

NETROPY™ N60 HARDWARE GUIDE



Netropy N60 Hardware Guide

Hardware Revision: L1
Documentation Version: 2
Printed June 2011

Apposite® Technologies, Inc.

11500 W. Olympic Blvd., Suite 510
Los Angeles, CA 90064 USA
www.apposite-tech.com

tel: 1.310.477.9955
fax: 1.310.477.9956
email: info@apposite-tech.com

Copyright ©2005-2011 Apposite Technologies, Inc. All rights reserved. Apposite and Linktropy are registered trademarks of Apposite Technologies, Inc. Netropy, the Apposite logo and “WAN Emulation Made Easy” are trademarks of Apposite Technologies, Inc.

Part No. DOC-HG-N60-L12

CONTENTS

1 Overview	3
2 Included Items.....	4
3 Front and Rear Panels	5
Front Panel	5
Rear Panel.....	6
4 Capacity Limitations	7
5 Rack Mounting	8
6 SFP Interfaces	9
7 Console Interface.....	10
8 Apposite Support.....	11
Appendix A: <i>Specifications</i>	12
Appendix B: <i>Regulatory</i>	13
Federal Communications Commission Notice	13
Canadian Notice / Avis Canadien.....	13
CE Certification.....	13
Appendix C: <i>Netropy End User License Agreement</i>	14

1 | OVERVIEW

This *Netropy N60 Hardware Guide* describes the physical hardware of the Netropy N60 Network Emulator. The companion *User's Guide* describes the installation, configuration, and operation of the Netropy network emulation functionality. A separate *Quick Start Guide* provides a walk-through for first time configuration.



The Netropy N60 contains no user serviceable parts. Opening the chassis voids the warranty. If you believe your unit is not functioning properly, see Section 8 for information on obtaining support.

This guide is for the Netropy N60 hardware revision –L1.

2 | INCLUDED ITEMS

The Netropy N60 shipping carton contains the following items:

- ▶ Netropy N60 hardware unit
- ▶ Rack mount brackets (2) and screws (6)
- ▶ Documentation CD
- ▶ Netropy N60 Quick Start Guide
- ▶ AC power cord (U.S.)
- ▶ RJ-45 to DB-9 serial cable

3 | FRONT AND REAR PANELS

Front Panel



Standard RJ45 Interface Version



Optional SFP Interface Version

The front panel of the Netropy N60 contains:

Power LED: Lit green when the unit is powered on. Unlit when power is off

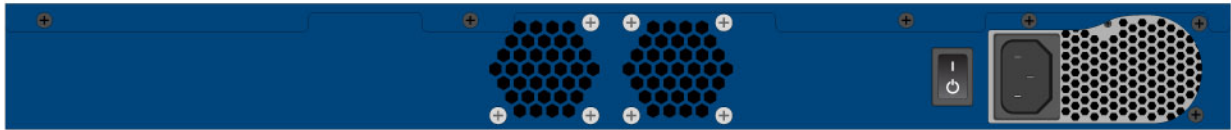
CONSOLE: Console interface using RS-232 with an RJ-45 connector. See Section 7 for a pin-out of the console interface.

MGMT: 10/100/1000baseT Gigabit Ethernet interface with a standard RJ-45 connector for management of the unit over the network.

PORT 1 and PORT 2: A pair of Gigabit Ethernet ports used for network emulation. The standard version of the Netropy N60 has 10/100/1000baseT Gigabit Ethernet interfaces with RJ-45 connectors. The Netropy N60 is optionally available instead with modular SFP Gigabit Ethernet interfaces to provide connectivity to either fiber or copper network infrastructure. The SFP interfaces may be used with any standard Gigabit Ethernet SFP transceiver. See Section 6 for more details on the SFP interfaces.

Emulation interfaces support jumbo frames up to 9 KB.

Rear Panel



The rear panel of the Netropy N60 contains:

Power input: Standard IEC C14 socket for power input. U.S. and Canadian customers should use the supplied power cord to connect the Netropy N60 to a power outlet. International customers may need to substitute a local power cord with a standard IEC C13 plug. The Netropy N60 handles AC power input from 100 to 240 V.

Power switch: Rock the switch to the 1 position to turn on the unit. Rock the switch again to the 1 position and hold for 5 seconds to turn off.

Fan outlets: Hot air is vented through the fan outlets.



Please ensure the space around the fan outlet on the back panel and the air intakes on the front panel remains unblocked to provide adequate airflow and prevent overheating..

4 | CAPACITY LIMITATIONS

The Netropy N60 can forward up to 1 Gbps of packets in each direction, 2 Gbps aggregate, at a maximum aggregate rate of 1 million packets per second. These limits apply regardless of whether emulation is on or off. These limits may be reduced depending on the classification method used.

The maximum round trip latency that the Netropy N60 supports depends on the aggregate throughput between the two directions and the packet sizes. The chart below summarizes a few typical examples. Users who need to emulate latencies close to these limits are advised to contact Apposite to discuss their requirements.

Aggregate Throughput	Packet Size			
	64 bytes	500 bytes	1500 bytes	9000 bytes
10 Mbps	>20 sec	>20 sec	>20 sec	>20 sec
100 Mbps	7.5 sec	>20 sec	>20 sec	>20 sec
1 Gbps	**	6 sec	6 sec	6 sec
2 Gbps	**	3 sec	3 sec	3 sec

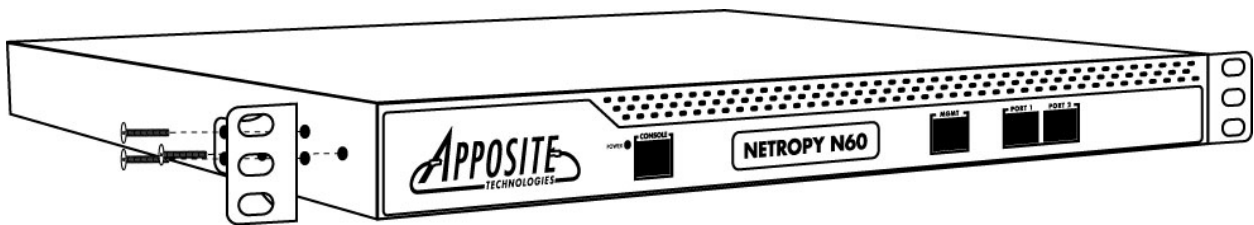
** Not supported by maximum packet rate

Table 1: Maximum Round-Trip Latency

The maximum emulation bandwidth may be limited below the hardware capacity of 1 Gbps in each direction by the device's license key. See the *Netropy User's Guide* for more details on the license key.

5 | RACK MOUNTING

The Netropy N60 includes a pair of brackets for mounting the device into a standard 19" rack. Attach the brackets to both sides of the unit using three of the supplied screws with each bracket as shown in the diagram below.



6 | SFP INTERFACES

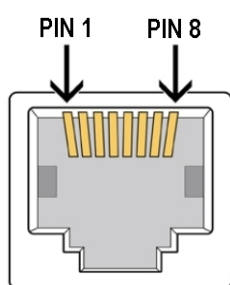
The Netropy N60 is optionally available with Gigabit Ethernet small form-factor pluggable (SFP) interfaces, also known as mini-GBIC, for the PORT 1 and PORT 2 interfaces. SFP interfaces are modular and support both fiber-optic and copper-based cabling depending on the installed transceiver. Standard fiber and copper transceivers are available from a variety of vendors.

Select an appropriate transceiver type based on network and cabling requirements. Slide the transceiver into the SFP port until it clicks into place.

The SFP interfaces only support 1 Gbps full duplex transfer mode regardless of whether a copper or fiber-optic transceiver is used.

7 | CONSOLE INTERFACE

Console access to the Netropy N60 is through the RJ-45 interface on the front panel labeled “CONSOLE.” An RJ-45 to DB-9 cable is included with the unit to connect the device to a standard PC serial port. The pin-out for the RJ-45 interface is shown below:



Pin	Definition	Pin	Definition
1	CTS/RTS	2	DTR
3	TxD	4	GND
5	GND	6	RxD
7	DSR	8	CTS/RTS

To connect to the console, use a terminal or a computer running terminal emulator software such as HyperTerminal or PuTTY, and set the following parameters:

- 9600 baud
- 8 data bits
- No parity
- 1 stop bit
- Disable flow control

8 | APPOSITE SUPPORT

Purchase of the Netropy N60 includes one year hardware warranty and one year of support and maintenance. Extended maintenance packages are available from Apposite or your local Netropy reseller.

If you believe your unit is not functioning properly and is under warranty, please upgrade to the latest firmware release. If the problem persists, please contact Apposite Support at:

support@apposite-tech.com
1.310.477.9955 ext. 2

When contacting Apposite Support, please include the following information:

- ▶ Netropy model
- ▶ Serial number
- ▶ Your e-mail address and phone number
- ▶ Installed firmware version
- ▶ A detailed description of the problem



Do not attempt to fix any hardware problem yourself. The Netropy N60 contains no user serviceable parts. Opening the chassis voids the warranty.

APPENDIX A

Specifications

Capacity			
Max. Emulation Rate		Up to 1 Gbps full duplex	
Max. Packet Rate		1,000,000 packets per second	
Interfaces			
Network		2 x 10/100/1000baseT Copper Gigabit Ethernet or 2 x SFP Gigabit Ethernet	
Management		1 x 10/100/1000baseT Copper Gigabit Ethernet	
Console		1 x RS-232	
Environmental and Physical			
AC Input Voltage		Auto ranging 100 VAC to 240 VAC	
AC Input Frequency		50 to 60 Hz	
AC Input Current		4.0 A Max. 0.4 A Typical	
Power Draw		45 Watts	
Dimensions		17" W x 10.9" D x 1.75" H (1 RU) 431 mm W x 277 mm D x 43.5 mm H (1 RU)	
Weight	Product	8.5 lbs. (3.9 kg)	
	Shipping	13 lbs. (6 kg)	
Temperature	Operating	32° to 104°F	(0° to 40°C)
	Storage	-4° to 158°F	(-20° to 70°C)
Humidity	Operating	5% to 95% (non-condensing)	
	Storage	5% to 95% (non-condensing)	
Certifications		FCC Class A, CE, RoHS	
Warranty and Support			
Hardware warranty		1 year	
Support and Maintenance		1 year, including all firmware upgrade	

APPENDIX B

Regulatory

Federal Communications Commission Notice

This equipment has been tested and verified to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be required to take whatever measures may be required to correct the interference at their own expense.

Canadian Notice / Avis Canadien

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

CE Certification

The product described in this manual complies with all applicable European Union (CE) directives, including EU Directives 1999/5/EC Radio Equipment and Telecommunications Terminal Equipment and 2002/95/EC Restriction of Hazardous Substances (RoHS).

APPENDIX C

Netropy End User License Agreement

The Apposite Technologies, Inc. (“Apposite”) Netropy product includes the Netropy hardware (“Hardware”), software embedded in the Hardware (“Software”), including any upgrades, modified versions, updates, additions and copies of the Software, and related explanatory materials (“Documentation”). Collectively, the Hardware, Software, and Documentation are the “Product.”

Conditioned upon compliance with the terms and conditions of this Agreement, Apposite hereby grants you a nonexclusive and nontransferable license to use the Software solely as embedded on the Hardware, and to use the Documentation solely in conjunction with the Software and Hardware.

Title and Restrictions

Apposite retains all right, title and interest in the Software and Documentation. The Software and Documentation are protected by United States and international copyright and other intellectual property laws and international trade provisions. Except as otherwise expressly provided under this Agreement, you shall not directly or authorize any third party to:

- (i) copy the Software, except as necessary for archival or backup purposes only;
- (ii) transfer, assign, sublicense, rent, lease, lend, or otherwise transfer your license rights to any other person or entity;
- (iii) install or use the Software on any computing device other than the Hardware;
- (iv) modify or adapt the Software or Documentation or create derivative works based upon the Software or Documentation;
- (v) reverse engineer, disassemble, decompile, decrypt, or otherwise attempt to derive the source code of the Software, except to the extent otherwise expressly permitted under applicable law notwithstanding this restriction. To the extent required by law, and at your written request, Apposite will provide you with the interface information needed to achieve interoperability between the Software and another independently created program;
- (vi) remove, alter, cover or obfuscate any of the trademarks, trade names, logos, patent or copyright notices or markings, or add any other notices or markings to or on the Software, Documentation, or Hardware without the express written authorization of Apposite.

Limited Warranty

Apposite warrants that for a period of one (1) year from the date of shipment of the Hardware to you (“Warranty Period”), the Hardware will be free of any defects in materials and workmanship under normal use and the Software will perform substantially in accordance with the Documentation. This limited warranty extends only to the original user of

the Product. This limited warranty is void if failure of the Hardware or Software to conform to the warranty has resulted from improper installation, testing, misuse, neglect, accident, fire or other hazard, or any breach of this Agreement.

Apposite and its suppliers' entire liability and your sole and exclusive remedy shall be, at Apposite's sole discretion, to (i) repair the Software or Hardware; (ii) provide replacement Hardware or Software; or (iii) refund the purchase price and terminate this Agreement. This limited warranty applies only if the product is returned to Apposite, freight and insurance prepaid, in accordance with Apposite's Return Material Authorization (RMA) procedures. Any repaired or replaced Software or Hardware will be warranted for the remainder of the original Warranty Period or thirty (30) days, whichever is longer.

Disclaimer of Warranties

THE FOREGOING LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, AND APPOSITE DISCLAIMS ANY AND ALL IMPLIED WARRANTIES OR CONDITIONS, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF TITLE, NONINFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY BY JURISDICTION.

Limitation of Liability

REGARDLESS WHETHER ANY REMEDY SET FORTH HEREIN FAILS OF ITS ESSENTIAL PURPOSE, IN NO EVENT WILL APPOSITE OR ITS SUPPLIERS BE LIABLE FOR ANY DAMAGES, INCLUDING WITHOUT LIMITATION, ANY LOST PROFITS, BUSINESS INTERRUPTION, LOSS OF INFORMATION, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES HOWEVER CAUSED AND REGARDLESS OF THE THEORY OF LIABILITY OR WHETHER ARISING OUT OF THE USE OF OR INABILITY TO USE THE PRODUCT AND EVEN IF APPOSITE OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL APPOSITE OR ITS SUPPLIERS' LIABILITY, WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE), BREACH OF WARRANTY, OR OTHERWISE, EXCEED THE PRICE PAID FOR THE PRODUCT. SOME STATES DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

Term and Termination

This agreement takes effect upon your use of the software and remains effective until terminated. You may terminate it at any time by destroying all copies of the Software and Documentation in your possession. This license will terminate immediately if you fail to comply with any term or condition of this agreement. You agree on termination of this license to cease all use of the Software and Documentation. In addition, the provisions of the sections "U.S. Government Restricted Rights" and "Export" shall survive termination of this agreement.

Export

The Product, including the underlying technology, is subject to U.S. export control laws, and may be subject to export or

import regulations in other countries. You may not export or import the Product and the underlying technology, directly or indirectly, in violation of these laws. You agree to comply strictly with all such laws and regulations and acknowledge that you have the responsibility to obtain such licenses to export, re-export, or import as may be required.

U.S. Government Restricted Rights

The Software and Documentation qualify as “commercial computer software” and “commercial computer software documentation” pursuant to FAR 12.212 and DFAR 227.7202. The Software and Documentation are being licensed to U.S. Government end users only as Commercial Items and with only those rights as are granted to all other end users pursuant to the terms and conditions of this agreement.

General Provisions

This agreement will be governed by and construed in accordance with the laws of the State of California without reference to its conflicts of law provisions. This agreement shall not be governed by the United Nations Convention on Contracts for the International Sale of Goods, the application of which is expressly excluded. If for any reason a court of competent jurisdiction finds any provision, or portion thereof, to be unenforceable, the remainder of this agreement shall continue in full force and effect.

This agreement constitutes the entire agreement between the parties with respect to the Product and supersedes all prior or contemporaneous understandings regarding such subject matter, whether written or oral, and supersedes any conflicting or additional terms contained in any purchase order or elsewhere, all of which terms are excluded. No amendment to or modification of this agreement are binding unless in writing and signed by Apposite.

Third Party Acknowledgements

Portions of the Software utilize or include third party software and other copyrighted material. Acknowledgements, licensing terms and disclaimers for such material are contained in the Netropy User’s Guide, and your use of such material is governed by their respective terms. Certain third party software are free software licensed under the terms of the GNU General Public License (GPL). You may obtain a complete machine-readable copy of the source code for such free software under the terms of the GPL. The GPL software is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY, without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. A copy of the GPL is included in the product User’s Guide.

Apposite® Technologies, Inc.

11500 W. Olympic Blvd., Suite 510

Los Angeles, CA 90064 USA

www.apposite-tech.com

tel: 1.310.477.9955

fax: 1.310.477.9956

email: info@apposite-tech.com