PowerHawk

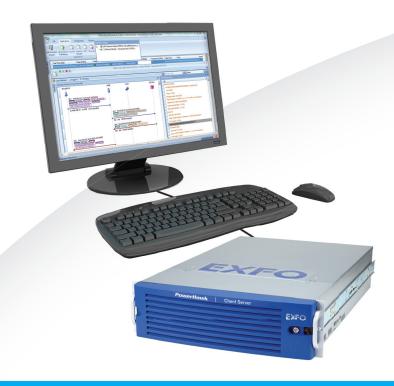## MULTI-USER ANALYZER

Real-time, multitechnology and multi-user analyzer solution with location-independent access

KEY FEATURES AND BENEFITS

Powerful analyzer solution that allows high-volume testing in the lab

Allows multiple users from different locations to access independently the same source of data in real time

Client interface is the familiar GUI of the M5 Analyzer software with full analysis capabilities and functionalities

Only one centralized server hardware to maintain and operate instead of multiple units—network interface adapters, client and server software are all installed in one-rack server PC; client access via LAN/Internet with remote desktop connection

Lowers CAPEX and OPEX:

› Low investment in hardware with one centralized server hardware

› Global 24-hour use of the same testing system

› Reduced traveling to site for troubleshooting

› Remote maintenance of the whole system

Upgradable to PowerHawk Pro

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INTRODUCTION

Across an organization, there are often different network analyzer users with varying analysis needs; e.g., operators and vendors will each use test networks for distinct purposes. However, despite this difference, the source of the information remains in the same network interface, and therefore, all users are able to access the same lines–simultaneously and independently. With the PowerHawk, EXFO has overcome the challenges that come with simultaneous and independent use by developing a real-time, multi-user analyzer system with location-independent access.

REAL-TIME MULTI-USER SYSTEM REQUIREMENTS

Different users in the lab or in an operational network have different analysis needs. For instance, customer support is interested in solving problems, such as dropped calls within a certain area, and viewing the related statistics. On the other hand, service teams might be more interested in launching new services and observing how they are utilized by different subscriber segments. What's more, network testing is more intensive now than with previous network generations.

To meet all the needs of an organization, the system in place must satisfy the various requirements of distinct user groups, while ensuring that they do not conflict with each other; i.e., one user group must not prevent others from accessing data when high-rate equipment is used.

WHERE TO USE POWERHAWK

PowerHawk is a powerful multitechnology, multi-user solution that enables high-volume testing of LTE, UTRAN, GERAN, CS/PS core and IMS networks. It is typically used in:

> Functional testing of network elements

> System verification

> Interoperability testing of a system comprised of multiple network elements

PowerHawk allows multiple users–up to ten simultaneously–to access the same interfaces in real time. It keeps up with the latest developments in network technology, supporting the latest industry specifications and vendor-specific implementations. PowerHawk is based on the world-leading M5 Analyzer software and offers an easy-to-use graphical user interface, automatic configuration and intelligent data analysis applications.

ONE CENTRALIZED SERVER HARDWARE, MULTIPLE USERS

EXFO interface adapters, licensing and client-analyzer software all operate on the same high-end PowerHawk server PC. Each client has the full M5 Analyzer software functionalities required to configure or analyze any network interface attached to the network interface adapters on the PowerHawk server. PowerHawk clients are accessed via a remote desktop connection. This all-in-one solution creates superior usability that is independent of the customer's PC, operating system or location.

Reducing CAPEX

Instead of having multiple analysis tools in the lab, PowerHawk only requires one server hardware–allowing savings in PC technology investments and in interface adapters. The location-independent usage allows the same hardware to be used from multiple locations. Ideally, the same test network and test equipment can be used for eight hours from Asia, eight hours from Europe and eight hours from the Americas–requiring only one third of the investment. Also, because users do not need high-end PCs, they can continue using any of their current PCs with any operating system.

Reducing OPEX

PowerHawk also reduces traveling costs. For example, a specialist abroad can perform detailed troubleshooting over a secure LAN instead of traveling onsite to help local engineers. With PowerHawk, test equipment maintenance is simplified–saving time and money. Software can be updated remotely in one shot, both for the server as well as for all customers. What's more, user PCs are free of any EXFO license or software installation. Also, since cabling is more permanent, it only needs to be done once–for all customers.

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CORRELATED MULTI-INTERFACE SIGNALING AND USER-PLANE ANALYSIS

PowerHawk features intelligent data analysis applications that enable real-time call and session tracing, LTE user-plane session and flow analysis, key performance indicator (KPI) generation and quality of service (QoS) measurements—with capability to drill down into the details of the decoded protocols.

Signaling Tracing and Analysis

The **Call and Session Analysis** application is a key troubleshooting tool that allows you to quickly see if there are any problems in the network.

› Real-time tracing and filtering of calls and sessions over the monitored interfaces in a multitechnology network

› Correlation of intersystem calls between LTE, UTRAN, GERAN, core and IMS

› Overall status of the calls and sessions in one view; each transaction has its own line with illustrative phase icons

› Full signaling details of a call, QoS values or related IP flows of an LTE session with one click

With the **Protocol Monitor** application, transactions can be analyzed to the last detail in real time and from multiple interfaces simultaneously.

› Message sequences for easy analysis of message flows

› Overall view of the network, with each event seen on its own line, along with its specific information and protocol content

› Easy access to complete signaling details for each event

› Correlated protocol messages between analysis views, making it easier to switch to another view

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POWERHAWK OPTIONS

INTERFACE ADAPTERS

Eight E1/T1 (bidirectional) Interface Adapter (D5)	Physical interface with eight bidirectional links for E1/T1/J1 physical interfaces capable for ATM or PCM data analysis; bantam connectors; cables must be purchased separately.
D5 Adapter Option: Inversed Multiplexed ATM (IMA)	Brings inversed multiplexed ATM capability to the PowerHawk platform. The IMA technology carries logical ATM link over multiple E1/T1 physical link.
Two Bidirectional STM-1/OC3 Interface Adapter (D6)	Physical interface for two bidirectional STM-1/OC-3 links carrying ATM traffic. Different connectors and multimode and singlemode sets available. Cable set with SFP adapters and optical splitters must be purchased separately.
D6 Adapter Option: Channelized STM-1	Channelized STM-1 option gives the possibility to analyze network where STM-1 is carrying multiple logical E1/T1 links.
Four 1G/10M/100M (Optical or Copper) Ethernet Interface Adapter (D7 Pro)	Physical interface for four (unidirectional) 1G/10M/100M Ethernet links. Cables and connector (SFP) sets must be purchased separately. SFP are available for copper or optical (singlemode or multimode) environments.
Two 10G (Optical) Ethernet Interface Adapter (D10)	Physical interface for two (unidirectional) 10G Ethernet links. Cables and connectors (SFP+) must be purchased separately. Multimode and singlemode sets are available.

LTE (4G) TECHNOLOGY PACKAGE

LTE (4G) Technology Support with Correlated Session Analysis (eUTRAN, EPC, Diameter)	Covers LTE and EPC interface analysis, detailed decoding, session analysis and session correlation over the LTE and EPC interfaces. Support is up to 3GPP REL9. [a]
NAS Deciphering (EEA0 Null,128-EEA1 SNOW 3G and 128-EEA2 AES Algorithms)	Fully automated NAS deciphering with defined algorithms. NAS deciphering with unlimited LTE sessions in real time, keys obtained automatically from S6a interface or can be manually added to the file.
NAS Deciphering (ZUC Algorithm)	Fully automated NAS deciphering with defined algorithms. NAS deciphering with unlimited LTE sessions in real time, keys obtained automatically from S6a interface or can be manually added to the file.
NSN eNB Internal Interface Tracing (LTE Air Interface Support over NSN eNB)	LTE air interface analysis (RRC and NAS messages, and RLC/MAC headers), LTE S1-MME signaling and X2 signaling with session analysis support. Connect the M5 software directly to one or multiple eNBs' internal interfaces port (supports NSN eNBs).
3GPP LTE R10	Decoding and session analysis for 3GPP REL10 protocols from all LTE/EPC interfaces.

UMTS (3G) TECHNOLOGY PACKAGE

UMTS (3G) Technology Support with Correlated Call and Session Analysis	Covers all UMTS RAN and core interface analysis, detailed decoding, session analysis and session correlation over the interfaces. Support is up to 3GPP REL7. [a]
Iub f8 Deciphering Support	Fully automatic Iub deciphering. Fetches keys from IU-PS and IU-CS interfaces and correlates them to the correct calls. No limitations of simultaneous calls under analysis.
Proprietary UTRAN Decoder/DoCoMo	DoCoMo specific decoding support for UTRAN interfaces. [a]
Proprietary UTRAN Decoder/NSN (Nokia)	NSN-specific decoding support for UTRAN interfaces. [a]
3GPP UTRAN R8	Covers full functionalities and new protocols as well as all protocol updates for 3GPP UMTS Rel8 specifications. [a]
3GPP UTRAN R9	Covers full functionalities and new protocols as well as all protocol updates for 3GPP UMTS Rel9 specifications. [a]
3GPP UTRAN R10	Covers full functionalities and new protocols as well as all protocol updates for 3GPP UMTS Rel10 specifications. [a]

Note

a. For details, please refer to Analyzer Technology Coverage product note.

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POWERHAWK OPTIONS (CON'T)

GSM (2G) TECHNOLOGY PACKAGE

GSM (2G) Technology Support with Correlated Call and Session Analysis	Covers all GSM (EDGE) RAN and core interface analysis, detailed decoding, session analysis and session correlation over the interfaces. Support is up to 3GPP REL7. [a]
Gb Deciphering	Fully automatic Gb interface deciphering (requires PSTN and Registers technology support). Automatic key fetching from Gr interface.
Proprietary GERAN Decoder/Ericsson	Ericsson-specific decoding support for GERAN interfaces. [a]
Proprietary GERAN Decoder/NSN	NSN-specific decoding support for GERAN interfaces. [a]
Abis over IP for NSN	Supports Abis over IP in NSN environments. Requires Proprietary GERAN Decodings/NSN package.
3GPP GSM R8	Covers full functionalities and new protocols as well as all protocol updates for 3GPP GSM Rel8 specifications. [a]
3GPP GSM R9	Covers full functionalities and new protocols as well as all protocol updates for 3GPP GSM Rel9 specifications. [a]
3GPP GSM R10	Covers full functionalities and new protocols as well as all protocol updates for 3GPP GSM Rel10 specifications. [a]

IMS TECHNOLOGY PACKAGE

IMS Technology Support with SIP Session Analysis	Full IMS interface decoders and session support. [a]

CORE TECHNOLOGY PACKAGE

Core Technology Support with Call and Session Analysis	Full CS and PS core (Mc, Nc, Nb), PSTN (SS7, Sigtran, Sip-I) and Registers (MAP, CAP, CAMEL, Diameter, etc.) interfaces decoding and session support. [a]
Proprietary Core Decodings/Ericsson	Ericsson-specific core decoding support. [a]
Proprietary Core Decodings/NSN	NSN-specific core decoding support. [a]

SIMO, NSN PS AND CS CORE SIGNALING SUPPORT

CS SiMo with Call and Session Analysis	Brings the possibility to connect M5 Analyzer software directly to live network NSN M-GW, or MSC server. Trace live data from CS core networks. [b]
PS SiMo with Call and Session Analysis	Brings the possibility to connect M5 Analyzer software directly to live network NSN SGSN, or GGSN elements. Allows tracing live data from PS core networks.
Gb Deciphering	Brings Gb interface analysis deciphering option to PS-SiMo.

Notes
a. For details, please refer to Analyzer Technology Coverage product note.
b. For details, please refer to M5 SiMo product note.

HARDWARE

PowerHawk Server 3.1—Technical Details

- › 12 core CPU
  - › Two Intel Xeon X5670 2.93 GHz six-core
- › 48 GB of memory
  - › Twelve 4 GB DDR-3-1333 ECC REG
- › 6 TB of storage
  - › Hard disk: six 1 TB Seagate Constellation ES SAS 6 Gbit/s (ST31000424SS), RAID 5 (usable space of 1024 GB for system, 3628 GB for traces), tolerates failure of one disk

- › Redundant power supply (800 W)
- › Operating system: Win 2008 server EE R2 64 bit
- › Free slots for interface adapters: 3 x PCI Express, 2 x PCI-X
- › Two 10/100/1000 Mbit/s Ethernet ports
- › DVD+/-RW
- › Dimensions (H x W x D): 132 mm x 437 mm x 648 mm (5.2 in x 17.2 in x 25.5 in)

Capacity and Connections

- › Multitechnology support:
  - › Up to 6 x STM-1/OC-3 or 3 x STM-4/OC-12 links
  - › Up to 16 x E1/T1/J1 links
  - › Up to 12 x optical or copper 10/100 Mbit/s and Gigabit Ethernet ports
  - › Up to 4 x optical 10 Gbit Ethernet ports

SUPPORTED CONFIGURATIONS

STM-1/OC-3 links	or	STM-4/OC-12 links	and	E1/T1/J1 links	and	1 Gbit Ethernet ports	and	10 Gbit Ethernet ports
6		3		16		0		0
0		0		16		12		0
4		2		16		4		0
2		1		16		8		0
2		1		8		4		2
0		0		0		0		4

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