IP Office™ Platform 9.1

Using IP Office System Monitor

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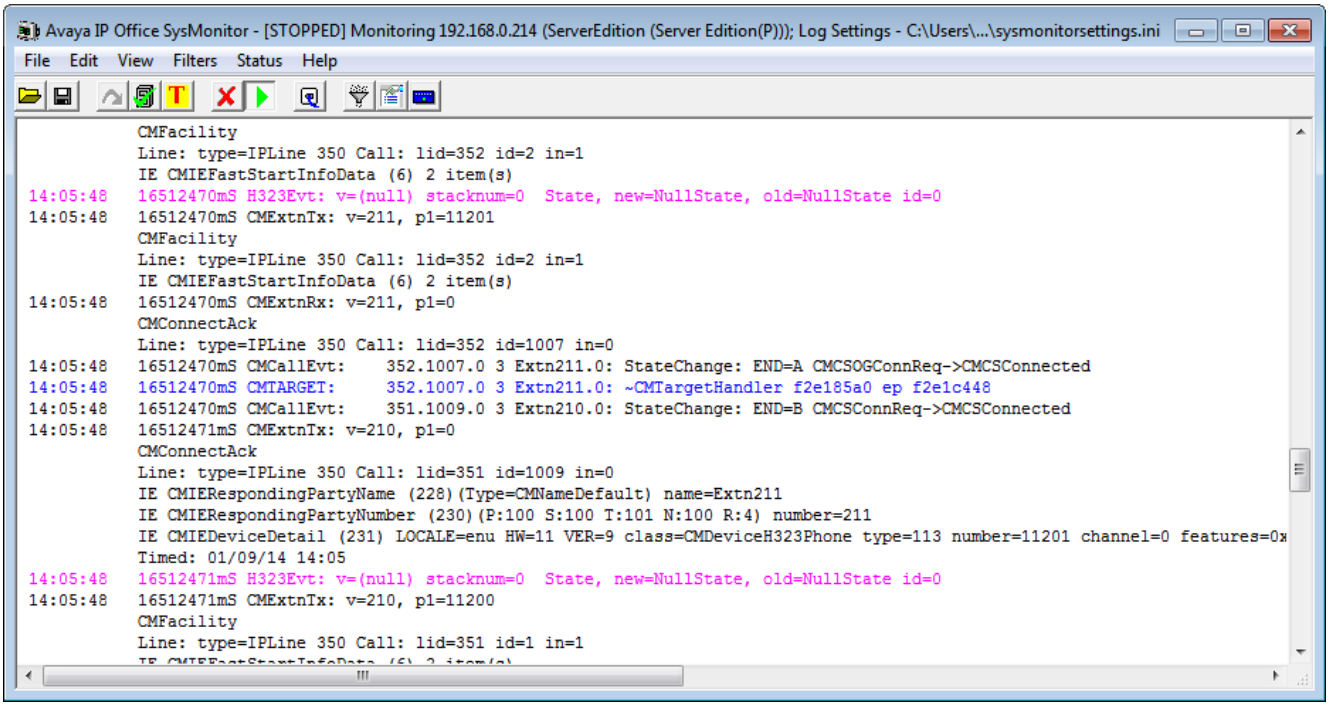
Chapter 1.
System Monitor

1. System Monitor

System Monitor can assist in the detailed diagnosis of system problems. Through configuration of its trace options, it is able to display information on specific areas of a system's operation. It can also record that information as log files for later analysis.



- System Monitor is also known as "Monitor" or "SysMon".
- System Monitor is intended primarily for use by Avaya support and development staff. The settings within System Monitor and the information shown frequently change between software releases.
- Analysis of the information shown can require detailed data and telecommunications knowledge plus system knowledge and is not intended for general users. For general purpose monitoring of the status of a system and calls, use IP Office System Status Application rather than System Monitor. The System Status Application provides much easier to interpret data and information and is suitable for use by system maintainers and advanced system users.
- Despite the facts above, all persons maintaining systems need to be able to run System Monitor in order to capture logs for submission with fault reports even if they cannot interpret those logs themselves.

1.1 Installing System Monitor

Avaya supply System Monitor on the IP Office Administrator Applications DVD. The installation process normally includes installation of System Monitor and the IP Office Manager application by default. However, if necessary you can install System Monitor separately.

System Monitor is a Windows application. Its interface runs in English only but does not require any licenses.

PC Requirements

Minimum PC Requirements	
RAM	128MB
Hard Disk Free Space	10GB
Processor:	
- Pentium	PIII 800MHz
- Celeron	Celeron 3 800Mhz
- AMD	Athlon B 650MHz

Operating System Support	
Server OS:	
2008/2008 R2 Server	Yes
2012/2012 R2 Server	Yes
Client OS:	
Windows 7	Yes
Windows 8.1	Yes

- Windows 7 support is only on Professional, Enterprise and Ultimate versions.
- Any speed mismatch between the PC running System Monitor and the system being monitored increases the likelihood of dropped packets. For example using a 10Mbps PC port connected to a IP Office Server Edition server with 100MBps ports. The same problem may also arise from speed differences in any intermediate devices.

Ports

By default, System Monitor connects to UDP port 50794 on the monitored system. The same port is also used for TCP. HTTP uses port 80 and HTTPS used 443.

To install System Monitor:

1. Inserting the DVD into the PC's DVD drive. This starts the Installation Wizard.
2. Select the required language. Click **Next**.
3. Select the file path for the installed files. Click **Next**.
4. From the list of available applications, check that **System Monitor** is selected for installation. Be careful about de-selecting any other highlighted options, as this triggers their removal if already installed.
5. Click **Next**.
6. Click **Install**.

1.2 Starting System Monitor

When starting monitor, you can select which protocol should be used for the connection. Use of unwanted protocols can be disabled if required for security.

- **UDP** 12
  The default Protocol for System Monitor operation is UDP. This reduces the impact on the system of sending records, especially when a large number of records are being sent.
- **TCP** 13
  This protocol is supported when connecting to IP Office Release 9.0 or higher systems. Using the TCP protocol to connect to pre-9.0 systems can cause packet congestion on the IP Office and affect services. In order to use System Monitor remotely through Avaya SAL, select TCP.
- **HTTP** 14**/HTTPS** 16
  These protocols are supported for connecting to IP Office Release 9.1 or higher systems. Rather than using the target system's monitor password, these protocols use the name and password of an IP Office service user account configured for monitor use.

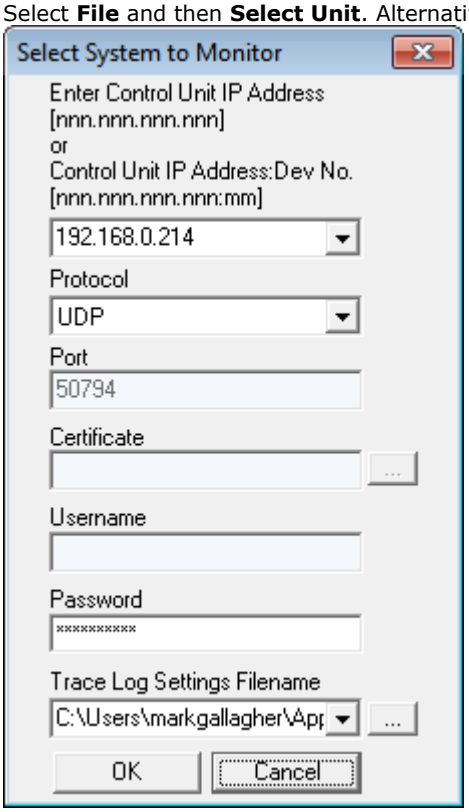
1.2.1 UDP Connection

The default connection protocol for System Monitor is ***UDP***. This protocol reduces the impact on the system of sending records, especially when a large number of records are being sent. However, this protocol is not secure. Use of UDP can be disabled through the IP Office system's security settings, see Disabling UDP/TCP/HTTP Connection 18.

- Any speed mismatch between the PC running System Monitor and the system being monitored increases the likelihood of dropped packets. For example using a 10Mbps PC port connected to a IP Office Server Edition server with 100MBps ports. The same problem may also arise from speed differences in any intermediate devices.

To connect to a system using UDP:

1. Select **Start | Programs | IP Office | Monitor**.
2. If System Monitor has run before, it automatically attempts to connect with the system that was previously being monitored. If otherwise or you want to monitor a different system, use the steps below to select the required system.
3. Select **File** and then **Select Unit**. Alternatively, click on the icon.



   a. Enter the **IP Address**.
      - If the PC running System Monitor and the targeted system are on the same subnet, then you can either use the system's IP address (eg. 192.168.42.1) or the local subnet broadcast address (eg. 192.168.42.255). If there is more than one system on the local subnet, then you must use the system's IP address.
      - If the PC running System Monitor and the targeted system are on the different subnets (these can be different local subnets or from a remote subnet) then you must use the system's unique IP address. It is also essential that bi-directional routing exists between the two subnets in question.

   b. Set the **Protocol** to ***UDP***.

   c. The **Port**, **Certificate** and **Username** fields are not used for UDP connection.

   d. Enter the monitor password. See Setting the Monitor Password 18.

   e. If you want System Monitor to start with a previously saved set of trace options, use the **Trace Log Settings Filename** browse button to select the trace options settings file. See Saving Trace Options as a File 47.

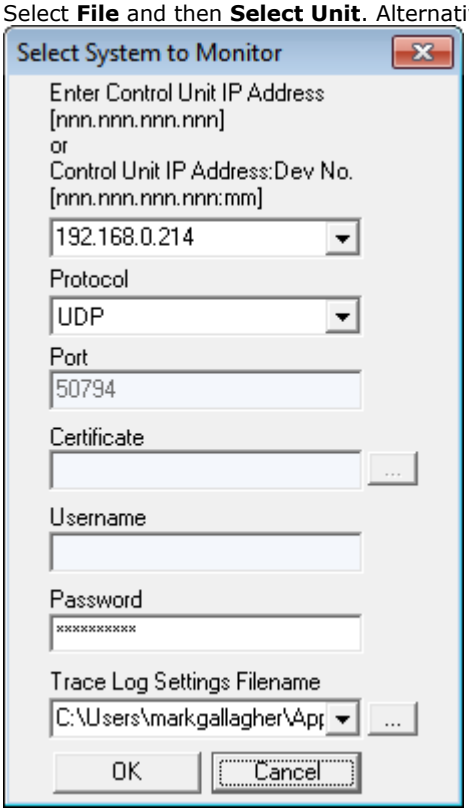
8. Click **OK**.
9. Once System Monitor has connected with a system, it displays the system's status report 21 and alarm log 23.

1.2.2 TCP Connection

TCP connection is supported for IP Office Release 9.0 and higher systems. In order to use System Monitor remotely through Avaya SAL, select ***TCP***. However, this protocol is not secure. Use of TCP can be disabled through the IP Office system's security settings, see Disabling UDP/TCP/HTTP Connection 18.

To connect to a system using UDP:

1. Select **Start | Programs | IP Office | Monitor**.
2. If System Monitor has run before, it automatically attempts to connect with the system that was previously being monitored. If otherwise or you want to monitor a different system, use the steps below to select the required system.
3. Select **File** and then **Select Unit**. Alternatively, click on the icon.



   a. Enter the **IP Address**.
      - If the PC running System Monitor and the targeted system are on the same subnet, then you can either use the system's IP address (eg. 192.168.42.1) or the local subnet broadcast address (eg. 192.168.42.255). If there is more than one system on the local subnet, then you must use the system's IP address.
      - If the PC running System Monitor and the targeted system are on the different subnets (these can be different local subnets or from a remote subnet) then you must use the system's unique IP address. It is also essential that bi-directional routing exists between the two subnets in question.
   b. Set the **Protocol** to ***TCP***.
   c. The **Port**, **Certificate** and **Username** fields are not used for TCP connection.
   d. Enter the monitor password.
   e. If you want System Monitor to start with a previously saved set of trace options, use the **Trace Log Settings Filename** browse button to select the trace options settings file. See Saving Trace Options as a File 47.
8. Click **OK**.
9. Once System Monitor has connected with a system, it displays the system's status report 21 and alarm log 23.

1.2.3 HTTP Connection

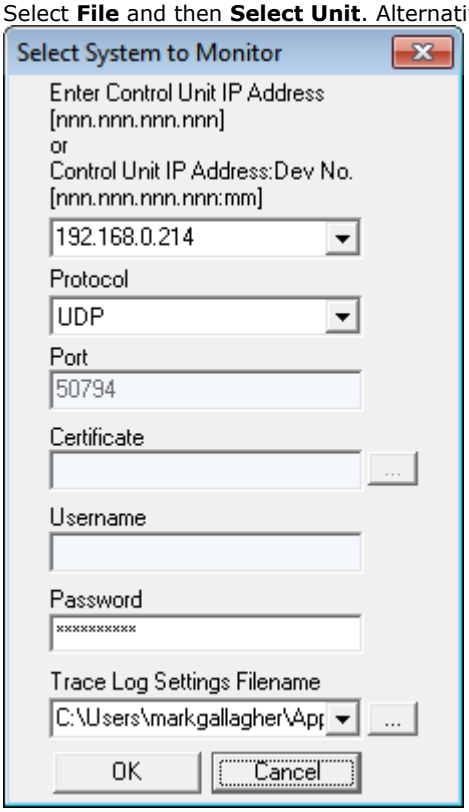
HTTP and HTTPS connection are supported for IP Office Release 9.1 and higher systems. Using these protocols is more secure.

This type of connection uses the name and password of a IP Office service user who has been configured for System Monitor access, see Configuring a User for HTTP/HTTPS 18. By default only the ***Administrator*** account is configured for HTTP or HTTPS.

Use of HTTP can be disabled through the IP Office system's security settings, see Disabling UDP/TCP/HTTP Connection 18 .

To connect to a system using UDP:

1. Select **Start | Programs | IP Office | Monitor**.
2. If System Monitor has run before, it automatically attempts to connect with the system that was previously being monitored. If otherwise or you want to monitor a different system, use the steps below to select the required system.
3. Select **File** and then **Select Unit**. Alternatively, click on the icon.



   a. Enter the **IP Address**.
      - If the PC running System Monitor and the targeted system are on the same subnet, then you can either use the system's IP address (eg. 192.168.42.1) or the local subnet broadcast address (eg. 192.168.42.255). If there is more than one system on the local subnet, then you must use the system's IP address.
      - If the PC running System Monitor and the targeted system are on the different subnets (these can be different local subnets or from a remote subnet) then you must use the system's unique IP address. It is also essential that bi-directional routing exists between the two subnets in question.

   b. Set the **Protocol** to ***HTTP***. The **Port** changes to the default ***80***. Change this if a different port is configured in the IP Office security settings.

   c. The **Certificate** field is not used for HTTP connection.

   d. In the **Username** field enter the name of the IP Office service user account configured for System Monitor access 18 to the system. In the **Password** field, enter the password for that service user account. Incorrect entry does not disable the account in the same way as for accessing IP Office Manager. However, more than 10 incorrect login attempts in a 10 minute period will block further access attempts from that source for a minute.

   e. If you want System Monitor to start with a previously saved set of trace options, use the **Trace Log Settings Filename** browse button to select the trace options settings file. See Saving Trace Options as a File 47.

8. Click **OK**.
9. Once System Monitor has connected with a system, it displays the system's status report 21 and alarm log 23.

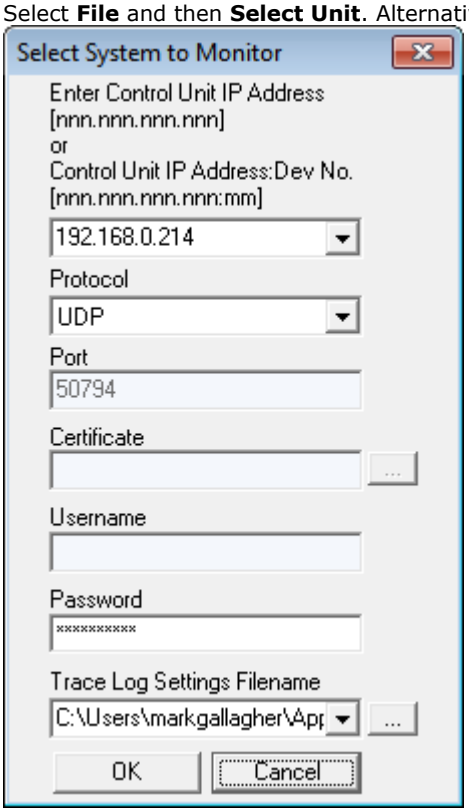
1.2.4 HTTPS Connection

HTTP and HTTPS connection are supported for IP Office Release 9.1 and higher systems. Using these protocols is more secure.

This type of connection uses the name and password of a IP Office service user who has been configured for System Monitor access, see Configuring a User for HTTP/HTTPS 18. By default only the ***Administrator*** account is configured for HTTP or HTTPS.

To connect to a system using UDP:

1. Select **Start | Programs | IP Office | Monitor**.
2. If System Monitor has run before, it automatically attempts to connect with the system that was previously being monitored. If otherwise or you want to monitor a different system, use the steps below to select the required system.
3. Select **File** and then **Select Unit**. Alternatively, click on the icon.



   a. Enter the **IP Address**.
      - If the PC running System Monitor and the targeted system are on the same subnet, then you can either use the system's IP address (eg. 192.168.42.1) or the local subnet broadcast address (eg. 192.168.42.255). If there is more than one system on the local subnet, then you must use the system's IP address.
      - If the PC running System Monitor and the targeted system are on the different subnets (these can be different local subnets or from a remote subnet) then you must use the system's unique IP address. It is also essential that bi-directional routing exists between the two subnets in question.
   b. Set the **Protocol** to ***HTTPS***. The **Port** changes to the default ***443***. Change this if a different port is configured in the IP Office security settings.
   c. Select the **Certificate** that should be used for the connection. To select a certificate, click on the **...** browse button. Select the certificate to use and click **OK**. If you do not select a certificate, System Monitor will auto-generate a self-signed certificate.
   d. In the **Username** field enter the name of the IP Office service user account configured for System Monitor access 18 to the system. In the **Password** field, enter the password for that service user account. Incorrect entry does not disable the account in the same way as for accessing IP Office Manager. However, more than 10 incorrect login attempts in a 10 minute period will block further access attempts from that source for a minute.
   e. If you want System Monitor to start with a previously saved set of trace options, use the **Trace Log Settings Filename** browse button to select the trace options settings file. See Saving Trace Options as a File 47.
8. Click **OK**.
9. Once System Monitor has connected with a system, it displays the system's status report 21 and alarm log 23.

1.3 IP Office Security Configuration

Use of monitor to access an IP Office system is configured through that system's security settings. Monitor can use a range of protocols for the connection with a balance between security and performance depending on the protocol chosen.

HTTPS is recommended for security. UDP is recommended for low performance impact but requires leaving an unsecure port open on the system. For full details, refer to the *"Avaya IP Office Security Guidelines"* document, especially chapters 8 and 9.

1.3.1 Setting the Monitor Password

For UDP/TCP access, monitor uses the **Monitor Password** set in the target system's security configuration. If no password is set, it uses the **System Password** set in the same security configuration.

To set the Monitor password:

1. Using IP Office Manager, access the IP Office system's security settings.
2. Click **System** and select the **Unsecure Interfaces** tab.
3. Click on the **Change** button next to the **Monitor Password** field.
   - The **Use Service User Credentials** option can be used to disable the **Monitor Password**. When selected, UDP and TCP access uses the password of any service users configured for monitor access 18.
4. Enter the existing password and then the new password and click **OK**. The default password for a system is blank.
5. Click on the icon to save the security changes.

1.3.2 Disabling UDP/TCP/HTTP Access

UDP/TCP/HTTP access to the IP Office using System Monitor can be disabled.

- **Important**
  Note that this involves disabling the interface used by some legacy third-party applications and so will also disable their operation.

To disable UDP/TCP access:

1. Using IP Office Manager, access the IP Office system's security settings.
2. Click **System** and select the **Unsecure Interfaces** tab.
3. In the **Application Controls** section, unselect **DevLink**.
4. Click **OK**.
5. Click on the icon to save the security changes.

1.3.3 Configuring a Service User for Monitor Access

HTTP/HTTPS access uses the name and password of a service user configured specifically for monitor access. Configuring such a user is done in two parts:

- a security rights group is configured with monitor access
- selected service users are made members of that rights group.

To configure rights group access:

1. Using IP Office Manager, access the IP Office system's security settings.
2. Click **Rights Groups** and then select the rights group that you want to configure. By default the **System Status Group** is used and has monitor access enabled as a default option.
3. Select the **System Status** tab.
4. The **SysMonitor access** option is used to set whether service users who are members of the rights group can access a system using System Monitor.
5. Click **OK**.
6. Click on the icon to save the security changes.

To configure rights group membership:

2. Using IP Office Manager, access the IP Office system's security settings.
2. Click **Service Users** and select the service user.

3. In the **Rights Group Membership** section, ensure that the rights group configured for monitor access is selected.
4. Click **OK**.
5. Click on the icon to save the security changes.

1.3.4 Adjusting the HTTP Service

HTTP and HTTPS access to the IP Office uses the HTTP service in the IP Office systems security settings. You can edit that service to configure whether unsecure access (HTTP) and or secure (HTTPS) access is allowed and to set the level of certificate checking used for secure access.

- **Important**
  The HTTP service is used by other IP Office applications. Changes to this service will affect the connection settings required for all those applications and not just System Monitor.

To configure the HTTP service:

1. Using IP Office Manager, access the IP Office system's security settings.
2. Click **Services** and select ***HTTP***.
3. The **Service Security Level** is the only setting that can be changed. It controls whether unsecure (HTTP port 80) and or secure (HTTPS 443) access is allowed:

Service Security Level	Usage
Disabled	The service and corresponding TCP ports are inactive.
Unsecure Only	This option allows only unsecured access to the service. The service's secure TCP port is disabled.
Unsecure + Secure	This option allows both unsecured and secure (Low) access.
Secure, Low	This option allows secure access to that service using TLS, and demands weaker (for example 3DES) encryption and authentication or higher. The service's unsecured TCP port is disabled.
Secure, Medium	This option allows secure access to that service using TLS, and demands moderate (for example AES-128) encryption and authentication or higher. The service's unsecured TCP port is disabled.
Secure, High	This option allows secure access to that service using TLS and demands stronger (for example AES-256) encryption and authentication, or higher. In addition, a certificate is required from the client. The service's unsecured TCP port is disabled.

4. Click **OK**.
5. Click on the icon to save the security changes.

1.4 The System Status Report

The status report is output whenever monitor connects to a system. The information included varies depending on the type of system and the equipment installed with it.

IP500 V2 System Example

The example below is a typical output for an IP500 system. The first few lines include the time, date plus the IP address of the system and up time of the monitored system.

```
********** SysMonitor v6.2 (4) **********
********** contact made with 192.168.42.1 at 10:45:17 22/7/2008 **********
********** System (192.168.42.1) has been up and running for 1day, 2hrs and 19secs(93619928mS) **********
  93619928mS PRN: System Monitor Started IP=192.168.42.203 IP 500 4.2(4) IP500 Site A
                  (IP Office: Supports Unicode, System Locale is eng)
  93619928mS PRN: LAW=A PRI=0, BRI=4, ALOG=4, ADSL=0 VCOMP=64, MDM=0, WAN=0, MODU=0 LANM=0 CkSRC=5 VMAIL=1(VER=3 TYP=1) CALLS=0(TOT=
  93623929mS PRN: ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
  93623929mS PRN: + loader: 0.0
  93623929mS PRN: + cpu: id 2 board a0 pld 17 type c10 options 802
  93623929mS PRN: + fpga: id 1 issue 0 build 5e
  93623929mS PRN: ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
  93623929mS PRN: +++++++++++++++++++++   LIST OF MODULES   +++++++++++++++++++++
  93623930mS PRN: +------------------------------------------------------------
  93623930mS PRN: + Slot 1: Base      DIGSTA8   Board=0xc0  PLD=0x05
  93623930mS PRN: +         Mezzanine NONE
  93623930mS PRN: +------------------------------------------------------------
  93623930mS PRN: + Slot 2: Base      VCM64     Board=0x01  PLD=0x10
  93623930mS PRN: +         Mezzanine BRI8      Board=0x01  PLD=0x07
  93623930mS PRN: +------------------------------------------------------------
  93623930mS PRN: + Slot 3: Base      PHONE8    Board=0x01  PLD=0x03
  93623931mS PRN: +         Mezzanine ATM4      Board=0x00  PLD=0x06
  93623931mS PRN: +------------------------------------------------------------
  93623931mS PRN: + Slot 4: Base      NONE
  93623931mS PRN: +         Mezzanine NONE
  93623931mS PRN: +------------------------------------------------------------
  93623931mS PRN: +++++++++++++++++   END OF LIST OF MODULES    +++++++++++++++
```

The next line gives information about various aspects of the system. This line is output at regular intervals, set through the file logging preferences 40.

```
93619928mS PRN: LAW=A PRI=0, BRI=4, ALOG=4, ADSL=0 VCOMP=64, MDM=0, WAN=0, MODU=0 LANM=0 CkSRC=5 VMAIL=1(VER=3 TYP=1) CALLS=0(TOT=
```

LAW =	A-Law or U-law system.
PRI =	Number of PRI channels
BRI =	Number of BRI channels.
ALOG =	Number of Analog Trunk Channels
ADSL =	*Not Used.*
VCOMP =	Number of voice compression channels installed.
MDM =	Size of Modem Card Fitted
WAN =	Number of WAN Ports configured.
MODU =	Number of external expansion modules (excluding WAN3 modules) attached.
LANM =	Number of WAN3 external expansion modules attached.
CkSRC =	The current clock source being used for PRI/BRI trunks (0 = Internal Clock Source).
VMAIL =	Indicates whether the voicemail server is connected. 1 if connected, 0 if not connected.
VER =	The software version of the voicemail server if obtainable.
TYP =	The type of Voicemail Server: 0 = None. 1 = Voicemail Lite/Pro. 2 = Centralized Voicemail Pro. 3 = Embedded Voicemail. 4 = Group (3rd party) voicemail. 5 = Remote Audix Voicemail
CALLS =	Number of current calls
TOT =	Total number of calls made to date since last system reboot.

In addition, when System Monitor starts, the initial output may include the system's alarm log. See The Alarm Log 23.

IP Office Server Edition System Example

The example below is for an primary server in a IP Office Server Edition system. It shows details of the server and lists the core services running on the server.

```
Monitor Started IP=192.168.0.6 S-Edition Primary 9.1.0.0 build 87 ServerEdition (Server Edition(P))
                        (Supports Unicode, System Locale is default)
PRN: Linux Whoo
 8147790mS LIC: Processing token (serial number = 1342837622)
 8147790mS LIC: Processing token (serial number = 2749693813)
 8147790mS LIC: Processing token (serial number = 1351209077)
 8147791mS LIC: Processing token (serial number = 3748848757)
 8147791mS LIC: Processing token (serial number = 197602678)
 8147791mS LIC: Processing token (serial number (big) = 611926526051)
 8147791mS LIC: ProcessToken (Serial number (big) = 611926526051)
 8148673mS PRN: IPOKeepaliveTask::Main sending keepalives at 5000 ms
 8150830mS PRN: ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 8150864mS PRN: + hardware id: Generic
 8150864mS PRN: + virtualized: no
 8150864mS PRN: + ova: no
 8150864mS PRN: + hosted: no
 8150864mS PRN: + cpu: Intel(R) Pentium(R) 4 CPU 3.20GHz
 8150864mS PRN: + ram: 1868MB
 8150864mS PRN: + hdd:  WDC
 8150864mS PRN: + hdd size: 73579MB
 8150864mS PRN: + inventory code:
 8150864mS PRN: + model info:
 8150864mS PRN: + serial number:
 8150864mS PRN: ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 8150864mS PRN: ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 8150864mS PRN: +++++++++++++++++++   LIST OF SERVICES  +++++++++++++++++++++
 8150864mS PRN: +------------------------------------------------------------
 8150864mS PRN: + Service 1: IPO-Linux-PC
 8150864mS PRN: +------------------------------------------------------------
 8150864mS PRN: + Service 2: IPO-MediaServer
 8150864mS PRN: +------------------------------------------------------------
 8150864mS PRN: + Service 3: one-X Portal
 8150864mS PRN: +------------------------------------------------------------
 8150864mS PRN: + Service 4: Voicemail Pro
 8150864mS PRN: +------------------------------------------------------------
 8150864mS PRN: + Service 5: Contact Recorder
 8150864mS PRN: +------------------------------------------------------------
 8150864mS PRN: + Service 6: WebLM
 8150864mS PRN: +------------------------------------------------------------
 8150864mS PRN: + Service 7: Web RTC Gateway
 8150864mS PRN: +------------------------------------------------------------
 8150864mS PRN: + Service 8: Authentication Module
 8150864mS PRN: +------------------------------------------------------------
 8150864mS PRN: + Service 9: Web Collaboration
 8150864mS PRN: +------------------------------------------------------------
 8150864mS PRN: ++++++++++++++++   END OF LIST OF SERVICES   ++++++++++++++++
 8150964mS RES: Mon 1/9/2014 11:46:26 UsedMem=16302080 MemObjs=0(Max 0) CMMsg=5(5) Buff=5000 20000 30000 49694 500 Links=111938(160
 8150964mS RES2: (SE-P) S-Edition Primary 9.1.0.0 build 87 Tasks=36 RTEngine=0 CMRTEngine=0 ExRTEngine=0 Timer=61 Poll=0 Ready=0 CM
```

1.5 The Alarm Log

When System Monitor connects to a system, the trace includes the system's alarm log. The alarms cannot be interpreted. However, if a site is the same repeated problem, Avaya may request the alarm log details.

The presence of alarms is not necessarily critical as each system keeps a record of the first 8 alarms since the alarm log was last cleared. However, once the alarm log is full, the system ignores additional alarms.

```
3003mS PRN: +++ START OF ALARM LOG DUMP +++
3019mS PRN: ALARM: 18/03/2004 13:07:56 IP 412 2.1(8) <Program Exception> CRIT RAISED addr=00000000 d=5 pc=00000000 0082eef0 0094d780
3019mS PRN: ALARM: 22/04/2004 07:26:44 IP 412 2.1(11) <Program Exception> CRIT RAISED addr=00000000 d=5 pc=00000000 0095dfe0 0095e27
3019mS PRN: ALARM: 22/04/2004 07:26:46 IP 412 2.1(11) <WATCHDOG> CRIT RAISED addr=00000000 d=0 pc=00000000 01e75750 01f983d4 0095e27
3004mS PRN: +++ END OF ALARM LOG DUMP +++
```

You can view the alarm log again at any time. You can also clear the alarm log to remove old alarms. See Alarms 95.

1.6 Adding Log Stamps

Using their phone, system users can access a log stamp function. This allows the user to insert a log stamp event into their system's monitor records. You can use this to have users indicate when an issue that you are trying to capture in the system log has occurred.

The log stamp record includes the date, time, user name and extension of the user who triggered the log stamp function. The system prefixes the record with **LSTMP: Log Stamped** and a log stamp number.

The system restarts the log stamp number from 000 whenever the system is restarted. Each time the log stamp function is used, the number increments, in a cycle from 000 to 999. However, a specific log stamp number can be assigned to a button or short code used to trigger the function. When triggered, the user's phone briefly displays the log stamp number.

A default system short code *55 is automatically added for new systems. For users with appropriate telephones, the log stamp function can also be assigned to a programmable button on the phone using the **Advanced | Miscellaneous | Stamp Log**.

To send a log using the default system short code:

1. When the event to be marked, dial ***55**. If already on a call, put that call on hold before dialing ***55**.

1.7 Monitor Icons

The System Monitor window contains a number of icons:

- **Open File**
  Open a previous saved monitor log file, see Opening a Log File 43. Can also be used to open a Syslog file that has been produced by an IP Office system, see Opening Syslog Files in System Monitor 91.
- **Save Log As**
  Save the current monitor log to a text file. See Saving the Current Screen as a Log File 43.
- **Rollover Log**
  Force the current log file to rollover. System Monitor adds a date and time stamp to the log file name and a new log file started. See Manually Rolling Over the Log File 43.
- **Stop Logging**
  Stop logging to a file. See Stopping File Logging 42.
- **Start Logging**
  Start logging to a file. See Starting File Logging 42.
- **Text Log File**
  This icon indicates that System Monitor is currently set to log to a plain text file. Clicking the icon changes the mode to binary file logging (forcing a rollover of any current log file). See Switching Between Binary and Text Logging 42.
- **Binary Log File**
  This icon indicates that System Monitor is currently set to log to a binary file. Clicking the icon changes the mode to text file logging (forcing a rollover of any current log file). See Switching Between Binary and Text Logging 42.
- **Clear Screen Display**
  Clear the current log shown in the display. See Clearing the Screen Log 31.
- **Run Screen Display**
  Show the live monitor log in the display. See Starting the Screen Log 31.
- **Freeze Screen Display**
  Pause the live monitor log in the display. This does not stop the logging to file. See Pausing the Screen Log 31.
- **Reconnect**
  Connect to the system specified in the **Select Unit** options. See Reconnecting to the Monitored System 33.
- **Filter Trace Options**
  Set the filter options for what should be included in the logs. See Filtering the Screen Log 32.
- **Log Preferences**
  Set the format and destination for the monitor log file. See Setting the Log Preferences 41.
- **Select Unit**
  Set the details of the system to monitor. See Selecting the System to Monitor 33.

1.8 Keyboard Shortcuts

You can use the following keyboard shortcuts with System Monitor:

Function	Shortcut	
Select unit	Ctrl+U	See Selecting the System to Monitor 33.
Reconnect	Ctrl+E	See Reconnecting to the Monitored System 33.
Open file	Ctrl+O	See Opening a Log File 43. See also Opening Syslog Files in System Monitor 91.
Save screen log as	Ctrl+S	See Saving the Screen Log as a Log File 35.
Send to mail recipient	Ctrl+M	See Emailing the Screen Log 35.
Send to mail recipient as attachment	Ctrl+H	See Emailing the Screen Log 35.
Rollover log	Ctrl+R	See Manually Rolling Over the Log File 43.
Log preferences	Ctrl+L	See Setting the Log Preferences 41.
Clear the screen log	Ctrl+X	See Clearing the Screen Log 31.
Copy the screen log	Ctrl+C	See Copying Screen Log Information 35.
Select all	Ctrl+A	See Copying Screen Log Information 35.
Find	Ctrl+F	See Searching the Screen Log 32.
IP Calculate	Ctrl+D	See Converting IP Address Hex Values 32.
Log to screen (start/pause)	Ctrl+G	See Starting the Screen Log 31 and Pausing the Screen Log 31.
Trace options	Ctrl+T	See Setting the Trace Options 46.
US PRI Trunk status	Ctrl+I	See US PRI Trunks 112.
Filter screen log	F4	See Filtering the Screen Log 32.
Close System Monitor	Alt+F4	See Stopping System Monitor 27.

1.9 Closing System Monitor

Closing System Monitor ends screen and file logging. When System Monitor is next started, it attempts to reconnect to the same system that it was connected to when it was closed.

To close System Monitor:

1. Click the **X** icon at the top-right of the window. Alternatively, press ***Alt+F4*** or click **File** and select **Exit**.
2. The application is closed. All logging stops.

Chapter 2.
Using the Screen Log

2. Using the Screen Log

System Monitor uses its main display area to show records received from the connected system. Alternatively, it can display a previously saved logged file for study.

- **IMPORTANT**
  The screen log is limited to approximately 5000 records. If you anticipate logging for a long period or selecting a lot of trace options, you should log to file and then display that file. Large log files can be displayed in a separate text editor.

The records displayed in the screen log are not the raw records as received from the system, instead that are "interpreted" records. System Monitor applies various changes to aid the interpretation of the records. For example, a record containing the raw entry ***pcol=6*** is interpreted and displayed as ***pcol=6 (TCP)***.

2.1 Pausing the Screen Log

When System Monitor displays the trace from a connected system, you can pause the trace in order to inspect it.

To pause the screen log:

1. Click the **Freeze Screen Logging** icon. Alternatively, press ***Ctrl+G***.
2. System Monitor displays a warning **Logging to Screen Stopped** as part of the log.
3. To restart the screen log, see Starting the Screen Log 31.

2.2 Starting the Screen Log

When System Monitor displays the records from a connected system, you may need to pause the output in order to inspect it. See Pausing the Screen Log 31. You can use the following option to restart displaying records received.

When you load a log file for display, any screen logging from a connected system is automatically paused. Restarting the screen log add records from the connected system when they are received.

To restart the screen log:

1. Click the **Log to Screen** icon. Alternatively, press ***Ctrl+G***.
2. System Monitor displays a warning **Logging to Screen Started** as part of the log.

2.3 Clearing the Screen Log

You can clear the currently displayed trace.

- If the trace was from a connected system, those records are lost unless the trace was also being logged to a file.
- Clearing the trace does not affect any trace records logged to a file.
- If the screen log was loaded from a previously saved log file, clearing the trace clears the screen log but does not erase records from the log file.

To clear the screen log:

1. Click the **Clear Display** icon. Alternatively, press **Ctrl+X**.

2.4 Filtering the Screen Log

System Monitor can display a filtered summary of the current screen log. You can base the filter on any selected part of the existing screen log, for example an IP address or extension number. System Monitor displays the filtered log as a separate window you can save to a text file.

To display a filtered screen log:

1. Using the cursor, highlight the part of the current screen log that you want used as the filter. If necessary, pause the screen in order to make the selection, see Pausing the Screen Log 31.
2. Press **F4**.
3. System Monitor displays a separate window that shows those records that contain matches to the filter.

To save a filtered screen log:

1. Filter the log using the process above.
2. In the filtered log window, click **File** and select **Save As**.
3. Enter a file name or select an existing file to overwrite.
4. Click **Save**.

To copy the filtered screen log:

1. Filter the log using the process above.
2. In the filtered log window, select the filter records that you want to copy.
3. Click **File** and select **Copy**.

2.5 Searching the Screen Log

You can search the screen log for records that contain text that match the search string you specify.

To search the screen log:

1. Optional: Selecting a piece of text in the screen log before starting search automatically makes that text the search string.
2. Click **Edit** and select **Find**. Alternatively, press ***Ctrl+F***.
3. Enter the search string for which you want to search the screen log.
4. Click **Find Next** to find the first match.
5. Click **Find Next** again to find the next match.

2.6 Converting IP Address Hex Values

Some values displayed in the screen log are Hex values. These are indicated by a 0x prefix to the number. Typically these are IP addresses. System Monitor can display the converted value. For example, ***0xff*** becomes ***0.0.0.255***.

To display the IP address conversion of a hex value:

1. In the screen log, select and highlight the value to be converted. It does not matter if you include the 0x in the selection or not.
2. Click **Edit** and select **IP Calculated (Selected Hex)**. Alternatively, press **Ctrl+D**.
3. System Monitor displays the converted value.

2.7 Selecting the System to Monitor

Whilst already monitoring a system or viewing a log file, you can switch to receiving and displaying the log records from another system.

To select the system to monitor and start screen monitoring:

1. Click the **Select Unit** icon. Alternatively, press **Ctrl+U**.
2. Follow the process for the method of connection you want to use:
   - **UDP Connection** 12
   - **TCP Connection** 13
   - **HTTP Connection** 14
   - **HTTPS Connection** 16

2.8 Reconnecting to the Monitored System

System Monitor automatically attempts to reconnect to a system when it detects that the connection has been lost. However, if necessary you can manually select to reconnect.

To select the system to monitor and start screen monitoring:

1. Click the **Reconnect** icon. Alternatively, press **Ctrl+E**.
2. Once System Monitor has connected with a system, System Monitor displays the system's status report 21 and alarm log 23.

2.9 Setting the Trace Options

The output received from a system includes records for all activity. This can make it difficult to spot just those details needed to diagnose a particular issue. Therefore, System Monitor allows selection of which records are included in the current screen log and file logging. See Trace Options 46.

2.10 Viewing the System Alarms

This status menu displays the alarms records in the connected system's alarms log.

When System Monitor connects to a system, the trace includes the system's alarm log. The alarms cannot be interpreted. However, if a site is the same repeated problem, Avaya may request the alarm log details.

The presence of alarms is not necessarily critical as each system keeps a record of the first 8 alarms since the alarm log was last cleared. However, once the alarm log is full, the system ignores additional alarms.

```
3003mS PRN: +++ START OF ALARM LOG DUMP +++
3019mS PRN: ALARM: 18/03/2004 13:07:56 IP 412 2.1(8) <Program Exception> CRIT RAISED addr=00000000 d=5 pc=00000000 0082eef0 0094d78
3019mS PRN: ALARM: 22/04/2004 07:26:44 IP 412 2.1(11) <Program Exception> CRIT RAISED addr=00000000 d=5 pc=00000000 0095dfe0 0095e2
3019mS PRN: ALARM: 22/04/2004 07:26:46 IP 412 2.1(11) <WATCHDOG> CRIT RAISED addr=00000000 d=0 pc=00000000 01e75750 01f983d4 0095e2
3004mS PRN: +++ END OF ALARM LOG DUMP +++
```

To view the alarm log:

1. Click **Status** and select **Alarms**.
2. System Monitor displays the alarm records in a separate window.

To clear the alarm log:

1. View the alarm log using the process above.
2. Click **Clear Alarms**.

2.11 Viewing the Status Menus

In addition to the screen log, System Monitor can display a number of different status screens for different aspects of system operation.

To view a status screen:

1. Click Status and select the status screen required. See Status Screens 94.

2.12 Emailing the Screen Log

You can use the default email application configured on the PC to send an email copy of the current screen log.

You can send an email with the screen log either pasted into the email text or attached as a separate ***.txt*** file. Attaching as a file allows the recipient to easily load the log into their copy of System Monitor.

To email the screen log pasted into an email:

1. Click **File**, select **Send To** and then **Mail Recipient**. Alternatively, press ***Ctrl+M***.
2. The default email application displays a new email with the screen log pasted into the message text.
3. Complete the email details and click **Send**.

To email the screen log as an email attachment:

1. Click **File**, select **Send To** and then **Mail Recipient as Attachment**. Alternatively, press ***Ctrl+H***.
2. The default email application displays a new email with the screen log attached as a file.
3. Complete the email details and click **Send**.

2.13 Opening a Log File

You can use System Monitor to view an existing log file. Opening a log file automatically pauses the display of the screen log from any connected system.

To open a log file:

1. Click the **Open File** icon. Alternatively, press ***Ctrl+O*** or click **File** and select **Open File**.
2. Browse to and select the log file.
   - Text log files end in ***.txt***. Binary log files end in ***.mon***.
   - The ***.log*** option is used to open Syslog files that contain System Monitor events, see Syslog Tracing 88.
   - Zipped log files cannot be opened directly by monitor. The file must first be unzipped.
3. Click **Open**.
4. The file opens in the System Monitor view.

2.14 Copying Screen Log Information

You can copy and paste the information shown in the screen log using the standard Windows methods.

To copy screen log information:

1. Using the cursor, select the section of the screen log to copy. Alternatively, press ***Ctrl+A*** to select the whole screen log.
2. System Monitor highlights the selected portion of the screen log.
3. Press ***Ctrl+C*** to copy the selected portion of the screen log.

2.15 Saving the Screen Log as a Log File

You can save the records displayed in the screen log as a text file.

- **Converting a Binary Log File**
  Using this option to open a binary log file and then save it as a plain text log file can be problematic if System Monitor displays a very large number of records. If that is the reason a plain text file is require, see Converting a Binary Log to a Text Log 44.

To save the current screen log as a file:

1. Click the **Save Screen Log As** icon. Alternatively, press ***Ctrl+S*** or click **Files** and select **Save Screen Log as** .
2. Enter a file name for the file.
3. Click **Save**.

2.16 Setting the Screen Font

You can select the default font used for displaying the logs.

To set the screen font:

1. Click **View** and select **Font**.
2. Select the font settings required.
3. Click **OK**.

2.17 Setting the Screen Background Colour

You can select the colour used for the background of the screen log.

To set the screen background colour:

1. Click **View** and select **Background Colour**.
2. Select the colour required.
3. Click **OK**.

2.18 Setting the Trace Colours

You can select a colour for a particular type of trace option. System Monitor then applies that colour to any matching records when added to the screen log.

To apply a colour to a trace option:

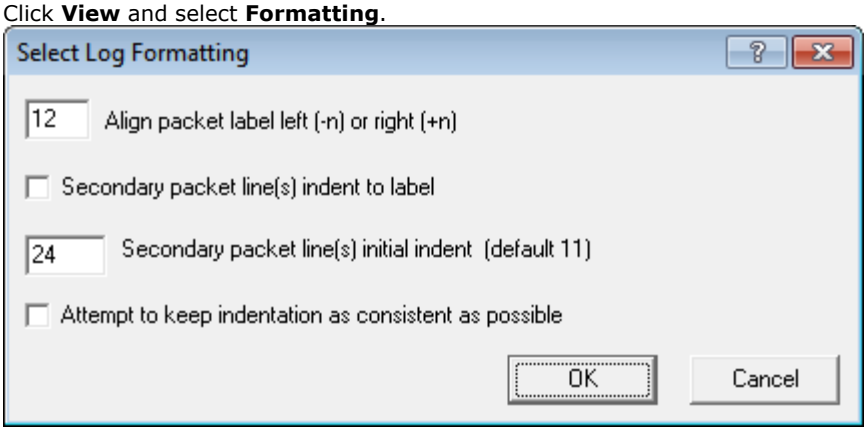
1. Click the **Trace Options** icon. Alternatively, press **Ctrl+T** or click **Filters** and select **Trace options**.
2. Select the tab showing the trace option for which you require a specific colour.
3. Right click on the name of the trace option.
4. Select the required colour.
5. Click **OK**.
6. System Monitor displays the trace option name in the selected colour.

2.19 Setting the Indenting

To aid the reading of the monitor trace and its import into other applications, you can adjust the indentation applied to the records. This does not affect the display of the date and time on each line.

To adjust the indentation applied to event records:

1. Click **View** and select **Formatting**.



2. Use the controls to adjust the indentation applied to the packets of information shown on each line.
3. Click **OK**.

2.20 Showing the Date and Time

Every record shown in the screen trace and recorded in the a log is prefixed with the number of milliseconds since the system last rebooted. You can also prefix it with the current system date and/or time.

To set the trace options

1. Click the **Trace Options** icon. Alternatively, press **Ctrl+T** or click **Filters** and select **Trace options**.
2. Select the **System** tab.
   - **To add the date:** Select **Prefix YYYY-MM-DD**.
   - **To add the time:** Select **Prefix hh:mm:ss**.
3. Click **OK**.

Chapter 3.
Logging to a File

3. Logging to a File

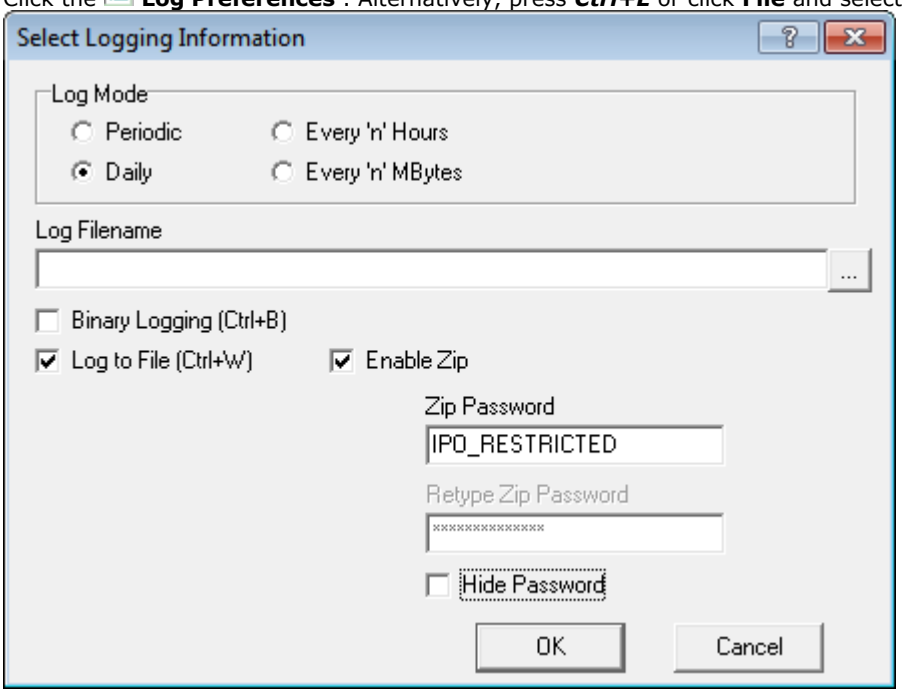
In addition to displaying records in the screen log, System Monitor can copy records into a log file. You can view log files at a later time or send them for analysis by another person.

3.1 Setting the Log Preferences

The settings below set where System Monitor stores log files and how often it starts a new log file.

To set the log preferences

1. Click the **Log Preferences** . Alternatively, press ***Ctrl+L*** or click **File** and select **Logging Preferences**.



2. Select the **Log Mode** required. This setting controls when System Monitor saves the current log and starts a new log file. This is called "rolling over the log file".
   - **Periodic**
     Only rollover the log when the icon is pressed. See Manually Rolling Over the Log File 43.
   - **Daily**
     Rollover the log automatically at the end of each day.
   - **Every 'n' Hours**
     Rollover the log automatically every few hours. When selected, System Monitor displays an **Hours Interval** box to set the number of hours between each rollover.
   - **Every 'n' MBytes**
     Rollover the log automatically when it reaches a set size. When selected, System Monitor displays a **MBytes Interval** box to set the size limit.
3. Set the log file name and location using the **Log Filename** field. The default location is the System Monitor application program folder ***C:\Program Files (x86)\Avaya\IP Office\Monitor***. Each time file log stops or rolls over, System Monitor adds the date and time to the log file name.
4. Select the log format required by selecting **Binary Logging** or not:
   - **Binary format**
     This is the raw format of records as received from the system. The records are not processed in any way by System Monitor other than being added to the log file.
   - **Text format**
     This is the interpreted format of records. System Monitor adds additional information. For example, a record containing the raw entry ***pcol=6*** is changed to ***pcol=6 (TCP)***.
     - **Recommended Format**
       When logging in text format or running the screen log, it is possible for some records to be lost due to the high number of packets that System Monitor has to interpret. Running a binary log and pausing the System Monitor screen log reduces the chances of such lost packets.
5. You can select whether you want the log file zipped into a password protected zip file. To do this, select **Enable Zip** and enter a password of at least 4 characters.
6. To start logging to file immediately, select **Log to File**. If not selected, you need to start logging manually when required. See Starting Logging 42. When selected, System Monitor adds any records added to the screen log to the file log.
7. Click **OK**.

3.2 Starting File Logging

You can manually start logging to file if file logging is not already running.

To start logging to file:

1. Click the **Start Logging to File** icon. Alternatively, press ***Ctrl+W***.
2. The records are logged to file using the settings defined for the log preferences. See Setting the Log Preferences 41.
3. The icon changes to a icon that can be used to stop logging. See Stopping Logging 42.

3.3 Stopping File Logging

You can stop the file logging at any time. When logging is stopped, the log file is saved in the folder specified in the log preferences with the date and time appended to the file name.

To stop logging to file:

1. Click the **Stop Logging to File** icon. Alternatively, press ***Ctrl+W***.
2. The icon changes to a icon that can be used to stop logging. See Stopping Logging 42.

3.4 Switching Between Binary and Text Logging

You can switch logging between using binary or text formats. Switching format automatically rolls over the current log file.

- **Binary format**
  This is the raw format of records as received from the system. The records are not processed in any way by System Monitor other than being added to the log file.
- **Text format**
  This is the interpreted format of records. System Monitor adds additional information. For example, a record containing the raw entry ***pcol=6*** is changed to ***pcol=6 (TCP)***.
  - **Recommended Format**
    When logging in text format or running the screen log, it is possible for some records to be lost due to the high number of packets that System Monitor has to interpret. Running a binary log and pausing the System Monitor screen log reduces the chances of such lost packets.

To switch to binary logging:

1. Click the **Binary Logging** icon. Alternatively, press **Ctrl+B**.
2. Any current log is saved as a text log file and a new log in binary format started.
3. The icon changes to a icon.

To switch to text logging:

1. Click the **Text Logging** icon. Alternatively, press **Ctrl+B**.
2. Any current log is saved as a binary log file and a new log in text format started.
3. The icon changes to a icon.

3.5 Opening a Log File

You can use System Monitor to view an existing log file. Opening a log file automatically pauses the display of the screen log from any connected system.

To open a log file:

1. Click the **Open File** icon. Alternatively, press ***Ctrl+O*** or click **File** and select **Open File**.
2. Browse to and select the log file.
   - Text log files end in ***.txt***. Binary log files end in ***.mon***.
   - The ***.log*** option is used to open Syslog files that contain System Monitor events, see Syslog Tracing 88.
   - Zipped log files cannot be opened directly by monitor. The file must first be unzipped.
3. Click **Open**.
4. The file opens in the System Monitor view.

3.6 Saving the Screen Log as a Log File

You can save the records displayed in the screen log as a text file.

- **Converting a Binary Log File**
  Using this option to open a binary log file and then save it as a plain text log file can be problematic if System Monitor displays a very large number of records. If that is the reason a plain text file is require, see Converting a Binary Log to a Text Log 44.

To save the current screen log as a file:

1. Click the **Save Screen Log As** icon. Alternatively, press ***Ctrl+S*** or click **Files** and select **Save Screen Log as** .
2. Enter a file name for the file.
3. Click **Save**.

3.7 Manually Rolling Over the Log File

The logging preferences can automatically rollover the log file; creating a new log file daily, every few hours or after a certain amount of data. When this occurs, System Monitor saves the log file with the date and time added to the file name and starts a new log file. See Setting the Log Preferences 41.

You can force System Monitor to rollover the log file at anytime. You can do this even if System Monitor is already set to automatically rollover the file.

To manually rollover the log file:

1. Click **File** and select **Rollover Log**. Alternatively, press the **Rollover Log** icon or press ***Ctrl+R***.
2. System Monitor saves the existing log file and starts a new log file.

3.8 Converting a Binary Log to a Text Log

You can use System Monitor to view binary log files (.mon files). However, it may sometimes be necessary to create a plain text copy of the log file. For example, so that it can be viewed in other applications.

- **Why not use Files | Save As**
  While you can save the current screen log to a text file 43 at any time, this can be potentially problematic if a very large number of records have been displayed. That would typically apply when a large binary log file is loaded. While the method below is more complex, it ensures that no records are lost.

To convert a binary log file to a plain text log file:

1. Start System Monitor.
2. Clear the current screen log:
   a. If logging to screen, click the **Freeze Screen Logging** icon. Alternatively, press ***Ctrl+G***.
   b. Clear any existing contents in the screen log by clicking the **Clear Display** icon. Alternatively, press **Ctrl+X**.
3. Configure System Monitor to a non existent IP address.
   a. Click the **Select Unit** icon. Alternatively, press **Ctrl+U**.
   b. Enter an IP address that is not used.
   c. Click **OK**.
4. Set System Monitor to capture the screen log records as they appear into a plain text log file.
   a. Click the **Log Preferences** icon. Alternatively, press ***Ctrl+L*** or click **File** and select **Logging Preferences** .
   b. Set the **Log Mode** to ***Daily***.
   c. Ensure the **Binary Logging** is not selected.
   d. Select the **Log to File** option.
   e. Click **OK**.
5. Open the binary log file:
   a. Click the **Open File** icon. Alternatively, press ***Ctrl+O*** or click **File** and select **Open File**.
   b. Browse to and select the log file.
   c. Click **Open**.
   d. The file opens in the screen log.
6. Due to the log preferences selected above, as System Monitor adds each binary log file record to the screen log, it also write the record into a plain text log file.
7. Once the binary log file has been fully loaded, rollover the log file.
   a. Click the **Rollover Log** icon. Alternatively, press ***Ctrl+R*** or click **File** and select **Rollover Log**

Chapter 4.
Setting the Trace Options

4. Setting the Trace Options

The trace options set which records System Monitor receives from the connected system. The settings affect both the screen log and logging to file.

4.1 Setting the Trace Options

To set the trace options

1. Click the **Trace Options** icon. Alternatively, press **Ctrl+T** or click **Filters** and select **Trace options**.
2. Click the setting to enable or disable it.
3. Click **OK**.

4.2 Saving Trace Options as a File

The current set of trace options can be exported to an .ini file. You can then reload the settings from that file at a later time or send them to another user to set the trace options of their application. See Loading Trace Options from a File 47.

- **Note**
  System Monitor does not save trace option colour settings as part of the trace options file.

To export the trace options:

1. Click the **Trace Options** icon. Alternatively, press **Ctrl+T** or click **Filters** and select **Trace options**.
2. Select **Save File**.
3. Enter the name for the file and select the location. Alternatively, select an existing file to overwrite.
4. Click **Save**.

4.3 Loading Trace Options from a File

You can import a previously saved set of trace options. See Saving Trace Options as a File 47.

To load a set of trace options:

1. Click the **Trace Options** icon. Alternatively, press **Ctrl+T** or click **Filters** and select **Trace options**.
2. Select **Load File**.
3. Locate and select the file to load.
4. Click **Open**.

4.4 Colouring Individual Trace Options

You can select a colour for a particular type of trace option. System Monitor then applies that colour to any matching records when added to the screen log.

To apply a colour to a trace option:

1. Click the **Trace Options** icon. Alternatively, press **Ctrl+T** or click **Filters** and select **Trace options**.
2. Select the tab showing the trace option for which you require a specific colour.
3. Right click on the name of the trace option.
4. Select the required colour.
5. Click **OK**.
6. System Monitor displays the trace option name in the selected colour.

4.5 Colouring Tab Trace Options

For some tabs, in addition to applying colours to individual trace options (see Colouring Individual Trace Options 48), a single colour selection can be used to apply a colour to all trace options on the tab. This selection overrides any existing individual trace option colour selections, however those selections can be reapplied.

To colour the tab trace options:

1. Click the **Trace Options** icon. Alternatively, press **Ctrl+T** or click **Filters** and select **Trace options**.
2. Select the tab. The Call 53, H.323 61 and System 79 tabs support this option.
3. Click on **Trace Colour**.
4. Select the required colour and
5. Click **OK**.

4.6 Clearing a Trace Options Tab

You can clear all the currently selected trace options on the currently displayed trace options tab.

To clear the current trace options tab:

1. Click the **Trace Options** icon. Alternatively, press **Ctrl+T** or click **Filters** and select **Trace options**.
2. Select the tab that you want to clear.
3. Click **Tab Clear All**.

4.7 Setting a Trace Options Tab

You can set all the options on the currently displayed trace options tab.

To clear the current trace options tab:

1. Click the **Trace Options** icon. Alternatively, press **Ctrl+T** or click **Filters** and select **Trace options**.
2. Select the tab on which you want to set all the options.
3. Click **Tab Set All**.

4.8 Clearing All the Trace Options

You can clear all selected trace options.

To clear all trace options:

1. Click the **Trace Options** icon. Alternatively, press **Ctrl+T** or click **Filters** and select **Trace options**.
2. Click **Clear All**.
3. System Monitor displays a warning. To continue with the defaulting, click **Yes**.

4.9 Defaulting the Trace Options

You can default the trace options. This defaults both the selected trace options and the trace option colour settings.

To default all the trace options:

1. Click the **Trace Options** icon. Alternatively, press **Ctrl+T** or click **Filters** and select **Trace options**.
2. Click **Default All**.
3. System Monitor displays a warning. To continue defaulting the trace options, click **Yes**.

The Default Trace Options

Trace Options Tab	Default Selected Trace Options
ATM	• *None*
Call	• **Call**, **Call Delta**, **Call Logging**, **Extension**, **Targeting**, **ARS**, **LRQ**, **Extension Send**, **Extension Receive**, **Extension TxP**, **Extension RxP**, **Line Send**, **Line Receive**, **Sort IEs**.
Directory	• *None*
DTE	• *None*
EConf	• *None*
Frame Relay	• **Frame Relay Events**, **Management Events**.
GOD	• *None*
H.323	• **H.323**
Interface	• **Interface Queue**, **TCP**, **UDP**, **ARP**, **MultiCast**.
ISDN	• **Layer 1**, **Layer 2**, **Layer 3**.
Jade	• *None*
Key/Lamp	• *None*
Media	• **Map**.
PPP	• **Err Msg**
R2	• **CAS**, **Channel**, **Dialler**, **DSP**, **Line**.
Routing	• *None*
SCN	• *None*
Services	• *None*
SIP	• **STUN**, **SIP Rx**, **SIP Tx**.
System	• **Error**, **Print**, **Prefix YYYY-MM-DD hh:mm:ss:mss**, **Resource Status Prints**, **Licencing**.
T1	• *None*
VPN	• **Security Engine: Regs on H/W Cmd Error**. **SSL VPN: Session** and **Session State**.
WAN	• **WAN Events**.

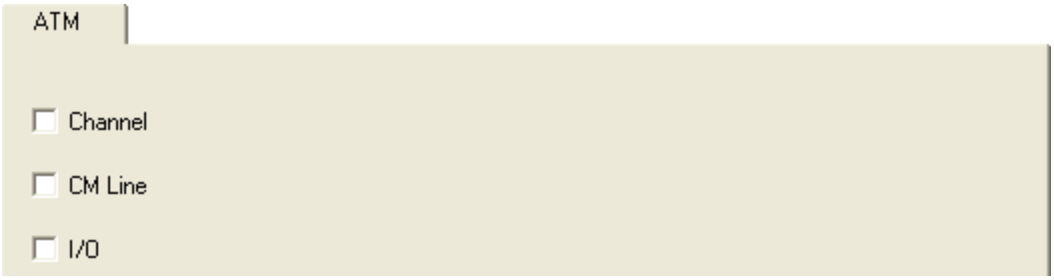
4.10 Trace Option Menus

The trace options are grouped onto the following tabs:

- **ATM** 52
  Monitor analog trunk traffic and events.
- **Call** 53
  Monitoring of extensions and calls.
- **Directory** 56
  Monitor LDAP traffic and events.
- **DTE** 57
  Monitoring of the system's DTE port.
- **EConf** 58
  Monitor IP Office Conferencing Center events.
- **Frame Relay** 59
  Monitor Frame Relay traffic and events.
- **GOD** 60
  Monitor messages between the modules in a system.
- **H.323** 61
  Monitoring of H.323 VoIP calls.
- **Interface** 62
  Monitoring IP data interfaces such as NAT and the Firewall.
- **ISDN** 64
  Monitor ISDN traffic and events.
- **Jade** 66
  For Linux based systems, monitor the call media services.
- **Key/Lamp** 67
  Monitor appearance functions.
- **Media** 68
  Monitor the media support provided by the system.
- **PPP** 69
  Monitor PPP traffic and events.
- **R2** 71
  Monitor R2 trunk traffic and events.
- **Routing** 72
  Monitor IP traffic and events.
- **SCN** 74
  Monitor Small Community Network traffic and information.
- **Services** 75
  Monitoring traffic and events for IPOffice services like DHCP, DNS, HTTP, TAPI, Telnet, Time, TFTP, SMTP, SNMP, Web Services.
- **SIP** 77
  Monitor SIP trunks and connections.
- **SSI** 78
  Monitor the system's SSI connections.
- **System** 79
  Monitor internal events.
- **T1** 80
  Monitor T1 traffic and events.
- **VComp** 81
  Monitor the system's voice compression channels.
- **VPN** 83
  Monitor VPN events.
- **WAN** 85
  Monitor WAN traffic and events.

4.10.1 ATM

This tab provides trace options for monitoring the system's analog trunks.



- **Channel**
  If selected, this option logs information relating to the Analog Trunk state machine.
- **CM Line**
  If selected, this option logs information relating to the interaction between the Line Handler and the Call Manager (CM).
- **I/O**
  If selected, this option logs events on the Line or in the DSP.

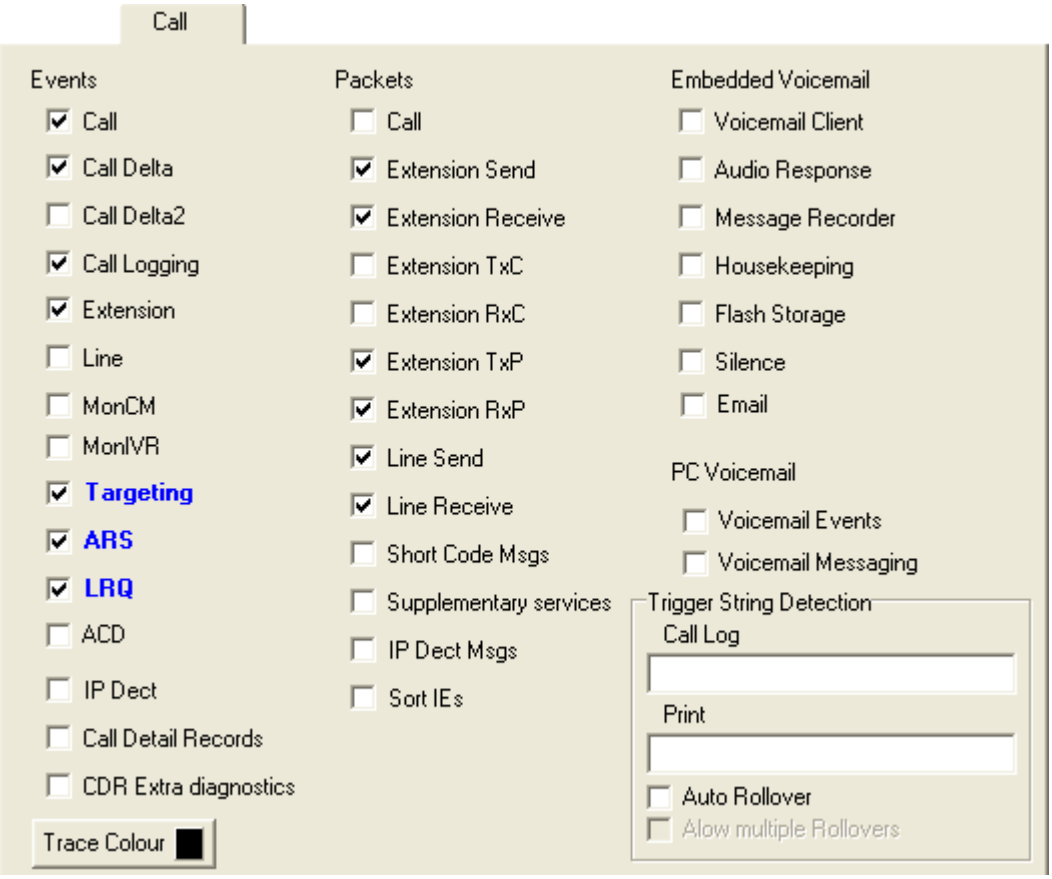
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- *None*.

4.10.2 Call

This tab provides trace options for monitoring the system's calls including the use of voicemail.



Events

- **Call**
  If selected, this option logs changes of state for the call (Aend and Bend).
- **Call Delta**
  If selected, this option logs information on general call state changes.
- **Call Delta2**
- **Call Logging**
  If selected, this option logs ACD status messages, CALL message giving statistics of call and SERVICE message giving statistics of service.
- **Extension**
  If selected, this option logs changes of state for the extension plus console print on setting bchan.
- **Extension Cut**
  If selected, this option logs changes of 'cut' state for the extension (mapping connections).
- **Line**
  Currently this option does not provide any trace messages. It is included for possible future use only.
- **MonCM**
  If selected, this option logs all received call control messages (NOT Short Code messages) and some additional console print messages - adjustcount, ringback.
- **MonIVR**
  If selected, this option logs up to date information on the messages in a user's voicemail box.
- **Targeting**
  If selected, this option logs information concerning call routing (targeting).
- **ARS**
- **LRQ**
- **ACD**
- **IP Dect**
- **Call Detail Records**

- **CDR Extra Diganostics**

Packets

- **Call**
  If selected, this option logs all received call control messages and contents.
- **Extension Send**
  If selected, this option logs all call control messages and contents transmitted to an extension.
- **Extension Receive**
  If selected, this option logs all call control messages and contents received from an extension.
- **Extension TxC**
  If selected, this option logs all call control messages and contents transmitted to the call object. Note: this message is actually received from the extension.
- **Extension RxC**
  If selected, this option logs all call control messages and contents received from the call object. Note: this message is actually sent to the extension.
- **Extension TxP**
  If selected, this option logs all call control messages and contents transmitted to a partner application (eg. SoftConsole). Also enables ***CMExtnCopyProcessMsg***, ***CMExtnCopyProcessCallMsg***, ***CMExtnConfCopyProcessCallMsg***, ***CMExtnCopySendCallMsg*** and ***CMExtnCopyCallLostMsg*** messages.
- **Extension RxP**
  If selected, this option logs all call control messages and contents received from a partner application such as IP Office SoftConsole.
- **Line Send**
  If selected, this option logs all call control messages and contents sent to a line. Also enables ***CMCallReleaseStart***, ***CMCallReleaseEnd*** and ***CMCallLostRecord Timeout*** messages.
- **Line Receive**
  If selected, this option logs all call control messages and contents received from a line. Also enables Incoming ***Call Waiting***, ***CallRefused Incoming Blocked*** and ***CallRefused*** because channels are in use messages.
- **Short Code Msgs**
  If selected, this option logs short code messages associated with the selected **Extension Send**, **Extension Receive** and **MonCM** trace options.
- **Supplementary services**
- **IP Dect Msgs**
- **Sort IEs**
  If selected, sort the order of line alerting and connected events when displayed in the System Monitor screen log. The order of line alerting and connected events varies depending on whether the system is transmitting or receiving. That makes it difficult to compare side by side traces of calls between two systems. This settings only affects how those events are sorted when displayed in the screen log, it does not affect the order of records logged to file.

Embedded Voicemail

- **Voicemail Client**
- **Audio Response**
- **Message Recorder**
- **Housekeeping**
- **Flash Storage**
- **Silence**
- **Email**

PC Voicemail

- **Voicemail Events**
- **Voicemail Messaging**

Trigger String Detection

The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

These options should only be used under the guidance of an authorized Avaya development engineer.

- **Call Log**

- **Print**
- **Auto Rollover**
- **Allow Multiple Rollovers**

Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- **Call**, **Call Delta**, **Call Logging**, **Extension**, **Targeting**, **ARS**, **LRQ**, **Extension Send**, **Extension Receive**, **Extension TxP**, **Extension RxP**, **Line Send**, **Line Receive**, **Sort IEs**.

4.10.3 Directory

This tab provides trace options for monitoring the system's directory requests.

Events

- **LDAP Events**
  If selected, this option logs information on the status of the system's LDAP "software" state machine and associated events.

Packets

Use the following options with caution as they produce a prolific amount of records. For both, if **Packets In** (see Interface 62) is also selected, System Monitor also adds the packet information to the end of a packet.

- **LDAP Tx**
  If selected, this option logs a breakdown of any transmitted LDAP data packets.
- **LDAP Rx**
  If selected, this option logs a detailed breakdown of any received LDAP data packets.

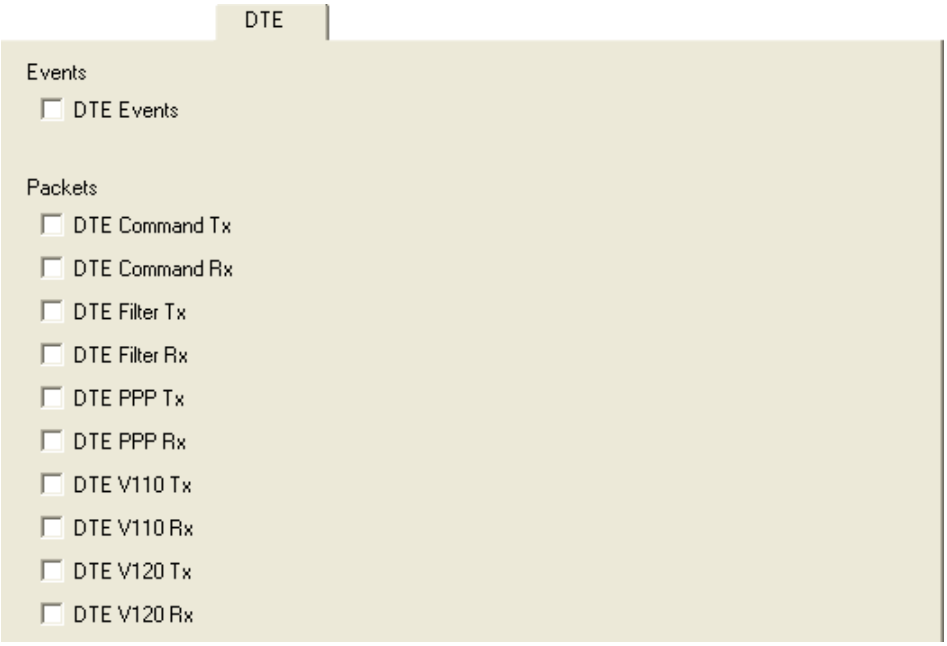
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- *None*.

4.10.4 DTE

This tab provides trace options for monitoring the system's DTE port.



Events

- **DTE Events**
  If selected, this option logs on the status of Flow Control, Modem Controls (DTR, DCD, etc), Baud Rate changes on the DTE port, etc.

Packets

- **DTE Command Tx**
  If selected, this option logs the Hayes AT commands send out of the DTE interface.
- **DTE Command Rx**
  If selected, this option logs the Hayes AT commands received from the DTE interface.
- **DTE Filter Tx**
  If selected, this option logs serial data transmitted out of the DTE interface once connected.
- **DTE Filter Rx**
  If selected, this option logs serial data received from the DTE interface once connected.
- **DTE PPP Tx**
  If selected, this option logs Framed PPP packets Transmitted to the DTE interface if the Hayes ATB0 option is set on the port.
- **DTE PPP Rx**
  If selected, this option logs Framed PPP packets received from the DTE interface if the Hayes ATB0 option is set on the port.
- **DTE V110 Tx**
  If selected, this option logs Framed V.110 packets received from the DTE interface if the Hayes ATB3 option is set on the port.
- **DTE V110 Rx**
  If selected, this option logs Framed V.110 packets received from the DTE interface if the Hayes ATB3 option is set on the port.
- **DTE V120 Tx**
  If selected, this option logs Framed V.120 packets received from the DTE interface if the Hayes ATB2 option is set on the port.
- **DTE V120 Rx**
  If selected, this option logs Framed V.120 packets received from the DTE interface if the Hayes ATB2 option is set on the port.

Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- *None*.

4.10.5 EConf

This tab provides trace options for monitoring the IP Office Conferencing Center application.

Events

- **Session**
  If selected, this option logs incoming and outgoing messages to/from the conferencing server. It also shows the session being established between the system and the conferencing server.
- **Api**
  If selected, this option logs state changes of the various EConf resources used.
- **Targets**
  If selected, this option logs the targeting information, as calls try to enter an enhanced conference.
- **Conf**
  If selected, this option logs events happening to ***CMConference*** object. It displays information on the creation/deletion of conferences, as well as calls being added/removed.
- **Vmail**
  If selected, this option logs information on the call as it arrives at the system from the voicemail server. It displays the GUID's that the server has given for the calls transfer into the conference and it shows the voicemail server making announcements into the conference.

Packets

- **Vmail Tx**
  If selected, this option logs messages which show the contents of IP packets transmitted to the voicemail server that are specifically associated with the IP Office Conferencing Centre.
- **Vmail Rx**
  If selected, this option logs messages which show the contents of IP packets received from the voicemail server that are specifically associated with the IP Office Conferencing Centre.

Report

- **Report**
  The **Report** button gives an instant snapshot of the state of all the resources in the EConf system. It shows what states all the EConferences and EChannels are in, and what CMConferences and CMCalls are associated with them at that time. It also shows you how many free reserved resources are available. When this button is clicked, a series of PRN: traces are output to the log. Note that the **Print** 79 option must be enabled.

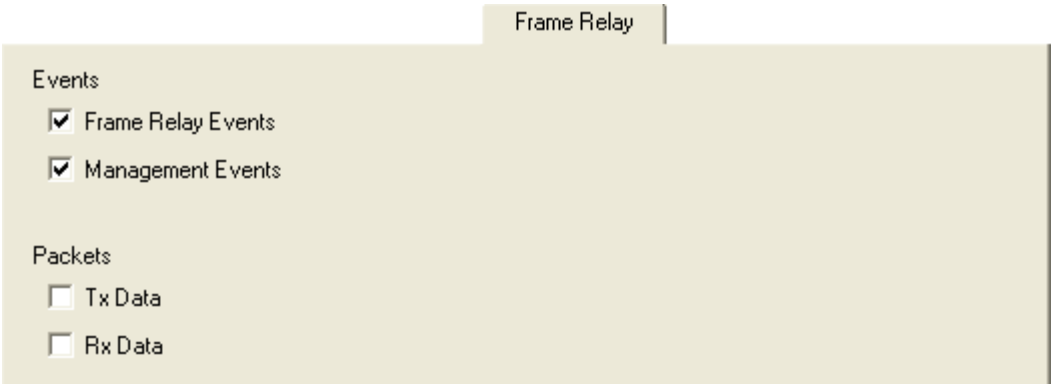
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- *None*.

4.10.6 Frame Relay

This tab provides trace options for monitoring the system's frame relay services.



Events

- **Frame Relay Events**
  If selected, this option logs Frame Relay events be it data in, data out, management, status etc.
- **Management Events**
  If selected, this option logs Management events/packets, ie. SE/FSE packets and management status.

Packets

- **Tx Data**
  If selected, this option logs transmitted packets on a Frame Relay link - both data & management.
- **Rx Data**
  If selected, this option logs received packets on a Frame Relay link - both data & management.

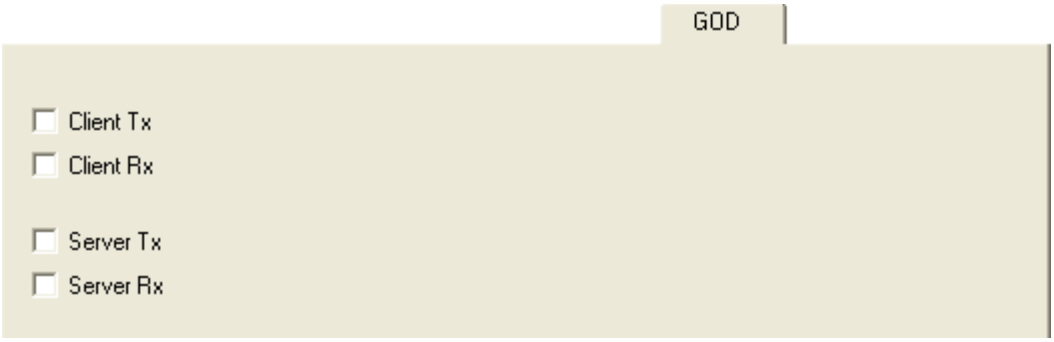
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- **Frame Relay Events**, **Management Events**.

4.10.7 GOD

This tab provides trace options for monitoring the system's communications between individual modules.



- **Client Tx**
  If selected, this option logs Inter-Unit protocol messages sent by the unit, other those from the Gatekeeper.
- **Client Rx**
  If selected, this option logs Inter-Unit protocol messages received by the unit, other those to the Gatekeeper.
- **Server Tx**
  If selected, this option logs Inter-Unit protocol messages sent by the Gatekeeper.
- **Server Rx**
  If selected, this option logs Inter-Unit protocol messages received by the Gatekeeper.

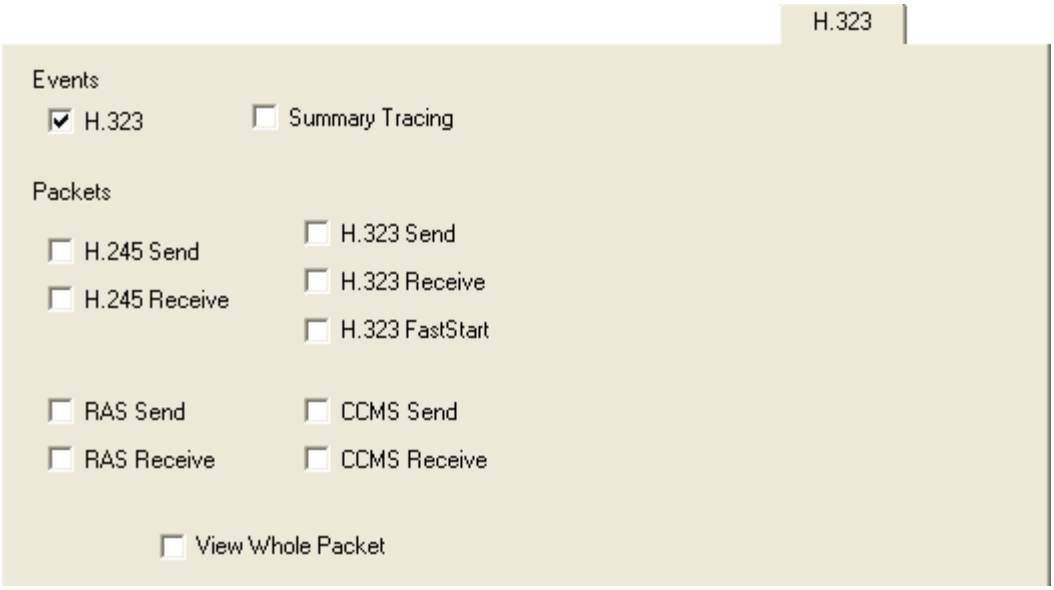
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- *None*.

4.10.8 H.323

This tab provides trace options for monitoring H.323 and H.245 events related to VoIP calls.



Events

- **H.323**
  If selected, this option logs the state changes of the H.323 call.

Packets

- **H.245 Send**
  If selected, this option logs H.245 messages sent to an H.323 endpoint (IP phone or IP trunk).
- **H.245 Receive**
  If selected, this option logs H.245 messages received from an H.323 endpoint (IP phone or IP trunk).
- **H.323**
  If selected, this option logs the state changes of the H.323 call.
- **H.323 Send**
  If selected, this option logs the H.323 messages sent to an H.323 endpoint (IP phone or IP trunk).
- **H.323 Receive**
  If selected, this option logs H.323 messages received from an H.323 endpoint (IP phone or IP trunk).
- **H.323 Fast Start**
  If selected, this option logs H.323 fast-start messages send to/received from an H.323 endpoint (IP phone or IP trunk).
- **RAS Send**
  If selected, this option logs RAS (registration, admission and status) messages sent to an IP phone.
- **RAS Receive**
  If selected, this option logs RAS messages received from an IP phone.
- **CCMS Send**
  If selected, this option logs the CCMS (Control Channel Message Set) messages sent to an H.323 endpoint (IP phone or IP trunk).
- **CCMS Receive**
  If selected, this option logs CCMS messages received from an H.323 endpoint (IP phone or IP trunk).
- **View Whole Packet**
  If selected, the full H.323 message is decoded and included in the trace. If not selected, the trace only includes the first two lines of the H.323 message.

Default Settings

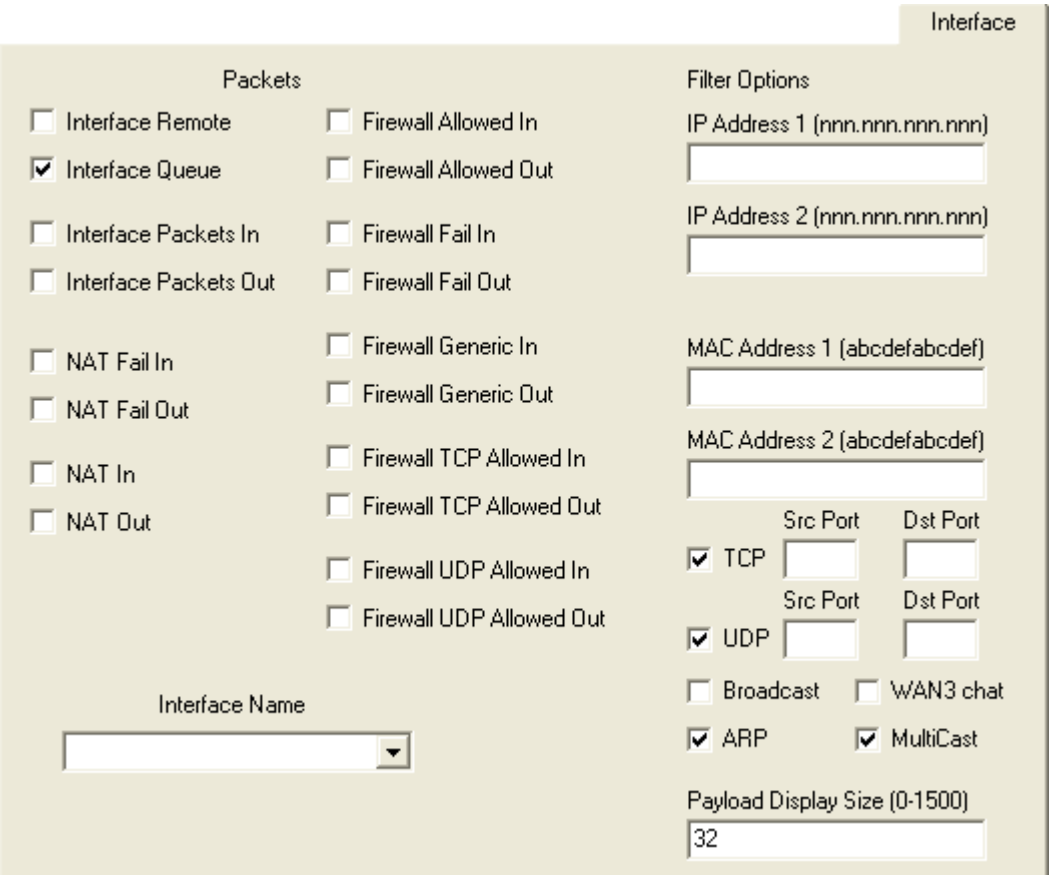
The following trace options are enabled by default (see Defaulting the Trace Options 50):

The default settings also apply the colour pink to the whole tab.

- **H.323**

4.10.9 Interface

This tab provides trace options for monitoring the system's data network interfaces. An interface can be a physical interface like a LAN port or a configuration interface, like a data connection to a remote system or a Dial-In User.



Packets

- **Interface Remote**
  If selected, this option logs traffic tunneled through to any externally connected WAN3 modules.
- **Interface Queue**
  If selected, this option logs packets being queued at an interface. Especially useful for determining what packet, and therefore which IP address on the internal network, caused an outgoing data call to be made.

The following trace options provide information on either the whole system or on the specific interface specified in the **Interface Name** field, see below.

- **Interface Packets In**
  If selected, this option logs all packets received.
- **Interface Packets Out**
  If selected, this option logs all packets transmitted.
- **NAT Fail In**
  If selected, this option logs all NAT (Network Address Translation) packets received that have failed to pass through the firewall
- **NAT Fail Out**
  If selected, this option logs all NAT (Network Address Translation) packets transmitted that have failed to pass through the firewall.
- **NAT In**
  If selected, this option logs all NAT (Network Address Translation) packets received.
- **NAT Out**
  If selected, this option logs all NAT (Network Address Translation) packets transmitted.
- **Firewall Allowed In**
  If selected, this option logs all packets received that have successfully passed through the firewall.
- **Firewall Allowed Out**
  If selected, this option logs all packets transmitted that have successfully passed through the firewall.
- **Firewall Fail In**
  If selected, this option logs all packets received that have failed to pass through the firewall.

- **Firewall Fail Out**
  If selected, this option logs all packets transmitted by the system that have failed to pass through the firewall.
- **Firewall Generic In**
  If selected, this option logs all packets received (except UDP, TCP and ICMP) that have successfully passed through the firewall.
- **Firewall Generic Out**
  If selected, this option logs all packets transmitted (except UDP, TCP and ICMP) that have successfully passed through the firewall.
- **Firewall TCP Allowed In**
  If selected, this option logs all TCP packets received that have successfully passed through the firewall.
- **Firewall TCP Allowed Out**
  If selected, this option logs all TCP packets transmitted that have successfully passed through the firewall.
- **Firewall UDP Allowed In**
  If selected, this option logs all UDP packets received that have successfully passed through the firewall.
- **Firewall UDP Allowed Out**
  If selected, this option logs all UDP packets transmitted that have successfully passed through the firewall.
- **Interface Name**
  This option can be used to limit the information shown for the fields above to those associate with a selected service. A blank entry matches all services.

Filters

These options are used in conjunction with the other options on the tab to limit the number of packets displayed or to display packets from a range of devices.

- **IP Address 1**
  If set, only packets to and from the IP address are logged.
- **IP Address 2**
  If set, this field is used in conjunction with **IP Address 1** to display only packets between the pair of addresses.
- **MAC Address 2**
  If set, only packets to and from the MAC are logged.
- **MAC Address 2**
  If set, this field is used in conjunction with **MAC Address 1** to display only packets between the pair of MAC addresses.
- **TCP**
  - **Src Port**
  - **Dst Port**
- **UDP**
  - **Src Port**
  - **Dst Port**
- **Broadcast**
  If set, this option logs all broadcast packets except ARP broadcasts.
- **WAN3 chat**
  This option allows you to filter out the continuous dialogue which takes place between an system's control unit and an associated WAN3 module.
- **ARP**
  If selected, this option logs ARP packets.
- **MultiCast**
  If selected, this option logs MultiCast packets (i.e. packets with either a source or destination address of 224.0.0.0).
- **Payload Display Size**
  This option limits the size of the IP packet displayed. Displayed payload can be set to anything between 0 and 1500 bytes. The default setting is 32 bytes.

Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- **Interface Queue**, **TCP**, **UDP**, **ARP**, **MultiCast**.

4.10.10 ISDN

This tab provides trace options for monitoring the system's ISDN digital trunks (BRI and PRI).

Events

- **Layer 1**
  If selected, this option logs information on the status of the system's ISDN Layer 1 software state machine and associated events.
- **Layer 2**
  If selected, this option logs information on the status of the system's ISDN Layer 2 software state machine and associated events.
- **Layer 3**
  If selected, this option logs information on the status of the system's ISDN Layer 3 software state machine and associated events.

Packets

- **Layer 1 Send**
  If selected, this option logs the actual data packets transmitted at the ISDN Layer 1 level.
- **Layer 1 Receive**
  If selected, this option logs the actual data packets received at the ISDN Layer 1 level.
- **Layer 2 Send**
  If selected, this option logs the actual data packets transmitted at the ISDN Layer 2 level.
- **Layer 2 Receive**
  If selected, this option logs the actual data packets received at the ISDN Layer 2 level.
- **Layer 3 Send**
  If selected, this option logs the actual data packets transmitted at the ISDN Layer 3 level.
- **Layer 3 Receive**
  If selected, this option logs the actual data packets received at the ISDN Layer 3 level.

Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- **Layer 1**, **Layer 2**, **Layer 3**.

The following messages are output when ISDN/Events/Layer1 are selected:

```
ISDNL1Evt: v=[line_no.] peb=[hardware device no.], [new state] [old state]
```

where the state values shown are:

Value	Definition
F1	Inactive.
F2	Sensing.
F3	Deactivated.
F4	Awaiting signal.
F5	Identifying input.
F6	Synchronised.
F7	Activated.
F8	Lost framing.

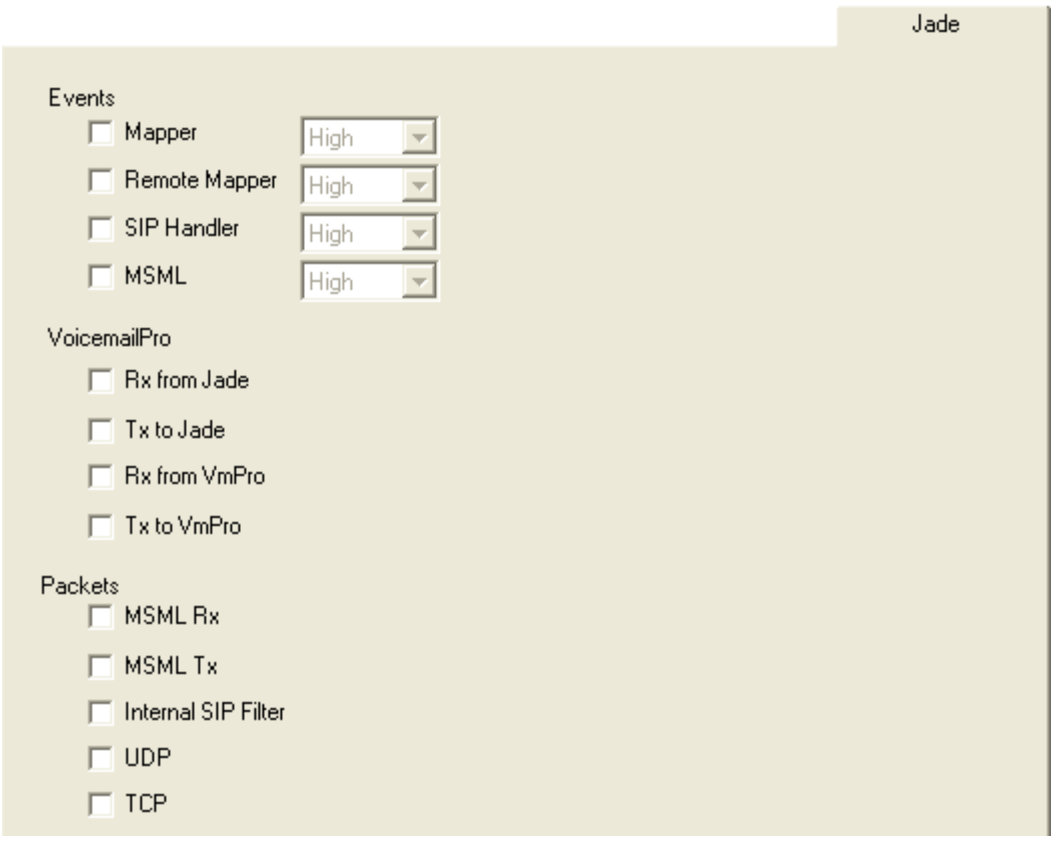
```
ISDNL1Evt: v=[line_no.] peb=[hardware device no.], [message]
```

where message value are:

Value	Definition
PHAI	Physical Activate Indication (i.e. Line is UP)
PHDI	Physical Deactivate Indication (Line is DOWN)
T3TO	T3 timeout has occurred
TxErr	A Transmit error has occurred
UnLocked	The system is not able to lock its clock to this line
Locked	The system and the clock extracted from this line are locked together.

4.10.11 Jade

This tab provides trace options for monitoring the Jade service used by Linux base systems.



Events

- **Mapper**
- **Remote Mapper**
- **SIP Handler**
- **MSML**

Voicemail Pro

- **Rx from Jade**
- **Tx to Jade**
- **Rx from VmPro**
- **Tx to VmPro**

Packets

- **MSML Rx**
- **MSML Tx**
- **Internal SIP Filter**
- **UDP**
- **TCP**

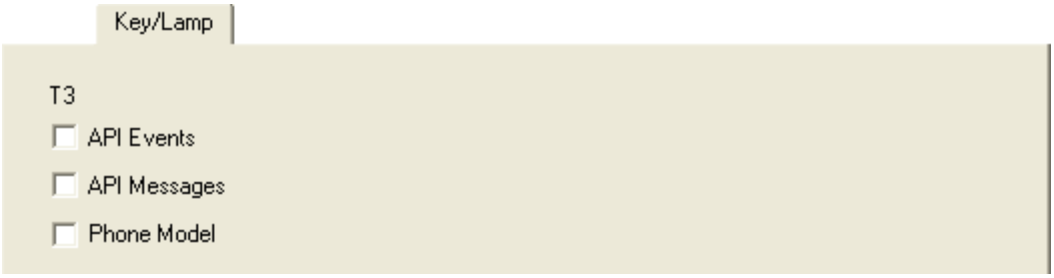
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- *None*.

4.10.12 Key/Lamp

This tab provides trace options for monitoring the events for T3 Series telephones.



T3

- **API Events**
- **API Messages**
- **Phone Model**

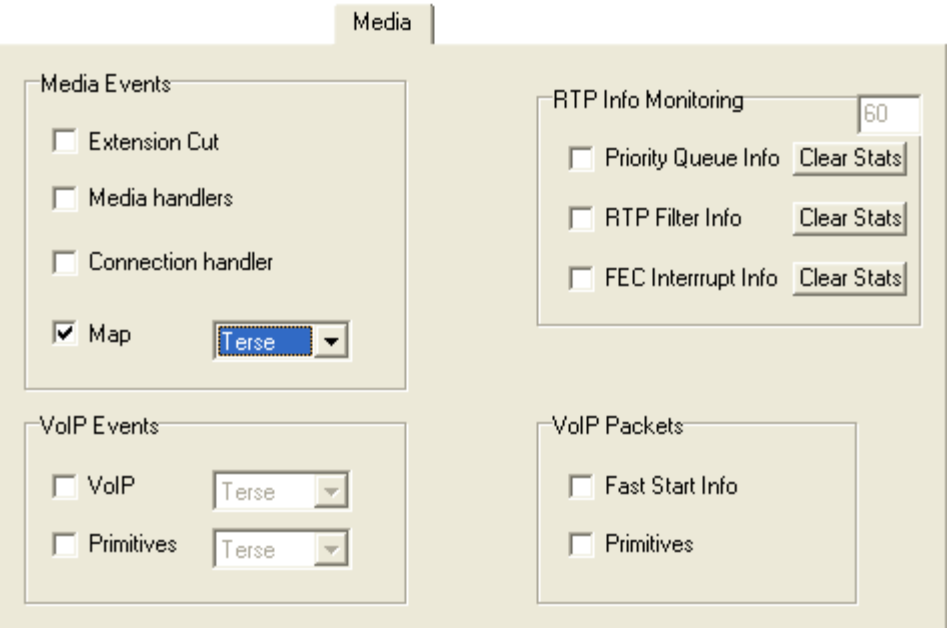
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- *None*.

4.10.13 Media

This tab provides trace options for monitoring the system's media service.



Media Events

- **Extension Cut**
  If selected, this option logs changes of 'cut' state for the extension (mapping connections).
- **Media handlers**
- **Connection handle**
- **Map**
  - The drop down is used to select the level of detail included in the records. The options are ***Terse***, ***Standard*** or ***Verbose***.

VoIP Events

- **VoIP**
  - The drop down is used to select the level of detail included in the records. The options are ***Terse***, ***Standard*** or ***Verbose***.
- **Primitives**
  - The drop down is used to select the level of detail included in the records. The options are ***Terse***, ***Standard*** or ***Verbose***.

RTP Info Monitoring

For each record type, the **Clear Stats** button can be used to reset the values.

- **RTP Filter Info**
- **Priority Queue Info**
- **FEC Interrupt Info**

VoIP Packets

- **Fast Start Info**
- **Primitives**

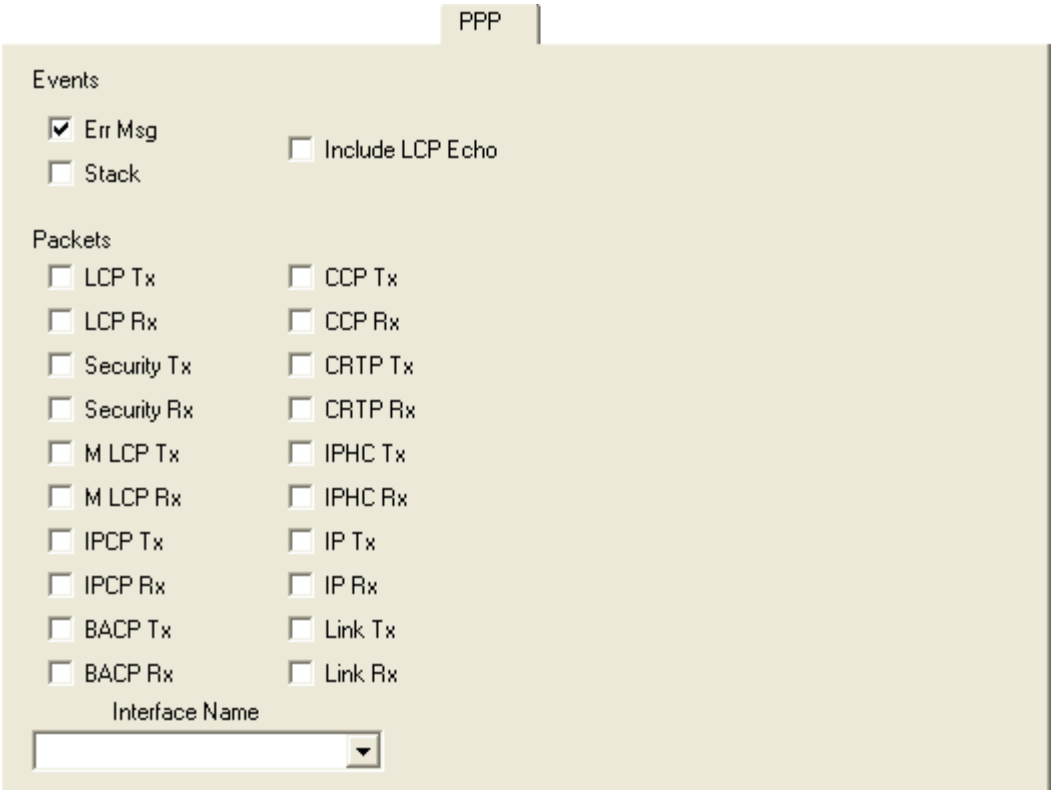
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- **Map**.

4.10.14 PPP

This tab provides trace options for monitoring the system's PPP service events.



Events

- **Err Msg**
  Currently this option does not provide any trace messages. It is included for possible future use only.
- **Stack**
  If selected, this option logs interface utilisation and bandwidth allocation increase/decrease messages.
- **Include LCP Echo**
  If selected, this option logs all LCP Echo and LCP Echo Reply packets received and transmitted.

Packets

- **LCP Tx**
  If selected, this option logs all LCP (Link Control Protocol) packets transmitted.
- **LCP Rx**
  If selected, this option logs all LCP (Link Control Protocol) packets received.
- **Security Tx**
  If selected, this option logs all PAP (Password Authentication Protocol) and/or CHAP (Control Handshake Authentication Protocol) packets transmitted.
- **Security Rx**
  If selected, this option logs all PAP (Password Authentication Protocol) and/or CHAP (Control Handshake Authentication Protocol) packets received.
- **M LCP Tx**
  If selected, this option logs all MLCP (Multilink Layer Control Protocol messages) packets transmitted.
- **M LCP Rx**
  If selected, this option logs all MLCP (Multilink Layer Control Protocol messages) packets received.
- **IPCP Tx**
  If selected, this option logs all IPCP (Internet Protocol Control Protocol) packets transmitted.
- **IPCP Rx**
  If selected, this option logs all IPCP (Internet Protocol Control Protocol) packets received.
- **BACP Tx**
  If selected, this option logs all BACP (Bandwidth Allocation Control Protocol) packets transmitted.
- **BACP Rx**
  If selected, this option logs all BACP (Bandwidth Allocation Control Protocol) packets received.

- **CCP Tx**
  If selected, this option logs all CCP (Compression Control Protocol) packets transmitted.
- **CCP Rx**
  If selected, this option logs all CCP (Compression Control Protocol) packets received.
- **CRTP Tx**
  If selected, this option logs all CRTP (Compressed Real Time Protocol) packets transmitted.
- **CRTP Rx**
  If selected, this option logs all CRTP (Compressed Real Time Protocol) packets received.
- **IPHC Tx**
  If selected, this option logs all IPHC (IP Header compression) packets transmitted.
- **IPHC Rx**
  If selected, this option logs all IPHC (IP Header compression) packets received.
- **IP Tx**
  If selected, this option logs all IP (Internet Protocol) packets transmitted.
- **IP Rx**
  If selected, this option logs all IP (Internet Protocol) packets received.
- **Link Tx**
  If selected, this option logs all packets transmitted.
- **Link Rx**
  If selected, this option logs all packets received.
- **Interface Name**
  This option can be used to limit the information shown for the fields above to those associate with a selected service. A blank entry matches all services.

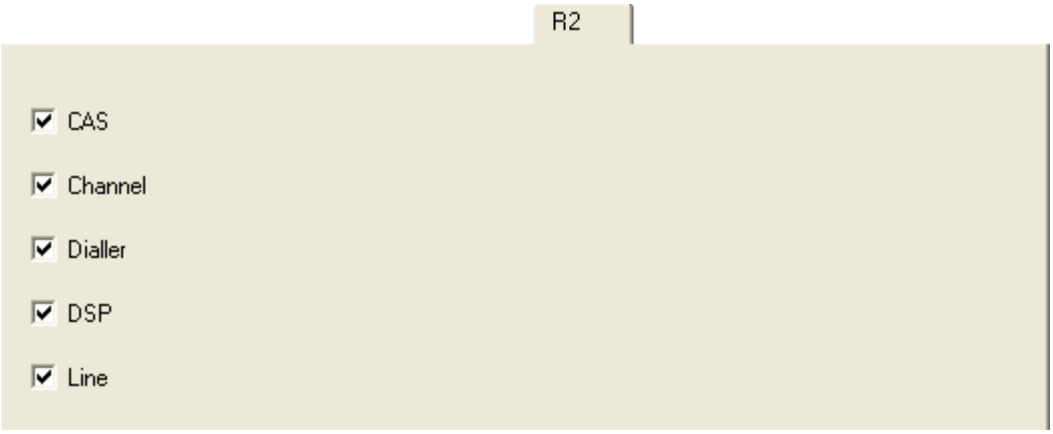
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- **Err Msg**

4.10.15 R2

This tab provides trace options for monitoring the system's E1-R2 trunks.



- **CAS**
  If selected, this option logs the common-channel Channel Associated Signaling (CAS) being transmitted and received on all of the channels.
- **Channel**
  If selected, this option logs the events, messages and status changes on the lower level signaling handlers being used on each channel.
- **Dialler**
  If selected, this option logs Dialler events and state changes on all channels. This includes outgoing and incoming digits, MFC dialer state transitions and translations of transmitted and received MFC tones into the correct meanings.
- **DSP**
  If selected, this option logs all significant events, digits and MFC tones being processed by the DSP on the R2 card.
- **Line**
  If selected, this option logs the events, messages and status changes on the line in general, and of "upper level" channel events, messages and status changes, which are independent of the lower level signaling handler being used on each channel.

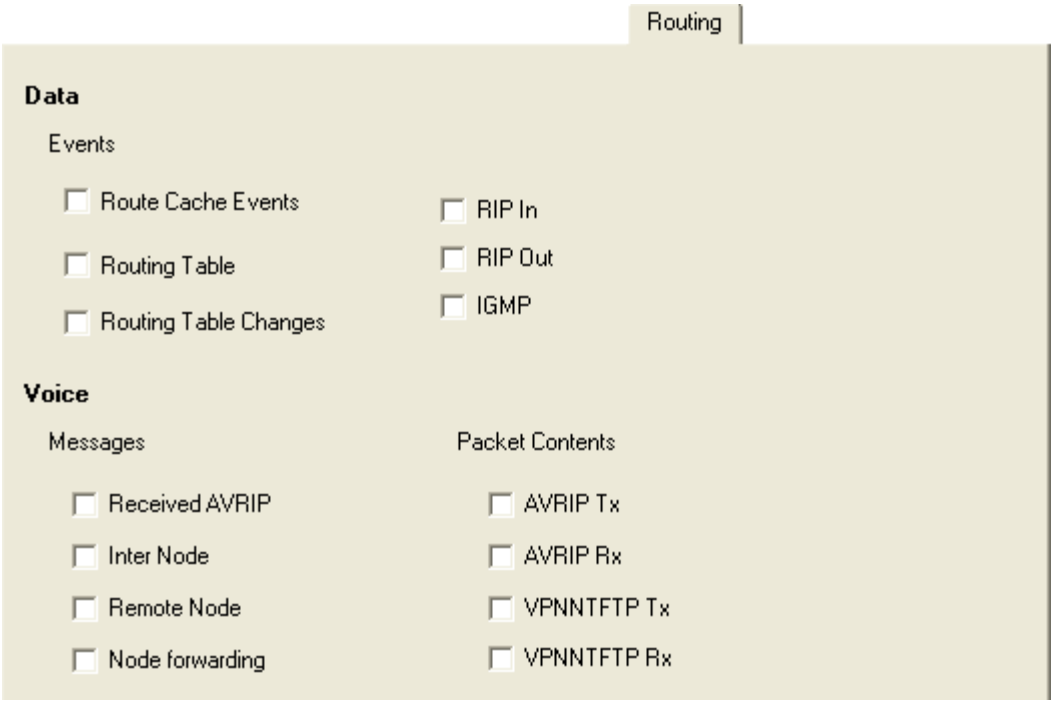
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- **CAS**, **Channel**, **Dialler**, **DSP**, **Line**.

4.10.16 Routing

This tab provides trace options for monitoring the system's IP data routing events for data and for voice.



Data

The event options under this heading are used to display information pertinent to the IP Routing activities on the system. They provide information on the system's Route Cache, Routing Table, and any RIP updates it receive or transmits.

Events

- **Route Cache Events**
  If selected, this option logs information on the current state of the system's route cache.
- **Routing Table**
  If selected, this option logs information on the system's Routing table.
- **Routing Table Changes**
  If selected, this option logs changes made to the system's Routing Table.
- **RIP In**
  If selected, this option logs received RIP packets.
- **RIP Out**
  If selected, this option logs transmitted RIP packets.
- **IGMP**
  If selected, this options logs IGMP packets.

Voice

The options under this heading are used to display event information pertinent to the Small Community Networking (SCN) Voice Routing activities on the system. These activities include information on SCN messages sent between Adjacent Nodes, and the actual information contained within those message packets.

Messages

- **Received AVRIP**
  If selected, this option logs, when enabled, traces the received AVRIP messages which are sent every 10 seconds during user activity and stop after 11 when idle. They can be used to check what nodes are active in a network. (If you want to see the actual messages then enable Voice/Packets/AVRIP Tx)
- **Inter Node**
  If selected, this option logs general Small Community Networking (SCN) messages which may help in the diagnosis of problem networks.
- **Remote Node**
  If selected, this option logs information on the establishment (or breakdown) of remote nodes in a SCN. These messages can be used to check what nodes are active in a network (note that a remote node is 2 or more hops away).

- **Node Forwarding**
  If selected, this option logs information about how this node is forwarding information about adjacent nodes to other adjacent nodes. Note that in a star network, the central node receives a large number of forwarding messages.

Packet Contents

An AVRIP packet contains information about the voicemail status of that node and information about what other nodes can be reached (IP address and number of hops and voicemail status). VPN TFTP packets contain information on the nodes User configuration data, User VoiceMail message counts, extension BLF status, call information.

- **AVRIP Tx**
  If selected, this option logs all transmitted SCN AVRIP packets from the Node being monitored.
- **AVRIP Rx**
  If selected, this option logs all received SCN AVRIP packets from Nodes adjacent to the one being monitored.
- **VPN TFTP Tx**
  If selected, this option logs all transmitted SCN TFTP packets from the Node being monitored.
- **VPN TFTP Rx**
  If selected, this option logs all received SCN TFTP packets from Nodes adjacent to the one being monitored.

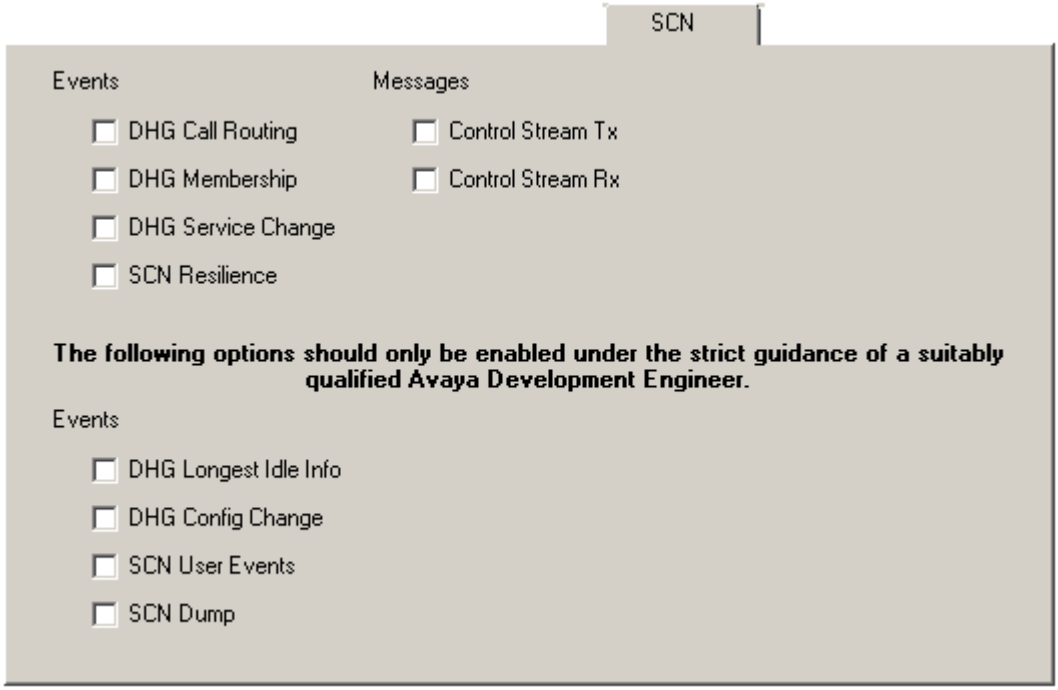
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- *None*.

4.10.17 SCN

This tab provides trace options for monitoring the system's Small Community Network events.



Events

- **DHG Call Routing**
- **DHG Membership**
- **DHG Service Change**
- **SCN Resilience**

Messages

- **Control Stream Tx**
- **Control Stream Rx**

The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

These options should only be used under the guidance of an authorized Avaya development engineer.

Events

- **DHG Longest Idle Info**
- **DHG Config Change**
- **SCN User Events**
- **SCN Dump**

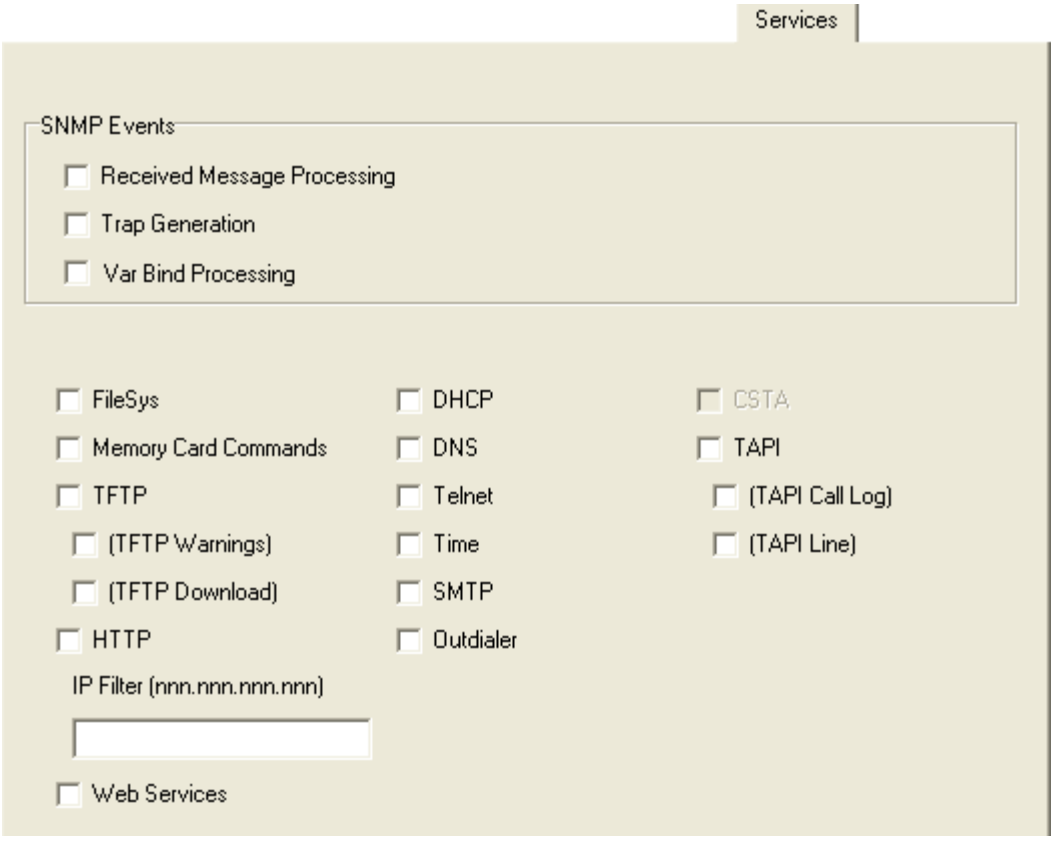
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- *None*.

4.10.18 Services

This tab provides trace options for monitoring various services provided by the system.



SNMP Events

- **Received Message Processing**
  If selected, this option logs SNMP requests (Get, Get-Next, Set) received by the system and the responses if valid or associated errors if invalid.
- **Trap Generation**
  If selected, this option logs SNMP trap events sent by the system.
- **Var Bind Processing**
  This option is available when either of the above SNMP trace options are selected. If selected, this option logs a decode of SNMP Var Binds processed in received requests, returned Var Bind for Get-Next requests, and Var Binds sent out in Traps.

Others

- **FileSys**
  If selected, this option logs file requests received by the system.
- **Memory Card Commands**
  If selected, this option logs memory card commands and actions.
- **TFTP**
  If selected, this option logs TFTP file requests to the system and by the system.
  - **TFTP Warnings**
    If selected, this option logs TFTP warnings that occur in response to file requests.
  - **TFTP Download**
    If selected, this option logs the progress of TFTP downloads.
- **HTTP**
  If selected, this option logs HTTP requests.
- **DHCP**
  If selected, this option logs DHCP requests.
- **DNS**
  If selected, this option logs DNS requests.
- **Telnet**
  If selected, this option logs Telnet activity.

- **Time**
  If selected, this option logs time and date requests and responses to the system and between the system and its configured time server.
- **SMTP**
  If selected, this option logs SMTP activity on the system.
- **Outdialer**
  If selected, this option logs messages between the system and the outdialing server. System Monitor can also display a status summary of the current outdialer session, see Outdialer Status 105.
- **CSTA**
  If selected, this option logs CSTA messages and responses.
- **TAPI**
  If selected, this option logs TAPI messages.
  - **TAPI Call Log**
    If selected, this option logs TAPI Call Log messages.
  - **TAPI Line**
    If selected, this option logs TAPI Line messages.
- **IP Filter**
  The value in this field can be used to only show only messages to and from the specified IP address. The filter is applied to all the other selected trace options on the tab.
- **Web Services**
  If selected, this option logs web service messages.

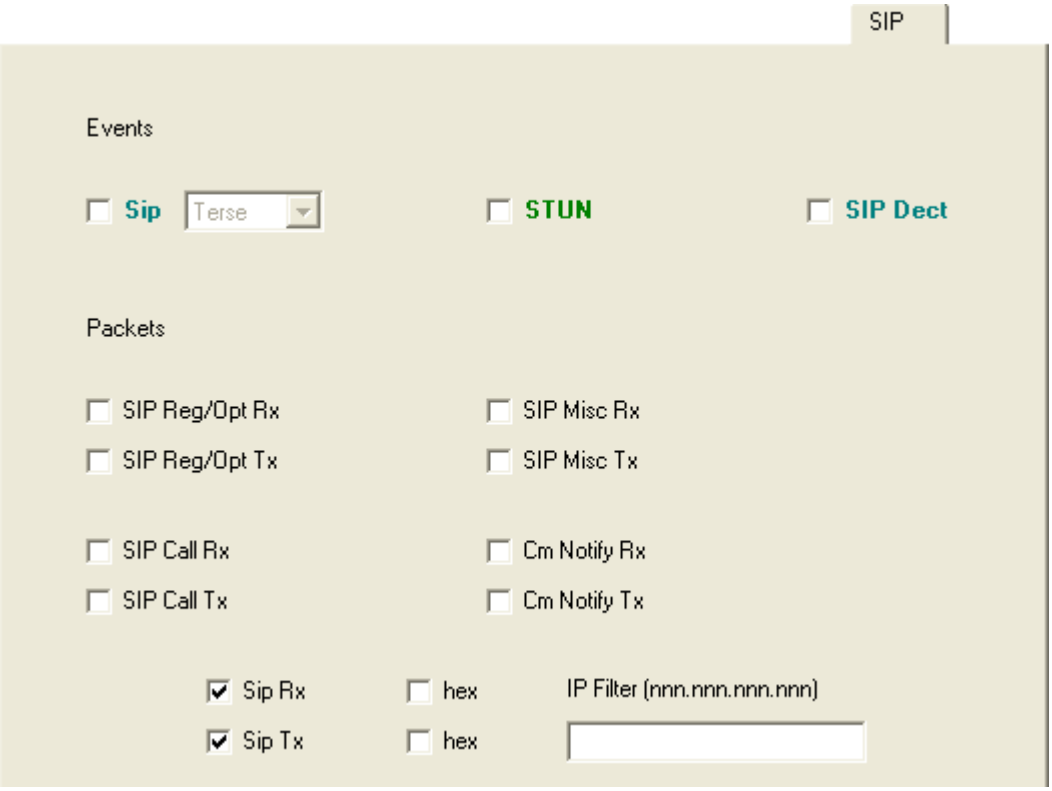
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- *None*.

4.10.19 SIP

This tab provides trace options for monitoring the system's SIP events.



Events

- **SIP**
  - The drop down is used to select the level of detail included in the records. The options are ***Terse***, ***Standard*** or ***Verbose***.
- **STUN**
- **SIP Dect**

Packets

- **SIP Reg/Opt Rx**
- **SIG Reg/Opt Tx**
- **SIP Call Rx**
- **SIP Call Tx**
- **SIP Misc Rx**
- **SIP Misc Tx**
- **Cm Notify Rx**
- **Cm Notify Tx**
- **Sip Rx**
- **Sip Tx**
- **IP Filter**

Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

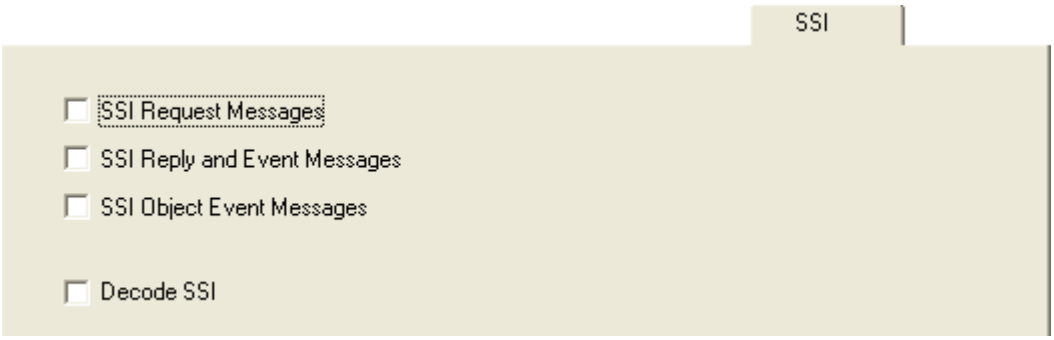
- **STUN**, **SIP Rx**, **SIP Tx**.

4.10.20 SSI

This tab provides trace options for monitoring the system's SSI connections. SSI is used for the IP Office Customer Call Reporter and IP Office System Status applications.

The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

These options should only be used under the guidance of an authorized Avaya development engineer.



- **SSI Request Messages**
- **SSI Reply and Event Messages**
- **SSI Object Event Messages**
- **Decode SSI**

Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- *None*.

4.10.21 System

This tab provides general trace options.

- **Error**
  If selected, this option logs all messages that are tagged with ***[ERROR:]***.
- **Print**
  If selected, this option logs all messages that are tagged with ***[PRN:]***. These are messages relating to major events or changes in status of the software modules running.
- **Prefix YYY-MM-DD**
  If selected, each record received is prefixed with the current date.
- **Prefix hh:mm:ss**
  If selected, each record received is prefixed with the current time.
- **Resource Status Prints**
  If selected, once every 20 seconds the trace includes a summary of the system memory resources and the number of connections. The messages are tagged with ***[RES:]***.
- **Date/Time Periodic Prints**
  If selected, once a minute the trace includes a record of the date and time plus details of the connected system name and IP address. This is useful in a trace if the **Prefix YYY-MM-DD hh:mm:ss** trace option is not selected.
- **Licencing**
  If selected, this option logs messages relating to the verification of system licenses. Licensing messages are tagged with ***[LIC:]***.
- **Development Tracing**
  This option should only be selected when advised to do so by Avaya. When is selected, System Monitor has access to additional trace option tabs for SSI 78 and VComp 81 and a number of additional status screens, see Status Screens 94.
- **Copy Logging to Main Window**

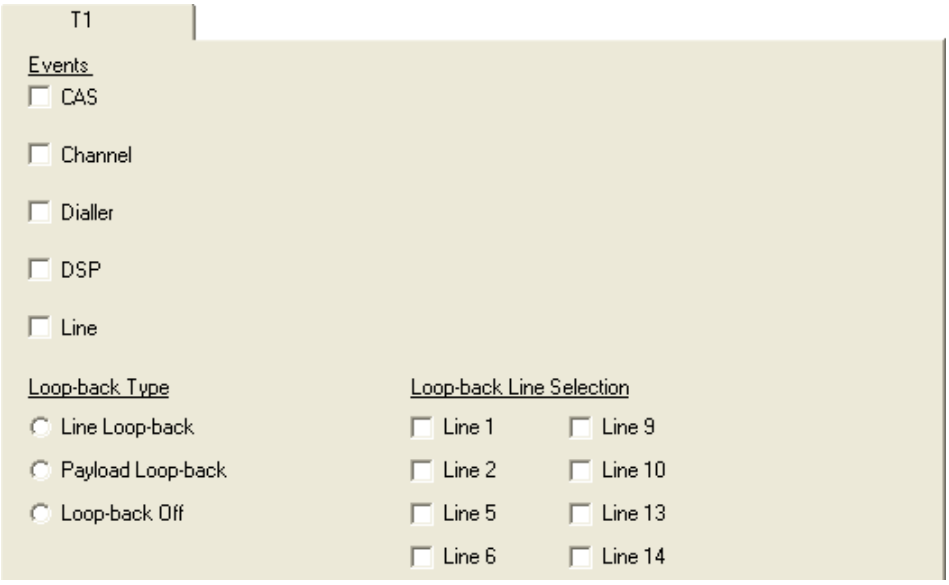
Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- **Error**, **Print**, **Prefix YYYY-MM-DD hh:mm:ss:mss**, **Resource Status Prints**, **Licencing**.

4.10.22 T1

This tab provides trace options for monitoring the system's T1 trunks.



Events

- **CAS**
  If selected, this option logs the robbed-bit Channel Associated Signaling (CAS) being transmitted and received on all of the channels.
- **Channel**
  If selected, this option logs the events, messages and status changes on the lower level signaling handlers being used on each channel.
- **Dialler**
  If selected, this option logs "Dialler" events and state changes on all channels. This includes outgoing and incoming digits.
- **DSP**
  If selected, this option logs all significant events and digits being processed by the DSP on the T1 card.
- **Line**
  If selected, this option logs the events, messages and status changes on the T1 line in general, and "upper level" channel events, messages and status changes, which are independent of the lower level signaling handler being used on each channel.

Loop-back

These options are used to set loop-back operation. First select the line on which loop-back is required and then the type of loop-back. The settings are applied after clicking OK.

Loop-back Type

- **Line Loop-back**
  This loop-back type loops back the entire received signal to the far end of the line without the signal entering the system at all.
- **Payload Loop-back**
  This loop-back type allows the received signal into the line driver chip-set. The signal payload is extracted from the incoming framed signal and transmitted back to the line with new framing.
- **Loop-Back Off**
  This option disables any loop-back operation currently applied to the selected line.

Loop-back Line Selection

- **Loop-back Line Selection**
  These settings are used to select the lines to which the selected Loop-back Type are applied.

Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

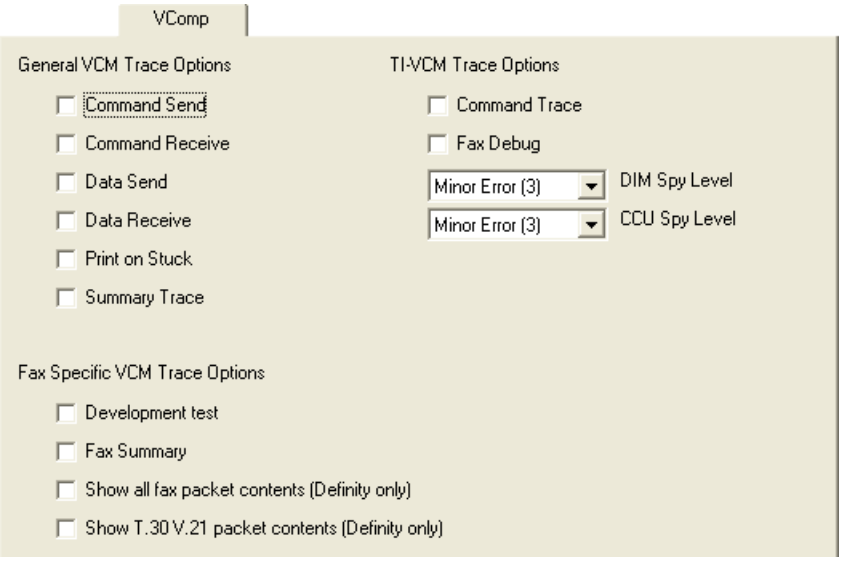
- *None*.

4.10.23 VComp

This tab provides trace options for monitoring the system's voice compression channels. Note that these options produce a large amount of trace records and so should be used with caution.

The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

These options should only be used under the guidance of an authorized Avaya development engineer.



General VCM Trace Options

- **Command Send**
  If selected, this option logs details of commands transmitted to the voice compressor chip.
- **Command Receive**
  If selected, this option logs details of commands received from the voice compressor chip.
- **Data Send**
  If selected, this option logs details of data transmitted to the voice compressor chip (additional detail from the Command Send option).
- **Data Receive**
  If selected, this option logs details of data received from the voice compressor chip (additional detail from the Command Receive option).
- **Print on Stuck**
  This option produce the summary trace but only if the system detects a severe problem.
- **Summary Trace**
  If selected, this option logs the commands to and from all the voice compressor chips (multiple occurrences are counted to reduce output) and the output is controlled so as not to swamp the system. Care should be exercised when selecting this option - especially if multiple VoIP calls are in progress.

Fax Specific VCM Trace Options

- **Development Test**
  Used when debugging private variations of Development s/w.
- **Fax Summary**
  If selected, this option logs the V.21 and T.30 messages.
- **Show all fax packet contents (Definity only)**
  Display the contents of ALL fax packets - including the actual fax data (only when connected to a Definity).
- **Show T.30 V.21 packet contents (Definity only)**
  Display the contents of T.30 and V.21 packet (only when connected to a Definity).

TI-VCM Trace Options

- **Command Trace**
- **Fax Debug**
- **DIM Spy Level**
- **CCU Spy Level**

Default Settings

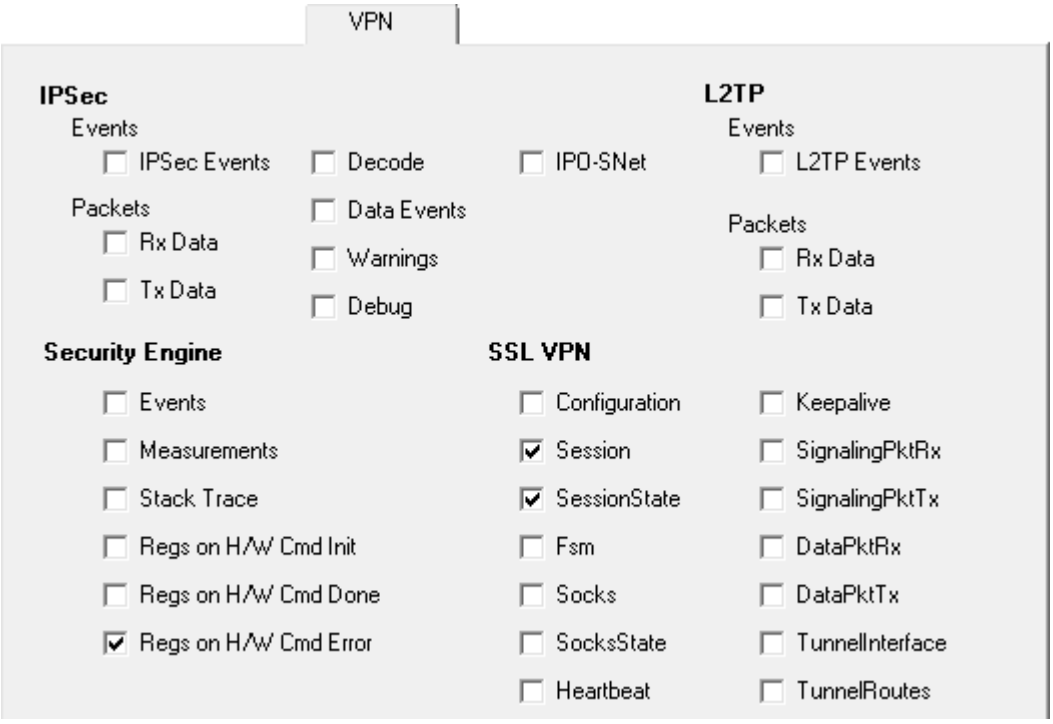
The following trace options are enabled by default (see Defaulting the Trace Options 50):

- *None*.

4.10.24 VPN

This tab provides trace options for monitoring the systems VPN connections.

These options should only be used under the guidance of an authorized Avaya development engineer.



IPSec

Events

- **IPSec Events**
  If selected, this option logs primary events when bringing up and tearing down IPSec tunnels. It also indicates when packets are being discarded, etc.
- **Decode**
  If selected, this option logs the decrypted IKE packets.
- **IPO-SNet**
  Not currently used.
- **Data Events**
  If selected, this option logs when packets are encrypted into and out of tunnel. It does not display the actual packet contents, they can be logged using the **Interface** 62 tab options **Interface Packets In** and **Interface Packets Out**.
- **Warnings**
  If selected, this option logs information relating to faults in the IPSec processing.
- **Debug**
  If selected, this option logs special engineering trace information.

Packets

- **Rx Data**
  If selected, this option logs the content of received ESP encrypted packets before decryption.
- **Tx Data**
  If selected, this option logs the content of sent ESP encrypted packets after encryption.

L2TP

Events

- **L2TP Events**
  If selected, this option logs the establishment of the L2TP tunnel (the stage underneath the PPP). You really need to include the appropriate PPP tracing additionally to this to see the complete picture.

Packets

- **Rx Data**
  Currently not used.

- **Tx Data**
  Currently not used.

Security Engine

- **Events**
- **Measurements**
- **Stack Trace**
- **Regs on H/W Cmd Init**
- **Regs on H/W Cmd Done**
- **Regs on H/W Cmd Error**

SSL VPN

- **Configuration**
- **Session**
- **Session State**
- **Fsm**
- **Socks**
- **SocksState**
- **Heartbeat**
- **Keepalive**
- **SignalingPktRx**
- **SignalingPkTx**
- **DataPktRx**
- **DataPktTx**
- **TunnelInterface**
- **TunnelRoutes**

Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- **Security Engine: Regs on H/W Cmd Error**. **SSL VPN: Session** and **Session State**.

4.10.25 WAN

This tab provides trace options for monitoring the system's WAN ports.

Events

- **WAN Events**
  If selected, this option logs messages that are associated with changes to the software state machine controlling the WAN link on the selected unit.

Packets

- **WAN Tx**
  If selected, this option logs all IP data packets transmitted on the WAN ports of the selected unit.
- **WAN Rx**
  If selected, this option logs all IP data packets received on the WAN ports of the selected unit.

Default Settings

The following trace options are enabled by default (see Defaulting the Trace Options 50):

- **WAN Events**.

Chapter 5.
Syslog Tracing

5. Syslog Tracing

For IP Office Release 9.0 and higher, in addition to the existing Syslog output of alarms and events, IP Office systems can also output system monitor events to Syslog.

Activation of Syslog monitor events output is done through IP Office Manager. Configuration of which trace options to include in the output is done using System Monitor.

To view the Syslog files containing monitor events in monitor, they need to be converted to monitor log file. That task can be done using monitor.

Summary:

1. **Enable IP Office Syslog Monitor Output** 88
   Enable the output of system monitor events from the IP Office system as part of its Syslog output.
2. **Configuring the Syslog Trace Options** 89
   Apply a set of system monitor trace options to the Syslog monitor output.
3. **Downloading Monitor Syslog Files from a Linux System** 90
   If sending the Syslog records to a Linux based IP Office server, they can be downloaded from the server's web control menus.
4. **Converting Monitor Syslog Files** 91
   Convert the Syslog monitor files to monitor log files. You can then view the converted files can in monitor. See Opening a Log File 43.

5.1 Enabling Syslog Monitor Output

Syslog output from IP Office systems is configured using IP Office Manager.

- Whilst an IP Office system can have several Syslog outputs, only one output can include **System Monitor** events.

To include System Monitor events in a system's Syslog output:

1. Using IP Office Manager, receive the configuration from the IP Office system.
2. Select **System** and then select the **System Events** tab.
3. Click **Add** and set the **Destination** to ***Syslog***.
4. Enter the details for the destination server for the Syslog output.
   - For Linux based IP Office servers you can use ***127.0.0.1*** to specify that the server should store the Syslog records itself.
   - If the Syslog server is a Linux based IP Office server, then the logs are stored in ***/var/log/sysmon***. This store hourly Syslog monitor files a maximum of 3 days. However, the maximum total log files size per day is 4GB.
5. The recommended **Protocol** is ***UDP***.
6. Set the **Format** to ***Enterprise***.
7. From the list of **Events** select ***System Monitor***.
8. Click **OK**. and save the configuration back to the IP Office system.
9. You can now customize the monitor trace options to include in the Syslog output. See Configuring the Syslog Trace Options 89.

5.2 Configuring the Syslog Trace Options

Unless specified otherwise, when a system's Syslog output includes System Monitor events 88, the events included are **Print**, **Error**, **Resource** and **Licensing**. However, using System Monitor you can alter the trace options that the system includes.

To set the Syslog Trace Options:

1. Using System Monitor connect to the IP Office system. See Selecting the System to Monitor 33.
2. Set the trace options required. See Setting the Trace Options 47.
   - **Tip:** Save the trace options 47 as a file so that you can reload them at a later date if you need to reapply or amend them.
3. Select **Filters** and click **Send To Syslog**. This sends the trace option settings as a file to the connected IP Office system. They are then applied to the monitor events included in the system's Syslog output.

5.3 Downloading a Syslog Archive

Linux based servers can store their own Syslog monitor records by using the destination ***127.0.0.1***. You can then download these records from the server's web management menus.

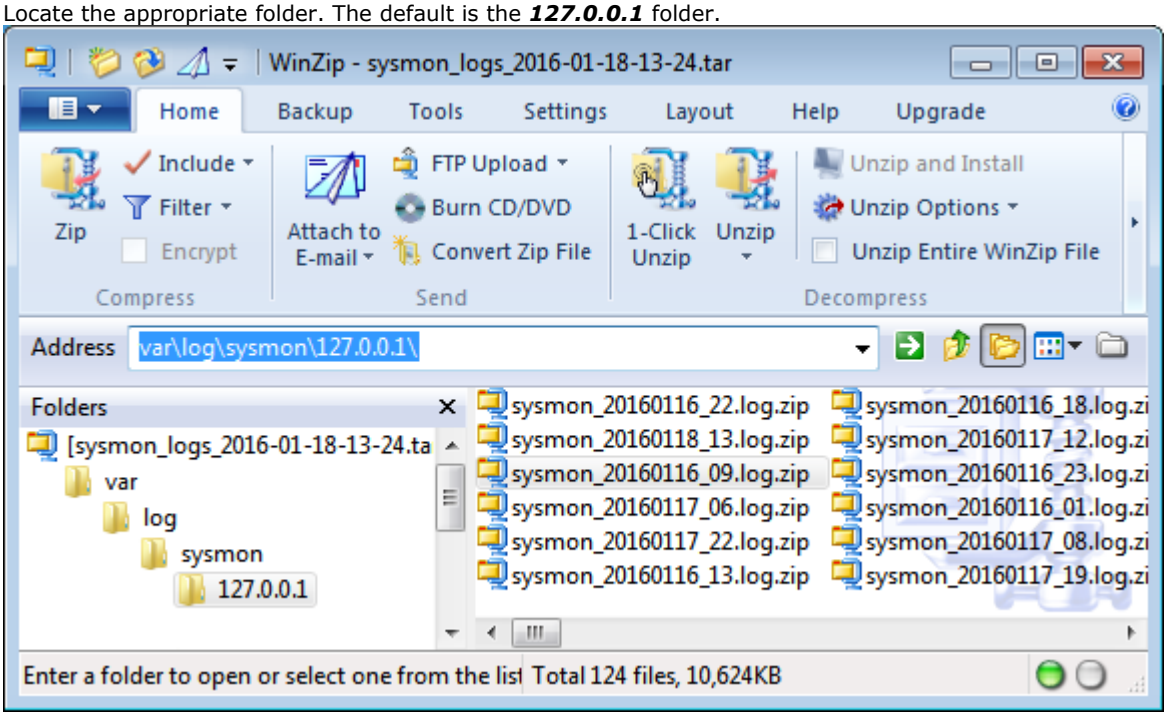
The download file is a ***.tar.gz*** format archive file. It can contain a number of ***.zip*** files, each of which contains a Syslog monitor ***.log*** file.

To download a server's Syslog monitor files:

1. Using a browser, login to the server's web management menus.
2. Click **Solution**.
3. Click on the ☰ icon next to the required server and select **Platform View**.
4. Select **Log** and then **Download**.
5. Click on the **Create Archive** button in the **Logs** section. The button remains greyed out whilst the server creates an compressed archive file for each of the different types of log files it is storing. Each file contains all the logs that have not been previously archived.
6. The Syslog monitor file is prefixed with ***sysmon_logs*** followed by the date and time. To download the file, click on the filename and follow the normal download options for your browser.

To extract the system monitor Syslog files:

1. Open the ***sysmon_logs .tar.gz*** file using a suitable tool such as 7-Zip.
2. Locate the appropriate folder. The default is the ***127.0.0.1*** folder.



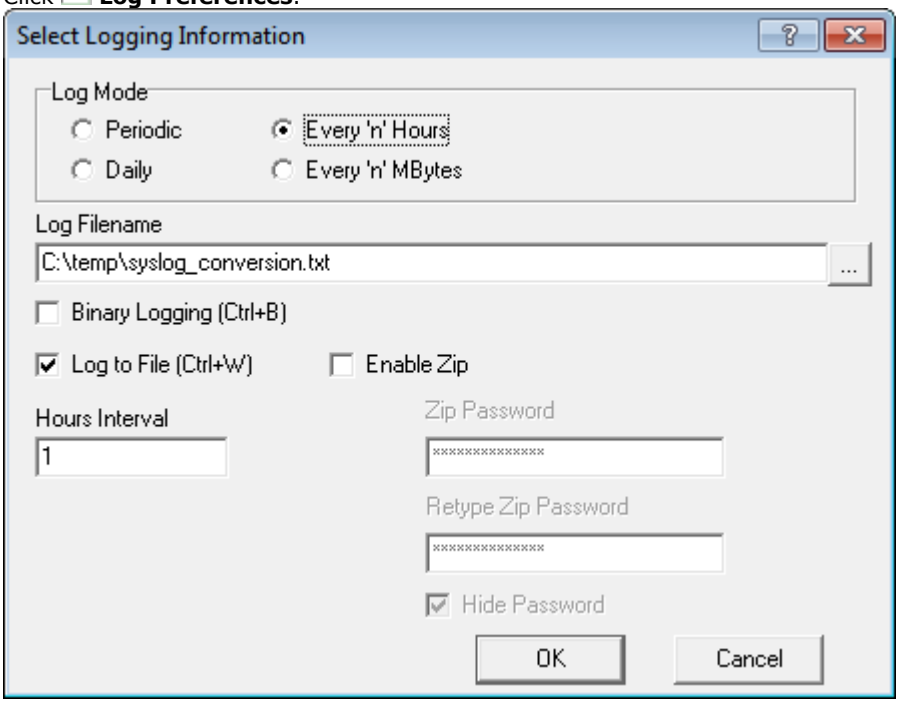
3. Extract the individual ***.zip*** files to your PC.

5.4 Converting Syslog Files

The monitor Syslog files can be converted to system monitor log files.

To configure the logging options for file conversion:

1. Start monitor.
2. Click **Log Preferences**.



3. You can use the **Log Mode** setting ***Every 'n' MBytes***. If set, the current ***.txt*** file is rolled over to start a new ***.txt*** file when necessary. Otherwise, a new file is started each time the current log file reaches 100MB.
4. Set the log file name and location using the **Log Filename** field. The default location is the System Monitor application program folder ***C:\Program Files (x86)\Avaya\IP Office\Monitor***. Each time and new log file is started, monitor adds the date and time to the log file name.
   - One monitor ***.txt*** file is created for each Syslog ***.log*** file being converted.
   - If the **Every 'n' MBytes** setting is set, a new ***.txt*** file is started if it is reached during the conversion of a file.
5. Do not select **Binary Logging** and **Enable Zip**.
6. Select **Log to File**.
5. Click **OK**.

To convert the Syslog monitor files:

1. Configure the required logging settings as above.
2. If converting a large file or numerous files, click to pause the screen trace display. This speeds up the conversion process.
3. Click **Open File**.
4. Browse to and select the ***.zip*** file containing the monitor Syslog log files. You can select more than one file if required. Alternatively, select the ***.log*** file or files if they have already been extracted from the archive file.
5. You are prompted for a password. Just click **OK**.
6. Click **Open**.
7. The file or files are converted to system monitor ***.txt*** log files using the logging settings.

Chapter 6.
Status Screens

6. Status Screens

In addition to screen logging, System Monitor can display a number of status screens that show additional information about the connected system. These are accessed by clicking Status and selecting the required status menu.

The following additional status menus are accessible if the **Development Tracing** trace option is selected. See System Trace Options 79.

6.1 Alarms

This status menu displays the alarms records in the connected system's alarms log.

When System Monitor connects to a system, the trace includes the system's alarm log. The alarms cannot be interpreted. However, if a site is the same repeated problem, Avaya may request the alarm log details.

The presence of alarms is not necessarily critical as each system keeps a record of the first 8 alarms since the alarm log was last cleared. However, once the alarm log is full, the system ignores additional alarms.

```
3003mS PRN: +++ START OF ALARM LOG DUMP +++
3019mS PRN: ALARM: 18/03/2004 13:07:56 IP 412 2.1(8) <Program Exception> CRIT RAISED addr=00000000 d=5 pc=00000000 0082eef0 0094d780
3019mS PRN: ALARM: 22/04/2004 07:26:44 IP 412 2.1(11) <Program Exception> CRIT RAISED addr=00000000 d=5 pc=00000000 0095dfe0 0095e27
3019mS PRN: ALARM: 22/04/2004 07:26:46 IP 412 2.1(11) <WATCHDOG> CRIT RAISED addr=00000000 d=0 pc=00000000 01e75750 01f983d4 0095e27
3004mS PRN: +++ END OF ALARM LOG DUMP +++
```

To view the alarm log:

1. Click **Status** and select **Alarms**.
2. System Monitor displays the alarm records in a separate window.

To clear the alarm log:

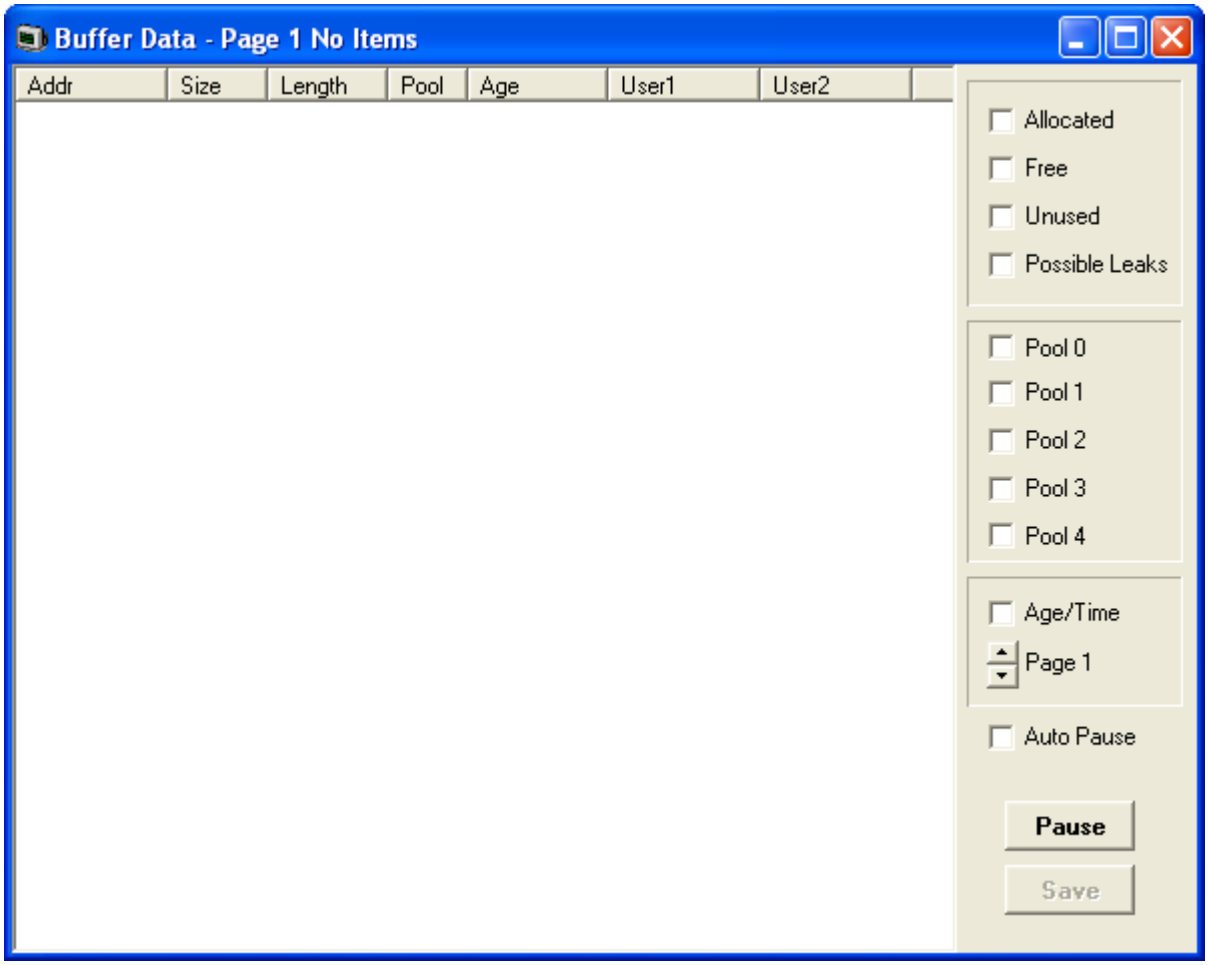
1. View the alarm log using the process above.
2. Click **Clear Alarms**.

6.2 Buffer Data

This status menu displays data about the system's memory buffers.

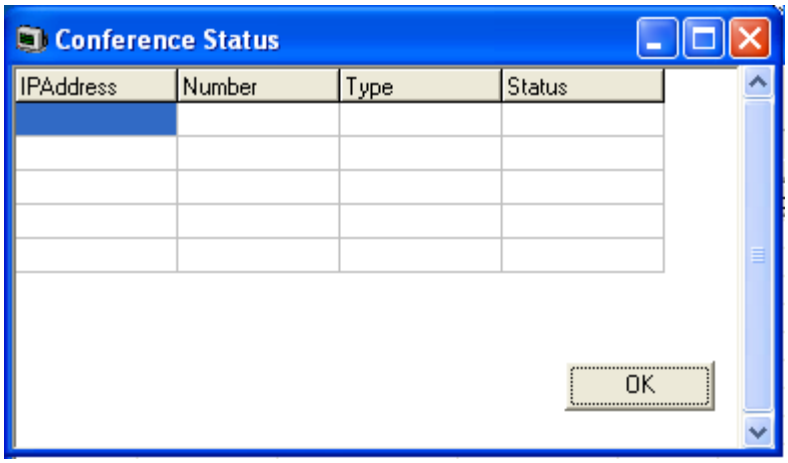
The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

These options should only be used under the guidance of an authorized Avaya development engineer.



6.3 Conference Status

This status menu displays the status of conference's being supported by the system.

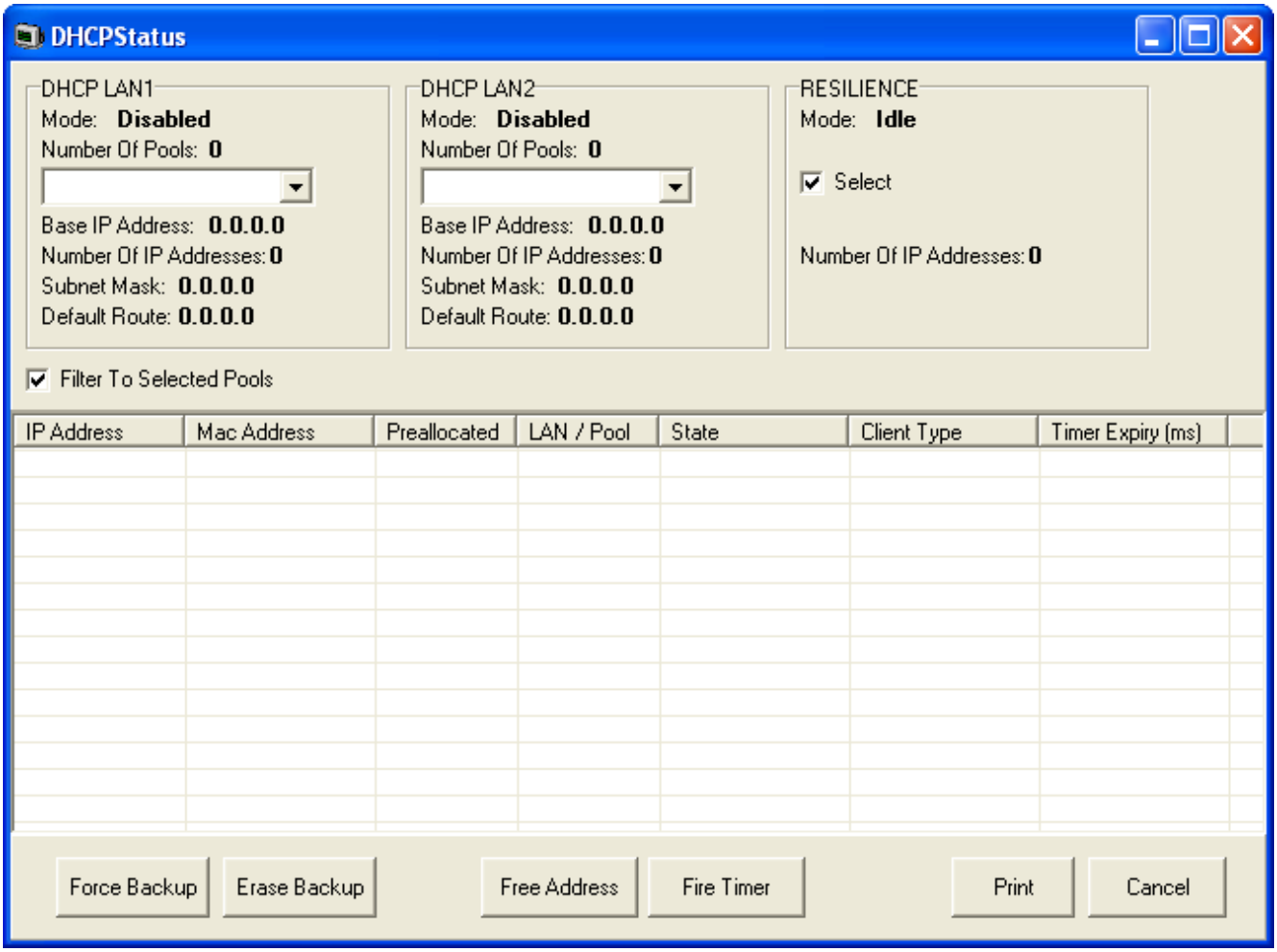


6.4 DHCP Data

This status menu displays details of the system's DHCP server settings and the DHCP clients being supported by the system.

The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

These options should only be used under the guidance of an authorized Avaya development engineer.

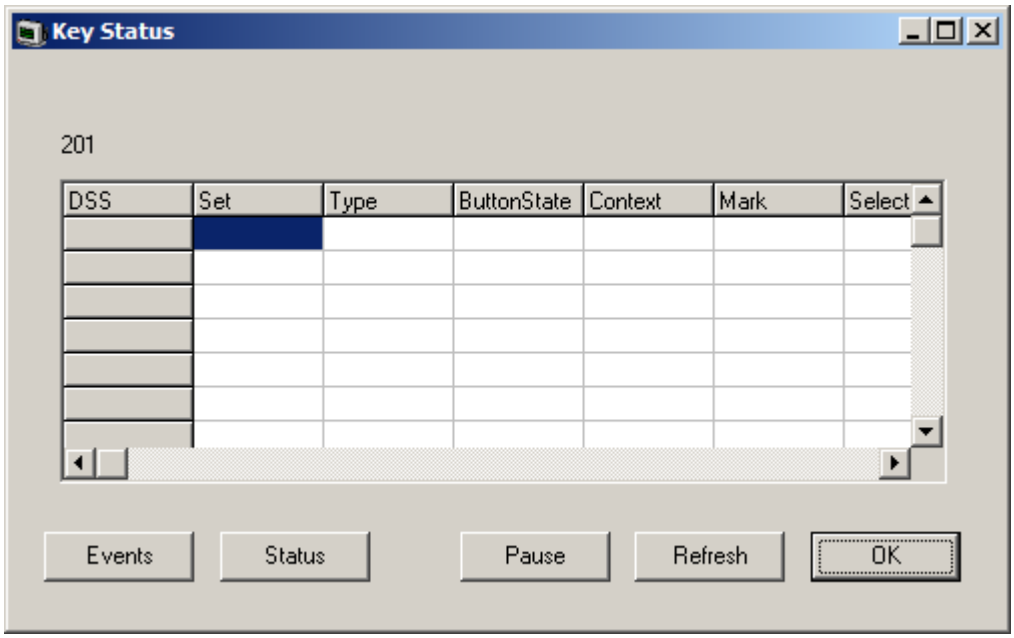


6.5 DSS Status

This status menu displays details of an extensions DSS keys. When selected, System Monitor prompts for the extension first. It then displays the status of that extensions DSS keys.

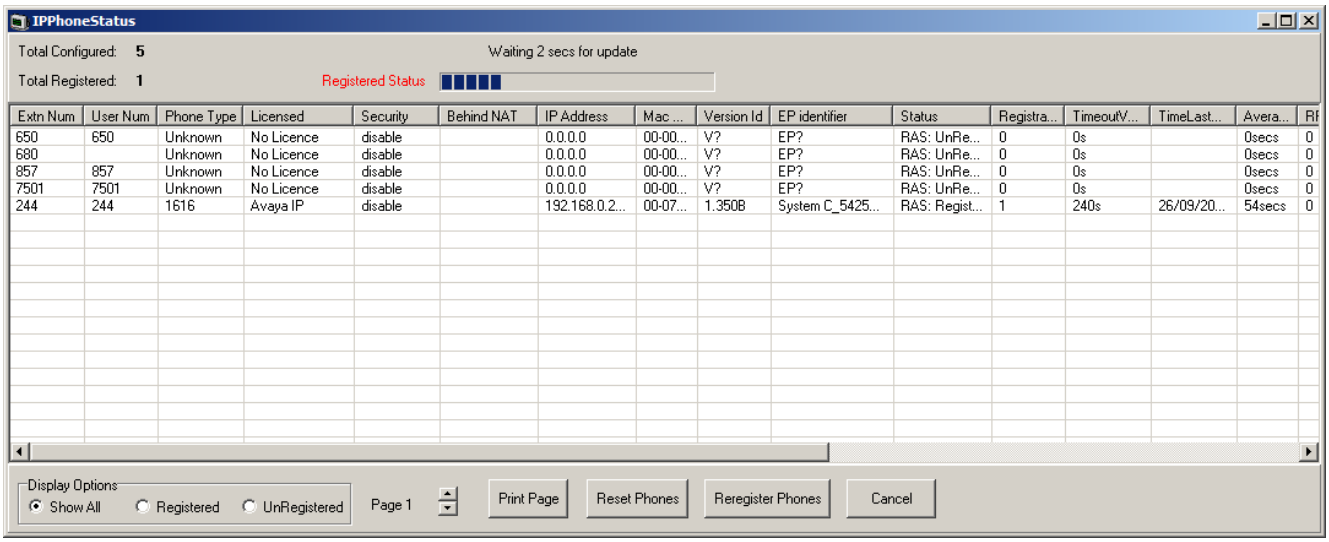
The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

These options should only be used under the guidance of an authorized Avaya development engineer.



6.6 H.323 Phone Status

This status menu displays details of the H.323 end points known by the system.



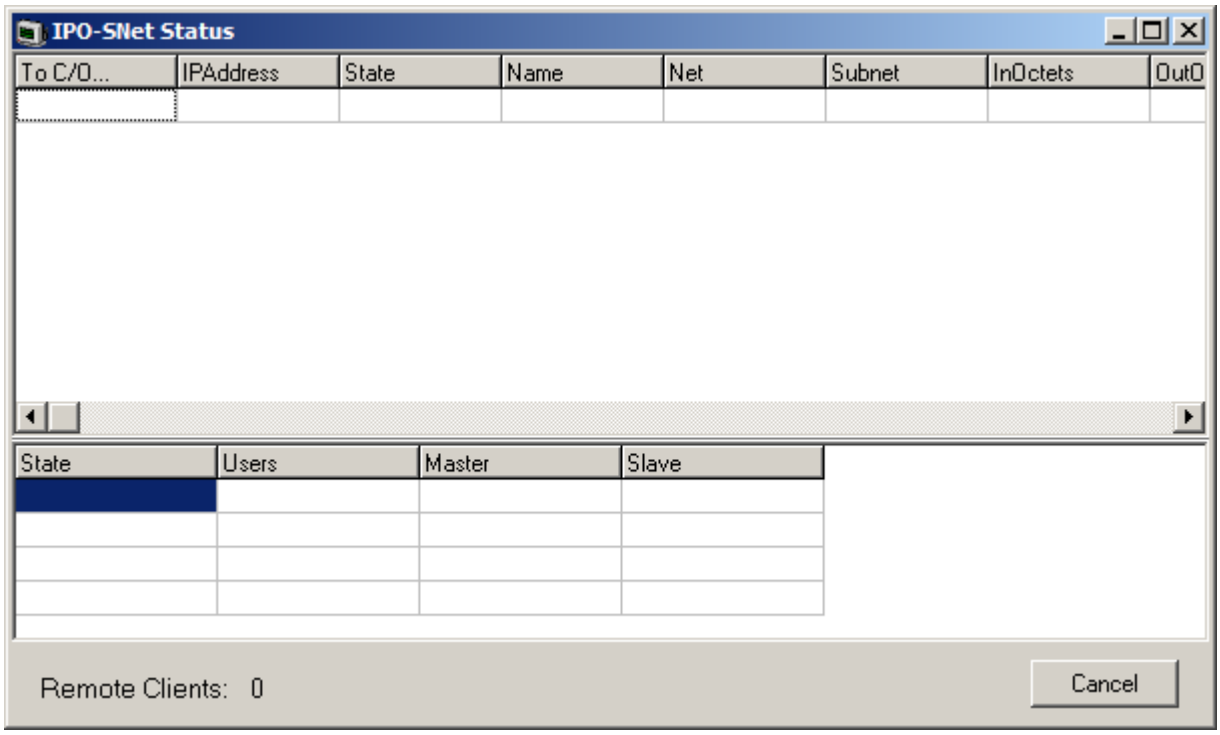
Extn Num	User Num	Phone Type	Licensed	Security	Behind NAT	IP Address	Mac ...	Version Id	EP identifier	Status	Registra...	TimeoutV...	TimeLast...	Avera...	Rf
650	650	Unknown	No Licence	disable		0.0.0.0	00-00...	V?	EP?	RAS: UnRe...	0	0s		0secs	0
680		Unknown	No Licence	disable		0.0.0.0	00-00...	V?	EP?	RAS: UnRe...	0	0s		0secs	0
857	857	Unknown	No Licence	disable		0.0.0.0	00-00...	V?	EP?	RAS: UnRe...	0	0s		0secs	0
7501	7501	Unknown	No Licence	disable		0.0.0.0	00-00...	V?	EP?	RAS: UnRe...	0	0s		0secs	0
244	244	1616	Avaya IP	disable		192.168.0.2...	00-07...	1.350B	System C_5425...	RAS: Regist...	1	240s	26/09/20...	54secs	0

- **Reset Phones**
  Cause the selected phones to restart and reregister.
- **Reregister Phones**
  Cause the selected phones to reregister without restarting.

6.7 IPO-SNet

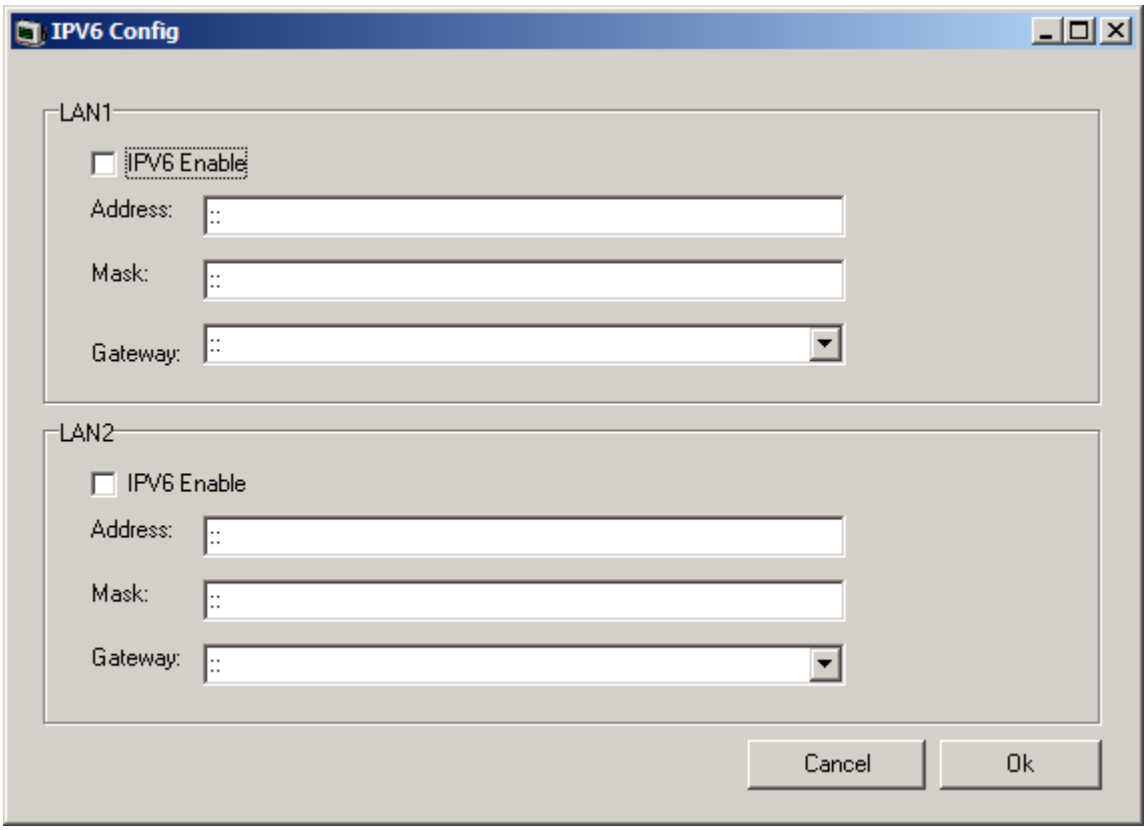
The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

These options should only be used under the guidance of an authorized Avaya development engineer.



6.8 IPV6 Config

This status menu is not currently used.

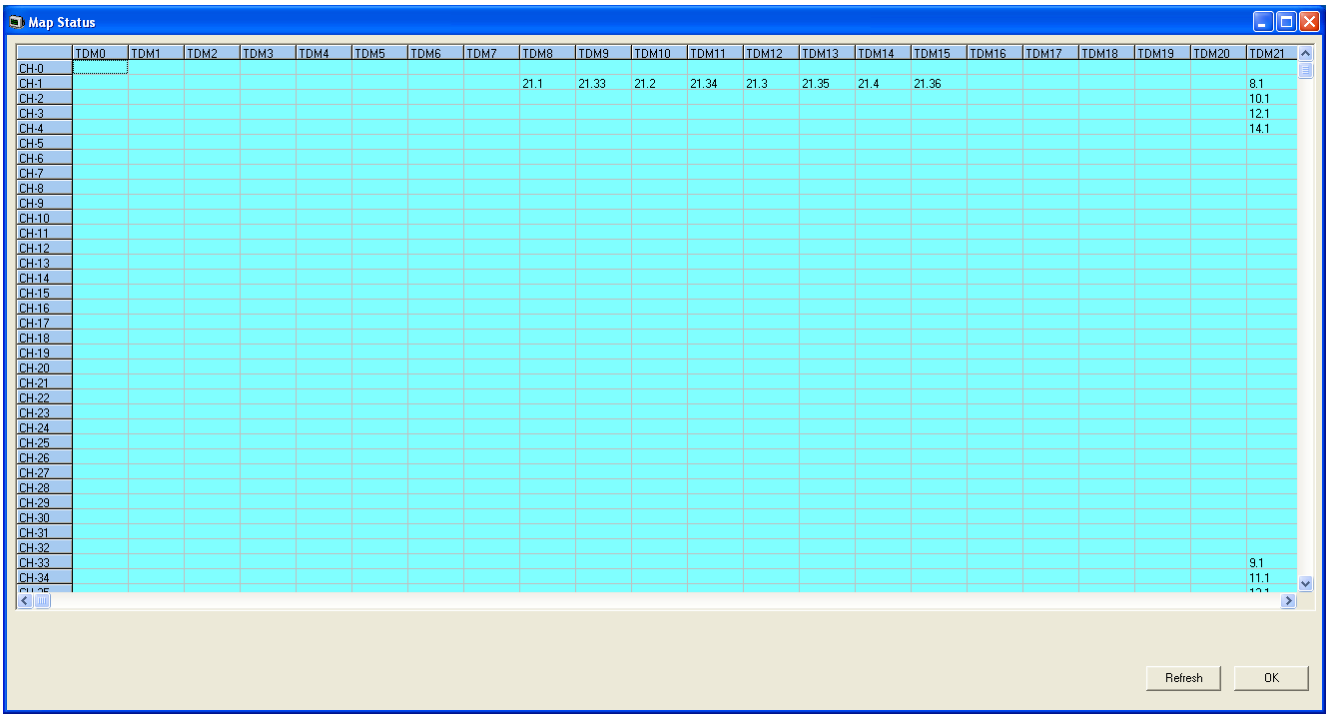


6.9 Logging

The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

These options should only be used under the guidance of an authorized Avaya development engineer.

6.10 Map Status



6.11 Memory Data

The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

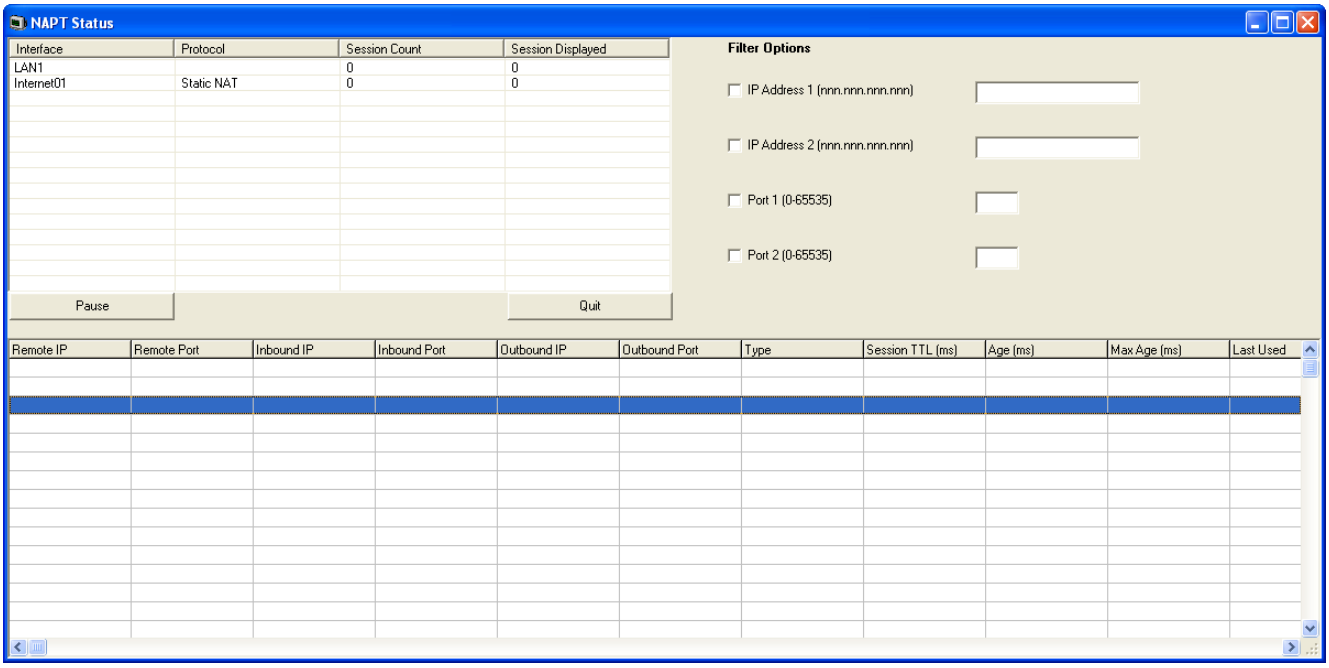
These options should only be used under the guidance of an authorized Avaya development engineer.

6.12 NAPT Status

This status menu displays the status of NAPT sessions being supported by the system.

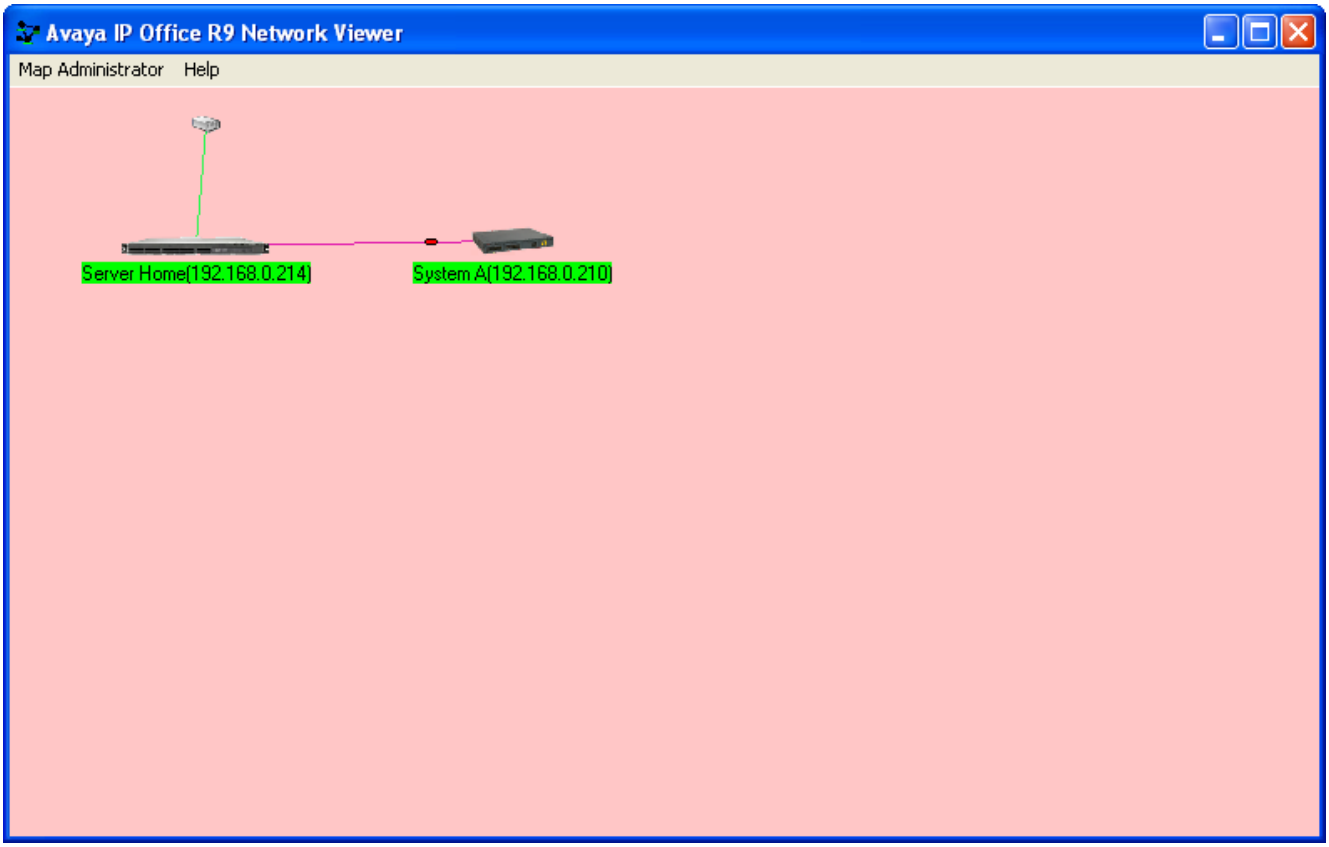
The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

These options should only be used under the guidance of an authorized Avaya development engineer.



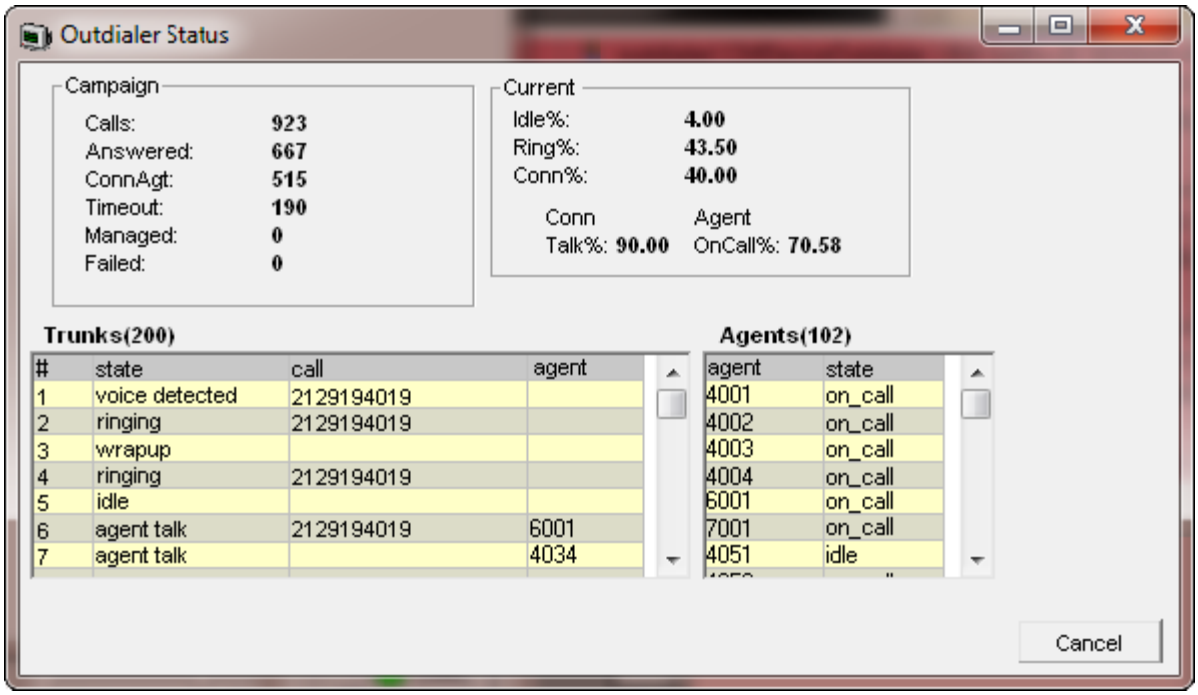
6.13 Network View

This status menu displays a view of the multisite network of which the system is a part. It can also display calls between the sites. Network view is currently not supported when using TCP, HTTP or HTTPS to connect System Monitor to the system.



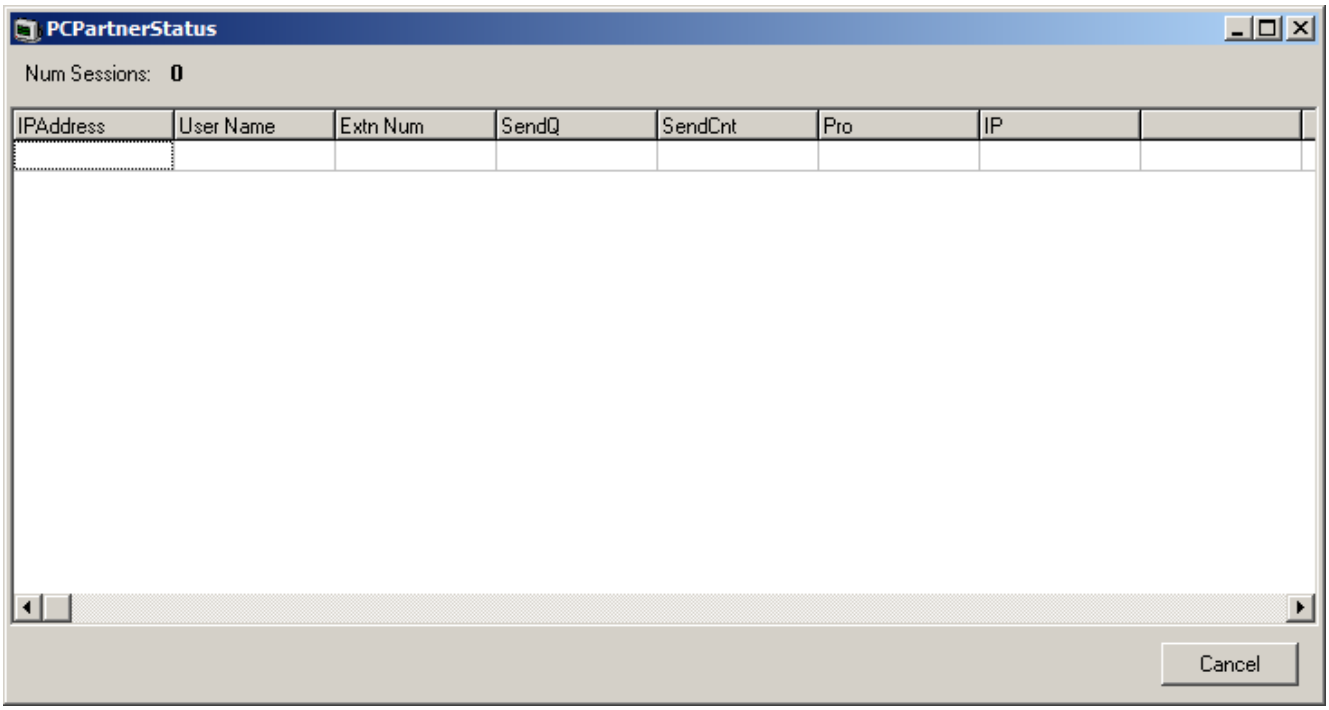
6.14 Outdialer Status

This status menu shows a summary of the activity of the outdialing server supported by the system.



6.15 Partner Sessions

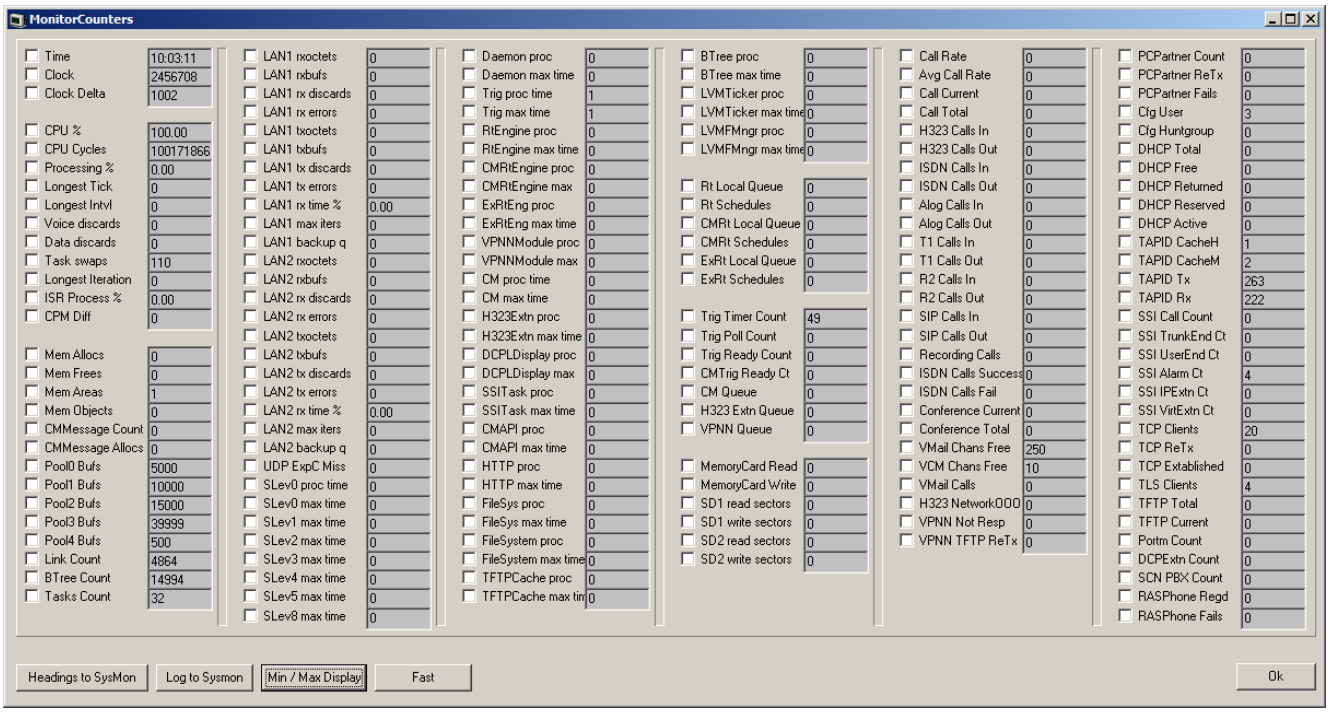
This status menu displays details of the the connections for IP Office PCPartner applications (SoftConsole) to the system.



6.16 Performance Data

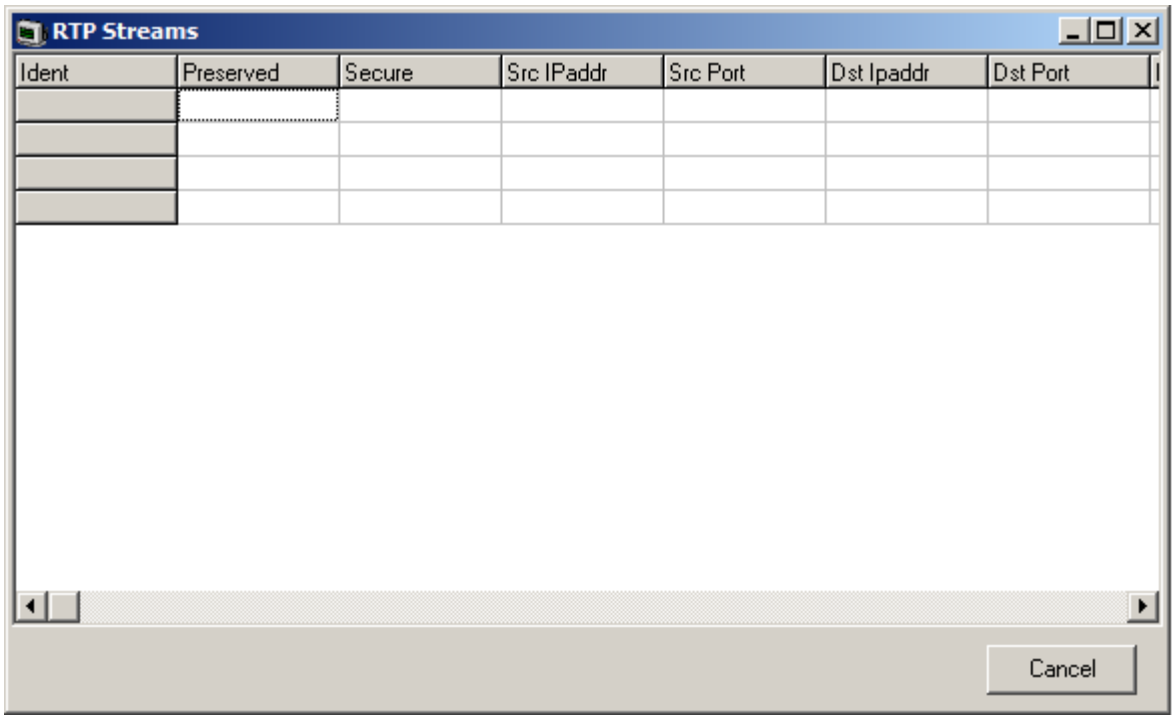
The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

These options should only be used under the guidance of an authorized Avaya development engineer.



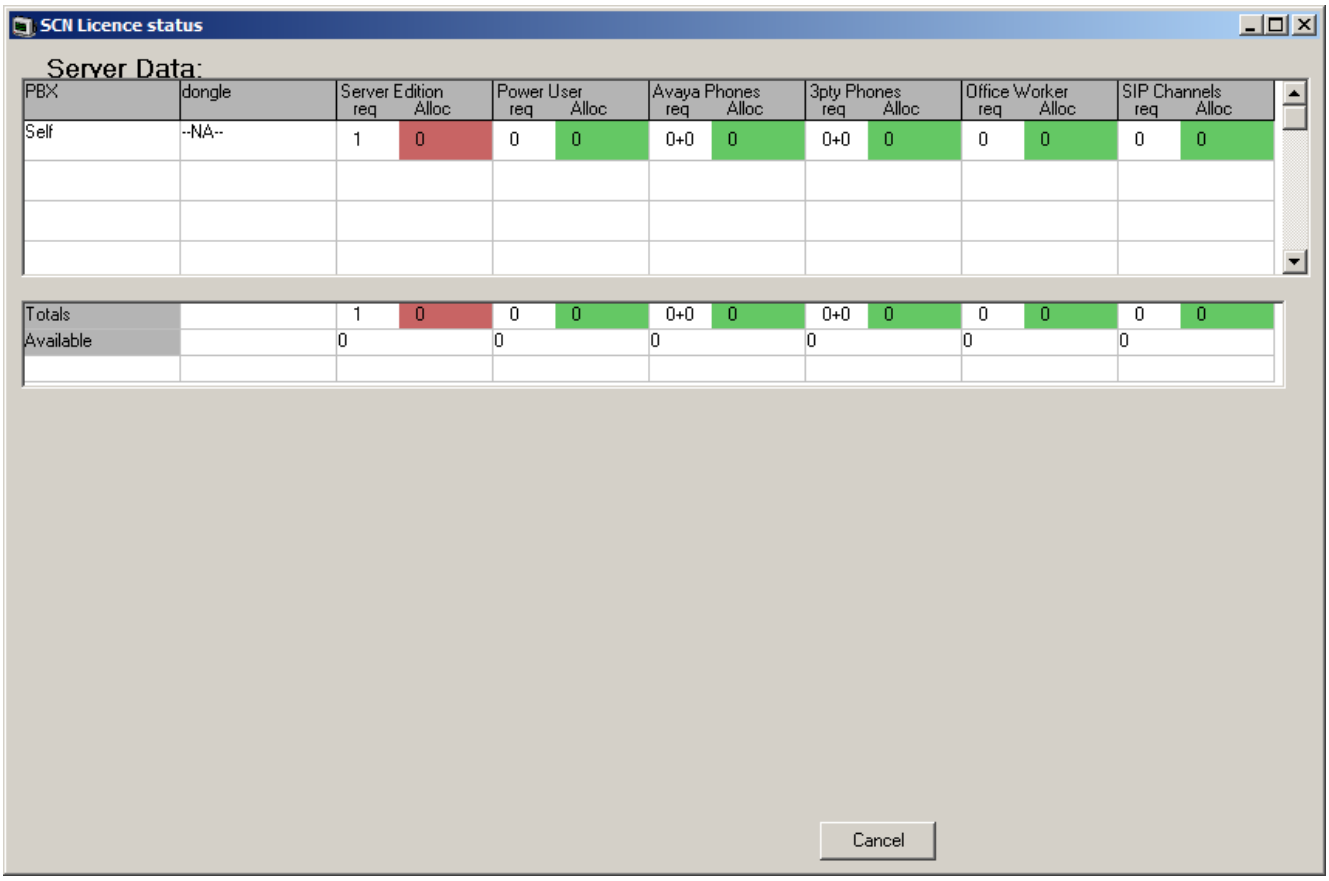
6.17 RTP Sessions

This status menu displays details of the RTP sessions being supported by the system.



6.18 SCN Licence

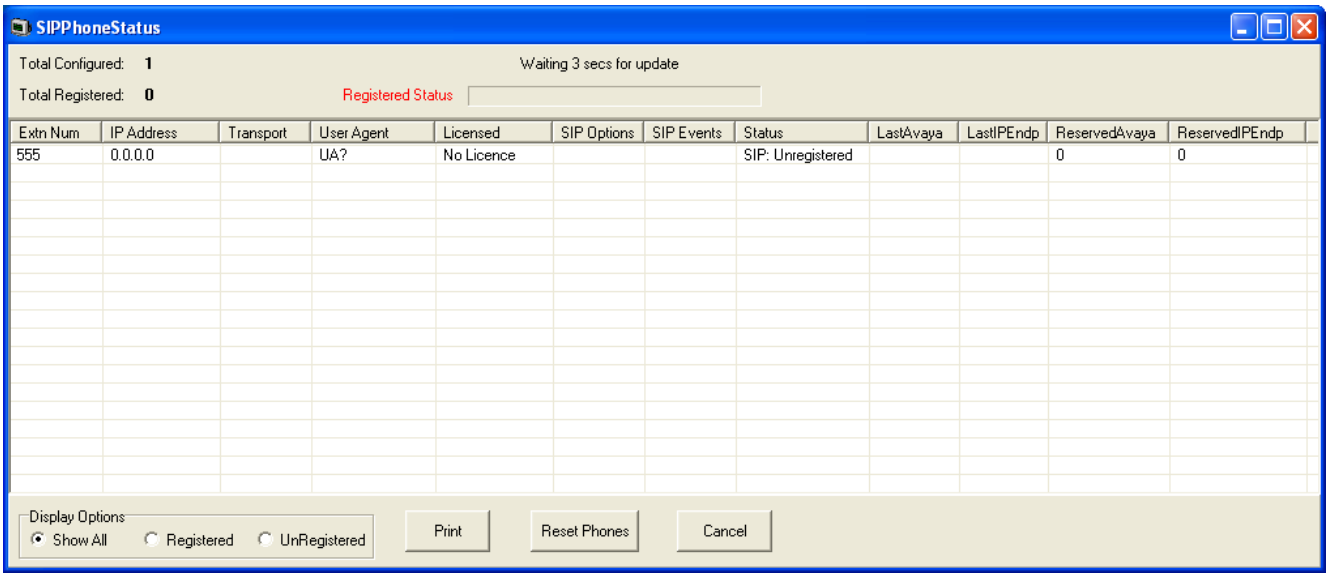
This status menu displays details of the available and those used in a Server Edition network.



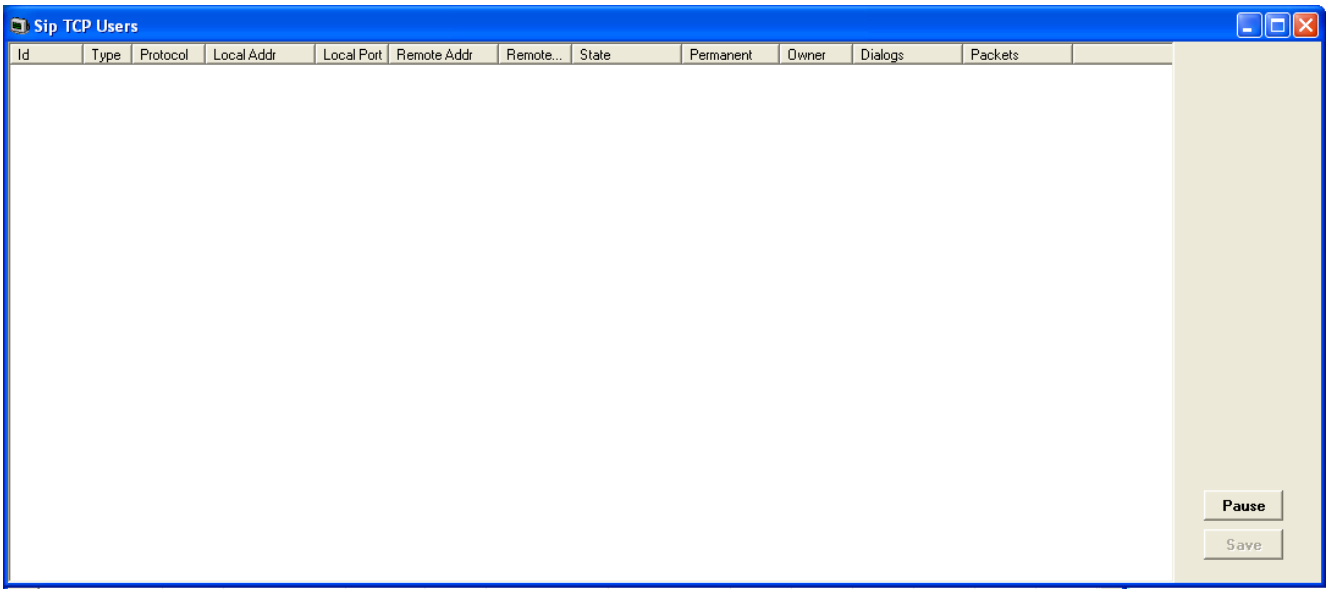
PBX	dongle	Server Edition req	Server Edition Alloc	Power User req	Power User Alloc	Avaya Phones req	Avaya Phones Alloc	3pty Phones req	3pty Phones Alloc	Office Worker req	Office Worker Alloc	SIP Channels req	SIP Channels Alloc
Self	--NA--	1	0	0	0	0+0	0	0+0	0	0	0	0	0
Totals		1	0	0	0	0+0	0	0+0	0	0	0	0	0
Available		0		0		0		0		0		0	

6.19 SIP Phone Status

This status menu displays the status of the SIP end points known by the system.

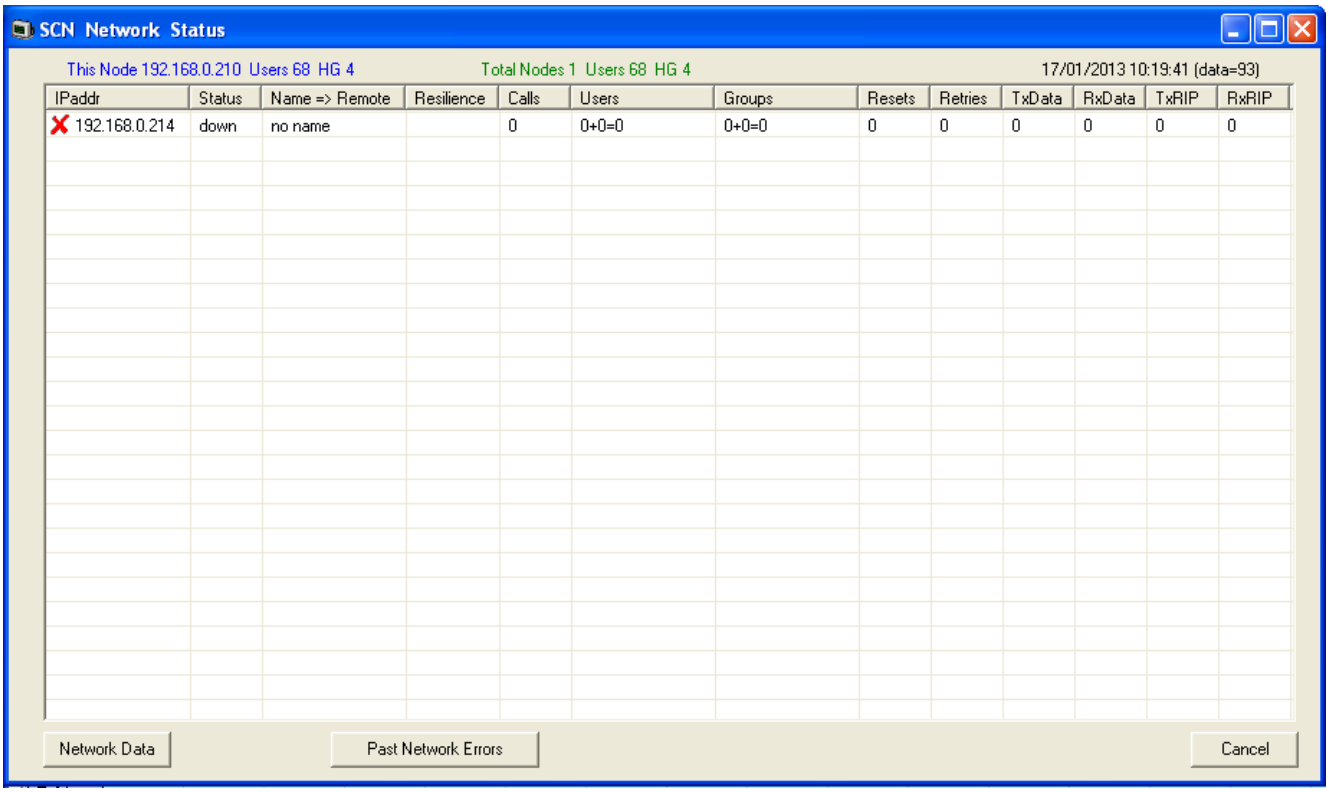


6.20 SIP TCP User Data



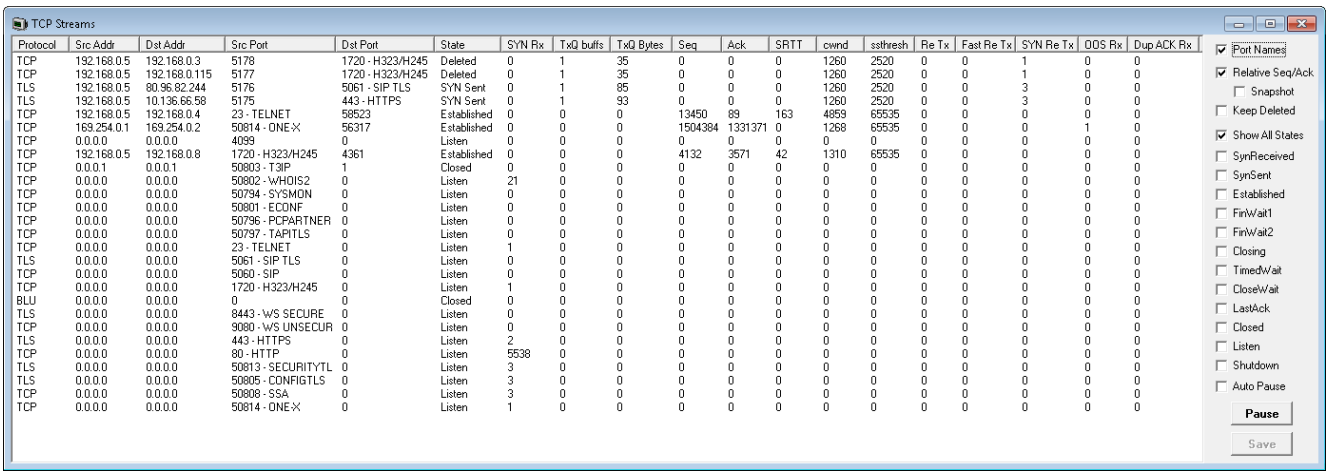
6.21 Small Community Networking

This status menu displays the status of the system's multisite network connections.



IPaddr	Status	Name => Remote	Resilience	Calls	Users	Groups	Resets	Retries	TxData	RxData	TxRIP	RxRIP
192.168.0.214	down	no name		0	0+0=0	0+0=0	0	0	0	0	0	0

6.22 TCP Streams Data



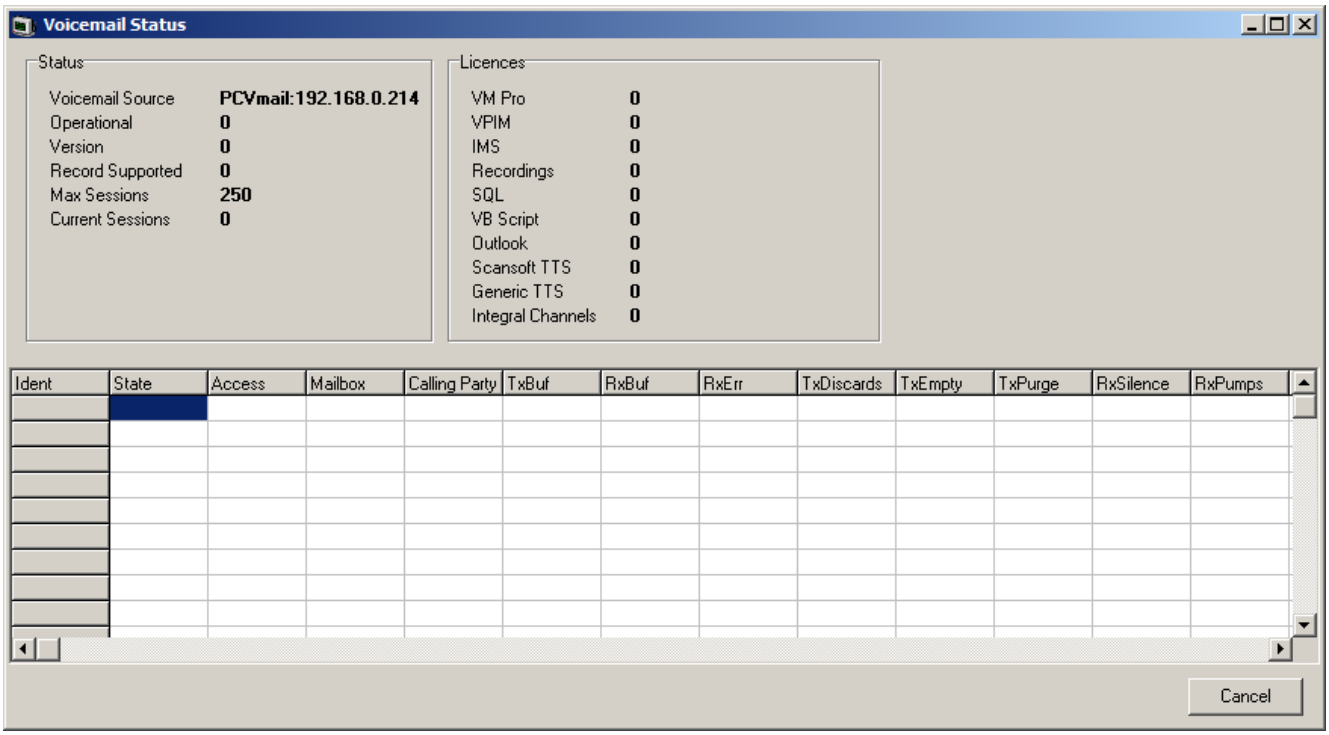
Protocol	Src Addr	Dst Addr	Src Port	Dst Port	State	SYN Rx	TxQ buffs	TxQ Bytes	Seq	Ack	SRTT	cwnd	ssthresh	Re Tx	Fast Re Tx	SYN Re Tx	OOS Rx	Dup ACK Rx
TCP	192.168.0.5	192.168.0.3	5178	1720 - H323/H245	Deleted	0	1	35	0	0	0	1260	2520	0	0	1	0	0
TCP	192.168.0.5	192.168.0.115	5177	1720 - H323/H245	Deleted	0	1	35	0	0	0	1260	2520	0	0	1	0	0
TLS	192.168.0.5	80.96.82.244	5176	5061 - SIP TLS	SYN Sent	0	1	85	0	0	0	1260	2520	0	0	3	0	0
TLS	192.168.0.5	10.136.66.58	5175	443 - HTTPS	SYN Sent	0	1	93	0	0	0	1260	2520	0	0	3	0	0
TCP	192.168.0.5	192.168.0.4	23 - TELNET	58523	Established	0	0	0	13450	89	163	4859	65535	0	0	0	0	0
TCP	169.254.0.1	169.254.0.2	50814 - ONEX	56317	Established	0	0	0	1504384	1331371	0	1268	65535	0	0	0	1	0
TCP	0.0.0.0	0.0.0.0	4099	0	Listen	0	0	0	0	0	0	0	0	0	0	0	0	0
TCP	192.168.0.5	192.168.0.8	1720 - H323/H245	4361	Established	0	0	0	4132	3571	42	1310	65535	0	0	0	0	0
TCP	0.0.0.1	0.0.0.1	50803 - T3IP	1	Closed	0	0	0	0	0	0	0	0	0	0	0	0	0
TCP	0.0.0.0	0.0.0.0	50802 - WHOIS2	0	Listen	21	0	0	0	0	0	0	0	0	0	0	0	0
TCP	0.0.0.0	0.0.0.0	50794 - SYSMON	0	Listen	0	0	0	0	0	0	0	0	0	0	0	0	0
TCP	0.0.0.0	0.0.0.0	50801 - ECONF	0	Listen	0	0	0	0	0	0	0	0	0	0	0	0	0
TCP	0.0.0.0	0.0.0.0	50796 - PCPARTNER	0	Listen	0	0	0	0	0	0	0	0	0	0	0	0	0
TCP	0.0.0.0	0.0.0.0	50797 - TAPITLS	0	Listen	0	0	0	0	0	0	0	0	0	0	0	0	0
TCP	0.0.0.0	0.0.0.0	23 - TELNET	0	Listen	1	0	0	0	0	0	0	0	0	0	0	0	0
TLS	0.0.0.0	0.0.0.0	5061 - SIP TLS	0	Listen	0	0	0	0	0	0	0	0	0	0	0	0	0
TCP	0.0.0.0	0.0.0.0	5060 - SIP	0	Listen	0	0	0	0	0	0	0	0	0	0	0	0	0
TCP	0.0.0.0	0.0.0.0	1720 - H323/H245	0	Listen	1	0	0	0	0	0	0	0	0	0	0	0	0
BLU	0.0.0.0	0.0.0.0	0	0	Closed	0	0	0	0	0	0	0	0	0	0	0	0	0
TLS	0.0.0.0	0.0.0.0	8443 - WS SECURE	0	Listen	0	0	0	0	0	0	0	0	0	0	0	0	0
TCP	0.0.0.0	0.0.0.0	9080 - WS UNSECUR	0	Listen	0	0	0	0	0	0	0	0	0	0	0	0	0
TLS	0.0.0.0	0.0.0.0	443 - HTTPS	0	Listen	2	0	0	0	0	0	0	0	0	0	0	0	0
TCP	0.0.0.0	0.0.0.0	80 - HTTP	0	Listen	5538	0	0	0	0	0	0	0	0	0	0	0	0
TLS	0.0.0.0	0.0.0.0	50813 - SECURITYTL	0	Listen	3	0	0	0	0	0	0	0	0	0	0	0	0
TLS	0.0.0.0	0.0.0.0	50805 - CONFIGTLS	0	Listen	3	0	0	0	0	0	0	0	0	0	0	0	0
TCP	0.0.0.0	0.0.0.0	50808 - SSA	0	Listen	3	0	0	0	0	0	0	0	0	0	0	0	0
TCP	0.0.0.0	0.0.0.0	50814 - ONEX	0	Listen	1	0	0	0	0	0	0	0	0	0	0	0	0

6.23 US PRI Trunks

This status menu displays the status of the system's US PRI trunk channels.

6.24 Voicemail Sessions

This status screen displays a summary of the voicemail service connections.



6.25 Voice Compression

This status menu displays the status of the voice compress channels provided by voice compression components not based on the TI chipset.

The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

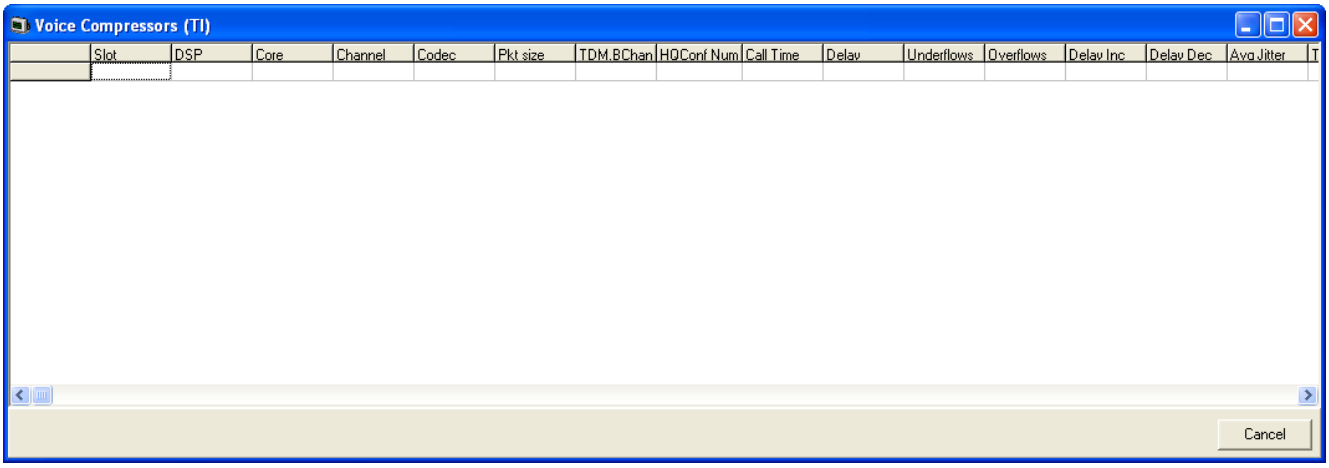
These options should only be used under the guidance of an authorized Avaya development engineer.

6.26 Voice Compression (TI)

This status menu displays the status of the voice compress channels provided by voice compression components based on the TI chipset.

The following options are only available when the **Development Tracing** option is selected in the **Trace Options | System** 79 menu. They are not covered by this document as they are used by Avaya for product trials and are subject to frequent changes.

These options should only be used under the guidance of an authorized Avaya development engineer.



Chapter 7.
Example Monitor Settings

7. Example Monitor Settings

This document gives examples of the typical monitor settings to provide useable traces in different test and diagnosis scenarios.

Interpretation of the resulting traces is not covered in detail as this requires in depth data and telecoms experience.

Scenarios covered are:

7.1 Analog Trunk Caller ID

The following is an example trace from an analogue trunk that supports ICLID/CLI.

```
108691mS PRN: AtmTrunk1: StateChange CLIPossibleIncoming->Idle
108692mS PRN: AtmIO1: Block Forward OFF
108692mS PRN: AtmIO1: CLI Detection ON Equaliser ON
109703mS PRN: AtmTrunk1: CLI Message Rx'd:
109703mS PRN: 0x4500
109704mS PRN: 0x3031
109704mS PRN: 0x3134
109704mS PRN: 0x3136
109704mS PRN: 0x3035
109705mS PRN: AtmTrunk1: CLI Message Rx'd:
109705mS PRN: 0x4980
109706mS PRN: 0x3031
109706mS PRN: 0x3730
109706mS PRN: 0x372d
109706mS PRN: 0x3339
109706mS PRN: 0x3033
109707mS PRN: 0x3931
109707mS PRN: AtmTrunk1: CLI Message Rx'd:
109707mS PRN: 0x5800
09708mS PRN: AtmIO1: CLI Detection OFF Equaliser OFF
109708mS PRN: AtmTrunk1: StateChange CLIAwaitData->CLIDataSettle
109911mS PRN: AtmTrunk1: StateChange CLIDataSettle->CLIAwaitSecondRing
110191mS PRN: AtmTrunk1: StateChange CLIAwaitSecondRing->PossibleIncoming
```

Explanation
`108691mS PRN: AtmTrunk1: StateChange CLIPossibleIncoming->Idle` • The Line interface is primed ready for the possibility of an incoming ICLID/CLI message.
`108692mS PRN: AtmIO1: Block Forward OFF` • AtmIO1 = Line Number 1.
`108692mS PRN: AtmIO1: CLI Detection ON Equaliser ON` • CLI detection has been enabled for trunk 1.
`109703mS PRN: AtmTrunk1: CLI Message Rx'd:` • The first part of a ICLID message on trunk 1 has been detected.
`109703mS PRN: 0x4500` • 4500 = Date and time information. The info then follows in the 4 byte words.

`109704mS PRN: 0x3031`
`109704mS PRN: 0x3134`
`109704mS PRN: 0x3136`
`109704mS PRN: 0x3035`
• The call date and time is 16:05 on 14th January.
  • Month: 30 (hex) = 0 (ASCII), 31 (hex) = 1 (ASCII) > 01 (January)
  • Day: 31 (hex) = 1 (ASCII), 34 (hex) = 4 (ASCII) > 14th.
  • Hours: 31 (hex) = 1 (ASCII), 36 (hex) = 6 (ASCII) > 16:00.
  • Minutes: 30 (hex) = 0 (ASCII), 35 (hex) = 5 (ASCII) > 00:05.

`109705mS PRN: AtmTrunk1: CLI Message Rx'd:` • The second part of the ICLID message on trunk 1 has been detected.
`109705mS PRN: 0x4980` • 4980 = Calling Party Number information.

`109706mS PRN: 0x3031`
`109706mS PRN: 0x3730`
`109706mS PRN: 0x372d`
`109706mS PRN: 0x3339`
`109706mS PRN: 0x3033`
`109707mS PRN: 0x3931`
• The Calling Party Number is 01707-390391
  • 30 (hex) = 0 (ASCII), 31 (hex) = 1 (ASCII) > 01
  • 37 (hex) = 7 (ASCII), 30 (hex) = 0 (ASCII) > 70
  • 37 (hex) = 7 (ASCII), 2d (hex) = - (ASCII) > 7-
  • 33 (hex) = 3 (ASCII), 39 (hex) = 9 (ASCII) > 39
  • 30 (hex) = 0 (ASCII), 33 (hex) = 3 (ASCII) > 03
  • 39 (hex) = 9 (ASCII), 31 (hex) = 1 (ASCII) > 91

`109707mS PRN: AtmTrunk1: CLI Message Rx'd:` • The third part of the ICLID message on trunk 1 has been detected.
`109707mS PRN: 0x5800` • 5800 = End of ICLID.
`09708mS PRN: AtmIO1: CLI Detection OFF Equaliser OFF` • ICLID dectection has been disabled.

`109708mS PRN: AtmTrunk1: StateChange CLIAwaitData->CLIDataSettle`
`109911mS PRN: AtmTrunk1: StateChange CLIDataSettle->CLIAwaitSecondRing`
`110191mS PRN: AtmTrunk1: StateChange CLIAwaitSecondRing->PossibleIncoming`

- Line state changes from receiving ICLID to awaiting the incoming audio call.

7.2 ISDN Trunk Caller ID

1. On the PC running IP Office Manager, click the Windows Start icon and select Programs|IP Office|Monitor.
2. On the System Monitor, click **Trace Options** to select the trace settings.
3. On the **Call** tab, make sure the **Line Receive** check box is ticked.
4. Click **OK**.
5. In the System Monitor window, look for trace codes similar to the following:

```
22984658mS ISDNL3Rx: v=5 peb=5
            ISDN Layer3 Pcol=08(Q931) Reflen=2 ref=272F(Remote)
            Message Type = Setup
                InformationElement = BearerCapability
             0000 04 03 80 90 a2                                  .....
                InformationElement = CHI
             0000 18 03 a1 83 95                                  .....
                InformationElement = CallingPartyNumber
             0000 6c 0c 21 83 36 31 38 37 30 39 33 39 39 31       l.!.6187093991
                InformationElement = CalledPartyNumber
             0000 70 08 c1 36 34 36 37 31 33 31                   p..6467131
                InformationElement = HigherLayerCompat
             0000 7d 02 91 81                                     }...
```

- The Calling Party Number is [6187093991]
- The Called Party Number is [6467131]

7.3 ISDN Calls Disconnecting

Enable the following trace option settings:

Tab	Trace Options
ISDN	Layer 1, Layer 2, Layer 3, Layer 1 Send, Layer 1 Receive, Layer 2 Send, Layer 2 Receive, Layer 3 Send and Layer 3 Receive.
Call	Extension Send, Extension Receive, Extension TxP, Extension RxP, Line Send, Line Receive, Targetting and Call Logging.
System	Error, Print and Resource Status Prints.

This following is a sample trace of an PRI line going down, cutting off the calls in progress and then the line coming back up:

```
1072151mS ISDNL1Evt: v=0 peb=5,F2 F1
1072651mS ISDNL1Evt: v=0 peb=5,PHDI ?
1072651mS ISDNL3Evt: v=0 p1=0,p2=1001,p3=5,p4=127,s1=
1072651mS ISDNL3Evt: v=0 stacknum=0  State, new=NullState, old=Active id=4
1072652mS ISDNL3Evt: v=0 stacknum=0  State, new=NullState, old=Active id=24
1072653mS ISDNL3Evt: v=0 p1=0,p2=1001,p3=5,p4=0,s1=
1072656mS CMLineRx: v=5
          CMReleaseComp
          Line: type=Q931Line 5 Call: lid=5 id=4 in=1
          Cause=38, NetworkOOO
1072658mS  CALL:2000/11/2408:40,00:00:17,033,01732464420,I,300,027624,,,,0
1072682mS CMLineRx: v=5
          CMReleaseComp
          Line: type=Q931Line 5 Call: lid=5 id=24 in=1
          Cause=38, NetworkOOO
1072684mS  CALL:2000/11/2408:36,00:04:12,004,01689839919,I,300,027624,,,,0
1075545mS ISDNL1Evt: v=0 peb=5,F1 F2
1075595mS ISDNL1Evt: v=0 peb=5,PHAI ?
```

Explanation
`1072151mS ISDNL1Evt: v=0 peb=5,F2 F1` • PRI Line 5 (peb=5) has gone from the F1 state (normal Operational state) to the F2 state (Fault condition 1 state - receiving RAI or receiving CRC errors).
`1072651mS ISDNL1Evt: v=0 peb=5,PHDI ?` • Line 5 (peb=5) is now in the Disconnected state (PHDI – Physical Deactivate Indication).

`1072651mS ISDNL3Evt: v=0 p1=0,p2=1001,p3=5,p4=127,s1=`
• ISDN Layer 3 event which gives current status of line 5 (p3=5)
  • P1=0 -> ISDN Stacknum = 0.
  • P2=1001 ->Line Disconnecting.
  • P3=5 -> Internal reference number.
  • P4=127 ->TEI = 127.
  • S1= ->not used.

`1072651mS ISDNL3Evt: v=0 stacknum=0  State, new=NullState, old=Active id=4` • ISDN Layer 3 event which indicates that call with id 4 (id=4) on the first ISDN stack (stacknum=0) has changed from being Active (old=Active) to No Call exists (new=NullState).
`1072652mS ISDNL3Evt: v=0 stacknum=0  State, new=NullState, old=Active id=24` • ISDN Layer 3 event which indicates that call with id 24 (id=24) on the first ISDN stack (stacknum=0) has changed from being Active (old=Active) to No Call exists (new=NullState).

`1072653mS ISDNL3Evt: v=0 p1=0,p2=1001,p3=5,p4=0,s1=`
• ISDN Layer 3 event which gives current status of line 5 (p3=5)
  • P1=0 -> ISDN Stack number = 0.
  • P2=1001 ->Line Disconnecting.
  • P3=5 ->Internal reference number.
  • P4=0 ->TEI = 0.
  • S1= ->not used.

`1072656mS CMLineRx: v=5`
`CMReleaseComp`
`Line: type=Q931Line 5 Call: lid=5 id=4 in=1`
`Cause=38, NetworkOOO`
• The incoming call (in=1) on line 5 (lid=5), with an internal call id of 4 (id=4) has been dropped. Clear code is 38 – Network Out Of Order (refer to ISDN Clear codes on our web site). There is no ISDNL3RX trace information as the call is dropped by the PBX NOT by the local exchange (due to the fact that we are no longer in communication with the Local Exchange!).

`1072658mS  CALL:2000/11/2408:40,00:00:17,033,01732464420,I,300,027624,,,,0` • The Incoming call from 01732464420 to [02083]027624 (Extn300) has been disconnected.

`1072682mS CMLineRx: v=5`
`CMReleaseComp`
`Line: type=Q931Line 5 Call: lid=5 id=24 in=1`
`Cause=38, NetworkOOO`

Explanation
• The incoming call (in=1) on line 5 (lid=5), with an internal call id of 24 (id=24) has been dropped. Clear code is 38 – Network Out Of Order (refer to ISDN Clear codes on our web site). Again there is no ISDNL3RX trace information as the call is dropped by the PBX NOT by the local exchange (due to the fact that we are no longer in communication with the Local Exchange!).
`1072684mS CALL:2000/11/2408:36,00:04:12,004,01689839919,I,300,027624,,,,0` • The incoming call from 01689839919 to [02083]027624 (Extn300) has been disconnected.
`1075545mS ISDNL1Evt: v=0 peb=5,F1 F2` • Line 5 (peb=5) has gone from the F2 state (Fault condition 1 state i.e. receiving RAI or receiving CRC errors) to the F1 state (normal Operational state).
`1075595mS ISDNL1Evt: v=0 peb=5,PHAI ?` • Line 5 (peb=5) has now fully recovered and is in the Connected state (PHAI – Physical Activate Indication).

7.4 System Rebooting

Enable the following trace option settings:

Tab	Trace Options
Call	Line Send, Line Receive, Extension Send, Extension Receive, Extension RxP, Extension TxP, Call Delta, Map, Targetting and Call Logging
System	Error, Print and Resource Status Prints.

You should also capture the data that is output on the DTE port on the back of the system control unit. This is necessary as the unit sends information to the DTE port during a reboot that is not seen by System Monitor as it cannot make contact with the unit via the LAN until after the reboot is completed.

If you are experiencing a rebooting problem then it is very important that both traces are provided in order to make an effective investigation into the problem.

Both traces should cover the period before and after the reboot occurs.

A reboot can be easily seen in the System Monitor application by the following:

```
== 25/4/2000 14:27 contact lost - reselect = 1
****************************************************************

******************** From: 192.168.27.1 (13597) ********************
== 25/4/2000 14:27 contact made
```

As a System Reboot can be easily located, all you have to do is search the trace for [contact lost].

7.5 ISDN Problems (T1 or E1 PRI connections)

Enable the following trace option settings. These provide information about the ISDN line itself and any calls in progress.

Tab	Trace Options
ISDN	Layer 1, Layer 2, Layer 3, Layer 1 Send, Layer 1 Receive, Layer 2 Send, Layer 2 Receive, Layer 3 Send and Layer 3 Receive.
Call	Extension Send, Extension Receive, Extension TxP, Extension RxP, Line Send, Line Receive, Targetting and Call Logging.
System	Error, Print and Resource Status Prints.

If the problem is with a specific ISDN line then the System Monitor can record info for a specific line only. This is done by entering an ISDN line number in the "Port Number" field. ISDN line numbers range from 0 – 8. The Line number is shown in the Configuration Lines List. A blank entry means all ISDN lines are monitored.

7.6 ISP & Dial-Up Data Connection Problems

Enable the following trace option settings:

Tab	Trace Options
ISDN	Later3 Tx and Layer3 Rx.
Call	Line Send, Line Receive, Targetting and Call Logging
Interface	Interface/Interface Queue
PPP	LCP Tx, LCP Rx, Security Tx, Security Rx, IPCP Tx and IPCP Rx.
System	Error, Print and Resource Status Prints.

If the problem is to a specific destination then System Monitor can record information pertinent to that connection only. This is done by entering the appropriate service name in the **Interface Name** field in the PPP trace option settings. A blank entry means monitor all data connections.

You should also look for things like PAP/CHAP password failure. This indicates that the "Service" configuration is not correct.

7.7 Remote Site Data Connection Problems over Leased (WAN) Lines

Enable the following trace option settings:

Tab	Trace Options
WAN	WAN Tx, WAN Rx and Events.
PPP	LCP Tx, LCP Rx, Security Tx, Security Rx, IPCP Tx, IPCP Rx, IP Tx and IP Rx.
System	Error, Print and Resource Status Prints.

- If the line is connected via the WAN port on the system's control unit, System Monitor should be configured to monitor the IP address of the system.
- If the line is connected via a WAN port on a WAN3 module, System Monitor should be configured to monitor the IP address of the WAN3 unit.

If the Leased Line problem is to a specific destination, System Monitor can record information pertinent to that connection only. This is done by entering the service name in the **Interface Name** field in PPP trace options settings. A blank entry means all data connections (Services) are monitored.

You should also look for things like PAP/CHAP password failure. This indicates that the service configuration is not correct.

Note that the WAN Tx and WAN Rx information is in raw hex format only. An in-depth knowledge of the IP Packet make-up is required to manually decode these messages – it is not done automatically.

7.8 Frame Relay Links

Enable the following trace option settings:

Tab	Trace Options
Frame Relay	Events, Tx Data, Tx Data Decode, Rx Data, Rx Data Decode, Tx Data and Mgmt Events (if Management enabled on link)

Please note that the following PPP options may also be required if using PPP over Frame Relay as the connection method :-

Tab	Trace Options
PPP	LCP Tx, LCP Rx, Security Tx, Security Rx, IPCP Tx, IPCP Rx, IP Tx and IP Rx

7.9 Speech Calls Dropping

ISDN or QSIG Line

Enable the following trace option settings:

Tab	Trace Options
ISDN	Layer 1, Layer 3, Layer 1 Send, Layer 1 Receive, Layer 3 Send and Layer 3 Receive
Call	Line Send, Line Receive, Extension Send, Extension Receive, Extension RxP, Extension TxP, Short Code Msgs, Call Delta, Targetting and Call Logging
System	Error, Print and Resource Status Prints

Analogue Line

Enable the following trace option settings:

Tab	Trace Options
ATM	Channel, I-O and CM Line
Call	Line Send, Line Receive, Extension Send, Extension Receive, Extension RxP, Extension TxP, Short Code Msgs, Call Delta, Targetting and Call Logging
System	Error, Print and Resource Status Prints

VoIP Line

Enable the following System Monitor settings:

Tab	Trace Options
ISDN[1]	Layer 3 Send[1] and Layer 3 Receive.
ATM[2]	Channel[2] , I-O2 and CM Line.
T1[3]	Line, Channel, Dialler, DSP and CAS.
H.323	H.323, H.323 Send, H.323 Receive, H.323 Fast Start[4], H.245 Send, H.245 Receive and View Whole Packet.
Call	Line Send, Line Receive, Extension Send, Extension Receive, Extension RxP, Extension TxP, Short Code Msgs, Call Delta, Targetting and Call Logging.
System	Error, Print and Resource Status Prints

Notes:

1. If VoIP call traverses a T1 ISDN, E1 ISDN, BRI ISDN or QSig line to get to its final destination.
2. If VoIP call traverses out over an Analogue Line to get to its final destination.
3. If VoIP call traverses out over a Channelized T1 Line to get to its final destination.
4. If in use by VPN Line or VoIP Extension

Channelized T1 Line

Enable the following System Monitor settings:

Tab	Trace Options
T1	Line, Channel, Dialler, DSP and CAS.
Call	Line Send, Line Receive, Extension Send, Extension Receive, Extension RxP, Extension TxP, Short Code Msgs, Call Delta, Targetting and Call Logging.
System	Error, Print and Resource Status Prints

7.10 Problems Involving Non-IP Phones

Enable the following trace option settings:

Tab	Trace Options
Call	Line Send, Line Receive, Extension Send, Extension Receive, Extension RxP, Extension TxP, Short Code Msgs, Call Delta, Targetting and Call Logging.

You should be able to pick up items like Call Setup, Call Proceeding, Alerting, Call Connected, and Call Disconnected. It provides a step by step trace of the process that the call has gone through. It presents all information relating directly to the setup of the call.

7.11 Problems Involving IP Phones

Enable the following trace option settings:

Tab	Trace Options
H.323	H.323, H.323 Send, H.323 Receive, H.323 Fast Start, H.245 Send, H.245 Receive, RAS Send, RAS Receive and View Whole Packet.

You should be able to pick up items like Call Setup, Call Proceeding, Alerting, Call Connected, and Call Disconnected. It provides a step by step trace of the process that the call has gone through. It presents all information relating directly to the setup of the call.

7.12 Locating a Specific PC Making Calls to the Internet

Enable the following trace option settings:

Tab	Trace Options
ISDN	Layer3 Tx and Layer3 Rx.
Interface	Interface Queue
Call	Line Send, Line Receive, Targeting and Call Logging
System	Error, Print and Resource Status Prints.

If NAT is not being used on the connection this produces:

```
Interface Queue: v=UKIP WAN 1 1
            IP Dst=194.217.94.100 Src=212.46.130.32 len=48 id=043e ttl=127 off=4000 pcol=6 sum=017c
             TCP Dst=80 (0050) Src=4105 (1009) Seq=338648156 Ack=0 Code=02 (SYN )
             Off=112 Window=8192 Sum=6aae Urg=0
              0000 02 04 05 b4 01 01 04 02
```

The source (Src) of this packet is 212.46.130.32, the destination (IP Dst) is 194.217.94.100, the protocol is TCP (pcol=6), the destination socket is 80 (80=World Wide Web HTTP i.e. a PC is trying to access a web page), the source socket is 4105 (unassigned - ie. free to be used by any program), the packet is a TCP SYN. All you need to do is locate the PC with address 212.46.130.32. To find out where on the web it was accessing type the IP Dst in the address bar of your browser and it takes you to that page.

If NAT is being used - you can tell this from the trace by observing System Monitor Traces like :-

```
PRN: ~NATranslator d40190dc 00000000
PRN: ~UDPNATSession in=c0a84d01 out=d40190dc rem=d401809c in_port=0035 out_port=1000 rem_port=0035
PRN: ~TCPNATSession in=c0a84d02 out=d40190dc rem=c2ed6d49 in_port=0423 out_port=1005 rem_port=0050
```

The above mentioned Interface Queue trace is preceded by the following System Monitor output :-

```
PRN: TCPNATSession in=c0a84d02 out=d40190dc rem=c2ed6d49 in_port=0423 out_port=1005 rem_port=0050
```

Where :-

- "in=" is the IP address (in hex format) of the device on the LAN that is initiating the request;
- "out=" is the IP address of the PBX (i.e. the local IP address of the link) as allocated by the ISP/Remote Routing device;
- "rem=" is the requested destination IP address;
- "in_port=" is the port (socket) number used by the initiating device on the LAN; "out_port=" is the outgoing port we use on the link (due to the NAT), and "rem_port=" is the requested destination port (socket) number.

7.13 Firewall Not Working Correctly

Enable the following trace option settings:

Tab	Trace Options
Interface	Interface Queue, Firewall Fail In and Firewall Fail Out.
System	Error, Print and Resource Status Prints.

When monitoring starts, if you do not see any specified 'failing' in the trace, then enable the following additional settings:

Tab	Trace Options
Interface	Interface Queue, Firewall Fail In and Firewall Fail Out.
System	Error, Print and Resource Status Prints.

This traces those packets that are Allowed In and Out of the PBX via the Firewall.

Note: The Interface trace option settings menu includes an **Interface Name** field. You can use this to enter the name of a particular service that you want to monitor.

7.14 Remote Site Data Connection over Leased (WAN) Lines

Enable the following trace option settings:

Tab	Trace Options
WAN	WAN Tx, WAN Rx and Events.
PPP	LCP Tx, LCP Rx, Security Tx, Security Rx, IPCP Tx, IPCP Rx, IP Tx and IP Rx.
System	Error, Print and Resource Status Prints.

- If the line is connected via the WAN port on the system's control unit, System Monitor should be configured to monitor the IP address of the system.
- If the line is connected via a WAN port on a WAN3 module, System Monitor should be configured to monitor the IP address of the WAN3 unit.

If the Leased Line problem is to a specific destination then System Monitor can record information pertinent to that connection only. This is done by entering the appropriate service name in the PPP trace option settings **Interface Name** field. A blank entry means all data connections (Services) are monitored.

You should also look for things like PAP/CHAP password failure. This indicates that the "Service" configuration is not correct.

Note that the WAN Tx and WAN Rx information is in raw hex format only. An in-depth knowledge of the IP Packet make-up is required to manually decode these messages – it is not done automatically.

7.15 Calls Answered/Generated by IP Office Applications

Enable the following trace option settings:

Tab	Trace Options
Call	Line Send, Line Receive, Extension Send, Extension Receive, Extension TxP, Extension RxP, Short Code Msgs, Call Delta, Targetting and Call Logging.
System	Error, Print and Resource Status Prints.

7.16 Message Waiting Indication

To determine if Voicemail Pro is transmitting message waiting indication (MWI) information.

Enable the following trace option settings:

Tab	Trace Options
Call	Extension Send, MonIVR and Targetting
System	Print

Whenever voicemail is accessed for a mailbox (message leaving\retrieval); Voicemail sends a voicemail status update for that mailbox to the PBX. This is traced out within System Monitor with the MonIVR option and is an IVR Event type message.

The following is a trace example received with leaving a message to mailbox 206, note the following:

IVR Events indicate the number of new, read, saved messages. If the new message count is zero then the PBX should extinguish the message waiting light, otherwise the message waiting light should be activated.

When the MWL indication is sent to the phone, the CMExtnTx event should indicate the transmission of the message CMVoiceMailStatus with the number of new messages being in the display field (may also be in the calling party field). The UUI field may also contain the information format (length of UUI, number of messages, unread messages, extension state).

```
7201633mS CMExtnTx: v=203, p1=1
           CMVoiceMailStatus
           Line: type=DigitalExtn 3 Call: lid=0 id=-1 in=0
           Calling[00000001] Type=Default (100)
           UUI type=Local [....] [0x03 0x01 0x01 0x00 ]
           Display [Extn203 Msgs=1]
           Timed: 06/05/05 12:26
7201634mS IVR Event: Voicemail message update for [Extn203]:- New=1,Read=1,Saved=0
```

Chapter 8. Addendum

8. Addendum

8.1 Ports

The port being used by a data packet is shown as ***src=*** followed by a port number (http://www.iana.org/assignments/port-numbers). For the following ports, System Monitor automatically adds the protocol name after the number when the log is displayed. For example ***src=23*** is displayed as ***src=23 (Telnet)***.

Number	Protocol	Number	Protocol
20	File Transfer [Default Data]	**179**	Border Gateway Protocol
21	File Transfer [Control]	**1719**	H.323Ras
23	Telnet	**1720**	H.323/H.245
25	Simple Mail Transfer	**1764**	NA Monitor
37	Time	**1765**	NA BLF/TAPI
43	Who Is	**1766**	NA PCPartner
53	Domain Name Server	**1775**	NA Who-Is response
67	Bootstrap Protocol Server	**3851**	NA Voicemail
68	Bootstrap Protocol Client	**3852**	NA Network DTE
69	Trivial File Transfer	**3867**	NA SoloMail
70	Gopher	**50791**	IPO Voicemail
79	Finger	**50792**	IPO Network DTE
80	World Wide Web-HTTP	**50793**	IPO Solo Voicemail
115	Simple File Transfer Protocol	**50794**	IPO Monitor
123	Network Time Protocol	**50795**	IPO Voice Networking
137	NETBIOS Name Service	**50796**	IPO PCPartner
138	NETBIOS Datagram Service	**50797**	IPO TAPI
139	NETBIOS Session Service	**50798**	IPO Who-Is response
156	SQL Service	**50799**	IPO BLF
161	SNMP	**50800**	IPO License Dongle
162	SNMPTRAP	**54050**	BT Fusion

8.2 Protocols

The protocol being used by a data packet is shown as ***pcol=*** followed by a protocol number (http://www.iana.org/assignments/protocol-numbers). For the following common protocols, System Monitor automatically adds the protocol name after the number when the log is displayed. For example ***pcol=1*** is displayed as ***pcol=1 (ICMP)***
.

Number	Protocol	Monitor shows...
1	Internet Control Message	ICMP
2	Internet Group Management	IGMP
6	Transmission Control	TCP
8	Exterior Gateway Protocol	EGP
9	Interior Gateway Protocol	IGP
17	User Datagram	UDP
41	Ipv6	IPV6
46	Reservation Protocol	RSVP
47	General Routing Encapsulation	GRE
58	ICMP for IPv6	IPv6-ICMP
111	IPX in IP	IPX-In-IP
115	Layer Two Tunneling Protocol	L2TP
121	Simple Message Protocol	SMP

8.3 IP Office Ports

Details of the range of ports used by different releases of IP Office and IP Office applications are found at https://support.avaya.com/helpcenter/getGenericDetails?detailId=C201082074362003. The tables below give a summary of the ports used for IP Office Release 9.0.

Table 1. IP Office Solution System Ports

The table lists the ports required for IP Office services (embedded and Linux) and applications such as Manager, SSA, SysMonitor.

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Authenticated
Ingress						
22	TCP/SSH	No	Open	Admin terminal or SAL Gateway	Remote maintenance connection	Username + password
67	UDP/DHCP	Yes	Open	DHCP clients such as IP Phones	IP Office DHCP service	–
67	UDP/BOOTP Server	Yes	Open	Manager	Manager BOOTP server for IP address and firmware for IP Office	–
69	UDP/TFTP	No	Open	Legacy Manager, Voicemail Pro, Upgrade Wizard, SoftConsole.	IP Office status, configuration data, program data, Whois #1. The information that is obtained can be controlled with security settings	Obfuscated password
80 (1-100)	TCP/HTTP	Yes	Open	File transfer Manager and phones, Web client, DECT R4 Provisioning, SoftConsole, WebSocket SCN, Voicemail Pro.	General purpose HTTP file and WebSocket server.	Some URIs RFC2617 Authenticated
123	NTP	No	Open	DECT R4, IP Office	NTP (RFC4330) Service - SNTP	–
161 (161, 1024-65535)	UDP/SNMP	Yes	Open	SNMP Agent	Read-only access to MIB entries	Community string
411	TCP/HTTPS	Yes	Open	H.323 phone	Phone settings, backup/restore	–
443	TCP/HTTPS	Yes	Open	Softphone, Manager and phones, Web client, DECT R4 Provisioning, SoftConsole, WebSocket SCN, Voicemail Pro.	General purpose HTTPS file and WebSocket server.	Shared secret (Softphone) X.509 certificate (IP Office)

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Authenticated
520	UDP/RIP	Yes	Open	Router	Exchange routing information with adjacent IP routers or receive information	–
1701	UDP/L2TP	Yes	Closed	Remote Network devices	From layer 2 tunnels to remote network devices	CHAP
1718	UDP/H.323 discovery	Yes	Filtered	H.323 phone	H.323 service to IP Phones	Shared secret (password) HMAC-SHA1-96
1719	UDP/H.323 status	Yes	Filtered	H.323 phone	H.323 service to IP Phones	Shared secret (password) HMAC-SHA1-96
1720	TCP/H.323 signalling	Yes	Filtered	H.323 phone	H.323 service to IP Phones	Shared secret (password) HMAC-SHA1-96
4097	TCP	No	Filtered	N/A	Debug (disabled)	–
5060-5061 (1024-64510)	TCP+UDP+TLS/SIP	Yes	Open	SIP endpoint SIP trunk SIP Proxy	–	MD5 CHAP
5443	TCP/HTTPS	Yes	Open	Backup/Restore client, UC client	Secure server for solution backup/restore. Secure URI for VM listen for UC client. Applies only to IP Office Linux and Application Server	–
5480	TCP/HTTPS	Yes	Open	Web interface for Virtual Appliance Management Infrastructure (VAMI)	Applies only to IP Office Linux and Application Server No firewall configuration needed	Authenticated
5488/5489	TCP	Yes	Open	CIM client for VAMI	Applies only to IP Office Linux and Application Server No firewall configuration needed	Authenticated
5807 (5800-5899)	TCP	Yes	Open	VNC Server	Used for VNC viewer	–
7070	TCP/HTTPS	Yes	Open	Web Management client WebRTC signalling gateway	Applies only to IP Office Linux and Application Server	Username + password

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Authenticated
7071	TCP/HTTPS	Yes	Open	Web Management control	Applies only to IP Office Linux and Application Server	Username + password
8000	TCP/HTTP	No	Open	Web Management client	Upgrade web service Log download	Username + password
8411	TCP/HTTP	Yes	Open	H.323 phone	Firmware download	–
8443 (1-65535)	TCP/HTTPS	Yes	Open	Web Management client	–	–
9080	TCP/HTTP	No	Open	Web Management client	–	Username + password
40750-50750 (Min start 1024, min end 2048)	UDP/RTP-RTCP UDP/SRTP-SRTCP	Yes	N/A	Media end points	IP Office Linux user the port range 32768-61000 for RTP connections. Default IP500 V2 range 40750-50750	–
50780	UPD/Proprietary	Yes	Open	Dongle application	Not used	–
50792	UPD/Voicemail	Yes	Open	Voicemail server	Voicemail Pro media	–
50793	TCP/Proprietary	Yes	Open	Solo Server	TAPI Wave Driver – audio stream interface for TAPI based applications	–
50794	UPD+TCP/SysMonitor	Yes	Open	System Monitor	Event, trace and diagnostics outputs	Password
50795	UDP/Voicenet	Yes	Open	SCN Trunks	Small Community Networks peer to peer trunk signaling	–
50796	TCP/TLS	Yes	Open	IPOCC/ACCS	CTI link for Contact Center application	Password
50797	TCP/TAPI	Yes	Open	TAPI clients CPA, PC Dialer, Web Agent	Control of telephones for TAPI or Outbound contact express	–
50801	TCP/Proprietary	Yes	Open	Voice Conferencing application	–	–
50802	TCP/Proprietary	Yes	Open	IP Office Manager, Web Management	Whois #2 and Whois #3, TCP discovery	–
50804 (49152-65280)	TCP/Proprietary	Yes	Open	IP Office Manager	IP Office configuration interface	HMAC SHA-1 challenge sequence

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Authenticated
50805 (49152-65280)	TCP/TLS	Yes	Open	IP Office Manager	IP Office configuration interface secure (encrypted)	HMAC SHA-1 challenge sequence X.509 Certificate
50808 (49152-65280)	TCP/Proprietary	Yes	Open	System Status Application	IP Office status information	HMAC SHA-1 challenge sequence
50809 (49152-65280)	TCP/TLS	Yes	Open	System Status Application	IP Office status information secure (encrypted)	HMAC SHA-1 challenge sequence
50812 (49152-65280)	TCP/Proprietary	Yes	Open	IP Office Manager	IP Office security settings	HMAC SHA-1 challenge sequence
50813 (49152-65280)	TCP/TLS	Yes	Open	IP Office Manager	IP Office security settings secure (encrypted)	HMAC SHA-1 challenge sequence X.509 Certificate
50814 (49152-65280)	TCP/Proprietary	Yes	Open	One-X server	IP Office CTI control for One-X	HMAC SHA-1 challenge sequence
50823	TCP	No	Closed	N/A	Debug IP Office Linux (disabled)	–
52233	TCP/HTTPS	Yes	Closed	WebLM client	WebLM server for licensing	X.509 certificate
56000-58000	UDP/STRP	No	Open	WebRTC Media gateway	Media endpoints	–
Egress						
25	TCP/SMTP	Yes	N/A	SMTP email server	Email transmission from IP Office	–
37	UDP/TIME	Yes	N/A	Manager and VMPro	TIME (RFC868) Service	–
53	UDP/DNS	Yes	N/A	DNS server	Name Service	–
68	UDP/DHCP	Yes	N/A	DHCP server	IP Office obtaining DHCP address from a server	–
68	UDP/BOOTP	Yes	N/A	Manager	IP Office obtaining IP address and firmware	–
69	UDP/FTP	Yes	N/A	Manager	IP Office obtaining firmware on behalf of phones	–
123	UDP/NTP	Yes	N/A	NTP server	NTP (RFC 4330) Service - SNTP	–
162 (Configurable)	UDP/SNMP	Yes	N/A	SNMP Receiver	Trap generation from IP Office	Community string

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Authenticated
389	TCP/LDAP	Yes	N/A	LDAP service	Import of directory information from LDAP database	Kerberos 4 or simple password
443	TCP/HTTPS	Yes	N/A	SCEP server	SCEP to System Manager	Password
500	UDP/IKE	Yes	N/A	Remote device	Form IPSec association with remote security devices	Shared secret MD5 or SHA
514 (Configurable)	UDP+TCP/Syslog	Yes	N/A	Syslog server	–	–
520	–	Yes	Open	Router	Exchange routing information with adjacent IP routers or receive information	–
5060/5061	UDP+TCP+TLS/SIP	Yes	N/A	SIP trunk	–	MD5 CHAP
5443	TCP/HTTPS	Yes	N/A	HTPS server	Solution backup/restore using HTTPS	Username + password
6514	TLS/Syslog	Yes	N/A	Syslog server	–	–
10162	UDP/SNMP	Yes	N/A	SNMP trap	SNMP trap to System Manager	–
40750-50750 (min start 1024, min end 2048)	UDP/RTP-RTCP UDP/SRTP-SRTCP	Yes	N/A	Media end points	IP Office Linux uses the port range of 32768-61000 for RTP connections with the media server Default IP500 V2 range 46750-50750	–
50791	UDP/Voicemail	Yes	N/A	Voicemail server	Voicemail Pro signaling/media	–
50795	UDP/Voicenet	Yes	N/A	SCN trunks	SCN peer to peer trunk signalling Legacy trunks only, WebSocket SCN uses 80/443	–
52233	TCP/HTTPS	Yes	N/A	WebLM server	Used for WebLM licensing	X.509 certificate
Intra-Device						
4096	TCP	Yes	Open	IP Office SNMP Agent	–	Internal

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Authenticated
4443	TCP/JMX	Yes	Open	WebRTC signalling gateway	Management port used by WebRTC signal gateway to communicate with media gateway	Internal
4444	TCP/JMX	Yes	Open	WebRTC signalling gateway	Messaging port used by WebRTC signal gateway to communicate with media gateway	Internal
5005 (Configurable)	TCP	Yes	Open	RCTP monitoring	–	Internal
6006	TCP	Yes	Open	QoS	–	Internal
17777	TCP	Yes	Open	IP Office and Jade	Communication between IP Office and JADE	Internal
42004 (Configurable)	TCP/SIP	Yes	Open	WebRTC signalling gateway	SIP client connections from IP Office	Internal
42008 (Configurable)	TCP/SIP	Yes	Open	WebRTC signalling gateway	SIP trunk connections from IP Office	Internal

Table 2: Voicemail Pro Ports

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Authenticated
Ingress						
25	TCP	Yes	Open	SMTP	Voicemail Pro client for SMTP operations	–
37	UDP/TIME	Yes	Open	IP Office	TIME (RFC868) Service for IP Office	–
80	TCP/HTTP	Yes	Open	Browser, UC client, one-X Portal server	Share access to Voicemail Pro media files with one-X Portal server Web voicemail support Windows server only	Authenticated
143	TCP/IMAP4	Yes	Open	IMAP4 client	Access to voicemails using IMAP4 over non-secure connection	–
993	IMAP4 – SSL	Yes	Open	IMAP4 client – SSL	Access to voicemails using IMAP4 over SSL connection	–

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Authenticated
5443	TCP/HTTPS	No	Open	UC client, one-X Portal server	Secured share access to Voicemail Pro media files with one-X Portal server and UC clients Linux server only	
50791	UDP-TCP/Voicemail	Yes	Open	Voicemail Pro client	Voicemail Pro communication with IP Office. This is also used for one-X Portal communication	–
50792/50793	TCP/Voicemail	Yes	Open	Voicemail Pro MAPI proxy service	These ports are required on the Windows server machine which runs the Voicemail Pro MAPI service	–
Egress						
22	TCP/FTP	Yes	N/A	Contact Recorder Backup file server	FTP or SFTP	–
25	TCP	Yes	N/A	SMTP	Voicemail email integration	–
443	TCP/HTTPS	Yes	N/A	Exchange server	Web service API client for Exchange integration	–
50792	UDP/Voicemail	Yes	N/A	IP Office	Voicemail Pro media	–
50792	SSL/Voicemail	Yes	N/A	Exchange MAPI proxy	Exchange MAPI proxy connector	–
50793	SSL/Voicemail	Yes	N/A	Exchange MAPI proxy	Exchange MAPI proxy connector	–
50802	TCP/Proprietary	No	N/A	IP Office	Whois	–
Intra-Device						
25	TCP	Yes	Open	SMTP	Messaging and configuration updates between Voicemail Pro servers	–

Table 3: one-X Portal for IP Office Ports (includes Communicator and one-X Mobile)

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Authenticated
Ingress						
4560	TCP/Log4j	No	Open	Log4j appender	–	–

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Authenticated
5222	TCP/XMPP	Yes	Open	XMPP client	Instant message clients	Username + password
5269	TCP/XMPP	Yes	Open	XMPP federation	Instant message federation	Username + password
7171	TCP/BOSH	Yes	Open	OpenFire for BOSH	–	Username + password
7443	TCP/BOSH	Yes	Open	OpenFire for BOSH	–	Username + password
8005	TCP/Tomcat shutdown	No	Filtered	Tomcat shutdown listener	–	–
8063	TCP/HTTPS	No	Open	Avaya Communicator for Windows, Microsoft Outlook plugin, Call assistant and Salesforce.com plug-in access to one-X Portal	–	Username + password
8069	TCP/HTTP	No	Open	Avaya Communicator for Windows, Microsoft Outlook plugin, Call assistant and Salesforce.com plug-in access to one-X Portal	–	Username + password
8080	TCP/HTTP	Yes	Open	Web Client	one-X Portal	Username + password
8443	TCP/HTTPS	Yes	Open	Web Client	Secure user access to Windows one-X Portal server.	Username + password
8444	TCP/Proprietary	Yes	Open	Mobility client	Mobility client authentication	Username + password
8666	TCP/JMX	Yes	Open	Java extension	–	Username + password
9092	TCP/JDBC	No	Open	Database client listener	–	Username + password
9094	TCP/XMP RPC	No	Open	–	OpenFire XML Remote Procedure Call and Admin console	Username + password
9095	TCP/HTTPS	No	Open	Administration console	OpenFire Admin Console	–
9443	TCP/HTTPS	Yes	Open	Web Client	Secure user access to Linux one-X Portal server.	Username + password X.509 Certificate
Egress						

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Authenticated
80/8000	TCP/HTTP	Yes	N/A	Voicemail Pro	Voicemail Pro communication with one-X Portal	–
50791	TCP/Voicemail	Yes	N/A	Voicemail Pro	Voicemail Pro communication with one-X Portal	–
50814 (Configurable 49152-65280)	TCP/Proprietary	Yes	Open	IP Office	IP Office CTI control for one-X Portal	HMAC SHA-1 challenge sequence
Intra-Device						
8086	TCP/HTTP	No	Open	XMPP	Internal REST interface	–
61616	TCP/Proprietary	No	Open	Internal one-X server	Active MQ JMS Broker	–

Table 4: Contact Recorder Ports

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Authenticated
Ingress						
8805	TCP/Tomcat shutdown	No	Open	Tomcat shutdown listener	Used by Contact Store/Contact Recorder for internal activities.	–
9444	TCP/HTTPS	No	Open	Web client	HTTP listener port.	–
9888	TCP/HTTP	No	Open	Web client	HTTP listener port.	–
Egress						
21	TCP	Yes	Open	FTP	FTP server for transferring Voicemail Pro recordings to Contact Store/Contact Recorder.	–
22	TCP	Yes	Open	SFTP	SFTP server for transferring Voicemail Pro recordings to Contact Store/Contact Recorder.	–

Table 5: Port Changes Between IP Office Release 8.1FP and IP Office Release 9.0

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Notes
Added						

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Notes
21	TCP	Yes	Open	FTP	This port is used by FTP server for transferring VMPro recordings to Contact Store/Contact Recorder.	–
22	TCP	Yes	Open	SFTP	This port is used by SFTP server for transferring VMPro recordings to Contact Store/Contact Recorder.	–
7071	TCP/HTTPS	No	Open	Web Management client	Web control access IP Office Linux	–
8805	TCP/Tomcat shutdown	No	Open	Tomcat shutdown listener	This port is used by Contact Store/Contact Recorder for internal activities.	–
9444	TCP/HTTPS	No	Open	Web client	This is the HTTP listener port.	–
9888	TCP/HTTP	No	Open	Web client	This is the HTTP listener port.	–
52233	TCP/HTTPS	Yes	N/A	Web LM server	WebLM licensing IP Office	–

Table 6: Port Changes Between IP Office Release 9.0 and IP Office Release 9.0.3FP

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Notes
Changed						
47000-54000 (Min start 1024, min end 2048)	UDP/RTP-RTCP	Yes	N/A	Media end points	IP Office Linux uses the port range 32768-61000 for RTP connections with the media server.	Default range updated.

Table 7: Port Changes Between IP Office Release 9.0.3FP and IP Office Release 9.1

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Notes
Added						
441	TCP/HTTPS	Yes	Open	H.323 phone	Phone settings, backup/restor e	–

Port: Default (Range)	Protocol	Switch On/Off	Default State	External Device	Description	Notes
4443	TCP/JMX	Yes	Open	WebRTC signaling gateway	Management port user by WebRTC signaling gateway to communicate with Media gateway	–
4444	TCP/JMX	Yes	Open	WebRTC signaling gateway	Messaging port user by WebRTC signaling gateway to communicate with Media gateway	–
7171	TCP/BOSH	Yes	Open	OpenFire for BOSH	–	–
8086	TCP/HTTP	No	Open	XMPP	Internal REST interface	–
52233	TCP/HTTPS	Yes	Closed	WebLM client	WebLM server for licensing	–
56000-58000 (Configurable)	UDP/SRTP	No	Open	WebRTC media gateway	Media endpoints	–
Changed						
40750-50750 (Min start 1024, min end 2048)	UDP/RTP-RTCP	Yes	N/A	Media end points	IP Office Linux uses the port range 32768-61000 for RTP connections with the media server.	Default range updated.

8.4 Cause Codes (ISDN)

When a call is ended, a cause code may be shown in the System Monitor trace. This cause code is not necessarily an error as cause codes are shown at the end of normal calls. Cause codes 0 to 102 are standard ISDN cause codes. Causes codes 103 upwards are system specific codes.

To display cause codes, ensure that the System Monitor | Call | Extension Send option is enabled. The cause code is then shown are part of ***CMExtnTx:*** events within the monitor trace. For example:

```
10185mS CMExtnTx: v=100, p1=1
        CMReleaseComp
        Line: type=DigitalExtn 3 Call: lid=0 id=-1 in=0
        UUI type=Local [....] [0x03 0x00 0x00 0x00 ]
        Cause=16, Normal call clearing
        Timed: 12/07/05 11:00
```

The cause codes are listed below. Those marked with a * were added in release 3.0.1. Those marked with a + were added in 3.0.40. Note that the Disconnect codes marked with a * or + are not available in 2.1 or 3.0DT releases.

Cause Code	Definition
0	Unknown.
1	Unallocated (unassigned) number.
2	No route to specific transit network/(5ESS)Calling party off hold.
3	No route to destination / (5ESS) Calling party dropped while on hold.
4	Send special information tone / (NI-2) Vacant Code.
5	Misdialed trunk prefix.
6	Channel unacceptable.
7	Call awarded and being delivered.
8	Preemption/(NI-2)Prefix 0 dialed in error.
9	Preemption, cct reserved / (NI-2) Prefix 1 dialed in error.
10	(NI-2) Prefix 1 not dialed.
11	(NI-2) Excessive digits received call proceeding.
16	Normal call clearing.
17	User busy.
18	No user responding / No response from remote device.
19	No answer from user.
20	Subscriber absent (wireless networks).
21	Call rejected.
22	Number changed.
23	Redirection to new destination.
25	Exchange routing error.
26	Non-selected user clearing.
27	Destination Out Of Order.
28	Invalid number format.
29	Facility rejected.
30	Response to STATUS ENQUIRY.
31	Normal, unspecified.
34	No cct / channel available.
38	Network out of order.
39	Permanent frame mode connection out of service.
40	Permanent frame mode connection is operational.
41	Temporary failure.
42	Switching equipment congestion.
43	Access information discarded.
44	Requested cct / channel not available.
45	Pre-empted.
46	Precedence blocked call.
47	Resources unavailable/(5ESS)New destination.
49	Quality of service unavailable.
50	Requested facility not subscribed.

Cause Code	Definition
52	Outgoing calls barred.
54	Incoming calls barred.
57	Bearer capability not authorised.
58	Bearer capability not presently available.
63	Service or option not available, unspecified.
65	Bearer capability not implemented.
66	Channel type not implemented.
69	Requested facility not implemented.
70	Only restricted digital bearer capability is available.
79	Service or option not implemented, unspecified.
81	Invalid call reference.
82	Identified channel does not exist.
83	A suspended call exists, but this id does not.
84	Call id in use.
85	No call suspended.
86	Call having the requested id has been cleared.
87	User not a member of Closed User Group.
88	Incompatible destination.
90	Non-existent Closed User Group.
91	Invalid transit network selection.
95	Invalid message, unspecified.
96	Mandatory information element missing.
97	Message type non-existent/not implemented.
98	Message not compatible with call state, non-existent or not implemented.
99	Information element non-existent or not implemented.
100	Invalid information element contents.
101	Message not compatible with call state / (NI-2) Protocol threshold exceeded.
102	Recovery on timer expiry.
IP Office Specific Cause Codes	
103	Parameter not implemented.
110	Message with unrecognised parameter.
111	Protocol error, unspecified.
117	Parked (Internal system code).
118	UnParked (Internal system code).
119	Pickup (Internal system code).
120	Reminder (Internal system code).
121	Redirect (Internal system code).
122	Call Barred (Internal system code).
123	Forward To Voicemail (Internal system code).
124	Answered By Other (Internal system code).
125	No Account Code (Internal system code).
126	Transfer (Internal system code).
129	Held Call (Internal system code).*
130	Ring Back Check (Internal system code).*
131	Appearance Call Steal (Internal system code).*
132	Appearance Bridge Into (Internal system code).*
133	Bumped Call (Internal system code).*
134	Line Appearance Call (Internal system code).+
135	Unheld Call (Internal system code).+
136	Replace Current Call (Internal system code).+
137	Glare (Internal system code).+
138	R21 Compatible Conf Move (Internal system code).+

Cause Code	Definition
139	RingBack Answered (Internal system code).+
140	Transfer Request Failed (Internal system code).+
141	HuntGroup Drop (Internal system code).+

8.5 Decoding FEC Errors

This section details how to decoding the FEC Receiver Error "PRN" statements that appear in the log. These "Fast Ethernet Controller" error messages are shown when the System/Print option is enabled.

An example error would be:

```
PRN: IP403_FEC::ReceiverError 844
```

The message format is:-

```
PRN: PLATFORM_FEC::ReceiverError ABCD
```

Where:-

- PRN: = Indicates that message was output as the result of having the **System | Print** option enabled.
- PLATFORM_ = Indicates the type of system control unit reporting the error. Possible values are IP401NG (Small Office Edition), IP403, IP406, IP406V2 (shows as IP405 in Version 2.1(27)) and IP412.
- ABCD = This is the actual error code. It is a decode of the "Ethernet Receive Buffer Descriptor" packet. Note that if the most significant byte (ie. A) is 0 (zero) it is not printed and the error code is only 3 characters long (ie. BCD).

FEC::ReceiverError Codes are derived from the "Ethernet Receive Buffer Descriptor (RxBD)". The table below shows the bits within the RxBD that are used to generate the error codes. Those labeled as "N/U" are NOT used in the FEC Error Decoding mechanism although they may be non zero.

Byte	Bit	Value	Option	Description
A	0	8	N/U	May be non-zero but not used for FEC decode.
	1	4	N/U	May be non-zero but not used for FEC decode.
	2	2	N/U	May be non-zero but not used for FEC decode.
	3	1	N/U	May be non-zero but not used for FEC decode.
B	4	8	L	Last in frame. 0 = The buffer is not the last in the frame. 1 = The buffer is the last in the frame.
	5	4	0	Always zero.
	6	2	0	Always zero.
	7	1	N/U	May be non-zero but not used for FEC decode.
C	8	8	N/U	May be non-zero but not used for FEC decode.
	9	4	N/U	May be non-zero but not used for FEC decode.
	10	2	LG	Length Error: Rx frame length violation. The frame length exceeds the value of MAX_FRAME_LENGTH in the bytes. The hardware truncates frames exceeding 2047 bytes so as not to overflow receive buffers This bit is valid only if the L bit is set to 1.
	11	1	NO	Non-Octet: A frame that contained a number of bits not divisible by 8 was received and the CRC check that occurred at the preceding byte boundary generated an error. NO is valid only if the L bit is set. If this bit is set, the CR bit is not set.
D	12	8	SH	Short Frame: A frame length that was less than the minimum defined for this channel was recognized.
	13	4	CR	CRC Error: This frame contains a CRC error and is an integral number of octets in length. This bit is valid only if the L bit is set.
	14	2	OV	Overrun Error: A receive FIFO overrun occurred during frame reception. If OV = 1, the other status bits, LG, NO, SH, CR, and CL lose their normal meaning and are cleared. This bit is valid only if the L bit is set.
	15	1	TR	Truncate Error: Set if the receive frame is truncated (= 2 Kbytes)

Example

Decode of typical message produced using above information :-

```
PRN: IP403_FEC::ReceiverError 844
```

The Error code in the above example is 844.

- Byte A = 0 and so was not shown.
- Byte B = 8, which is 1000 in binary - so bit 4 (L) is set
- Byte C = 4, which is 0100 in binary – so bit 9 (N/U) is set
- Byte D = 4, which is 0100 in binary – so bit 13 (CR) is set

This is a Receive CRC error (as bit 13 of the RxBD is set) – note that the first byte (A) is missing so it is equal to 0, resulting in a 3 byte error code.

8.6 Miscellaneous

What does the message "PRN: FEC::ReceiverError" mean?

FEC stands for Fast Ethernet Controller (100mb LAN). The "ReceiverError" line is followed by a number that denotes the exact problem.

Basically it is stating that the system received a packet that it considers wrong or corrupt in some way or perhaps there was a collision so it threw it away, the packet would then have been re-sent. This is does not normally indicate a problem and is nothing to worry about unless the error's are streaming in the trace. See Decoding FEC Errors 151.

What does the message "PRN: UDP::Sending from indeterminate address to 0a000003 3851" mean?

The port number 3851 at the end indicates that the system is looking for an IP Office Voicemail Server.

If your system is not using voicemail, remove the entry in the Voicemail IP Address field, found on the Voicemail tab of the System form in the system configuration.

Chapter 9.
Document History

9. Document History

Date	Issue	Changes
1st September 2014	**06a**	Updates for IP Office Release 9.1: • Update to the section for connecting to a system 11. • Addition of section for setting IP Office security settings 18. • Added notes for zipping log files 41. • Added note for indenting the trace events 37. • Restart and Reregister buttons on the H323 Phone Status menu. • Inserting missing step of setting protocol to HTTP or HTTPS. • Better polish to the security settings descriptions. "Use Service User Credentials" still not included as still have not seen it working.
13th October 2014	**06b**	• Advice of speed mismatch increasing likelihood of UDP packet drop.
16th April 2015	**06c**	• Correct appearance of old name of Avaya Communicator.
12th May 2015	**06d**	• Alignment of IP Office ports 137 listing with 9.1 release.
15th May 2015	**06e**	• Correct of step numbering in starting Monitor sections.
4th February 2016	**06f**	• Updated details of handling monitor Syslog output. • Updated security configuration wording.
8th February 2016	**06g**	• Disabling DevLink 18 also disabled HTTP access.

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