



> version 5.1 > 13 January 2004

### NetHawk BSC/Abis Simulator

#### PRODUCT OVERVIEW

The NetHawk BSC/Abis Simulator is an effective PC-based tool for simulating the telecom functions of the base station controller (BSC) on the Abis interface. The simulator also contains the essential protocol elements of the network elements above BSC - such as MSC, HLR, GGSN, SGSN - to fulfil the signalling needs in the Abis interface.

The NetHawk BSC/Abis Simulator is useful in laboratory tests for BTS and MS, commissioning and demonstrations, i.e. in those occasions where light weight is an asset and a real GSM or GPRS infrastructure is unavailable or impractical to use.

#### MAIN NEW FEATURES

- > Support for 4 BTSes or TRXes
  - Both PS and CS connections are Supported
- > Improved message filtering and synchronisation
  - Filtering by mobile and BTS/TRX
  - Possibility to stop protocol engine during the watch is processed to user application
- > NHDRIVER as an option
  - More advanced UI and Test management system
- > Windows XP support
- > Support for two NetHawk N2 Adapters

#### NETHAWK BSC/ABIS SIMULATOR CONSISTS OF

- > NetHawk BSC/Abis Simulator software
  - NetHawk Configuration
  - NetHawk Simulation
  - NetHawk Script Builder
  - NetHawk Monitoring
- > NetHawk PCM N2 adapter (E1 or T1)
- > PCM cables
- > Accurate Clock Source Unit(ACSU) and
- > Installation Guide
- > NetHawk Product Help



NetHawk BSC/Abis Simulator software and NetHawk N2 Adapter

#### NETHAWK BSC/ABIS SIMULATOR IN BRIEF

The NetHawk BSC/Abis Simulator simulates the functions of the base station controller (BSC) on the Abis interface.

- > Simulates BSC (and MSC and VLR) functionality towards BTS on Abis interface,
- > An effective tool for BTS, MS, RF field testing, BTS troubleshooting during commissioning, and for demonstration and education systems concerning GSM systems,
- > Can be connected to one base station (BTS) having 4 TRXes, or 4 BTSes having 1 TRX(or any other combination),
- > Traffic channel connections can either be 64 kbit/s A $\mu$ -law or 16 kbit/s GSM full rate coded,
- > 30 simultaneous mobile to simulator or simulator to mobile calls with speech connection can be signalled,
- > 15 simultaneous mobile to mobile calls with speech connection can be signalled, when MSes are located to the same BTS,
- > 15 simultaneous mobile to mobile calls can be signalled, and 8 (of these 15) calls with speech connection, when MSes are located to different BTSes,

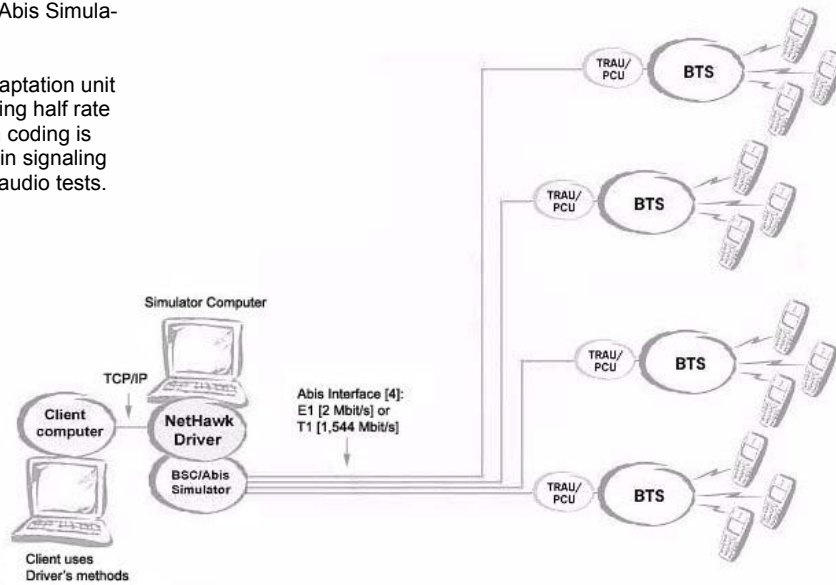
- > 8 simultaneous mobile to mobile calls can be signalled, when MSes are located to different BTSes, and at the same time 14 simultaneous mobile to simulator calls can be signalled, when MSes are located to the same BTS,
- > 2 simultaneous GPRS data calls can be signalled.
- > With MS to simulator calls possible to use loopback connection, additionally one of these calls can be connected to the PC Audio System with speech (A-law or  $\mu$ -law). A transcoder is required in the BTS site.
- > The signaling links (TRX and O&M signalling) can be 16, 32 or 64 kbit/s,
- > Instructive scripting and message editing with Watches,
- > BSC/SMSCB Configuration for configuring contents of SMSCB message files.
- > Message encoding and decoding support
  - UI has CSN.1 based tool for encoding interactively GPRS layer messages. XML formatted encoding and decoding support using COM interfaces.

> version 5.1 > 13 January 2004

**ENVIRONMENT OVERVIEW**

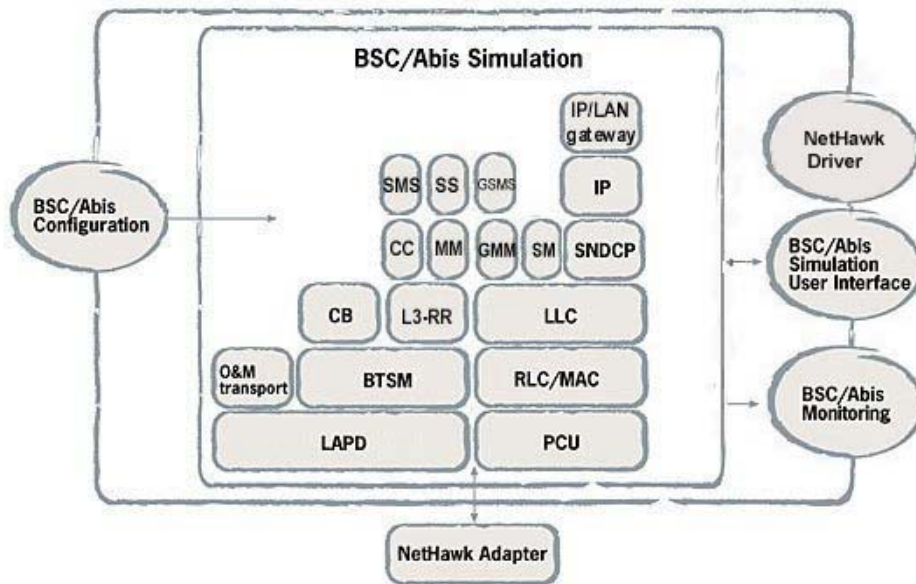
The drawing illustrates the operating environment of NetHawk BSC/Abis Simulator.

The transcoding and rate adaptation unit is needed if audio in calls using half rate or enhanced full rate speech coding is tested. TRAU is not needed in signaling tests and in full rate speech audio tests.



Operating environment of NetHawk BSC/Abis Simulator

**STRUCTURAL OVERVIEW**



Structure on NetHawk BSC/Abis Simulator software

**FUNCTIONS AND SPECIFICATIONS****NetHawk BSC/Abis Configuration**

The NetHawk Configuration is an easy and conductive way to set the system parameters for simulation. The parameters of the simulated part of the network as well as the system under test can be described by using dialogs which inform you about the purpose, legal values and ranges of the parameters. The context sensitive help is always at hand with references to the messages and specifications.

**NetHawk BSC/Abis Simulation**

NetHawk Simulation consists of three parts: link layer service, protocol simulation core and the simulation user interface. The link layer service contains the LAPD protocol. The protocol simulation core contains ready to run, multi-connection capable implementation of the protocol entities above the link layer. The Core autonomously responds to the incoming signals. Above all there is the simulation user interface featuring simulation command menus, Console window for full control of the simulation, Call Status windows for each ongoing call connection and the Script Viewer window showing the dialog of the currently active script file.

With **Watches** it is possible to instruct the Simulator to edit messages with commands such as skip, delete, insert and replace bytes. The simulator UI provides you the means to visually verify the effects each editing command has on the original message as you specify the editing commands. The editing instructions come into effect as soon as they are completed and will edit the subsequent messages matching the specification. The same functionality is available for scripts too: A message watch can be used to instruct the simulator Core to report protocol messages of interest, modifying and replacing contents of a message being encoded or decoded at a particular protocol layer. The purpose in using watches in scripts could be to monitor protocol messages, synchronise a script with protocol execution or to modify the protocol implementation.

NetHawk Simulators can automatically connect traffic (speech) channels of the calls. This enables immediate audio testing of the traffic channels. Also GPRS IP traffic is automatically routed from MS to LAN and vice versa enabling full GPRS application testing.

**NetHawk Script Builder**

The NetHawk Script Builder is a visual tool for creating and modifying test scripts. The user interface of the scripts is implemented with HTML. The controlling part of the scripts is implemented with JScript or VBScript. DCOM methods provide even more possibilities for scripting.

The NetHawk Script Builder and Script Viewer in the simulation user interface both utilise the Microsoft Internet Explorer web browser and the scripting features of it. Thus, in addition to HTML, also DHTML and ActiveX controls can be used in script user interface production.

**NetHawk BSC/Abis Monitoring**

NetHawk Monitoring decodes and analyses signalling protocols in various formats, levels of detail and coding options. Statistics information about the traffic is collected simultaneously with analysis. The traffic can also be recorded on the PC hard disk for later analysis. NetHawk Monitoring also contains a powerful and easy-to-use environment for setting filters and triggering selected actions on the specified events. The online monitoring help as well as comprehensive online protocol descriptions are always available.

**NetHawk Driver**

The NetHawk Driver is an add-on product for the NetHawk BSC/Abis Simulator. The NetHawk Driver encapsulates the use of the NetHawk BSC/Abis Simulator in automated test setups and provides the test system designer with an easier user interface for testing handsets against a GSM network.

The NetHawk Driver makes it possible for the test system designer to automatically initialise the BTS, establish/release the LAPD link(s), create any type of call, perform handovers and send short messages with minimum knowledge of how the NetHawk Simulator works. The NetHawk Driver is expected to make the use of the NetHawk BSC/Abis Simulator in an automated test setup as smooth and easy as possible.

The NetHawk Driver for the BSC/Abis Simulator includes the following features:

- > NetHawk Driver server software
- > BTS initialisation functions
- > TRX management functions
- > Call handling functions
- > Handover handling functions
- > Short message handling functions
- > Usability features

The NetHawk Driver for the BSC/Abis Simulator is a licenced product.

**SUPPORTED PROTOCOLS****CS protocols**

- > BTSM: GSM 08.58 v.3.5.0, v.5.7.0
- > RR, MM, CC: GSM 04.08 v.5.0.2
- > SMS p-to-p: GSM 04.11 v.5.2.0, GSM 03.40 v.5.5.0
- > SMS CB: GSM 04.12 v.5.2.0, GSM 03.41 v.5.5.0
- > O&M transport: GSM 08.59 v.3.0.0
- > LAPD: Q.921, CCITT Blue Book
- > Manufacturer-specific Abis O&M decoding for Nokia

**GPRS protocols**

- > RLC/MAC: GSM 04.60 v.7.0.0
- > LLC: GSM 04.64 v.7.1.1
- > GMM: GSM 04.08 v.7.1.2
- > SM: GSM 04.08 v.7.1.2
- > SNDCP: GSM 04.65 v.7.1.1
- > PCU: Nokia 16kbit/s
- > Manufacturer-specific BTSM GPRS extensions for Nokia

> version 5.1 > 13 January 2004

**HARDWARE**

NetHawk BSC/Abis Simulator supports maximum two NetHawk N2 Adapters.

**NetHawk N2 Adapter**

- > PC Card type II card and an extension pod for connectors,
- > Cardbus compatible,
- > Support for simulation of two lines with one card,
- > ITU-T G.703 / G.704 (E1) 2 Mbit/s physical primary rate interface,
- > PCM30 mode with AMI coding and CRC4 supported,
- > ITU-T G.703, G.704, G.733, ANSI T1.111 (T1) 1.544 Mbit/s physical primary rate interface.



*NetHawk BSC/Abis Simulator supports two NetHawk N2 Adapters*

**PC RECOMMENDATIONS**

- > Windows® XP or Windows® 2000 Professional with Service Pack 2
- > Intel Pentium III® @ 1000 MHz CPU or faster
- > Microsoft Internet Explorer 5.5 or newer with full installation (Active desktop not needed)
- > 512 MB of RAM and 30 MB of free disk space when IE 5.5 is already installed
- > CardBus (PC card type II) slot for NetHawk N2 Adapter



**NETHAWK OFFICES GLOBALLY**

- > Finland (HQ)
- > France
- > Germany
- > Hong Kong
- > Japan
- > P.R. china
- > Singapore
- > Sweden
- > United states