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NetHawk GSM Analyser

INTRODUCTION

The NetHawk GSM Analyser is an effective and easy-to-use PC-based protocol analyser for real-time monitoring and analysis of GSM, SS7, GPRS, EDGE and GSM-R networks. It is a powerful tool for protocol monitoring and call and session analysis and has proven to be a crucial help for both network element manufacturers and mobile operators in different tasks in all stages of the network life cycle. Typical applications include:

- > R&D
- > System integration
- > Interoperability testing
- > Installation & commissioning
- > Network optimisation
- > Network monitoring
- > Troubleshooting

PRODUCT OVERVIEW

Portability or capacity – your choice of a product platform

The NetHawk Analysers are recognised as the most portable testing tools on the market as they can be used in standard laptops. A test engineer can easily take the NetHawk GSM Analyser into the field with him where its small size and light weight is an advantage.

For multi-interface monitoring, the NetHawk Analysers can be used in desktop PCs. With the intelligence of the NetHawk GSM Analyser in software, you are able to choose the type of PC for product platform that best suits you.



Figure 1: The NetHawk GSM Analyser is an effective and easy-to-use PC-based protocol analyser for real-time monitoring and analysis of GSM, SS7, GPRS, EDGE and GSM-R networks.

Real-time decoding of Release 4, 99 and manufacturer-specific protocols

The NetHawk GSM Analyser is capable of analysing in real-time a wide set of 2G/2.5G protocols at multiple network interfaces simultaneously. In GERAN, you can monitor Abis, A and Gb over Frame Relay/IP interfaces, and at core network SS7 (C, D, E, F, G, Gc, Gd, Gf, Gr), High Speed Signalling Link (HSL), SigTran, PSTN, Ga, Gi, Gn, Gp and Gs as well as Location Services (LCS) interfaces.

3GPP specification versions Release 4, September 2002 or Release 99, March 2002 can be used as a baseline in the protocol analysis. The NetHawk GSM Analyser has a wide support for manufacturer-specific protocols. For Nokia, Ericsson, Nortel and Siemens GSM, GPRS and EDGE protocols are fully supported. Lucent is supported for GSM and GPRS protocols; Motorola and Alcatel also for GSM protocols.

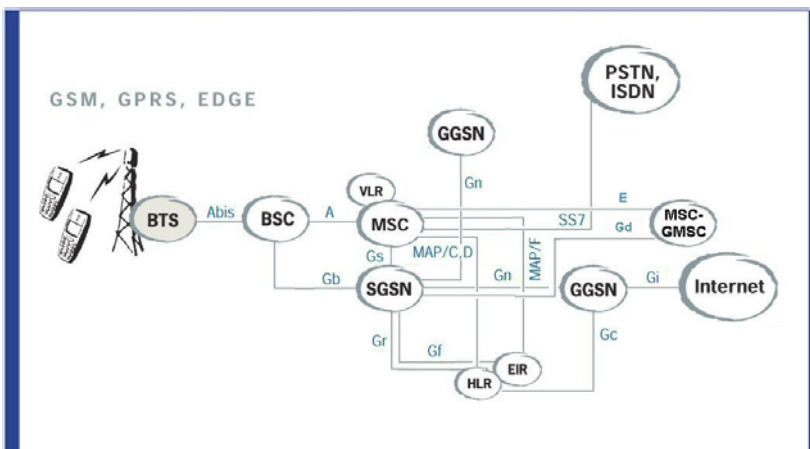


Figure 2: With the NetHawk GSM Analyser you can perform effective multi-interface monitoring at GERAN and core networks in real-time.

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The NetHawk GSM Analyser has an extensive support for the SS7 and SigTran protocols at the core network interfaces. Also the GSM-R (Global System for Mobile Communications for Railways) protocols can be decoded with the NetHawk GSM Analyser to test and analyse the railway communications networks from Nortel or Siemens.

Gb deciphering supported

The NetHawk GSM Analyser is capable of deciphering the encrypted calls with GEA confidentiality algorithm at the Gb interface. This way all the vital information from the Gb interface is available for network monitoring and troubleshooting even when signalling and traffic are secured.

Detailed decodings for real-time protocol analysis

The NetHawk GSM Analyser is able to show the analysed traffic in real-time with the most detailed level of decodings. The monitoring view can be customised to show each message with a desired level of detail, coding format and colour. Errors in the physical link can be seen in the NetHawk GSM Analyser's State Monitor window.

Correlated, multi-interface Call Trace for efficient real-time troubleshooting

Call Trace provides an efficient and easy way to solve subscriber-related problems by providing the means to filter signalling of individual subscribers from traffic loads. With the Call Trace the status and phases of individual CS calls and GPRS sessions (Attach, Detach, PDP Context, Anonymous PDP Context, Routed PDP Context and SMS) can be followed at the Abis, A and Gb over Frame Relay/IP interfaces. Call Trace also allows handover analysis at Abis and A interfaces.

Traced transactions from Abis to Gb or Abis to A are correlated together, allowing the follow, e.g., of call proceedings over the BSC. One line represents a call in the Call Trace window and detailed decodings related to calls can be studied in the monitoring window.

The signalling of individual subscribers can be filtered according to IMSI, IMEI, TMSI, P-TMSI, calling number or a mobile station's IP address. You can also do the filtering according, e.g., to timing information, Layer 3 cause values, location area (LA) and routing area (RA) codes.

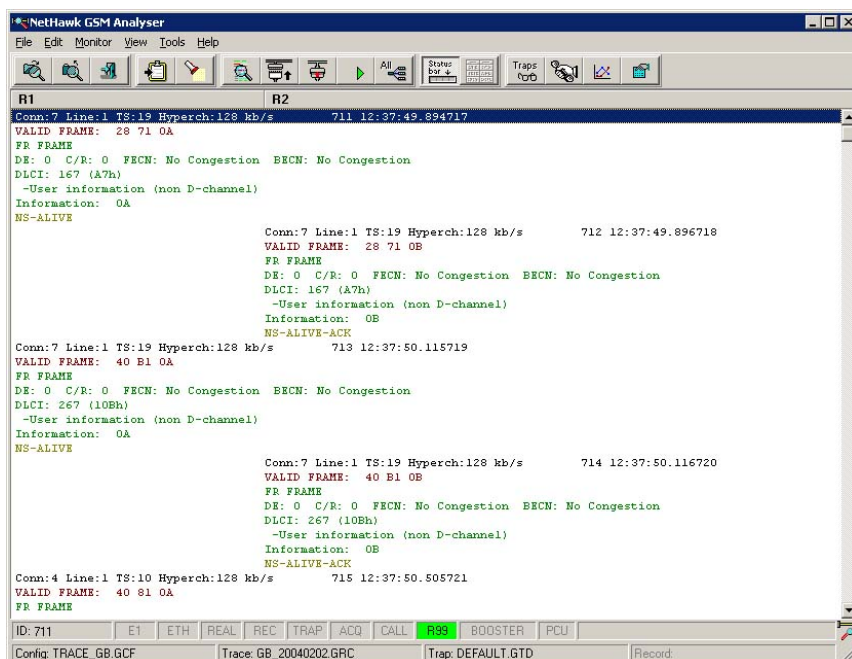


Figure 3: Protocol analysis with the NetHawk GSM Analyser with your choice for level of detail.

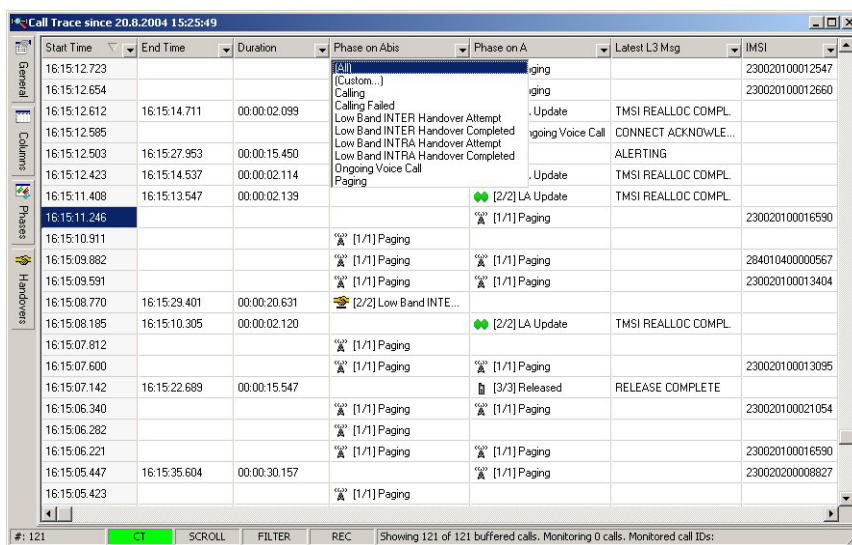


Figure 4: Tracing calls and sessions at the Abis, A and Gb interfaces in supported in real-time with the NetHawk GSM Analyser. Calls, sessions and handovers can be arranged and filtered according to various parameters for effective troubleshooting.

Call Trace data can be stored in .csv-format to a file to produce statistics, e.g. Key Performance Indicators, with a 3rd party application. The Call Trace statistics can also be recorded periodically with a given interval.

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Real-time data filtering

With the NetHawk GSM Analyser's real-time control/user-plane pre-filtering capability it is possible to filter any type of PCU frames to limit the amount of data captured from the Abis interface.

The NetHawk GSM Analyser also provides traps for filtering the protocol messages. They effectively reduce the data for analysis and help in solving the reported problems more quickly. In addition to filtering, traps can be used to trigger several other actions as well, such as starting or stopping the recording or configuring statistical counters. A trap can also be activated to perform several actions consecutively.

Dynamic Abis support

The NetHawk GSM Analyser supports 'Dynamic Abis' functionality for monitoring the Abis interfaces from Nokia, Ericsson, Nortel and Siemens. With the Dynamic Abis support the NetHawk GSM Analyser is automatically able to configure timeslots and subchannels at Abis interface also when the resources are changing dynamically.

Data post-processing

For analysing the data later, you can record the traffic with the NetHawk GSM Analyser and store the trace file (.grc-file format) on the PC's hard disk. To make post-processing of the protocol data most efficient, you can install the basic NetHawk GSM Analyser software without the NetHawk Adapters to any PC in your organisation free of charge.

Powerful and accurate multi-interface monitoring

The NetHawk GSM Analyser can be connected simultaneously to eight bi-directional E1/T1 and two Ethernet links in the desktop solution. The portable laptop solution has the capacity for two bi-directional E1/T1s and one Ethernet for effective troubleshooting in the field.

With the use of NetHawk C8 PCM Concentrators, the monitoring capacity of the NetHawk GSM Analyser can be increased in the desktop solution to 20 bi-directional links and to eight in the laptop solution. The NetHawk C8 PCM Concentrator is a cost-efficient solution to increase the number of monitored interfaces with the NetHawk GSM Analyser.



Figure 5: The NetHawk GSM Analyser is easy to transport around. Desktop PC solution is available for multi-interface monitoring.

The NetHawk GSM Analyser supports monitoring of up to 128 connections with different protocol stacks simultaneously. The NetHawk GSM Analyser is able to scan the PCM line to produce a "ready-to-use" connection configuration. It is easy then to choose which of the detected connections to monitor and, if necessary, modify the setup.

Open interface for developing remote control applications

The NetHawk Remote Control API (RCA) provides an open interface to the NetHawk GSM Analyser allowing development of remote control applications. With a remote control application, you would be able to control the NetHawk GSM Analyser over a Local Area Network, e.g. to control when to start/stop data acquisition and which configuration to use for connections and traps. This way you could for instance leave the NetHawk GSM Analyser to a lab or site and control it from your work place.

Remote control application interacts with the NetHawk GSM Analyser by using Monitoring Link Interface (MLI) messages defined in the NetHawk Remote Control API Programmer's Guide.

Guidance to your work

The NetHawk GSM Analyser features an extensive protocol help. The easily available protocol help assists in analysing recordings by explaining in detail the functions and contents of the protocols. Just a click of the mouse and the information on the protocol in question is shown on the screen. The context-sensitive help is available for giving instructions on how to use the NetHawk GSM Analyser without the need for printed manuals.

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PRODUCT COMPONENTS

- > NetHawk GSM Analyser SW
- > NetHawk Adapter(s)
- > User documentation
- > A cable set
- > Options:
 - Manufacturer-specific protocols
 - Gb protocols and Gb Call Trace
 - Gb deciphering
 - Abis Call Trace
 - SS7 protocols
 - Remote Control API (RCA)
- > Optional HW:
 - NetHawk C8 PCM Concentrator
 - USB Dongle

NetHawk Adapter for a laptop PC



NetHawk N2 for E1/T1 interfaces. Capacity for one bi-directional link.

NetHawk Adapter for a desktop PC



NetHawk NAP for E1/T1 interfaces. Capacity for two bi-directional links.

NetHawk C8 PCM Concentrator



NetHawk C8 PCM Concentrator to increase the number of monitored links with NetHawk N2 or NAP Adapters. Configurable to have either eight E1 or seven T1 input ports.

An **USB Dongle** can be used instead of NetHawk Adapters with the NetHawk GSM Analyser in offline mode to enable Gb deciphering (requires HW to be present in the PC).

Supported NetHawk Adapter configurations

Laptop configurations

- > 1-2 x NetHawk N2
- > 1-2 x NetHawk N2 + 1-2 x NetHawk C8 PCM Concentrator

Desktop configurations

- > 1-4 x NetHawk NAP
- > 1-4 x NetHawk NAP + 1-4 NetHawk C8 PCM Concentrator

PC RECOMMENDATIONS

- > The minimum PC configuration:
 - Pentium® 1 GHz CPU
 - 512 MB of RAM and 1 GB of free disk space
- > The recommended PC configuration:
 - Pentium® 2.4 GHz CPU
 - 512 MB of RAM and 1 GB of free disk space
- > Operating system:
 - Windows® XP Professional (Service Pack 1)
 - Windows® 2000 Professional (Service Pack 4)

NETHAWK GSM ANALYSER IN BRIEF

The NetHawk GSM Analyser is an effective and easy-to-use PC-based protocol analyser for real-time monitoring of GSM, SS7, GPRS, EDGE and GSM-R networks. The NetHawk GSM Analyser is available for both laptop and desktop installations with different configuration options.

- > Real-time monitoring and analysis of signalling and traffic at the Abis, A, Gb over Frame Relay/IP, SS7 (C, D, E, F, G, Gc, Gd, Gf, Gr), High Speed Signalling Link (HSL), SigTran, PSTN, Ga, Gi, Gn, Gp and Gs and Location Services (LCS) interfaces:
 - Selectable baseline for 3GPP protocols: Release 4 (2002-09) and Release 99 (2002-03) supported.
 - Extensive support for manufacturer-specific protocols for Nokia, Ericsson, Nortel, Siemens, Lucent, Motorola and Alcatel.
 - Gb deciphering supported.
 - GSM-R decoding supported.
- > Detailed decodings are shown in the monitoring window in real-time. Errors at the physical link are displayed in the State Monitor.
- > Correlated Call Trace for Abis, A and Gb interfaces for following and filtering in real-time ongoing CS calls, PS sessions and handovers.
- > PCU frame filtering and traps for real-time filtering to limit the amount of data for analysis.
- > Dynamic Abis supported for Nokia, Ericsson, Nortel and Siemens to allow decoding of PCU frames even when the resources are changing dynamically at the Abis interface.
- > PCM line scanning for a "ready-to-use" connection configuration.
- > Recordings can be stored to PC's hard disk and post-processed later. In offline use, the standard NetHawk GSM Analyser can be used free of charge.
- > Physical capacity:
 - Up to eight (desktop) or two (laptop) bi-directional E1/T1 links.
 - The capacity can be increased to 20 (desktop) / 8 (laptop) bi-directional links with the use of NetHawk C8 PCM Concentrators.
 - 128 connections simultaneously:
 - 64 kbit/s time-slot, 32 kbit/s, 16 kbit/s or 8kbit/s sub-channels.
 - Two Ethernet interfaces.



Figure 6: It only takes a few moments to install the NetHawk GSM Analyser software and plug-in the NetHawk Adapter(s) to the PC. Then your NetHawk GSM Analyser is ready for use.