Quality of Service Data Collection*

The *Quality of Service Data Collection* mask is displayed.

This option allows you to view and edit the current settings for QoS Data Collection.

QDC Configuration

- *Send to QCU*: Enable this checkbox if you want to send data to the QCU. Default value: Checkbox disabled.
- *QCU IP Address*: Enter the IP address or the name of the QCU host here. Default value: 0.0.0.0.
- *QCU Receiving Port*: Receive port for QCU. Enter the port number for the QCU host here. Default value: 12010.

- *Send to Network Management enabled*: Enable this checkbox if you want to send data to the Network Management system. Default value: Checkbox disabled.

IMPORTANT: If one of the checkboxes **Send to QCU** or **Send to Network Management enabled** activated (checked) QoS reports will be generated.

QDC report mode

- *Send Report if*: Select the send time for the report from the list box. The following options are available:
- – *End of session and threshold exceeded*: A report will only be sent at the end of a session and only if the threshold is exceeded.
  – *End of report interval and threshold exceeded*: A report will be sent for each report interval once the threshold has been exceeded.
  – *End of session, unconditional*: A report is always sent when the session ends.
  – *End of report interval, unconditional*: A report is always sent at the end of a reporting interval.
- *Report Interval (sec)*: Enter the interval (in sec.) at which the reports should be sent. A QoS report will be sent for each report interval if the report mode is set correspondingly. Default value: 60 sec. Valid values: 0 ... 65535
- *Observation Period (sec)*: This parameter cannot be adjusted. Default value: 10 sec.
- *Minimum Session Length (* 100 msec)*: Enter the minimum session length (* 100 msec) here. A QoS report will not be sent if a session (for example, a call) is shorter than the set minimum value. Default value: 20 (2 sec) Valid values: 0 ... 255

IMPORTANT: The time scale is segmented during the observation period and the report interval. Each observation period is checked to monitor if the threshold has been exceeded. A QoS report will be sent for each report interval if the corresponding report mode setting is enabled.

QDC Threshold Values

- *Upper Jitter Threshold (msec)*: In this field, enter the upper threshold value for report generation. The jitter is checked to monitor if this threshold has been exceeded and is measured in the time between two consecutive RTP packets. Default value: 20 msec Valid values: 0 ... 255
- *Average Round Trip Delay Threshold (msec)*: Round trip delay reflects the total runtimes in both directions. , ; In this field, enter a threshold value for the average round trip delay that results in report generation. Default value: 100msec Valid values: 0 ... 65535
- *Thresholds Values (for) Compression Codec*: In this field, enter the required number of packets for the compression codec thresholds. The following options are available:
- – *lost packets (per 1000 packets)*: In this field, enter a threshold value for the packets lost during voice decoding. This value represents the packet loss in relation to the total number of packets. Default value: 10 Valid values: 0 ... 255

  - *consecutive lost packets*: In this field, enter a threshold value for consecutive lost packets. The number of consecutive packets lost (uninterrupted by "good" packets) is counted. If the value counted is greater than the value specified, the threshold has been exceeded. Default value: 2 Valid values: 0 ... 255
  - *consecutive good packets*: In this field, enter a threshold value for consecutive good packets. The number of consecutive "good" packets (uninterrupted by lost packets) is counted. If the value counted is less than the value specified, the threshold has been exceeded. Default value: 8 Valid values: 0 ... 255
- *Thresholds Values (for) Non-Compression Codec*: In this field, enter the required number of packets for the non-compression codec thresholds. The following options are available:
- – *lost packets (per 1000 packets)*: For a description see *Thresholds Values (for) Compression Codec*.
  - *consecutive lost packets*: For a description see *Thresholds Values (for) Compression Codec*.
  - *consecutive good packets*: For a description see *Thresholds Values (for) Compression Codec*.

  Description and application of compression and non-compression codecs:

  Table 4: Codec - Types

Codec	Audio Mode	Application
High quality preferred	Uncompressed voice transmission.	Use uncompressed voice transmission. Suitable for broadband intranet connections.
Low bandwidth preferred	Use compressed voice transmission (preferred).	Suitable for connections with different bandwidths.
Low bandwidth only	Use compressed voice transmission only.	Suitable for connections with low bandwidth.

  Click *Apply* followed by *OK* in the confirmation mask. The *Quality of Service Data Collection* mask is displayed.

5.6.4 Media Stream Control (MSC)

The Media Stream Control (MSC) monitors and administers the media streams that are routed via HG 3500/3575. The MSC is used to transmit media data between LAN and ISDN.

Background information:

See Section 7.1, "Environment Requirements for VoIP" See Section 7.2, "Bandwidth Requirements in LAN/WAN Environments"

WBM path:

WBM > Configuration > Payload > *Media Stream Control (MSC)*

Single-click the plus sign (+) next to *Media Stream Control (MSC)* to display the following entries.

1) *Edit MSC Settings Reset MSC to Factory Settings*

You can view the current settings for media stream control (MSC).

The *MSC Settings* mask is displayed.

5.6.4.1 Edit MSC Settings

You can edit the current settings for media stream control (MSC).

IMPORTANT: Media stream control should only be reconfigured by specialists. The parameters available have a complex effect on the transmission quality; a description of these parameters would exceed the scope of this manual.

WBM path:

WBM **>** *Configuration* **>** *Voice Gateway* **>** *Payload* > Media Stream Control (MSC) > *Edit MSC Settings*

The *Edit MSC Settings* mask is displayed.

- *Lower Port Limit (RTP/RTCP)*: This field specifies the lower limit for the UDP port number range available. Port number 15000 is set by default. Entries from 1024 to 65535 are possible. This value is not programmable in HG 3575.
- *Upper Port Limit (RTP/RTCP)*: The field specifies the upper limit for the UDP port number range available. Port number 30000 is set by default. Entries from 1024 to 65535 are possible. The field does not exist in HG 3575.

IMPORTANT: For port assignment, a search is performed beginning with the port configured under *Lower Port Limit (RTP/RTCP):* to determine which port is free. The first unassigned port is assigned to the RTP port of the existing connection. The port for RTCP is the next highest port. In the first connection, for example, port 15000 is used for RTP and port 15001 for RTCP, and in the second connection, port 15002 is used for RTP and port 15003 for RTCP. With a maximum of 60 possible voice connections, 15000 can be specified for the low port boundary and 15119 can be specified for the high port boundary.

- *Traffic Statistics (SNMP Only)*: This field allows you to activate or deactivate "Per-Call Statistics". If the statistics function is deactivated, "Per-Call Statistics" data associated with the gateway cannot be accessed via SNMP.
- *RTCP Packet Generation Interval (sec)*: Enter the number of seconds after which RTCP packets are generated in this field.
- Reporting of Bad Payload Quality (for HG 3575 only):

- The following values are displayed but are not programmable:
  - Low Threshold of the Average Network Delay (msec): 120
  - High Threshold of the Average Network Delay (msec): 200
  - Low Threshold of the Fraction Lost: 2
  - Upper limit for the smoothing factor: 3

  If one of these limits is exceeded, a poor payload quality is flagged.

  Click *Apply* followed by *OK* in the confirmation mask. The *MSC Settings* mask reappears.

5.6.4.2 Reset MSC to Factory Settings

You can reset the original settings globally for all MSC settings.

WBM > Configuration > *Voice Gateway* **>**Payload > Media Stream Control (MSC) > *Reset MSC to Factory Settings* **>** *Reset MSC Settings to Factory Defaults*

The *Reset MSC Settings to Factory Settings* mask is displayed and contains a warning.

Click *Reset to Factory Default* and *OK* in the confirmation mask.

5.6.5 HW Modules

HG 3500/3575 comes with DSP modules (DSP â“ Digital Signal Processor) that support voice, modem and fax functions. If the maximum number of modules is installed, this function is available for up to 60 voice channels simultaneously. The V.90 modem also supports PPP (HG 3500/3575 as server) but not for IP networking.

You can manage the DSP module settings.

WBM path:

WBM > Configuration > Voice Gateway **>** Payload > *HW Modules* > *DSP Settings*

Single-click *HW Modules* to display the following entries:

1) *Display DSP Jitter Settings Display All HW Modules*

You can edit the current settings for the DSP modules.

Background information:

See Section 7.4, "Static and Adaptive Jitter Buffer"

The *DSP Settings* mask is displayed. You can edit the following fields:

General:

- *Echo Canceller*: EC (Echo Cancellation) suppresses the echo effect in voice transmissions. The function is based on G.168. If you do not want to offer this function, deactivate this option. Normally, EC should always be enabled.
- *DTMF Outband Signaling*: If this option is enabled, DTMF signals are transferred in a separate signaling channel (outband). If it is disabled, the DTMF signals are transferred in the normal voice channel.

- *Default DTMF Tone Duration (msec):* The pulse duration should be set so that the DTMF tone can be securely identified by an analog switch. Usually, this value is between 50 and 100 msec, with the most common value being 70 msec. The value range for this input field is 50-300 msec. The default value is 90 msec.
- *Default DTMF Pause Duration (msec):* The pause duration should be set so that DTMF tones are far enough apart to be securely identified by an analog switch. Usually, pauses are set between 20 and 50 msec. The value range for this input field is 50-300 msec. The default value is 70 msec.
- *Max. No. of Bytes for G.711:* 960. Only displayed, cannot be changed.
- *Max. No. of Bytes for G.723:* 96. Only displayed, cannot be changed.
- *Max. No. of Bytes for G.729:* 120. Only displayed, cannot be changed.

Fax Parameters:

- *Error Correction Mode*: If this option is activated, one of the two error correction mechanisms available to the T.38 fax protocol via UDP are selected. Both mechanisms aim to ensure that fax transmissions are error-free even if limited packet losses occur in the network.
- Open the *Fax Channel*with detected Tone: Default setting: activated.
- *Number of Redundancy Packets:*Select the number of redundant packets selected for the error correction mechanism. The higher the value, the more robust the fax transmission against packet loss in the network. The bandwidth required increases for larger values.
- *Maximum Network Jitter (msec)*: If the maximum network jitter is known, enter it in this field. This helps reduce the transmission time for some fax devices. The value must be entered as a decimal figure. Value range: 140 msec - 500 msec. Default setting: 200 msec.Click *Apply* followed by *OK* in the confirmation mask (save the new configuration status permanently with the Save icon in the control area). The *DSP Settings* dialog reappears.

5.6.5.1 Display DSP Jitter Settings

You can review the current jitter settings.

For details/background information, see Section 7.4, "Static and Adaptive Jitter Buffer".

WBM path:

WBM > Configuration > *Voice Gateway* **>** Payload > HW Modules > *Display DSP Jitter Settings* **>** *DSP Jitter Buffer Settings*

The *DSP Jitter Buffer Settings mask* appears with the following values:

- *Jitter Buffer Type*[AdaptJitterBufferEnable]: The display shows whether the jitter buffer is static or adaptive. In adaptive mode, the jitter buffer aligns with the average delay when receiving data. It attempts to keep the delay as low as possible while keeping data packet loss to a minimum. In static mode, the average delay always remains the same.
- *Average Delay for Voice (msec)* [jbAvgDelayVoice]: The display shows the average number of milliseconds an IP packet is held in the jitter buffer in the case of IP-based voice transmission. For *adaptive* jitter buffer, this value is simply a starting point. The value "40" can be used in most environments.
- *Maximum Delay for Voice (msec)* [jbMaxDelayVoice]: In the case of the *static* jitter buffer type, this row shows the maximum number of milliseconds

permitted for a delay before the jitter buffer intervenes in the data stream when receiving IP packets as part of a voice transmission. For the *adaptive* jitter buffer type, this row shows the maximum number of milliseconds for the average delay for voice. Outgoing packets are lost if the actual delay measured is higher. The static jitter buffer value "80" can be used for most environments; "120" is suitable for adaptive jitter buffer. The value is always higher than the value entered in the *Average Delay for Voice (msec)* field.

- *Minimum Delay for Voice (msec)* [jbMinDelayVoice]: If *adaptive* was selected as the jitter buffer type, this row shows the minimum number of milliseconds permitted for the average delay for voice. The average delay is always greater than or equal to this value.
- *Packet Loss / Delay Preference*[jbPacketLoss]: In this row, the value "4" is set for an adaptive jitter buffer. The value may lie between 0 and 8 and influences the total delay for voice connections. 0 indicates a preference for minimum packet loss and acceptance of delays in the voice data stream, 8 indicates a preference for a minimum delay in the voice data stream and acceptance of packet losses.
- *Average Delay for Data (msec)*[jbAvgDelayData]: This row shows the average number of milliseconds for which an IP packet is held in the jitter buffer for data transmissions. The value "60" can be used in most environments.
- *Maximum Delay for Data (msec)*[jbMaxDelayData]: This row shows the maximum number of milliseconds permitted for a delay before the jitter buffer intervenes when receiving IP packets as part of a data transmission. The value "200" can be used in most environments. For a greater value (approx. 2000 and higher), packets received completely in the buffer leave the buffer again immediately.

5.6.5.2 Display All HW Modules

You can display information on the individual HW modules.

WBM path:

WBM > Configuration **>** *Voice Gateway* > Payload > HW Modules > *Display All HW Modules* **>** *HW Modules*

The *HW Module* mask is displayed. This shows the HW index, an internal identification number, the HW type (at present only PDM modules are possible â“ PMC DSP module for B channel expansion), and, where applicable, a brief description of the module.

5.6.6 Fax/Modem Tone Handling

The parameters in the *Fax/Modem Tone Handling* dialog allow you to decide whether the processing of certain Fax/Modem tone signals shall be disabled (ignored) or enabled.

WBM Path:

WBM > *Configuration* > *Voice Gateway* **>** *Payload* > *Fax/Modem Tone Handling*

You can view and edit the current parameter settings.

The *Fax/Modem Tone Handling* dialog with the following parameters is displayed.

- *Disable Processing of CT Tone*: (Yes/No)
- *Disable Processing of CNG Tone*: (Yes/No)
- *Disable Processing of Early ANS/CED Tone*: (Yes/No)
- *Disable Processing of ANS/CED Tone*: (Yes/No)
- *Disable Processing of CT Tone*: (Calling Tone sent from Modems). If you activate this parameter, the CT Tone sent by the calling modem will be ignored.
- – Possible settings: Enabled/Disabled
  – Default value: Disabled
- *Disable Processing of CNG Tone*: (Calling Tone sent from Faxes). If you activate this parameter, the CNG Tone sent by the calling fax will be ignored.
- – Possible settings: Enabled/Disabled
  – Default value: Disabled
- *Disable Processing of Early ANS/CED Tons*: (Early Detection of Called Tone sent from Modem or Fax). If you activate this parameter, the Early ANS/CED Tone sent by the called fax or modem will be ignored.
- – Possible settings: Enabled/Disabled
  – Default value: Disabled
- *Disable Processing of ANS/CED Tons*: (Called Tone sent from Modem or Fax). If you activate this parameter, the ANS/CED Tone sent by the called fax or modem will be ignored.
- – Possible settings: Enabled/Disabled
  – Default value: Disabled

  Click *Apply* followed by *OK* in the confirmation mask. The *Fax/Modem Tone Handling* mask reappears.

5.6.7 Mikey

You can view information on the Mikey procedure here (Mikey is an abbreviation for Multimedia Internet Keying). Mikey is a form of key management for realtime multimedia communication and facilitates the exchange of keys and other security parameters between subscribers, enabling secure SRTP transmission.

WBM path:

WBM > *Configuration* **>** *Voice Gateway* > *Payload* > Mikey

The menu structure shows the following points:

1) *Mikey Policies SRTP Security Policy Mikey Statistics*

5.6.7.1 Mikey Policies

WBM path:

WBM > *Configuration* > *Voice Gateway* **>** *Payload* > Mikey > *Mikey Policies*

A table shows information on the Mikey procedure in use, key exchange methods, encryption algorithm and MAC algorithm.

5.6.7.2 SRTP Security Policy

WBM path:

WBM > *Configuration* **>** *Voice Gateway* > *Payload* > Mikey > SRTP Security Policy

A table shows information on the SRTP security line.

The following is displayed:

- *Authentication Algorithm*
- *Authentication Key Length*
- *Salting Key Length*
- *Authentication Tag Length*
- *Encryption Algorithm*
- *Encryption Key Length*
- *Key Derivation Rate*
- *Key Derivation Function*
- *SRTP Encryption active*
- *SRTP Authentication active*
- *SRTP Prefix Length*
- *SRTCP Encryption active*

5.6.7.3 Mikey Statistics

WBM path:

WBM > *Configuration* **>** *Voice Gateway* > *Payload* > Mikey > Mikey Statistics

The mask is displayed.

- *Total number of key exchanges*
- *Successfully finished key exchanges*
- *Failed key exchanges*
- *Currently active key exchanges*
- *Maximum simultaneous key exchanges*
- *Key exchanges in Initiator Role*
- *Key exchanges in Responder Role*
- *Key exchanges in DMC Proxy Role*

6 Maintenance

This module contains the functions necessary for the maintenance and administration of the HG 3500/3575 gateways.

WBM path:

WBM **>** *Maintenance*

The *Maintenance* moduleâs options are displayed on the left.

Options in the Maintenance module:

1) *Config & Update Job List Traces & Events SNMP*

6.1 Config & Update

6.1.1 Configuration

Configuration and SSL data can be saved externally and reloaded. It is also possible to reset the configuration to the factory default.

WBM path:

WBM **>** *Maintenance* **>** *Config & Update* **>** *Configuration*

The *Configuration* tree structure is displayed.

Entries under *Configuration*:

1) *Configuration Data SSL Data*

Saving Local Configuration for Upgrade

Reset Configuration to Factory Default

6.1.2 Configuration Data

You can back up and restore configuration data. You can also define what data should be saved or what data should be loaded.

The configuration data is saved as plain text and can be read or printed using any text editor.

IMPORTANT: Always back up the current configuration data before you load a new software image or different configuration data. If the newly loaded configuration data or the new software image cannot be used for any reason, you can at least access the configuration last used.

WBM path:

WBM **>** *Maintenance* **>** *Config & Update* **>** *Configuration Data*

The *Configuration Data* tree structure is displayed.

Entries under *Configuration Data*:

1) *Load from Gateway Load to Gateway*

6.1.2.1 Load from Gateway

This is the backup function. You can backup the current HG 3500/3575 configuration at a secure location.

WBM path:

WBM **>** *Maintenance* **>** *Config & Update* **>** *Configuration Data* **>** *Load from Gateway*

The *Load Configuration from the Gateway via HTTP* mask appears. In this dialog, you can set which configuration data should be backed up.

***Load Configuration Data from the Gateway via HTTP* dialog:**

In the individual window areas, you can select the data you wish to back up:

- *Optional parameters*:
- – *Use Compression:* Depending on the storage available, you can define whether backed up data should be compressed.
- *Specify Tables to Back Up*:
- – *Select all tables*: All subsequent tables are set to *All*.
  – *Deselect all tables*: All subsequent tables are set to *None*.

  You can also select/deselect tables individually.
- *Trunking Data*: (not for HG 3575)
- – *All*/*None*: If *All* is selected, the table entry is marked. The selection is canceled by clicking *None*.
  – The list includes: *Class Mark*
- *IP Data*:
- – *All*/*None*: If you select *All*, all the data listed in that table is marked. If you select *None*, none of the data in that table is marked.
  – You can mark the following individually: *Global IP Settings*, *Static Routes*, *IP Filter*, *MAC Filter*, *SNTP Server*
- *PPP/DSL Data*:
- – *All*/*None*: If you select *All*, all the data listed in that table is marked. If you select *None*, none of the data in that table is marked. The data cannot be individually marked.
  – The list includes:
  – – For HG 3500: *Global PSTN Data*, *Global PSTN Data (Scripting)*, *PSTN Parameters (PPP Peer)*, *PSTN Parameters (Phone Numbers)*, *PSTN Partners (ISDN)*, *PSTN Partners (IP)*
    – For HG 3575: *PSTN Partners (IP)*
- *LAN Data*:
- – *All*/*None*: If you select *All*, all the data listed in that table is marked. If you select *None*, none of the data in that table is marked.
  – You can mark the following individually: *LAN1 Interface*, *LAN2 Interface*, *PPTP/PPPoE Parameters* (not for HG 3575)
- *Dialing Parameters*:

- – *All*/*None*: If you select *All*, all the data listed in that table is marked. If you select *None*, none of the data in that table is marked.
  – The list includes: *ToN Table*
- *Payload Data*:
- – *All*/*None*: If you select *All*, all the data listed in that table is marked. If you select *None*, none of the data in that table is marked.
  – The list includes: *Protocol Variants*, *Media Stream Control (MSC)*, *DSP Channel Conf.*, *QoS Data Collection*
- *H.323 Data*:
- – *All*/*None*: If you select *All*, all the data listed in that table is marked. If you select *None*, none of the data in that table is marked.
  – The list includes: *H.323*, *Endpoint Registration* (not for HG 3575)
- *SIP Data*: (not for HG 3575)
- – *All*/*None*: If you select *All*, all the data listed in that table is marked. If you select *None*, none of the data in that table is marked.
  – The list includes: *SIP Parameters*, *Internet Telephony Service Provider*, *Internet Telephony Station*, *SIP Protocol Manager*, *Loadable SIP Profiles*, *Hunt group for SIP video users*
- *Diagnostic Data*:
- – *All*/*None*: If you select *All*, all the data listed in that table is marked. If you select *None*, none of the data in that table is marked.
  – The list includes: *Trace Components* (only for HG 3575), *Global Trace Information*, *Trace Profiles* (only for HG 3575), *Event Log Conf.*, *Event Reaction Table*, *Trap Destination*, *E-mail List*, *Trace via LAN Conf.*, *CPU Monitor*, *Service Center*
- *Miscellaneous Data*:
- – *All*/*None*: If you select *All*, all the data listed in that table is marked. If you select *None*, none of the data in that table is marked.
  – The list includes: *Global Data*, *Automatic Actions*, *Online Help*, *TFTP Servers*, *Port Administration (Global)*, *Port Administration (Local)*, *Version Information*, *Global Network Routing Data* (not for HG 3575), *SCN Fallback*, *Codecs*, *Destination Codecs*, *Class Mark* (not for HG 3575), *DLS Addressing*

  Once you have selected the data you wish to back up, click *Load*. An information window is displayed that you must confirm with *OK*. Click Undo to discard the changes entered.

6.1.2.2 Load to Gateway

This is the restore function. You can load an externally stored configuration to the gateway.

WBM path:

WBM **>** *Maintenance* **>** *Config & Update* **>** *Configuration Data* **>** *Load to Gateway* **>** *Load via HTTP*.

The *Load configuration to the Gateway via HTTP* dialog appears.

"Load Configuration Data to the Gateway via HTTP" dialog:

The following is displayed:

- *Remote File Name (PC File System)*: Enter the file name under which the data is saved.
- *Browse*: You can search the local file system for the backup file.

Then click *Load*. An information window is displayed that you must confirm with *OK*. The data is now loaded to the gateway flash memory (but not yet activated).

The mask *Do you want to activate the configuration now?* is now displayed. In this mask, you can set which configuration data should be loaded.

In the individual window areas, you can select the data you wish to back up. For explanations on this, please see the previous section *Load from Gateway*. Finally click *Activate Now*.

Save data:

The changes will be automatically saved - if necessary - perform a restart (note the Reset icon! See also Section 3.3.2, "Icons in the WBM Windowâs Status Area").

IMPORTANT: If the configuration file downloaded should be activated at a later date, click *Do Not Activate*. To activate the configuration data at a later point, click *Job List* in the maintenance menu and then activate this job (see Section 6.3, "Job List").

IMPORTANT: Parameters for LAN speed are not saved or restored because each LAN section may have different parameters for the LAN speed. If necessary, these parameters must be modified manually.

6.1.3 SSL Data

The VPN/SSL/SPE configuration data is encrypted when downloaded from the gateway and must be protected by an encryption password. This encryption password must be specified again for loading the configuration data into the gateway.

WBM path:

WBM **>** *Maintenance* **>** *Config & Update* **>** *Configuration* **>** *SSL Data*

The *SSL Data* tree structure is displayed.

Entries under *SSL Data*:

1) *Load from Gateway Load to Gateway*

6.1.3.1 Load from Gateway

WBM path:

WBM > *Maintenance* > *Config & Update* > *Configuration* > *SSL Data* > *Load from Gateway* > *Load VPN/SSL/SPE Configuration Data from the Gateway via HTTP*

The *Load VPN/SSL/SPE Configuration Data from the Gateway via HTTP* dialog appears.

***Load VPN/SSL/SPE Configuration Data from the Gateway via HTTP* dialog:**

The following is displayed:

- *Encryption Password*: Enter encryption password for the VPN/SSL/SPE configuration data.
- *Re-enter Encryption Password*: Repeat the encryption password.

Click *Load* after selecting the data to be backed up. A message window is displayed that you have to acknowledge with *OK*.

6.1.3.2 Load to Gateway

This is the restore function. You can load a configuration that is saved externally to the gateway.

WBM path:

WBM > *Maintenance* > *Config & Update* > *Configuration* > *SSL Data* > *Load to Gateway*.

The *Load VPN/SSL/SPE Configuration Data to Gateway via HTTP* dialog appears.

***Load VPN/SSL/SPE Configuration Data to Gateway via HTTP* dialog:**

The following is displayed:

- *Remote File Name (PC File System)*: Enter the required file name under which the data is saved.
- *Browse*: You can search the local file system for the backup file.

Then click *Load*. A message window is displayed that you have to acknowledge with *OK*. The data is now loaded to the gateway flash memory. It is not activated yet, however.

The dialog *Do you want to activate the configuration now?* is now displayed. In this dialog, you can define which configuration data should be loaded.

Save data:

The changes will be automatically saved - if necessary - perform a restart (note the Reset icon. See also Section 3.3.2, "Icons in the WBM Windowâs Status Area").

IMPORTANT: If the configuration file downloaded is to be activated at a later date, click *Do Not Activate*. To activate the configuration data at a later point, click *Job List* in the

maintenance menu and then activate this job (see Section 6.3, "Job List").

6.1.4 Saving Local Configuration for Upgrade

The configuration data can be saved on the local flash of the board. This data can be restored and used for the local backup and restore during a loadware update without the OpenScape 4000 Assistant.

WBM path:

WBM **>** *Maintenance* **>** *Config & Update* **>** *Configuration* **>** *Saving Local Configuration for Upgrade*

6.1.5 Reset Configuration to Factory Default

You can reset the gateway configuration to the factory defaults that were preset upon delivery.

WBM path:

WBM **>** *Maintenance* **>** *Config & Update* **>** *Configuration* **>** *Reset Configuration to Factory Default*

An important message is displayed that you should read:

NOTICE: This action resets the complete configuration to the delivery status. All administration and customer data is deleted! Only the IP address, netmask, and IP address of the default router for LAN1 are preserved. The gateway automatically reboots while this action is running.

Then click *Reset to Factory Settings*. The HG 3500/3575 automatically reboots while this action is running.

6.2 Software Update

WBM path:

WBM **>** *Maintenance* **>** *Software Update*

Single-click the plus sign (+) next to Software Update to display the following entries:

1) *Load Software Image to Gateway*

Loading the COMGA Firmware via HTTP Loading the SENTA Firmware via HTTP

6.2.1 Load Software Image to Gateway

WBM path:

WBM > *Maintenance* > *Software Update* > *Load Software Image to Gateway (not for HG 3575)*

1) The *Loading Software Image to the Gateway via HTTP* dialog appears. Click *Browse* to select the file containing the software image and then click *Load* to load it to the HG 3500/3575 gateway.

6.2.2 Loading the COMGA Firmware via HTTP

WBM path:

WBM > *Maintenance* > *Software Update* > *Loading COMGA Firmware via HTTP*

The *Loading COMGA Firmware to the Gateway via HTTP* dialog appears. Click *Browse* to select the file containing the COMGA firmware and then click *Load* to load it to the HG 3500/3575 gateway.

6.2.3 Loading the SENTA Firmware via HTTP

WBM path:

WBM > *Maintenance* > *Software Update* > *Loading SENTA Firmware via HTTP*

The *Loading SENTA Firmware to the Gateway via HTTP* dialog appears. Click *Browse* to select the file containing the SENTA firmware and then click *Load* to load it to the HG 3500/3575 gateway.

6.2.4 Scheduled Software Activation

You can define when a new software image should be installed for HG 3500/3575. The software image must first be loaded.

WBM path:

WBM > *Maintenance* > *Software Update* > *Software Activation*

The Edit *Automatic Action* window is displayed. This window shows whether the action is activated, how often it is performed and when.

Modify Action

You can define whether the action should be performed after a specified time period or at a specific time.

Click *Apply* to save changes. Click Undo to discard the changes entered.

Here you can edit the following fields:

- *Action Activated:* Select whether the action should be started automatically at the specified times.
- *Start Time (after Midnight)*: Specify the time when the action should begin.

- *Days on which to Perform Action*: Select the days on which the action should be started at the specified time.
- Use Calendar: You can display a calendar to select the date on which the action should be started.
- Hide Calendar: Select this option to hide the calendar.

Start action

When an automatic action has been stopped (red bullet point in the tree structure), it can be started. The action will then be performed at the time specified.

The *Actions* tree structure is updated.

Stop action

When an automatic action has been started (green bullet point in the tree structure), it can be stopped. If the action is stopped at the automatic start time specified, it will not be started.

The *Actions* tree structure is updated.

6.3 Job List

The job list contains entries for current data transmissions.

WBM path:

WBM **>** *Maintenance* **>** *Job List*

The list of jobs is displayed. The list contains the following columns:

- *Type*: This column shows the task of each job and how it was started.
- *ID*: The column shows the unique job number in each case.
- *Duration*: This column shows how many seconds have passed since the job was started.
- *Status*: This column indicates whether jobs are still in progress or already completed.
- *Action*:
- – Use the *Abort and Delete Job* button to cancel the corresponding action.
  – The downloaded configuration is activated using the *Activate Configuration* button.

The following buttons are also provided:

- *Refresh*: The displayed job list is reloaded and shows the current data.
- *Delete All Jobs*: All jobs in the list are deleted. An information window must be confirmed with *OK*.
- *Activate All*: Can only be used if there are jobs for the "Multigateway Administration" feature.
- *Save All:* Can only be used if there are jobs for the "Multigateway Administration" feature.

6.4 Traces & Events

This section documents Traces and Events in the WBM.

For further information on traces, see Section 7.7.2, "Traces".

For further information on events, see Section 7.7.3, "Events". For details on the log file for events, see Section 7.7.4, "Event Log Files".

6.4.1 Traces

A trace logs the execution of a software component. A technician can use these process records to determine the cause of an error.

IMPORTANT: Activating traces can have a negative impact on the performance of the system. A higher load can result in the board not being able to process all trace information. For more information, refer to Section 6.4.1.4, "Overloading the Board with Trace Information". When the trace file has reached the maximum size, it is closed and saved as "trace.bak" in the same directory. At the same time a new (empty) "trace.txt" is created.

WBM path:

WBM **>** *Maintenance* **>** *Traces & Events* **>** *Traces*

The *Traces* tree structure is displayed.

Entries under *Traces*:

1) *Load All Logs*

Delete All Logs

Trace Configuration

Load Trace Log

Clear Trace Log

Pcap File Trace

Load Pcap Trace Files

rpcap Daemon

Trace Profiles

Stop All Trace Profiles

Trace Components

Display Started Trace Components

Stop All Trace Components

Secure Trace

M5T Trace Components (not for HG 3575)

M5T Syslog Trace

Service Center

With the trace configuration you can define whether traces should be logged and how this should be performed. If the traces on the gateway machine are logged in a file, you can save and delete the trace log for this file. Using trace profiles and trace components, you can configure the traces to be logged, and the detail in which this information should be provided.

6.4.1.1 Load All Logs

WBM path:

WBM > *Maintenance* > *Traces & Events* > *Traces* > *Load All Logs*

The *Load All Logs* dialog is displayed.

Options

- *Trace Log*: Can be activated/deactivated. The trace log can be loaded.
- *Event Logs*: Can be activated/deactivated. The event log can be loaded.
- *PPP Log*: Can be activated/deactivated. The trace log can be loaded.
- *DDC Logs*: Can be activated/deactivated. The trace log can be loaded.
- *RAM Trace Logs*: Can be activated/deactivated. The trace log can be loaded.
- *CPU Log*: Can be activated/deactivated. The trace log can be loaded.

Buttons

- *None*: The enabled check boxes are disabled.
- *Load*: The selected logs are loaded.
- Undo: The changes are discarded.

6.4.1.2 Delete All Logs

You can delete all logs stored on the gateway. For example: Trace, Event, PPP, CPU and PostMortem logs as well as Core logs.

WBM path:

WBM > *Maintenance* > *Traces & Events* > *Traces* > *Delete All Logs*

Click *Delete Logs* to delete all logs.

6.4.1.3 Trace Configuration

You can check/specify which interface should be used to output trace data.

WBM path:

WBM > *Maintenance* > *Traces & Events* > *Traces* > *Trace Configuration*

The trace configuration is displayed. You can edit the following fields:

Console Trace

- *Switch Synchron Console Trace On*: Trace messages are not buffered if you activate this option; in other words, trace messages are immediately displayed on the console as soon as you call them. This type of trace slows down software processing and should only be used for diagnostics. It is especially suited to tracing system failures. Activating this option deactivates all trace interfaces.
- *Switch Console Trace On*: Activate this option to output the trace data to the console at the V.24 connector.

File Trace

- *Switch File Trace On*: Activate this option to write the trace data to a log file.

The following fields provide additional information:

- *Maximum Trace File Size (byte)*: The maximum size of the log file if the option *Switch File Trace On* is activated.
- *Trace Timer (sec)*: The interval in seconds until data is written to the trace file if the option *Switch File Trace On* is activated.

Trace via rpcap (Wireshark)

- *rpcap Daemon/Interface State*: The status is shown, e.g. ready (daemon running, server port 2002 open)
- *Trace via rpcap started at*: The status is shown, e.g. not started yet

General Trace Configuration

- *Trace Levels Survive Upgrade*: Activate this option to trace upgrade problems.

Trace via LAN (XTracer)

- *Switch Trace via LAN (XTracer) On*: Activate this option to transfer the trace data via the LAN interface. A server port is opened when you do this, which is used for connections from a LAN tracer client. The server port remains open following deactivation until the next reboot.

The following fields provide additional information:

- *XTracer connected*: Indicates whether or not XTracer is connected.
- *Timer Value (sec)*: The interval in seconds until data is transferred if the option *Switch Trace via LAN On* is activated.
- *Server Port*: Server port for connections from a LAN tracer client

---

IMPORTANT: All other trace interfaces are deactivated automatically if the trace output is handled via ServiceCenter/ CSDA, rpcap/wireshark or XTracer.

Click *Apply* followed by *OK* in the confirmation mask.

6.4.1.4 Overloading the Board with Trace Information

If the load is particularly heavy, the volume of trace information may be so great that the board is unable to process it. Console overload is indicated by the message "`OAM Msg Queue [...] full. Remove Messages`". If this happens, perform the following steps in sequence:

1) Deactivate the option *Switch Console Trace On*. If the console remains overloaded:

2) Deactivate the option *Switch File Trace On*. If the console still remains overloaded:

3) Activate the option *Switch Trace via LAN On*. Use a trace tool then to process the trace data via the connected LAN instead of via the board.

If the overload conditions continue even though the console trace has been disabled, the event logs will also be included in the event log file on the board.

The board can retrieve and display the event log file. This allows you to determine whether the console is still overloaded.

6.4.1.5 Load Trace Log

If file trace is activated, (see Section 6.4.1.3, "Trace Configuration"), you can load the log file from the gateway to the administration PC or to another computer. You can also delete the log file.

WBM path:

WBM > *Maintenance* > *Traces & Events* > *Traces* > *Load Trace Log*

Load via HTTP

You can save trace log files from HG 3500/3575 on the administration PC.

The data starts to load when the *Load via HTTP* menu item is selected. The alert message "File loading. Please wait!â is displayed.

IMPORTANT: You have to wait for the load process to complete. This may take some time. The load process is canceled if you launch another function in the WBM during this time.

Once the file has been transferred it is shown immediately in the system editor.

6.4.1.6 Clear Trace Log

The log file can be deleted from the gateway flash memory. This is useful if you have performed Load via HTTP.

WBM path:

WBM > *Maintenance* > *Traces & Events* > *Traces* > *Clear Trace Log*

An important warning is displayed. Click *Delete* followed by *OK* in the confirmation mask.

6.4.1.7 Pcap File Trace

WBM path:

WBM > *Maintenance* > *Traces & Events* > *Traces* > *Pcap File Trace*

The *Pcap File Trace* is a diagnosis mechanism that records pcap packages on the LAN interface. The packages are written to a local RAM disk and can be loaded via WBM and can be displayed with the Wireshark software.

Configuring of pcap File Trace:

- *Switch File Tracing via pcap On:* can be activated or deactivated. Default is off.
- *Time between Rotate of pcap Trace File (sec):* The log uses the size of the pcap and time as criteria for starting new log files and compressing old ones.

6.4.1.8 Load Pcap Trace Files

WBM path:

WBM > *Maintenance* > *Traces & Events* > *Traces* > *Load Pcap Trace Files*

The *Load Pcap Trace Files* mask is displayed.

- *File name*
- *Modified*
- *Size (in Byte)*

6.4.1.9 rpcap Daemon

NOTICE: This function may only be used by developers.

WBM path:

WBM > *Maintenance* > *Traces & Events* > *Traces* > *rpcap Daemon* > *Start the rpcap Daemon*

The *Start rpcap* window is displayed. Proceed as described in Section Section 6.4.1.10, "Monitoring IP Data Packets with rpcap and Wireshark (Ethereal)".

Stopping the rpcap Daemon

The *Stopping the rpcap Daemon* window is displayed. Proceed as described in Section Section 6.4.1.10, "Monitoring IP Data Packets with rpcap and Wireshark (Ethereal)".

6.4.1.10 Monitoring IP Data Packets with rpcap and Wireshark (Ethereal)

IMPORTANT: In addition to this window, important information is also provided in the "Starting the rpcap Daemon" window (Maintenance > Traces & Events > *Traces* > *rpcap Daemon* Pay heed to this information.

Overview

Tracing using the HIP interface

The interface between OpenScape 4000 and HG 3500 cannot be traced directly. However, external connections to the interface can be traced via the LAN interfaces (LAN1: emac0 or LAN2: emac1). A server port is opened on the HG 3500 when the rpcap service is started. This enables direct access to TCP/IP packets by an IP trace tool, such as Wireshark (Ethereal).

Wireshark is a program for analyzing network communication connections. It records the data packets from the HG 3500 and displays these clearly in a table.

rpcap (Remote Packet Capture)

The rpcap protocol allows a program, such as Wireshark, to run as a server on the destination system, which records data packets and transfers them to a client. The data packets are processed, analyzed and archived by the client.

Performing monitoring

To monitor the HG 3500 data packets, the rpcap service must be set up and started in the HG 3500 WBM and the IP trace tool Wireshark must be set up and started on the administrator PC.

1) Setting up and starting the rpcap service on the HG 3500

2) Proceed as follows in the HG 3500 WBM:

a) Start WBM.

Log on as a developer.

Use Maintenance **>** Traces & Events **>** Traces **>** *rpcap Daemon* **>**to open the window *Start the rpcap Daemon*.

Make the following input in the *IP Address (numeric or literal)* field:

a) IP address of HG 3500 (numeric or literal)

b) • Port on HG 3500

Click *Apply* to start the rpcap daemon. A server port on the HG 3500 opens.

3) Setting up Wireshark and starting monitoring

4) Proceed as follows in Wireshark:

a) Start the program.

Use *Capture -> Options* to open the "Wireshark: Capture Options" window.

Enter the following in the "Interface:" selection and input field:

`rpcap://<IP address of HG 3500>/emac0`

Or:

`rpcap://<IP address of HG 3500>/emac1`

Only the HG 3500 data packets are monitored.

Enter the following in the "Capture Filter:" selection and input field:

`not host <IP address of administrator PC>`

The data packets from the administrator PC are excluded.

Make any other necessary settings, see www.wireshark.org.

Click *Start* to start recording the data packets. The data stream from HG 3500 is displayed.

5) Ending monitoring

6) To end monitoring, carry out the following steps in this sequence in order to avoid the HG 3500 crashing.

a) Stop Wireshark with *Capture -> Stop*.

Stopping the rpcap daemon of the HG 3500:

Use Maintenance **>** Traces & Events **>** *Traces* **>** rpcap Daemon in WBM to open the window "Stopping the rpcap Daemon". The IP address for the HG 3500 entered above is displayed under "Client Identification for Access Control" in the "IP Address (numeric or literal):" field.

Click *Apply* to stop the rpcap daemon. The server port on the HG 3500 is closed and access, for example via Wireshark, is no longer possible.

6.4.1.11 Trace Profiles

Trace profiles define the data to be logged and the detail in which this information should provided. Trace components (see Section 6.4.2, "Events") are assigned to a trace profile. This allows you to specify the gateway components for which a trace profile process and status information should be logged. The detail provided in the logs can be set using trace levels.

You can create, modify and delete user-defined trace profiles. Predefined trace profiles are also provided. You can stop all trace profiles at once, or start and stop them individually. When you start a trace profile, logging is activated for this profile. When you stop the profile, logging is deactivated.

See also: Section 8.1.2, "Trace Profiles".

WBM path:

WBM > *Maintenance* > *Traces & Events* > *Traces* > *Trace Profiles*

Single-click the plus sign (+) next to *Trace Profiles* to view the individual trace profiles. Trace profiles with a green bullet point have been started, those with a red bullet point have been stopped.

You can view a list of all predefined and user-defined trace profiles.

The *List of Trace Profiles* mask is displayed. The name of each trace profile is displayed together with status information indicating whether the trace profile has been started.

Display All Trace Profiles

You can view a list of all predefined and user-defined trace profiles.

The *Trace Profile:[Name]* mask is displayed. The profile name is displayed together with status information indicating whether the trace profile is write-protected and whether it is currently started. The table underneath provides a list of the trace components assigned to the trace profile and the trace level configured in each case.

6.4.1.12 Add Trace Profile (with Current Trace Settings)

You can create a new, user-defined trace profile. The profile will be assigned all trace components that are currently started, as well as their configured trace levels (see Section 6.4.2, "Events" and Section 6.4.1.17, "Secure Trace").

WBM path:

WBM > *Maintenance* > *Traces & Events* > *Traces* > *Trace Profiles* > *Add Trace Profile (with Current Trace Settings)*

The *Add Trace Profile* mask is displayed. You can edit the following field:

- *Profile Name*: Enter a suitable name for the profile.

The trace components that are currently started are listed in the table underneath. The name of the trace component in each case is specified in the column on the left. You can edit the next two columns for each trace component:

- *Included*: Activate the field if the corresponding trace component should be assigned to this trace profile.
- *Level*: Specify the accuracy (trace level) that the corresponding trace component should apply in this profile. Trace levels have a value range from 0 to 9. 0 stands for the least amount, and 9 for the greatest amount of detail. Thus, the higher the number, the more trace information provided.

The following buttons are provided at the end of the table:

- *None* or *All* (in the *Included* column): Click this button to add all or none of the trace components listed to the current profile.
- *Set All to 0*, *Set All to 3*, *Set All to 6* or *Set All to 9* in the *Level* column: Click this button to configure a uniform trace level. Repeat if necessary.

Click *Apply* followed by *OK* in the confirmation mask. The trace profile you have created now appears in the *Events* tree structure and in the list of trace profiles (see Section 6.4.1.11, "Display All Trace Profiles").

6.4.1.13 Stop All Trace Profiles

You can stop all started trace profiles at once (see Section 6.4.1.14, "Trace Components").

WBM path:

WBM **>** *Maintenance* **>** *Traces & Events* **>** Traces **>** *Stop All Trace Profiles*

The *Traces* tree structure is updated.

6.4.1.14 Trace Components

Trace components are gateway components for which process and status information can be logged. You can view and edit the settings for trace components as well as activating and deactivating monitoring by trace components.

See also: Section 8.1.1, "Trace Components".

WBM path:

WBM **>** *Maintenance* **>** *Traces & Events* **>** *Traces* **>** *Trace Components*

Trace Components (folder):

Single-click the plus sign (+) next to *Trace Components* to view the individual trace components. Trace components with a green bullet point have been started, those with a red bullet point have been stopped.

The *Edit All Trace Components* is displayed by default. For each trace profile, the subsystem name, component index, and configured trace level are displayed together with status information as to whether the trace component is currently started.

You can view a list of all trace components that are currently started.

For each trace profile, the subsystem name and the configured trace level are displayed.

You can call up a list of all trace components containing detailed information, and modify the trace level data provided.

The subsystem name is shown for each trace profile. You can edit the following fields:

- *Trace Level*: Specify the accuracy (trace level) that the corresponding trace component should apply. Trace levels have a value range from 0 to 9. 0 stands for the least amount, and 9 for the greatest amount of detail. Thus, the higher the number, the more trace information provided.
- *Trace On*: Activate this field to start the corresponding trace component.

IMPORTANT: There are trace components which cannot be modified or which can be modified with restrictions. Non-changeable elements of a trace component are displayed in gray.

Click *Apply* followed by *OK* in the confirmation mask.

6.4.1.15 Display Started Trace Components

You can view detailed information for an individual trace component.

WBM path:

WBM **>** *Maintenance* **>** *Traces & Events* **>** *Traces* **>** selected trace component **>** *List of Started Trace Components*

The *Trace Component mask: [Name]* is displayed. This mask shows the trace component index, subsystem name, configured trace level and whether the trace level is currently started. The area *Data Included in the Trace Output* lists the trace data that is logged for this trace component. Exact field descriptions are provided in Section 6.4.1.14, "Trace Components".

6.4.1.16 Stop All Trace Components

You can view a list of all trace components that are currently stopped.

WBM path:

WBM **>** *Maintenance* **>** *Traces & Events* **>** Traces **>** *Display Stopped Trace Components*

The *List of Stopped Trace Components* mask is displayed.

6.4.1.17 Secure Trace

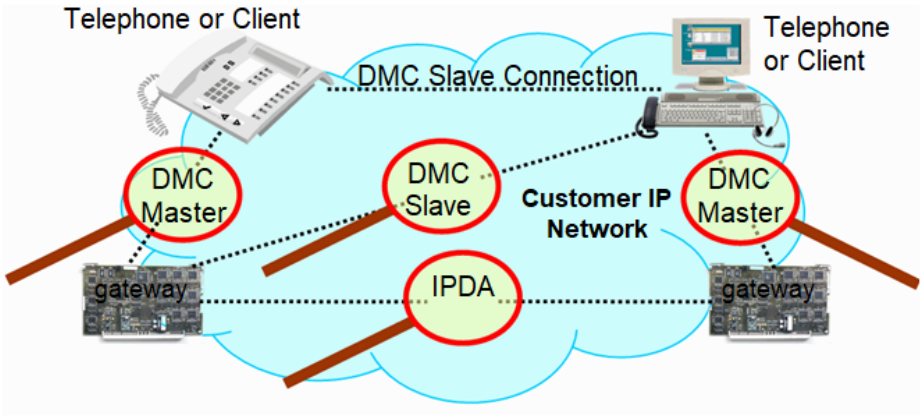
WBM path:

WBM **>** Maintenance **>** Traces & Events **>** Traces **>** *Secure Trace*

What is a secure trace?

Secure Trace is a feature for determining malfunctions in the OpenScape system. It produces information about encrypted VoIP user and signaling data streams to and from the common gateway.

IMPORTANT: In this document, a gateway is the HG 3500 gateway on OpenScape 4000 V10.



A secure trace can be generated for the following connections:

- DMC master connections (gateway <-> client/telephone)
- DMC slave connections (gateway <-> client/telephone)
- Standard SIP connections (gateway <-> client/telephone)
- CorNet-IP NQ network (gateway <-> gateway)
- SIP-Q network (gateway <-> gateway)
- IPDA connectivity (SL200 <-> gateway)

The secure trace contains encrypted information. This information can be decrypted by the developer with an appropriate key.

Secure trace procedure:

The procedure for creating a secure trace is as follows:

1) The service technician detects a problem in the network. The technician discusses the need for a secure trace with the developer.

2) The customer is informed of this need and must confirm receipt of notification. The customer then issues a secure-trace request specifying when monitoring should start and end (with date and time).

3) The developer generates a key pair consisting of the public key and the private key. This key pair can only be used for one secure trace. The certificates are used as follows:

4)
- The certificate with the private key is strictly confidential and can only be used by authorized developers.
- The certificate with the public key is provided to the service technician.

5) The service technician informs the customer about the beginning of trace activities. The customer must inform the affected users.

IMPORTANT: Recording calls and connection data is a criminal offence if the affected users have not been informed.

1) The service technician supplies the certificate to the gateways for which the secure trace is being created; see Section 6.4.1.18, "Secure Trace Options".

2) The service technician activates the secure trace function. A secure trace is created. The activation and later deactivation are logged by the OpenScape systems involved.
3) Once the secure trace has been generated, the customer is informed about the end of trace activities. The service technician removes the certificate from the system.
4) The secure trace is forwarded to the developer.
5) The developer decrypts the secure trace using the private key. He or she then analyzes the decrypted recordings.
6) All relevant material and data must be safely destroyed once analysis is complete. The private key must also be destroyed to prevent decryption of any illegal copies of the secure trace.

6.4.1.18 Secure Trace Options

This entry allows you to display and edit the gateway properties and settings.

WBM path:

WBM > Maintenance > Traces & Events > Traces > *Secure Trace* > *Secure Trace Options*

Secure Trace State

This mask indicates if a secure trace is currently active.

The *SecureTrace State* mask is displayed with the following data:

- *SecureTrace is active*: This field shows if a secure trace is currently underway.
- *Automatic Deactivation Time*: This field shows when the secure trace is scheduled to finish and when the secure trace function will automatically deactivate.
- *SecureTrace for these protocols*: This field shows the protocols for which the secure trace is generated. The options are: TC (TLS), H.323 Core/HSA (TLS), MMX (PEP), SIP Core/SSA (TLS), MSC (SRTP).

6.4.1.19 Start Secure Trace

Prerequisites:

You can only start the secure trace if the following prerequisites have been satisfied:

- Secure trace is not yet active.
- The customer requested a secure trace and would like to enter the *Secure-Trace Activation Password* in WBM (passphrase: a password that consists of multiple words and contains up to 20 characters).
- You received a public key from the developer and imported it into WBM.

WBM path:

WBM > Maintenance > Traces & Events > Traces > *Secure Trace* > *Start Secure Trace*

Procedure:

Proceed as follows to start the secure trace:

1) Select:WBM > Maintenance > Traces & Events > Traces > *Secure Trace* > *Start Secure Trace.* The *Start SecureTrace* mask is displayed.
2) Enter the following data in the "Start Parameters" area:
3) • *SecureTrace Activation Password*: To restrict the use of the Secure Trace function, activation is protected by a special passphrase known only to the customer. This passphrase is therefore the customerâs key and the certificate is the service technicianâs key. Both keys are needed to start the secure trace.
   • *Duration of SecureTrace (s)*: This is a mandatory entry.
4) Set the protocols for which the secure trace is to be created: All protocols in the "SecureTrace protocols" area are activated by default. Deactivate the protocols for which a secure trace should not be generated:
5) • TC (TLS)
   • H.323 Core/HSA (TLS)
   • MMX (PEP)
   • SIP Core/SSA (TLS)
   • MSC (SRTP)
6) Click *Start SecureTrace*. The secure trace is generated.

6.4.1.20 Stop Secure Trace

WBM path:

WBM > Maintenance > Traces & Events > Traces > *Secure Trace* > *Stop Secure Trace*

Procedure:

Click *Stop SecureTrace* in the "Stop SecureTrace" mask.

6.4.1.21 Secure Trace Certificate

WBM path:

WBM > Maintenance > Traces & Events > Traces > Secure Trace > *Secure Trace Certificate (for HG 3575 only)*

After The Secure Trace certificate is imported, it is displayed here, see section: Section 6.4.1.21, "Secure Trace Certificate"

6.4.1.22 Import Secure Trace Certificates (PEM or Binary)

Certificate:

This certificate is needed to generate a secure trace and is provided by the developer. It contains the public key and must be provided in PEM or binary format. The certificate is valid for up to one month.

WBM path:

WBM > Maintenance > Traces & Events > Traces > *Secure Trace* > *Import Secure Trace Certificates (PEM or Binary)* > *Load the Secure Trace Certificate via HTTP.*

Procedure:

Proceed as follows to import the certificate:

1) Select: WBM > Maintenance > Traces & Events > Traces > *Secure Trace* > *Import Secure Trace Certificates (PEM or Binary)* > *Load the Secure Trace Certificate via HTTP*. The *Load the Secure Trace Certificate via HTTP* mask is displayed.
2) Click *Browse* to select a file containing the certificate and confirm with *Open*. The file is loaded.
3) Click *View Fingerprint of Certificate*. A window showing the fingerprint of the certificate to be imported is displayed:

Check the fingerprint (= hexadecimal numeral). The fingerprint always changes if a certificate has been changed. An unchanged fingerprint is the only guarantee that the certificate is authentic. If the two fingerprints are not identical, an attempted attack has probably occurred. If this happens, you must destroy the key and take appropriate measures.

Click *OK* to close the window with the fingerprint.

1) Click *Import Certificate from File* if you are satisfied with the fingerprint check. Do not import the certificate if the fingerprint does not meet your expectations.

You can now generate the secure trace.

6.4.1.23 M5T Trace Components (not for HG 3575)

WBM path:

WBM > Maintenance > Traces & Events > Traces > M5T Trace Components (not for HG 3575) > *Edit All Trace Components*

The *Edit all Trace Components* dialog is displayed. The table contains the following parameters:

- *Package Name*: Name of trace component, cannot be changed
- *Trace Level*: Value range 0 to 9
- *Trace on*: Yes/No

Click *Apply* and *OK* in the confirmation dialog.

Displaying packages

In the *M5T Trace Package: <Name of Trace Component>* dialog, the package for the trace component is displayed. For a description of the individual parameters, see M5T Trace Package.

M5T Trace Package

WBM > Maintenance > Traces & Events > Traces > M5T Trace Components (not for HG 3575) > *<Trace Component>* > *M5T Trace Package*

The *M5T Trace Package: <Name of Trace Component>* dialog is displayed. The packages contain the following parameters:

- *Package Name*: Name of trace component, cannot be changed
- *Index*: cannot be changed
- *Trace Level*: Value range 0 to 9
- *Trace on*: Yes/No

Starting the trace component

WBM **>** Maintenance **>** Traces & Events **>** Traces **>** M5T Trace Components (not for HG 3575) *<Non-active Trace Component>* **>** *Trace On*

The trace is started. The symbol in front of the module name switches from default black to green.

Stopping the trace component

WBM **>** Maintenance **>** Traces & Events **>** Traces **>** M5T Trace Components (not for HG 3575) *<Active Trace Component>* **>** *Trace Off*

The trace is stopped. The symbol in front of the module name switches from default black to red.

Click *Apply* and *OK* in the confirmation dialog.

6.4.1.24 M5T Syslog Trace

The M5T Syslog Trace mask is displayed. The following parameter is shown:

Address the M5T Trace shall be sent to:

- IP Address:
- Port: e.g (6000)

Click *Apply* and *OK* in the confirmation dialog.

6.4.1.25 Service Center

The Service Center is an additional diagnostic tool for developers.

NOTICE: This function may only be used by developers.

WBM path:

WBM **>** Maintenance **>** Traces & Events **>** Traces **>** M5T Trace Components (not for HG 3575) *Service Center*

The *Service Center* window is displayed. It contains settings for the Service Center, i. e. whether the Service Center is enabled and its server port.

Use the *Activate Service Center* check box to enable or disable the Service Center.

6.4.2 Events

Events report problems in the system. The administrator should check the network or gateway configuration to correct the irregularity.

For further information on events, see Section 7.7.3, "Events". For details on the log file for events, see Section 7.7.4, "Event Log Files".

WBM path:

WBM **>** *Maintenance* **>** *Traces & Events* **>** *Events*

Single-click the plus sign (+) next to *Events* to display the following entries:

1) *Event Configuration E-Mail Reaction Table Get Diagnosis Logs*

Delete Diagnosis Logs

6.4.2.1 Event Configuration

You can view the event configuration settings and specify whether the event log should be transferred via a LAN.

WBM path:

WBM **>** *Maintenance* **>** *Traces & Events* **>** *Events* **>** *Event Configuration*

You can view the current event configuration settings.

The *Event Configuration* mask is displayed. For descriptions of the individual fields, see below.

Edit Event Configuration

A special tool, for example, TMT-Tracer or X-Trace, is needed for event logging over LAN. You can activate and deactivate event logging via LAN.

Event file settings

The following fields provide additional information:

- *Maximum Event Buffer Size (byte)*: The number of log files saved to the buffer memory.
- *Maximum Event File Size (byte)*: The maximum size of the log file.
- *Event Timer (sec)*: The interval in seconds until data is written to the log file.

Event via LAN (XTracer)

You can edit the following field:

- *Switch Event Logging via LAN On*: Using this option you can activate and deactivate event logging.

The following field is shown for information purposes:

- *Timer Value (sec)*: The interval in seconds before data is transferred.

Click *Apply* followed by *OK* in the confirmation mask .

6.4.2.2 E-Mail

You can review and define the e-mail address to which a warning should be sent if an event occurs.

WBM path:

WBM > *Maintenance* > *Traces & Events* > *Events* > *E-mail Settings*

You can view detailed information on mail delivery when an event occurs.

The *E-mail Settings* mask is displayed. For descriptions of the individual fields, see Section 6.4.2.2, "Edit E-mail Settings".

Edit E-mail Settings

You can modify detailed information for mail delivery when an event occurs.

The *E-mail Settings* mask is displayed. You can edit the following fields:

- *SMTP Server (IP Address)*: Enter the IP address of the computer via which e-mails routed using SMTP should be sent. As HG 3500/3575 does not support authentication for SMTP, select an SMTP server without authentication.
- *SMTP Server (Port)*: Enter the SMTP server port. The default value is 25.
- *SMTP Domain*: Enter the domain name of the computer via which e-mails routed using SMTP should be sent. The SMTP domain corresponds to the domain name of the mail server.

IMPORTANT: Adhere to the conventions in accordance with RFC 821 and RFC 822. The SMTP server settings are required because the HG 3500/3575 only supports the "relay agent" function and cannot itself be used as an SMTP server.

- *From*: Enter the text that should appear in the "From" field in the case of notification e-mails.
- *Subject*: Enter the text that should appear in the "Subject" field in the case of notification e-mails. The subject line should specifically refer to a message in the event log.
- *Recipient 1* to *Recipient 5*: You can enter up to five e-mail addresses in this field. Notification e-mails are sent to all addresses entered.

Click *Apply* followed by *OK* in the confirmation mask.

6.4.2.3 Reaction Table

You can define individually for *Events* how the system should react to this event.

NOTICE: The events in the reaction table are described in *Overview: Event Codes*.

WBM path:

WBM > *Maintenance* > *Traces & Events* > *Events* > *Reaction Table* > *Event Reaction Configuration*

Reaction Table (folder):

Single-click the plus sign (+) next to *Reaction Table* to view the individual event messages. Single-click an individual event message to display the *Event Reaction Configuration.*

Edit All Events

Details of the individual events are displayed clearly in a single table in the *Event Reaction Configurations* dialog.

The following information is displayed for each event:

- *Event Name*: The internal name of the event is shown.
- *Send an SNMP Trap*: This indicates whether an SNMP trap is sent when the event occurs (see Section 6.5.3, "Traps").

The following settings can be changed for each event:

- *Send an E-mail*: If this option is activated, an e-mail will be sent when this event occurs (see Section 6.4.2.2, "E-Mail").
- *Associated Trace Profile*: You can assign one of the existing trace profiles to this event (see Section 6.4.2, "Events").
- *Start/Stop Trace Profile*: You can specify whether the selected trace profile should be started or stopped by this event.

Click *Apply* and *OK* in the confirmation dialog.

WBM path:

WBM > *Maintenance* >Traces & Events > *Events* > *Reaction Table* > selected event > *Event Reaction Configuration*

The *Event Reaction Configurations* mask is displayed. For descriptions of the individual fields, see Section 6.4.2.3, "Edit Event".

Edit Event

The following fields provide additional information:

- *Event Name*: The internal name of the event is shown.
- *Send an SNMP Trap*: This indicates whether an SNMP trap is sent when the event occurs (see Section 6.5.3, "Traps").
- *Reboot Gateway*: This indicates whether the gateway must be restarted if the event occurs.
- *Notify OpenScape*: This indicates whether a message is sent to the OpenScape system if the event occurs.

You can edit the following fields:

- *Send an E-mail*: If this option is activated, an e-mail will be sent when this event occurs (see Section 6.4.2.2, "E-Mail").
- *Associated Trace Profile*: You can assign one of the existing trace profiles to this event (see Section 6.4.2, "Events").
- *Start/Stop Trace Profile*: You can specify whether the selected trace profile should be started or stopped by this event.

Click *Apply* followed by *OK* in the confirmation mask.

6.4.2.4 Get Diagnosis Logs

WBM path:

WBM **>** *Maintenance* **>**Traces & Events **>** *Events* **>** *Get Diagnosis Logs* **>** *Load Diagnosis Logs from the Gateway via HTTP*

The diagnosis logs created by the gateway can be viewed in a table and loaded via HTTP.

The table *Load Diagnosis Logs from the Gateway via HTTP* is displayed. For each available log, the associated file name, the file size (in bytes), the last modification date and the file attributes are displayed.

6.4.2.5 Delete Diagnosis Logs

You can delete the diagnosis logs.

WBM path:

WBM **>** *Maintenance* **>**Traces & Events **>** *Events* **>** *Delete Diagnosis Logs*

To delete the diagnosis log, you must confirm the deletion by clicking *Delete Log*.

6.4.3 Admin Log

The administration log is generated on the gateway machine. Logins are logged on the gateway machine. You can review and configure the protocol language. You can also download the log file from the gateway machine.

WBM path:

WBM **>** *Maintenance* **>** Traces & Events **>** *Admin Log*

Single-click the plus sign (+) next to *Admin Log* to display the following entries:

1) *Configuration Load Admin Log Data*

6.4.3.1 Configuration

You can review and configure the administration log language on the gateway machine.

WBM path:

WBM **>** *Maintenance* **>**Traces & Events **>** *Admin Log* **>** *Configuration* **>** *Admin Log Properties*

You can configure a different language for the administration log.

The *Admin Log Properties* mask is displayed. You can edit the following field:

- *Admin Log Language*: Select the required language. You can choose between English and German.

Click *Apply* followed by *OK* in the confirmation mask.

6.4.3.2 Load Admin Log Data

You can download the administration log from the gateway machine.

WBM path:

WBM **>** *Maintenance* **>** *Admin Log* **>** Traces & Events **>** *Load Admin Log Data*

Load via HTTP

You can transfer the administration file from the HG 3500/3575 to the computer used to administer the gateway.

Once the file has been transferred it is shown immediately in the system editor.

6.5 SNMP

SNMP (**S**imple **N**etwork **M**anagement **P**rotocol) has been created for use with network management systems (NMS). NMS uses SNMP to integrate the management of network elements from different manufacturers.

WBM path:

WBM **>** *Maintenance* **>** *SNMP*

The *SNMP* tree structure is displayed.

Entries under *SNMP*:

Communities

If gateway problems occur, traps are generated to inform administrators of errors and failures. Access authorizations for SNMP data are regulated using communities. A community is a specific IP address.

6.5.1 SNMP Management

SNMP (Simple Network Management Protocol) is designed to be used in conjunction with Network Management Systems (NMS). NMS uses SNMP to integrate the management of network elements from different manufacturers.

The gateway contains an SNMP agent which accesses a standard MIB 2 as well as a private MIB specific to the gateway. Authorized administrators can read out administration and configuration data via SNMP. Some settings in the gateway can be modified via SNMP.

Both MIBs are available to administrators if a standard operating environment (for example, HP OpenView) is used.

The gateway can limit SNMP access to certain IP addresses, enabling data to be read out or modified via the NMS by authorized administrators only.

Read-only access

- MIB II (Management Interface Base); RFC 1213
- HiPathCommonMonitoringMIB (commonNotificationGroup only)

Write access

- MIB II (system group, TrapDestTable)
- HiPathCommonMonitoringMIB (IPConnControlTable)

SNMP Traps

SNMP can be used to generate traps. Modifications to the existing conditions or the gateway status are transferred by the trap in real time. If a trap is generated, the gateway sends a PDU (Protocol Data Unit) trap to the SNMP agent which then forwards it to the NMS.Starting with Version V7 R2 OpenScape 4000 Assistant offers the possibility to configure read and write access and trap destinations centrally from Assistant.

The Assistant will in this case overwrite any locally configured entries on the gateway.

In the WBM you can see if an entry was generated by Assistant or by WBM.

6.5.2 Communities

Communities are IP addresses with particular SNMP access authorizations.

WBM path:

WBM **>** *Maintenance* **>** *SNMP* **>** *Communities*

Single-click the plus sign (+) next to *Communities* to display a menu containing the following entries:

1) *Read Communities Write Communities Trap Communities*

These are the available community types or access authorization classes.

6.5.2.1 Read Communities

You can display a list of all SNMP communities.

WBM path:

WBM **>** *Maintenance* **>** *SNMP* **>** *Communities* **>** *Read Communities*

The *List of Communities* mask is displayed. For each community, the IP address, community name and authorization type (read community, write community or trap community) is displayed.

Read communities have the following access authorizations:

- MIB II (Management Interface Base); RFC 1213,
- HG1500MIB (HLB2 configuration and statistics),
- RG2500MIB (MIB for some routing functions),
- HiPathCommonMonitoringMIB (commonNotificationGroup only).

Single-click the plus sign (+) next to *Read Communities* to display the following entry:

1) *Add Read Community*

6.5.2.2 Add Read Community

You can add a new IP address to the read communities.

WBM path:

WBM > *Maintenance* > *SNMP* > *Communities* > *Read Communities* > *Add Read Community*

The *Add Read Community* mask is displayed. You can edit the following fields:

- *IP Address*: Enter the IP address of the new trap recipient in this field.
- *Community*: This field defines the SNMP permissions. Enter the community as a character string.

Click *Apply* followed by *OK* in the confirmation mask.

6.5.2.3 Write Communities

Write communities have the following access authorizations:

- MIB II (system group, TrapDestTable),
- HG1500MIB (control group),
- HiPathCommonMonitoringMIB (IPConnControlTable).

WBM path:

WBM > *Maintenance* > *SNMP* > *Communities* > *Write Communities*

Single-click the plus sign (+) next to *Write Communities* to display a menu containing the following entries:

1) *Add Write Community*

Single-clicking *Write Communities* shows all IP addresses (communities) assigned this community type.

6.5.2.4 Add Write Community

You can add a new IP address to the write communities.

WBM path:

WBM > *Maintenance* > *SNMP* > *Communities* > *Write Communities* > *Add Write Community*

The *Add Write Community* mask is displayed. You can edit the following fields:

- *IP Address*: Enter the IP address of the new trap recipient in this field.
- *Community*: This field defines the SNMP permissions. Enter the community as a character string.

Click *Apply* followed by *OK* in the confirmation mask.

6.5.2.5 Trap Communities

Trap communities have trap authorization.

WBM path:

WBM > *Maintenance* > *SNMP* > *Communities* > *Trap Communities*

Single-click the plus sign (+) next to *Trap Communities* to display a menu containing the following entry:

1) *Add Trap Community*

Single-clicking *Trap Communities* shows all IP addresses (communities) assigned this community type.

6.5.2.6 Add Trap Community

You can add a new IP address to the trap communities.

WBM path:

WBM > *Maintenance* > *SNMP* > *Communities* > *Trap Communities* > *Add Trap Community*

The *Add Trap Community* mask is displayed. You can edit the following fields:

- *IP address* Enter the IP address of the new trap recipient in this field.
- *Community*: This field defines the SNMP access rights. Enter the community as a character string.

Click *Apply* followed by *OK* in the confirmation mask.

6.5.3 Traps

If gateway problems occur, traps are generated to inform administrators of errors and failures. The following types of trap are available:

- System Traps (system errors that require immediate corrective action)
- Performance Traps (information on performance problems that do not require corrective action)

For further information on traps, see Section 7.7.1, "Traps".

Traps are classified according to their effect and are colored accordingly in the tree representation.

Table 5: Effect Classes for Traps

Effect Classes	Bullet Point Colors
Critical	Red
Major	Red
Minor	Orange
Warning	Yellow
Deleted	Green
Informative	Gray

Effect Classes	Bullet Point Colors
Intermediate status	Gray
Other traps	Gray

Traps are displayed in the tree structure in the order that they occur in the system.

WBM path:

WBM **>** *Maintenance* **>** *SNMP* **>** *Traps*

Single-click *Traps* to display a menu containing the following entries:

1) *Display All Traps Display All Critical Traps Refresh*

Traps (folder):

If traps are available, the entry *Traps* is represented by a folder icon in the tree structure. Double-clicking *Traps* adds the available traps to the tree structure. The following function is available in this case:

1) *Display Trap*

6.5.3.1 Display All Traps

You can display a list containing detailed information on all traps currently available in the system.

WBM path:

WBM **>** *Maintenance* **>** *SNMP* **>** *Traps* **>** *Display All Traps*

The *List of All Traps* mask is displayed. Traps are displayed in the table in the order that they occur in the system. The display is automatically updated every 30 seconds. However, by clicking *Refresh*, you can also update the list manually at any time.

6.5.3.2 Display All Critical Traps

You can display a list containing detailed information on system-critical traps (those indicated by a red bullet point).

WBM path:

WBM **>** *Maintenance* **>** *SNMP* **>** *Traps* **>** *Display All Critical Traps*

The *List of All Critical Traps* mask is displayed. Traps are displayed in the table in the order that they occur in the system. The display is automatically updated every 30 seconds. However, by clicking *Refresh*, you can also update the list manually at any time.

6.5.3.3 Refresh

You can update the trap tree structure at any time.

WBM path:

WBM **>** *Maintenance* **>** *SNMP* **>** *Traps* **>** *Refresh*

The tree structure is updated.

6.5.3.4 Display Trap

You can view detailed information for an individual trap.

WBM path:

WBM **>** *Maintenance* **>** *SNMP* **>** *Traps* **>** selected trap **>** *Display Trap*

The following trap information is displayed: The first four entries displayed have the following meaning:

- Trap severity (for example, Information)
- Trap name
- Explanation of this trap
- Trap type (1 = software, 2 = hardware)

6.6 Platform Diagnostics (not for HG 3575)

WBM path:

WBM **>** *Maintenance* **>** *Platform Diagnostics*

The features in this area may only be used by developers.

6.7 Appl. Diagnostics (not for HG 3575)

WBM path:

WBM **>** *Maintenance* **>** *Appl. Diagnostics*

The features in this area may only be used by developers.

7 Technical Concepts

A number of administrable gateway functions require a more comprehensive understanding of technical details. This chapter contains sections that deal with these technical details.

7.1 Environment Requirements for VoIP

Relevant WBM functions:

See Section 5.4.1.1, "LAN1 (LAN1)" See Section 5.4.1.2, "*LAN2 (Redundancy LAN1) [for HG 3500 only]*" See Section 5.6.4, "Media Stream Control (MSC)" See Section 5.6.5, "HW Modules" See Section 5.2.2, "MSC Statistics"

To ensure voice transfer quality and avoid unacceptable delays, the networks being used must meet certain requirements.

7.1.1 Environmental Requirements in the LAN

LANs used for VoIP must meet the following specifications:

- At least 256 Kbps transmission capacity per networked unit
- Not more than 50 msec delay in one direction (One Way Delay) Not more than 150 msec total delay
- Not more than 1% packet loss
- QoS support â“ IEEE 802.1p, DiffServ (RFC 2474) or TOS (RFC 791)
- Every HG 3500/3575 must be connected via a switch or a dedicated port of a router.
- It is recommended that the VoIP application be connected via a separate VLAN to reduce collisions with other transmissions. If all involved devices support VLAN (in accordance with IEEE 802.1q), all VoIP traffic can be placed in a separate VLAN. For administration access, LAN switches must provide individual PCs with access to multiple VLAN segments.
- Not more than 20% of the available bandwidth should be used.
- Not more than 10% of the total data traffic should be broadcast packets.
- The error rate should not amount to more than 1% of data traffic and should not tend to increase.

7.1.2 Environmental Requirements in the WAN

LANs that are linked over WANs and share the same VoIP functionality must meet the following minimum requirements:

- Each LAN must each be connected to the Internet via DSL with a fixed IP address.
- QoS support â“ IEEE 802.1p, DiffServ (RFC 2474) or TOS (RFC 791) â“ over the entire connection
- The bandwidth required for the calls must always be available in both directions, to the network and to the user.
- Not more than 50 msec delay in one direction (One Way Delay) Not more than 150 msec total delay

- Not more than 3% packet loss
- Not more than 3% error rate
- Not more than 10% jitter
- As little broadcast and multicast traffic in the network as possible. If necessary this can be achieved by structuring the network â“ using VPN, for instance â“ with Layer 3 switches and routers, or with Layer 2 switches that recognize multicasting.
- Not more than 40% network load (without VoIP traffic)
- Less than 40 broadcast packets per second if possible

7.2 Bandwidth Requirements in LAN/WAN Environments

Relevant WBM functions:

See Section 5.4.1.1, "LAN1 (LAN1)" See Section 5.4.1.2, "*LAN2 (Redundancy LAN1) [for HG 3500 only]*" See Section 5.5.3, "Codec Parameters"

The HG 3500/3575 is configured for optimal bandwidth usage. It implements various functions for this, including:

- silence suppression
- background noise detection and suppression
- dynamic voice and fax detection

Bandwidth Availability

The bandwidth required for voice must be available at all times in the network. You must measure and analyze the network to ensure this is the case before installing components.

Payload connections with RTP (Real-Time Transport Protocol) in a LAN environment:

The bandwidth required for voice transmission in an IP network can be calculated using the following table:

Table 6: Codec-Based Bandwidth Requirements

Codec type	Packetizing parameter	Packet interval/ Frame size (msec)	Payload (bytes)	Ethernet packet length (bytes)	Payload packet (overhead in percent)	Ethernet Load (incl.) header (Kbps)
G.711	20	20	160	230	44%	92
G.711	30	30	240	310	29%	82.7
G.711	40	40	320	390	22%	78
G.711	60	60	480	550	15%	73.3
G.723.1	1	30	24	94	292%	25.1
G.723.1	2	60	48	118	146%	15.7
G.729A	1	20	20	90	350%	36

Codec type	Packetizing parameter	Packet interval/ Frame size (msec)	Payload (bytes)	Ethernet packet length (bytes)	Payload packet (overhead in percent)	Ethernet Load (incl.) header (Kbps)
G.729A	2	40	40	110	175%	22
G.729A	3	60	60	130	117%	17.3
RTCP		5000		280		0.4

The LAN load is calculated for a single route. The bandwidth must be doubled for payload connections in both directions. HG 3500/3575 supports VAD with codecs G.7231A and G.729AB. If you use these codecs, bandwidth requirements vary in relation to the length of idle periods in voice signals.

VLAN tagging based on IEEE 802 1q is also performed as part of the calculation. Packet length is shorter by 4 bytes without VLAN tagging.

The overhead is calculated as follows:

Table 7: Overhead Calculation

Protocol	Bytes
RTP header	12
UDP header	8
IP header	20
802.1Q VLAN tagging	4
MAC (incl. preamble, FCS)	26
Total	**70**

Table 8: Payload Connection Check with Parallel RTCP (Real-Time Transport Control Protocol)

Report type	Report interval (sec)	Average. Ethernet packet size (bytes)	Ethernet load (incl.) header (Kbps)
Sender report	5	140	0.2
Recipient report	5	140	0.2
Total			0.4

Payload connections with RTP (Real-Time Transport Protocol) in a WAN environment:

The following values apply to payload connections with RTP (Real-Time Transport Protocol) in a WAN environment:

Table 9: WAN bandwidth requirements according to Codec

Codec	Packeti para-meter	Packet interval/ Frame size (msec)	Payloa (bytes)	Packet length (bytes)	Payload packet (over-head in %)	WAN load (Kbps)	Packet length with header com-pressio (bytes)	WAN load with header com-pression (Kbps)
G.711	20	20	160	206	29%	82.4		
G.711	30	30	240	286	19%	76.3		
G.711	40	40	320	366	14%	73.2		
G.711	60	60	480	526	10%	70.1		
G.723.1	1	30	24	70	192%	18.7	32	8.5
G.723.1	2	60	48	94	96%	12.5	56	7.5
G.729A	1	20	20	66	230%	26.4	28	11.2
G.729A	2	40	40	86	115%	17.2	48	9.6
G.729A	3	60	60	106	77%	14.1	68	9.1
RTCP		5000		230		0.4		0.4

The WLAN load is calculated for a single direction. As WLAN channels usually contain channels in both directions, this is the same as the bandwidth requirement, for example, for one ISDN channel.

The overhead is calculated as follows:

Table 10: Overhead Calculation

Protocol	Bytes
RTP header	12
UDP header	8
IP header	20
PPP	9
Total	**46**
Compressed header	8

A "compressed header" is usually used for RTP/UDP/IP Header compression. In addition every 5 seconds a full header is sent (total = 46 octets).

The rule of thumb for calculating the bandwidth requirement for n parallel VoIP connections with G.711 (one frame per RTP packet) is:

BandwidthLAN = n Ã— (180voice payload + 0.4RTPC)

BandwidthWAN = n Ã— (82voice payload + 0.4RTPC)

The approximate values for voice payload changes for other codecs or packet values. In addition, the bandwidth for Attendant P, call charge information, and other applications must also be taken into account.

Bandwidth requirements for CAR Alive/Node Survey

There are two different methods for performing a CAR-Alive/Node Survey: either a TCP-based mechanism or an ICMP ping (configurable with Manage I or WBM).

Table 11: LAN Bandwidth Requirement for CAR-Alive/Node Survey

Node Number	TCP load (Kbps)	Ping load (Kbps)	Time- out
1	0.1	0.1	12
2	0.2	0.3	
3	0.5	0.8	
4	1.0	1.7	
5	1.7	2.8	
6	2.5	4.2	

Table 12: WAN Bandwidth Requirement for CAR-Alive/Node Survey

Node Number	TCP load (Kbps)	Ping load (Kbps)
1	0.07	0.11
2	0.14	0.22
3	0.41	0.66
4	0.82	1.31
5	1.37	2.19
6	2.06	3.28

The rule of thumb for calculating the bandwidth requirement for CAR-Alive between n nodes is:

BandwidthLAN = n Ã— (n-1) Ã— bytesAliveMsg Ã— 8 Ã· 1000 Ã· Ttimeout between ping

and the rule of thumb for calculating the bandwidth requirement for CAR-Alive between n nodes at the HG 3500/3575 interface is:

BandwidthLAN = (n-1) Ã— (n-1) Ã— bytesAliveMsg Ã— 8 Ã· 1000 Ã· Ttimeout between ping

The value for **bytesAliveMsg**:

in the LAN is **212** with ping or **127** with TCP in the WAN is **188** with ping or **102** with TCP

The default timeout between two pings is 12 seconds.

The following table contains information on additional bandwidth requirements for signals:

Table 13: Bandwidth Requirements for Signals

Device/application	BHCA	Load (Kbps)
DSS server, outgoing and incoming calls	1400	2
Attendant P (busy)	1400	3
Call charge information	1400	1
ACD information	1400	10
Fax over VCAPI, 14400 bauds		2
CDB synchronization system with DBFS (TFTP, burst)		162

7.3 Quality of Service (QoS)

Relevant WBM functions:

See Section 5.4.1.1, "LAN1 (LAN1)" See Section 5.4.1.2, "*LAN2 (Redundancy LAN1) [for HG 3500 only]*" See Section 5.4.4.4, "PSTN Peers" See Section 5.1.4, "Quality of Service" See Section 5.6.3, "QoS Data Collection"

Quality of Service encompasses various methods for guaranteeing certain transmission properties in packet-oriented networks (IP).

It is thus important, for example, to ensure a minimum bandwidth for Voice over IP for the entire duration of the transfer operation. If multiple applications with equal rights are operating via IP, then the available bandwidth for the transmission path (e. g. an ISDN B channel, 64 Kbps) is split. In this case, a voice connection may experience packet losses which can reduce voice quality.

The HG 3500/3575 uses a number of procedures for Quality of Service.

On layer 2 (in accordance with OSI, Ethernet), you can activate an extension (IEEE 802.1p) to the standard Ethernet format (DIX V2). This adds more information to the Ethernet header including a 3-bit data field. This field carries priority information on the data packet. For all packets that reach the board from the LAN, both Ethernet formats (IEEE 802.1p and DIX V2) are understood; the format can be selected for all packets that are sent from the board to the LAN. You should check whether all components in the network support this format before this parameter is activated. Otherwise, it may not be possible to access HG 3500/3575 from the LAN anymore.

The Ethernet header is not transported when switching to another transport medium (e. g. ISDN). An IP router (like the HG 3500/3575âs router) can, however, use the information contained in the IP header for prioritization. Straightforward IP routers that connect two network segments, for example, can use the IP level prioritization. In the case of the QoS procedure, either three bits (IP precedence based on RFC 791, older standard) or six bits (Differentiated Services or DiffServ, based on RFC 2474) are evaluated for the creation of

various classes. HG 3500/3575âs IP router provides various bandwidths for these classes, so that voice packets can be processed first.

For the DiffServ parameter, various so-called codepoints ("Basic Settings > AF/EF Codepoints") are defined, and based on these codepoints two different procedures are used for processing the payload of different marked data flows:

The "Expedited Forwarded (EF)" procedure (based on RFC 2598) guarantees a constant bandwidth for data in this class. If this defined value is reached, all packets that exceed this bandwidth are rejected. A separate class is defined for EF on HG 3500/3575. For this class, the bandwidth can be defined as a percentage for every ISDN peer (QoS bandwidth for EF).

The "Assured Forwarding (AF)" procedure (based on RFC 2597) guarantees a minimum bandwidth for the data of one (of many) classes. Lower priority classes share the bandwidth not used by EF or the classes with higher priority. In addition, the speed at which packets are rejected if the system is unable to forward them fast enough can be defined for every class by means of the Dropping Level setting. Nothing is thus to be gained by buffering voice packages for an extended period of time (this only increases the delay). In the case of secure data transfer (e. g. file transfer), on the other hand, a large buffer is advantageous as packets are otherwise sent repeatedly between the two terminals.

Four classes are reserved for AF on the HG 3500/3575: AF1x (high priority), AF2x, AF3x and AF4x (low priority), where "x" stands for one of three dropping levels: low (1), medium (2) and high (3). In the case of "low", packets are buffered over an extended period, in the case of "high", packets are promptly rejected if they cannot be forwarded. Unmarked IP packets (ToS field=00) are handled in the same way as the lowest priority.

If a routing partner can only work with one of the two standards (DiffServ or IP precedence, for example an older router that only works with IP precedence), then HG 3500/3575 can translate the ToS field accordingly. This can be set for each PSTN peer or LAN interface. When the default value is set ("identical"), nothing is translated; with the values "DiffServ" or "IP Precedence", translation is performed on the basis of the table below, if data is not entered in the field in accordance with the standard set.

In the case of IP data traffic, the IP packets that generate HG 3500/3575 are split into five groups (e. g. the VCAPI server, H.323 gateway). You can set which codepoint is to be used for marking the packets for four of these groups.

- Voice Payload for IP telephony (Voice over IP)
- Call Signaling for connection setup in H.323/SIP
- Data Payload, for example, for IP networking with fax or modem
- Network Control, for example, SNMP traps

The remaining data traffic is marked "disabled", that is 00.

The following table shows the various DiffServ codepoints and the default settings.

Table 14: Codepoint implementation

Layer-3 QoS values										
DSCP (Differentiated Services Code Point)							Default	Total TOS bytes		
				Drop level						
Name	binary	hex	dec	high	med	low		binary	hex	dec
DE (default)	0	0	0				All other packets	0	0	0
AF 11	1010	0A	10			x		101000	28	40
AF 12	1100	0C	12		x			110000	30	48
AF 13	1110	0E	14	x				111000	38	56
AF 21	10010	12	18			x		1001000	48	72
AF 22	10100	14	20		x			1010000	50	80
AF 23	10110	16	22	x				1011000	58	88
AF 31	11010	1A	26			x	Signaling	1101000	68	104
AF 32	11100	1C	28		x			1110000	70	112
AF 33	11110	1E	30	x				1111000	78	120
AF 41	100010	22	34			x		10001000	88	136
AF 42	100100	24	36		x			10010000	90	144
AF 43	100110	26	38	x				10011000	98	152
EF	101110	2E	46				Voice/ Fax/ Modem	10111000	B8	184
CS7	111000	38	56		x		Network Control	11100000	E0	224

Table 15: Codepoint implementation

Layer-2 QoS values		
binary	hex	Default
000	0	All other packets
000	0	Network Control
011	3	Signaling
110	5	Fax/Modem
110	5	Voice

If layer-3 is the only priority available, as in routing links, for example, these packets are assigned layer-2 tags containing a layer-3 TOS value that matches the TOS value in one of the four priority classes, as set under Basic Settings -> Quality of Service.

7.4 Static and Adaptive Jitter Buffer

The HG 3500/3575 jitter buffer can be configured for the connection requirements of a specific network.

Relevant WBM functions:

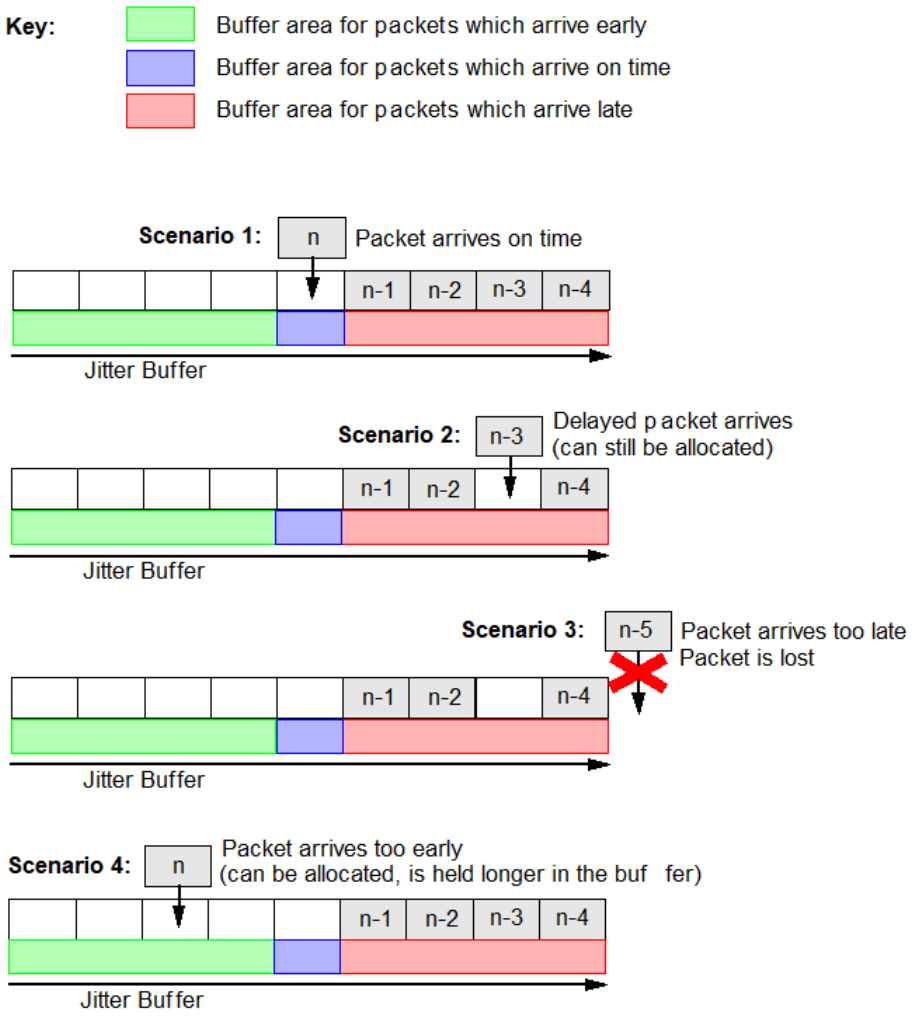
See Section 5.1.4, "Quality of Service" See Section 5.6.5, "HW Modules"

7.4.1 Jitter Buffer Function

In TCP/IP-based networks, packets forming part of a single transmission can be sent at different speeds. As this property can have a negative impact, especially on voice signal transmissions, data stream manipulation is required. The jitter buffer is a cache memory for IP packets. It can counter-balance IP packet delays to a certain degree.

IP packets are stored in the jitter buffer in the sequence of arrival. Each packet bears a timestamp saved in the packetâs RTP header. These timestamps are used to determine the correct sequence. The jitter buffer ensures that the packets exit in the correct sequence and in real time. The average time (average delay) defines how long packets that arrive at the anticipated time remain in the jitter buffer. Packets that arrive later than anticipated remain in the jitter buffer for a correspondingly shorter length of time; packets that arrive sooner than anticipated remain longer in the jitter buffer. If a packet arrives too late to be placed in the correct sequence, it is lost. Theoretically, packets can also arrive too early to be placed in the correct sequence. This rarely happens, however, in practice.

The following illustration shows how the jitter buffer works:



Individual packet loss is acceptable in voice transmissions. However, the delay should be as low as possible as excessive delays negatively impact calls.

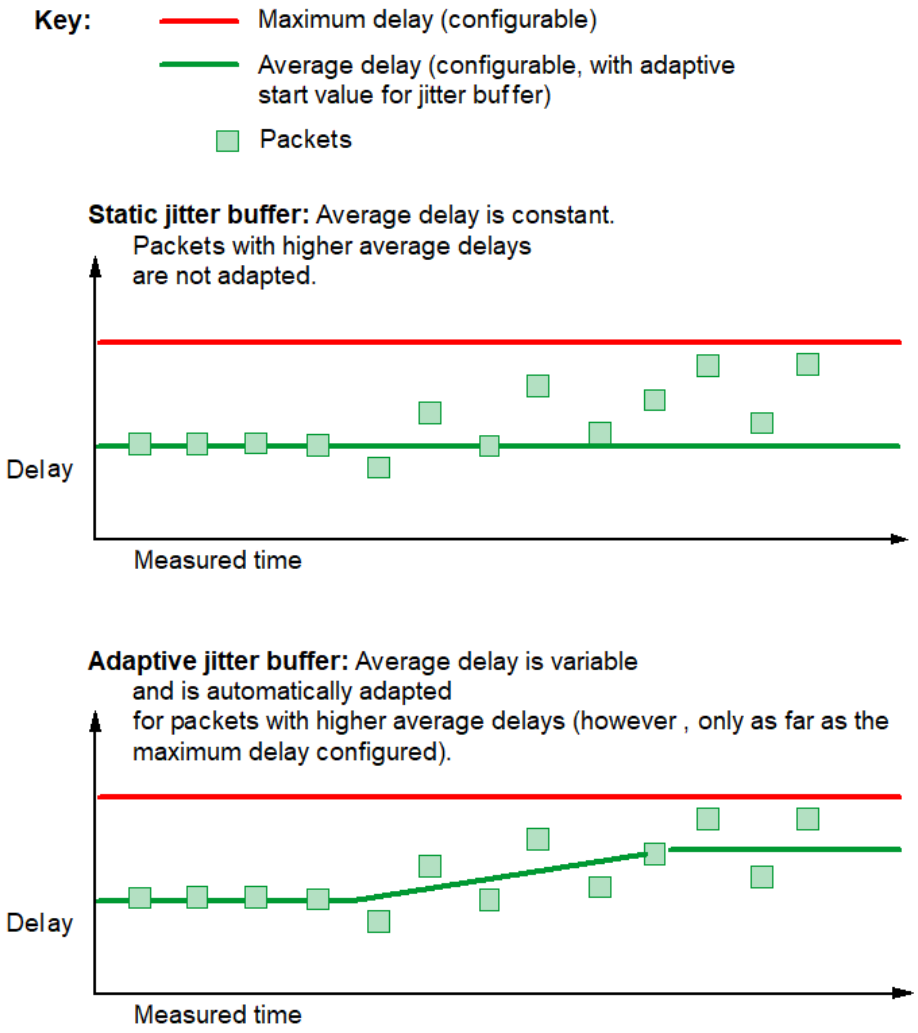
In the case of data transmission, packet loss should be as low as possible to guarantee data integrity. Delays, however, do not play a significant role.

7.4.2 How the Jitter Buffer Works

The jitter buffer supports three different modes. Two of these are suitable for voice transmission and one is for data transmission (for example, transparent fax, transparent modem or ISDN data):

- **static** jitter buffer for voice
- **static** jitter buffer for data
- **adaptive** (dynamic) jitter buffer for voice

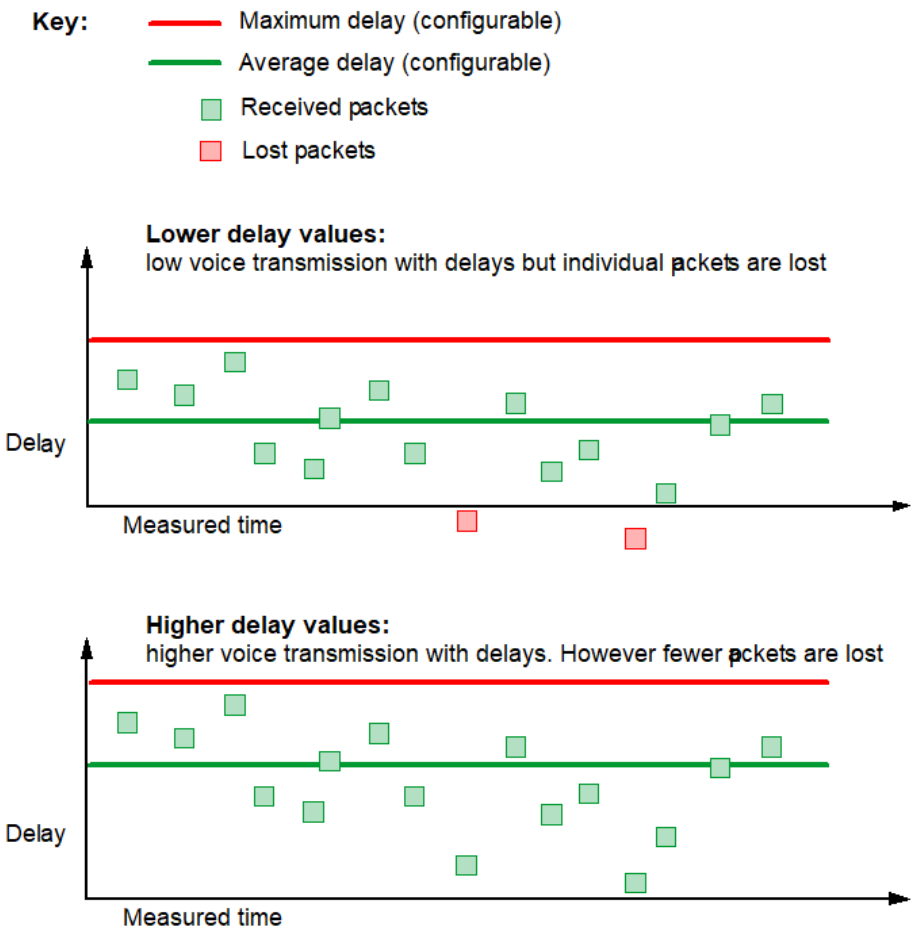
The adaptive jitter buffer is specially designed for voice transmission. While the average packet delay remains constant for the static jitter buffer, it is automatically adapted depending on the situation in the case of the adaptive jitter buffer. The following illustration shows the difference between static and adaptive jitter buffers in a situation with increased packet delays:



The adjustable average delay (green line) is only the start value for the adaptive jitter buffer.

7.4.3 Considerations when Setting the Delay for Static Jitter Buffers

The lower the settings for average and maximum delay values, the lower the distortion factor, especially for voice transmissions. However, these settings increase the risk of packet loss. When the delay values are set higher, fewer packets are lost but the distortion factor increases. The following illustration shows this relationship:

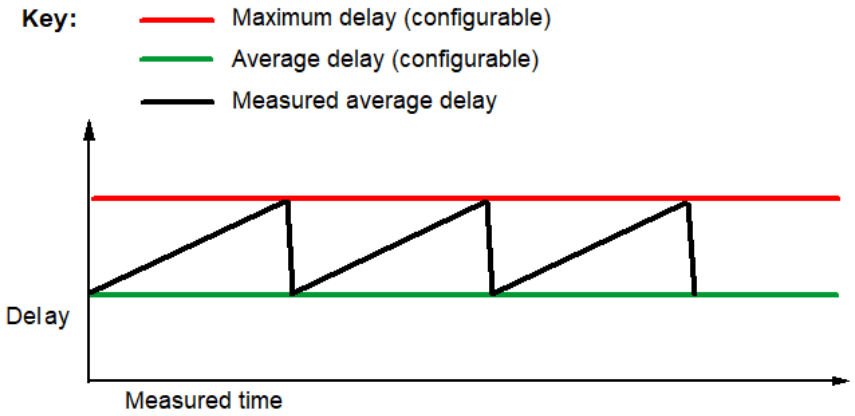


The HG board is set by default to average values that have been proven in most environments.

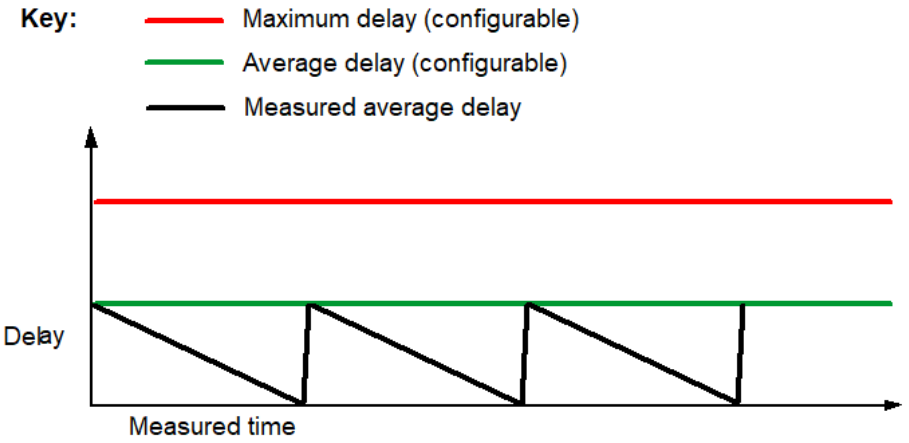
7.4.4 Clock Drift in Static Jitter Buffers

The measured time provides the timestamp for the packets that make up an IP-based voice transmission. If the time measurements on the send and receive side do not exactly match, more or fewer packets are generated on the send side than anticipated on the receive side. This discrepancy is known as clock drift.

If more packets are generated on the receive side than anticipated in the HG boardâs jitter buffer, more packets than expected flow into the jitter buffer. This causes a steady increase in the measured average delay. The jitter buffer readjusts when the maximum delay value is reached. It skips supernumerary packets until the measured average delay reaches the value set for average delay. Then the entire procedure starts again from the beginning. The following illustration shows this process:

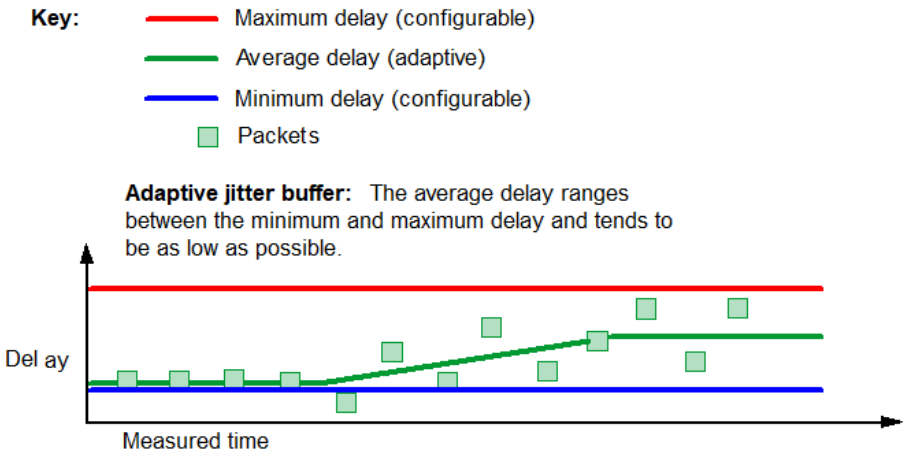


If fewer packets are generated on the receive side than anticipated in the HG boardâs jitter buffer, fewer packets than expected flow into the jitter buffer. This causes a steady decrease in the measured average delay. When there are no more packets in the jitter buffer, the jitter buffer readjusts and adapts the measured average delay once again to the value set for average delay. Then the entire procedure starts again from the beginning. In this case, no packets are lost. The following illustration shows this process:



7.4.5 Minimum Delay in Adaptive Jitter Buffers

In adaptive operating mode, the jitter buffer tries to keep the average delay as low as possible. In a situation where no jitter occurs, the average delay falls to a minimum. This minimum can be set on the HG board. The average delay that is adjusted on the basis of the current measured delay therefore fluctuates between two limits: the minimum delay set and the maximum delay set. The following illustration shows this:



The minimum and maximum delay limits are even maintained in the event of packet loss.

7.4.6 Packet Loss Verification in Adaptive Jitter Buffers

To avoid excessive packet loss, two factors are considered when calculating the average delay for adaptive jitter buffers: 1. the current delay measured 2. the number of packets lost

The weighting of the second factor can be set using a "preference" parameter in the HG board. Using values between 0 and 8, you can set whether more emphasis should be placed on minimizing the delay or preventing packet loss when calculating the average delay. Here, 0 means "avoid packet loss as far as possible" and 8 means "keep average delay as low as possible". The average value (4) is set by default.

The following rule of thumb applies: the value 0 produces an average delay that is approximately 10 ms longer than the average value 4 and the value 8 produces an average delay that is approximately 10 ms shorter than the average delay 4.

7.5 H.235 Security

The H.235 protocol enhances the capabilities of H.323 and other protocols to include security functions for authentication, data protection, and data integrity. H.235 supports various encryption algorithms and adjustable options, such as, key length.

HG 3500/3575 supports the H.235 protocol. The basic settings, however, are not included in the gatewayâs configuration scope, but are rather included in OpenScape 4000 Manager.

7.6 Using SNMP

HG 3500/3575 offers SNMP support.

Relevant WBM functions:

see Section 6.5, "SNMP"

The application for using SNMP functionality is an MIB browser, for example, as part of Hewlett-Packard's "Network Node Manager".

7.6.1 SNMP Traps

Table 16: Generic SNMP Traps (MIB-2)

Trap
COLD START
WARM START
INTERFACE UP
INTERFACE DOWN
AUTHENTICATION ERROR (incorrect SNMP community name)

The following HG 3500/3575-specific trap classes are available:

- General traps
- Reboot traps
- Threshold/statistic, resource/diagnostic traps,
- Security traps
- License traps
- Traps for internal errors

The following tables list the individual traps for each of these classes. A distinction is made under "Type" between hardware traps (HW) and software traps (SW).

Table 17: General Traps (HG 3500/3575-Specific)

Type (SW/ HW)	Trap Message	Explanation
SW	MSG_GW_SUCCESSFUL-LY_STARTED	Gateway successfully started

Table 18: Reboot Traps (HG 3500/3575-Specific)

Type (SW/ HW)	Trap Message	Explanation
SW	*MSG_CAT_H323_REBOOT*	Reboot with H.323
SW	*MSG_CAT_HSA_REBOOT*	Reboot with HSA
SW	*MSG_ADMIN_REBOOT*	Reboot with WBM/CLI-Admin, software upgrade or data restore

Type (SW/ HW)	Trap Message	Explanation
SW	*MSG_SYSTEM_REBOOT*	Automatic reboot, for example with Garbage Collection
SW	*MSG_EXCEPTION_REBOOT*	Reboot with SW exception
SW	*MSG_RESTORE_CFG_REBOOT*	Reboot following data recovery by HBS
SW	*MSG_GW_OBJ_MEMORY_EXHAUSTED*	Too much memory reserved or insufficient memory
SW	*MSG_GW_OBJ_ALLOC_FAILED*	Too much memory reserved or insufficient memory
SW	*MSG_GW_OBJ_MEMORY_INCONSISTENT*	Memory overwritten or shared memory is shared again
SW	*ASSERTION_FAILED_EVENT*	Reboot following declared exception
SW	*EXIT_REBOOT_EVENT*	Reboot following exception on termination
SW	*MSG_TLS_POOL_SIZE_EXCEEDED*	Internal pool size configuration problem
SW	*MSG_SSM_NUM_OF_CALL_LEGS_2BIG*	No longer possible as two call legs per session
SW	*MSG_SSM_SESSION_CREATION_FAILED*	No session created, therefore signaling no longer possible
n/a	*MSG_ASP_REBOOT*	Reboot from DSP driver
HW	MSG_DSP_REBOOT	Reboot following DSP error
HW	*MSG_DELIC_ERROR*	Reboot following DELIC error

Table 19: Threshold/Statistic, Resource/Diagnostic Traps (HG 3500/3575-Specific)

Type (SW/ HW)	Trap Message	Explanation
HW	MSG_IP_LINK_FAILURE	IP-Link 1 up/down
HW	MSG_IP_LINK_FAILURE	IP Link 2 up/down
HW	MSG_OAM_HIGH_TEMPERATURE_EXCEPTION	Temperature limit reached (too hot)
SW	MSG_GW_OBJ_MEMORY_EXHAUSTED	Out of memory
SW	MSG_GW_OBJ_ALLOC_FAILED	Out of memory (signaled by external source)

Type (SW/ HW)	Trap Message	Explanation
SW	MSG_GW_OBJ_MEMORY_INCONSISTENT	Memory inconsistency
SW	MSG_TLS_POOL_SIZE_EXCEEDED	No more internal pools
SW	MSG_OAM_RAM_THRESHOLD_REACHED	RAM limit reached
SW	MSG_OAM_DMA_RAM_THRESH-OLD_REACHED	DRAM limit reached
SW	MSG_OAM_THRESHOLD_REACHED	Limit reached, for example, for flash memory or IP pools
SW	MSG_DVMGR_LAYER2_SERVICE_TRAP	B channel up/down

Table 20: Security Traps (HG 3500/3575-Specific)

Type (SW/ HW)	Trap Message	Explanation
SW	MSG_HACKER_ON_SNMP_PORT_TRAP	Unauthorized access to SNMP port

Table 21: License Traps (HG 3500/3575-Specific)

Type (SW/ HW)	Trap Message	Explanation
SW	MSG_LIC_DATA_ACCEPTED	License data accepted
SW	MSG_LIC_DATA_CORRUPTED	License data incomplete
SW	MSG_LIC_DATA_NOT_ACCEPTED	License data not accepted

Table 22: Traps for Internal Errors (HG 3500/3575-Specific)

Type (SW/ HW)	Trap Message
SW	MSG_WEBSERVER_MAJOR_ERROR
SW	MSG_SSM_NUM_OF_CALL_LEGS_2BIG
SW	MSG_SSM_SESSION_CREATION_FAILED
SW	MSG_IPNCV_STARTUP_ERROR
SW	MSG_IPNCV_STARTUP_SHUTDOWN
SW	MSG_IPNCV_INTERNAL_ERROR
SW	MSG_IPNCV_MEMORY_ERROR
SW	MSG_IPNCV_SIGNALING_ERROR

The weighting of the individual traps can vary depending on the severity of the event or error and is described by the following categories:

- Cleared (problem already resolved)
- Indeterminate (no classification possible)
- Critical (critical error)
- Major (major error)
- Minor (minor error)
- Warning (warning only)
- Information (for information only)

General traps, such as MSG_GW_SUCCESSFULLY_STARTED, are sent as "information".

Reboot traps are always "critical", "major" or "minor" errors.

Threshold/resource traps occur as follows: When an event is received, the trap is sent as either "Warning", "Minor" or "Major". If the trap recurs, reminders are sent (at increasing intervals) with a weighting that is at least the same or higher than the initial trap. If the event was corrected (for example, "Link up" or sufficient RAM was provided), the trap is sent with the category "Cleared".

7.6.2 SNMP Functions

The SNMP functions include:

- With MIB browser and standard MIB (based on RFC1213):
- – querying and modifying standard MIB 2 parameters
- With MIB browser and private MIB:
- – querying and modifying HG 3500/3575âs private MIB parameters
- With OpenScape 4000 Manager:
- – defining communities of standard parameters (classes of service)
  – defining trap communities and stations to which the traps are sent
  – defining the trap level for various trap groups (error sensitivity)
- With trap receiver:
- – receiving traps

  MIBs also contain a brief commentary explaining the meaning of each parameter.

  The following is a list of some parameters:
- mgmt > mib-2 > system > sysUpTime: time since the last HG 3500/3575 startup
- HLB2MIB > siemensUnits > pn > hlb2mib > controlGrouphlb20 > sysSoftwareVersion: board software release
- mgmt->mib-2->ip->ipRouteTable: HG 3500/3575 routing table

HG 3500/3575 sends SNMP traps (diagnostic and error messages) to the stations configured under "SNMP > Trap Communities". These messages are transmitted in accordance with the severity levels set under "SNMP".

Examples of traps generated by HG 3500/3575:

1) Generic traps (cannot be deactivated):

2)
- warm start
- cold start
- authentication failure

3) Enterprise traps (can be configured)

4)
- data init (WARNING - forced data reinitialization)
- memory low (WARNING - memory resources below the threshold)
- duplicate mac (MINOR - duplicated MAC address)
- ip firewall (WARNING - IP firewall violation)
- mac firewall (WARNING - MAC firewall violation)
- isdn access (WARNING - ISDN access verification)

SNMP information can also be sent as e-mail to a mail address configured with the WBM.

7.7 Fault Detection with Traps, Traces, and Events

Board errors can be detected and traced with the following options:

- **Traps** indicate irregular states, critical errors or important system information.
- **Traces** log the execution of a software component.
- **Events** report system problems or system information.

Traces and events are written to their own event log files.

Relevant WBM functions:

See Section 6.5.3, "Traps" See Section 6.4, "Traces & Events" See Section 6.4.2, "Events"

References to trace components, trace profiles, and events:

See Section 8.1, "Traces" See Section 8.2, "Events"

7.7.1 Traps

When board problems occur, traps are generated to inform the administrator of errors. The following types of trap are available:

- System Traps
- Performance Traps

WBM displays traps dynamically. The list of traps is refreshed every 30 seconds. You can also manually refresh the display.

System Traps

These traps:

- indicate system errors and require the administrator to take countermeasures,
- or they signal important system information.

Table 23: System Traps

Trap	Recommended action
Board started successfully	Information only, no action required

Trap	Recommended action
Reboot initiated by administrator, garbage collection, VxWorks, H.323 or H.323 Stack Adapter (HSA)	The reboot will be executed, no action required
Memory problems (memory full, memory allocation failed, memory is inconsistent)	Reboot will be executed automatically, no action required
Internal software problem (Check failed, "exit" event, problem with configuring pool size, session setup)	Reboot will be executed automatically, no action required
Flash memory capacity has been reached	Remove any unnecessary files from flash memory (this should only be done by a system specialist)
IP network stack resources are exhausted	Check the IP configuration of the gateway and routers
SCN connection error	Information only, no action required

Performance Traps

These traps indicate performance problems.

Table 24: Performance Traps

Trap	Recommended action
System memory is full	none
DMA memory is full	none
Temperature threshold on the board is exceeded	When using a ventilator kit: check that the fan is working correctly.

7.7.2 Traces

A trace logs the execution of a software component. A technician can use these process records to find the cause of an error.

Trace results can be:

- saved in a log file and/or
- saved on a PC via a LAN connection.

The following trace functions are available:

Table 25: Trace Functions

Trace function	Description
Trace Format Configuration	Specify which header data appears in the trace and how the trace data should be formatted for the output.

Trace function	Description
Trace Output Interfaces	Specify which interface should be used to output trace data.
Trace Log	Loads trace results as a log file from the board to a destination computer via HTTP and enables trace data to be deleted from the board.
Customer Trace Log	The HG 3500/3575 customer trace log can be displayed, loaded via HTTP to the administration PC and deleted from the gateway flash memory.
Trace Profiles	Groups the monitoring of individual components into customized profiles. Profiles can be created, changed, started or deleted.
Trace Components	Monitoring can be started or enabled and disabled for each component individually. In addition, the data to be entered for each component can be specified.

The possible settings are described in Section 6.4, "Traces & Events".

If the load is particularly heavy, the board may not be able to process all trace information. For more information, refer to Section 6.4.1.4, "Overloading the Board with Trace Information".

7.7.3 Events

Events notify you of system faults. Check the network configuration and/or gateway configuration to clear up any abnormalities.

Depending on the setting and the class of problem, events can generate an SNMP trap, send a message to the OpenScape system, send an E-mail, initiate a trace observation and reboot the board.

Events are always written to a log file (see Section 7.7.4, "Event Log Files").

7.7.4 Event Log Files

All events are written to a log file of a limited size. When the maximum file size is exceeded, new messages overwrite the oldest entries.

The event log file name is:

evtlog.txt

It is saved in the HG 3500/3575 flash memory in the following directory:

\tffs\evtlog

The event log file can be transferred to a PC. Use the WBM maintenance function "Load via HTTP" for this.

The meanings of these entries are as follows:

Table 26: Meanings of Entries in Event Log Files

Entry in Log File	Meaning
IFTABLE	Name of component that initiated the event
tH323-CLP	Name of task that initiated the event
03/17/2000	Date of event
08:13:56.828020	Time of event in hh:mm:ss (seconds with six places after decimal point)
ciftable01.cpp 433	Name of source file with line number where event occurred
csevWarning	Event class
MSG_DVMGR_INTERROR_DEVID	Internal event code
DeviceID(0XFFFFFFFF): CIlfTable:: fCheckConsistency Persistency files and hw_specification inconsistent!	Text in event file

8 Appendix: Traces and Events

This reference chapter contains:

- *Traces*, described according to individual trace components and trace profiles. Traces can be administered using the WBM (See Section 6.4, "Traces & Events", and in particular Section 6.4.2, "Events" and Section 6.4.2, "Events").
- *Events*, described according to individual event codes. Events can be administered using the WBM (See Section 6.4.2, "Events").

8.1 Traces

NOTICE: If traces are requested by the service, then the components and profiles to be traced are also notified.

8.1.1 Trace Components

The table is used for locating the trace components more quickly. The trace components are created in the same sequence as in WBM.

Overview of Trace Components
ADMIN
ASP
ASP_DSP
ASP_DSP_EVENT
ASP_DSP_IFTASK
ASP_DSP_INIT
ASP_DSP_IOCTL
ASP_DSP_STAT
ASP_FAX
ASP_PS
ASP_VMOD
ASP_VMUX
CARDADM
CFG_CODECS
CFG_H235
CFG_H323
CFG_H323ENDPOINT

Overview of Trace Components
CFG_H323GKI
CFG_H323GWI
CFG_H323I
CG
CMGMT
CNQ
CNQIWK
COMMUNITIES
CPMSG
CPUTRACE
CTS
DELIC_DRIVER
DEVMGR
DISPATCH
DLSC
DMC
DSP
DSP_TRACE
DSS1
EMAIL_MANAGER
EMIWK
EVTLOG
EVTLOGTRAP
FAXCONV_IF
FAXCONV_LOGT
FAXCONV_OS
FAXCONV_T30DOWN
FAXCONV_T30INT
FAXCONV_T30UP
FAXCONVERTER
FMSEM

Overview of Trace Components
GATEWAY
GWGLOBAL_DATA
GWGLOBAL_SI_DOWNL_PORTFUNC (HG 3500 only)
GWSI (HG 3500 only)
H323
H323_EPT
H323_GLOBAL_SI_DOWNLOADS
H323_SPE
H323IWK
H323MSG
HFAC (HG 3500 only)
HSA_H225_CS
HSA_H225_RAS
HSA_H245
HSA_H323_NSD
HSA_RV_LOG
HSA_SPE
HSA_SYSTEM
ICC
IFTABLE
IP_ROUTES
IPMONITOR
IPSTACK
IPSTACK_1LAN_IF
IPSTACK_2LAN_IF
IPSTACK_GLOBAL
IPSTACK_IPFILTER
IPSTACK_MACFILTER
IPSTACK_NAT
IPSTACK_ROUTE
IPSTACK_SNTPS

Overview of Trace Components
ISDN_FM
LAN
LICMGMT
LOCSERV
LOCSERV_CFG
LOCSERV_QUERY
LOCSERV_REG
LOG_MSG
LSDCL
LTUC
MANAGER
MAT_STREAM
MCP
MGAF_TBL
MIKEY
MMX (HG 3575 only)
MPH
MSC
MSC_DSP
MSC_QM
MSC_RTCP
MSC_SPECIFIC_STAT
MSC_TMT
MSP_CAPI_IF
MSP_HDLC
MSP_PPP_IF
MSP_RTP_MOD
NWRS
OAM
OAM_ACTIONLIST
OSF_PCS

Overview of Trace Components
PERFM_PL
PERFM_SIG
PLATFORM
PORT
PORT_MGR
PPP_CC
PPP_STACK_DBG_IF
PPP_STACK_PROC
PPPM_TBAS
PPPM_TEXT
PPPM_TSTD
PPTP_DBG_IF
PPTP_PROC
Q931
QDC
QDC_UDPPING
ROUTE98
RTPQM
SACCOB_DRV (HG 3500 only)
SCN
SCNPAY
SDR
SECURE_TRACE
SECURITY_SVC
SENDTMT
SENTA_API
SERVICE_TRACE
SESSION_MGMT
SI
SIP
SIP_CFG

Overview of Trace Components
SIP_CFG_INT
SIP_FM
SIP_GLOBAL_SI_DOWNLOADS
SIP_HT
SIP_REG
SIP_SA
SIP_TRK
SIP_TRK_FM
SIU_STARTUP
SLMO_HFA
SNMP
SPE_SVC
SPL
SS
SSL_UTIL
SSM
STACKTRACE
STATIC_ROUTES
STB (HG 3575 only)
STRC
STREAMS
SWCONF
SYSTEM
T90
TC (HG 3500 only)
TCP_IP_CONF (HG 3575 only)
TCPMOT_WT (HG 3575 only)
TCPSIG (HG 3575 only)
TCPSIG_WT (HG 3575 only)
TCPSUV (HG 3575 only)
TCPSUV_WT (HG 3575 only)

Overview of Trace Components
TESTLW
TIME_SYNC
TIME_SYNCH_TASK (HG 3575 only)
TOOLS
TRAP
TSA (HG 3500 only)
WAN
WEBAPPL
WEBSERVER
WEBSERVER_STATISTIC
WEBSRV_CLIENT_IF
WEBSRV_SYS_IF
X25
X75
XMLUTILS

ADMIN

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Incoming and outgoing admin messages with all details. This impacts the system performance.

Trace level **9** (DETAIL): Incoming and outgoing admin messages with all details, likewise internal admin messages such as poll information. This impacts the system performance significantly.

ASP

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Information on connection setup and cleardown.

Trace level **9** (DETAIL): Detailed information on connection setup and cleardown from MSP (with the exception of DSP-DD)

ASP_DSP

Configured default trace level: **0** (STATUS)

ASP_DSP_EVENT

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Information on detected tone selection or fax devices or modems.

ASP_DSP_IFTASK

Configured default trace level: **0** (STATUS)

ASP_DSP_INIT

Configured default trace level: **0** (STATUS)

ASP_DSP_IOCTL

Configured default trace level: **0** (STATUS)

Trace level **9** (DETAIL): Detailed information on connection setup and cleardown (with all parameters).

ASP_DSP_STAT

Configured default trace level: **0** (STATUS)

Trace level **6** (INTRA): Information on data channel configuration following connection setup (fax, modem, V.110).

ASP_FAX

Configured default trace level: **0** (STATUS)

ASP_PS

Configured default trace level: **0** (STATUS)

ASP_VMOD

Configured default trace level: **0** (STATUS)

ASP_VMUX

Configured default trace level: **0** (STATUS)

CARDADM

Configured default trace level: **0** (STATUS)

CFG_CODECS

Configured default trace level: **0** (STATUS)

CFG_H235

Configured default trace level: **0** (STATUS)

CFG_H323

Configured default trace level: **0** (STATUS)

CFG_H323ENDPOINT

Configured Default Trace Level: 0 (STATUS)

CFG_H323GKI

Configured default trace level: **0** (STATUS)

CFG_H323GWI

Configured default trace level: **0** (STATUS)

CFG_H323I

Configured default trace level: **0** (STATUS)

CG

Configured default trace level: n/a

CMGMT

Configured default trace level: **0** (STATUS)

Trace level **0-9**: Status Output (0) Detailed Information (9) for CLI Actions
Please only use this trace component following consultation with Development!

CNQ

Configured default trace level: 3

Trace level **0**: ISDN trace

Trace level **1**:ISDN trace with data

Trace level **2**:Transport container trace

Trace level **3**:Trace of all parameters including the transport container

Trace level **4**:TMT trace

Trace level **5**:TMT trace and ISDN trace

Trace level **6**:TMT trace and ISDN trace with data

Trace level **7**:TMT-TMT trace and transport container

Trace level **8**:TMT-TMT trace and all parameters including the transport container

Trace level **9**:TMT-TMT trace and all parameters including the transport container and ASN.1 trace

CNQIWK

Configured default trace level: **3**

Trace level **0** - 9 see *CNQ*

COMMUNITIES

Configured default trace level: **0** (STATUS)

Trace level **6** (INTRA): Adding, deleting, modifying read, write or trap communities for SNMP. Receipt of SNMP trap destinations with automatic search.

CPMSG

Configured default trace level: **0** (STATUS)

CPUTRACE

Configured default trace level: **0** (STATUS)

CTS

Configured default trace level: **0** (STATUS)

DELIC_DRIVER

Configured default trace level: **0** (STATUS)

Trace level **0**-**9**: Status information up to detailed information on the DELIC driver (SWC). For developers only.

DEVMGR

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Shows CP interface functions for connection setup and connection errors.

DISPATCH

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Listing of header data for all messages sent via the dispatcher. This impacts the system performance. The setting is preferred in order to get an idea of all messages sent via the dispatcher.

Trace level **6** (INTRA): This impacts the system performance quite significantly. The setting should only be used in order to get message details.

Trace level **6/9** (INTRA/DETAIL): Problems with the logical message queue (see comments above). Incorrectly coded component message handling, internal software problems: - Message not unregistered (incorrect RecvListType), - Message not registered (incorrect RecvListType), - Posting of message unsuccessful (incorrect RecvListType), - Sending of message unsuccessful (incorrect RecvListType), - Unregistered posting of message, - Unregistered sending of message.

DLSC

Configured default trace level: **0** (STATUS)

DMC

Configured default trace level: **0** (STATUS)

DSP

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Not used

Trace level 3-**9** : Messages output from the DSP and displayed by the DSB driver.

DSP_TRACE

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Not used

DSS1

Configured default trace level: **3**

Trace level **0** - 9 see *CNQ*

EMAIL_MANAGER

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Information on mail dispatch and connections to the mail server.

EMIWK

Configured default trace level: **0** (STATUS)

EVTLOG

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Make sure that events are also visible on the console / in the trace log / via LAN trace.

Trace level **6** (INTRA): Mutex blocking situations.

EVTLOGTRAP

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Activation/deactivation of a trace profile for a registered event.

FAXCONV_IF

Configured default trace level: **0** (STATUS)

Trace level **0-9**: Status information up to detailed information on the CAPI interface actions of the fax converter. For developers only.

FAXCONV_LOGT

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Customer trace for displaying faulty fax transmissions.

FAXCONV_OS

Configured default trace level: **0** (STATUS)

Trace level **0-9**: Status information up to detailed information on the OS interface actions of the fax converter. For developers only.

FAXCONV_T30DOWN

Configured default trace level: **0** (STATUS)

Trace level **0-9**: Status information up to detailed information on the downstream interface actions of the fax converter T.30 module. For developers only.

FAXCONV_T30INT

Configured default trace level: **0** (STATUS)

Trace level **0-9**: Status information up to detailed information on the actions of the fax converter T.30 module. For developers only.

FAXCONV_T30UP

Configured default trace level: **0** (STATUS)

Trace level **0-9**: Status information up to detailed information on the upstream interface actions of the fax converter T.30 module. For developers only.

FAXCONVERTER

Configured default trace level: **0** (STATUS)

Trace level **0-9**: Status information up to detailed information on the routines and data flow interface actions of the fax converter. For developers only.

FMSEM

Configured default trace level: **0** (STATUS)

GATEWAY

Configured default trace level: **0** (STATUS)

GWGLOBAL_DATA

Configured default trace level: **0** (STATUS)

GWGLOBAL_SI_DOWNL_PORTFUNC (HG 3500 only)

Configured default trace level: **3** (INTER)

Indicates if port/channel download data is received from the system interface containing information about the function type and the number of b channels for a port/channel.

GWSI (HG 3500 only)

Configured default trace level: **0** (STATUS)

H323

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): general information.

Trace level **3** (INTER): Receipt of dispatcher messages, admin recipients.

Trace level **6** (INTRA): Posting/sending of messages to other components.

Trace level **9** (DETAIL): Trace for function/parameter.

H323_EPT

Configured default trace level: **9** (DETAIL)

H323_GLOBAL_SI_DOWNLOADS

Configured default trace level: **0** (STATUS)

Trace level **9** (DETAIL): Trace for download data.

H323_SPE

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): H.323 Protocol Manager: SPE 2 traces

Trace level 3 (INTER)

Trace level **6** (INTRA)

Trace level 9 (DETAIL)

H323IWK

Configured default trace level: **0** (STATUS)

H323MSG

Configured default trace level: **0** (STATUS)

H323STACK

Configured default trace level: 0 (STATUS)

HFAC (HG 3500 only)

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Status information about the HFAC component, component initialization.

Trace level **3** (INTER): Basic communication between the other components and the HFAC component, information about the basic-connected clients.

Trace level **6** (INTRA): Internal method calls and detailed information about the component.

Trace level **9** (DETAIL): Internal debugger information.

HSA_H225_CS

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): general information, H.323 stack API errors.

Trace level **3** (INTER): callbacks that caused a message to be sent to the H.323 Protocol Manager; stack API functions that triggered a LAN message.

Trace level **6** (INTRA): PVT use of the H.323 stack.

Trace level **9** (DETAIL): function/parameter trace.

HSA_H225_RAS

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): general information.

Trace level **3** (INTER): callbacks that caused a message to be sent to the H.323 Protocol Manager; stack API functions that triggered a LAN message.

Trace level **6** (INTRA): only used in exceptional situations.

Trace level **9** (DETAIL): function/parameter trace.

HSA_H245

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): general information.

Trace level **3** (INTER): callbacks that caused a message to be sent to the H.323 Protocol Manager; stack API functions that triggered a LAN message.

Trace level **6** (INTRA): callbacks that only collect parameter information.

Trace level **9** (DETAIL): function/parameter trace.

HSA_H323_NSD

Configured default trace level: **0** (STATUS)

Trace-Level **3** (INTER): No standard data traces.

Trace-Level **6** (INTRA):

HSA_RV_LOG

Configured default trace level: **6** (DETAIL)

Trace level **6** (INTRA): logging of RADVision stack traces.

HSA_SPE

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): H.323 stack adapter SPE2 traces

Trace level **3** (INTER)

Trace level 6 (INTRA)

Trace level 9 (DETAIL)

HSA_SYSTEM

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS), Trace level **3** (INTER), Trace level **6** (INTRA), Trace level **9** (DETAIL): Configuration and start issues as well as information not relating to the protocol.

ICC

Configured default trace level: **0** (STATUS)

IFTABLE

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Indicates errors.

Trace level **6** (INTRA): Indicates function calls with important parameters.

Trace level **9** (DETAIL): Not used.

IP_ROUTES

Configured default trace level: **0** (STATUS)

IPMONITOR

Configured default trace level: **0** (STATUS)

IPSTACK

Configured default trace level: **0** (STATUS)

Trace level **9** (DETAIL): Error situation with IP accounting hash functions. For developers only.

IPSTACK_1LAN_IF

Configured default trace level: **0** (STATUS)

Trace level **9** (DETAIL): Handling of configuration data.

IPSTACK_2LAN_IF

Configured default trace level: **0** (STATUS)

Trace level **9** (DETAIL): Handling of configuration data.

IPSTACK_GLOBAL

Configured default trace level: **0** (STATUS)

IPSTACK_IPFILTER

Configured default trace level: **0** (STATUS)

IPSTACK_MACFILTER

Configured default trace level: **0** (STATUS)

IPSTACK_NAT

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Initialization.

Trace level **6** (INTRA): Detailed information about NAT processes.

Trace level **9** (DETAIL): Translated data.

IPSTACK_ROUTE

Configured default trace level: **0** (STATUS)

Trace level **9** (DETAIL): Error situation with routing data.

IPSTACK_SNTPS

Configured default trace level: **0** (STATUS)

ISDN_FM

Configured default trace level: **3**

Trace level **3:** ISDN FM trace (default)

LAN

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): shows various normal operation procedures and errors.

Trace level **6** (INTRA): Displays interface functions with important parameters.

Trace level **9** (DETAIL): shows detailed information.

LICMGMT

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): not used

Trace level **3** (INTER): Messages received and sent via admin interface.

Trace level **6** (INTRA): Function terminations and results.

Trace level **9** (DETAIL): Other details.

LOCSERV

Configured default trace level: **0** (STATUS)

LOCSERV_CFG

Configured default trace level: **0** (STATUS)

LOCSERV_QUERY

Configured default trace level: **0** (STATUS)

LOCSERV_REG

Configured default trace level: **0** (STATUS)

LOG_MSG

Configured default trace level: **0** (STATUS)

LSDCL

Configured default trace level: n/a

LTUC

Configured default trace level: n/a

MANAGER

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Problems deleting, adding or changing manager objects.

MAT_STREAM

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Not used

Trace level 3-**9** : Internal messages from Materna storage management.

MCP

Configured default trace level: **0**

Trace level **0** (STATUS): Start and stop, errors received from other components.

Trace level **3** (INTER): Received/sent message or function entry, etc.

Trace level **6** (INTRA): Function-specific information.

Trace level **9** (DETAIL): Function-specific information with data.

MGAF_TBL

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Serious errors, for example missing parameters, invalid session ID, etc.

Trace level **3** (INTER): Status information on logins, logouts and connections.

Trace level **6** (INTRA): Detailed socket information.

MIKEY

Configured default trace level: **3** (INTER)

MMX (HG 3575 only)

Configured default trace level: **0** (STATUS)

MPH

Configured default trace level: **0** (STATUS)

MSC

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): API for Magic (function calls with parameters).

Trace level **3** (INTER): The input/output controls for the MSP are defined additionally.

Trace level **6** (INTRA): Tracking of internal MSC functions and handles/file descriptors.

Trace level **9** (DETAIL): Settings for configuration parameters (MSC, MSP/DSP) are defined. Detailed information on all MSC functions.

MSC_DSP

Configured default trace level: **0** (STATUS)

MSC_QM

Configured default trace level: **0** (STATUS)

Trace level **9** (DETAIL): Detailed information on all MSC functions (only in RTCP context).

Trace level **3** (INTER): Information about quality surveillance

MSC_RTCP

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): General information on RTCP session, timer etc.

Trace level **3** (INTER): Callback function of MSP for RTCP events.

Trace level **6** (INTRA): Internal functions that were called during an RTCP session.

Trace level **9** (DETAIL): Detailed information on all MSC functions (though only in RTCP context).

MSC_SPECIFIC_STAT

Configured default trace level: **0** (STATUS)

MSC_TMT

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): MSC functions called by Magic are tracked.

Trace level **6** (INTRA): All input/output controls (interface to MSP) are tracked.

MSP_CAPI_IF

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Not used.

Trace level **3-9**: Internal messages from CAPI interface driver.

MSP_HDLC

Configured default trace level: **0** (STATUS)

Trace level **0-9**: Detailed information on HDLC driver actions â“ only for developers.

MSP_PPP_IF

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Not used.

Trace level **3-9**: Internal messages from PPP interface driver.

MSP_RTP_MOD

Configured default trace level: **0** (STATUS)

NWRS

Configured default trace level: **0** (STATUS)

OAM

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Data flow from uploads and backup, export and upgrade actions (requires execution of the admin action).

Trace level **3** (INTER): Data flow of routing wizard actions (not relevant for HG 3500/3575).

Trace level **4**: Memory overrun information for all tasks.

Trace level **5**: Memory occupancy information for all tasks.

Trace level **5**: Execution of OAM threshold timer.

Trace level **6** (INTRA): Problems with OAM task queue (queue full, etc.).

Trace level **6** (INTRA): Problems when configuring SNTP time synchronization (not relevant for HG 3500/3575, moved to TIME_SYNC component).

OAM_ACTIONLIST

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Execution of automatic actions (garbage collection, gatekeeper switchback, etc.).

OSF_PCS

Configured default trace level: **3** (INTER)

PERFM_PL

Configured default trace level: **0** (STATUS)

PERFM_SIG

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Performance trace for signaling part.

PLATFORM

Configured default trace level: **0** (STATUS)

PORT

Configured default trace level: **0** (STATUS)

PORT_MGR

Configured default trace level: **0** (STATUS)

PPP_CC

Configured default trace level: **3** (INTER)

Trace level **0** (STATUS): Not used.

Trace level **3** (INTER): External interfaces for controlling PPP connections to other components, e.g. PPP Manager.

Trace level **6** (INTRA): External and internal PPP connection control interfaces.

Trace level **9** (DETAIL): External and internal interfaces as well as details of processes within PPP connection control.

PPP_STACK_DBG_IF

Configured default trace level: **0** (STATUS)

Trace level **6**-**9**: Other detailed information on call settings/connection cleardown.

Trace level **3** (INTER): PPP stack internal error messages.

PPP_STACK_PROC

Configured default trace level: **0** (STATUS)

Trace level **6**-**9**: PPP stack internal program flow.

Trace level **3** (INTER): Status of a PPP connection setup/cleardown.

PPPM_TBAS

Configured default trace level: **0** (STATUS)

Trace level **6**-**9**: PPP negotiation phase.

Trace level **0** (STATUS): PPP Manager: Basic configuration and status messages, abnormal conditions.

PPPM_TEXT

Configured default trace level: **0** (STATUS)

Trace level **3**-**9**: Advanced information on internal processes in the PPP Manager.

PPPM_TSTD

Configured default trace level: **0** (STATUS)

Trace level **3**-**9**: Internal message flow of PPP Manager.

PPTP_DBG_IF

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Not used

Trace level 3-**9** : Internal error messages from PPTP for debugging.

PPTP_PROC

Configured default trace level: **0** (STATUS)

Trace level **9** (DETAIL): Detailed information on MSC-specific quality data.

Trace level 3 (INTER): Information on setting up/clearing down calls at the PPP management interface.

Q931

Configured default trace level: **3**

Trace level **0** - 9 see *CNQ*

QDC

Configured default trace level: **0**

Trace level **0**: Status information on the QDC client; the traces are only displayed once.

- Information on starting/stopping the QDC client.
- Indicates if transmission to the QCU/NetMgr was started or interrupted.

Trace level **3**: Flowcharts and error messages at top level.

Trace level **6**: Flowcharts and traces are displayed when a function or class method is entered.

Trace level **9**: Detailed information about internal data and interface data.

- Buffer contents, for example QoS report from MSC/to QCU.
- Interface data

QDC_UDPPING

Configured default trace level: **0**

Trace level **0**: Status information about the QDC UDP ping. The traces are only displayed once:

1) Information on starting/stopping the QDC UDP ping.

2) • Indicates if the UDP listening task was started or interrupted.

Trace level **3**: Flowcharts and error messages at top level.

Trace level **6**: Flowcharts:

• Traces are displayed when a function or class method is entered.

Trace level **9**: Detailed information about internal data and interface data:

• Interface data

REMSURV

Configured default trace level: n/a

ROUTE98

Configured default trace level: **0** (STATUS)

RTPQM

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Trace for the function "Fallback to SCN".

Trace level **3** (INTER): Trace for the function "Fallback to SCN".

Trace level **6** (INTRA): Trace for the function "Fallback to SCN".

Trace level **9** (DETAIL): Trace for the function "Fallback to SCN".

SACCOB_DRV (HG 3500 only)

Configured default trace level: 0 (STATUS)

SCN

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Indicates different normal operational processes and errors.

Trace level **6** (INTRA): Indicates interface functions with important parameters.

Trace level **9** (DETAIL): Indicates detailed information.

SCNPAY

Configured default trace level: **0** (STATUS)

SDR

Configured default trace level: **0** (STATUS)

SECURE_TRACE

Configured default trace level: **0** (STATUS)

SECURITY_SVC

Configured default trace level: **0** (STATUS)

Trace level **0**: Fatal errors, for example missing parameters, invalid commands.

Trace level **3**: Status information and handling.

Trace level **6**: Detailed information, method calls.

SENDTMT

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Error sending or posting a message (extra info for TMT).

Trace level **3** (INTER): Receiving a message (extra info for TMT).

SENTA_API

Configured default trace level: **0**

Trace level **3** (INTER): An error has occurred.

Trace level **6** (INTRA): Functions and results exist.

Trace level **9** (DETAIL): Details.

SERVICE_TRACE

Configured default trace level: **0** (STATUS)

SESSION_MGMT

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Information on: GetUserInfo, SessionUpdate, SessionID-Verification

Trace level **6** (INTRA): Creation or verification of an admin session (only >= 2.1), updating of an admin session, deletion of an expired admin session, closing admin sessions, write authorization key/access handling (get/release).

Trace level **9** (DETAIL): Continuously updates admin session data with/without synchronization.

SI

Configured default trace level: **0** (STATUS)

SIP

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): SIP Protocol Manager: Status information trace Trace level **3** (INTER): Messages to other components Trace level **6** (INTRA): Messages after SSA Trace level **9** (DETAIL): All other actions

SIP_CFG

Configured default trace level: **0** (STATUS)

Trace level **9** (DETAIL): Configuration data trace that can be accessed via WBM.

SIP_CFG_INT

Configured default trace level: **0** (STATUS)

Trace level **9** (DETAIL): Internal configuration data trace.

SIP_FM

Configured default trace level: **3**

Trace level **0**: not used.

Trace level **3**: external interfaces of the SIP feature manager.

Trace level **6**: external and internal interfaces of the SIP feature manager.

Trace level **9**: external and internal interfaces and details of the processing method within the SIP feature manager.

SIP_GLOBAL_SI_DOWNLOADS

Configured default trace level: **0** (STATUS)

Trace level **9** (DETAIL): Trace for the system interface's download data.

SIP_HT

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): SIP for H.323 converter: SIP call signaling. Trace level **3** (INTER): Trace level **6** (INTRA): Trace level **9** (DETAIL):

SIP_REG

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): SIP stack adapter: REGISTER and OPTIONS Trace level **3** (INTER): Trace level **6** (INTRA): Trace level **9** (DETAIL):

SIP_SA

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): SIP stack adapter Trace level **3** (INTER): Trace level **6** (INTRA): Trace level **9** (DETAIL):

SIP_TRK

Configured default trace level: **0** (STATUS)

SIP_TRK_FM

Configured default trace level: **0** (STATUS)

SIU_STARTUP

Configured default trace level: n/a

SLMO_HFA

Configured default trace level: **0** (STATUS)

SMP

Configured default trace level: **0** (STATUS)

SNMP

Configured default trace level: **0** (STATUS)

Trace level **0-9**: Status output (0) detailed information (9) on the configuration data (via SNMP) and internal SNMP information and problems. Please only use this trace component following consultation with Development!

SPE_SVC

Configured default trace level: **0** (STATUS)

SPL

Configured default trace level: **0** (STATUS)

SS

Configured default trace level: **0** (STATUS)

SSL_UTIL

Configured default trace level: **0** (STATUS)

SSM

Configured default trace level: **0** (STATUS)

STACKTRACE

Configured default trace level: **0** (STATUS)

STATIC_ROUTES

Configured default trace level: **0** (STATUS)

STB (HG 3575 only)

Configured default trace level: **3** (INTER)

Trace level **0** (STATUS): Startup and shutdown; errors received from other components.

Trace level **3** (INTER): Received and sent messages, etc.

Trace level **6** (INTRA): Function-specific information.

Trace level **9** (DETAIL): Function-specific information with data.

STRC

Configured default trace level: **0** (STATUS)

STREAMS

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Not used

Trace level 3-**9**: Internal messages from streams storage management.

SWCONF

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Serious errors, for example missing parameters, invalid commands, etc.

Trace level **3** (INTER): Status information on job handling and process.

Trace level **6** (INTRA): Detailed information on all types of jobs, for example HTTP file transfers, MGAF, etc.

SYSTEM

Configured default trace level: **3** (INTER)

Trace level **3** (INTER): Always on; global system information (do not change!).

T90

Configured default trace level: **0** (STATUS)

Trace level **0-9**: Status information up to detailed information on the actions of the T.90 protocol. For developers only.

TC (HG 3500 only)

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Status information about the TC component, component initialization.

Trace level **3** (INTER): Basic communication between other components and the TC component.

Trace level **6** (INTRA): Internal method calls and detailed information about the component.

Trace level **9** (DETAIL): Internal debugger information.

TCP_IP_CONF (HG 3575 only)

Configured default trace level: **0** (STATUS)

TCPMOT_WT (HG 3575 only)

Configured default trace level: **0** (STATUS)

TCPSIG (HG 3575 only)

Configured default trace level: **0** (STATUS)

TCPSIG_WT (HG 3575 only)

Configured default trace level: **0** (STATUS)

TCPSUV (HG 3575 only)

Configured default trace level: **0** (STATUS)

TCPSUV_WT (HG 3575 only)

Configured default trace level: **0** (STATUS)

TESTLW

Configured default trace level: **0** (STATUS)

Trace level **0**-9: Detailed information on TESTLW actions â“ only for developers.

TIME_SYNC

Configured default trace level: **0** (STATUS)

Trace level **6** (INTRA): Problems when configuring SNTP time synchronization (not relevant for HG 3500/3575).

TIME_SYNCH_TASK (HG 3575 only)

Configured default trace level: **0** (STATUS)

TOOLS

Configured default trace level: **0** (STATUS)

Trace level **6** (INTRA): End of a thread in class *OSThread*.

TRAP

Configured default trace level: **0** (STATUS)

Trace level **3** (INTER): Important status information (IP address and port trap, SNMP trap version). Serious error receiving traps.

Trace level **6** (INTRA): Status information such as: - Receive trap OK, - Trap received from localhost or woanders, - Error information. Addition of a trap to the trap memory and deletion of a trap from the trap memory.

Trace level **9** (DETAIL): Detailed information.

TSA (HG 3500 only)

Configured default trace level: **0** (STATUS)

Trace level **0** (STATUS): Status information about the TSA component, component initialization.

Trace level **3** (INTER): Basic communication between other components and the TSA component.

Trace level **6** (INTRA): Internal method calls and detailed information about the component.

Trace level **9** (DETAIL): Internal debugger information.

WAN

Configured default trace level: **0** (STATUS)

WEBAPPL

Configured default trace level: **0** (STATUS)

Trace level **3/6** (INTER/INTRA): Input/output of important Web application functions and methods (for developers).

WEBSERVER

Configured default trace level: **0** (STATUS)

Trace level **6** (INTRA): Input/output of important Web server functions and methods (for developers).

WEBSERVER_STATISTIC

Configured default trace level: **0** (STATUS)

WEBSRV_CLIENT_IF

Configured default trace level: **0** (STATUS)

Trace level **1**: Trace of all URLS and URIs requested by a HTTP client (usually a browser). Only the name of the URI is output.

Trace level **3** (INTER): HTTP socket trace (without poll requests). HTTP data including the HTTP stack is output as sent from the browser. HTTP data including the HTTP stack's dynamic pages (XML) is output as sent to the browser.

Trace level **4**: As level 3, though additionally with poll requests.

Trace level **6** (INTRA): HTTP socket trace (without poll requests). HTTP data including the HTTP stack is output as sent from the browser. HTTP data including the HTTP stack's dynamic pages (XML) and generated/static pages (HTML) are output as sent to the browser.

WEBSRV_SYS_IF

Configured default trace level: **0** (STATUS)

Trace level **2**: Caution: This trace does not contain any trace information for poll requests. Data sent from and to the gatekeeper (gateway detection, automatic locating).

Trace level **3** (INTER): Administration interface trace. Data sent to the administration interface and XML data received from the administration interface.

Trace level **6** (INTRA): User and password information.

Trace level **9** (DETAIL): Login data sent to the administration interface, response sent to a client as well as internal parameter table information.

X25

Configured default trace level: **0** (STATUS)

Trace level **0**-**9**: Status information up to detailed information on the actions of the X.25 protocol. For developers only.

X75

Configured default trace level: **0** (STATUS)

Trace level **0**-**9**: Status information up to detailed information on the actions of the X.75 protocol. For developers only.

XMLUTILS

Configured default trace level: **0** (STATUS)

8.1.2 Trace Profiles

8.1.2.1 Profiles under Normal/Heavy Load

NOTICE: These profiles load the system in only a minor way and can therefore be started under normal/heavy load.

Overview of Profiles under Normal/Heavy Load
"1.1.1(normal) SIP Reg. for Sub. and Trk."
"1.1.2(normal) SIP Trk. General problems"
"1.1.3(normal) SIP Trk. Payload problems"
"1.1.4(normal) SIP Trk. Fax problems"
"1.2.1(normal) SIP Sub. General problems"
"1.2.2(normal) SIP Sub. Payload problems"
"1.2.3(normal) SIP Sub. Fax problems"
"1.3(normal) SPE Additional for SIP Sub./Trk."
"2.1.1(normal) H.323 Trk. General problems"
"2.1.2(normal) H.323 Trk. Payload problems"
"2.1.3(normal) H.323 Trk. Fax problems"
"2.2.1(normal) HFA Registration"
"2.2.2(normal) HFA General problems"
"2.2.3(normal) HFA Payload problems"
"2.3(normal) SPE Additional for HFA/H323 Trk."
"3.1(normal) IPDA General problems"
"3.2(normal) IPDA Payload problems"
"3.3(normal) IPDA Fax problems"
"4.1(normal) WAML (signaling survivability)"

"1.1.1(normal) SIP Reg. for Sub. and Trk."

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – SIP, Level 9
  – SIP_REG, Level 9
  – SIP_SA, Level 9

"1.1.2(normal) SIP Trk. General problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – CNQ, Level 0
  – DSS1, Level 0
  – SIP, Level 9
  – SIP_SA, Level 9

"1.1.3(normal) SIP Trk. Payload problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  – ASP_DSP_EVENT, Level 9
  – ASP_DSP_IOCTL, Level 9
  – CNQ, Level 0
  – DSS1, Level 0
  – MSC, Level 0
  – SENTA_API, Level 9
  – SIP, Level 9
  – SIP_SA, Level 9

"1.1.4(normal) SIP Trk. Fax problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  – ASP_DSP_EVENT, Level 9
  – ASP_DSP_IOCTL, Level 9
  – ASP_FAX, Level 9
  – CNQ, Level 9
  – DMC, Level 9
  – DSS1, Level 9
  – ISDN_FM, Level 9
  – MSC, Level 9
  – SENTA_API, Level 9
  – SIP, Level 9
  – SIP_SA, Level 9

"1.2.1(normal) SIP Sub. General problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – CNQ, Level 0
  – DSS1, Level 0
  – SIP, Level 9
  – SIP_SA, Level 9

"1.2.2(normal) SIP Sub. Payload problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  – ASP_DSP_EVENT, Level 9
  – ASP_DSP_IOCTL, Level 9
  – CNQ, Level 0
  – DSS1, Level 0

  - MSC, Level 0
  - SENTA_API, Level 9
  - SIP, Level 9
  - SIP_SA, Level 9

"1.2.3(normal) SIP Sub. Fax problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
  - ASP, Level 9
  - ASP_DSP_EVENT, Level 9
  - ASP_DSP_IOCTL, Level 9
  - ASP_FAX, Level 9
  - CNQ, Level 0
  - DSS1, Level 0
  - MSC, Level 0
  - SENTA_API, Level 9
  - SIP, Level 9
  - SIP_SA, Level 9

"1.3(normal) SPE Additional for SIP Sub./Trk."

- Category: Can be activated under normal/heavy load.
- Additional: The following should also be activated:
  - A LAN trace (e.g. Wireshark)
  - The secure trace, to generate trace beacons for the LAN trace.
- Included trace components and assigned trace level:
  - DEVMGR, Level 9

"2.1.1(normal) H.323 Trk. General problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
  - CNQ, Level 0
  - DSS1, Level 0
  - HSA_SYSTEM, Level 1

"2.1.2(normal) H.323 Trk. Payload problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
  - ASP, Level 9
  - ASP_DSP_EVENT, Level 9
  - ASP_DSP_IOCTL, Level 9
  - CNQ, Level 0
  - DSS1, Level 0
  - HSA_SYSTEM, Level 1
  - MSC, Level 0
  - SENTA_API, Level 9

"2.1.3(normal) H.323 Trk. Fax problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  – ASP_DSP_EVENT, Level 9
  – ASP_DSP_IOCTL, Level 9
  – ASP_FAX, Level 3
  – CNQ, Level 0
  – HSA_SYSTEM, Level 1
  – MSC, Level 0
  – SENTA_API, Level 9

"2.2.1(normal) HFA Registration"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – HFAC, Level 6
  – SLMO_HFA, Level 6
  – TC, Level 6

"2.2.2(normal) HFA General problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – H323, Level 9
  – HSA_SYSTEM, Level 1
  – TSA, Level 9

"2.2.3(normal) HFA Payload problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  – ASP_DSP_EVENT, Level 9
  – ASP_DSP_IOCTL, Level 9
  – MSC, Level 9
  – SENTA_API, Level 9

"2.3(normal) SPE Additional for HFA/H323 Trk."

- Category: Can be activated under normal/heavy load.
- Additional: The following should also be activated:
- – A LAN trace (e.g. Wireshark)
  – The secure trace, to generate trace beacons for the LAN trace.
- Included trace components and assigned trace level:
- – HSA_SPE, Level 3

"3.1(normal) IPDA General problems"

- Category: Can be activated under normal/heavy load.

- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – MPH, Level 3
  – MSC, Level 0

"3.2(normal) IPDA Payload problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  – ASP_DSP_EVENT, Level 9
  – ASP_DSP_IOCTL, Level 9
  – MCP, Level 9
  – MPH, Level 9
  – MSC, Level 0

"3.3(normal) IPDA Fax problems"

- Category: Can be activated under normal/heavy load.
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  – ASP_DSP_EVENT, Level 9
  – ASP_DSP_IOCTL, Level 9
  – ASP_FAX, Level 9
  – MCP, Level 9
  – MPH, Level 9
  – MSC, Level 0

"4.1(normal) WAML (signaling survivability)"

- Category: Can be activated under normal/heavy load.
- Additional: The following should be carried out:
- – Activate a LAN trace (e.g. Wireshark)
  – Call "arpShow" and "mRouteShow" in the command shell
- Included trace components and assigned trace level:
- – MSC, Level 6
  – MSP_HDLC, Level 9

8.1.2.2 Profiles under Light Load

NOTICE: These profiles cause a heavy load on the system and must therefore only be started under light load!

Overview of Profiles under Light Load
"1.1.1(detail) SIP Reg. for Sub. and Trk."
"1.1.2(detail) SIP Trk. General problems"
"1.1.3(detail) SIP Trk. Payload problems"

Overview of Profiles under Light Load
"1.1.4(detail) SIP Trk. Fax problems"
"1.2.1(detail) SIP Sub. General problems"
"1.2.2(detail) SIP Sub. Payload problems"
"1.2.3(detail) SIP Sub. Fax problems"
"1.3(detail) SPE Additional for SIP Sub./Trk."
"2.1.1(detail) H.323 Trk. General problems"
"2.1.2(detail) H.323 Trk. Payload problems"
"2.1.3(detail) H.323 Trk. Fax problems"
"2.2.1(detail) HFA Registration"
"2.2.2(detail) HFA General problems"
"2.2.3(detail) HFA Payload problems"
"2.3(detail) SPE Additional for HFA/H323 Trk."
"3.1(detail) IPDA General problems"
"3.2(detail) IPDA Payload problems"
"3.3(detail) IPDA Fax problems"
"4.1(detail) WAML (signaling survivability)"
"4.2(detail) Signaling survivability problems"

"1.1.1(detail) SIP Reg. for Sub. and Trk."

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – SIP, Level 9
  – SIP_REG, Level 9
  – SIP_SA, Level 9

"1.1.2(detail) SIP Trk. General problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – CNQ, Level 9
  – DMC, Level 9
  – DSS1, Level 9
  – ISDN_FM, Level 9
  – SIP, Level 9
  – SIP_SA, Level 9

"1.1.3(detail) SIP Trk. Payload problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  – ASP_DSP_EVENT, Level 9
  – ASP_DSP_IOCTL, Level 9
  – CNQ, Level 9
  – DMC, Level 9
  – DSS1, Level 9
  – ISDN_FM, Level 9
  – MSC, Level 9
  – SENTA_API, Level 9
  – SIP, Level 9
  – SIP_SA, Level 9

"1.1.4(detail) SIP Trk. Fax problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  – ASP_DSP_EVENT, Level 9
  – ASP_DSP_IOCTL, Level 9
  – ASP_FAX, Level 9
  – MSC 0
  – SENTA_API, Level 9
  – SIP, Level 9
  – SIP_SA, Level 9

"1.2.1(detail) SIP Sub. General problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – CNQ, Level 9
  – DMC, Level 9
  – DSS1, Level 9
  – ISDN_FM, Level 9
  – SIP, Level 9
  – SIP_SA, Level 9

"1.2.2(detail) SIP Sub. Payload problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  – ASP_DSP_EVENT, Level 9
  – ASP_DSP_IOCTL, Level 9
  – CNQ, Level 0
  – DSS1, Level 0

- MSC, Level 0
- SENTA_API, Level 9
- SIP, Level 9
- SIP_SA, Level 9

"1.2.3(detail) SIP Sub. Fax problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  – ASP_DSP_EVENT, Level 9
  – ASP_DSP_IOCTL, Level 9
  – ASP_FAX, Level 9
  – CNQ, Level 9
  – DMC, Level 9
  – DSS1, Level 9
  – MSC, Level 9
  – SENTA_API, Level 9
  – SIP, Level 9
  – SIP_SA, Level 9

"1.3(detail) SPE Additional for SIP Sub./Trk."

- Category: May only be activated under light load!
- Additional: The following should also be activated:
- – A LAN trace (e.g. Wireshark)
  – The secure trace, to generate trace beacons for the LAN trace.
- Included trace components and assigned trace level:
- – DEVMGR, Level 9

"2.1.1(detail) H.323 Trk. General problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – CNQ, Level 9
  – DMC, Level 9
  – DSS1, Level 9
  – H323, Level 9
  – HSA_H225_CS, Level 9
  – HSA_H225_RAS, Level 9
  – HSA_H245, Level 9
  – HSA_SYSTEM, Level 9
  – ISDN_FM, Level 9

"2.1.2(detail) H.323 Trk. Payload problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  – ASP_DSP_EVENT, Level 9

  - ASP_DSP_IOCTL, Level 9
  - CNQ, Level 9
  - DMC, Level 9
  - DSS1, Level 9
  - H323, Level 9
  - HSA_SYSTEM, Level 1
  - ISDN_FM, Level 9
  - MSC, Level 9
  - SENTA_API, Level 9
  - SPL 3

"2.1.3(detail) H.323 Trk. Fax problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  - ASP_DSP_EVENT, Level 9
  - ASP_DSP_IOCTL, Level 9
  - ASP_FAX, Level 9
  - CNQ, Level 9
  - DMC, Level 9
  - FMSEM, Level 9
  - H323, Level 9
  - HSA_SYSTEM, Level 1
  - ISDN_FM, Level 9
  - MSC, Level 9
  - SENTA_API, Level 9

"2.2.1(detail) HFA Registration"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – HFAC, Level 6
  - SLMO_HFA, Level 6
  - TC, Level 6

"2.2.2(detail) HFA General problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – H323, Level 9
  - HSA_SYSTEM, Level 1
  - TSA, Level 9

"2.2.3(detail) HFA Payload problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9

  - ASP_DSP_EVENT, Level 9
  - ASP_DSP_IOCTL, Level 9
  - MSC, Level 9
  - SENTA_API, Level 9

"2.3(detail) SPE Additional for HFA/H323 Trk."

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Additional: The following should also be activated:
- – A LAN trace (e.g. Wireshark)
  - The secure trace, to generate trace beacons for the LAN trace.
- Included trace components and assigned trace level:
- – DEVMGR, Level 9
  - H323_SPE, Level 9
  - HSA_SPE, Level 6

"3.1(detail) IPDA General problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ICC, Level 9
  - MCP, Level 9
  - MPH, Level 9
  - MSC, Level 9

"3.2(detail) IPDA Payload problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  - ASP_DSP_EVENT, Level 9
  - ASP_DSP_IOCTL, Level 9
  - MCP, Level 9
  - MPH, Level 9
  - MSC, Level 9

"3.3(detail) IPDA Fax problems"

- Category: May only be activated under light load!
- Additional: A LAN trace (e.g. Wireshark) should also be activated.
- Included trace components and assigned trace level:
- – ASP, Level 9
  - ASP_DSP_EVENT, Level 9
  - ASP_DSP_IOCTL, Level 9
  - ASP_FAX, Level 9
  - MCP, Level 9
  - MPH, Level 9
  - MSC, Level 9

"4.1(detail) WAML (signaling survivability)"

- Category: May only be activated under light load!
- Additional: The following should be carried out:
- – Activate a LAN trace (e.g. Wireshark)
  – Call "arpShow" and "mRouteShow" in the command shell
- Included trace components and assigned trace level:
- – MSC, Level 6
  – MSP_HDLC, Level 9

"4.2(detail) Signaling survivability problems"

- Category: May only be activated under light load!

"4.4(detail) NCUI reboots after TCP timeout"

- Category: May only be activated under light load!

8.2 Events

The sections below reflect the content of the original event templates.

An event type is assigned to each event. The following event types are available:

- **Information:** status message only, not an error message.
- **Warning:** message indicating a procedure or status that may be problematic; not an error message.
- **Minor:** error message. However, the error is not causing problems.
- **Major:** error message. This error could cause problems.
- **Critical:** error message. This error causes problems.
- **Cleared:** error message. The error has already been cleared by the system.
- **Indeterminate:** error message. The exact cause of the error cannot be established.

The descriptions contain the following information about each event:

- the event code,
- the message text in the log entry or at the user interface,
- the event type (see above),
- clarification of the causes, system responses and, if applicable, possible troubleshooting measures.

Some message texts (event texts) contain variable data. These are indicated as follows:

- `%s` means: character string
- `%d` and `%I` mean: positive decimal number
- `%u` means: positive or negative decimal number
- `%f` means: floating point number
- `%p` means: pointer (memory address)
- `%x` means: hexadecimal number (using lowercase letters)
- `%X` means: hexadecimal number (using uppercase letters)
- `%c` means: single character

8.2.1 Overview: Event Codes

The table is intended to help you find specific status and error messages faster. It has been sorted alphabetically according event codes. Since all event codes begin with `MSG_`, sorting effectively starts with the 5th character.

Event Code	Section
ASSERTION_FAILED_EVENT	8.2.3, âReboot Eventsâ
CCE_GENERAL_ERROR	8.2.49, âLAN Signaling Events â“ CCEâ
CCE_PSS_STORE_ERROR	8.2.49, âLAN Signaling Events â“ CCEâ
COMGA_NOK_UPGRADE_REG	8.2.2, âStatus Eventsâ
EXIT_REBOOT_EVENT	8.2.3, âReboot Eventsâ
FP_EVT_CRITICAL	8.2.3, âReboot Eventsâ
FP_EVT_INDETERMINATE	8.2.2, âStatus Eventsâ
FP_EVT_MAJOR	8.2.3, âReboot Eventsâ
FP_EVT_MINOR	8.2.2, âStatus Eventsâ
FP_EVT_SNMP_TRAP	8.2.2, âStatus Eventsâ
FP_EVT_INFORMATION	8.2.2, âStatus Eventsâ
FP_EVT_TRACE_START	8.2.2, âStatus Eventsâ
FP_EVT_TRACE_STOP	8.2.2, âStatus Eventsâ
FP_EVT_WARNING	8.2.3, âReboot Eventsâ
FW_NOK_UPGRADE_REG	8.2.2, âStatus Eventsâ
H323_NO_IP	8.2.8, âH.323 Eventsâ
H323_SNMP_TRAP	8.2.8, âH.323 Eventsâ
MSG_ADMIN_DIDNâT_GET_WRITE_ACCESS	8.2.29, âOAM Eventsâ
MSG_ADMIN_FORCE_RELEASE_WRITE_ACCESS	8.2.29, âOAM Eventsâ
MSG_ADMIN_GOT_WRITE_ACCESS	8.2.29, âOAM Eventsâ
MSG_ADMIN_INVALID_LOGIN	8.2.29, âOAM Eventsâ
MSG_ADMIN_LOGGED_IN	8.2.29, âOAM Eventsâ
MSG_ADMIN_LOGGED_OUT	8.2.29, âOAM Eventsâ
MSG_ADMIN_REBOOT	8.2.3, âReboot Eventsâ
MSG_ADMIN_RELEASED_WRITE_ACCESS	8.2.29, âOAM Eventsâ
MSG_ADMIN_SESSION_CREATED	8.2.29, âOAM Eventsâ

Event Code	Section
MSG_ADMIN_SESSION_EXPIRED	8.2.29, âOAM Eventsâ
MSG_ASC_ERROR	8.2.35, âMajor ASC Eventsâ
MSG_ASP_ERROR	8.2.36, âMajor ASP Eventsâ
MSG_ASP_INFO	8.2.34, âImportant Platform Software Status Eventsâ
MSG_ASP_INFO	8.2.37, âMinor ASP Eventsâ
MSG_ASP_REBOOT	8.2.3, âReboot Eventsâ
MSG_BSD44_ACCEPT_DGW_ERR	8.2.12, âDGW Eventsâ
MSG_BSD44_ACCEPT_ERROR	8.2.23, âVCAPI Eventsâ
MSG_BSD44_DGW_BIND_FAIL	8.2.12, âDGW Eventsâ
MSG_BSD44_DGW_CONNECT_FAIL	8.2.12, âDGW Eventsâ
MSG_BSD44_DGW_NO_LIST	8.2.12, âDGW Eventsâ
MSG_BSD44_DGW_SOCKET_FAIL	8.2.12, âDGW Eventsâ
MSG_BSD44_SELECT_ERROR	8.2.23, âVCAPI Eventsâ
MSG_BSD44_VCAPI_NO_LIST	8.2.12, âDGW Eventsâ
MSG_CAR_ALIVE_IP_CONNECTION_LOST	8.2.13, âCAR Eventsâ
MSG_CAR_ALIVE_IP_CONNECTION_LOST	8.2.13, âCAR Eventsâ
MSG_CAR_ALIVE_IP_CONNECTION_OK_AGAIN	8.2.13, âCAR Eventsâ
MSG_CAR_CALL_ADDR_REJECTED	8.2.29, âOAM Eventsâ
MSG_CAR_CAN_NOT_ARRANGE_NODE_TAB	8.2.13, âCAR Eventsâ
MSG_CAR_CAN_NOT_SORT_MAC_ADDRESS	8.2.13, âCAR Eventsâ
MSG_CAR_CODEC_ENTRY_DELETED	8.2.13, âCAR Eventsâ
MSG_CAR_CODECS_INCONSISTENT	8.2.13, âCAR Eventsâ
MSG_CAR_DB_READ_NODE_TABLE_ERROR	8.2.13, âCAR Eventsâ
MSG_CAR_DBF_SERVER_INCONSISTENT	8.2.13, âCAR Eventsâ
MSG_CAR_DBFS_POSS_CONFLICT	8.2.13, âCAR Eventsâ
MSG_CAR_ERROR_WITH_OAM_INTERFACE	8.2.13, âCAR Eventsâ
MSG_CAR_FKT_GET_IPADR_FAILED	8.2.13, âCAR Eventsâ
MSG_CAR_GENERAL_ERROR	8.2.13, âCAR Eventsâ
MSG_CAR_MALLOC_FAILED	8.2.4, âResource Monitoring Eventsâ

Event Code	Section
MSG_CAR_NO_FREE_CODEC_TAB_ELE	8.2.13, âCAR Eventsâ
MSG_CAR_NO_MAC_ADDRESS	8.2.13, âCAR Eventsâ
MSG_CAR_NO_MEMORY	8.2.13, âCAR Eventsâ
MSG_CAR_NODE_INFO_ALREADY_AVAILABLE	8.2.13, âCAR Eventsâ
MSG_CAR_PARAM_NOT_FOUND	8.2.13, âCAR Eventsâ
MSG_CAR_SENDING_UPDATE_REQUEST_-FAILED_NO_MEMORY	8.2.13, âCAR Eventsâ
MSG_CAR_SENDING_UPDATE_REQUEST_-FAILED_SOH_ERROR	8.2.13, âCAR Eventsâ
MSG_CAR_SOH_MESSAGE_NOT_FROM_VENUS	8.2.13, âCAR Eventsâ
MSG_CAR_START_TCP_LISTENER_FAILED	8.2.13, âCAR Eventsâ
MSG_CAR_UNAUTHORIZED_IP_ACCESS	8.2.13, âCAR Eventsâ
MSG_CAR_UNEXPECTED_DATA_RECV	8.2.13, âCAR Eventsâ
MSG_CAR_UNEXPECTED_MSG_RECV	8.2.13, âCAR Eventsâ
MSG_CAR_UPDATE_NUMBER_OF_ENTRIES_CAL-LADDRTAB_TOO_BIG	8.2.13, âCAR Eventsâ
MSG_CAR_WRONG_EVENT	8.2.13, âCAR Eventsâ
MSG_CAR_WRONG_IP_ADDRESS	8.2.13, âCAR Eventsâ
MSG_CAR_WRONG_LENGTH	8.2.13, âCAR Eventsâ
MSG_CAR_WRONG_NODE_ID	8.2.13, âCAR Eventsâ
MSG_CAR_WRONG_SERVICE	8.2.13, âCAR Eventsâ
MSG_CAT_H235	8.2.9, âH.235 Eventsâ
MSG_CAT_H323_REBOOT	8.2.3, âReboot Eventsâ
MSG_CAT_HSA_REBOOT	8.2.2, âStatus Eventsâ
MSG_CAT_NWRS	8.2.5, âRouting Eventsâ
MSG_CLI_LOGGED_IN_FROM_TELNET	8.2.30, âCLI Eventsâ
MSG_CLI_LOGGED_IN_FROM_V24	8.2.30, âCLI Eventsâ
MSG_CLI_TELNET_ABORTED	8.2.30, âCLI Eventsâ
MSG_DELIC_ERROR	8.2.41, âDELIC Eventsâ
MSG_DEVM_BINDING_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVM_NO_PROTOCOL_FOR_DEVICE	8.2.33, âMAGIC/Device Manager Eventsâ

Event Code	Section
MSG_DEVM_NO_PROTOCOL_FOR_DEVICE	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_CAN_NOT_READ_PERSISTENCY	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_CLOSE_LEG_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_CONNECT_LEGS_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_CONNECT_WRONG_LEGS	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_CONNECT_WRONG_RES_STATE	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_CREATE_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_DEVICEID_OUT_OF_RANGE	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_DISCONNECT_LEGS_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_INTERROR_CHNID	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_INTERROR_DEVID	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_INTERROR_RESID	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_LAYER2_SERVICE_TRAP	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_LISTEN_WRONG_RES_STATE	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_MSCERROR_RESID	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_NO_DEVICE_ID_FOR_DEVICE	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_NO_DEVICE_TYPE_FOR_DEVICE	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_OPEN_LEG_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_OPEN_WRONG_RES_STATE	8.2.33, âMAGIC/Device Manager Eventsâ

Event Code	Section
MSG_DEVMGR_SCN_TASK_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DEVMGR_UPDATE_LEG_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_DGW_ABORT_SOCK_UNKN	8.2.12, âDGW Eventsâ
MSG_DGW_ACCEPT_FAILED	8.2.12, âDGW Eventsâ
MSG_DGW_ALLOC_CHN_CONN_FAIL	8.2.12, âDGW Eventsâ
MSG_DGW_ALLOC_CHN_RUN_OUT	8.2.12, âDGW Eventsâ
MSG_DGW_ALLOC_CONF_ERR	8.2.12, âDGW Eventsâ
MSG_DGW_ALLOC_DISC_B3	8.2.12, âDGW Eventsâ
MSG_DGW_ALLOC_REQ_ERR	8.2.12, âDGW Eventsâ
MSG_DGW_BUFAVAIL_SOCK_UNKN	8.2.12, âDGW Eventsâ
MSG_DGW_CONF_ALLOC_ERR	8.2.12, âDGW Eventsâ
MSG_DGW_CONN_B3_ACT_IND	8.2.12, âDGW Eventsâ
MSG_DGW_CONN_COMPL_ALLOC	8.2.12, âDGW Eventsâ
MSG_DGW_CONN_OUT_OF_RANGE	8.2.12, âDGW Eventsâ
MSG_DGW_CONN_RUN_OUT	8.2.12, âDGW Eventsâ
MSG_DGW_CONNECT_FAILED	8.2.12, âDGW Eventsâ
MSG_DGW_DATA_B3_ALLOC_ERR	8.2.12, âDGW Eventsâ
MSG_DGW_DISC_B3_IND	8.2.12, âDGW Eventsâ
MSG_DGW_DISC_B3_NOT_SEND	8.2.12, âDGW Eventsâ
MSG_DGW_FREE_ALLOC_ERR	8.2.12, âDGW Eventsâ
MSG_DGW_FREE_CHN_ALLOC_FAIL	8.2.12, âDGW Eventsâ
MSG_DGW_FREE_NOT_SEND	8.2.12, âDGW Eventsâ
MSG_DGW_FREE_UNKNOWN_ID	8.2.12, âDGW Eventsâ
MSG_DGW_IND_ALLOC_ERR	8.2.12, âDGW Eventsâ
MSG_DGW_INV_DATA_LEN	8.2.12, âDGW Eventsâ
MSG_DGW_INV_MSG_LEN	8.2.12, âDGW Eventsâ
MSG_DGW_INVALID_LENGTH	8.2.12, âDGW Eventsâ
MSG_DGW_LISTENING_ERR	8.2.12, âDGW Eventsâ
MSG_DGW_MGR_NOT_READY	8.2.12, âDGW Eventsâ

Event Code	Section
MSG_DGW_MSG_IGNORED	8.2.12, âDGW Eventsâ
MSG_DGW_MSG_RCV_FAIL	8.2.12, âDGW Eventsâ
MSG_DGW_NO_PLCI	8.2.12, âDGW Eventsâ
MSG_DGW_OPEN_CHN_ALLOC_FAIL	8.2.12, âDGW Eventsâ
MSG_DGW_OPEN_CHN_UNKNOWN_ID	8.2.12, âDGW Eventsâ
MSG_DGW_OPEN_CHN_WRONG	8.2.12, âDGW Eventsâ
MSG_DGW_RCV_ALLOC_FAIL	8.2.12, âDGW Eventsâ
MSG_DGW_RCV_FAILED	8.2.12, âDGW Eventsâ
MSG_DGW_RCV_SOCK_UNKN	8.2.12, âDGW Eventsâ
MSG_DGW_RECEIVE_ERR	8.2.12, âDGW Eventsâ
MSG_DGW_SEC_ALLOC_FAIL	8.2.12, âDGW Eventsâ
MSG_DGW_SEND_DATA_ERR	8.2.12, âDGW Eventsâ
MSG_DGW_SEND_FAILED	8.2.12, âDGW Eventsâ
MSG_DGW_SOCKET_BIND_ERR	8.2.12, âDGW Eventsâ
MSG_DGW_SOCKET_NOT_OPEN	8.2.12, âDGW Eventsâ
MSG_DGW_SOCKET_UNKNOWN	8.2.12, âDGW Eventsâ
MSG_DGW_UNH_MSG_CAPI20_MGR	8.2.12, âDGW Eventsâ
MSG_DGW_UNHANDLED_EVENT	8.2.12, âDGW Eventsâ
MSG_DGW_UNHANDLED_MSG	8.2.12, âDGW Eventsâ
MSG_DGW_UNKNOWN_ID_CHANNEL	8.2.12, âDGW Eventsâ
MSG_DGW_UNKNOWN_NOTIFIC	8.2.12, âDGW Eventsâ
MSG_DGW_UNKNOWN_PRIMITIVE	8.2.12, âDGW Eventsâ
MSG_DGW_WRONG_EVENT_CAPI	8.2.12, âDGW Eventsâ
MSG_DGW_WRONG_EVENT_CAPI20	8.2.12, âDGW Eventsâ
MSG_DGW_WRONG_STATE	8.2.12, âDGW Eventsâ
MSG_DLSC_BOOTSTRAP_OK	8.2.2, âStatus Eventsâ
MSG_DISP_SENDER_NOT_SET	8.2.29, âOAM Eventsâ
MSG_ERH_ADMISSION_ERROR	8.2.45, âEndpoint Registration Handler (ERH) Trace Eventsâ

Event Code	Section
MSG_ERH_ERROR	8.2.45, âEndpoint Registration Handler (ERH) Trace Eventsâ
MSG_ERH_INFORMATION	8.2.45, âEndpoint Registration Handler (ERH) Trace Eventsâ
MSG_ERH_NO_LICENSE	8.2.45, âEndpoint Registration Handler (ERH) Trace Eventsâ
MSG_ERH_REGISTRATION_ERROR	8.2.45, âEndpoint Registration Handler (ERH) Trace Eventsâ
MSG_ERH_SECURITY_DENIAL	8.2.45, âEndpoint Registration Handler (ERH) Trace Eventsâ
MSG_ERH_SUB_OUT_OF_SERVICE	8.2.45, âEndpoint Registration Handler (ERH) Trace Eventsâ
MSG_EXCEPTION_REBOOT	8.2.3, âReboot Eventsâ
MSG_FAXCONV_ERROR	8.2.43, âFax Converter, HDLC and X.25 Eventsâ
MSG_FIREWALL_ALARM	8.2.2, âStatus Eventsâ
MSG_FAXCONV_INFO	8.2.43, âFax Converter, HDLC and X.25 Eventsâ
MSG_GSA_SNMP	8.2.11, âGSA Eventsâ
MSG_GW_OBJ_ALLOC_FAILED	8.2.3, âReboot Eventsâ
MSG_GW_OBJ_MEMORY_EXHAUSTED	8.2.3, âReboot Eventsâ
MSG_GW_OBJ_MEMORY_INCONSISTENT	8.2.3, âReboot Eventsâ
MSG_GW_SUCCESSFULLY_STARTED	8.2.2, âStatus Eventsâ
MSG_H323_INFORMATION	8.2.8, âH.323 Eventsâ
MSG_H323_INVALID_CONFIGURATION	8.2.8, âH.323 Eventsâ
MSG_H323_INVALID_PARAMETER_VALUE	8.2.8, âH.323 Eventsâ
MSG_H323_INVALID_POINTER	8.2.8, âH.323 Eventsâ
MSG_H323_LOGIC_ERROR	8.2.8, âH.323 Eventsâ
MSG_H323_MISSING_PARAMETER	8.2.8, âH.323 Eventsâ
MSG_H323_OSCAR_NSD_ERROR	8.2.8, âH.323 Eventsâ
MSG_H323_PROTOCOL_ERROR	8.2.8, âH.323 Eventsâ

Event Code	Section
MSG_H323_SNMP_TRAP	8.2.8, âH.323 Eventsâ
MSG_H323_STACK_ERROR	8.2.8, âH.323 Eventsâ
MSG_H323_UNEXPECTED_MESSAGE	8.2.8, âH.323 Eventsâ
MSG_H323_UNEXPECTED_RETURN_VALUE	8.2.8, âH.323 Eventsâ
MSG_H323CLIENT_INVALID_ADMIN_MSG	8.2.25, âH.323 Client Eventsâ
MSG_H323CLIENT_INVALID_CLIENTID	8.2.25, âH.323 Client Eventsâ
MSG_H323CLIENT_INVALID_PARAM	8.2.25, âH.323 Client Eventsâ
MSG_H323CLIENT_MAPS_DIFFER	8.2.25, âH.323 Client Eventsâ
MSG_H323CLIENT_NWRS_ENTRY_FAILED	8.2.25, âH.323 Client Eventsâ
MSG_HBR_WARNING	8.2.2, âStatus Eventsâ
MSG_HACKER_ON_SNMP_PORT_TRAP	8.2.4, âResource Monitoring Eventsâ
MSG_HFAA_INTERNAL_ERROR	8.2.18, âHFA Adapter Eventsâ
MSG_HFAA_INTERNAL_EVENT	8.2.18, âHFA Adapter Eventsâ
MSG_HFAA_MEMORY_ERROR	8.2.18, âHFA Adapter Eventsâ
MSG_HFAA_MESSAGE_ERROR	8.2.18, âHFA Adapter Eventsâ
MSG_HFAA_PARAM_ERROR	8.2.18, âHFA Adapter Eventsâ
MSG_HFAM_HAH_ALLOC_CHAN_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_HAH_ALLOC_CONF_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_ACCEPT_CLIENT_CON_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_ACCEPT_INETOA_CON_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_ACCEPT_TCPIP_CON_ERR	8.2.17, âHFA Manager Eventsâ

Event Code	Section
MSG_HFAM_LIH_ALGORITM_OBJID_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_BIND_REGISOCK_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_CREATE_REGISOCK_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_IPADR_TOO_LONG_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_LISTEN_REGISOCK_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_MAX_CON_EXCEED_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_PROTOCOL_LIST_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_RETURNED_SOCKET_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_SOCK_REUSE_ADR_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_SOCK_WOULDBLOCK_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_SUBNO_TOO_LONG_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_TCDATAGRAM_RCV_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_LIH_UNEXP_CORNET_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_MAIN_ILLEG_PORTNO_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_MAIN_NO_LOGONTIMER_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_MAIN_UNEXP_LWEVENT_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_MON_NO_MON_TIMER_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_REG_ESTAB_NOTREG_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_REG_INVAL_PWD_LEN_ERR	8.2.17, âHFA Manager Eventsâ

Event Code	Section
MSG_HFAM_REG_LOGIN_NOTREG_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_REG_LOGON_REJECT_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_REG_MISSING_L2INFO_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_REG_RELIN_NOTREG_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_REG_SUBNO_NOTCONFIG_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_REG_SUBNO_TOO_LONG_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_SIH_CORNET_LONGER_28_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_SIH_INVAL_TSLOT_PARAM_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HFAM_SIH_NO_LOGIN_TIMER_ERR	8.2.17, âHFA Manager Eventsâ
MSG_HIP_ALLOC_DEV_OBJ	8.2.31, âHIP Eventsâ
MSG_HIP_ALLOC_MES_SI	8.2.31, âHIP Eventsâ
MSG_HIP_NO_CLBLK	8.2.31, âHIP Eventsâ
MSG_HIP_NO_CLPOOL_ID	8.2.31, âHIP Eventsâ
MSG_HIP_NO_CLUSTER	8.2.31, âHIP Eventsâ
MSG_HIP_NO_DEVLOAD	8.2.31, âHIP Eventsâ
MSG_HIP_NO_DEVSTART	8.2.31, âHIP Eventsâ
MSG_HIP_NO_MEM_CL	8.2.31, âHIP Eventsâ
MSG_HIP_NO_MEM_CLBLK	8.2.31, âHIP Eventsâ
MSG_HIP_NO_MEM_TO_SI	8.2.31, âHIP Eventsâ
MSG_HIP_NO_NETPOOL_INIT	8.2.31, âHIP Eventsâ
MSG_HIP_NO_OBJ_INIT	8.2.31, âHIP Eventsâ
MSG_HIP_NO_PMBLK	8.2.31, âHIP Eventsâ
MSG_HIP_PKTLEN_ZERO	8.2.31, âHIP Eventsâ
MSG_HIP_PMBLK_ZERO	8.2.31, âHIP Eventsâ
MSG_IP_LINK_FAILURE	8.2.4, âResource Monitoring Eventsâ

Event Code	Section
MSG_IP_LINK2_FAILURE	8.2.4, âResource Monitoring Eventsâ
MSG_IP_LINK_RESTORE	8.2.4, âResource Monitoring Eventsâ
MSG_IP_LINK2_RESTORE	8.2.4, âResource Monitoring Eventsâ
MSG_IP_LINK_SWITCHOVER	8.2.4, âResource Monitoring Eventsâ
MSG_IP_LINK2_SWITCHOVER	8.2.4, âResource Monitoring Eventsâ
MSG_IP_RTP_QUALITY_FAILURE	8.2.10, âRTPQM Eventsâ
MSG_IP_RTP_QUALITY_WARNING	8.2.10, âRTPQM Eventsâ
MSG_IPACCSRV_INTERNAL_ERROR	8.2.44, âIP Accounting Eventsâ
MSG_IPACCSRV_LOGON	8.2.44, âIP Accounting Eventsâ
MSG_IPACCSRV_MARK_REACHED	8.2.44, âIP Accounting Eventsâ
MSG_IPACCSRV_MEMORY_ERROR	8.2.44, âIP Accounting Eventsâ
MSG_IPACCSRV_MESSAGE_ERROR	8.2.44, âIP Accounting Eventsâ
MSG_IPACCSRV_OVERFLOW	8.2.44, âIP Accounting Eventsâ
MSG_IPACCSRV_SOCKET_ERROR	8.2.44, âIP Accounting Eventsâ
MSG_IPF_ON_OFF	8.2.38, âIP Filter Eventsâ
MSG_IPF_PARAMETER	8.2.38, âIP Filter Eventsâ
MSG_IPF_STARTED	8.2.38, âIP Filter Eventsâ
MSG_IPF_STOPPED	8.2.38, âIP Filter Eventsâ
MSG_IPNC_CP_ASYNCH	8.2.26, âIPNC Eventsâ
MSG_IPNC_INCONSISTENT_STATE	8.2.26, âIPNC Eventsâ
MSG_IPNC_INTERNAL_ERROR	8.2.26, âIPNC Eventsâ
MSG_IPNC_MESSAGE_DUMP	8.2.26, âIPNC Eventsâ
MSG_IPNC_MESSAGE_ERROR	8.2.26, âIPNC Eventsâ
MSG_IPNC_PARAM_ERROR	8.2.26, âIPNC Eventsâ

Event Code	Section
MSG_IPNCA_ERROR	8.2.27, âIPNCA Eventsâ
MSG_IPNCV_INTERNAL_ERROR	8.2.2, âStatus Eventsâ
MSG_IPNCV_MEMORY_ERROR	8.2.4, âResource Monitoring Eventsâ
MSG_IPNCV_SIGNALING_ERROR	8.2.46, âIPNCV Eventsâ
MSG_IPNCV_STARTUP_ERROR	8.2.2, âStatus Eventsâ
MSG_IPNCV_STARTUP_SHUTDOWN	8.2.2, âStatus Eventsâ
MSG_IPSEC_REBOOT	8.2.3, âReboot Eventsâ
MSG_IPSTACK_INVALID_PARAM	8.2.40, âIP Stack Eventsâ
MSG_IPSTACK_NAT_ERROR	8.2.40, âIP Stack Eventsâ
MSG_IPSTACK_SOH_ERROR	8.2.40, âIP Stack Eventsâ
MSG_ISDN_CMR_ADD_OBJECT_FAILED	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_DEVICE_PTR_BAD	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_GEN_CALL_REF_FAILED	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_GENRIC_EVENT	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_INIT_FAILED	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_MAND_FIELDS_MISSING	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_MESSAGE_ERROR	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_MSG_DECODE_FAILED	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_MSG_ENCODE_FAILED	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_MSG_SEND_FAILED	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_MSG_UNEXPECTED	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_NEW_OBJECT_FAILED	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_OBJECT_NOT_FOUND	8.2.7, âSCN Protocol Eventsâ

Event Code	Section
MSG_ISDN_CMR_PROTOCOL_ERROR	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_SEG_MSG_ERROR	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_SESSION_NOT_FOUND	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_STATUS_MSG_RECEIVED	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_TIMER_EXPIRED	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_UNEXPECTED_ERROR	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_UNEXPECTED_EVENT	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_UNEXPECTED_VALUE	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_UNH_STATE_EVENT	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_UNIMPLEMENTED	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_WRONG_DEVICE_TYPE	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_WRONG_INTERFACE	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_CMR_WRONG_PROTVAR	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_DEVICE_PTR_NOT_FOUND	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_ERROR	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_NO_ERROR	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_NULL_PTR	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_OVERLOAD_CONDITION	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_RESOURCE_IN_USE_BY_O_CALL	8.2.7, âSCN Protocol Eventsâ

Event Code	Section
MSG_ISDN_RESOURCE_NOT_AVAILABLE	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_RESOURCE_NOT_IN_SERVICE	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_START_UP	8.2.7, âSCN Protocol Eventsâ
MSG_ISDN_START_UP_ERROR	8.2.7, âSCN Protocol Eventsâ
MSG_LDAP_ENCODE_DECODE_ERROR	8.2.4, âResource Monitoring Eventsâ
MSG_LDAP_GENERAL_ERROR	8.2.4, âResource Monitoring Eventsâ
MSG_LDAP_IP_LINK_ERROR	8.2.4, âResource Monitoring Eventsâ
MSG_LDAP_MEMORY_ERROR	8.2.4, âResource Monitoring Eventsâ
MSG_LDAP_SOCKET_ERROR	8.2.4, âResource Monitoring Eventsâ
MSG_LDAP_SUCCESSFULLY_STARTED	8.2.2, âStatus Eventsâ
MSG_LLC_EVENT_INVALID_PARAMETER_VALUE	8.2.50, âEvents for LLC Operationâ
MSG_LLC_EVENT_MISSING_PARAMETER	8.2.50, âEvents for LLC Operationâ
MSG_LLC_EVENT_MISSING_RESOURCE	8.2.50, âEvents for LLC Operationâ
MSG_LLC_EVENT_UNEXPECTED_RETURN_VALUE	8.2.50, âEvents for LLC Operationâ
MSG_MAF_ETHERNET_HEADER	8.2.39, âMAC Filter Eventsâ
MSG_MAF_NETBUFFER	8.2.39, âMAC Filter Eventsâ
MSG_MAF_NO_OF_RULES	8.2.39, âMAC Filter Eventsâ
MSG_MAF_ON_OFF	8.2.39, âMAC Filter Eventsâ
MSG_MAF_PARAMETER	8.2.39, âMAC Filter Eventsâ
MSG_MAF_STARTED	8.2.39, âMAC Filter Eventsâ
MSG_MAF_STOPPED	8.2.39, âMAC Filter Eventsâ
MSG_MAND_PARAM_MISSING	8.2.6, âCall Control and Feature Eventsâ
MSG_MIKEY_REBOOT	8.2.3, âReboot Eventsâ

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MSG_MPH_INFO	8.2.28, âMPH Eventsâ
MSG_MSP_FAX_OVERLONG_PKT	8.2.43, âFax Converter, HDLC and X.25 Eventsâ
MSG_MSP_HDLC_ERROR	8.2.43, âFax Converter, HDLC and X.25 Eventsâ
MSG_MSP_HDLC_INFO	8.2.43, âFax Converter, HDLC and X.25 Eventsâ
MSG_NU_CAR_FAILED	8.2.15, âNU Eventsâ
MSG_NU_CAR_RESP_INVALID	8.2.15, âNU Eventsâ
MSG_NU_DEV_TAB_NOT_FOUND	8.2.15, âNU Eventsâ
MSG_NU_EVENT_EXCEPTION	8.2.15, âNU Eventsâ
MSG_NU_FREE_CHN_COMF_TOO_LATE	8.2.15, âNU Eventsâ
MSG_NU_FREE_CHN_UNEXPECTED	8.2.15, âNU Eventsâ
MSG_NU_GENERAL_ERROR	8.2.15, âNU Eventsâ
MSG_NU_INTERNAL_ERROR	8.2.15, âNU Eventsâ
MSG_NU_INVALID_CIDL	8.2.15, âNU Eventsâ
MSG_NU_IP_ERROR	8.2.15, âNU Eventsâ
MSG_NU_NO_FREE_TRANSACTION	8.2.15, âNU Eventsâ
MSG_NU_NO_PORT_DATA	8.2.15, âNU Eventsâ
MSG_NU_SOH_RESP_INVALID	8.2.15, âNU Eventsâ
MSG_NU_SUPERFLUOS_MSG	8.2.15, âNU Eventsâ
MSG_NU_TCP_LISTENER_FAILED	8.2.15, âNU Eventsâ
MSG_NU_TOO_MUCH_DIGITS	8.2.15, âNU Eventsâ
MSG_NU_TRANSPCONT_MISSING	8.2.15, âNU Eventsâ
MSG_NU_UNEXPECTED_MSG	8.2.15, âNU Eventsâ
MSG_NU_UNEXPECTED_SETUP	8.2.15, âNU Eventsâ
MSG_NU_UNEXPECTED_TIMER	8.2.15, âNU Eventsâ
MSG_NU_UNKNOWN_MESSAGE	8.2.15, âNU Eventsâ
MSG_NU_WRONG_CALL_REF	8.2.15, âNU Eventsâ
MSG_NULC_INTERNAL_ERROR	8.2.16, âNU Leg Control Eventsâ
MSG_NULC_INTERNAL_EVENT	8.2.16, âNU Leg Control Eventsâ

Event Code	Section
MSG_NULC_MEMORY_ERROR	8.2.16, âNU Leg Control Eventsâ
MSG_NULC_MESSAGE_ERROR	8.2.16, âNU Leg Control Eventsâ
MSG_NULC_PARAM_ERROR	8.2.16, âNU Leg Control Eventsâ
MSG_NWRS_DEVICE_NOT_FOUND	8.2.5, âRouting Eventsâ
MSG_NWRS_DEVICE_TABLE_NOT_FOUND	8.2.5, âRouting Eventsâ
MSG_NWRS_DPLN_ENTRY_INVALID	8.2.5, âRouting Eventsâ
MSG_NWRS_DPLN_NOT_FOUND	8.2.5, âRouting Eventsâ
MSG_NWRS_EMPTY_FIELD_ECHOED	8.2.5, âRouting Eventsâ
MSG_NWRS_NO_DPLN_FOUND_FOR_DEVICE	8.2.5, âRouting Eventsâ
MSG_NWRS_ODR_COMMAND_UNKNOWN	8.2.5, âRouting Eventsâ
MSG_NWRS_ODR_NOT_FOUND	8.2.5, âRouting Eventsâ
MSG_NWRS_ROUTE_NOT_FOUND	8.2.5, âRouting Eventsâ
MSG_NWRS_UNKNOWN_FIELD_ECHOED	8.2.5, âRouting Eventsâ
MSG_NWRS_UNSPEC_ERROR	8.2.5, âRouting Eventsâ
MSG_OAM_DMA_RAM_THRESHOLD_REACHED	8.2.4, âResource Monitoring Eventsâ
MSG_OAM_OVERLOAD_REACHED	8.2.4, âResource Monitoring Eventsâ
MSG_OAM_OVERLOAD_CLEARED	8.2.4, âResource Monitoring Eventsâ
MSG_OAM_FAN_OUT_OF_SERVICE	8.2.4, âResource Monitoring Eventsâ
MSG_OAM_HIGH_TEMPERATURE_EXCEPTION	8.2.4, âResource Monitoring Eventsâ
MSG_OAM_INTERNAL_EVENT	8.2.29, âOAM Eventsâ
MSG_OAM_PRIO_INCREASED	8.2.29, âOAM Eventsâ
MSG_OAM_PRIO_SWITCHED_BACK	8.2.29, âOAM Eventsâ
MSG_OAM_PSU_OR_RPS_OUT_OF_SERVICE	8.2.4, âResource Monitoring Eventsâ
MSG_OAM_PUT_TO_QUEUE_FAILED	8.2.29, âOAM Eventsâ
MSG_OAM_QUEUE_BLOCKED	8.2.29, âOAM Eventsâ

Event Code	Section
MSG_OAM_QUEUE_FULL	8.2.29, âOAM Eventsâ
MSG_OAM_RAM_THRESHOLD_REACHED	8.2.4, âResource Monitoring Eventsâ
MSG_OAM_THRESHOLD_REACHED	8.2.4, âResource Monitoring Eventsâ
MSG_OAM_TIMESYNC	8.2.29, âOAM Eventsâ
MSG_OAM_TIMESYNC_FAILED	8.2.29, âOAM Eventsâ
MSG_OS_EXCEPTION_ERROR	8.2.3, âReboot Eventsâ
MSG_ERH_NO_LICENSE	8.2.48, âError Eventsâ
MSG_OSF_PCS_EXCEPTION	8.2.3, âReboot Eventsâ
MSG_PPP_STACK_PROC	8.2.21, âPPP Stack Eventsâ
MSG_PPP_STACK_REBOOT	8.2.3, âReboot Eventsâ
MSG_PS_INVALID_STREAM_FROM_ADDRESS	8.2.2, âStatus Eventsâ
MSG_PS_INVALID_STREAM_FROM_PORT	8.2.2, âStatus Eventsâ
MSG_PPTP_STACK_REBOOT	8.2.3, âReboot Eventsâ
MSG_PPPM_ERR_CONFIG	8.2.20, âPPP MANAGER Eventsâ
MSG_PPPM_ERR_OPERATION	8.2.20, âPPP MANAGER Eventsâ
MSG_REG_ERROR_FROM_SOH	8.2.14, âREG Eventsâ
MSG_REG_GLOBAL_ERROR	8.2.14, âREG Eventsâ
MSG_REG_NIL_PTR_FROM_SOH	8.2.14, âREG Eventsâ
MSG_REG_NO_MEMORY	8.2.14, âREG Eventsâ
MSG_REG_NO_REGISTRATION_POSSIBLE	8.2.14, âREG Eventsâ
MSG_REG_REQUEST_WITHIN_REGISTRATION	8.2.14, âREG Eventsâ
MSG_REG_SOH_SEND_DATA_FAILED	8.2.14, âREG Eventsâ
MSG_REG_SOH_UNKNOWN_EVENT_FROM_SOH	8.2.14, âREG Eventsâ
MSG_RESTORE_CFG_REBOOT	8.2.3, âReboot Eventsâ
MSG_SCN_ADD_PARAMETER_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_SCN_BIND_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_SCN_DEV_NOT_IN_DEVLIST	8.2.33, âMAGIC/Device Manager Eventsâ

Event Code	Section
MSG_SCN_ERROR_12_MSG	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_SCN_GET_ADMMSG_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_SCN_GET_LDAPMSG_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_SCN_OPEN_STREAM_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_SCN_OPERATION_ON_STREAM_FAILED	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_SCN_POLL_FD	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_SCN_UNEXPECTED_L2_MSG	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_SCN_UNEXPECTED_POLL_EVENT	8.2.33, âMAGIC/Device Manager Eventsâ
MSG_SDR_INIT	8.2.6, âCall Control and Feature Eventsâ
MSG_SDR_UNEXPECTED_EVENT	8.2.6, âCall Control and Feature Eventsâ
MSG_SI_L2STUB_COUDNT_OPEN_STREAM	8.2.32, âSI Events (System Interface Events)â
MSG_SI_L2STUB_ERROR_INIT_DRIVER	8.2.32, âSI Events (System Interface Events)â
MSG_SI_L2STUB_NO_ALLOC	8.2.32, âSI Events (System Interface Events)â
MSG_SI_L2STUB_NO_CLONE	8.2.32, âSI Events (System Interface Events)â
MSG_SI_L2STUB_OPEN_OTHER_STREAM_NOT_POSSIBLE	8.2.32, âSI Events (System Interface Events)â
MSG_SI_L2STUB_PORT_NOT_OPEN	8.2.32, âSI Events (System Interface Events)â
MSG_SI_L2STUB_STREAM_ALREADY_OPEN	8.2.32, âSI Events (System Interface Events)â
MSG_SI_L2STUB_UNEXPECTED_DB_TYPE	8.2.32, âSI Events (System Interface Events)â
MSG_SI_L2STUB_UNKNOWN_SOURCE_PID	8.2.32, âSI Events (System Interface Events)â
MSG_SIP_FM_INTERNAL_ERROR	8.2.2, âStatus Eventsâ

Event Code	Section
MSG_SIP_FM_MSG_INTERNAL_ERROR	8.2.2, âStatus Eventsâ
MSG_SIP_FM_MSG_NOT_PROCESSED	8.2.2, âStatus Eventsâ
MSG_SIP_FM_STARTUP_FAILURE	8.2.2, âStatus Eventsâ
MSG_SNCP_ADD_OBJECT_FAILED	8.2.6, âCall Control and Feature Eventsâ
MSG_SNCP_CHANNEL_ID_MISSING	8.2.6, âCall Control and Feature Eventsâ
MSG_SNCP_COULD_NOT_CREATE_OBJECT	8.2.6, âCall Control and Feature Eventsâ
MSG_SNCP_COULD_NOT_DELETE_OBJECT	8.2.6, âCall Control and Feature Eventsâ
MSG_SNCP_COULD_NOT_SET_FORW_ENC	8.2.6, âCall Control and Feature Eventsâ
MSG_SNCP_COULD_NOT_SET_REV_ENC	8.2.6, âCall Control and Feature Eventsâ
MSG_SNCP_DEVICE_ID_MISSING	8.2.6, âCall Control and Feature Eventsâ
MSG_SNCP_ERROR	8.2.6, âCall Control and Feature Eventsâ
MSG_SNCP_NEITHER_ENC_COULD_BE_SET	8.2.6, âCall Control and Feature Eventsâ
MSG_SNCP_NO_RESOURCE_ID	8.2.6, âCall Control and Feature Eventsâ
MSG_SNCP_UNANTICIPATED_MESSAGE	8.2.6, âCall Control and Feature Eventsâ
MSG_SNMP_TRAP_COLLECTOR_START_ERROR	8.2.3, âReboot Eventsâ
MSG_SPE_CERT_MISSING	8.2.22, âSPE Eventsâ
MSG_SPE_CERT_AVAIL	8.2.22, âSPE Eventsâ
MSG_SPE_CERT_UPDATED	8.2.22, âSPE Eventsâ
MSG_SPE_CERT_EXPIRED	8.2.22, âSPE Eventsâ
MSG_SPE_CERT_TIMEREMAINING	8.2.22, âSPE Eventsâ
MSG_SPE_CRL_EXPIRED	8.2.22, âSPE Eventsâ
MSG_SPE_CRL_UPDATED	8.2.22, âSPE Eventsâ
MSG_SPE_ALL_CRLS_UPTODATE	8.2.22, âSPE Eventsâ
MSG_SPL_ADD_OBJECT_FAILED	8.2.6, âCall Control and Feature Eventsâ

Event Code	Section
MSG_SPL_ERROR	8.2.6, âCall Control and Feature Eventsâ
MSG_SPL_FMSEM_ERROR	8.2.6, âCall Control and Feature Eventsâ
MSG_SPL_MISSING_CS_ID	8.2.6, âCall Control and Feature Eventsâ
MSG_SPL_SESSION_NOT_FOUND	8.2.6, âCall Control and Feature Eventsâ
MSG_SPL_UNANTICIPATED_MESSAGE	8.2.6, âCall Control and Feature Eventsâ
MSG_SSM_BAD_NWRS_RESULT	8.2.6, âCall Control and Feature Eventsâ
MSG_SSM_INVALID_PARAM	8.2.6, âCall Control and Feature Eventsâ
MSG_SSM_NO_CSID	8.2.6, âCall Control and Feature Eventsâ
MSG_SSM_NUM_OF_CALL_LEGS_2BIG	8.2.3, âReboot Eventsâ
MSG_SSM_SESSION_CREATION_FAILED	8.2.3, âReboot Eventsâ
MSG_SSM_UNSPEC_ERROR	8.2.6, âCall Control and Feature Eventsâ
MSG_SYSTEM_REBOOT	8.2.3, âReboot Eventsâ
MSG_STRC_STOP	8.2.2, âStatus Eventsâ
MSG_STRC_START	8.2.2, âStatus Eventsâ
MSG_T90_ERROR	8.2.43, âFax Converter, HDLC and X.25 Eventsâ
MSG_T90_INFO	8.2.43, âFax Converter, HDLC and X.25 Eventsâ
MSG_TESTLW_ERROR	8.2.42, âTest Loadware Eventsâ
MSG_TESTLW_INFO	8.2.42, âTest Loadware Eventsâ
MSG_TLS_MUTEX_BLOCKED	8.2.29, âOAM Eventsâ
MSG_TLS_POOL_SIZE_EXCEEDED	8.2.3, âReboot Eventsâ
MSG_VCAPI_ACCEPT_ERROR	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_ADD_OBJECT_FAILED	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_BUF_NOT_CREATED	8.2.23, âVCAPI Eventsâ

Event Code	Section
MSG_VCAPI_CONF_ALLOC_ERR	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_CONF_WITHOUT_REQ	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_CONV_H2N_ERROR	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_CONV_H2N_FAILED	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_CONV_N2H_FAILED	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_COULD_NOT_CREATE_OBJECT	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_COULD_NOT_DELETE_OBJECT	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_COULD_NOT_FIND_CSID	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_COULD_NOT_FIND_OBJECT	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_COULD_NOT_FIND_PLCI	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_COULD_NOT_STORE_REQ	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_CSID_MISSING	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_DATA_B3_ALLOC_ERR	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_DATA_NOT_STORED	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_DISP_NOT_READY	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_ILLEGAL_LINK_NUMBER	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_ILLEGAL_PARTNER_NUMBER	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_IND_ALLOC_ERR	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_LINK_TABLE_FULL	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_LISTENING_ERR	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_MESSAGE_LENGTH_TOO_SHORT	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_MSG_NOT_SEND	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_MSGBASE_WITHOUT_CAPIMSG	8.2.24, âVCAPI Application Eventsâ

Event Code	Section
MSG_VCAPI_MSGBASE_WITHOUT_DATAGWMSG	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_MSGBASE_WITHOUT_DISPMSG	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_NO_ALLOC_EXTENDED	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_NO_ALLOC_MSG	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_NO_ALLOC_SINGLE	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_NO_CAPI_DATA	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_NO_CLIENT	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_NO_LIST_SOCKET	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_NO_LNK_CONN	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_NO_NEW_BUF	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_NO_PLCI	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_NO_PLCI_AVAILABLE	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_NO_PLCI_DATA_B3	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_NO_PLCI_DISCONNECT	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_NO_RCV_BUFFER	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_PLCI_NOT_FOUND	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_RCV_LEN_ERR	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_RECEIVE_ERR	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_SERVER_ERROR	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_SOCK_NOT_AVAIL	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_SOCKET_BIND_ERR	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_SOCKET_NOT_OPEN	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_SOCKET_RCV_ERR	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_TOO_MANY_CLIENTS	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_UNANTICIPATED_CAPI_MESSAGE	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_UNANTICIPATED_DISP_MESSAGE	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_UNANTICIPATED_MESSAGE	8.2.24, âVCAPI Application Eventsâ

Event Code	Section
MSG_VCAPI_UNANTICIPATED_MESSAGE_BASE	8.2.24, âVCAPI Application Eventsâ
MSG_VCAPI_UNKNOWN_MSG_N2H	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_UNKNOWN_NTFY	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_WRONG_BUF_LEN	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_WRONG_CONV_H2N	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_WRONG_CONV_N2H	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_WRONG_EVENT_CAPI	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_WRONG_EVENT_SRV	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_WRONG_LENGTH_MSG	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_WRONG_LINKNUM	8.2.23, âVCAPI Eventsâ
MSG_VCAPI_WRONG_MSG_LENGTH	8.2.23, âVCAPI Eventsâ
MSG_WEBSERVER_INTERNAL_ERROR	8.2.29, âOAM Eventsâ
MSG_WEBSERVER_MAJOR_ERROR	8.2.3, âReboot Eventsâ
MSG_X25_ERROR	8.2.43, âFax Converter, HDLC and X.25 Eventsâ
MSG_X25_INFO	8.2.43, âFax Converter, HDLC and X.25 Eventsâ
MSG_X75_ERROR	8.2.43, âFax Converter, HDLC and X.25 Eventsâ
MSG_X75_INFO	8.2.43, âFax Converter, HDLC and X.25 Eventsâ
MSG_XMLUTILS_ERROR	8.2.47, âXMLUTILS Eventsâ
QDC_ERROR_IN_CLIENT	8.2.52, âQDC-CGWA-Related Eventsâ
QDC_ ERROR_IN_COMMON_CLIENT	8.2.51, âClient-Related Eventsâ
QDC_INVALID_CONFIGURATION	8.2.52, âQDC-CGWA-Related Eventsâ
QDC_MSG_QUEUE_ERROR	8.2.51, âClient-Related Eventsâ
QDC_PERSYSTENCY_ERROR	8.2.52, âQDC-CGWA-Related Eventsâ
QDC_SIGNALLING_DATA_ERROR	8.2.51, âClient-Related Eventsâ

Event Code	Section
QDC_SYSTEM_ERROR	8.2.51, âClient-Related Eventsâ
QDC_VOIPSD_ERROR	8.2.53, âQDC VoIPSD Error Report Eventsâ
SENTA_NOK_UPGRADE_REG	8.2.2, âStatus Eventsâ
SIP_INFORMATION	8.2.54, âSIP Eventsâ
SIP_INVALID_PARAMETER_VALUE	8.2.54, âSIP Eventsâ
SIP_INVALID_POINTER	8.2.54, âSIP Eventsâ
SIP_REBOOT	8.2.3, âReboot Eventsâ
SIP_UNEXPECTED_RETURN_VALUE	8.2.54, âSIP Eventsâ

8.2.2 Status Events

COMGA_NOK_UPGRADE_REG

Loading the COMGA Firmware via HTTP

FW_NOK_UPGRADE_REG

Loading the firmware

MSG_DLSC_BOOTSTRAP_OK

The bootstrapping of the deployment and licensing server clients was successful.

MSG_FIREWALL_ALARM

Alarm at firewall.

MSG_GW_SUCCESSFULLY_STARTED

`EventText: 11/21/2001 20:46:52`

Type: **Information**

Gateway was started successfully at given time. An SNMP trap is generated.

MSG_IPNCV_STARTUP_ERROR

`EventText: IPNCV Startup: %s`

Type: **Major**

IPNCV could not be started. An SNMP trap is generated. Create a TR/MR.

MSG_IPNCV_STARTUP_SHUTDOWN

`EventText: IPNCV start/stop: %s`

Type: **Information**

IPNCV was started or stopped successfully. An SNMP trap is generated.

MSG_IPNCV_INTERNAL_ERROR

`EventText: Internal IPNCV error: %s`

Type: **Warning**

Software error: invalid internal data found. An SNMP trap will be generated with the profile IPNCV-Detailed.

MSG_LDAP_SUCCESSFULLY_STARTED

`EventText: %s`

Type: **Information**

LDAP started successfully.

FP_EVT_INFORMATION

`EventText: %x %c #%d/%d %x-%x %s`

Type: **Information**

Internal SW event â“ for information only

FP_EVT_TRACE_STOP

`EventText: %x %c #%d/%d %x-%x %s`

Type: **Information**

Trace stop provided

FP_EVT_TRACE_START

`EventText: %x %c #%d/%d %x-%x %s`

Type: **Information**

Trace start provided

FP_EVT_SNMP_TRAP

`EventText: %x %c #%d/%d %x-%x %s`

Type: **Warning**

Important events with SNMP trap. Important events â“ SNMP trap is generated.

FP_EVT_MINOR

`EventText: %x %c #%d/%d %x-%x %s`

Type: **Minor**

Internal SW error with remote signaling

FP_EVT_INDETERMINATE

`EventText: %x %c #%d/%d %x-%x %s`

Type: **Information**

Internal software error with trace stop and remote signaling

MSG_PS_INVALID_STREAM_FROM_ADDRESS

Invalid data from a specific address.

MSG_PS_INVALID_STREAM_FROM_PORT

Invalid data from a specific port.

MSG_SIP_FM_MSG_INTERNAL_ERROR

`EventText: %p`

Type: **Major**

Software error within SIP_FM_MSG

MSG_SIP_FM_STARTUP_FAILURE

`EventText: SIP_FM startup failed: %s`

Type: **Major**

Software error during SIP_FM start

MSG_SIP_FM_INTERNAL_ERROR

`EventText: %p`

Type: **Major**

Software error within SIP_FM

MSG_SIP_FM_MSG_NOT_PROCESSED

`EventText: SIP_FM received an illegal message: %d`

Type: **Major**

SIP_FM could not send a "received" message.

MSG_STRC_STOP

STRC stopped.

MSG_STRC_START

STRC started.

MSG_HBR_WARNING

Warning of HiPath backup and restore.

SENTA_NOK_UPGRADE_REG

Loading the SENTA Firmware via HTTP

8.2.3 Reboot Events

MSG_CAT_H323_REBOOT

The H.323 stack adapter has no more internal resources and causes a reboot. The reboot is executed. An SNMP trap is generated.

MSG_CAT_HSA_REBOOT

`EventText: HSA (Reboot) Q931 cmCallNew() failed:reaching vtNodeCount limit`

Type: **Critical**

The H.323 stack adapter has run out of internal resources and causes a reboot. The reboot is executed. An SNMP trap is generated. Include the event log with the error report.

MSG_OSF_PCS_EXCEPTION

`EventText: "%p"`

Type: **Critical**

The OSF has registered a critical exception. The reboot will still be executed.

MSG_OS_EXCEPTION_ERROR

The OS has registered a critical exception. The reboot is executed.

MSG_WEBSERVER_MAJOR_ERROR

`EventText: %p`

Type: **Major**

Internal error on web server. As other activities on the part of the web server have been influenced, a reboot will be forced. The reboot is executed.

MSG_ADMIN_REBOOT

Type: **Information**

`EventText: Reboot initiated by Admin`

A restart forced by the administrator is executed. An SNMP trap is generated.

`EventText: Reboot initiated by Admin (SW Image Activation)`

A restart forced by the administrator by loading a new software image is executed. An SNMP trap is generated.

`EventText: Reboot initiated by Admin (SW Upgrade)`

A restart forced by the administrator by loading new data is executed. An SNMP trap is generated.

MSG_SYSTEM_REBOOT

`EventText: Reboot initiated by Garbage Collection. Available memory: xxxx`

Type: **Information**

A restart necessitated by an internal garbage collection is executed. An SNMP trap is generated.

MSG_EXCEPTION_REBOOT

`EventText: Reboot initiated by VxWorks Task Exception`

Type: **Information**

A restart is executed following a VxWorks task. An SNMP trap is generated.

MSG_RESTORE_CFG_REBOOT

`EventText: Special reboot initiated by Admin (Backup Service)`

Type: **Information**

A restart necessitated by a HBS data restore procedure is executed. An SNMP trap is generated.

MSG_GW_OBJ_MEMORY_EXHAUSTED

`EventText: Object memory has been exhausted. Last allocation size: xxxx. Using failsafe areas to attempt a graceful shutdown`

Type: **Critical**

Possible memory problems: too much memory has been reserved, or not enough memory available. The necessary reboot is executed. An SNMP trap is generated.

MSG_GW_OBJ_ALLOC_FAILED

`EventText: Memory allocation in partition xxx failed. xxx Error. Last allocation size: xxxx. Rebooting ...`

Type: **Critical**

Possible memory problems: too much memory has been reserved, or not enough memory available. The necessary reboot is executed. An SNMP trap is generated.

MSG_GW_OBJ_MEMORY_INCONSISTENT

`EventText: Memory corruption in partition xxx XXX Error. Invalid block address: xxxx. Rebooting ...`

Type: **Critical**

Possible memory problems: memory was overwritten, or an attempt was made to free up memory that has already been freed up. The necessary reboot is executed. An SNMP trap is generated.

ASSERTION_FAILED_EVENT

`EventText: Assertion failed ...`

Type: **Information**

Internal software encoding problem. The necessary reboot is executed. An SNMP trap is generated. Create a TR/MR.

EXIT_REBOOT_EVENT

Type: **Information**

`EventText: Rebooting due to Exit Event ...`

Internal software encoding problem. The necessary reboot is executed. An SNMP trap is generated. Create a TR/MR.

`EventText: cannot create Task tV24CliI. ...`

Task generation on the V.24-CLI interface has failed. The necessary reboot is executed.

`EventText: internal error: not enough memory ...`

The reservation of memory has failed. The necessary reboot is executed.

`EventText: CLI: read operation from STD_IN has failed ...`

Input/output faulty. The necessary reboot is executed.

MSG_TLS_POOL_SIZE_EXCEEDED

`EventText: ?*?maximum number of elements exceeded`

Type: **Major**

Problem with internal pool size configuration. The necessary reboot is executed. An SNMP trap is generated. Create a TR/MR.

MSG_SSM_NUM_OF_CALL_LEGS_2BIG

`EventText: More than 2 call Legs: not supported! CSID: %x/%x`

Type: **Major**

No more than two call Legs per session are permitted. This has caused the software to become unstable. The necessary reboot is executed. An SNMP trap is generated.

MSG_SSM_SESSION_CREATION_FAILED

`EventText: Session creation failed`

Type: **Major**

Signaling is no longer possible because a session could not be created. The necessary reboot is executed. An SNMP trap is generated.

MSG_SNMP_TRAP_COLLECTOR_START_ERROR

`EventText: Trap collector could not be started:%n%s`

Type: **Information**

The thread in the trace collector could not be started. Check whether trap port 162 has already been used elsewhere.

MSG_PPP_STACK_REBOOT

The reboot is executed.

MSG_PPTP_STACK_REBOOT

The reboot is executed.

MSG_ASP_REBOOT

The reboot is executed. An SNMP trap is generated.

MSG_DELIC_ERROR

A DELIC error has occurred. The reboot is executed. An SNMP trap is generated.

MSG_IPSEC_REBOOT

The reboot is executed.

FP_EVT_CRITICAL

`EventText: %x %c #%d/%d %x-%x %s`

Type: **Critical**

Reboot triggered by a software error.

FP_EVT_MAJOR

`EventText: %x %c #%d/%d %x-%x %s#`

Type: **Major**

Reboot because resources are exhausted.

FP_EVT_WARNING

`EventText: %x %c #%d/%d %x-%x %s`

Type: **Warning**

Reboot initiated via the tool.

SIP_REBOOT

`EventText: InternalSetUserA`

Type: **csevMajor**

Configuration of the SIP stack failed. The reboot is executed.

MSG_MIKEY_REBOOT

The reboot is executed.

8.2.4 Resource Monitoring Events

MSG_IP_LINK_FAILURE

`EventText: IP Link [still] out of order`

Type for this log entry: **Warning**

An IP network connection is not or is still not possible. An SNMP trap is generated. Check the terminal connections and cables

`EventText: IP Link no longer out of order`

Type for this log entry: **Cleared**

The IP network connection has become available again. An SNMP trap is generated.

MSG_IP_LINK2_FAILURE

n/a

MSG_IP_LINK_RESTORE

n/a

MSG_IP_LINK2_RESTORE

n/a

MSG_IP_LINK_SWITCHOVER

n/a

MSG_IP_LINK2_SWITCHOVER

n/a

MSG_OAM_RAM_THRESHOLD_REACHED

```
EventText: High WaterMark "XXX" [still] reached:
           Configured: xxx Current: xxx
```

Type for this log entry: **Warning**

The system memory limit has been reached. Details are listed in the event message (percentage limit value, current value and capacity utilization). This may be caused by a high volume of calls. An SNMP trap is generated. Please note the Information in Section 6.4.1.4, "Overloading the Board with Trace Information"

```
EventText: High WaterMark "XXX" no longer reached:
           Configured: xxx Current: xxx
```

Type for this log entry: **Cleared**

The problem with the system memory limit has been eliminated. Lower memory utilization may be caused by a lower call volume. An SNMP trap is generated.

MSG_OAM_DMA_RAM_THRESHOLD_REACHED

```
EventText: High WaterMark "XXX" [still] reached:
           Configured: xxx Current: xxx
```

Type for this log entry: **Warning**

The DMA memory limit has been reached. Details are listed in the event message (percentage limit value, current value and capacity utilization). This may be caused by a high volume of calls. An SNMP trap is generated.

```
EventText: High WaterMark "XXX" no longer reached:
           Configured: xxx Current: xxx
```

Type for this log entry: **Cleared**

The problem with the DMA memory limit has been eliminated. Lower memory utilization may be caused by a lower call volume. An SNMP trap is generated.

MSG_OAM_OVERLOAD_REACHED

n/a

MSG_OAM_OVERLOAD_CLEARED

n/a

MSG_OAM_THRESHOLD_REACHED

```
EventText: High/Low WaterMark "XXX" [still] reached:
           Configured: xxx Current: xxx
```

Type for this log entry: **Warning**

A threshold value has been reached (in the flash memory, in the file system memory capacity or in the netstack IP resources). Details are listed in the event

message (percentage limit value, current value and capacity utilization). An SNMP trap is generated.

```
EventText: High/Low WaterMark "XXX" no longer reached:
           Configured: xxx Current: xxx
```

Type for this log entry: **Cleared**

The problem with the threshold value has been eliminated. An SNMP trap is generated.

MSG_OAM_PSU_OR_RPS_OUT_OF_SERVICE

```
EventText: PSU or RPS [still] out of Service
```

Type for this log entry: **Warning**

There is (still) a problem with PSU or RPS. An SNMP trap is generated. Check the PSU and RPS and replace them if necessary.

```
EventText: PSU or RPS no longer out of Service
```

Type for this log entry: **Cleared**

The problem with the PSU or RPS has been eliminated. An SNMP trap is generated.

MSG_OAM_FAN_OUT_OF_SERVICE

```
EventText: Fan [still] out of Service
```

Type for this log entry: **Warning**

There is (still) a problem with the fan. An SNMP trap is generated. Check the fan and replace it if necessary.

```
EventText: Fan no longer out of Service
```

Type for this log entry: **Cleared**

The problem with the fan has been eliminated. An SNMP trap is generated.

MSG_OAM_HIGH_TEMPERATURE_EXCEPTION

```
EventText: High WaterMark "Temperature" reached:
Configured: xxx Current: xxx . Gateway stopped.
```

Type: **Warning**

A serious problem has occurred with the temperature. The gateway has been stopped. Check the environment and replace boards and/or fan if necessary.

MSG_CAR_MALLOC_FAILED

```
EventText: Malloc failed
```

Type: **Major**

The reservation of memory has failed.

MSG_IPNCV_MEMORY_ERROR

```
EventText: IPNCV Memory: %s
```

Type: **Major**

Memory overflow: an SNMP trap is generated. Restart the gateway. Create a TR/MR.

MSG_LDAP_IP_LINK_ERROR

`EventText: IP Link out of order`

Type: **Warning**

No network-IP connection.

MSG_LDAP_MEMORY_ERROR

`EventText: No Materna Buffer Available`

Type: **Major**

Not enough memory to send/receive a message.

MSG_LDAP_ENCODE_DECODE_ERROR

`EventText: Unable to Encode/Decode LDAP Msg`

Type: **Major**

BER encoding or decoding of a LDAP-ASN.1 message failed.

MSG_LDAP_SOCKET_ERROR

`EventText: LDAP Socket Failure`

Type: **Major**

An error has occurred with LDAP socket calls.

MSG_LDAP_GENERAL_ERROR

`EventText: LDAP Returns General Error`

Type: **Warning**

An error has occurred with LDAP function calls.

MSG_HACKER_ON_SNMP_PORT_TRAP

`EventText: %s has tried to connect with TCP port 7161`

Type: **Information**

The IP address specified has made an attempt to connect with the SNMP TCP port 7161.

8.2.5 Routing Events

MSG_CAT_NWRS

Type: **Warning/Major**

Invalid data for NPI or TONE value in an ODR command. The command is ignored. This message may also be displayed if an administrator switches the ODR while the system is running. Check the ODR commands NPITYPE, TONTYPE (and CGNPITYPE, CGTONTYPE) for plausible values.

MSG_NWRS_DPLN_ENTRY_INVALID

`EventText: Dial Plan Entry invalid: Dpln=#, DplnEntry=#member`

Type: **Minor**

Syntax error in the numbering plan: characters other than `0123456789*#ANXZ-` are not allowed. Use permitted characters only. Do not use more than one separator in sequence and do not use separators at the beginning or at the end.

MSG_NWRS_NO_DPLN_FOUND_FOR_DEVICE

`EventText:` Dial Plan not found for Device #port

Type: **Major**

The specified port is not assigned to a specific numbering plan entry. Assign the specified port in the numbering plan and, if necessary, generate a new numbering plan first.

MSG_NWRS_EMPTY_FIELD_ECHOED

`EventText:` Empty field # echoed by Out Dial Rule #

Type: **Warning**

The echo command of an outdial rule for outgoing calls results in a blank or implausible sub-string. Check the digit string of the numbering plan entry in conjunction with the echo commands of the outdial rule for outgoing calls.

MSG_NWRS_UNKNOWN_FIELD_ECHOED

`EventText:` Unknown field # echoed by Out Dial Rule #

Type: **Minor**

The echo command of an outdial rule for outgoing calls results in a blank or implausible substring. Check the digit string of the numbering plan entry in conjunction with the echo commands of the outdial rule for outgoing calls.

MSG_NWRS_ODR_COMMAND_UNKNOWN

`EventText:` Unknown Command ...string in Out Dial Rule #

Type: **Minor**

An outdial rule for outgoing calls contains an unrecognizable command or an invalid value. Check the syntax of the outdial rule for keywords and separator characters (â:â and â;â) as well as all constants and limit values.

MSG_NWRS_ODR_NOT_FOUND

`EventText:` Out Dial Rule # not found"

Type: **Warning**

A gateway contains an index that cannot be resolved in outdial rules for outgoing calls. Use an outdial rule already configured for outgoing calls or create a new one.

MSG_NWRS_DEVICE_NOT_FOUND

`EventText:` Device # port not found

Type: **Major**

An invalid port has been assigned to a route member. Assign a valid destination port to the route member.

MSG_NWRS_DEVICE_TABLE_NOT_FOUND

`EventText:` Device Table not found

Type: **Major**

A port is not available. Try to resolve the problem by restarting the hardware.

MSG_NWRS_ROUTE_NOT_FOUND

`EventText:` Route # not found

Type: **Major**

A numbering plan member contains a route number that cannot be resolved. Use a route that has already been configured or create a new one.

MSG_NWRS_DPLN_NOT_FOUND

`EventText:` Dial Plan not found: Dpln %I

Type: **Major**

A numbering plan with the specified ID could not be found.

MSG_NWRS_UNSPEC_ERROR

`EventText:` %p

Type: **Major**

Inconsistent software status, for example, as a result of invalid data.

8.2.6 Call Control and Feature Events

MSG_SDR_INIT

`EventText:` SDR init %p

Type: **Major**

SDR could not be started (no files). An error occurred during initialization of SDR.

MSG_SDR_UNEXPECTED_EVENT

`EventText:` SDR: Unexpected event %n%M%n in state %s%n from %s - EXCEP: %n%e

Type: **Warning**

Unexpected or unregistered message.

MSG_SNCP_UNANTICIPATED_MESSAGE

`EventText:` SCN Payload: Unanticipated Message %s in state %s - EXCEP: %n%e

Type: **Warning**

An unknown message was received.

MSG_SNCP_DEVICE_ID_MISSING

`EventText:` SCN Payload: Mandatory field device ID missing in message 0x %X - EXCEP: %n%e

Type: **Major**

The mandatory field for the device ID, which is required for creating the resource ID, is missing from the specified message.

MSG_SNCP_CHANNEL_ID_MISSING

`EventText:` SCN Payload: Mandatory field device ID missing in message 0x %X - EXCEP: %n%e

Type: **Major**

The mandatory field for the channel ID, which is required for creating the resource ID, is missing from the specified message.

MSG_SNCP_NO_RESOURCE_ID

`EventText:` SCN Payload: No resource ID available in message 0x%X - EXCEP: %n%e

Type: **Major**

There is no resource ID in the specified message.

MSG_SNCP_COULD_NOT_DELETE_OBJECT

`EventText:` SCN Payload: Could not delete SCN Payload Object - EXCEP: %n%e

Type: **Major**

SCN payload object could not be deleted.

MSG_SNCP_COULD_NOT_CREATE_OBJECT

`EventText:` SCN Payload: Could not delete SCN Payload Object - EXCEP: %n%e

Type: **Major**

SCN payload object could not be deleted.

MSG_SNCP_COULD_NOT_SET_FORW_ENC

`EventText:` SCN Payload: Could not set forward encoding to %I for CSID: (%s) and ResID: (%u) - EXCEP: %n%e

Type: **Major**

Could not set forward encoding.

MSG_SNCP_COULD_NOT_SET_REV_ENC

`EventText:` SCN Payload: Could not set reverse encoding to %I for CSID: (%s) and ResID: (%u) - EXCEP: %n%e

Type: **Major**

Could not set reverse encoding.

MSG_SNCP_NEITHER_ENC_COULD_BE_SET

`EventText:` SCN Payload: Neither encoding could be set for CSID: (%s) and ResID: (%u) - EXCEP: %n%e

Type: **Major**

Neither encoding could be set.

MSG_SNCP_ADD_OBJECT_FAILED

`EventText:` SCN Payload: Could not add SCN Payload Object - EXCEP: %n %e

Type: **Major**

SCN payload object could not be added.

MSG_SNCP_ERROR

`EventText:` SNCP Error: %p

Type: **Warning/Major**

Inconsistent software status in SNCP component.

MSG_SPL_SESSION_NOT_FOUND

`EventText:` No session for Session Payload Object found using CSID: %u) - EXCEP: %n%e

Type: **Major**

No session object found.

MSG_SPL_ADD_OBJECT_FAILED

`EventText:` Session Payload: Object could not be added - EXCEP: %n%e

Type: **Major**

Object could not be added

MSG_SPL_MISSING_CS_ID

`EventText:` Session Payload: Missing Call and Session ID - EXCEP: %n%e

Type: **Major**

Call and session ID missing.

MSG_SPL_UNANTICIPATED_MESSAGE

`EventText:` Session Payload: Unanticipated Message %s in state %s - EXCEP: %n%e

Type: **Warning**

Unanticipated message.

MSG_SPL_ERROR

`EventText: SPL Error: %p`

Type: **Warning/Major**

Inconsistent software status in SPL component.

MSG_SPL_FMSEM_ERROR

`EventText: FMSEM Error: %p`

Type: **Warning/Major**

Inconsistent software status in FMSEM component, which is part of SPL.

MSG_SSM_NO_CSID

`EventText:` Msg doesnât contain a CSID !

Type: **Major**

Call and session ID missing.

MSG_SSM_INVALID_PARAM

`EventText:` Invalid parameter %s, value %x

Type: **Major**

A parameter contained an invalid value.

MSG_SSM_UNSPEC_ERROR

`EventText: %p`

Type: **Major**

Inconsistent software status, for example, as a result of invalid data.

MSG_SSM_BAD_NWRS_RESULT

`EventText:` Bad result from NWRS

Type: **Major**

Probably a protocol loop was detected. Check configuration of the route from the signal source to the destination.

MSG_MAND_PARAM_MISSING

`EventText:` Mandatory parameter %s for construction of message missing

Type: **Major**

A CCP message could not be built from the message base because a mandatory parameter was missing.

8.2.7 SCN Protocol Events

MSG_ISDN_CMR_INIT_FAILED

`EventText: Initialization for protocol manager failed. %p`

Type: **Warning**

Initialization of the protocol manager failed.

MSG_ISDN_CMR_MAND_FIELDS_MISSING

`EventText: %pMandatory fields missing (ID %s)`

Type: **Warning**

Mandatory fields are missing from the message.

MSG_ISDN_CMR_OBJECT_NOT_FOUND

`EventText: %pThe object for Call and Session ID %s could not be found`

Type: **Critical**

The session object for a connection segment could not be found.

MSG_ISDN_CMR_UNIMPLEMENTED

`EventText: %pUnimplemented feature%s`

Type: **Warning**

The requested feature is not implemented.

MSG_ISDN_CMR_TIMER_EXPIRED

`EventText: %pTimer %S expired in state %S`

Type: **Information**

A timer has expired.

MSG_ISDN_CMR_WRONG_DEVICE_TYPE

`EventText: %p%Device Id %I is not a valid device type`

Type: **Warning**

A specified device type is invalid.

MSG_ISDN_CMR_MSG_DECODE_FAILED

`EventText: %pEvent decoding failed. %s %s %nEvent data: %b`

Type: **Warning**

Message decoding failed.

MSG_ISDN_CMR_NEW_OBJECT_FAILED

`EventText: %pThe object for this Call and Session ID could not be created`

Type: **Critical**

Creation of a session object for a call segment failed.

MSG_ISDN_CMR_ADD_OBJECT_FAILED

`EventText: %pThe object created for this Call and Session ID could not be added to the manager`

Type: **Critical**

A call segment object could not be linked to the protocol manager.

MSG_ISDN_CMR_UNEXPECTED_EVENT

`EventText: %pReceived unexpected event Message ID: %s`

Type: **Information**

An unexpected event was received.

MSG_ISDN_CMR_SESSION_NOT_FOUND

```
EventText: %pThe session object for this Call and Session
ID could not be found by the manager
```

Type: **Critical**

The session object for the call segment was not found.

MSG_ISDN_CMR_STATUS_MSG_RECEIVED

```
EventText: %pL3 Status message received in state %s
```

Type: **Information**

A status message was received.

MSG_ISDN_CMR_WRONG_PROTVAR

```
EventText: %pProtocol Variant %I, Key %x is not valid.
Using default Timer Values !
```

Type: **Critical**

A protocol variant is invalid.

MSG_ISDN_CMR_GENRIC_EVENT

```
EventText: %p
```

Type: **Information**

A general event.

MSG_ISDN_RESOURCE_NOT_IN_SERVICE

```
EventText: %pResource not in service, Resource State %s
```

Type: **Information**

Wrong resource status: the resource does not exist in this service.

MSG_ISDN_RESOURCE_NOT_AVAILABLE

```
EventText: %pResource not available, Resource State %s
```

Type: **Information**

Resource not available.

MSG_ISDN_RESOURCE_IN_USE_BY_O_CALL

```
EventText: %pResource in use by other call. Resource not
released, Resource State %s
```

Type: **Information**

Resource reserved by another call (call collision).

MSG_ISDN_DEVICE_PTR_NOT_FOUND

```
EventText: %pThe device ID could not be found
```

Type: **Warning**

The device object could not be found.

MSG_ISDN_CMR_DEVICE_PTR_BAD

`EventText: %pNull device pointer`

Type: **Critical**

The device object pointer is pointing to NULL.

MSG_ISDN_CMR_MSG_ENCODE_FAILED

`EventText: %pEvent encoding failed. %s %s %nEvent data: %b`

Type: **Warning**

Encoding of message failed.

MSG_ISDN_CMR_MSG_SEND_FAILED

`EventText: %pL3 Message sending failed`

Type: **Critical**

Encoding of message failed.

MSG_ISDN_CMR_SEG_MSG_ERROR

`EventText: %pSegmented message error`

Type: **Minor**

Segmented message error.

MSG_ISDN_CMR_UNEXPECTED_ERROR

`EventText: %pUnexpected error`

Type: **Minor**

Unexpected error occurred.

MSG_ISDN_CMR_UNEXPECTED_VALUE

`EventText: %pUnexpected value for this Device ID`

Type: **Warning**

Unexpected value for device ID.

MSG_ISDN_CMR_MSG_UNEXPECTED

`EventText: %pUnexpected event`

Type: **Warning**

Message was unexpected in the current call status.

MSG_ISDN_CMR_GEN_CALL_REF_FAILED

`EventText: %pCould not generate a Call Reference`

Type: **Critical**

Generation of call reference failed.

MSG_ISDN_CMR_WRONG_INTERFACE

`EventText: %pWrong interface type %s`

Type: **Critical**

Wrong interface type.

MSG_ISDN_CMR_UNH_STATE_EVENT

`EventText: %pUnhandled event`

Type: **Warning**

Event was not handled in the appropriate call state.

MSG_ISDN_NULL_PTR

`EventText: %p%p`

Type: **Critical**

An attempt was made to use a pointer at NULL.

MSG_ISDN_ERROR

`EventText: %pError: %p`

Type: **Minor**

ISDN error.

MSG_ISDN_NO_ERROR

`EventText: %pNo Error`

Type: **Information**

No ISDN error.

MSG_ISDN_CMR_PROTOCOL_ERROR

`EventText: Protocol error: Device ID %d`

Type: **Warning**

Message did not comply with the present protocol.

MSG_ISDN_CMR_MESSAGE_ERROR

`EventText: Message Error 0x%X`

Type: **Minor**

Message contains an error.

MSG_ISDN_START_UP_ERROR

`EventText: %s: Start up error. %p`

Type: **Critical**

Error during startup of ISDN protocol.

MSG_ISDN_START_UP

`EventText: %s: Start up OK. %p`

Type: **Information**

ISDN startup concluded.

MSG_ISDN_OVERLOAD_CONDITION

`EventText: %pOverload Condition. SETUP received, RELEASE COMPLETE sent`

Type: **Information**

Overload reached: call cleared.

8.2.8 H.323 Events

H323_NO_IP

n/a

H323_SNMP_TRAP

n/a

MSG_H323_MISSING_PARAMETER

`EventText: ...`

Types: **Major, Minor, Warning, Information**

A parameter is missing from a message that was sent to a H.323 component. Activate an appropriate H.323 analysis trace profile, and attach the trace and the event log to the error report.

MSG_H323_INVALID_PARAMETER_VALUE

`EventText: ...`

Types: **Major, Minor, Warning**

There is a parameter that exceeds the specified value range. Activate an appropriate H.323 analysis trace profile, and attach the trace and the event log to the error report.

MSG_H323_INVALID_CONFIGURATION

`EventText: ...`

Types: **Major, Warning**

The configuration for H.323 is wrong. Activate an appropriate H.323 analysis trace profile and attach the trace, event log and gateway config data to the error report.

MSG_H323_UNEXPECTED_RETURN_VALUE

`EventText: ...`

Types: **Major, Minor, Warning**

The current function call returns an unexpected error. Activate an appropriate H.323 analysis trace profile, and attach the trace and the event log to the error report.

MSG_H323_INVALID_POINTER

`EventText: ...`

Types: **Major, Minor, Warning, Information**

This pointer contains an invalid value. Activate an appropriate H.323 analysis trace profile, and attach the trace and the event log to the error report.

MSG_H323_INFORMATION

`EventText: ...`

Type: **Information**

This is for information purposes only.

MSG_H323_UNEXPECTED_MESSAGE

`EventText: ...`

Types: **Major, Minor, Warning**

H.323 protocol received an unexpected message. Activate an appropriate H.323 analysis trace profile, and attach the trace and the event log to the error report.

MSG_H323_LOGIC_ERROR

`EventText: ...`

Types: **Major, Warning, Information**

A logical error was detected during message processing. Activate an appropriate H.323 analysis trace profile, and attach the trace and the event log to the error report.

MSG_H323_STACK_ERROR

`EventText: ...`

Types: **Major, Minor, Warning, Information**

An error occurred during a H.323 stack operation. Activate an appropriate H.323 analysis trace profile, and attach the trace and the event log to the error report.

MSG_H323_PROTOCOL_ERROR

`EventText: ...`

Types: **Major, Minor, Warning, Information**

Protocol information missing or contains an error. Activate an appropriate H.323 analysis trace profile, and attach the trace and the event log to the error report.

MSG_H323_OSCAR_NSD_ERROR

`EventText: ...`

Types: **Major, Minor, Warning, Information**

This error relates to non-standard data. Activate an appropriate H.323 analysis trace profile, and attach the trace and the event log to the error report.

MSG_H323_SNMP_TRAP

`EventText: ...`

Types: **Major, Minor, Warning, Information**

This event indicates a situation that requires the attention of a service engineer. The service department should take measures in accordance with the event text (for example, perform a network check).

8.2.9 H.235 Events

MSG_CAT_H235

`EventText: H.235...`

Types: **Major, Warning, Information**

H.235 security related events. Verify H.235 configuration in gateway, gatekeeper and clients.

8.2.10 RTPQM Events

MSG_IP_RTP_QUALITY_FAILURE

`EventText: ...`

Type for this log entry: **Major**

The LAN quality for the specified destination IP address is classified as "too bad for voice calls". As a result, all further calls to that destination are routed over the line network. Call attempts for this destination are rejected by the gateway. Check the packet loss setting for IP traffic to this IP address.

`EventText: ...`

Type for this log entry: **Cleared**

The time for rejecting LAN calls for the specified IP destination address has elapsed. LAN calls to this destination address can be established again.

MSG_IP_RTP_QUALITY_WARNING

`EventText: ...`

Type: **Major**

This is a warning that LAN quality is deteriorating. The route to the specified destination address may soon be blocked. Check the packet loss setting for IP traffic to this IP address.

8.2.11 GSA Events

MSG_GSA_SNMP

`EventText: %p`

Type: **Critical**

Critical error for GSA which generates an SNMP trap.

8.2.12 DGW Events

MSG_BSD44_VCAPI_NO_LIST

`EventText: No listening socket for VCAPI`

Type: **Major**

Not possible to create a listening socket for VCAPI. LAN traffic not possible.

MSG_BSD44_DGW_NO_LIST

`EventText: No listening socket for DATA-GW`

Type: **Major**

Not possible to create a listening socket for DATAGWI. LAN traffic not possible.

MSG_BSD44_ACCEPT_DGW_ERR

`EventText: accept error for DATAGW Dispatcher`

Type: **Major**

Not possible to set up a new connection for DATAGW.

MSG_BSD44_DGW_SOCKET_FAIL

`EventText: DGW socket() failed`

Type: **Minor**

Client cannot retrieve a socket.

MSG_BSD44_DGW_BIND_FAIL

`EventText: DGW bind() failed`

Type: **Minor**

Client cannot bind a socket.

MSG_BSD44_DGW_CONNECT_FAIL

`EventText: DGW connect() failed`

Type: **Minor**

Client cannot connect to the server.

MSG_DGW_CONN_OUT_OF_RANGE

`EventText: dg_capi_HandleCapi20Msg: connection_id=%D out of range!`

Type: **Minor**

Connection ID exceeds the maximum allowed channels.

MSG_DGW_WRONG_STATE

`EventText: dg_capi_HandleCapi20Msg: id=%d wrong state!`

Type: **Minor**

Wrong state for DATAGW Dispatcher.

MSG_DGW_MSG_IGNORED

`EventText: %s from CAPI_PAYLOAD_IF ignored!`

Type: **Minor**

Message ignored because DGW Dispatcher in wrong state.

MSG_DGW_CONN_B3_ACT_IND

`EventText: ALLOC error: no more buffers`

Type: **Major**

Cannot allocate a buffer to send CONNECT_B3_ACTIVE_RESPONSE. The gateway performs an automatic restart.

MSG_DGW_DISC_B3_IND

`EventText: CAPI2_DISCONNECTB3_IND dreadful!: no more buffers`

Type: **Major**

Cannot allocate a buffer to send DGW_CLOSE_REQ. The gateway performs an automatic restart.

MSG_DGW_ALLOC_DISC_B3

`EventText: CAPI2_DISCONNECTB3_IND(2) dreadful!: no more buffers`

Type: **Major**

Cannot allocate a buffer to send DGW_FREE_REQ. The gateway performs an automatic restart.

MSG_DGW_UNHANDLED_MSG

`EventText: unhandled %s msg=%d from CAPI_PAYLOAD_IF`

Type: **Major**

Unknown message from CAPI_PAYLOAD_IF to DGW Dispatcher.

MSG_DGW_DATA_B3_ALLOC_ERR

`EventText: DATAB3_REQ:ALLOC ERROR: returncode %x`

Type: **Major**

Cannot allocate a buffer to send CMT_DATA_REQ to CAPI_PAYLOAD_IF. The gateway performs an automatic restart.

MSG_DGW_ALLOC_REQ_ERR

`EventText: DDGW_ALLOC_REQ received in wrong state!`

Type: **Minor**

DGW Dispatcher in wrong state when receiving DGW_ALLOC_REQ.

MSG_DGW_ALLOC_CONF_ERR

`EventText: DGW_ALLOC_CONF id=%d received in wrong state!`

Type: **Minor**

DGW Dispatcher in wrong state when receiving DGW_ALLOC_CONF.

MSG_DGW_FREE_ALLOC_ERR

`EventText: DGW_FREE_REQ: allocb failed!`

Type: **Major**

Cannot allocate a buffer to send DISCONNECT_B3_REQ. The gateway performs an automatic restart.

MSG_DGW_UNKNOWN_PRIMITIVE

`EventText: unknown capi primitive: %x`

Type: **Major**

Unknown message from CAPI_PAYLOAD_IF to DGW Dispatcher.

MSG_DGW_RECEIVE_ERR

`EventText: Error while receiving message for DATAGW Dispatcher:returncode %x`

Type: **Major**

Receive error.

MSG_DGW_UNHANDLED_EVENT

`EventText: Unhandled event for DGW-Dispatcher,received event:%D`

Type: **Warning**

Unhandled event received by DGW Dispatcher.

MSG_DGW_WRONG_EVENT_CAPI20

`EventText: wrong eventcode from CAPI20-Mgr`

Type: **Warning**

CAPI20 Manager received the wrong event code.

MSG_DGW_NO_PLCI

`EventText: Find connection ID by PLCI:PLCI %d not found`

Type: **Warning**

Not possible to find connection ID because of wrong PLCI.

MSG_DGW_IND_ALLOC_ERR

`EventText: Not possible to allocate a buffer for CMT_DATA_IND`

Type: **Major**

Not possible to allocate a buffer for CMT_DATA_IND. The gateway performs an automatic restart.

MSG_DGW_CONF_ALLOC_ERR

`EventText: Not possible to allocate a buffer for CMT_DATA_CONF`

Type: **Major**

Not possible to allocate a buffer for CMT_DATA_CONF. The gateway performs an automatic restart.

MSG_DGW_WRONG_EVENT_CAPI

`EventText: wrong eventcode from CAPI_PAYLOAD_INTERFACE`

Type: **Warning**

Wrong event code from CAPI_PAYLOAD_INTERFACE.

MSG_DGW_ALLOC_CHN_RUN_OUT

`EventText: ALLOC_CHANNEL_REQ: run out of connection handles`

Type: **Minor**

Too many connections.

MSG_DGW_ALLOC_CHN_CONN_FAIL

`EventText: ALLOC_CHANNEL_REQ:connect failed`

Type: **Major**

Not possible to set up a new connection to the server.

MSG_DGW_OPEN_CHN_UNKNOWN_ID

`EventText: AOPEN_CHANNEL_REQ: unknown id`

Type: **Minor**

Connection ID not found using the channel ID.

MSG_DGW_OPEN_CHN_WRONG

`EventText: OPEN_CHANNEL_REQ:dreadful!: wrong state`

Type: **Minor**

Wrong state for message OPEN_CHANNEL_REQ.

MSG_DGW_OPEN_CHN_ALLOC_FAIL

`EventText: OPEN_CHANNEL_REQ:Alloc failed`

Type: **Major**

Not possible to allocate a buffer for DGW_OPEN_CONFIRM. The gateway performs an automatic restart.

MSG_DGW_FREE_UNKNOWN_ID

`EventText: FREE_CHANNEL_REQ : unknown connection_id`

Type: **Major**

FREE_CHANNEL_REQ with unknown ID.

MSG_DGW_FREE_CHN_ALLOC_FAIL

`EventText: FREE_CHANNEL_REQ : Alloc failed`

Type: **Major**

ALLOC for FREE_CHANNEL_REQ failed. Not possible to send DISCONNECT_B3_REQ. The gateway performs an automatic restart.

MSG_DGW_SEC_ALLOC_FAIL

`EventText: FREE_CHANNEL_REQ : second Alloc failed`

Type: **Major**

Second ALLOC for FREE_CHANNEL_REQ failed. Not possible to send DGW_FREE_REQ. The gateway performs an automatic restart.

MSG_DGW_UNH_MSG_CAPI20_MGR

`EventText: unhandled message %d from CAPI20-Mgr`

Type: **Warning**

Unknown message from CAPI2.0 Manager.

MSG_DGW_UNKNOWN_ID_CHANNEL

`EventText: find_conn_id_by_chn_id: unknown id %D`

Type: **Minor**

Connection ID cannot be found using channel ID.

MSG_DGW_FREE_NOT_SEND

`EventText: Alloc error: DGW_FREE_REQUEST not sent`

Type: **Major**

Alloc error: DGW_FREE_REQUEST not sent. The gateway performs an automatic restart.

MSG_DGW_DISC_B3_NOT_SEND

`EventText: Alloc error: DISCONNECT_B3_REQUEST not sent`

Type: **Major**

Alloc error: DISCONNECT_B3_REQUEST not sent. The gateway performs an automatic restart.

MSG_DGW_SOCKET_UNKNOWN

`EventText: SO_NTFY_CONN_COMPLETE: unknown socket!`

Type: **Minor**

SO_NTFY_CONN_COMPLETE: unknown socket. Connection will be closed.

MSG_DGW_CONNECT_FAILED

`EventText: SO_NTFY_CONN_COMPLETE: error! ret= %d!`

Type: **Major**

SO_NTFY_CONN_COMPLETE: connection error.

MSG_DGW_CONN_COMPL_ALLOC

`EventText: SO_NTFY_CONN_COMPLETE: Alloc failed`

Type: **Major**

No allocation request to remote.

MSG_DGW_CONN_RUN_OUT

`EventText: SO_NTFY_CONNECTION: run out of connection handles:cnt=%d`

Type: **Warning**

Too many connections.

MSG_DGW_MGR_NOT_READY

`EventText: SO_NTFY_CONNECTION: CAPI20Mgr not ready:DGW_Disp_State=0x%x`

Type: **Warning**

SO_NTFY_CONNECTION: CAPI2.0 Manager not ready. Start operation message from CAPI2.0 Manager not received.

MSG_DGW_BUFAVAIL_SOCK_UNKN

`EventText: SO_NTFY_BUFAVAIL: unknown socket`

Type: **Minor**

Send not possible because socket unknown.

MSG_DGW_RCV_SOCK_UNKN

`EventText: SO_NTFY_RCV_SDATA: unknown socket`

Type: **Minor**

Data cannot be received because socket unknown.

MSG_DGW_ABORT_SOCK_UNKN

`EventText: SO_NTFY_ABORT: unknown socket`

Type: **Minor**

Connection cannot be received because of unknown socket.

MSG_DGW_UNKNOWN_NOTIFIC

`EventText: Unknown notification 0x%x`

Type: **Minor**

Unknown notification.

MSG_DGW_RCV_FAILED

`EventText: recv() failed, id=%d`

Type: **Minor**

Data not received correctly.

MSG_DGW_INV_MSG_LEN

`EventText: invalid message length: %d`

Type: **Minor**

Message with wrong length received from remote.

MSG_DGW_RCV_ALLOC_FAIL

`EventText: FATAL: allocb() failed, id=%d`

Type: **Major**

Not possible to allocate a receive buffer.

MSG_DGW_MSG_RCV_FAIL

`EventText: recv() failed, id=%d`

Type: **Minor**

Not possible to receive a message.

MSG_DGW_INVALID_LENGTH

`EventText: invalid length:%d %s`

Type: **Minor**

Wrong length received from remote.

MSG_DGW_INV_DATA_LEN

`EventText: invalid data length:%d`

Type: **Minor**

Wrong data length received from remote.

MSG_DGW_SEND_FAILED

`EventText: send() failed, id=%d`

Type: **Minor**

Not possible to send message to remote.

MSG_DGW_SEND_DATA_ERR

`EventText: send() data failed, id=%d`

Type: **Minor**

Not possible to send data to remote.

MSG_DGW_SOCKET_NOT_OPEN

`EventText: DGW socket not opened`

Type: **Major**

DGW socket not opened. No connections possible.

MSG_DGW_SOCKET_BIND_ERR

`EventText: bind error for DGW socket %d`

Type: **Major**

Bind error in DGW socket. No connections possible.

MSG_DGW_LISTENING_ERR

`EventText: listening error for DGW socket %d`

Type: **Major**

Listening error in DGW socket. No connections possible.

MSG_DGW_ACCEPT_FAILED

`EventText: so_accept() failed`

Type: **Minor**

No new connections accepted.

8.2.13 CAR Events

MSG_CAR_GENERAL_ERROR

`EventText: CAR : General error : %s`

Type: **Minor**

A generic error occurred in the CAR subsystem.

MSG_CAR_NO_MEMORY

`EventText: CAR : no more memory available`

Type: **Minor**

`EventText:` CAR: there is no more memory available.

MSG_CAR_FKT_GET_IPADR_FAILED

`EventText: CAR : car_fkt_get_ipadr result unsuccessful due to lack of memory (mat_allocb)`

Type: **Minor**

`Car_fkt_get_ipadr` returns an unsuccessful result due to the fact that `mat_allocb` cannot reserve any memory anymore.

MSG_CAR_START_TCP_LISTENER_FAILED

`EventText: CAR : SOH : start of TCP listener failed : returncode soh_api_start_tcp_listener = %d`

Type: **Critical**

`soh_api_send_tcp_listener` returns an incorrect value. Starting the TCP listener failed.

MSG_CAR_SENDING_UPDATE_REQUEST_FAILED_SOH_ERROR

`EventText: CAR : SOH : sending update request failed : returncode soh_api_send_tcp_data = %d`

Type: **Critical**

`soh_api_send_tcp_listener` returns an incorrect value. Sending the update request failed.

MSG_CAR_SENDING_UPDATE_REQUEST_FAILED_NO_MEMORY

`EventText: CAR : SOH : Start update failed due to lack of memory`

Type: **Minor**

CAR: SOH: sending the update request failed due to lack of memory.

MSG_CAR_UPDATE_NUMBER_OF_ENTRIES_CALLADDRTAB_TOO_BIG

`EventText: CAR : SOH : update data : number of CallAddressEntries = %d too big`

Type: **Minor**

CAR: SOH: the number of entries received by the update is too big. Possible SOH error.

MSG_CAR_SOH_MESSAGE_NOT_FROM_VENUS

`EventText: CAR : SOH : received message is not from the Venus server. Received IP address = 0x%x`

Type: **Major**

CAR: SOH: received message is not from the Venus server.

MSG_CAR_DB_READ_NODE_TABLE_ERROR

`EventText: CAR : DB : Read of Node Table failed : table index = %d`

Type: **Major**

CAR: DB: reading node table failed.

MSG_CAR_ALIVE_IP_CONNECTION_LOST

`EventText: CAR : Alive : ip connection %d.%d.%d.%d lost`

Type: **Major**

`EventText:` CAR: Alive: IP connection lost.

MSG_CAR_ALIVE_IP_CONNECTION_LOST

`EventText: CAR : Alive : ip connection %d.%d.%d.%d lost`

Type: **Major**

CAR: Alive: IP connection lost.

MSG_CAR_ALIVE_IP_CONNECTION_OK_AGAIN

`EventText: CAR: Alive : ip connection %d.%d.%d.%d ok again`

Type: **Information**

CAR: Alive: IP connection ok again.

MSG_CAR_ERROR_WITH_OAM_INTERFACE

`EventText: CAR : An error occurred with the OAM interface RC = %d`

Type: **Minor**

CAR: An error occurred on the OAM interface.

MSG_CAR_NO_FREE_CODEC_TAB_ELE

`EventText: No free table element for CODECs found`

Type: **Minor**

No free table element found for codecs.

MSG_CAR_CAN_NOT_ARRANGE_NODE_TAB

`EventText: Cannot arrange node table %d`

Type: **Major**

Node table cannot be arranged.

MSG_CAR_CAN_NOT_SORT_MAC_ADDRESS

`EventText: Cannot sort MAC addresses %s`

Type: **Minor**

MAC addresses cannot be sorted.

MSG_CAR_CODECS_INCONSISTENT

`EventText: HSA CODEC tables inconsistent %s`

Type: **Major**

The HSA CODEC tables are inconsistent.

MSG_CAR_WRONG_NODE_ID

`EventText: Wrong node id %d`

Type: **Major**

Wrong node identification.

MSG_CAR_WRONG_SERVICE

`EventText: Wrong service %d`

Type: **Minor**

Wrong service.

MSG_CAR_NODE_INFO_ALREADY_AVAILABLE

`EventText: Node info already available for %d`

Type: **Minor**

Node information for specified nodes is already available.

MSG_CAR_DBF_SERVER_INCONSISTENT

`EventText: DB feature server inconsistent %s`

Type: **Major**

The DB feature server is in an inconsistent state.

MSG_CAR_UNEXPECTED_MSG_RECV

`EventText: Unexpected message received %s`

Type: **Minor**

An unexpected message was received.

MSG_CAR_UNEXPECTED_DATA_RECV

`EventText: Unexpected data received %s`

Type: **Minor**

Unexpected data was received.

MSG_CAR_PARAM_NOT_FOUND

`EventText: Parameter not found %s`

Type: **Major**

Parameter not found.

MSG_CAR_WRONG_EVENT

`EventText: Wrong event received %x`

Type: **Major**

A wrong event was received.

MSG_CAR_WRONG_LENGTH

`EventText: Wrong length %d`

Type: **Minor**

Wrong length.

MSG_CAR_WRONG_IP_ADDRESS

`EventText: Wrong IP address %d.%d.%d.%d`

Type: **Major**

Wrong IP address.

MSG_CAR_UNAUTHORIZED_IP_ACCESS

`EventText: Unauthorized access from %d.%d.%d.%d`

Type: **Minor**

Unauthorized access from the specified IP address.

MSG_CAR_NO_MAC_ADDRESS

`EventText: No MAC address found`

Type: **Major**

MAC address not found.

MSG_CAR_DBFS_POSS_CONFLICT

`EventText: %s`

Type: **Warning**

Possible conflict.

MSG_CAR_CODEC_ENTRY_DELETED

`EventText: CODEC deleted for TableId %d, NodeId %d`

Type: **Major**

HSA CODEC Access deleted.

8.2.14 REG Events

MSG_REG_GLOBAL_ERROR

`EventText: REG : Global error : %s`

Type: **Minor**

REG: generic error.

MSG_REG_NO_MEMORY

`EventText: REG : No more memory available`

Type: **Minor**

REG: out of memory.

MSG_REG_SOH_SEND_DATA_FAILED

`EventText: REG : SOH : send data failed : returncode soh_api_send_tcp_data = %d`

Type: **Critical**

REG: SOH: send data failed: `soh_api_send_tcp_data` returned an incorrect return code.

MSG_REG_REQUEST_WITHIN_REGISTRATION

`EventText: REG : REG request within registration`

Type: **Minor**

REG: REG request within registration.

MSG_REG_NIL_PTR_FROM_SOH

`EventText: REG : NIL pointer received from SOH : Pointer = 0x%x`

Type: **Critical**

REG: NIL pointer (pointer with no address content) received from SOH.

MSG_REG_ERROR_FROM_SOH

`EventText: REG : SOH : error from SOH : errorcode = 0x%x`

Type: **Critical**

REG: SOH; error from SOH.

MSG_REG_SOH_UNKNOWN_EVENT_FROM_SOH

`EventText: REG : SOH : unknown event from SOH 0x%x`

Type: **Minor**

REG: SOH: unknown event from SOH.

MSG_REG_NO_REGISTRATION_POSSIBLE

`EventText: REG : No registration possible (no response)`

Type: **Major**

REG: no registration possible (no response).

8.2.15 NU Events

MSG_NU_GENERAL_ERROR

`EventText: General error %s`

Type: **Warning**

Only as a temporary dummy.

MSG_NU_TRANSPCONT_MISSING

`EventText: Transport container missing`

Type: **Major**

Transport container missing.

MSG_NU_NO_FREE_TRANSACTION

`EventText: No free transaction store found in %s`

Type: **Warning**

No free transaction store found in a function.

MSG_NU_INVALID_CIDL

`EventText: NCIDL invalid`

Type: **Major**

The CIDL sent in the message is invalid.

MSG_NU_CAR_FAILED

`EventText: Call to CAR function failed`

Type: **Major**

Call to CAR function failed. Wrong return code returned.

MSG_NU_CAR_RESP_INVALID

`EventText: Invalid Response from CAR: 0x%x`

Type: **Major**

Invalid response from CAR.

MSG_NU_UNEXPECTED_MSG

`EventText: Unexpected message: State:%d, Event:0x%x, Msgtype:0x%x`

Type: **Major**

Unexpected message in a certain NU state.

MSG_NU_UNEXPECTED_TIMER

`EventText: Timer unexpected: State: %d, Subind:0x%x`

Type: **Minor**

Unexpected timer event in a certain NU state.

MSG_NU_FREE_CHN_UNEXPECTED

`EventText: Free channel unexpected: State: %d`

Type: **Major**

Free channel unexpected in a certain NU state.

MSG_NU_FREE_CHN_COMF_TOO_LATE

`EventText: Free channel confirmation too late State: %d`

Type: **Major**

Free channel confirmation from the NU Leg control too late in certain NU state.

MSG_NU_EVENT_EXCEPTION

`EventText: Event exception: State: %d, Event:0x%x, Data:0x %x`

Type: **Minor**

Event exception in a certain NU state.

MSG_NU_WRONG_CALL_REF

`EventText: Wrong Call Reference. Event: 0x%x`

Type: **Major**

Wrong call reference from system or LAN.

MSG_NU_UNEXPECTED_SETUP

`EventText: Unexpected SETUP: State:%d, Lwport/IPAddr:0x%x, CR:%d, Direction:%d`

Type: **Warning**

Unexpected SETUP on active transaction in a certain NU state. Might be caused by glare situations.

MSG_NU_NO_PORT_DATA

`EventText: No data for port_%d found in %s`

Type: **Major**

No data for a port found in a certain function.

MSG_NU_SUPERFLUOS_MSG

`EventText: Superfluous message: Event:0x%x, Lwport:%d, Channel:%d, Data:0x%x`

Type: **Minor**

Superfluous message sent to NU. Might be caused by asynchronous behavior of the two nodes.

MSG_NU_IP_ERROR

`EventText: IP Error: IPAddress:0x%x, Error: 0x%x`

Type: **Minor**

IP error.

MSG_NU_UNKNOWN_MESSAGE

`EventText: Unknown message: Event:0x%x, Channel:%d`

Type: **Minor**

Unknown message sent to NU.

MSG_NU_INTERNAL_ERROR

`EventText: NU internal error: %s`

Type: **Minor**

NU Internal software error.

MSG_NU_TOO_MUCH_DIGITS

`EventText: ?*?Too many digits sent at a time`

Type: **Minor**

Too many digits sent at a time.

MSG_NU_TCP_LISTENER_FAILED

`EventText: Start_tcp_listener failed`

Type: **Critical**

The Socket Handler couldnât start a listener function.

MSG_NU_SOH_RESP_INVALID

`EventText: SOH call back response invalid. Event:0x%x, Reason:%s`

Type: **Minor**

Parameters returned in the Socket Handler callback function invalid, or SOH error.

MSG_NU_DEV_TAB_NOT_FOUND

`EventText: Device table not found`

Type: **Major**

Access to the device table not ok.

8.2.16 NU Leg Control Events

MSG_NULC_MESSAGE_ERROR

```
EventText: Unexpected message ID or eventcode (%x)
           %x = message type
```

Type: **Warning**

Received unexpected or unknown message.

MSG_NULC_PARAM_ERROR

```
EventText: Missing/not valid parameter %s in message %s
           %s = name of either parameter or message
```

Type: **Major**

Mandatory parameter missing or contains an invalid value.

MSG_NULC_MEMORY_ERROR

```
EventText: EventText: ?*?Canâ##t access/allocate memory
```

Type: **Major**

Application did not receive the requested memory, or another operation returned a null pointer.

MSG_NULC_INTERNAL_ERROR

```
EventText: %s
```

Type: **Major**

Internal error in NU Leg control.

MSG_NULC_INTERNAL_EVENT

```
EventText: %s
```

Type: **Information**

Successful startup or shutdown of application.

8.2.17 HFA Manager Events

MSG_HFAM_HAH_ALLOC_CHAN_ERR

```
EventText: tried to allocate channel for client that is not
in idle state
```

Type: **Major**

An attempt was made to seize a channel for a client that is not idle. Internal error in HFA Manager.

MSG_HFAM_HAH_ALLOC_CONF_ERR

```
EventText: HFAM_ALLOCATE_CHANNEL_CONF received from client
that is not in allocating or opening state
```

Type: **Major**

HFAM_OPEN_CHANNEL_CONF received from client that is not in opening state. HFAA error.

MSG_HFAM_MAIN_UNEXP_LWEVENT_ERR

```
EventText: unknown/unexpected event code received: lw_event
```

Type: **Major**

Unknown/unexpected event code received: `lw_event`. System-side DH/CP error.

MSG_HFAM_MAIN_ILLEG_PORTNO_ERR

`EventText: Illegal port no with event code`

Type: **Major**

Illegal port number with event code. Check system.

MSG_HFAM_MAIN_NO_LOGONTIMER_ERR

`EventText: No logon timer started for that client`

Type: **Major**

A logon timer was not started for the client. Internal error in the HFA Manager.

MSG_HFAM_LIH_CREATE_REGISOCK_ERR

`EventText: Could not create registration socket`

Type: **Critical**

Could not create registration socket. LAN-side error.

MSG_HFAM_LIH_SOCK_REUSE_ADR_ERR

`EventText: Could not set socket option â##reuse address`

Type: **Critical**

Could not set socket option "reuse Address". LAN-side error.

MSG_HFAM_LIH_BIND_REGISOCK_ERR

`EventText: Could not bind registration socket`

Type: **Critical**

Could not bind registration socket. LAN-side error.

MSG_HFAM_LIH_LISTEN_REGISOCK_ERR

`EventText: Could not listen at registration socket`

Type: **Critical**

Could not listen at registration socket. LAN-side error.

MSG_HFAM_LIH_ACCEPT_TCPIP_CON_ERR

`EventText: Could not accept TCP/IP connection from client`

Type: **Critical**

Could not accept TCP/IP connection from client. LAN-side error. Check client setup.

MSG_HFAM_LIH_ACCEPT_CLIENT_CON_ERR

`EventText: Could not accept TCP/IP connection from client`

Type: **Major**

Connection from client not accepted. LAN-side error. Check client setup.

MSG_HFAM_LIH_MAX_CON_EXCEED_ERR

`EventText: max no.(HFAM_MAX_CONNECTIONS) of TCP/IP connections exceeded`

Type: **Major**

Maximum number (`HFAM_MAX_CONNECTIONS`) of TCP/IP connections exceeded. Internal error in the HFA Manager.

MSG_HFAM_LIH_ACCEPT_INETOA_CON_ERR

`EventText: Cannot accept connection from client`

Type: **Major**

Cannot accept connection from client. LAN-side error. Check client setup.

MSG_HFAM_LIH_SOCK_WOULDBLOCK_ERR

`EventText: CSocket would block: no data -> ignore`

Type: **Minor**

Socket would block: no data. Ignore. LAN-side error.

MSG_HFAM_LIH_TCDATAGRAM_RCV_ERR

`EventText: TC_DATAGRAM received from client->subscriber_no while not in logged_in state, discarded`

Type: **Minor**

TC_DATAGRAM received from client->subscriber number, although not logged on. Discarded. LAN-side error. Check client setup.

MSG_HFAM_LIH_UNEXP_CORNET_ERR

`EventText: unknown/unexpected Cornet-TS message received from client`

Type: **Minor**

Unknown/unexpected Cornet-TS message received from client. Check client

MSG_HFAM_LIH_IPADR_TOO_LONG_ERR

`EventText: IP-address too long, cut !`

Type: **Major**

IP address was too long and was cut. Check client setup.

MSG_HFAM_LIH_SUBNO_TOO_LONG_ERR

`EventText: SubNo too long, cut !`

Type: **Major**

Subscriber number was too long and was cut. Check client setup.

MSG_HFAM_LIH_ALGORITM_OBJID_ERR

`EventText: SubNo too long, cut !`

Type: **Major**

Algorithm object ID was too long and was cut. Check client setup.

MSG_HFAM_LIH_PROTOCOL_LIST_ERR

`EventText: too many elements in protocol list`

Type: **Major**

Too many elements in the protocol list. Check client setup.

MSG_HFAM_LIH_RETURNED_SOCKET_ERR

`EventText: returned socket error`

Type: **Major**

Returned socket error. LAN-side error.

MSG_HFAM_SIH_NO_LOGIN_TIMER_ERR

`EventText: timeslot is valid`

Type: **Major**

Login timer for a client could not be started. Start HFA Manager.

MSG_HFAM_SIH_INVAL_TSLOT_PARAM_ERR

`EventText: Input Parameter for hfam_sih_send_ts invalid`

Type: **Major**

Input parameter for `hfam_sih_send_ts` invalid. System-side error.

MSG_HFAM_SIH_CORNET_LONGER_28_ERR

`EventText: cannot synthesize CorNet-TS message longer than 28 bytes`

Type: **Major**

Cannot synthesize CorNet-TS messages longer than 28 bytes. System-side error.

MSG_HFAM_MON_NO_MON_TIMER_ERR

`EventText: No monitor timer !`

Type: **Minor**

No monitor timer. Start HFA Manager.

MSG_HFAM_REG_LOGIN_NOTREG_ERR

`EventText: DL_LOGON_IN received for client not in not_registered state, subno`

Type: **Minor**

`DL_LOGON_IN` received for client not in registered state. HFA Manager-internal.

MSG_HFAM_REG_SUBNO_TOO_LONG_ERR

`EventText: DL_LOGON_IN received for client not in not_registered state`

Type: **Major**

SubNo in `DL_LOGON_IN` too long and was cut. Check client setup in system.

MSG_HFAM_REG_SUBNO_NOTCONFIG_ERR

`EventText: SubNo from System I/F not found in config data`

Type: **Minor**

SubNo from system I/F not found in config data. Check client setup in system.

MSG_HFAM_REG_ESTAB_NOTREG_ERR

`EventText: DL_EST_IN arrived for client not in registered state`

Type: **Minor**

`DL_EST_IN` received for the client not in registered state. Check system setup or WBM.

MSG_HFAM_REG_RELIN_NOTREG_ERR

`EventText: DL_REL_IN arrived for client not in registered state`

Type: **Minor**

`DL_REL_IN` received for the client not in registered state. Check system setup or WBM.

MSG_HFAM_REG_MISSING_L2INFO_ERR

`EventText: missing L2addr-InfoElem, no IP address`

Type: **Minor**

`L2addr-InfoElem` missing, no IP address. Check system setup or WBM.

MSG_HFAM_REG_LOGON_REJECT_ERR

`EventText: logon of client->subscriber_no rejected`

Type: **Information**

Logon of client subscriber number was rejected. Check system setup.

MSG_HFAM_REG_INVAL_PWD_LEN_ERR

`EventText: invalid password length of <sub_number>, no hash`

Type: **Minor**

Invalid password length for <sub_number>, no hash. Check client setup or WBM.

8.2.18 HFA Adapter Events

MSG_HFAA_MESSAGE_ERROR

`EventText: Unexpected message ID or eventcode (%x)`

Type: **Warning**

Received unexpected or unknown message.

MSG_HFAA_PARAM_ERROR

`EventText: Missing/not valid parameter %s in message %s`

Type: **Major**

Mandatory parameter missing or contains an invalid value.

MSG_HFAA_MEMORY_ERROR

`EventText: ?*?Canâ##t access/allocate memory`

Type: **Major**

Application doesnât get requested memory or constructor returns null pointer.

MSG_HFAA_INTERNAL_ERROR

`EventText: %s`

Type: **Major**

Internal error in HFA Adapter.

MSG_HFAA_INTERNAL_EVENT

`EventText: %s`

Type: **Information**

Successful startup or shutdown of application.

8.2.19 PPP Call Control Events

None implemented at the moment.

8.2.20 PPP MANAGER Events

MSG_PPPM_ERR_CONFIG

`EventText: %p`

Types: **Critical, Major, Minor**

Inconsistency in configuration data. Error in Admin receiver. Examine configuration data for PPP systematically. Inform Software Development Department, provide the trace files (PPPM_TBAS, PPPM_TSTD, PPPM_TEXT Level 9) that document this corrupt behavior.

MSG_PPPM_ERR_OPERATION

`EventText: %p`

Types: **Critical, Major, Minor**

Unexpected condition during operation. Inform Software Development Department, provide the trace files (PPPM_TBAS, PPPM_TSTD, PPPM_TEXT Level 9) that document this corrupt behavior.

8.2.21 PPP Stack Events

MSG_PPP_STACK_PROC

`EventText: %p`

Types: **Major, Minor, Warning**

Internal PPP stack processing error. Inform Software Development Department, provide the trace files (PPP_STACK_PROC Level 6 and PPP_STACK_DBG_IF Level 9) that document this corrupt behavior.

8.2.22 SPE Events

MSG_SPE_CERT_MISSING

Certificate for Signaling and Payload Encryption (SPE) is not available.

MSG_SPE_CERT_AVAIL

Certificate for Signaling and Payload Encryption is available.

MSG_SPE_CERT_UPDATED

Certificate for Signaling and Payload Encryption was updated.

MSG_SPE_CERT_EXPIRED

Certificate for Signaling and Payload Encryption has expired.

MSG_SPE_CERT_TIMEREMAINING

Certificate for Signaling and Payload Encryption, remaining time

MSG_SPE_CRL_EXPIRED

Certificate revocation list for SPE has expired.

MSG_SPE_CRL_UPDATED

Certificate revocation list for SPE was updated.

MSG_SPE_ALL_CRLS_UPTODATE

All certificate revocation lists for SPE are up to date.

8.2.23 VCAPI Events

MSG_BSD44_SELECT_ERROR

`EventText: Select error for VCAPI & DATAGW Dispatcher`

Type: **Major**

Sockets for VCAPI and DATAGW clients not working anymore.

MSG_BSD44_ACCEPT_ERROR

`EventText: Accept error for VCAPI Dispatcher`

Type: **Major**

Not possible to set up a new connection for VCAPI.

MSG_VCAPI_NO_CAPI_DATA

`EventText: No CAPI data in message with event 0x%x`

Type: **Minor**

No data in the message received from VCAPI server or from `CAPI_PAYLOAD_INT`.

MSG_VCAPI_WRONG_LINKNUM

`EventText: Wrong link number %d in message %s`

Type: **Minor**

Wrong link number in the message received from VCAPI server or from `CAPI_PAYLOAD_INT`.

MSG_VCAPI_LINK_TABLE_FULL

`EventText: No free element found in VS_Plci_Link table`

Type: **Major**

Too many physical link connections are not released correctly.

MSG_VCAPI_NO_PLCI

`EventText: PLCI not found in VS_Plci_Link table (to find message_nbr)`

Type: **Major**

PLCI not found in `VS_Plci_Link` (needed to find `message_nbr`).

MSG_VCAPI_CONV_H2N_ERROR

`EventText: Conversion error:%d`

Type: **Minor**

Message to client is not converted correctly.

MSG_VCAPI_CONV_H2N_FAILED

`EventText: Conversion for %s returns %d,expected %d`

Type: **Minor**

Conversion returns wrong value.

MSG_VCAPI_WRONG_CONV_H2N

`EventText: Wrong conversion for %s`

Type: **Minor**

Message not converted (wrong message).

MSG_VCAPI_WRONG_MSG_LENGTH

`EventText: Wrong message length %d`

Type: **Minor**

The total length of the CAPI message is wrong.

MSG_VCAPI_CONV_N2H_FAILED

`EventText: Conversion for %s returns %d,expected %d)`

Type: **Minor**

Conversion returns wrong value.

MSG_VCAPI_WRONG_CONV_N2H

`EventText: Wrong conversion for %s`

Type: **Minor**

Message not converted (wrong message).

MSG_VCAPI_UNKNOWN_MSG_N2H

`EventText: unknown msg %s`

Type: **Minor**

Wrong subcommand in message.

MSG_VCAPI_TOO_MANY_CLIENTS

`EventText: Too many clients connected`

Type: **Warning**

No free element found in the connection table. Connection will be closed.

MSG_VCAPI_ACCEPT_ERROR

`EventText: Accept error for VCAPI Dispatcher`

Type: **Major**

Not possible to set up a new connection for VCAPI.

MSG_VCAPI_DISP_NOT_READY

`EventText: VCAPI Dispatcher not ready`

Type: **Major**

The VCAPI server did not send `VCAPI_EVENT_START_OPERATION_REQ` to the dispatcher.

MSG_VCAPI_NO_CLIENT

`EventText: no client address`

Type: **Minor**

No client address.

MSG_VCAPI_WRONG_BUF_LEN

`EventText: Wrong buffer length %d`

Type: **Minor**

Buffer length not within the message limits.

MSG_VCAPI_NO_RCV_BUFFER

`EventText: rcvBufPP=0x%x null`

Type: **Minor**

Receive buffer either already cleared or not possible to allocate memory.

MSG_VCAPI_NO_ALLOC_SINGLE

`EventText: Not possible to allocate a single buffer`

Type: **Minor**

Not possible to get a single receive buffer (allocation error).

MSG_VCAPI_NO_ALLOC_EXTENDED

`EventText: Not possible to allocate an extended buffer`

Type: **Major**

Not possible to get an extended receive buffer (allocation error). The gateway performs an automatic restart.

MSG_VCAPI_BUF_NOT_CREATED

`EventText: Not possible to create buffer with size:%d`

Type: **Major**

Not possible to create buffer with the expected length.

MSG_VCAPI_NO_NEW_BUF

`EventText: No new buffer created by vs_bputd`

Type: **Major**

Not possible to create a new buffer to store the received data (allocation error). The gateway performs an automatic restart.

MSG_VCAPI_DATA_NOT_STORED

`EventText: Not possible to get a receive buffer,data not stored`

Type: **Major**

Received data not stored because new buffer could not be allocated (allocation error). The gateway performs an automatic restart.

MSG_VCAPI_SOCKET_NOT_OPEN

`EventText: VCAPI-Socket not opened`

Type: **Major**

Socket couldnât be opened (connections with clients not possible).

MSG_VCAPI_SOCKET_BIND_ERR

`EventText: bind error for socket %d`

Type: **Major**

Bind error for VCAPI socket (connections with clients not possible).

MSG_VCAPI_LISTENING_ERR

`EventText: listening error for socket %d`

Type: **Major**

Not possible to create a listening VCAPI socket (connections with clients not possible).

MSG_VCAPI_RECEIVE_ERR

`EventText: Error while receiving message for VCAPI Dispatcher:Returncode %x`

Type: **Minor**

Error while receiving message for VCAPI Dispatcher.

MSG_VCAPI_NO_ALLOC_MSG

`EventText: Not possible to allocate a buffer`

Type: **Major**

Not possible to send a message to VCAPI Dispatcher because no buffer could be allocated (allocation error). The gateway performs an automatic restart.

MSG_VCAPI_WRONG_EVENT_SRV

`EventText: wrong eventcode from VCAPI_SERVER`

Type: **Warning**

VCAPI Dispatcher has received wrong event from VCAPI server.

MSG_VCAPI_PLCI_NOT_FOUND

`EventText: PLCI not found in VS_Plci_Link table`

Type: **Minor**

PLCI not found in `VS_Plci_Link` table when receiving a message from `CAPI_PAYLOAD_IF`.

MSG_VCAPI_IND_ALLOC_ERR

`EventText: Not possible to allocate a buffer for CMT_DATA_IND`

Type: **Major**

Not possible to allocate a buffer for `CMT_DATA_IND`. Message cannot be sent to client. The gateway performs an automatic restart.

MSG_VCAPI_CONF_ALLOC_ERR

`EventText: Not possible to allocate a buffer for CMT_DATA_CONF`

Type: **Major**

Not possible to allocate a buffer for `CMT_DATA_CONF`. Message cannot be sent to client. The gateway performs an automatic restart.

MSG_VCAPI_WRONG_EVENT_CAPI

`EventText: Nwrong eventcode from CAPI_PAYLOAD_INTERFACE`

Type: **Warning**

VCAPI Dispatcher has received wrong event from CAPI_PAYLOAD_IF.

MSG_VCAPI_WRONG_LENGTH_MSG

EventText: Wrong message length %d

Type: **Warning**

Length of message from client to VCAPI server/CAPI_PAYLOAD_IF is incorrect.

MSG_VCAPI_NO_PLCI_DATA_B3

EventText: PLCI not found in VS_Plci_Link table (for DATA_B3_REQ)

Type: **Minor**

PLCI not found in VS_Plci_Link table (for DATA_B3_REQ). Message cannot be sent to CAPI_PAYLOAD_IF.

MSG_VCAPI_DATA_B3_ALLOC_ERR

EventText: ALLOC ERROR: returncode %x

Type: **Major**

Not possible to get a buffer to send the DATA_B3_REQ message to CAPI_PAYLOAD_IF (allocation error). The gateway performs an automatic restart.

MSG_VCAPI_NO_PLCI_DISCONNECT

EventText: PLCI Element not found in VS_Plci_Link table for DISCONNECT_RESPONSE

Type: **Minor**

PLCI element not found in VS_Plci_Link table for the DISCONNECT_RESPONSE message.

MSG_VCAPI_MSG_NOT_SEND

EventText: not possible to send message

Type: **Warning**

Not possible to send a message. Interface to CAPI_PAYLOAD returns -1.

MSG_VCAPI_NO_LIST_SOCKET

EventText: no listening socket stored in connection table

Type: **Major**

No listening socket stored in connection table. A new connection cannot be opened.

MSG_VCAPI_RCV_LEN_ERR

EventText: Wrong message length at receive data from client

Type: **Warning**

Wrong message length on receipt of data from client. Connection will be closed. Message is not sent to VCAPI server.

MSG_VCAPI_SOCKET_RCV_ERR

`EventText: Error on receiving data from the Socket (connection interrupted)`

Type: **Warning**

Connection has been interrupted causing an error on receipt of data.

MSG_VCAPI_SOCK_NOT_AVAIL

`EventText: connected socket not stored in connection table`

Type: **Minor**

Connected socket not stored in connection table. Not possible to receive data.

MSG_VCAPI_UNKNOWN_NTFY

`EventText: Unknown notification. Used value:%d`

Type: **Warning**

Unknown notification.

MSG_VCAPI_NO_LNK_CONN

`EventText: Link number not found in connection table`

Type: **Minor**

Link number not found in connection table.

8.2.24 VCAPI Application Events

MSG_VCAPI_SERVER_ERROR

`EventText: VCAPI Server error: %p`

Type: **Warning**

Various VCAPI Server errors from the HXG2 code.

MSG_VCAPI_UNANTICIPATED_MESSAGE

`EventText: Unanticipated Message %s for CSID %s in state %s`

Type: **Warning**

The CAPI Manager has received an unanticipated message for the current state of the relevant CAPI object.

MSG_VCAPI_UNANTICIPATED_CAPI_MESSAGE

`EventText: Unanticipated CAPI message %s`

Type: **Warning**

The CAPI Manager has received an unanticipated CAPI message with an unknown command and subcommand.

MSG_VCAPI_UNANTICIPATED_DISP_MESSAGE

`EventText: Unanticipated VCAPI Dispatcher message %d`

Type: **Warning**

The VCAPI Server has received a VCAPI Dispatcher message with an unknown event.

MSG_VCAPI_UNANTICIPATED_MESSAGE_BASE

`EventText: Unanticipated Message Base %m`

Type: **Warning**

The VCAPI Server, the VCAPI Interface or CAPI Manager has received a message base with an unanticipated ID.

MSG_VCAPI_MESSAGE_LENGTH_TOO_SHORT

`EventText: Part of the CAPI Message is missing (%d > %d)`

Type: **Warning**

The length of the CAPI message is greater than the size of the VB string containing this CAPI message.

MSG_VCAPI_MSGBASE_WITHOUT_CAPIMSG

`EventText: Message Base without CAPI message`

Type: **Warning**

The VCAPI Server, the VCAPI Interface or the CAPI Manager has received a `CapiInd` or `CapiReq` not containing the required CAPI message.

MSG_VCAPI_MSGBASE_WITHOUT_DATAGWMSG

`EventText: MMessage Base without Data GW message`

Type: **Warning**

The CAPI Manager has received a message base not containing the required VCAPI Dispatcher message from NU or from the Data GW dispatcher.

MSG_VCAPI_MSGBASE_WITHOUT_DISPMSG

`EventText: Message Base without VCAPI Dispatcher message`

Type: **Warning**

The VCAPI Server has received a message base not containing the required VCAPI Dispatcher message from the VCAPI Dispatcher.

MSG_VCAPI_ILLEGAL_LINK_NUMBER

`EventText: Illegal link number: %d`

Type: **Warning**

An attempt was made to address a member of the dynamic link table with an illegal index.

MSG_VCAPI_ILLEGAL_PARTNER_NUMBER

`EventText: Illegal partner number: %d`

Type: **Warning**

An attempt was made to address the info of a non-allocated VCAPI partner.

MSG_VCAPI_ADD_OBJECT_FAILED

`EventText: Could not add a CAPI object to the managed object list`

Type: **Major**

A newly created CAPI object could not be added to the managed object list. The gateway performs an automatic restart.

MSG_VCAPI_COULD_NOT_CREATE_OBJECT

`EventText: Could not create a CAPI object`

Type: **Warning**

A new CAPI object could not be created.

MSG_VCAPI_COULD_NOT_DELETE_OBJECT

`EventText: Could not delete a CAPI object`

Type: **Major**

The specified CAPI object could not be deleted. The gateway performs an automatic restart.

MSG_VCAPI_NO_PLCI_AVAILABLE

`EventText: No PLCI available`

Type: **Warning**

All available PLCIs are seized.

MSG_VCAPI_CSID_MISSING

`EventText: CSID is missing`

Type: **Warning**

The CAPI Manager has received a message from NU or from CCP that doesnât contain a call and session ID.

MSG_VCAPI_COULD_NOT_FIND_PLCI

`EventText: Could not find the corresponding PLCI`

Type: **Warning**

The PLCI belonging to a given call and session ID or to a given channel ID could not be found.

MSG_VCAPI_COULD_NOT_FIND_OBJECT

`EventText: Could not find the corresponding CAPI Object`

Type: **Warning**

The CAPI object belonging to a given call and session ID could not be found.

MSG_VCAPI_COULD_NOT_FIND_CSID

`EventText: Could not find the corresponding CSID`

Type: **Warning**

The call and session ID belonging to a given PLCI could not be found.

MSG_VCAPI_COULD_NOT_STORE_REQ

`EventText: Could not store the request %x %x for PLCI %d`

Type: **Major**

No more space available in the CAPI interface to store the request. The gateway performs an automatic restart.

MSG_VCAPI_CONF_WITHOUT_REQ

`EventText: Confirmation %x %x for PLCI %d without stored Request`

Type: **Warning**

The CAPI interface has received a confirmation without the relevant stored request.

8.2.25 H.323 Client Events

MSG_H323CLIENT_INVALID_CLIENTID

`EventText: invalid Peer ID: %d`

Type: **Major**

Software error: index of client table incorrect. Stop the H323Client-Internal trace profile.

MSG_H323CLIENT_INVALID_ADMIN_MSG

`EventText: invalid admin message for file %s received`

Type: **Minor**

Error received while reading/writing configuration files. Stop the H323Client-Internal trace profile.

MSG_H323CLIENT_NWRS_ENTRY_FAILED

`EventText: create %s entry failed for client (%I, %I)`

Type: **Major**

Creation of the NWRS entry failed. Stop the H323Client-Internal trace profile.

MSG_H323CLIENT_INVALID_PARAM

`EventText: invalid parameter %s, value %x`

Type: **Major**

Software error: invalid parameter. Stop the H323Client-Internal trace profile.

MSG_H323CLIENT_MAPS_DIFFER

`EventText: size of maps differ (call no: %I, IP: %I)`

Type: **Major**

Software error: invalid parameter. Stop the H323Client-Internal trace profile.

8.2.26 IPNC Events

MSG_IPNC_MESSAGE_ERROR

`EventText: message error: %s`

Type: **Major**

Unexpected message received - will be ignored. Stop the IPNC-Std trace profile.

MSG_IPNC_MESSAGE_DUMP

`EventText: message error: %s% M`

Type: **Major**

Unexpected message received - will be ignored. Stop the IPNC-Std trace profile.

MSG_IPNC_PARAM_ERROR

`EventText: message parameter error: %s %x`

Type: **Major**

Message with invalid parameter received - will be ignored. Stop the IPNC-Std trace profile.

MSG_IPNC_INTERNAL_ERROR

`EventText: internal error: %I`

Type: **Major**

Software error: invalid internal data detected. Stop the IPNC-Detailed trace profile.

MSG_IPNC_INCONSISTENT_STATE

`EventText: inconsistent internal state: %s %x`

Type: **Major**

Software error: data became inconsistent during processing. Stop the IPNC-Std trace profile.

MSG_IPNC_CP_ASYNCH

`EventText: CP and IPNC asynchronous: %s %s`

Type: **Major**

Asynchronism between states of HiPath-CP and IPNC detected. Stop the IPNC-Std trace profile.

8.2.27 IPNCA Events

MSG_IPNCA_ERROR

`EventText: IPNC Adapter: (some) Error description ("IPNC Adapter: %s")`

Type: **Minor**

A minor error has occurred.

8.2.28 MPH Events

MSG_MPH_INFO

`EventText: %p SGP Message not sent`

Type: **Information**

Event log for all MPH events. SGP message cannot be sent to IPNC.

8.2.29 OAM Events

MSG_TLS_MUTEX_BLOCKED

`EventText: Mutex blocked`

Type: **Major**

Software error: deadlock. Reboot the gateway; create error report.

MSG_DISP_SENDER_NOT_SET

`EventText: Sender not set in message: %n%M`

Type: **Critical**

Internal software error. Message header not set. Event is always followed by an ASSERT event, which causes an automatic reboot.

MSG_OAM_TIMESYNC

`EventText: Time Synchronization from %s to %s`

Type: **Information**

Time synchronization took place.

MSG_OAM_TIMESYNC_FAILED

`EventText: Time Synchronization failed`

Type: **Warning**

Time synchronization not performed.

MSG_OAM_PRIO_INCREASED

`EventText: Priority of %s increased`

Type: **Warning**

Priority of an OAM task (trace, event, OAM) was increased because of heavy load. This is still valid behavior.

MSG_OAM_PRIO_SWITCHED_BACK

`EventText: Priority of %s switched back. OAM Msg Queue OK`

Type: **Cleared**

Priority of an OAM task (trace, event, OAM) was decreased because the heavy load no longer exists. This is still valid behavior.

MSG_OAM_QUEUE_FULL

`EventText: POAM Msg Queue (%s) full. Remove Messages`

Type: **Major**

Queue of OAM tasks (trace, event, OAM) full. All messages are removed. See Section 6.4.1.4, "Overloading the Board with Trace Information".

MSG_OAM_PUT_TO_QUEUE_FAILED

`EventText: Put to OAM Msg Queue (%s) failed. Remove Message`

Type: **Major**

The addition of OAM tasks (trace, event, OAM) to the message queue failed for no apparent reason. All messages are removed.

MSG_OAM_QUEUE_BLOCKED

`EventText: Put to OAM Msg Queue (%s) failed. Queue blocked. Remove Message`

Type: **Major**

The addition of OAM tasks (trace, event, OAM) to the message queue failed. Reason: queue blocked. All messages are removed.

MSG_OAM_INTERNAL_EVENT

`EventText: %p`

Type: **Warning**

Execution of an automatic action failed.

MSG_ADMIN_LOGGED_IN

`EventText: %s user \"%s\" (session id = %d) logged in`

Type: **Information**

Information about successful administrator login.

MSG_ADMIN_SESSION_CREATED

`EventText: %s session created for user \"%s\" (session id = %d)`

Type: **Information**

A session for an administrator or an automatic login procedure (such as AutoDiscovery or data transfer from OpenScape 4000 V10 to HG 3500/3575) was created.

MSG_ADMIN_LOGGED_OUT

`EventText: %s user \"%s\" (session id = %d) logged out`

Type: **Information**

Information about successful administrator login.

MSG_ADMIN_INVALID_LOGIN

```
EventText: Invalid login from %s (user \"%s\")
```

Type: **Information**

Invalid login attempt.

MSG_ADMIN_SESSION_EXPIRED

```
EventText: Session id = %d of user \"%s\" expired
```

Type: **Information**

Session expired (session timeout reached). New login necessary.

MSG_ADMIN_GOT_WRITE_ACCESS

```
EventText: %s user \"%s\" (session id = %d) got write
access
```

Type: **Information**

Administrator has write access. He can therefore change the gateway configuration.

MSG_ADMIN_DIDNâT_GET_WRITE_ACCESS

```
EventText: %s user \"%s\" (session id = %d) didnâ##t get
write access
```

Type: **Information**

Administrator has not been granted write access. Another administrator already has write access. Wait for or force write access (for example, via WBM).

MSG_ADMIN_RELEASED_WRITE_ACCESS

```
EventText: %s user \"%s\" (session id = %d) released write
access
```

Type: **Information**

An administrator has released write access and cannot perform any more changes on the gateway configuration. Now other administrators can be granted write access.

MSG_ADMIN_FORCE_RELEASE_WRITE_ACCESS

```
EventText: %s user \"%s\" (session id = %d) released write
access
```

Type: **Information**

The current administrator was forced to release write access because another administrator took over write access. The gateway can now be changed by the other administrator only.

MSG_CAR_CALL_ADDR_REJECTED

```
EventText: Call address rejected %s
```

Type: **Minor**

The specified call address was rejected.

MSG_WEBSERVER_INTERNAL_ERROR

`EventText: %p`

Type: **Warning**

Internal error on the web server, internal exception situation which does not impact other web server activities however.

8.2.30 CLI Events

MSG_CLI_TELNET_ABORTED

`EventText: Telnet client \"%s\" aborted`

Type: **Warning**

Telnet client disconnected before logging in.

MSG_CLI_LOGGED_IN_FROM_TELNET

`EventText: User \"%s\" logged in (session id = %d) from telnet CLI with IP address %s`

Type: **Information**

Telnet client successfully logged in.

MSG_CLI_LOGGED_IN_FROM_V24

`EventText: User \"%s\" logged in (session id = %d) from V24 CLI`

Type: **Information**

A user has successfully logged in via the V.24 inferface.

8.2.31 HIP Events

MSG_HIP_ALLOC_DEV_OBJ

`EventText: hi_main: Device allocation memory not possible`

Type: **Warning**

No heap space for device data. Check available memory.

MSG_HIP_NO_MEM_CLBLK

`EventText: hi_main: No memory for Cluster block available`

Type: **Warning**

No space available for cluster block. Check why no allocatable memory is available in the gateway.

MSG_HIP_NO_MEM_CL

`EventText: hi_main: No memory for Cluster %d available`

Type: **Warning**

No space available for cluster. Check why no allocatable memory is available in the gateway.

MSG_HIP_NO_NETPOOL_INIT

`EventText: NETPOOL INIT not possible: Return value %d`

Type: **Warning**

Initialization of netpool for HIP not possible. Check return value %d and take appropriate measures.

MSG_HIP_NO_OBJ_INIT

`EventText: No initialization of END_OBJ Structure possible`

Type: **Warning**

Initialization of `END_OBJ` for HIP not possible. Check `END_OBJ` pointer and memory.

MSG_HIP_NO_DEVLOAD

`EventText: hi_main:Loading device into MUX not possible, unit = %d, pendLoad = %X,Pinitstring = %X, Loaning = %d,pBSP = %X`

Type: **Warning**

Loading HIP device in MUX not possible. Check parameters transferred to `muxDevLoad`.

MSG_HIP_NO_DEVSTART

`EventText: I_main: Start HIP device not Possible, return value = %X`

Type: **Warning**

Starting HIP device in MUX not possible. Check return value %X and take appropriate measures.

MSG_HIP_NO_MEM_TO_SI

`EventText: SI_main: allocating of memory for message to SI not possible`

Type: **Warning**

Allocation of memory for message to system interface not possible. Check why no allocatable memory available at gateway.

MSG_HIP_NO_CLPOOL_ID

`EventText: hi_main: No clusterpool ID available`

Type: **Warning**

No cluster pool ID available for sending a packet to an IP via MUX. Check for problem.

MSG_HIP_NO_CLUSTER

`EventText: I_main:No cluster available to make packet,packet_len = %d`

Type: **Warning**

Cluster of requested length not available. The problem may be that not enough clusters of a certain length are free or that the clusters have not been released.

MSG_HIP_NO_CLBLK

`EventText: No clusterblock for netpool available`

Type: **Warning**

No more cluster blocks. Number of defined cluster blocks too low.

MSG_HIP_NO_PMBLK

`EventText: No memory block for incoming messages from MUX`

Type: **Warning**

MUX calls HIP without a pointer to a memory block. Check the interface IP > MUX -> HIP.

MSG_HIP_PKTLEN_ZERO

`EventText: Packet length from MUX = zero`

Type: **Warning**

Length of packet from MUX is 0. Inform person responsible for IP about this message.

MSG_HIP_ALLOC_MES_SI

`EventText: No allocation for message SI possible`

Type: **Warning**

Could not send message from HIP to system interface. Check available memory.

MSG_HIP_PMBLK_ZERO

`EventText: Length of packet from Mux is zero`

Type: **Warning**

Length of packet from MUX is 0. Inform person responsible for IP/MUX about this message.

8.2.32 SI Events (System Interface Events)

MSG_SI_L2STUB_STREAM_ALREADY_OPEN

`EventText: Stream already open for device %X`

Type: **Warning**

Device has already been opened using the `SI_open` procedure. Check MAL to determine why it calls `SI_open` twice.

MSG_SI_L2STUB_COUDNT_OPEN_STREAM

`EventText: Stream couldnâ##t be opened for device %X`

Type: **Warning**

Error in Vxworks-Costream for opening a data channel for a device. Check maximum number of devices and interpret the error code.

MSG_SI_L2STUB_ERROR_INIT_DRIVER

`EventText: Critical Error in Initializing L2 driver`

Type: **Critical**

Initialization of L2 not possible. Check error code in Vxworks.

MSG_SI_L2STUB_NO_CLONE

`EventText: Unsupported non-Clone open!`

Type: **Warning**

A non-clone entity not supported has been opened.

MSG_SI_L2STUB_OPEN_OTHER_STREAM_NOT_POSSIBLE

`EventText: Unable to open another L2 stream`

Type: **Warning**

Check the Vxworks error code.

MSG_SI_L2STUB_UNEXPECTED_DB_TYPE

`EventText: Unexpected db_type (0x%x)"`

Type: **Warning**

The message type is not allowed for DLPI.

MSG_SI_L2STUB_NO_ALLOC

`EventText: Unable to allocb(%d)`

Type: **Critical**

Out of memory. The gateway performs an automatic restart. An SNMP trap is generated. Further measures not required.

MSG_SI_L2STUB_PORT_NOT_OPEN

`EventText: Port has not been opened`

Type: **Warning**

Port must be opened before transfer can be performed. Check why port is closed.

MSG_SI_L2STUB_UNKNOWN_SOURCE_PID

`EventText: PSource PID not known (0x%x)`

Type: **Warning**

Message from unknown PID. Check who has sent this message.

MSG_SI_L2STUB_UNEXPECTED_EVENT_CODE

`EventText: Unexpected event code (%d) from SWU`

Type: **Warning**

Event code sent from HiPath 3000 not known. Check DH in HiPath 3000.

8.2.33 MAGIC/Device Manager Events

8.2.33.1 Startup and Internal Messages

MSG_DEVM_NO_PROTOCOL_FOR_DEVICE

```
EventText: Device %u could not be bound to protocol %d.
Device has been taken out of service
```

Type: **Major**

Specified device couldnât be assigned to a protocol and is therefore "out-of-service". Check and correct content of file devmgr.txt.

MSG_DEVM_NO_PROTOCOL_FOR_DEVICE

```
EventText: Device %u could not be bound to protocol %d.
Device has been taken out of service
```

Type: **Major**

Specified device couldnât be assigned to a protocol and is therefore "out-of-service". Check and correct content of persistent file devmgr.txt.

MSG_DEVM_BINDING_FAILED

```
EventText: Protocol rejected. Device â##%uâ## will be taken
out of service
```

Type: **Major**

Invalid protocol specified in persistent file. Check and correct content of persistent file devmgr.txt.

MSG_DEVMGR_DEVICEID_OUT_OF_RANGE

```
EventText: The current DeviceId: %d is out of range
```

Type: **Major**

Specified device ID is outside valid range. Check and correct content of persistent file devmgr.txt.

MSG_DEVMGR_NO_DEVICE_TYPE_FOR_DEVICE

```
EventText: No Device Type for %s Device available in
persistency
```

Type: **Major**

Invalid device type in persistent file. Check and correct content of persistent file devmgr.txt.

MSG_DEVMGR_NO_DEVICE_ID_FOR_DEVICE

```
EventText: No Device Type for %s Device available in
persistency
```

Type: **Major**

No entry found in persistent file for specified device type. Check and correct content of persistent file devmgr.txt.

MSG_DEVMGR_CREATE_FAILED

`EventText: %s create failed`

Type: **Major**

Device object entity of specified class could not be created. Not enough memory. Restart system.

MSG_DEVMGR_CAN_NOT_READ_PERSISTENCY

`EventText: Can not read %s persistency file`

Type: **Major**

Specified persistent file cannot be read. Check persistent files. Restart system.

MSG_DEVMGR_SCN_TASK_FAILED

`EventText: SCN Task create failed`

Type: **Major**

Class entity of SCN_TASK cannot be created; startup interrupted. Restart system.

MSG_DEVMGR_INTERROR_DEVID

Type for following event texts: **Major**

`EventText: SCN Task create failed`

Could not find a valid device pointer in the global device table.

`EventText: DeviceId (%x): Got NULL pointer instead of Resource!`

A null pointer to a resource occurred.

`EventText: DeviceId (%x): No container object found!`

Could not find a valid object pointer in the global table.

`EventText: DeviceId (%x): No protocol manager found!`

Could not find a valid protocol manager.

`EventText: DeviceId (%x): No protocolId in message!`

Could not read protocol ID from persistent file. Check and correct content of persistent file devmgr.txt.

`EventText: DeviceId (%x): If Table init failed, DVMGR not initialized!`

Error in system startup. Could not create IF tables. Restart system. If problem persists, a new APS will be required.

`EventText: DeviceId (%x): Startup failed, DVMGR not initialized!`

Error in system startup. Could not start device manager. Restart system. If problem persists, a new APS will be required.

`EventText: DeviceId (%x): is not a fax deviceId. Could not set fax status.`

Got a wrong device ID.

`EventText: DeviceId (%x): Got NULL pointer !!!`

Received a null pointer.

`EventText: DeviceId (%x): No free channel found!`

Could not find a free channel.

`EventText: DeviceId (%x): Unknown Device Type!`

Unknown device type received. Check and correct content of persistent file devmgr.txt.

`EventText: DeviceId (%x): Device %d canâ##t be created!`

Could not create device. No connections possible for this device.

`EventText: DeviceId (%x): Insert in global Device Table failed!`

Inserting in global device table failed. This device will not be known to the system.

Type for following event text: **Minor**

`EventText:` DeviceId (%x): Not enough memory to create Resource object!!

Not enough memory to create a resource.

Type for following event texts: **Warning**

`EventText: DeviceId (%x): Amount of configured resources exceeds overall limit.`

The number of total resources is less than the number of resources assigned to this device. Check configuration of resources in devmgr.txt.

`EventText: DeviceId (%x): Unexpected SUSY id !!!`

Got an unexpected SUSY ID.

`EventText: DeviceId (%x): iAdmCommand: Unexpected value received`

Got an unexpected command.

`EventText: DeviceId (%x): id >= MAX_RESOURCE_NUMBER!`

Got wrong resource.

`EventText: DeviceId (%x): Wrong param from persistency file gwglobal.txt!`

Could not read parameter from persistent file. Check and correct content of persistent file gwglobal.txt.

`EventText: DeviceId (%x): BChannel not found in resources!`

Could not find B channel in resources.

`EventText: DeviceId (%x): Got a LOGON_TRK_IND msg for wrong device!`

Got a message for wrong device.

`EventText: DeviceId (%x): Unknown resource state!`

Resource state unknown.

`EventText: DeviceId (%x): Configured Trunk Channels exceed physical Limit!`

The configured trunk channels (Manager E) exceed the number of physical B channels.

Type for following event texts: **Information**

`EventText: DeviceId (%x): Unknown AdminState! AdminState set to AStateDown`

Unknown admin state.

`EventText: DeviceId (%x): Shutdown of SCN_Task failed! Continue with Shutdown.`

Shutdown of SCN_TASK failed. Shutdown will be continued anyway.

MSG_DEVMGR_INTERROR_RESID

Type for following event texts: **Warning**

`EventText: ResourceId (%x): Fax Indication received from wrong device`

Wrong device type.

`EventText: ResourceId (%x): No ASCII character defined for digit %d`

Wrong digit.

`EventText: ResourceId (%x): G711TransparentChannel Indication not from SCN-side`

Wrong indication.

`EventText: ResourceId (%x): State RESOURCE_IN_USE not set!`

Could not change state.

`EventText: ResourceId (%x): State RESOURCE_IDLE not set!`

Could not change state.

`EventText: ResourceId (%x): DecreaseResourceCounter() failed`

Decrease of the resource counter failed.

`EventText: ResourceId (%x): Leg not opened`

Leg is not opened yet.

`EventText: ResourceId (%x): No Codecs available!`

Did not find a codec. Calls not possible.

`EventText: ResourceId (%x): Codec value out of range!`

Unknown codec.

`EventText: ResourceId (%x): Number of licenses out of range!`

Unknown codec quantity.

`EventText: ResourceId (%x): new state not expected!`

Got unexpected state.

`EventText: ResourceId (%x): Leg already in a connection`

The systemâs own Leg or the partner Leg is already connected. Reject command.

`EventText: ResourceId (%x): ChangeState(%d): N/A in state %s`

State cannot be changed due to wrong state.

`EventText: ResourceId (%x): Resource not in state RESOURCE_IN_USE`

Wrong state.

`EventText: ResourceId (%x): No Dtmf tone defined for character %c`

Wrong character.

Type for following event texts: **Major**

`EventText: ResourceId (%x): GOT NULL POINTER !!!`

Received a null pointer.

MSG_DEVMGR_INTERROR_CHNID

`EventText: ChannelId (%x): Channel out of range!`

Type: **Warning**

Wrong channel number.

MSG_DEVMGR_MSCERROR_RESID

Type for following event texts: **Warning**

`EventText: Could not connect Legs. TIMEOUT, Faxstatus not changed from MSC`

Legs could not be connected because of timeout.

`EventText: DCould not connect Legs; FAX_STATUS_ERROR from MSC`

Legs could not be connected because of `FAX_STATUS_ERROR` from MSC.

8.2.33.2 LEG Management Messages

MSG_DEVMGR_OPEN_LEG_FAILED

`EventText: Open of %s Leg failed; MSC Error Code %d`

Type: **Warning**

Payload Leg couldnât be opened; MSC responds with specified error code.

MSG_DEVMGR_OPEN_WRONG_RES_STATE

`EventText: Open of %s Leg failed; Resource State %d`

Type: **Warning**

Resource state unexpected. State not changed, but returns `false` to the caller.

MSG_DEVMGR_UPDATE_LEG_FAILED

`EventText: Update of %s Leg failed; MSC Error Code %d`

Type: **Warning**

Data of payload Leg could not be changed; MSC responds with specified error code.

MSG_DEVMGR_CONNECT_WRONG_LEGS

`EventText: Connect of %s Leg failed; Partner not a %s Leg`

Type: **Warning**

Partner Leg has a wrong Leg type, which is why the connection cannot be established.

MSG_DEVMGR_CONNECT_LEGS_FAILED

`EventText: Connect of %s Leg failed; MSC Error Code %d`

Type: **Warning**

Connection to specified Leg failed; MSC created specified error code.

MSG_DEVMGR_LISTEN_WRONG_RES_STATE

`EventText: ListenForConnect on %s Leg failed; State %d Mode %d`

Type: **Warning**

Listening on the fax channel failed due to either false state or false mode.

MSG_DEVMGR_CONNECT_WRONG_RES_STATE

`EventText: Connect on %s Leg failed; State %d Mode %d`

Type: **Warning**

Connection on the fax channel failed due to either false state or false mode.

MSG_DEVMGR_DISCONNECT_LEGS_FAILED

`EventText: Disconnect of %S Leg failed; MSC Error Code %d`

Type: **Warning**

Disconnect of payload Legs failed; MSC responds with specified error code.

MSG_DEVMGR_CLOSE_LEG_FAILED

`EventText: Close of %s Leg failed; MSC Error Code %d`

Type: **Warning**

Proper closing of payload Leg failed; closed anyway.

8.2.33.3 Layer2 Communication Messages

MSG_SCN_ERROR_12_MSG

`EventText: L2 Error: %d Primitive: %d received on Device: %d`

Type: **Major**

Layer2 has sent an error message; logged only.

MSG_SCN_ADD_PARAMETER_FAILED

`EventText: L2 Error: %d Primitive: %d received on Device: %d`

Type: **Major**

Add parameter failed.

MSG_SCN_DEV_NOT_IN_DEVLIST

`EventText: Device %d not in devicelist of SCN_TASK`

Type: **Major**

Specified device not found in device list.

MSG_SCN_GET_ADMMSG_FAILED

`EventText: Reading message from admin stream failed`

Type: **Major**

A message cannot be read from the admin stream.

MSG_SCN_GET_LDAPMSG_FAILED

`EventText: Reading message for device %d failed`

Type: **Major**

A message cannot be read from the admin stream.

MSG_SCN_UNEXPECTED_L2_MSG

`EventText: Unexpected layer2 message on device %d`

Type: **Major**

Layer2 has sent an unexpected DLPI message; logging only.

MSG_SCN_OPERATION_ON_STREAM_FAILED

`EventText:` Operation on stream failed for device %u

Type: **Major**

Operation on specified stream failed.

MSG_SCN_POLL_FD

`EventText: Poll returned unexpected value -1`

Type: **Major**

Polling failed.

MSG_SCN_OPEN_STREAM_FAILED

`EventText: Open stream failed on device %d`

Type: **Major**

Opening communication path to Layer2 failed. Restart system.

MSG_SCN_UNEXPECTED_POLL_EVENT

`EventText: Unexpected poll event on device %u`

Type: **Major**

Got an unexpected event on the specified device.

MSG_SCN_BIND_FAILED

`EventText: Bind for device: %d failed`

Type: **Major**

Binding layer2 communication path failed. Restart system.

MSG_DEVMGR_LAYER2_SERVICE_TRAP

Type for following event texts: **Critical**

`EventText: DEVMGR DevId: %d Layer2 Out-Of-Service; Waiting for DL_CONNECT_IND`

Message from SI missing; layer2 not ready. An SNMP trap is generated.

`EventText: DEVMGR DevId: %d Layer2 Out-Of-Service; Initiated by Layer2`

SI takes layer2 out of service. No more calls possible for this device. An SNMP trap is generated.

`EventText: DEVMGR DevId: %d Layer2 Out-Of-Service; Initiated by Application/Operator`

Administrator takes Layer2 out of service. No more calls possible for this device. An SNMP trap is generated.

Type for following event text: **Information**

`EventText: DEVMGR DevId: %d Layer2 In-Service`

Layer2 is ready. Connections to this device possible. An SNMP trap is generated.

8.2.34 Important Platform Software Status Events

MSG_ASP_INFO

Type for following event texts: **Information**

`EventText: Booting DSP module #<nr> with <DSP SW Version > from < date>`

This message appears at startup and marks the beginning of the boot procedure of the DSP module.

`EventText: Loading ...`

This message is displayed at startup and marks the beginning of the DSP software download.

`EventText: Booting DSP Modules #<nr> done`

This message appears at startup and marks the successful conclusion of the boot procedure of the DSP module.

8.2.35 Major ASC Events

MSG_ASC_ERROR

`EventText: DSP channel not initialized`

Type: **Indeterminate**

Possibly a configuration problem. Verify the ASC configuration in the gateway.

8.2.36 Major ASP Events

MSG_ASP_ERROR

Type for following event texts: **Critical**

`EventText: Hardware Configuration invalid: <error string>`

Different DSP modules (DDM1, DDM2) plugged in. Check the DSP modules on the main board.

`EventText: DSP Error 7,<nr>,0,0,0,0...`

An RTP packet of invalid length may have been received from the LAN. Displayed on console only.

`EventText: DSP Error 9,<nr>,0,0,0,0...`

Space problem: something is blocked on the DSP side. Displayed on console only.

8.2.37 Minor ASP Events

MSG_ASP_INFO

`EventText: fec restarts because of high traffic on LAN - Restart counter <nr>`

Type: **Information**

This message appears every tenth time that the FEC sender is blocked by a collision or by high-volume traffic. Some packets are lost when FEC is restarted automatically. Monitor LAN traffic.

8.2.38 IP Filter Events

MSG_IPF_STARTED

`EventText: IP Filter started`

Type: **Information**

An IP filter object has been created.

MSG_IPF_STOPPED

`EventText: IP Filter stopped`

Type: **Information**

An IP filter object has been destroyed.

MSG_IPF_ON_OFF

`EventText: IP Filter is switched %s`

Type: **Information**

IP filter was switched ON/OFF.

MSG_IPF_PARAMETER

`EventText: Rule number %d: missing parameter %s`

Type: **Critical**

When reading the specified filter rule, could not read specified parameter.

8.2.39 MAC Filter Events

MSG_MAF_STARTED

`EventText: MAC Address Filter started`

Type: **Information**

A MAC address filter object has been created.

MSG_MAF_STOPPED

`EventText: MAC Address Filter stopped`

Type: **Information**

A MAC address filter object has been destroyed.

MSG_MAF_ON_OFF

`EventText: MAC Address Filter is switched %s`

Type: **Information**

MAC address filter was switched ON/OFF.

MSG_MAF_PARAMETER

`EventText: Rule number %d: missing parameter %s`

Type: **Critical**

When reading the specified filter rule, could not read specified parameter.

MSG_MAF_NO_OF_RULES

`EventText: Number of rules is bigger than the maximum of %d`

Type: **Critical**

The number of rules entered is greater than the predefined maximum.

MSG_MAF_NETBUFFER

`EventText: IP packet seems to be corrupt`

Type: **Critical**

An error occurred when trying to access the memory area where the IP packet should be.

MSG_MAF_ETHERNET_HEADER

`EventText: Cannot find ethernet header of IP packet`

Type: **Critical**

An error occurred when trying to access the Ethernet header of an IP packet.

8.2.40 IP Stack Events

MSG_IPSTACK_NAT_ERROR

`EventText: CNAT Error: %s`

Type: **Critical**

Critical error occurred during net address translation (NAT).

MSG_IPSTACK_SOH_ERROR

`EventText: Error occurred in Socket Handler`

Type: **Critical**

Error occurred in Socket Handler.

MSG_IPSTACK_INVALID_PARAM

`EventText: IP Stack invalid parameter %s, value %s`

Type: **Minor**

IP Stack receives invalid parameter.

8.2.41 DELIC Events

MSG_DELIC_ERROR

`EventText: delic mailbox fatal error; reboot delic`

Type: **Critical**

Reboot after a critical DELIC mailbox error. Reboot will be executed automatically. HiPath not informed.

8.2.42 Test Loadware Events

MSG_TESTLW_INFO

`EventText: Info: %p`

Type: **Information**

Information about TESTLW functions (successful initialization, etc.).

MSG_TESTLW_ERROR

`EventText: Error: %p`

Type: **Major**

Errors during initialization due to receipt of an unknown message, or with buffer and timer errors.

8.2.43 Fax Converter, HDLC and X.25 Events

MSG_FAXCONV_INFO

`EventText: Info: %p`

Type: **Information**

Information about Fax Converter module (successful initialization, operations, etc.).

MSG_FAXCONV_ERROR

`EventText: Error: %p`

Type for following errors: **Warning**

Errors during initialization, receiving an unknown message, buffer errors.

Type for following errors: **Major**

Errors opening Fax Converter module.

MSG_MSP_FAX_OVERLONG_PKT

n/a

MSG_T90_INFO

`EventText: Info: %p`

Type: **Information**

Information about T.90 protocol module (successful initialization, operations, etc.).

MSG_T90_ERROR

`EventText: Error: %p`

Type: **Warning/Major**

Errors during initialization, receiving an unknown message, buffer errors.

MSG_X25_INFO

`EventText: Info: %p`

Type: **Information**

Information about X.25 protocol module (successful initialization, operations, etc.).

MSG_X25_ERROR

`EventText: Error: %p`

Type: **Warning/Major**

Errors during initialization, receiving an unknown message, buffer errors.

MSG_X75_INFO

`EventText: Info: %p`

Type: **Information**

Information about X.75 protocol module (successful initialization, operations, etc.).

MSG_X75_ERROR

`EventText: Error: %p`

Type: **Warning/Major**

Errors during initialization, receiving an unknown message, buffer errors.

MSG_MSP_HDLC_INFO

`EventText: Info: %p`

Type: **Information**

Information about HDLC driver (successful initialization, operations, etc.).

MSG_MSP_HDLC_ERROR

`EventText: Error: %p`

Type: **Warning/Major**

Errors during initialization, receiving unknown messages, buffer errors and errors when opening HDLC driver.

8.2.44 IP Accounting Events

MSG_IPACCSRV_SOCKET_ERROR

`EventText: Socket Error: %d (%s)`

Type: **Major**

A fatal error occurred at the socket interface. The gateway performs an automatic restart.

MSG_IPACCSRV_MEMORY_ERROR

`EventText: Memory allocation failed`

Type: **Major**

Application doesnât get requested memory. The gateway performs an automatic restart.

MSG_IPACCSRV_INTERNAL_ERROR

`EventText: Internal Error in IP Accounting (code: %d %s)`

Type: **Major**

Various errors, for example, when OAM returns an error code. The message is displayed.

MSG_IPACCSRV_MESSAGE_ERROR

`EventText: Wrong internal message (origin: %s, code %d)`

Type: **Warning**

Received unknown message from IP Counting or IP Accounting client. The message is displayed.

MSG_IPACCSRV_MARK_REACHED

`EventText: WIP Accounting data reached upper mark, it shall be read`

Type: **Warning**

Upper level in IP Counting table reached. An SNMP trap is generated. If IP Accounting information is to be processed, log onto the IP Accounting client.

MSG_IPACCSRV_OVERFLOW

`EventText: IP Accounting data has overflown`

Type: **Warning**

Upper level in IP Counting table reached. Data will be lost. An SNMP trap is generated. If IP Accounting information is to be processed, log onto the IP Accounting client.

MSG_IPACCSRV_LOGON

`EventText: Login of IP Accounting client: %s`

Type: **Information**

Depending on the dummy %s, provides information on whether logon was successful or not. The message is displayed. If logon was unsuccessful, check reason.

8.2.45 Endpoint Registration Handler (ERH) Trace Events

MSG_ERH_INFORMATION

`EventText: %p`

Type: **Information**

Important ERH information. Check this event in connection with other ERH events if necessary.

MSG_ERH_ERROR

`EventText: %p`

Type: **Warning**

Errors, which occurred during an ERH operation (if not classified in other event classes). To get more information create a trace with ERH_REGISTRATION, ERH_ADMISSION and ERH_CONFIGURATION and trace level 6.

MSG_ERH_REGISTRATION_ERROR

`EventText: %p`

Type: **Warning**

Errors, which occurred during ERH registration. To get more information create a trace with ERH_REGISTRATION, ERH_CONFIGURATION and trace level 6. Very often this error is caused by a corrupt configuration. In addition, read messages of type MSG_ERH_INFORMATION.

MSG_ERH_ADMISSION_ERROR

`EventText: %p`

Type: **Warning**

Errors, which occurred when endpoints were being set up or cleared down. To get more information create a trace with ERH_ADMISSION and trace level 6. Check the endpoints that are not working.

MSG_ERH_SECURITY_DENIAL

`EventText: %p`

Type: **Critical**

This indicates that the ERH has rejected a request for registration, de-registration, setup or cleardown of endpoints for security reasons. Check carefully whether this message was caused by a faulty configuration in the network, or whether it is the result of attacks from a network hacker.

MSG_ERH_SUB_OUT_OF_SERVICE

n/a

MSG_ERH_NO_LICENSE

`EventText: %p`

Type: **Warning**

Indicates that there are no ComScendo licenses for registering a H.323 endpoint. More licenses need to be configured in the license manager (Manager E).

8.2.46 IPNCV Events

MSG_IPNCV_SIGNALING_ERROR

`EventText: IPNCV Signaling Error: %s`

Type: **Warning**

Software error: invalid internal data found.

8.2.47 XMLUTILS Events

MSG_XMLUTILS_ERROR

`EventText: %d`

Type: **Major**

An error has occurred in the XMLUTILS component.

8.2.48 Error Events

MSG_OSF_PCS_ERROR

`EventText: %p`

Type: **Major**

OSF has discovered a major error.

8.2.49 LAN Signaling Events â“ CCE

CCE_GENERAL_ERROR

`EventText: ...`

Type: **Major, Minor, Warning, Information**

CCE error not resolved through interaction with PSS saving (e. g. interaction with a QDC client).

CCE_PSS_STORE_ERROR

`EventText: ...`

Type: **Major, Minor, Warning, Information**

CCE error resolved through interaction with PSS saving (e. g. interaction with a QDC client).

8.2.50 Events for LLC Operation

MSG_LLC_EVENT_MISSING_RESOURCE

`EventText: %p`

Type: **Information**

Important information about an LLC operation.

MSG_LLC_EVENT_UNEXPECTED_RETURN_VALUE

`EventText: %p`

Type: **Critical**

In the case of errors that arise during an LLC operation (provided they are not already classified in other event classes).

MSG_LLC_EVENT_MISSING_PARAMETER

`EventText: %p`

Type: **Critical**

Mandatory element missing from message.

MSG_LLC_EVENT_INVALID_PARAMETER_VALUE

`EventText: %p`

Type: **Warning**

Invalid message.

8.2.51 Client-Related Events

(Events in the QoS Data Collection category)

QDC_SIGNALLING_DATA_ERROR

`EventText: Signaling data could not be completely retrieved for the QDC report`

Type: **Information**

Signaling data could not be completely retrieved for the QDC report.

QDC_MSG_QUEUE_ERROR

`EventText: QDC message queue is full.`

Type: **Major**

QDC message storage is full. Messages may be lost.

QDC_SYSTEM_ERROR

`EventText: QDC software failure`

Type: **Major**

QDC is not running correctly.

QDC_ ERROR_IN_COMMON_CLIENT

`EventText: Error in QDC Common Client: %s`

Type: **Warning**

General error message; Reason described in specific text represented instead of %s.

8.2.52 QDC-CGWA-Related Events

(Events in the QoS Data Collection category)

QDC_INVALID_CONFIGURATION

`EventText: Invalid QDC configuration`

Type: **Warning**

The administrator is attempting to use an invalid QDC configuration.

QDC_PERSYSTENCY_ERROR

`EventText: QDC default configuration could not be read from the persistency`

Type: **Warning**

The default QDC configuration could not be read from the persistency.

QDC_ERROR_IN_CLIENT

`EventText: Error in QDC Client: %s`

Type: **Warning**

General error message; Cause of error in plain text instead of %s.

8.2.53 QDC VoIPSD Error Report Events

QDC_VOIPSD_ERROR

`EventText: Error in secure data handling: %s`

Type: **Information**

One of the components reports an error with "secure" data transmission: %s

8.2.54 SIP Events

SIP_INFORMATION

`EventText: ...`

Type: **Major, Minor, Warning, Information**

Just informationSHT: startup/shutdown.

SIP_INVALID_PARAMETER_VALUE

`EventText: ...`

Type: **Major, Minor, Warning**

There is a parameter that exceeds the specified value range.

SIP_UNEXPECTED_RETURN_VALUE

`EventText: ...`

Type: **Major, Minor, Warning**

The current function returns an unexpected result.

SIP_INVALID_POINTER

`EventText: ...`

Type: **Major, Minor, Warning, Information**

This pointer has got an invalid value.

9 Appendix: WAN/LAN Management

The administration of linked networks in WAN/LAN is a highly technical procedure. When performing this task, configuration problems will always crop up which need to be corrected quickly and efficiently. The information provided in the following sections is intended to help you in such cases.

9.1 Utility Programs for TCP/IP Diagnostics

Any operating system provides tools designed for finding faults in a TCP/IP environment which do not have an obvious explanation. As each operating system includes its own tools and corresponding command parameters, only the main Microsoft operating system functions are described here. Other tools for UNIX-based operating systems are described in detail in RFC 1147. Special parameters are contained in the Help for the corresponding operating system and can normally be queried by entering `<Command> -?`.

9.1.1 ping

The tool most often used is probably the `ping` command. This command allows you to check whether a computer in the network can be reached, that is whether communication with that computer is possible. An ICMP ECHO message is sent to the computer and then returned to the sender. If the answer reaches the sending computer, communication with the specified computer is possible. Most variants of the PING command produce connection statistics.

Syntax for Windows operating systems:

:

`ping <Host> [<Parameter>]`

The following entries are possible for `<Parameter>`:

`<Host>`	Contains the destination address or the host name of the destination computer
`-t`	Uninterrupted transfer of test packets to the computer. Normally only 4 test packets are transferred.
`-a`	IP addresses are resolved to host names.
`-n <number>`	Sends <Number> test packets to the computer.
`-l <size>`	Sends test packets with <Size> bytes
`-I <TTL>`	Number of router hops allowed for one packet. The counter is set to a starting value by the sender and decremented by each router that forwards the packet.

-w <Timeout>	Timeout in milliseconds to wait for each reply. If this time elapses, a timeout message appears. This value is set by default to 1000 (1s). It is advisable to set this value to 5000 (5s) or 10000 (10s) in the case of slow connections such as via modem or GSM. If the reply takes more than 1 second, a timeout message will be received even though a connection is possible.

Example:

Check connection to local computer. The local computer can normally be reached under the loopback address `127.0.0.1` and the name `localhost`.

```
C:\>ping localhost

PING is executed for the local host [127.0.0.1] with 32
bytes of data:

Reply from 127.0.0.1: bytes=32 time<10msec TTL=128

Reply from 127.0.0.1: bytes=32 time<10msec TTL=128

Reply from 127.0.0.1: bytes=32 time<10msec TTL=128

Reply from 127.0.0.1: bytes=32 time<10msec TTL=128
```

Messages:

If the remote computer does not reply, the error can be deduced from the messages.

- Invalid IP address (unknown host): The host name could not be converted to a valid IP address. This message is generated when the DNS server cannot be reached or is out of service. This message is only output when the host is addressed using a name.
- Destination host not available (network unreachable): There are no valid routes to the destination system. The destination address could not be reached, as a gateway is out of service or was not correctly specified on the local host.
- (Timeout): The computer has a route to the destination computer but there is no reply. The message reaches the destination host, but cannot be returned. This error is caused by incorrect routing of the destination computer.

9.1.2 ipconfig

The `ipconfig` program is a quick way of querying the TCP/IP network configuration. In this way you can display IP addresses, netmasks, gateways and network card statistics. It also enables IP addresses assigned via DHCP to be released or renewed.

Syntax for Windows operating systems:

```
ipconfig [<Parameter>]

The following entries are possible for <Parameter>:
```

`/all`	Shows details of the network configuration. This includes the host name, DNS servers used, MAC addresses of each network adapter and DHCP information.
`/release [Adapter]`	Releases the IP address assigned via DHCP at the adapter.
`/renew [Adapter]`	Assigns a new IP address to the adapter via DHCP.

If no adapter is specified under the parameters `release` and `renew`, all IP addresses at all adapters assigned via DHCP will be released or re-assigned.

Example:

Detailed query of current configuration:

```
C:\>ipconfig /all

Windows NT IP Configuration

   Host Name ..............:  myhost.unify.de

   DNS Server..............:  192.168.50.23

                              192.168.50.160

   Node Type ..............:  Broadcast

   NetBIOS Scope ID .....:

   IP Routing Enabled.....:    No

   WINS Proxy Enabled.....:    No

   NetBIOS Resolution Uses     Yes
   DNS:
```

```
Ethernet adapter El90x2:

   Description.............:  3Com 3C90x Ethernet
                              adapter

   Physical Address.........:  00-10-5A-DD-56-55

   DHCP Enabled.............:  No

   IP Address..............:  192.168.129.1

   Netmask.................:  255.255.255.0

   Default Gateway..........:
```

```
Ethernet adapter El90x1:

   Description.............:  3Com 3C90x Ethernet
                              adapter
```

```
Physical Address.........:  00-10-5A-37-26-B1
DHCP Enabled.............:  Yes
IP Address...............:  192.168.14.6
Netmask..................:  255.255.255.0
Default Gateway..........:  192.168.14.1
DHCP Server..............:  192.168.11.103
Lease Supplied....... ...:  Tue, 17.08.1999 08:43:30
Lease Expires............:  Tue, 19.01.2038 04:14:07
```

9.1.3 nslookup

An IP address can be assigned via a host name. This assignment of name and IP address is stored in the DNS server (DNS = Domain Name Server). The command `nslookup` can be used to query data that was saved for a specific host in the DNS server. By entering the command `nslookup` in the MS-DOS prompt, the program tries to contact the DNS server provided in the network. If a name is queried, the corresponding IP address is returned. Conversely, if an IP address is queried, the host name is returned. If neither the IP address nor the host name is stored in the DNS server, a corresponding error message is output.

The `nslookup` command message `Invalid IP address` indicates that the host name specified cannot be converted into an IP address. This occurs when the DNS server is out of service or the entry does not exist. This requires that the DNS servers are entered in the network configuration and can be addressed via network.

`nslookup` can be used to query various entries (records) on the DNS server. Once the program has been started, the following entries can be used to query the corresponding data.

`set Type=<Type>`

The following entries are possible for `<Type>`:

`a`	Address entries
`any`	All entries
`mx`	Mail Exchanger entries
`ns`	Name Server entries
`soa`	Start of Authority entries
`hinfo`	Host Info entries
`axfr`	All entries in a single area
`txt`	Text entries

Syntax for Windows operating systems:

`nslookup <Host>`

`<Host>`	Contains the destination address or the host name of the destination computer

Example:

```
C:\>nslookup localhost
Server: ns.domain.com
Address: 192.168.0.1
Name: localhost
Address: 127.0.0.1
```

The host "localhost" has the IP address 127.0.0.1.

9.1.4 hostname

The command `hostname` returns the name of the local computer. Unlike other operating systems, in Microsoft operating systems the host name cannot be changed using this command.

Example:

```
C:\>hostname
localhost
```

9.1.5 netstat

The command `netstat` is used to check existing connections and configured routes, and returns detailed statistics and information on individual network interfaces. Besides the routing table, the most frequently used `netstat` function is the query feature, which ascertains which connections exist at the local computer as well as the status of these connections.

Syntax for Windows operating systems:

netstat [<Parameter>] [<Interval>]

The following entries are possible for `<Parameter>`:	
`-a`	Displays all connections. This means that listening applications such as a Telnet server are also displayed.
`-e`	Displays Ethernet statistics
`-n`	Displays IP addresses instead of host names
`-p <Proto>`	Displays connections established via the `<Proto>` protocol
`-r`	Displays the routing table, which can also be displayed using `route print`.

`-s`	Displays statistics for each protocol
`<Interval>`	Repeats the display after <Interval> seconds

Example:

Queries all connections in IP address format (abbreviated)

```
C:\>netstat -a -n

Active Connections

Proto  Local address          Remote address        State
....
....
TCP    0.0.0.0:25             0.0.0.0:0             LISTENING
TCP    0.0.0.0:80             0.0.0.0:0             LISTENING
....
....
TCP    192.168.129.3:110      192.168.129.1:1037    ESTABLISHED
TCP    192.168.129.3:23       192.168.129.2:1038    ESTABLISHED
TCP    192.168.129.3:1031     192.168.129.1:80      ESTABLISHED
....
....
UDP    0.0.0.0:25             *:*
UDP    0.0.0.0:80             *:*
....
```

IP connections and their statuses can be displayed using this table. Before explaining this example in more detail, we will briefly discuss the variables.

`<Proto>`	Indicates the protocol used for the communication. In this case, Windows only distinguishes between TCP and UDP. Unfortunately, certain servers which only operate via a single protocol are displayed both as TCP and as UDP servers. This prevents accurate determination of the actual protocol in use.
`<Local address>`	This indicates the local address which has established a connection or is listening for a connection. The local address and the remote address are displayed in the format <IP address>:<Port number>.

<Remote address>	This indicates the remote address which has established a connection or to which a connection has been established.

<State>

Shows the current state of the connections:

ESTABLISHED	The local computer has set up a connection to a server. In this case the local computer is a client.
LISTENING	The local computer is ready to accept a connection. In this case the local computer is a server.
SYN_SENT	The local computer signals to the server that it would like to establish a connection.
SYN_RECEIVED	The local computer where the server is running has received a "SYN_SENT" signal, that is the client would like a connection to be established.
FIN_WAIT_1	The local computer would like to clear down the connection to the server.
TIME_WAIT	The local computer is waiting for server confirmation that the connection is to be terminated.
CLOSE_WAIT	The local computer where the server is running has received a "FIN_WAIT_1" signal, that is the client would like a connection to be cleared down.
FIN_WAIT_2	The local computer has received confirmation from the server to clear down the connection.
LAST_ACK	The server has sent confirmation that the connection is to be cleared down.
CLOSED	The server has received client confirmation that the connection has been cleared down.

A computer can be both a client and a server at the same time. This is the case, for example, where the local computer is connected to its own server. This is possible using the loopback interface 127.0.0.1. If, for example, a Telnet server is running on the local computer, a Telnet session can be opened on the local computer using the command `telnet localhost`.

In order to determine which data can be collated using the above example, we will now explain the procedure step by step.

Proto	Local address	Remote address	State
TCP	0.0.0.0:80	0.0.0.0:0	LISTENING
TCP	0.0.0.0:25	0.0.0.0:0	LISTENING

The first two entries are in the "LISTENING" state, that is two programs (servers) have been started on the local computer, both of which are waiting for a client to establish a connection with them. Both are connected to the IP address "0.0.0.0". This IP address indicates that the server is connected to all

available network interfaces. Even if only one network card is installed, this already has two interfaces, that is the local network card (192.168.129.3) and the loopback interface "127.0.0.1" which is installed as standard by Windows. In this example, a HTTP server (Port 80) and an SMTP server (Port 25) are running on the local computer. In order to determine whether the network card is working correctly, send a test ping from the local computer, e.g. `ping 192.168.129.3`. Any error message triggered by this test indicates an incorrectly configured network interface. If you wish to test the connection to the local HTTP server for example , simply use your Web browser and enter the URL `https://127.0.0.1` or `https://192.168.129.3`. Entering "telnet localhost 25" or "telnet 192.168.129.3 25" allows a connection to be established to the local SMTP server. In this case, the port (that is the application) is specified using 25.

The next three entries are all active connections. These can be established either from the local to the remote computer, or from the remote to the local computer.

Proto	Local address	Remote address	State
TCP	192.168.129.3:1037	192.168.129.1:110	ESTABLISHED
TCP	192.168.129.3:1038	192.168.129.2:23	ESTABLISHED
TCP	192.168.129.3:80	192.168.129.1:1039	ESTABLISHED

In order to distinguish between an incoming and an outgoing connection, the entries contained in the "LISTENING" state (server) are required. To do this, you need to check whether the port specified for the local computer is running on the local computer itself. The first line shows port "1037". This port is not running as a server (LISTENING) on the local computer (192.168.129.3). Thus this must be a connection from the local computer to a remote computer (192.168.129.1) with the port "110" (POP3). In other words, the local computer is in the process of downloading its e-mails from the POP3 server.

The second entry must also be an outgoing connection, as it is also not in the "LISTENING" state on the local computer. The local computer has therefore set up a connection to the computer "192.168.129.2" and port "23" (Telnet). This means that the local computer has opened a Telnet session on the remote PC.

In the third entry, the local port "80" (HTTP) corresponds to that of a server. Thus the remote computer 192.168.129.1 is in the process of opening Web pages on the local computer.

9.1.6 nbtstat

This utility program allows connections which use the "NetBIOS over TCP/IP protocol" (WINS-Client(TCP/IP)) to be tested. In the "NetBIOS over TCP/IP protocol", the NetBIOS packet is packaged in a TCP/IP packet and then unpacked again on the remote side. This is necessary because NetBIOS cannot be routed like TCP/IP. As Windows drives can only be enabled via NetBIOS, such enablements must be packaged in TCP/IP in order to be transferred to other physical networks. For this purpose, Windows creates a NetBIOS name cache which can also be created manually. IP addresses are resolved in a table as computer names. This file is called `lmhosts` and is

located in either the system directory or a system subdirectory, depending on the operating system

Win95/98/ME:	*%systemroot%*
WinNT/2000/XP:	*%systemroot%\system32\drivers\etc*

In these directories, Windows provides various test files which can be used as samples. The structure of each test file is explained. These files have the extension *sam*. In this case, the file is called *lmhosts.sam*. If this *lmhosts* file does not already exist, it can simply be copied to *lmhosts* and edited.

Syntax for Windows operating systems:

`nbtstat [<Parameter>]`

The following entries are possible for `<Parameter>`:

`-a <Host Name>`	Returns the name table for the computer specified under <Host Name>
`-A<IP address>`	Returns the name table for the computer specified under <IP Address>
`-c`	The NetBIOS Name Cache is listed with NetBIOS names and corresponding IP addresses
`-n`	Lists all local NetBIOS names used
`-R`	Deletes the NetBIOS Name Cache and reloads the file `LMHOST`.
`-r`	Lists the names which have been resolved for the Windows networks
`-S`	Shows client and server connections as IP addresses.
`-s`	Shows client and server connections and resolves the IP addresses into names.

9.1.7 pathping

This command (available in Windows 2000 and later) traces routes and offers additional information as well as `ping` and `tracert` command features. The `pathping` command sends data packets to each router on the way to a destination over a specific time frame. Specific statistics are then calculated using the data packets returned by each segment. The `pathping` command displays packet loss information for every router and every connection so you can see which router or connection is causing network problems.

Win 2000:	*%systemroot%\system32*

Syntax for Windows operating systems:

`pathping [<Parameter>] destination name`

The following entries are possible for <Parameter>:	
-n	Prevents addresses from being resolved to form host names.
-h <section>	Specifies the maximum number of segments to be transited when searching for a destination. The default value is 30.
-c <host list>	Separates concatenated computers through the implementation of intermediate gateways (loose source route) based on the host list.
-p <interval>	Specifies (in milliseconds) the interval between sequential ping commands. The default value is 250 milliseconds (1/4 seconds).
-q <number>	Specifies the number of requests for each PC on the path. The default value is 100.
-w <timeout>	Specifies how long (in milliseconds) the system must wait for individual answers. The default value is 3000 milliseconds (3 seconds).
-T	Adds a layer-2 priority ID to the ping packets (for example, for 802.1) and sends this ID to all network devices on the route. This is a quick and easy way to establish which network devices are not correctly configured for the layer-2 priority. This parameter must be entered in capital letters.
-R	Checks whether the individual network devices on the route support the Resource Reservation Setup Protocol (RSVP). This protocol allows the host computer to reserve a certain bandwidth for a data flow. This parameter must be entered in capital letters.
Destination name	Specifies the destination computer (terminal) which is identified either by an IP address or a host name.

9.1.8 route

In order to interconnect several TCP/IP networks, you will need to configure routing. Without routing, it is impossible to leave the local network. Note when routing that the gateway which connects the local network to other networks must be located in the same TCP/IP network as the local computer.

Syntax for Windows operating systems:

route <command> <target> <subnet mask> <gateway> [metric <hops>] [<parameter>]

The following entries are possible for <command>:	
print	Displays the current routing table
add	Adds a new route
delete	Deletes an existing route

change	Modifies an existing route
<Destination>	Indicates the destination host or destination network reachable via the <Gateway>.
<Subnet>	Specifies the subnet mask.
<Gateway>	Indicates the IP address of the gateway via which the IP address specified under <Destination> can be reached.
<Hops>	Indicates the number of gateways located between the sender and the destination. This parameter is only relevant when several routes exist for one destination. Certain routes can be assigned priority using this parameter. However, since there is usually only one gateway, the value "1" can be set here.

The following entries are possible for <Parameter>:

-f	Deletes all routing entries in the routing table
-p	Creates a permanent entry. This parameter can only be specified using the command add. Normally routes are only set statically with the route command. This means that routes set in this way will be deleted by a system reboot. The parameter -p sets the entry permanently, so that it will not be deleted by a system reboot.

Example 1:

Adding a permanent default route

```
C:\cmd>route add 0.0.0.0 mask 0.0.0.0 192.168.0.199 -p
```

Example 2:

Querying a routing table

```
C:\>route print
Active Routes:
```

Network Address	Netmask	Gateway Address	Interface	Number
0.0.0.0	0.0.0.0	192.168.128.1	192.168.128.14	
10.2.0.0	255.255.0.0	192.168.128.1	192.168.128.14	
127.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1
192.168.128.14	255.255.255.255	127.0.0.1	127.0.0.1	1
192.168.128.255	255.255.255.255	192.168.128.14	192.168.128.14	
224.0.0.0	224.0.0.0	192.168.128.14	192.168.128.14	
255.255.255.255	255.255.255.255	192.168.128.14	192.168.128.14	

The last two entries are multicast or broadcast entries which will not be described in detail here.

9.1.9 tracert

The command `tracert` (trace route) is used to trace the route from the local computer to the destination host. It indicates all gateways located on the route to the destination host.

Syntax for Windows operating systems:

`tracert <Host> [<Parameter>]`

`<Host>`	Contains the destination address or the host name of the destination computer

The following entries are possible for `<Parameter>`:

`-d`	IP addresses are not resolved to host names
`-h <number>`	Indicates the maximum number of gateways to the destination host
`-j <list>`	Suggests a gateway route
`-w <timeout>`	Wait <Timeout> milliseconds for each reply

Example:

```
C:\cmd>tracert localhost

Tracing route to localhost [127.0.0.1] over a maximum of 30
hops:

1 <10 msec <10 msec <10 msec localhost [127.0.0.1]

Trace complete.
```

9.1.10 arp

Before a packet can be sent from one host to another, the hardware address (MAC address) of the destination hostâs network card must be determined. For this purpose, each computer which communicates via the TCP/IP protocol has an ARP table. "ARP" (Address Resolution Protocol) is used for resolving the IP address to the hardware address (MAC address). Before a connection is established, the ARP table is searched for the required destination host. If the host is not contained in the table, an ARP request with the IP address of the destination host is sent via the network. When the destination host receives this request, it sends its hardware address to the requesting computer. This in turn enters the hardware address in its local ARP table. The next time this connection is set up, the hardware address of the destination host is known and can be applied as usual. If a hardware address located outside the logical TCP/IP network is requested, the only hardware address necessary is that of the router via which the destination host can be reached.

Syntax for Windows operating systems:

arp <Parameter>

The following entries are possible for `<Parameter>`:	
a	Displays the ARP table
-d	Deletes an entry from the ARP table
-s	Adds a host entry to the ARP table

Example 1:

Entering a new MAC address into the ARP table

```
C:\>arp -s 192.168.0.199 02-60-8c-f1-3e-6b
```

Example 2:

Querying the ARP table

```
C:\>arp -a

Interface: 192.168.0.1 on Interface 1
```

Internet Address	Physical Address	Type
192.168.0.1	00-00-5a-42-66-60	dynamic
192.168.0.10	00-60-70-cd-59-22	dynamic
192.168.0.199	02-60-8c-f1-3e-6b	static

9.1.11 Telnet

Telnet enables the user to log onto a remote computer. By default, the program uses port 23 for this. If you wish to log onto a computer with another port, you must additionally specify the port number.

Syntax for Windows operating systems:

telnet [<Host> [<Port>]]

<Host>	Contains the destination address or the host name of the destination computer
<Port>	Port number which identifies the application on the destination computer

Example:

```
C:\>telnet localhost 110
```

9.2 IP Addressing: Subnets

To circumvent the scarcity of official IP addresses and to divide an IP network into separate sub-networks, the "sub-netting" procedure can be used.

For the allocation of official IP addresses, for example, sub-netting makes it possible to generate additional independent IP networks by using existing Class A, B and C network addresses.

Various classes and standard network masks have been agreed upon for networks:

Table 27: Network Classes and Standard Network Masks

Class	Subnet mask
A	255.0.0.0
B	255.255.0.0
C	255.255.255.0

Division into independent subnets also offers the considerable advantage that local network traffic remains in its own subnet. Access to third-party networks is only possible via a router.

The basic functionality of sub-netting is relatively simple and is based on the "netmask". This mask is used for defining bits which represent either the network or the host segment within an IP address. Set bits (1) represent the network segment, while deleted bits (0) represent the host segment.

The best way to analyze a netmask is in binary format. The Class C standard netmask "255.255.255.0" is a good example.

Table 28: Example of a Class C Standard Network Mask

	Network			Host
Bytes	1st byte	2nd byte	3rd byte	4th byte
Netmask	255	255	255	0
Binary format	1111 1111	1111 1111	1111 1111	0000 0000

In netmask "255.255.255.0", the first 3 bytes represent the network segment (all bits 1) and the last byte represents the host segment (all bits 0).

The host (router, workstation, etc.) uses this netmask to determine whether the IP address being addressed is located in the local network. If the destination host is not located in the same network, packets are forwarded to this address via suitably defined routing mechanisms.

To create customized subnets, you will first need to determine the number of sub-networks to be established within a class-based network (Class A, B, C). When a network is divided, 2n subnets are always created as a result. An example will illustrate this more clearly.

The Class C network "192.168.1.0" is to be divided into 4 subnets. A Class C network has the default netmask "255.255.255.0". Two bits are required for four different combinations in the binary system. The following table illustrates the interdependency between the bit number and the number of networks.

Table 29: Bit Number Depending on Number of Networks

Bits	Combinations	Bits	Combinations
1	21 = 2	17	217 = 131072
2	22 = 4	18	218 = 262144
3	23 = 8	19	219 = 524288
4	24 = 16	20	220 = 1048576
5	25 = 32	21	221 = 2097152
6	26 = 64	22	222 = 4194304
7	27 = 128	23	223 = 8388608
8	28 = 256	24	224 = 16777216
9	29 = 512	25	225 = 33554432
10	210 = 1024	26	226 = 67108864
11	211 = 2048	27	227 = 134217728
12	212 = 4096	28	228 = 268435456
13	213 = 8192	29	229 = 536870912
14	214 = 16384	30	228 = 1073741824
15	215 = 32768	31	231 = 2147483648
16	216 = 65536	32	232 = 4294967296

So that no gaps are left in the address range, additional 1s are added from left to right to the existing 1s of the netmask.

Table 30: Example of a Subnet Mask Binary Format

Class C	**Network**			**Host**
Bytes	1st byte	2nd byte	3rd byte	4th byte
Netmask	255	255	255	0
Binary format	1111 1111	1111 1111	1111 1111	0000 0000
New	**Network**			**Host**
Bytes	1st byte	2nd byte	3rd byte	4th byte
Binary format	1111 1111	1111 1111	1111 1111	**11** 00 0000
Netmask	255	255	255	192

If the new subnet is converted from binary to decimal form, the result is the subnet mask "255.255.255.192". Now 26 bits are available for the network segment and 6 for the host segment. Computers with a network segment with the same bit pattern can communicate directly in a physical network. Other

networks can only be reached via a gateway. If the modified 4th byte is viewed in terms of the two new network bits (25 and 26), the newly created subnets can now be calculated.

Table 31: Calculating New Subnets

4th byte	Decimal	New networks	Broadcast address	Host addresses
0000 0000	0	192.168.1.0	192.168.1.63	1â“62
0100 0000	64	192.168.1.64	192.168.1.127	65â“126
1000 0000	128	192.168.1.128	192.168.1.191	129â“190
1100 0000	192	192.168.1.192	192.168.1.255	193â“254

Thus sub-netting essentially involves the extension of the network segment of an IP address by reducing the host segment. The number of available subnets and hosts depends on the following conditions:

The number of available host addresses depends largely on the length of the host segment of the IP address. Viewed mathematically, a 6-bit host segment provides for 64 addresses. However, as each IP network and thus each individual subnet has two reserved addresses, the maximum number of addresses is reduced by two. These are the host addresses which contain either zeros or ones. The former is used for addressing a network, while the latter is used for broadcasts in the network in question.

As mentioned above, the new network segment bits are added from left to right to the existing bits. The reasons for this are described below. For example, if you use subnet mask "255.255.255.3" for the network "192.168.1.0", the host segment is located in the middle of the network segment.

Table 32: Host Segment in a Network Segment

	Network			Host	Network
Bytes	1st byte	2nd byte	3rd byte	4th byte	
Netmask	255	255	255	3	
Binary format	1111 1111	1111 1111	1111 1111	0000 00	**11**

No associated IP address areas are provided for by this subnet as only the hosts which have set the last two bits are located in a network. The resulting addresses are listed in the following table.

Table 33: Network Addresses Depending on Last Two Bit Digits

4th byte	Decima	New networks	Broadcast address	Host addresses
0000 00**00**	0	192.168.1.0	192.168.1.252	4,8,12,16,20...248
0000 00**01**	1	192.168.1.1	192.168.1.253	5,9,13,17,21...249
0000 00**10**	2	192.168.1.2	192.168.1.254	6,10,14,18,22...250

4th byte	Decima	New networks	Broadcast address	Host addresses
0000 00**11**	3	192.168.1.3	192.168.1.255	7,11,12,19,23...251

The host addresses indicate that the individual hosts are not located in associated areas. This type of sub-netting makes it difficult to maintain an overview for administration. This is why this type of sub-netting should not be used.

Up to now we have described how sub-networks are created. We will now explain how the IP addresses of computers are assigned to the respective subnets.

The following table shows four IP addresses for a network (Class C) and their connection to the netmask being used 255.255.255.224.

Table 34: Allocating IP Addresses to Class C Networks

	Network	Host
255.255.255.224	11111111.11111111.11111111.111	00000
193.98.44.33	11000001.01100010.00101100.001	00001
193.98.44.101	11000001.01100010.00101100.011	00101
193.98.44.129	11000001.01100010.00101100.100	00001
193.98.44.61	11000001.01100010.00101100.001	11101

The binary illustration of masks and addresses shows quite clearly which subnet the IP addresses in question belong to. Addresses 1 and 4 are in subnet ".32" (00100000), address 2 belongs to subnet ".96" (01100000) and address 3 is located in subnet ".128" (10000000).

If the example is based on the standard mask "255.255.255.0" of a Class C network, the length of the network segment is 24 bits, while the host segment is 8 bits long. Based on netmask "255.255.255.224" the network segment of an IP address in the network is exactly 27 bits long. Accordingly the host segment is just 5 bits long.

The following overview provides the most commonly-used Class C masks as a reference, together with the corresponding network and host allocations.

Table 35: Overview of the Most Commonly-Used Class C Masks

Subnet mask	Number of networks	Hosts per subnet	Subnet	Broadcast Address	Hosts
255.255.255.0	1	253	0	255	1 â“ 254
255.255.255.128	2	126	0	127	1 â“ 126
			128	255	129 â“ 254
255.255.255.192	4	62	0	63	1 â“ 62

Subnet mask	Number of networks	Hosts per subnet	Subnet	Broadcast Address	Hosts
			64	127	65 â“ 126
			128	191	129 â“ 190
			192	255	193 â“ 254
255.255.255.224	8	30	0	31	1 â“ 30
			32	63	33 â“ 62
			64	95	65 â“ 94
			96	127	97 â“ 126
			128	159	129 â“ 158
			160	191	161 â“ 190
			192	223	193 â“ 222
			224	255	225 â“ 254
255.255.255.240	16	16	0	15	1 â“ 14
			16	31	17 â“ 30
			32	47	33 â“ 46
			48	63	47 â“ 62
			64	79	65 â“ 78
			80	95	81 â“ 94
			96	111	97 â“ 110
			112	127	113 â“ 126
			128	143	129 â“ 142
			144	159	145 â“ 158
			160	175	161 â“ 174
			176	191	177 â“ 190

Subnet mask	Number of networks	Hosts per subnet	Subnet	Broadcast Address	Hosts
			192	207	193 â“ 206
			208	223	209 â“ 222
			224	239	225 â“ 238
			240	255	241 â“ 254

Example:

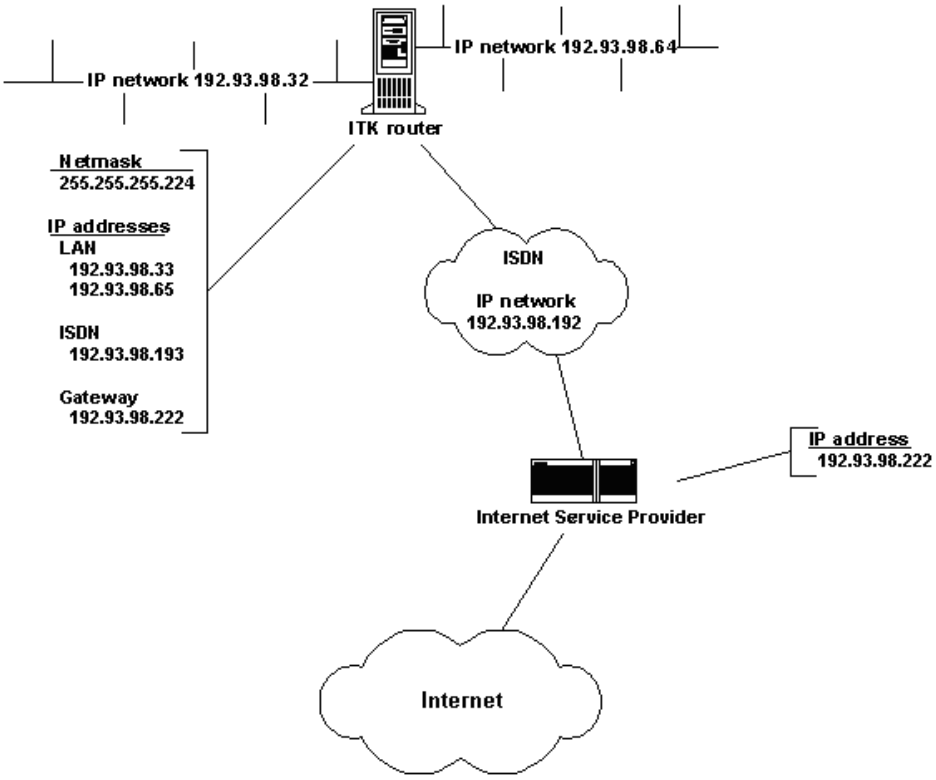
A LAN with two Ethernet networks is to be connected to the Internet via ISDN access. All stations in the local Ethernet are to have Internet access and also be directly accessible from the Internet. Based on the corresponding structures of a Class C address, a complete Class C network would normally have to be provided for each of the two Ethernet networks and for the ISDN network. However, as the maximum number of stations in a Thin Ethernet segment is limited to thirty, 223 host addresses per network would be lost here alone.

This is where sub-netting is of particular significance: With a corresponding netmask, just one Class C network is required to achieve a complete LAN connection, without the loss of host addresses.

For this purpose, an Internet Service Provider provides a Class C network with the following basic data:

Provider IP address:	192.93.98.222
Gateway IP address:	192.93.98.222
Networks IP address:	192.93.98.0
Netmask:	255.255.255.0

The following diagram shows the corresponding configuration:



Connection of BNC Network at Twisted Pair to HG 3500/3575

"255.255.255.224" is available as a netmask, as this mask provides 8 subnets with 30 hosts each. The number of hosts in each subnet is thus equivalent to the maximum number of stations in an Ethernet segment.

This illustration shows that two subnets, in this case "192.93.98.32" and "192.93.98.64", have been assigned to the two LAN boards of the ITK router. One of the LAN boards is assigned the IP address "192.93.98.33" and the other is assigned "192.93.98.65". In this way each board can supply 29 additional stations with IP addresses.

9.3 Port Numbers

9.3.1 Port Numbers on the OpenScape 4000 V10

Table 36: Port numbers on OpenScape 4000 V10

Client/Server	Protocol	Server	Client	Application
H.323 (H.225/ Q931)	TCP	1720	ephemeral	Voice over IP for system clients, H.323 clients, AllServe and IP networking
RTP/RTCP	UDP	1500	ephemeral	
H.245	TCP	ephemeral	ephemeral	

Client/Server	Protocol	Server	Client	Application
Accounting Server	TCP	13042		
SNMP (Get/Set)	UDP	161		SNMP browser, OpenScape FM
RTCP/MSC	UDP	162		

9.4 PC Sound Settings for Voice over IP

A number of special PC sound card configurations must be observed when using Voice over IP to make calls via networks and PCs. Faults such as poor sound quality and one-sided or non-existent connections can often be corrected by modifying your settings. The following chapter suggests solutions which should help when configuring a voice client. This help is kept rather general, since the exact settings depend on the hardware and software and on the environment where the PC is located. A detailed description would be too extensive and therefore unclear.

Poor sound quality is not always an indication of a configuration error or of hardware/software faults. For example, crackling noises, which signify brief interruptions (lost voice packets), could also be an indication that the LAN load is too high. It may be possible to improve the quality of the Voice over IP connection by restructuring the LAN, migrating to 100BaseT or using a switch. If the G.711 audio standard is used (64 kbps) rather than G.723 (5 kbps), a considerably higher LAN load may result. For a small number of voice applications, G.711 has no noticeable effect on the LAN load. However, if Voice over IP is used intensively when the LAN is already overloaded, the voice quality may deteriorate significantly.

Configuration options

1) Simultaneous talking and listening is not possible

2)
- The sound card driver is not fully duplex-compatible, an update must be installed to correct this.
- Incorrect configuration of the voice application, activate full duplex functionality in the software.

3) Full duplex functionality of the sound card driver can be tested with Netmeeting. Under **Options** #→ **Audio** you can activate/deactivate full duplex functionality. If this item cannot be modified, a fully-duplex driver must be installed for the sound card.

4) One-sided voice connections

5)
- Full duplex functionality activated
- Microphone connected
- Microphone activated for voice application
- Check PC volume setting, activate **Microphone** under Record

6) You hear your own voice, either immediately or after a delay.

7)
- Check PC volume setting, deactivate **Microphone** under Playback and deactivate **Wave** under Record

8) Call partner has difficulty hearing you

9)
- Check volume setting of PC or voice application, increase volume
- If available, activate Microphone Booster under **Volume** > **Playback** > **Advanced Settings**

10) The called party hears loud background noise (over-modulation).

11)
- If available, deactivate microphone booster under **Volume** > **Playback**> **Advanced Settings**
- Adjust microphone sensitivity in the voice application, for example in Netmeeting under **Options** > **Audio Microphone**, activate "Set manually" and adjust sensitivity
- Adjust recording volume, for example in Netmeeting go to **Options**> **Audio** and activate the Audio Wizard
- Change the audio standard, for example in Netmeeting go to **Options** > **Audio** > **Extended, and switch from G.723 Audio Codec** to **G.711 Audio Codec** (increases the LAN load)

10 Appendix: Internet References

The following Internet sources provide original or detailed information on technical standards used in HG 3500/3575.

10.1 RFCs

RFCs (Requests for Comments) are official Internet descriptions of relevant network standards.

http://tools.ietf.org/html/rfc793

1) RFC for the TCP protocol

http://tools.ietf.org/html/rfc791

RFC for the IP protocol

http://tools.ietf.org/html/rfc768

RFC for the UDP protocol

http://tools.ietf.org/html/rfc2616

RFC for the HTTP protocol

http://tools.ietf.org/html/rfc2821

RFC for the SMTP protocol

http://tools.ietf.org/html/rfc1157

RFC for the SNMP protocol

http://tools.ietf.org/html/rfc959

Standard for the FTP protocol

http://tools.ietf.org/html/rfc3550

RFC for the RTP protocol (Real-Time Application Protocol)

http://tools.ietf.org/html/rfc1994

PPP Challenge Handshake Authentication Protocol (CHAP)

http://tools.ietf.org/html/rfc2030

RFC for the SNTP protocol

http://tools.ietf.org/html/rfc1340

RFC for "Assigned Numbers" (protocol and port numbers)

http://tools.ietf.org/html/rfc1631

IP Network Address Translator (NAT)

http://tools.ietf.org/html/rfc3022

Traditional IP Network Address Translator (Traditional NAT)

http://tools.ietf.org/html/rfc3714

IAB Concerns Regarding Congestion Control for Voice Traffic in the Internet

http://tools.ietf.org/html/rfc3715

IPsec Network Address Translation (NAT) Compatibility Requirements

http://tools.ietf.org/html/rfc3762

Telephone number mapping (ENUM) service registration for H.323

http://tools.ietf.org/html/rfc3508

H.323 Uniform Resource Locator (URL) Scheme Registration

http://tools.ietf.org/html/rfc3709

Internet X.509 Public Key Infrastructure

http://tools.ietf.org/html/rfc3647

Internet X.509 Public Key Infrastructure Certificate Policy and Certification Practices Framework

http://tools.ietf.org/html/rfc3279

Algorithms and Identifiers for the Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile

http://tools.ietf.org/html/rfc3280

Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile

http://tools.ietf.org/html/rfc3394

Advanced Encryption Standard (AES) Key Wrap Algorithm

http://tools.ietf.org/html/rfc3670

Information Model for Describing Network Device QoS Datapath Mechanisms

http://tools.ietf.org/html/rfc3644

Policy Quality of Service (QoS) Information Model

http://tools.ietf.org/html/rfc3555

MIME Type Registration of RTP Payload Formats

http://tools.ietf.org/html/rfc3387

Considerations from the Service Management Research Group (SMRG) on Quality of Service (QoS) in the IP Network

10.2 Other Sources

http://www.protocols.com/pbook/VoIP.htm

1) Voice Over IP Reference Page

http://en.wikipedia.org/wiki/Voice_over_IP

Wikipedia article on "Voice over IP".

11 Glossary

Numbers

3DES

Triple DES. Improved version of the symmetrical DES encryption procedure in which the DES algorithm is applied three times to achieve a higher level of security.

A

AES

The Advanced Encryption Standard is the successor of the DES or 3DES encryption standard.

AF

Assured Forwarding. Procedure for controlling broadband for Quality of Service.

ARP

The Address Resolution Protocol is a protocol which maps level 3 IP addresses to level 2 hardware addresses (MAC addresses).

B

BBAE

Broadband connection unit. The BBAE is the physical port on the subscriber line for a connection line used for broadband. It splits the supplier network from the connection cable at the subscriber and processes the signals for transmission over the relevant connection segment. In the case of DSL connections, the BBAE usually also features a splitter that splits or combines the broadband and narrowband signals.

B-Channel

An ISDN user data channel ("bearer channel") with a capacity of 64 Kbps.

Bandwidth

The bandwidth of a communication channel is its capacity for transferring data.

Boot

This term refers to the startup procedure. The boot ROM contains the start code; "booting" is another word for "starting".

C

CA

Certification Authority. Trustworthy institution for issuing certificates.

CAPI

Common ISDN Application Interface. Important CAPI interface properties include support for multiple B channels for data and voice, use of the B channel protocol for connection control, selection of different services, support for multiple logical connections over a physical connection, support for multiple connections, use of multiple communication protocols and support for one or more basic accesses or primary rate accesses.

CHAP

Challenge Handshake Authentication Protocol. In the case of CHAP, authentication is controlled by the host. When a client dials in, he or she is prompted by the host to authenticate himself or herself. The username/ password combination used for authentication is transmitted by the client in encrypted form via MD5.

CLI

Command Line Interface. Generic term for command lines and shells, terminal emulations, etc.

CLIR

Calling Line Identification Restriction. ISDN feature.

Codec

Codecs convert analog audio or video data into digital format (encoding) and back into analog format (decoding).

CorNet-NQ

CorNet NQ (from "Corporate Networking") is a proprietary signaling protocol. CorNet-NQ is a superset of CorNet N which supports QSIG.

D

D channel

A D channel is an ISDN signaling channel which transmits call control information.

DES

Data Encryption Standard. Conventional encryption and decryption procedure with symmetrical algorithm; in other words, the same key is used for encryption and decryption. The block size is 64 bits, that is, a 64-bit block of plaintext is transformed into a 64-bit block of ciphertext. The key that controls this transformation is also 64-bit. However, only 56 of these 64 bits are available for the user; the remaining 8 bits (one bit from each byte) are required for the parity check.

DID

Abbreviation of "Direct Inward Dialing". DID is a method of forwarding incoming calls directly to H.323 terminals.

DLS

The DLS (Deployment Service) is a OpenScape management application for administering workpoints (optiPoint telephones and optiClient installations) in OpenScape and non-OpenScape networks.

DLI

DLI is the abbreviation for DLS interface.

DMA

Direct Memory Access. DMA technology allows peripheral devices, such as network cards or sound cards connected to PCs, to communicate directly with each other without a detour over the CPU. The advantage of DMA technology is increased data transmission speeds while at the same time unloading the processor.

DMC

Direct Media Connection. The DMC feature is used in OpenScape for VoIP (Voice over IP)

connections to support the "Payload Switching" feature.

The payload (voice channel) of a OpenScape-internal or network-wide voice connection is transferred via a LAN; here a direct IP connection with no previous TDM data stream conversion may be made.

When the "DMC any-to-any" feature is being used, the payload data in a OpenScape network is transferred directly between the IP endpoints without repeated IP TDM conversion. This direct payload connection is known as Direct Media Connection

DNS

Domain Name System. The DNS is a database distributed over a number of Internet hosts and responsible for correct routing based on the domain name. DNS assigns domain names to IP addresses.

DSA

Digital Signature Algorithm, an encryption algorithm. DSA works with a variable public key length of between 512 bits and (maximum) 1024 bits.

DSL

Digital Subscriber Line. DSL technology speeds up data transmitted over conventional telephone lines significantly and is designed chiefly for fast Internet access. DSL connections are primarily available with the technologies Asymmetric DSL (ADSL) and Single Pair DSL (SDSL). The more common variant, ADSL, transmits Internet data over the existing telephone network above the telephony frequencies between 138 and 1,104 kHz. ADSL is, for example, the basis for the T-DSL offering from Deutsche Telekom AG.

DSP

The HG 3500/3575 comes with DSP modules (DSP â“ Digital Signal Processor). A DSP provides for two VoIP channels.

DTMF

Abbreviation of "dual-tone multifrequency". DTMF is the multifrequency signaling mode for transmitting telephone numbers.

E

E-DSS1

Abbreviation of "European Digital Subscriber System No. 1". E-DSS1 is the ISDN transport protocol normally used in Europe.

EF

Expedited Forwarded. Procedure for controlling broadband for Quality of Service.

Terminal Device

A terminal device or endpoint is an H.323 component that can initiate or receive calls. Information flows begin or end here. Examples include clients, gateways or MCUs.

F

FTP

File Transfer Protocol. Platform-independent, TCP/IP-based network protocol for transmitting files between a client and a server (download and upload) and for simple file operations on the server.

G

G.711

G.711 is an ITU standard (International Telecommunication Union) standard for voice codecs for a data rate of 64 Kbps.

G.723.1

G.723.1 is an ITU standard (International Telecommunication Union) for voice codecs for transmission rates of 5.3 and 6.3 Kbps.

G.729

G.729 is a group of ITU standards (International Telecommunication Union) for voice codecs for transmission rates of 8 Kbps.

Gatekeeper

A gatekeeper is an H.323 component that provides address conversion and access control services for endpoints in an H.323 network.

Gateway

A gateway is a H.323 component which connects H.323 endpoints in an IP network to telephones in the public telephone network. It translates between H.323 and ISDN protocols.

GSM

Global System for Mobile Communications. Standard for digital mobile communications and the basis for the German D and E cellular network.

GW

Abbreviation of "gateway".

H

H.323

H.323 is a group of standards which describes the transmission of call and fax data in packet-oriented networks such as IP networks. These standards are set down in the H.323 series of ITU-T recommendations (International Telecommunication Union â“ Telecommunication Standardization Sector).

HFA

HiPath

HiPath (from "Highly Integrated Pathwork") is an innovative strategy which implements an extensive IP migration concept and thereby facilitates the integration of multimedia communication in existing corporate IP networks.

HTML

Hypertext Markup Language. Standard for displaying Web pages, developed by the World Wide Web (or W3) Consortium that is responsible for WWW standardization.

HTTP

Hypertext Transfer Protocol. Platform-independent, TCP/IP-based network protocol for data transmission in the World Wide Web.

HTTPS

Hypertext Transfer Protocol Secure. In contrast to HTTP, all data is transmitted in encrypted form.

I

IKE

Internet Key Exchange Protocol. Procedure for creating secure, authenticated connections. IKE supports various modes for exchanging keys. In the first phase, a secure, authenticated connection is established. In the second phase, the keys needed in the various protocols are exchanged and in general, individual keys (encryption, hashes) are derived from a master key.

ILS

Internet Locator Service. Directory service used primarily by Microsoft NetMeeting.

IP address

An IP address (IP â“ Internet Protocol) is a group of four numbers that identify a device. Each number can have a value between 0 and 255.

ISDN

Abbreviation of "Integrated Services Digital Network". ISDN is a fully digital public telephone network.

IVR

Abbreviation of "Interactive Voice Response". IVR is a procedure for forwarding calls if an individual line does not have numbers for dialing H.323 endpoints directly. HG 3500/3575 does not support IVR.

L

LAN

Abbreviation of "Local Area Network". A local area network (LAN) connects PCs within a company.

LCP

Link Control Protocol. The LCP is used to set up, configure, test, and clear down a PPP connection. Connection setup is split into a number of phases. First of all, the connection parameters are negotiated, including which type of authentication (PAP, CHAP) should be performed.

LCS

Abbreviation for "Live Communication Server". Live Communication Server is the new Instant Messaging solution for your business and an upgradable realtime communication platform from Microsoft.

M

MAL

Abbreviation for "Magic Adaptation Layer". Is the layer between application and platform.

MCU

Abbreviation of "Multipoint Controller Unit". MCUs are used for audio and video calls with multiple subscribers. They centralize data distribution and combine voice and video.

MD5

Message Digest algorithm that can create a 128-bit digital signature from a text of any length. The digital signature shows if the text was subsequently changed. MD5 is therefore used as an authentication procedure.

MIB

Abbreviation of "Management Information Base". An MIB compiles information and parameters of a network device. It is required for administration via SNMP.

DTMF

Dual-tone multifrequency signaling, also known as tone dialing. Procedure for transmitting station number and other data. Each key on a terminal is assigned two frequencies. When you press a key, a tone is generated from the two frequencies assigned to it. Dialing a station number at a subscriber generates a sequence of tones based on mixture frequencies.

MoH

Music on Hold. A melody or else an announcement text heard by the waiting subscriber when a connection is placed on hold or being forwarded within a telecommunication system.

MPPC

Microsoft Point-to-Point-Compression. Data compression procedure implemented for speeding up data transmissions.

MSC

Abbreviation for "Media Stream Control". The Media Stream Control (MSC) monitors and administers the media streams that are routed via HG 3500/3575. The MSC is used to transmit media data between LAN and ISDN.

Multicast

Multicast is the simultaneous transfer of data from a source to multiple recipients in networks.

N

NAT

Network Address Translation. Procedure for mapping private IP addresses to public IP addresses. NAT is necessary because public IP addresses are becoming scarcer. NAT is also used for data security because it conceals the internal LAN structure.

NTBA

Network terminator adapter. Is responsible for switching the Uk0 interface (national) to the S0 bus (international) for an ISDN basic access.

NTBBA

Network Termination Broadband Access. The NTBBA provides the network terminator for the broadband signal portion at the DSL subscriber line. In ADSL connections, this function is performed by the ADSL controller or the ADSL modem. The ADSL controller transforms the ADSL signal from the network interface into a mostly hardware-specific user interface suitable for the PC.

O

OAM

Operation, Administration, and Maintenance. OAM refers to all equipment that is used to operate, administer, and maintain networks.

OSPF

Open Shortest Path First. A routing protocol developed by the IETF. It is defined in RFC 1247 and based on the "Shortest Path First" algorithm developed by Edsger Dijkstra.

P

PAP

Password Authentication Protocol. Authentication procedure based on the point-to-point protocol, described in RFC 1334. In contrast to CHAP, the PAP protocol transmits the password for authentication in plaintext.

PBX

Abbreviation of "Private Branch Exchange". A PBX is a telecommunications system.

PCM

Physical Connection Management. Belongs to the functional blocks of Connection Management (CMT) in the FDDI ring.

PKI

Public Key Infrastructure Environment in which encryption and digital signature services based on the public key procedures are provided. In the case of this security structure, a certified partyâs public key is authenticated on the basis of the relevant identification features by a digital signature from the certification authority (CA). Using PKI provides a trustworthy network environment in which communication is protected against unauthorized access by encryption and the authenticity of the communication partner is guaranteed by the digital signature.

PPP

Point to Point Protocol. Protocol for connection setup over dial-up lines (mostly over modem or ISDN). It supports the transport of a wide variety of network protocols, including the Internetâs IP protocol.

PPPoE

PPP over Ethernet. Use of the PPP network protocol over an Ethernet connection. PPPoE is currently used in Germany for ADSL connections.

PPTP

Point-to-Point Tunneling Protocol. Microsoft protocol for creating a Virtual Private Network (VPN); it supports PPP tunneling by an IP network.

PSTN

Abbreviation of "Public Switched Telephone Network". PSTN is the worldwide public telephone network.

PRI

Abbreviation of "Primary Rate Interface". A PRI is an ISDN interface comprising 23 (TS1) or 30 (TS2) B channels each with a capacity of 64 Kbps and one D channel with a capacity of 16 Kbps.

Q

Q.931

Q.931 is a call signaling protocol for setting up and clearing down calls.

QCU

Abbreviation for "QoS Monitoring Control Unit".

QDC

Abbreviation for "Quality of Service Data Collection".

The OpenScape IP service QDC is a tool that collects data on OpenScape products. This data is used to analyze the voice and network quality of the products.

QSIG

QSIG is a protocol for networking nodes which has been adapted by the ITU-T (International Telecommunication Union â“ Telecommunication Standardization Sector). QSIG can be used to network PBXs from different manufacturers.

QoS

Quality of Service. Prioritization of IP data packets on the basis of specific features and ISDN properties. This means that voice over IP (VoIP) transmissions that need a delay-free and continuous date stream, for example, can be given a higher priority than downloads from file servers or Web page callups.

R

RAS

Registration/Admission/State is a protocol that regulates signaling between client and gateway in the area of automatic detection and registration.

RIP

The Route Information Protocol automatically generates and maintains network routes between routers that support this protocol.

Router

A router is a network component which connects subnetworks and transfers packets between them.

RSA

The RSA cryptosystem is an asymmetrical cryptosystem, that is, it uses different keys for encryption and decryption. It is named after its founders, Ronald L. Rivest, Adi Shamir, and Leonard Adleman.

RTP

The Real-Time Transport Protocol governs the transmission of real-time audio and video packets from a terminal to one or more different terminals.

S

SCN

Abbreviation of "Switched Circuit Network". Switched circuit network that includes all digital telephone and cellular networks as well as analog telephone facilities connected over digital telephone switches.

SHA1

Security Hash Algorithm. This generates a unique 160-bit hash from a string. It is a one-way encryption procedure. In other words, the encrypted string can no longer be determined from the hash.

SIP

Abbreviation for "Session Initiation Protocol". The SIP is a network protocol for setting up communication sessions between two or more stations. The protocol is specified in the RFC 3261.

SMTP

Simple Mail Transfer Protocol. Network transmission protocol for sending e-mails.

SNMP

Simple Network Management Protocol. The protocol is used to administer and monitor network elements that mainly originate in the LAN area (for example, routers, servers, etc.). SNMP transfers and changes management information and alarms. In LANs, a special SNMP management server can gather and evaluate this management information so that the network administrator has an overview of the most important events in the LAN.

SNTP

Simple Network Time Protocol. Protocol for transporting an official time in networks and the Internet. The SNTP protocol is characterized by its simplicity and an inaccuracy of several hundred milliseconds. It is defined in RFC 1769. The extended variant is called NTP.

SRTP

Abbreviation for "Secure Real-time Transport Protocol".

SSL

Secure Socket Layer. Transmission protocol that supports encrypted communication. The advantage of the SSL protocol is that it supports the implementation of every higher protocol based on the SSL protocol. This guarantees application- and system-independence. SSL performs encryption using public keys that are confirmed by a third party in accordance with the X.509 standard. The high level of security is guaranteed by the fact that the decryption key must be individually redefined and is only saved at the userâs facility.

STAC

Data compression procedure implemented for speeding up data transmissions. The PPP Stac LZS Compression protocol described in RFC 1974 is a competitor procedure for MPPC.

T

T.30

T.30 is an ITU standard for fax transmission. It specifies the functions within the first three layers for the implementation of the group 3 fax service.

T.38

T.38 is an ITU standard for fax transmission. It governs the communication of Group 3 fax devices via IP networks.

TCP

Transmission Control Protocol. TCP sets up a virtual channel between two computers (more precisely: endpoints between two applications on these computers). Data can be transmitted in both directions on this channel. In most cases, TCP is based on the IP protocol. It belongs to Layer 4 of the OSI network layer model.

TFTP

Trivial File Transfer Protocol described in RFC 783. This protocol does not support user authentication, directory switching or directory listings. It is only used for uploading and downloading files directly with get and put commands.

TLS

Abbreviation for "Transport Layer Security" or Secure Sockets Layer (SSL) is an encryption protocol for data transmissions on the Internet. TLS is the standardized further development of SSL 3.0.

U

UDP

User Datagram Protocol. The User Datagram Protocol (UDP) supports wireless data exchange between computers. The UDP was also developed to enable application processes to send datagrams and thereby to satisfy the requirements of transaction-oriented traffic. UDP is based directly on the IP protocol. UDP is a basic protocol mechanism that does not guarantee datagram delivery to a destination partner or provide mechanisms to protect against duplication or ordering errors. The functional scope of the UDP protocol is limited to the transport service, connection multiplexing and error correction.

URL

Uniform Resource Locator. Addressing form for Internet files that are used primarily in the World Wide Web (WWW). The URL format provides a unique designation for all documents on the Internet. It describes the address of a document or object that can be read by a WWW browser.

UTC

Universal Time Coordinated. This is a world time and as such replaces Greenwich Mean Time (GMT). UTC time is a reference time that is used as a global standard. The coordinated world time uses International Atomic Time (TAI) as the reference time. These are both identical apart from the leap seconds that may be added at the end of June and/or December. The reference point for Universal Time Coordinated (UTC) is the 0Â° degree of longitude.

V

VCAPI

Virtual CAPI. VCAPI lets you reach remote computers using ISDN-specific protocols (for example, Euro File Transfer).

VoIP

The Voice over Internet Protocol (VoIP) controls telephone calls via IP networks.

W

WAN

Wide Area Network. A WAN is a network that connects multiple LANs over long distances. For example, a WAN network can connect several branches of a company spread over different locations.

WBM

Web Based Management. This is an option for configuring PCs and telecommunication hardware and software over a Web browser. No specific software needs to installed locally. The software is implemented as a Web application and can be called up over HTTP or HTTPS.

X

XML

Extensible Markup Language. Standard developed by the W3 Consortium for the definition of markup languages. The best-known markup languages defined with XML are XHTML, SVG, and WML.

XSL

Extensible Stylesheet Language. Standard developed by the W3 Consortium for formatting and conversion (in the XSLT component) of XML-based markup languages into other formats.

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