Advisor SW Edition

Getting Started

Agilent Technologies

Notices

Copyright © 2000, 2001
Agilent Technologies, Inc. All rights reserved.

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Agilent Technologies, Inc. as governed by United States and international copyright laws.

Manual Part Number

5971-2925

Edition

Second edition, September 2001

Software version LAN.11.500.00

Printed in USA

Agilent Technologies
5070 Centennial Boulevard
Colorado Springs, CO 80919-2497 USA

Trademarks

Microsoft ® is a U.S. registered trademark of Microsoft Corporation.

Windows ® and MS Windows ® are U.S. registered trademarks of Microsoft Corporation.

Documentation Warranty

The material contained in this document is subject to change without notice. Agilent Technologies makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Agilent Technologies shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Warranty

A copy of the specific warranty terms applicable to your product and replacement parts can be obtained from your local Sales and Service Office.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

Product Support

Call your local Agilent Technologies representative, or:

Tel: 1-800-698-0061
Fax: 303-754-4802

or call your local Agilent Sales and Service Office.

Web:
http://onenetworks.comms.agilent.com/

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

In This Manual

1 Introduction

This chapter provides a detailed overview of the features of the Advisor SW Edition.

2 Getting Started

This chapter describes the steps you use to get started testing with the Agilent Advisor SW Edition.

3 Sample Tests

This chapter illustrates several test examples to lead you quickly through using the Agilent Advisor SW Edition to solve common Ethernet LAN testing problems.

A Declaration of Conformity

This appendix lists specific information for Declarations of Conformity.

B Accessories

This appendix gives you information about the J1990A Full Duplex Ethernet Tap for the Agilent Advisor SW Edition application in a PC with a NIC or PCMCIA card.

.

Contents

1 Introduction

Starting with the Quickstart Expert Guide 9

Starting with Expert Analyzer 10

Examining Physical Layer Activity 11

Examining the Top Talkers 12

Examining Protocol Errors 14

Discovering What Nodes Are on the Network 15

Decoding Frames on Your Network 16

Reporting Errors on a LAN Segment 17
- Error Reporting on a LAN Segment 18

2 Getting Started

Installing NIC and PCMCIA cards, and Software 27
- General Network Interface Card Installation 28
- General PCMCIA Card Installation 28
- Verify Network Card Installation 29
- Software Installation 29

Connecting to a Network 30
- To Connect as a Node 30
- To Connect in Monitor-Thru Mode 31

Starting the Application 32

Configuring the Instrument 35

Selecting a Measurement 36

Configuring a Measurement 37

Finding More Information 38

3 Sample Tests

How Busy Is The Network? 43

Who Are the Top Talkers on the Network? 48
Are There Problems on the Network? 53

A Declaration of Conformity

J1990A Full Duplex Ethernet Tap for Your Agilent Advisor 60

B Accessories

J1990A Full Duplex Ethernet Tap for Your Agilent Advisor 62

Index

1

Introduction

Starting with the Quickstart Expert Guide 9
Starting with Expert Analyzer 10
Examining Physical Layer Activity 11
Examining the Top Talkers 12
Examining Protocol Errors 14
Discovering What Nodes Are on the Network 15
Decoding Frames on Your Network 16
Reporting Errors on a LAN Segment 17

The Agilent Advisor SW Edition is a powerful software protocol analyzer designed to help you troubleshoot and analyze your Ethernet and Fast Ethernet networks.

With the Advisor SW Edition, you can use a personal computer (PC) equipped with a network interface card (NIC) or a PCMCIA card rather than the Advisor LAN acquisition hardware.

The industry-standard Network Driver Interface Specification (NDIS 5.0) is used because it supports most off-the-shelf NIC and PCMCIA network adapters.

You can use the Advisor SW to:

- prevent network problems before they affect users
- resolve network problems quickly and effectively
- optimize network performance

The following pages provide a more detailed overview of the features of the Advisor SW Edition.

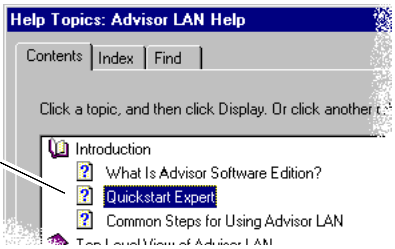
- Start with Expert Analyzer to see a quick overview of the health, utilization, and protocol activity on your network.
- Examine the physical layer to see if nodes on your network can connect and communicate.
- See who is sending the most traffic. See what protocols they are using. See which stations are establishing connections.
- Find out what network protocol errors are occurring on your network.
- Discover all nodes on your network.

Starting with the Quickstart Expert Guide

When you start the Advisor SW Edition application, the “Quickstart Expert” troubleshooting guide displays a list of common network problems you can solve with the Advisor SW Edition.

You can display the Quickstart Expert:

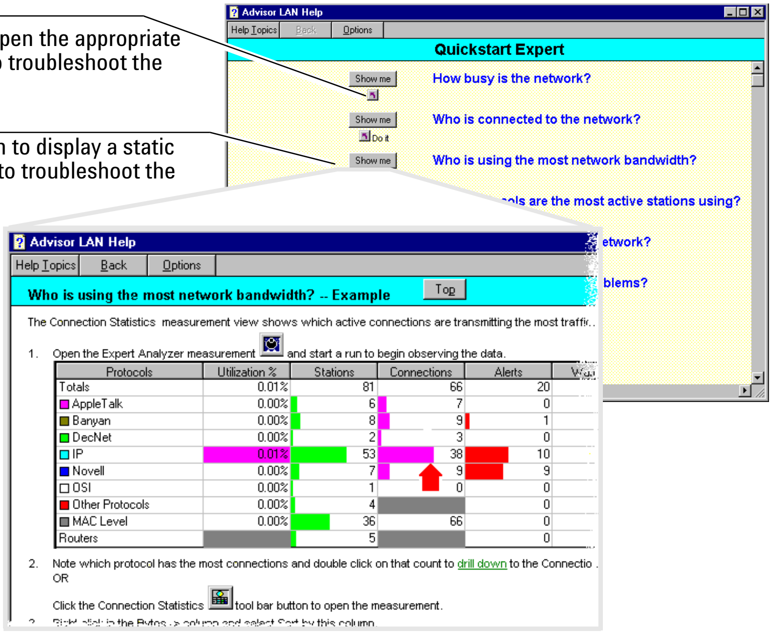
- At application start up
- From the Help menu
- In the Help window, use the Contents -- Introduction -- Solving Problems topic


Help Topics: Advisor LAN Help
Contents
Index
Find
Introduction
What Is Advisor Software Edition?
Quickstart Expert
Common Steps for Using Advisor LAN

Click a topic, and then click Display. Or click another

Use the Do It button to open the appropriate measurement window to troubleshoot the problem.

Use the Show Me button to display a static view of a measurement to troubleshoot the problem.


Advisor LAN Help
Help Topics
Back
Options
Quickstart Expert
Show me
Do it
Show me
Show me
Advisor LAN Help
Help Topics
Back
Options
Top

How busy is the network?

Who is connected to the network?

Who is using the most network bandwidth?

Who is using the most network bandwidth? -- Example

The Connection Statistics measurement view shows which active connections are transmitting the most traffic.

1. Open the Expert Analyzer measurement and start a run to begin observing the data.

Protocols	Utilization %	Stations	Connections	Alerts
Totals	0.01%	81	66	20
🟪 AppleTalk	0.00%	6	7	0
🟫 Banyan	0.00%	8	9	1
🟩 DecNet	0.00%	2	3	0
🟦 IP	0.01%	53	38	10
🟦 Novell	0.00%	7	9	9
☐ OSI	0.00%	1	0	0
🟥 Other Protocols	0.00%	4		0
⬛ MAC Level	0.00%	36	66	0
Routers		5		0

2. Note which protocol has the most connections and double click on that count to drill down to the Connectio
OR

Click the Connection Statistics tool bar button to open the measurement.

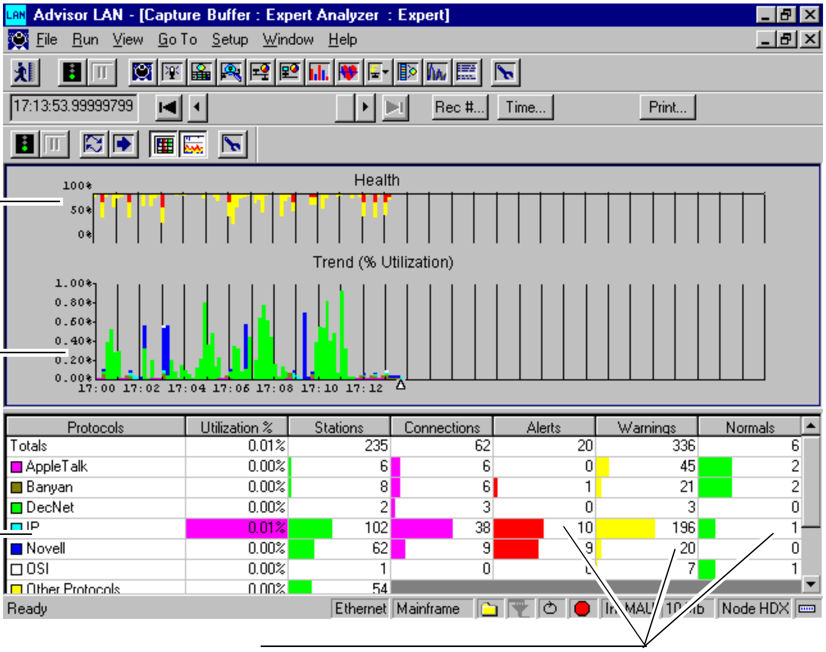
Starting with Expert Analyzer

See the health, utilization, and protocol activity at a glance

The Expert Analyzer measurement is an excellent way to see the performance of your network at a glance. In the top section, the Health graph starts the top of the graph at 100% and if your network is error free, it stays at 100%. When an event occurs, a value is subtracted from the health – more for Alert events, less for Warning events. These values are configurable. The Trend graph displays selectable parameters in a sliding 30-minute window. Each major protocol is shown in a different color on the Trend graph.

Below the Health and Trend graphs is a spreadsheet of information about your network. The rows are labeled with the active protocol stacks detected on the data source. The spreadsheet shows how much activity is occurring in each protocol. From this measurement, you can quickly drill down by double clicking to see supporting details to understand why a graph spike or a large count occurred.

Highlight any object within a measurement and press F1 to receive a detailed explanation of the object.


Advisor LAN - [Capture Buffer : Expert Analyzer : Expert]
File Run View Go To Setup Window Help
17:13:53.99999799
Rec #...
Time...
Print...
Health
100%
50%
0%
Trend (% Utilization)
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
17:00 17:02 17:04 17:06 17:08 17:10 17:12
Ready
Ethernet
Mainframe
Node HDX

Protocols	Utilization %	Stations	Connections	Alerts	Warnings	Normals
Totals	0.01%	235	62	20	336	6
AppleTalk	0.00%	6	6	0	45	2
Banyan	0.00%	8	6	1	21	2
DecNet	0.00%	2	3	0	3	0
IP	0.01%	102	38	10	196	1
Novell	0.00%	62	9	9	20	0
OSI	0.00%	1	0	0	7	1
Other Protocols	0.00%	54				

The Health graph shows a weighted view of Alert and Warning protocol events and frame errors.

See a graph of network utilization.

The spreadsheet quickly identifies where the majority of protocol activity is occurring.

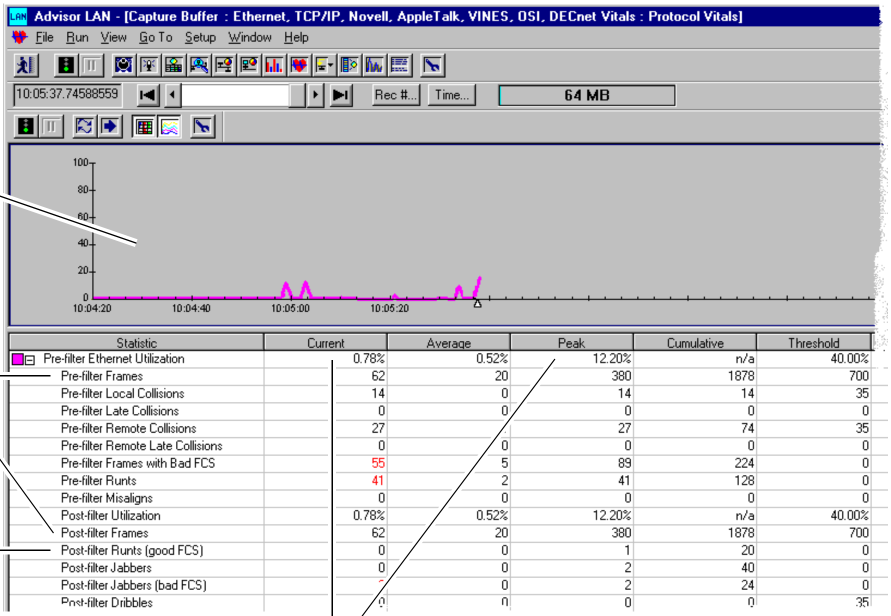
Count the Alerts, Warnings, and Normal protocol events for each protocol.

Examining Physical Layer Activity

Can stations connect and communicate?

Often, the first thing you want to know is if your network stations are able to connect and communicate. The Protocol Vitals measurement quickly shows you if the physical layer is operating.

Some of the Vitals counts indicate normal and desirable activity. Other counts may indicate serious and potentially damaging activity.


Advisor LAN - [Capture Buffer : Ethernet, TCP/IP, Novell, AppleTalk, VINES, OSI, DECnet Vitals : Protocol Vitals]
File Run View Go To Setup Window Help
10:05:37.74588559
Rec #...
Time...
64 MB
100
80
60
40
20
0
10:04:20
10:04:40
10:05:00
10:05:20

Statistic	Current	Average	Peak	Cumulative	Threshold
🟪 ⊟ Pre-filter Ethernet Utilization	0.78%	0.52%	12.20%	n/a	40.00%
Pre-filter Frames	62	20	380	1878	700
Pre-filter Local Collisions	14	0	14	14	35
Pre-filter Late Collisions	0	0	0	0	0
Pre-filter Remote Collisions	27	[illegible]	27	74	35
Pre-filter Remote Late Collisions	0	0	0	0	0
Pre-filter Frames with Bad FCS	55	5	89	224	0
Pre-filter Runts	41	2	41	128	0
Pre-filter Misaligns	0	0	0	0	0
Post-filter Utilization	0.78%	0.52%	12.20%	n/a	40.00%
Post-filter Frames	62	20	380	1878	700
Post-filter Runts (good FCS)	0	0	1	20	0
Post-filter Jabbers	0	0	2	40	0
Post-filter Jabbers (bad FCS)	[illegible]	0	2	24	0
Post-filter Dribbles	0	0	0	0	35

Right click an item in the spreadsheet to select it for the graph.

See traffic before and after filtering is applied.

See if any frames have transmission errors.

See the percentage of current and peak network utilization over the last minute.

Examining the Top Talkers

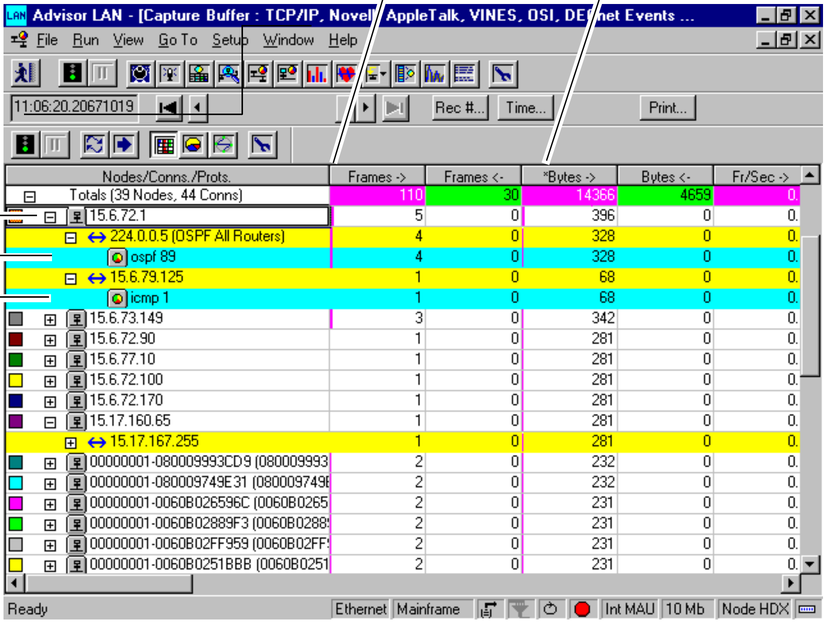
Who is sending the most traffic? Who are they talking to? What protocol are they using?

When network utilization is too high, and is causing slow network response, you can use the Connection Statistics measurement to quickly see who is using most of the network bandwidth. When you know who the top talkers are, you can make decisions about how to improve their network communications.

You can choose different parameters to sort. This shows you where most of the traffic is occurring for different traffic conditions.

Size this column width to show only as many address characters as you want to see.

An asterisk (*) indicates the column selected for sorting.

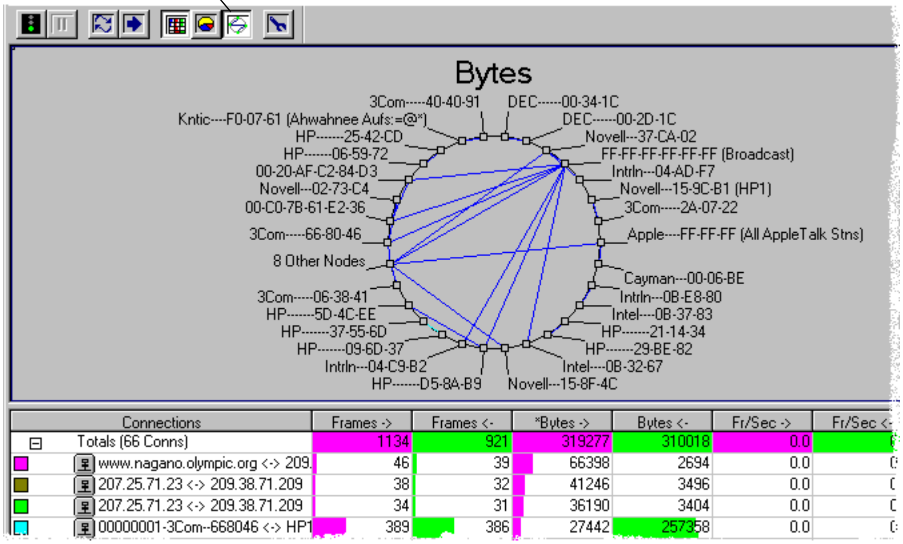

Advisor LAN - [Capture Buffer : TCP/IP, Novell, AppleTalk, VINES, OSI, DECnet Events ...
File Run View Go To Setup Window Help
11:06:20.20671019
Rec #...
Time...
Print...
Ready
Ethernet
Mainframe
Int MAU
10 Mb
Node HDX

Nodes/Conns./Prots.	Frames ->	Frames <-	*Bytes ->	Bytes <-	Fr/Sec ->
⊟ Totals (39 Nodes, 44 Conns)	110	30	14366	4659	0.
⊟ 15.6.72.1	5	0	396	0	0.
⊟ ↔ 224.0.0.5 (OSPF All Routers)	4	0	328	0	0.
ospf 89	4	0	328	0	0.
⊟ ↔ 15.6.79.125	1	0	68	0	0.
icmp 1	1	0	68	0	0.
⊞ 15.6.73.149	3	0	342	0	0.
⊞ 15.6.72.90	1	0	281	0	0.
⊞ 15.6.77.10	1	0	281	0	0.
⊞ 15.6.72.100	1	0	281	0	0.
⊞ 15.6.72.170	1	0	281	0	0.
⊟ 15.17.160.65	1	0	281	0	0.
⊞ ↔ 15.17.167.255	1	0	281	0	0.
⊞ 00000001-080009993CD9 (080009993	2	0	232	0	0.
⊞ 00000001-080009749E31 (080009749	2	0	232	0	0.
⊞ 00000001-0060B026596C (0060B0265	2	0	231	0	0.
⊞ 00000001-0060B02889F3 (0060B0288	2	0	231	0	0.
⊞ 00000001-0060B02FF959 (0060B02FF	2	0	231	0	0.
⊞ 00000001-0060B0251BBB (0060B0251	2	0	231	0	0.

This node has a connection to two other nodes.

Each of these connections is using a different protocol.

Also in the Connection Statistics measurement, you can use the Show Connections toolbar button to display a connection diagram that graphically displays the connections.



Show Connections toolbar button.

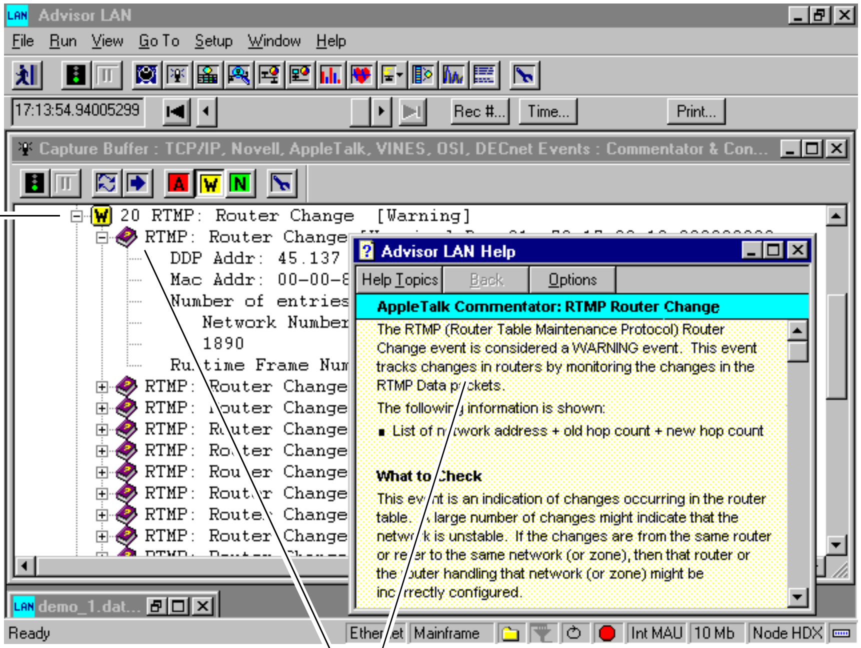
Bytes
3Com-----40-40-91
DEC------00-34-1C
Kntic----F0-07-61 (Ahwahnee Aufs:=@*)
DEC------00-2D-1C
HP-------25-42-CD
Novell---37-CA-02
HP-------06-59-72
FF-FF-FF-FF-FF-FF (Broadcast)
00-20-AF-C2-84-D3
Intrln---04-AD-F7
Novell---02-73-C4
Novell---15-9C-B1 (HP1)
00-C0-7B-61-E2-36
3Com-----2A-07-22
3Com-----66-80-46
Apple----FF-FF-FF (All AppleTalk Stns)
8 Other Nodes
Cayman---00-06-BE
3Com-----06-38-41
Intrln---0B-E8-80
HP-------5D-4C-EE
Intel----0B-37-83
HP-------37-55-6D
HP-------21-14-34
HP-------09-6D-37
HP-------29-BE-82
Intrln---04-C9-B2
Intel----0B-32-67
HP-------D5-8A-B9
Novell---15-8F-4C

	Connections	Frames ->	Frames <-	*Bytes ->	Bytes <-	Fr/Sec ->	Fr/Sec <-
⊟	Totals (66 Conns)	1134	921	319277	310018	0.0	
🟪	www.nagano.olympic.org <-> 209.	46	39	66398	2694	0.0	
🟫	207.25.71.23 <-> 209.38.71.209	38	32	41246	3496	0.0	
🟩	207.25.71.23 <-> 209.38.71.209	34	31	36190	3404	0.0	
🟦	00000001-3Com--668046 <-> HP1	389	386	27442	257358	0.0	

Examining Protocol Errors

What network protocol errors are occurring?

With the Commentator measurement, you can quickly see what protocol events are occurring and organize the events by severity.


Advisor LAN
File Run View Go To Setup Window Help
17:13:54.94005299
Rec #...
Time...
Print...
Capture Buffer : TCP/IP, Novell, AppleTalk, VINES, OSI, DECnet Events : Commentator & Con...
A
W
N
Advisor LAN Help
Help Topics
Back
Options
demo_1.dat...
Ready
Ethernet
Mainframe
Int MAU
10 Mb
Node HDX

```
20 RTMP: Router Change  [Warning]
   RTMP: Router Change
      DDP Addr: 45.137
      Mac Addr: 00-00-8
      Number of entries
         Network Number
         1890
      Runtime Frame Num
   RTMP: Router Change
   RTMP: Router Change
   RTMP: Router Change
   RTMP: Router Change
   RTMP: Router Change
   RTMP: Router Change
   RTMP: Router Change
   RTMP: Router Change
```

AppleTalk Commentator: RTMP Router Change

The RTMP (Router Table Maintenance Protocol) Router Change event is considered a WARNING event. This event tracks changes in routers by monitoring the changes in the RTMP Data packets.

The following information is shown:

- List of network address + old hop count + new hop count

What to Check

This event is an indication of changes occurring in the router table. A large number of changes might indicate that the network is unstable. If the changes are from the same router or refer to the same network (or zone), then that router or the router handling that network (or zone) might be incorrectly configured.

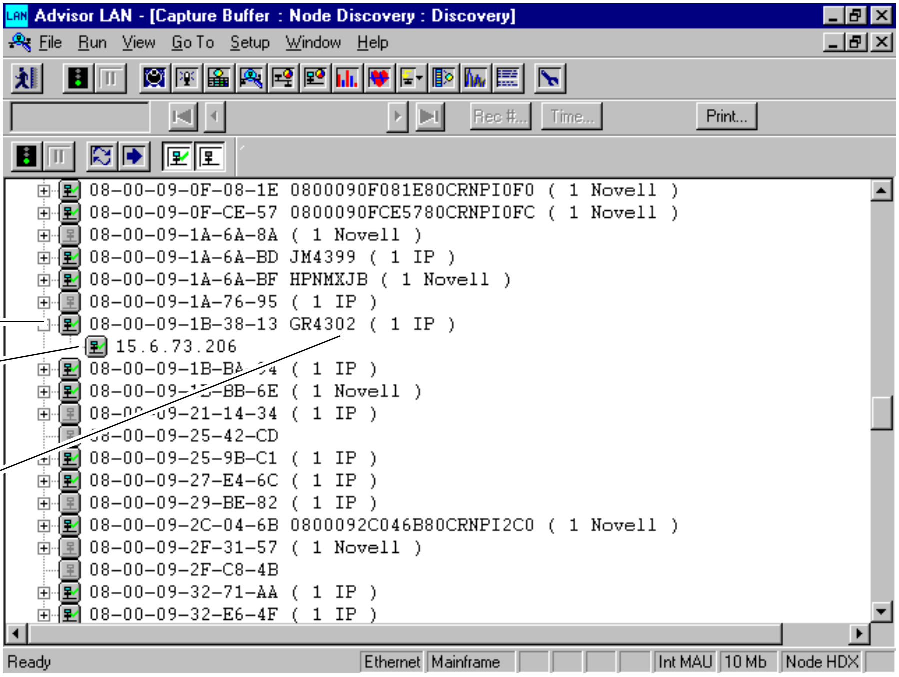
This protocol address has had 20 Router Change events occur. This is a Warning event.

Click the Book icon in the display to see detailed Help about this event. Suggestions are given for possible remedies.

Discovering What Nodes Are on the Network

Are any unexpected nodes on my network?

During a measurement run, you can use the Node Discovery measurement to “discover” all the nodes on your network. You can see the nodes listed by MAC address or network layer address. You can also see a “friendly” or well-known name if it is known.


Advisor LAN - [Capture Buffer : Node Discovery : Discovery]
File
Run
View
Go To
Setup
Window
Help
Rec #...
Time...
Print...
Ready
Ethernet
Mainframe
Int MAU
10 Mb
Node HDX

```
08-00-09-0F-08-1E 0800090F081E80CRNPI0F0 ( 1 Novell )
08-00-09-0F-CE-57 0800090FCE5780CRNPI0FC ( 1 Novell )
08-00-09-1A-6A-8A ( 1 Novell )
08-00-09-1A-6A-BD JM4399 ( 1 IP )
08-00-09-1A-6A-BF HPNMXJB ( 1 Novell )
08-00-09-1A-76-95 ( 1 IP )
08-00-09-1B-38-13 GR4302 ( 1 IP )
  15.6.73.206
08-00-09-1B-BA-94 ( 1 IP )
08-00-09-1B-BB-6E ( 1 Novell )
08-00-09-21-14-34 ( 1 IP )
08-00-09-25-42-CD
08-00-09-25-9B-C1 ( 1 IP )
08-00-09-27-E4-6C ( 1 IP )
08-00-09-29-BE-82 ( 1 IP )
08-00-09-2C-04-6B 0800092C046B80CRNPI2C0 ( 1 Novell )
08-00-09-2F-31-57 ( 1 Novell )
08-00-09-2F-C8-4B
08-00-09-32-71-AA ( 1 IP )
08-00-09-32-E6-4F ( 1 IP )
```

MAC address.

IP Protocol address.

A friendly name appears if it is seen for an address.

For example, the Domain Name Service (DNS) provides this service for IP protocol.

Decoding Frames on Your Network

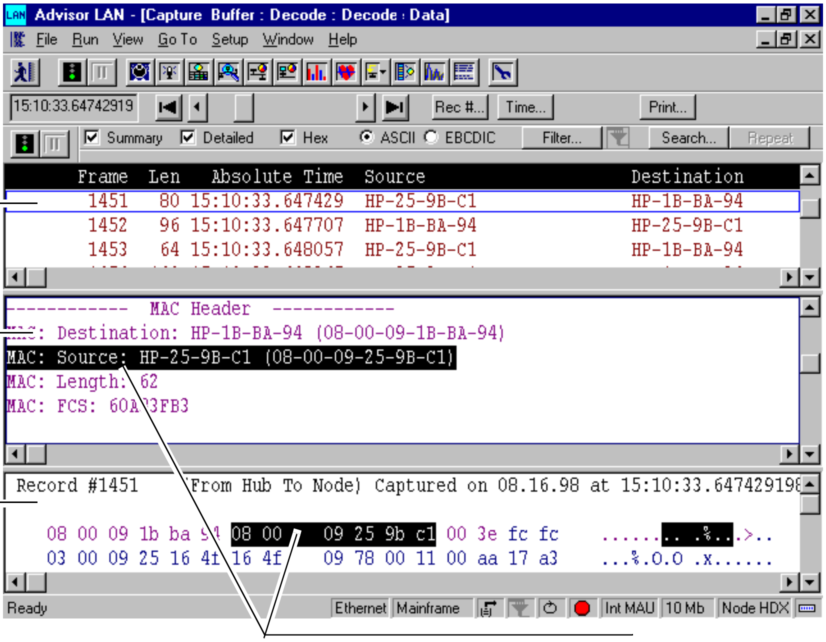
What are the actual contents of a frame on my network?

The Decode measurement interprets the data in a frame according to its protocol so you can examine the contents of the frames.

A timestamp and frame number are added to each frame to help you examine the data.

Examples of information you can determine from the Decode view include:

- Is a node on the network making requests and responses correctly?
- Do timing issues exist between frames on the network?
- Are higher levels of the protocol stack operating correctly (for example, does the Time to Live counter decrement properly)?


Advisor LAN - [Capture Buffer : Decode : Decode : Data]
File Run View Go To Setup Window Help
15:10:33.64742919
Rec #...
Time...
Print...
☑ Summary ☑ Detailed ☑ Hex ● ASCII ○ EBCDIC
Filter...
Search...
Repeat
Ready
Ethernet
Mainframe
Int MAU
10 Mb
Node HDX

```
     Frame  Len   Absolute Time  Source                   Destination
      1451   80 15:10:33.647429  HP-25-9B-C1              HP-1B-BA-94
      1452   96 15:10:33.647707  HP-1B-BA-94              HP-25-9B-C1
      1453   64 15:10:33.648057  HP-25-9B-C1              HP-1B-BA-94
```

```
------------  MAC Header  ------------
MAC: Destination: HP-1B-BA-94 (08-00-09-1B-BA-94)
MAC: Source: HP-25-9B-C1 (08-00-09-25-9B-C1)
MAC: Length: 62
MAC: FCS: 60A33FB3
```

```
 Record #1451     (From Hub To Node) Captured on 08.16.98 at 15:10:33.64742919

    08 00 09 1b ba 94 08 00    09 25 9b c1 00 3e fc fc    ...... .. .%...>..
    03 00 09 25 16 4f 16 4f    09 78 00 11 00 aa 17 a3    ...%.O.O .x......
```

Summary view shows a summary line for each frame.

Detail view shows the decoded contents of each field in the selected frame.

Hex view shows the actual bytes in the selected frame.
The right column shows the contents in ASCII or EBCDIC.

Click a field in the Detail view and see the corresponding bytes highlighted in the Hex view.

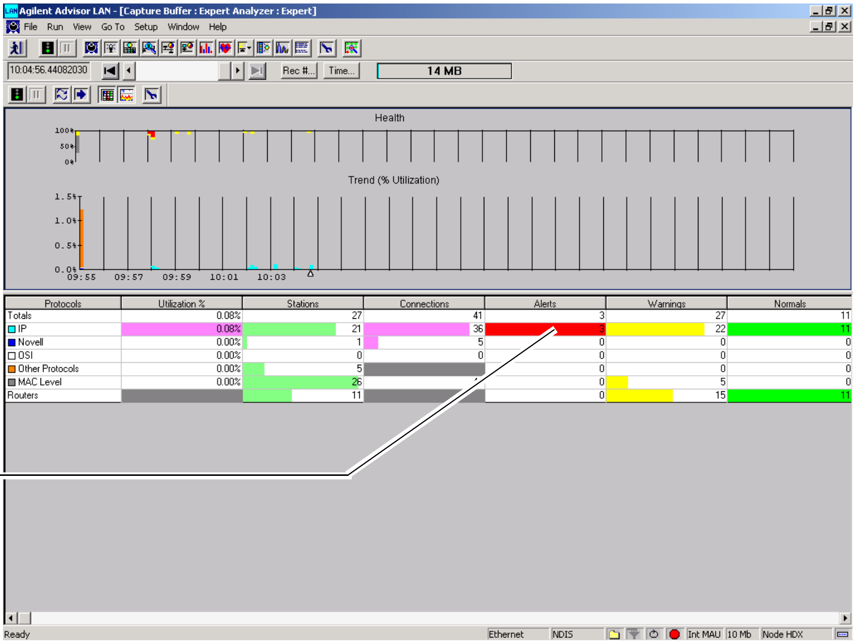
Reporting Errors on a LAN Segment

What errors are being detected on a LAN Segment? What kind of errors are they?

Agilent SW Edition with the required “Error Reporting NIC” J5478A or equivalent reports errors detected on the LAN segment (collision domain) to which it is attached.

Software Edition graphically reports these errors using the Expert Feature. Alerts and Warnings are counted and displayed.

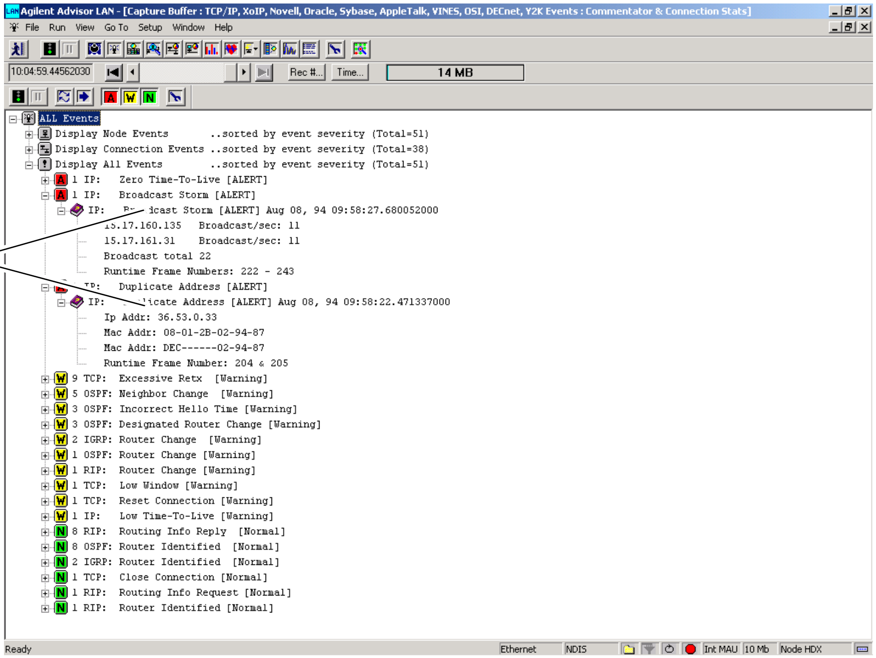
By double-clicking on an Alert or Error, you can drill down into the Commentator, which lets you drill down further to get detailed error information for a specific packet.


Agilent Advisor LAN - [Capture Buffer : Expert Analyzer : Expert]
File
Run
View
Go To
Setup
Window
Help
10:04:56.44082030
Rec #...
Time...
14 MB
Health
100%
50%
0%
Trend (% Utilization)
1.5%
1.0%
0.5%
0.0%
09:55
09:57
09:59
10:01
10:03
Ready
Ethernet
NDIS
Int MAU
10 Mb
Node HDX

Protocols	Utilization %	Stations	Connections	Alerts	Warnings	Normals
Totals	0.08%	27	41	3	27	11
IP	0.08%	21	36	3	22	11
Novell	0.00%	1	5	0	0	0
OSI	0.00%	0	0	0	0	0
Other Protocols	0.00%	5		0	0	0
MAC Level	0.00%	26	[illegible]	0	5	0
Routers		11		0	15	11

Double-click an Alert or Error to drill down into the Commentator view

In the following figure there is a combination of TCP/IP errors and Routing errors. With further drilling down, the critical information needed to diagnose the TCP/IP errors is displayed.


Agilent Advisor LAN - [Capture Buffer : TCP/IP, XoIP, Novell, Oracle, Sybase, AppleTalk, VINES, OSI, DECnet, Y2K Events : Commentator & Connection Stats]
File
Run
View
Go To
Setup
Window
Help
10:04:59.44562030
Rec #...
Time...
14 MB
A
W
N
Ready
Ethernet
NDIS
Int MAU
10 Mb
Node HDX

```
ALL Events
  Display Node Events       ..sorted by event severity (Total=51)
  Display Connection Events ..sorted by event severity (Total=38)
  Display All Events        ..sorted by event severity (Total=51)
    A 1 IP:   Zero Time-To-Live [ALERT]
    A 1 IP:   Broadcast Storm [ALERT]
        IP:   Broadcast Storm [ALERT] Aug 08, 94 09:58:27.680052000
          15.17.160.135   Broadcast/sec: 11
          15.17.161.31    Broadcast/sec: 11
          Broadcast total 22
          Runtime Frame Numbers: 222 - 243
    A   IP:   Duplicate Address [ALERT]
        IP:   Duplicate Address [ALERT] Aug 08, 94 09:58:22.471337000
          Ip Addr: 36.53.0.33
          Mac Addr: 08-01-2B-02-94-87
          Mac Addr: DEC------02-94-87
          Runtime Frame Number: 204 & 205
    W 9 TCP:  Excessive Retx  [Warning]
    W 5 OSPF: Neighbor Change  [Warning]
    W 3 OSPF: Incorrect Hello Time [Warning]
    W 3 OSPF: Designated Router Change [Warning]
    W 2 IGRP: Router Change  [Warning]
    W 1 OSPF: Router Change [Warning]
    W 1 RIP:  Router Change [Warning]
    W 1 TCP:  Low Window [Warning]
    W 1 TCP:  Reset Connection [Warning]
    W 1 IP:   Low Time-To-Live [Warning]
    N 8 RIP:  Routing Info Reply  [Normal]
    N 8 OSPF: Router Identified  [Normal]
    N 2 IGRP: Router Identified  [Normal]
    N 1 TCP:  Close Connection [Normal]
    N 1 RIP:  Routing Info Request [Normal]
    N 1 RIP:  Router Identified [Normal]
```

Diagnostic information for the TCP/IP error is displayed.

Error Reporting on a LAN Segment

With the correct NIC card, SW Edition can monitor the following errors:

- CRC Errors — reported as Bad FCS
- Alignment Errors — reported as Misaligns
- Symbol Errors — reported as Bad FCS

CRC Error Cyclic Redundancy Check is an error-detection method based on a transformation of the bit values in a data packet or frame. Frames that contain invalid frame check sequences usually indicate a faulty network interface card. In most cases the headers of these frames are readable, so that the station that transmitted them can be identified by capturing and decoding the packets. FCS errors can also be caused by defective hub ports or by induction voltage in the cabling.

Alignment Errors Ethernet frames that do not end on an octet boundary (the number of bits in such a packet is not an integer multiple of 8) are called alignment error frames. This type of error is typically caused by defective software drivers or by collision fragments on the segment.

Symbol Error Ethernet frames that have an incorrect label in the nibble prior to the CRC octet are called Symbol errors. This type of error is typically caused by defective software drivers or by collision fragments on the segment.

Collisions Collisions result when two stations on the same segment begin transmitting Ethernet frames at the same time. In Ethernet LANs operating in half-duplex mode, the occurrence of collisions is normal.

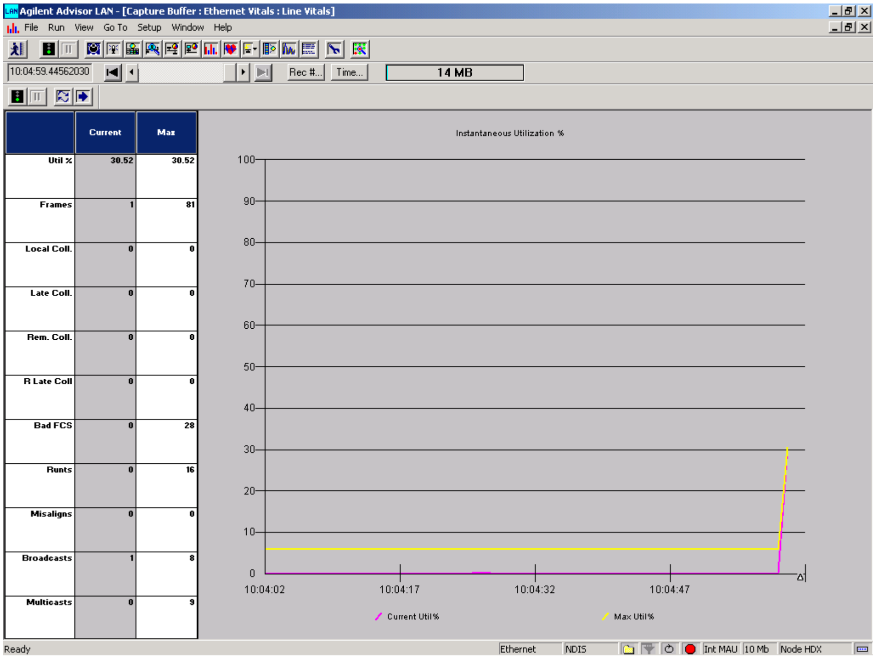
- Remote — Remote collisions are collisions fragments that are exported to other segments by repeaters or hubs. Their signal voltages are not higher than normal because they are corrected by the repeater hardware
- Local — Local collisions occur in a local segment. These collision fragments are less than 64 bytes long, have a signal voltage higher than that of a normal signal, and carry an invalid FCS.
- Late — Late collision fragments are longer than 64 bytes. They can be recognized as collision fragments by the increased signal voltage (in local late collisions) or by the lack of a checksum and the presence of jam (alternating pattern of 1’s and 0’s) bits (in remote late collisions). Late collisions can be caused by defective interface hardware or by cable segments that exceed distance limitations. Because the transmitting station does not detect the collision (the packet had already been emitted in its entirety before the collision occurred), the consequences of this type of collision can be doubly harmful: retransmission is requested only by the higher-layer protocols, which can have adverse effects on application performance.

Short Packets A short packet is less than 64 bytes long, but carries a valid FCS. Faulty packets most often are the cause. In rare cases, active network components such as bridges may use short packets to exchange data. Short packets are also referred to as Runts.

Jabbers A jabber is any frame longer than 1,518 bytes, whether its FCS is valid or not. The most common causes of jabber frames include faulty interface cards, defective cabling, and grounding problems.

Long Packets Long packets are longer than 1,518 bytes, but carry a valid FCS. Long packets can be caused by faulty interface card drivers or by software problems in bridges and routers.

SW Edition shows these errors in the Line Vitals display.



Agilent Advisor LAN - [Capture Buffer : Ethernet Vitals : Line Vitals]
File
Run
View
Go To
Setup
Window
Help
10:04:59.44562030
Rec #...
Time...
14 MB
Instantaneous Utilization %
100
90
80
70
60
50
40
30
20
10
0
10:04:02
10:04:17
10:04:32
10:04:47
Current Util%
Max Util%
Ready
Ethernet
NDIS
Int MAU
10 Mb
Node HDX

	Current	Max
Util %	30.52	30.52
Frames	1	81
Local Coll.	0	0
Late Coll.	0	0
Rem. Coll.	0	0
R Late Coll	0	0
Bad FCS	0	28
Runts	0	16
Misaligns	0	0
Broadcasts	1	8
Multicasts	0	9

2
Getting Started

Installing NIC and PCMCIA cards, and Software 27
Connecting to a Network 30
Starting the Application 32
Configuring the Instrument 35
Selecting a Measurement 36
Configuring a Measurement 37
Finding More Information 38

This chapter describes the steps you use to get started testing with the Agilent Advisor SW Edition.

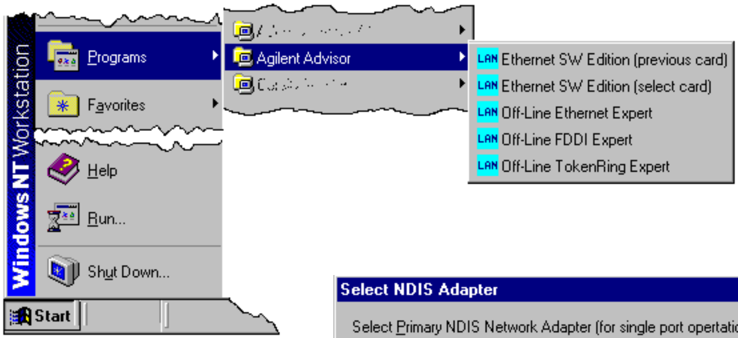
There are some steps you perform each time you start testing your network. Other steps you do only one time or just check that a step you performed previously is still valid.

① Install a network interface card (NIC) or a PCMCIA card in the personal computer you are using.
Install software if necessary.

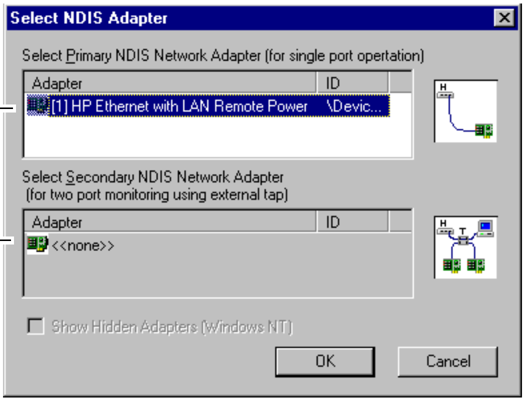
② Use the instructions on the CD holder for the Advisor Software Edition CD to install the software.

---

③ Start the Advisor SW Edition application.


Windows NT Workstation
Programs
Favorites
Help
Run...
Shut Down...
Start
Agilent Advisor
LAN Ethernet SW Edition (previous card)
LAN Ethernet SW Edition (select card)
LAN Off-Line Ethernet Expert
LAN Off-Line FDDI Expert
LAN Off-Line TokenRing Expert

④ Select the NIC or PCMCIA card you are using.



Select NDIS Adapter

Select Primary NDIS Network Adapter (for single port opertation)

Adapter	ID
[1] HP Ethernet with LAN Remote Power	\Devic...

Select Secondary NDIS Network Adapter
(for two port monitoring using external tap)

Adapter	ID
<<none>>	

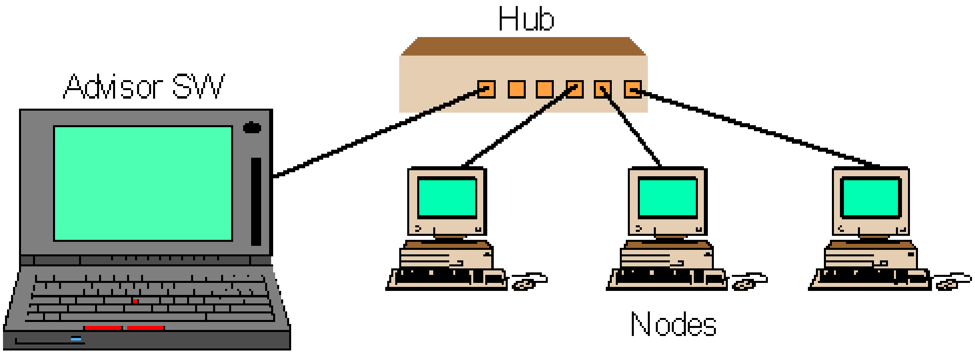
☐ Show Hidden Adapters (Windows NT)

Primary network adapter selection is used for connecting the Advisor SW Edition PC as a node.

Secondary network adapter selection is used for connecting the Advisor SW Edition PC in monitor-thru mode.
This connection uses the Full Duplex Ethernet Tap, product number J1990A.

⑤ Connect to the network.

This example shows connecting the Advisor SW Edition PC as a node to a hub.

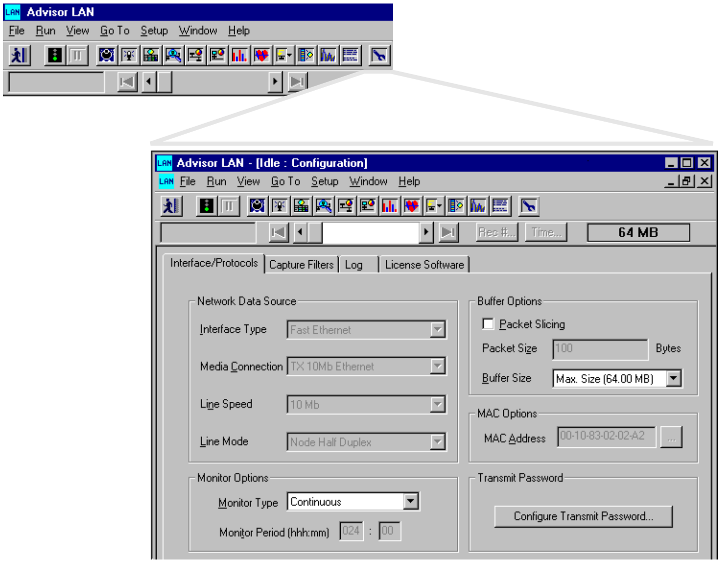

Hub
Advisor SW
Nodes

---

⑥ Configure the Advisor SW Edition PC.

What test port are you connecting to?

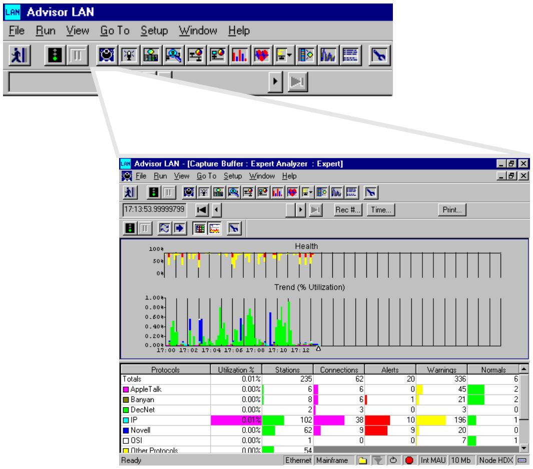
How do you want the capture buffer to operate?


Advisor LAN
File Run View Go To Setup Window Help
Advisor LAN - [Idle : Configuration]
Rec #...
Time...
64 MB
Interface/Protocols
Capture Filters
Log
License Software
Network Data Source
Buffer Options
MAC Options
Monitor Options
Transmit Password
Configure Transmit Password...

Interface Type: Fast Ethernet
Media Connection: TX 10Mb Ethernet
Line Speed: 10 Mb
Line Mode: Node Half Duplex
☐ Packet Slicing
Packet Size: 100 Bytes
Buffer Size: Max. Size (64.00 MB)
MAC Address: 00-10-83-02-02-A2
Monitor Type: Continuous
Monitor Period (hhh:mm): 024 : 00

⑦ Select a measurement.

The Expert Analyzer measurement is a good place to start.


Advisor LAN
File Run View Go To Setup Window Help
Advisor LAN - [Capture Buffer : Expert Analyzer : Expert]
17:13:53.99999799
Rec #...
Time...
Print...
Health
Trend (% Utilization)
17:00 17:02 17:04 17:06 17:08 17:10 17:12

Protocols	Utilization %	Stations	Connections	Alerts	Warnings	Normals
Totals	0.01%	235	62	20	336	6
AppleTalk	0.00%	6	6	0	45	2
Banyan	0.00%	8	6	1	21	2
DecNet	0.00%	2	3	0	3	0
IP	0.01%	102	38	10	196	1
Novell	0.00%	62	9	9	20	0
OSI	0.00%	1	0	0	7	1
Other Protocols	0.00%	54				

Ready | Ethernet | Mainframe | Int MAU | 10 Mb | Node HDX

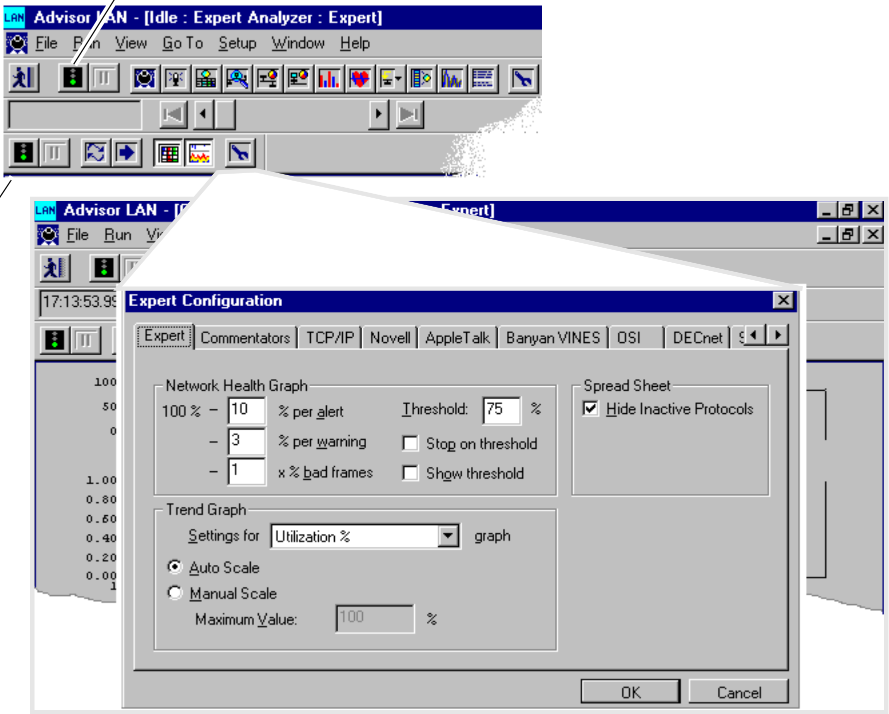
---

⑧ Configure the measurement and start the run.

What time do you want for the sample period?

Do you want to set any thresholds?

Start/Stop all open measurements.


Advisor LAN - [Idle : Expert Analyzer : Expert]
File Run View Go To Setup Window Help
Advisor LAN - [
Expert]
17:13:53.99
100
50
0
1.00
0.80
0.60
0.40
0.20
0.00
Expert Configuration
Expert
Commentators
TCP/IP
Novell
AppleTalk
Banyan VINES
OSI
DECnet
OK
Cancel

Start/Stop active measurement.

Expert Configuration

Network Health Graph
100 % – 10 % per alert
– 3 % per warning
– 1 x % bad frames
Threshold: 75 %
☐ Stop on threshold
☐ Show threshold

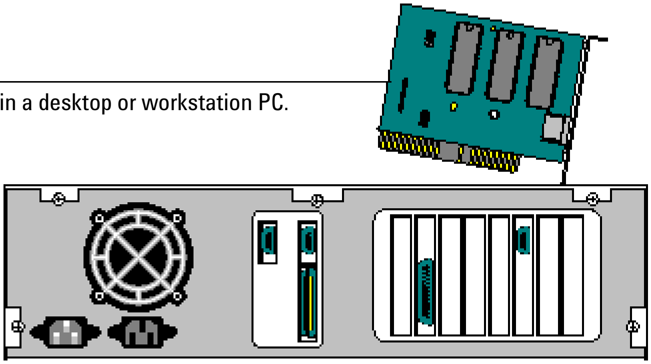
Spread Sheet
☑ Hide Inactive Protocols

Trend Graph
Settings for Utilization % graph
● Auto Scale
○ Manual Scale
Maximum Value: 100 %

Installing NIC and PCMCIA cards, and Software

NIC and PCMCIA card installation

You may have to install a network interface card (NIC) or PCMCIA card in your PC for the specific physical interface you intend to connect to.



Install a NIC adapter in a desktop or workstation PC.

Install a PCMCIA adapter in a laptop PC.

CAUTION

General descriptions of the procedure for installing NIC and PCMCIA cards are provided below. For more complete details, you should follow the manufacturer’s instructions for installation.

General Network Interface Card Installation

These are the general steps for installing a NIC in a desktop PC.

1. Make sure the system is turned off.
2. Remove the power cord from the system.
3. Open the computer case to gain access to the motherboard.
4. Find an empty slot and remove the metal cover.
5. Insert the new card.
6. Make sure the card is seated properly in the slot and then replace the screw to hold the card in place.
7. Replace the computer case and replace all screws.
8. Turn power On and make sure that there are no error messages during the Power On System Test.
9. Load any required drivers (if not already installed).

General PCMCIA Card Installation

These are the general steps for installing a PCMCIA card in a laptop PC.

1. Make sure the laptop is turned off.
2. Insert the network card in the PC Card slot.
3. Make sure the correct side of the card is facing up and the card is properly seated.
4. Connect the LAN cable to the card.
5. Turn power On.
6. Use the Control Panel | Network dialog to check that the adapter is operating properly.

Verify Network Card Installation

These are the general steps for verifying a network card is properly installed.

1. Reboot the PC.
2. If an installed Wizard displays on boot up, you will be guided during the installation of the drivers.
3. Select the Start button and then select Settings | Control Panel.
4. For Windows 98:
    - a Select the System icon.
    - b Select the Device Managers tab.
    - c Expand the Network Adapters line.
    - d Find the appropriate adapter from the list.
    - e Select the Properties button to view the adapter status.

    For Windows NT and 2000:

    - a Select the Network icon.
    - b Select the Adapters tab to view the adapter status.

Software Installation

Use the instructions on the Advisor SW Edition CD holder to install the Advisor SW Edition software.

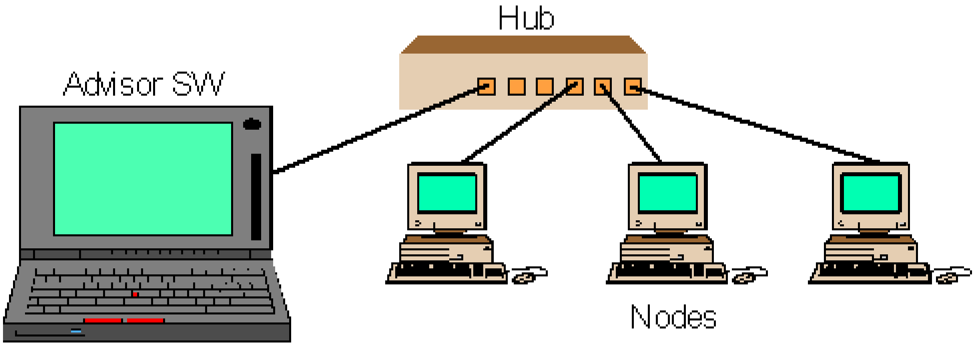
If you are installing other application software, follow the instructions provided with that software.

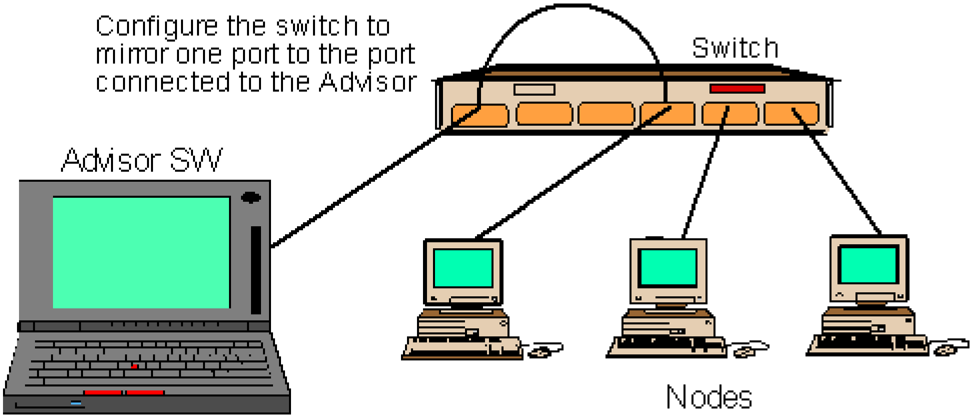
Connecting to a Network

To Connect as a Node

Connect as a Node

When you connect the Advisor SW Edition as a node to a network segment, the Advisor acts as regular node on the network. The Advisor can see the traffic occurring on that network segment.


Hub
Advisor SW
Nodes

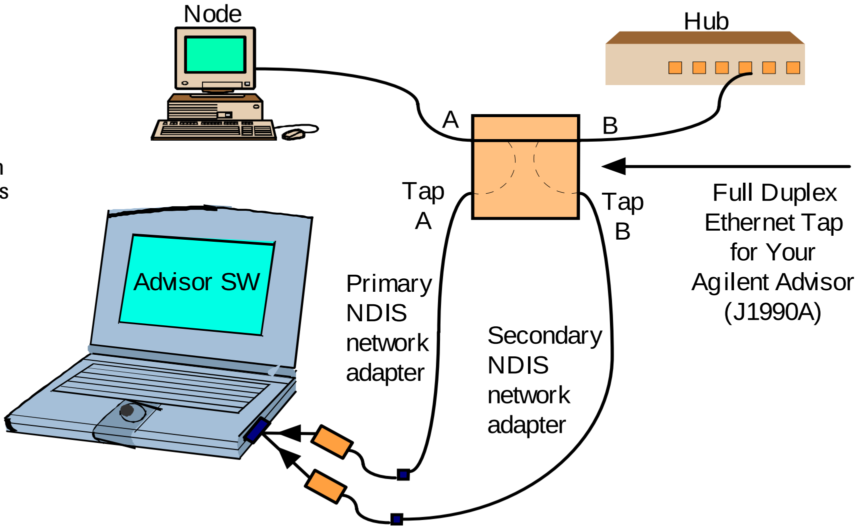

Configure the switch to mirror one port to the port connected to the Advisor
Switch
Advisor SW
Nodes

To Connect in Monitor-Thru Mode

Connect in Monitor-Thru Mode. When you connect the Advisor SW Edition in monitor-thru mode, the Advisor is inserted between two network devices. The Advisor SW Edition does not interact with the traffic it sees, it only passively displays the traffic that is passing between the two devices connected to it. When connected in this monitor mode, Advisor SW Edition cannot transmit.

TIP: Advisor SW Edition cannot monitor in auto negotiate mode because auto negotiation can only occur between the two end devices. In this mode, the Advisor SW Edition is only monitoring and cannot participate in the auto negotiate process.

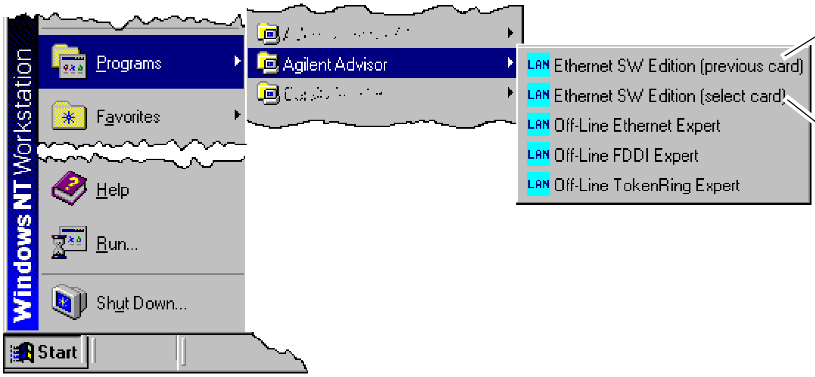
Monitoring between a node and a hub/switch with two PCMCIA cards and a tap.


Node
Hub
A
B
Tap A
Tap B
Full Duplex Ethernet Tap for Your Agilent Advisor (J1990A)
Advisor SW
Primary NDIS network adapter
Secondary NDIS network adapter

Starting the Application

Start the Advisor SW Edition

Use the Start menu to open the Advisor SW Edition application.


Windows NT Workstation
Programs
Favorites
Help
Run...
Shut Down...
Start
Agilent Advisor
LAN Ethernet SW Edition (previous card)
LAN Ethernet SW Edition (select card)
LAN Off-Line Ethernet Expert
LAN Off-Line FDDI Expert
LAN Off-Line TokenRing Expert

Start Advisor SW Edition and use the previously selected NDIS card.

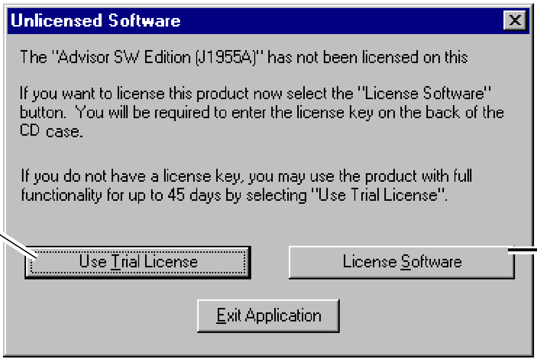
Display the dialog to select NDIS card(s) and then start Advisor SW Edition application.

Select the type of software license you are using

The first time you start the Advisor SW Edition, a dialog prompts you to select the type of license you are using.

If you have NOT purchased J1955A Advisor SW Edition, you can use a temporary Trial License.

If you have purchased J1955A Advisor Software Edition, you should enter the License Software key now.


Unlicensed Software
Use Trial License
License Software
Exit Application

The "Advisor SW Edition (J1955A)" has not been licensed on this

If you want to license this product now select the "License Software" button. You will be required to enter the license key on the back of the CD case.

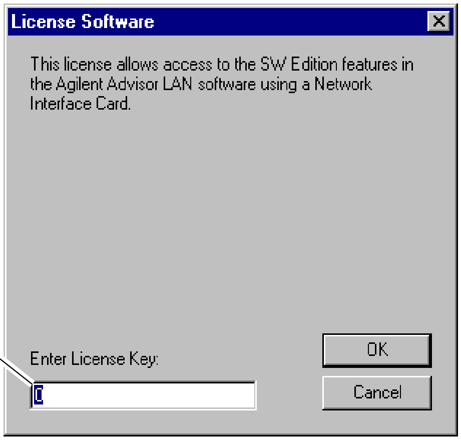
If you do not have a license key, you may use the product with full functionality for up to 45 days by selecting "Use Trial License".

Select this button if you want to try the product before you purchase a license.

Select this button if you have already purchased a J1995A Advisor SW Edition license.

Enter the software key if you have a software license

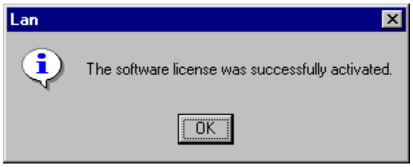
If you selected the License Software button, a new dialog prompts you to enter the software key supplied with the J1955A Software SW Edition documentation.



License Software

This license allows access to the SW Edition features in the Agilent Advisor LAN software using a Network Interface Card.

Enter the software key and select the OK button.



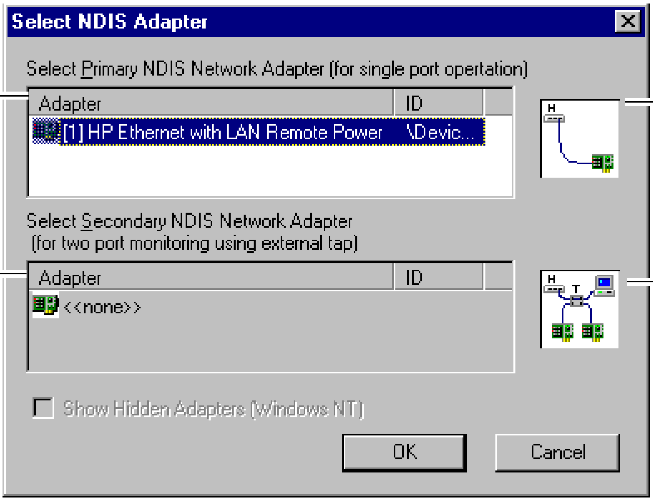
Lan

The software license was successfully activated.

This dialog confirms that you have successfully entered the software key to enable the Advisor SW Edition application.

Select the NDIS network adapter test port

Each time you start the Advisor SW Edition, you can choose to select a NDIS card or you can use the card selected previously.



Select NDIS Adapter

Select Primary NDIS Network Adapter (for single port opertation)

Adapter	ID
[1] HP Ethernet with LAN Remote Power	\Devic...

Select Secondary NDIS Network Adapter (for two port monitoring using external tap)

Adapter	ID
<<none>>	

☐ Show Hidden Adapters (Windows NT)

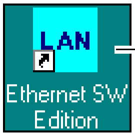
Select the primary NIC or PCMCIA test port to use for connecting to the network in single port operation.

Select the secondary NIC or PCMCIA test port to use for connecting between two devices on the network
Use the Full Duplex Ethernet Tap to make the monitor-thru connection.

Example of using one test port to connect as a node to a hub.

Example of using two test ports to monitor between a hub and a node.

This “select” dialog does not display
if you start from the Desktop shortcut,
or,
if you choose “Ethernet SW Edition (previous card)” in the Start menu.

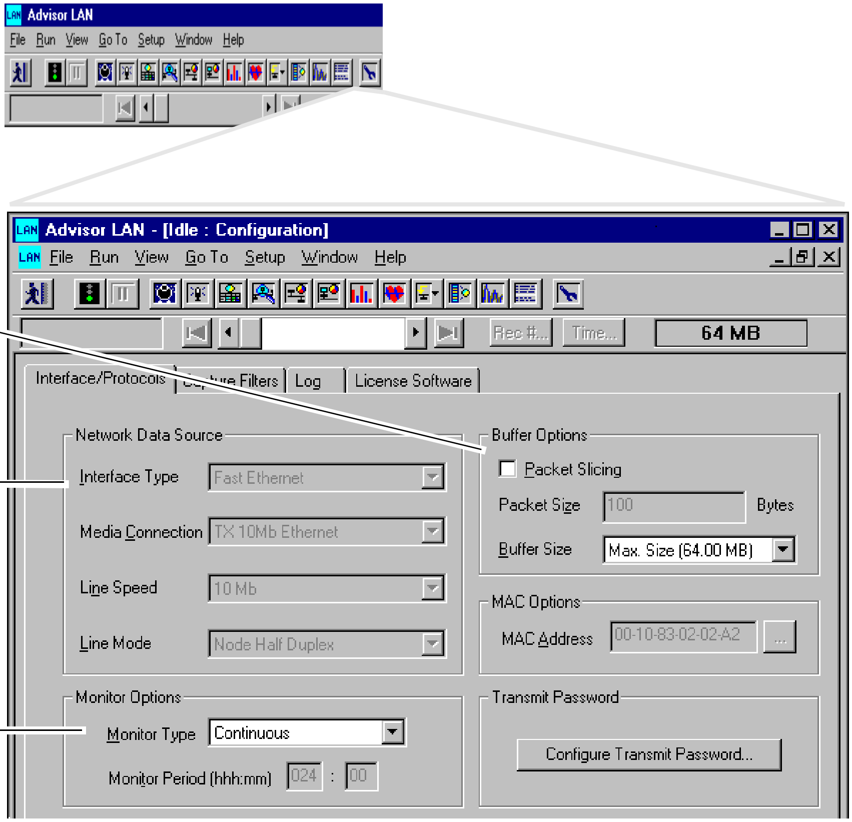


Desktop shortcut to Advisor SW Edition.

Configuring the Instrument

Before you run a measurement, you need to configure the Advisor SW Edition.

You can create Filters/Counters, to control which frames are stored in the capture buffer. And, you can Log or store measurement results over a long period of time.


Advisor LAN
File Run View Go To Setup Window Help
Advisor LAN - [Idle : Configuration]
File Run View Go To Setup Window Help
Rec #...
Time...
64 MB
Interface/Protocols
Capture Filters
Log
License Software
Network Data Source
Buffer Options
MAC Options
Monitor Options
Transmit Password
Configure Transmit Password...

Interface Type: Fast Ethernet
Media Connection: TX 10Mb Ethernet
Line Speed: 10 Mb
Line Mode: Node Half Duplex
☐ Packet Slicing
Packet Size: 100 Bytes
Buffer Size: Max. Size (64.00 MB)
MAC Address: 00-10-83-02-02-A2
Monitor Type: Continuous
Monitor Period (hhh:mm): 024 : 00

To display online help for a measurement window or configure dialog, open the window or dialog and press F1.

Do you want to capture each entire frame, or only a portion of each frame?

The Network Data Source group is not enabled in Advisor SW Edition.
You select the test port to be used in the dialog that displays each time the Advisor SW Edition is started.

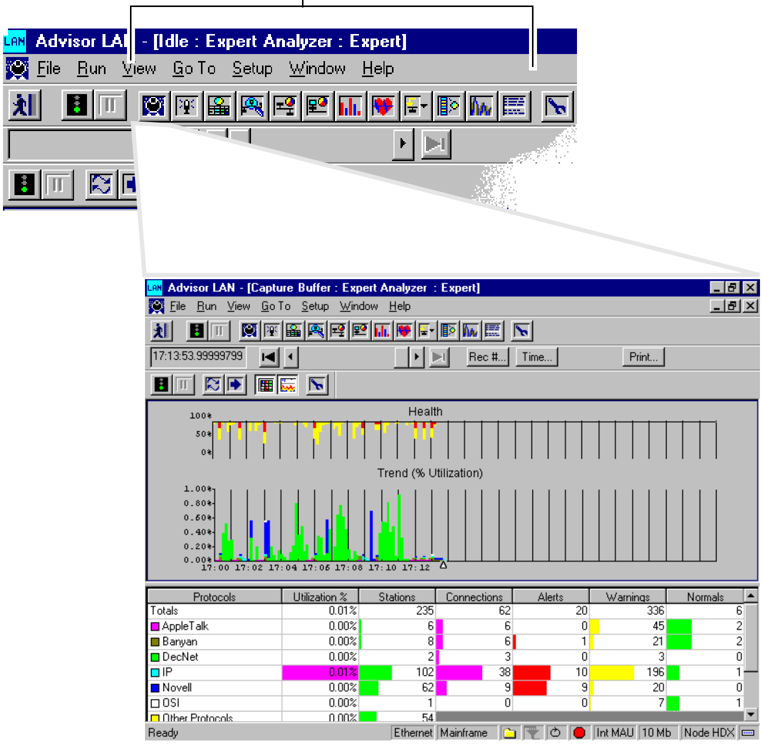
How do you want the capture buffer to operate?

Selecting a Measurement

The Advisor SW Edition has several measurements that can show different parameters about how your network is operating. You can open a measurement with the buttons on the toolbar or with items in the File | Open Measurement menu.

The toolbar buttons are the quickest way to open a measurement. Position the cursor over a toolbar button to display the measurement name.

More than one measurement can be open and running at a time.


Advisor LAN - [Idle : Expert Analyzer : Expert]
File Run View Go To Setup Window Help
Advisor LAN - [Capture Buffer : Expert Analyzer : Expert]
File Run View Go To Setup Window Help
17:13:53.99999799
Rec #...
Time...
Print...
Health
100%
50%
0%
Trend (% Utilization)
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
17:00 17:02 17:04 17:06 17:08 17:10 17:12
Ready
Ethernet
Mainframe
Int MAU
10 Mb
Node HDX

Protocols	Utilization %	Stations	Connections	Alerts	Warnings	Normals
Totals	0.01%	235	62	20	336	6
AppleTalk	0.00%	6	6	0	45	2
Banyan	0.00%	8	6	1	21	2
DecNet	0.00%	2	3	0	3	0
IP	0.01%	102	38	10	196	1
Novell	0.00%	62	9	9	20	0
OSI	0.00%	1	0	0	7	1
Other Protocols	0.00%	54				

Available Measurements.

Top level toolbar.

Toolbar for open and currently selected measurement.

To display online help for a measurement window, open the window and press F1.

Configuring a Measurement

Before you run a measurement, you can customize the measurement by selecting parameters to control how the measurement operates.

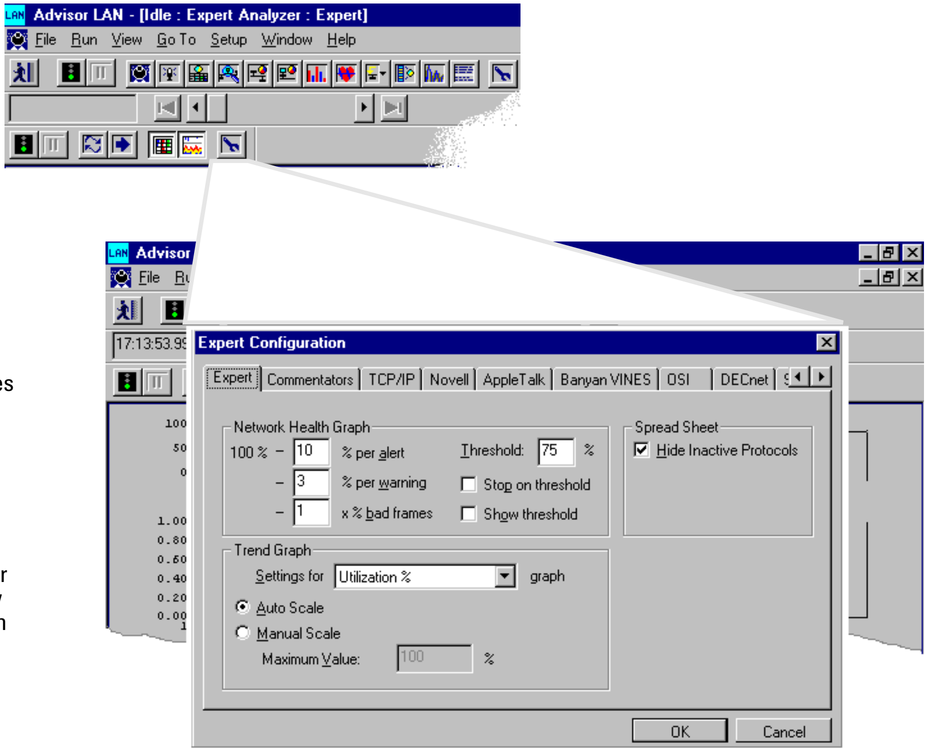
If the Expert Analyzer measurement is open, the configuration button for some measurements does not display.

What display update interval do you want to use?

Do you want to set thresholds to determine what to count?

Do you want to select which protocol messages to count or ignore?

To display online help for a measurement window or configure dialog, open the window or dialog and press F1.


Advisor LAN - [Idle : Expert Analyzer : Expert]
File Run View Go To Setup Window Help
Advisor
17:13:53.99
100
50
0
1.00
0.80
0.60
0.40
0.20
0.00
Expert Configuration
Expert
Commentators
TCP/IP
Novell
AppleTalk
Banyan VINES
OSI
DECnet
Network Health Graph
Spread Sheet
Trend Graph
OK
Cancel

Network Health Graph

100 % – 10 % per alert

– 3 % per warning

– 1 x % bad frames

Threshold: 75 %

☐ Stop on threshold

☐ Show threshold

Spread Sheet

☑ Hide Inactive Protocols

Trend Graph

Settings for Utilization % graph

● Auto Scale

○ Manual Scale

Maximum Value: 100 %

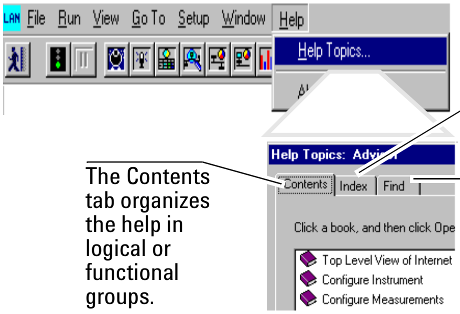
Finding More Information

Advisor SW Edition Online Help

Online help is built into the Advisor SW Edition application. You can access help from the menu bar at the top of the application window or by using the **F1** key.

Online Help Menu

The Help menu item opens the general Advisor SW Edition help window so that you can choose from three different ways to find the help you want.


File
Run
View
Go To
Setup
Window
Help
Help Topics...
Help Topics: Advisor
Contents
Index
Find
Top Level View of Internet
Configure Instrument
Configure Measurements

Click a book, and then click Ope

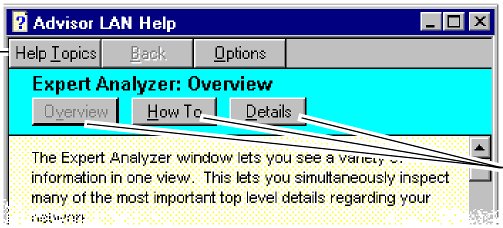
The Contents tab organizes the help in logical or functional groups.

The Index tab provides individual links to major topics.

You can use the Find tab to search for specific words or phrases that occur anywhere in the text of all the help topics.

Context Sensitive Online Help

You can quickly find information about the currently selected Advisor SW Edition window by pressing the F1 key.


Advisor LAN Help
Help Topics
Back
Options
Expert Analyzer: Overview
Overview
How To
Details

The Expert Analyzer window lets you see a variety of information in one view. This lets you simultaneously inspect many of the most important top level details regarding your network.

Use the Help Topics button to display help organized by Contents and Index tabs.

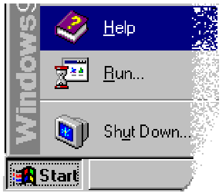
Help for the active window is organized by Overview, How To, and Details buttons.

Sample Tests

The next chapter in this book describes examples for using the Advisor SW Edition to measure your network.

Windows Online Help

You can find information on general Windows operation from the online Help tutorial - About Windows. If you are not familiar with the Windows operating system, it is a good idea to spend a few minutes learning the basic functions and terminology associated with the Windows environment.



3

Sample Tests

How Busy Is The Network? 43
Who Are the Top Talkers on the Network? 48
Are There Problems on the Network? 53

This chapter illustrates several test examples to lead you quickly through using the Agilent Advisor SW Edition to solve common Ethernet LAN testing problems:

- How busy is the network?
- Who are the “top talkers” on the network?
- Are there problems on the network?

Example file

The traffic used in some of the example tests is available in a file. You can just read the following pages, or, you can use the same data file and perform the example steps with your own Advisor SW Edition.

The data file for this example is included with the Advisor SW Edition in location:
C:\ADVISOR\LAN\DATA\DEMO_1.DAT

To learn more...

For more information about how to use the features of the Advisor SW Edition, refer to the online Help. You can press F1 while in the Advisor SW Edition application to get specific information about the currently active window, measurement view, or dialog box.

How Busy Is The Network?

Your network is running slowly, you suspect that utilization is getting high and you want to get a quick snapshot of the current traffic conditions. Things you may want to know include:

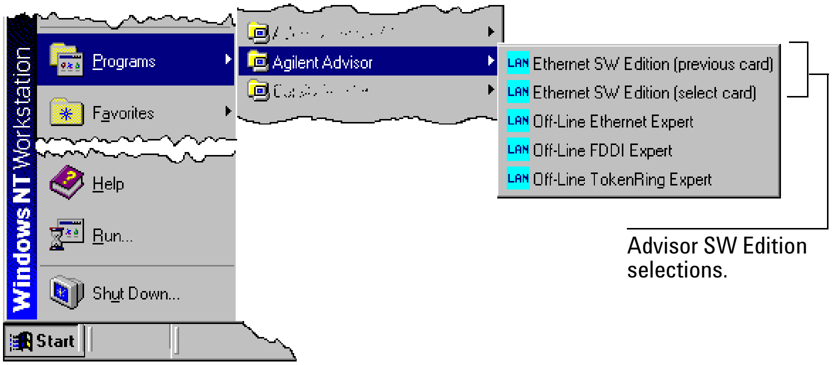
- how many stations are active on the network
- how many connections are there between stations
- what protocols are being used
- are errors being generated

Example equipment and menu choices

The Advisor SW Edition, in this example, can use either NIC or PCMCIA cards in a desktop or laptop PC. The cards can be for Ethernet or Fast Ethernet.

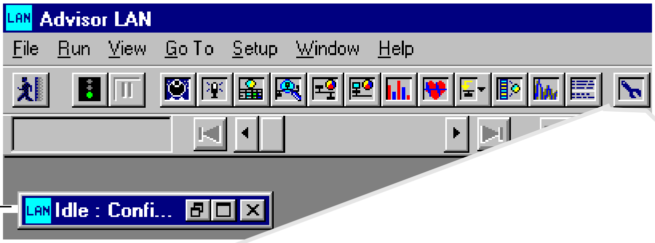
Several menu choices are made to configure the Advisor SW Edition for this example. These choices are usually the default selection or have been made for the easiest configuration. You can make these same choices or you can make different choices to observe how the Advisor SW Edition responds.

① Start the Advisor SW application.


Windows NT Workstation
Programs
Favorites
Help
Run...
Shut Down...
Start
Agilent Advisor
Ethernet SW Edition (previous card)
Ethernet SW Edition (select card)
Off-Line Ethernet Expert
Off-Line FDDI Expert
Off-Line TokenRing Expert

Advisor SW Edition selections.

② If the Configure Instrument view is not open (the view is minimized), click the Configure Instrument button on the toolbar.

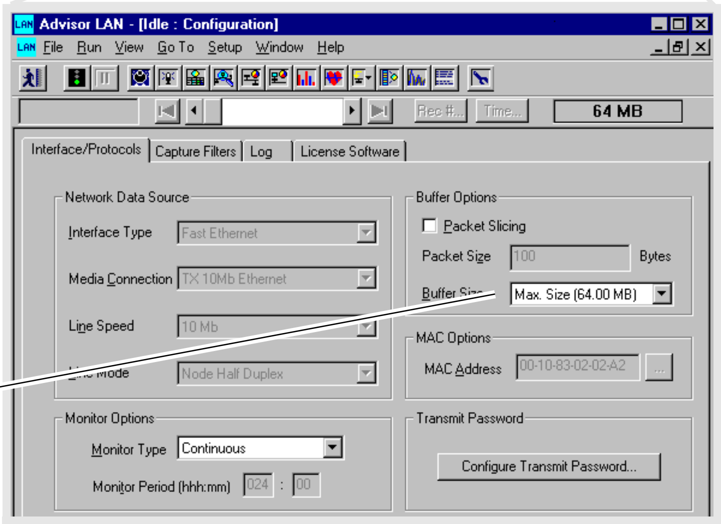

Advisor LAN
File Run View Go To Setup Window Help
Idle : Confi...

Configure Instrument view minimized.

③ Configure the Advisor SW Edition.

Since this example will be run from a data file loaded into the capture buffer, no Monitor Type selection is required.

For this example, let's ignore filtering and logging.


Advisor LAN - [Idle : Configuration]
File Run View Go To Setup Window Help
Rec #... Time... 64 MB
Interface/Protocols
Capture Filters
Log
License Software

Network Data Source

Interface Type: Fast Ethernet

Media Connection: TX 10Mb Ethernet

Line Speed: 10 Mb

Mode: Node Half Duplex

Buffer Options

☐ Packet Slicing

Packet Size: 100 Bytes

Buffer Si: Max. Size (64.00 MB)

MAC Options

MAC Address: 00-10-83-02-02-A2

Monitor Options

Monitor Type: Continuous

Monitor Period (hhh:mm): 024 : 00

Transmit Password

Configure Transmit Password...

④ Set the capture buffer size to at least 4 MBytes to display the following example's values.

⑤ If you are going to use the Demo_1.dat file and follow this example on your own Advisor SW Edition, load the file now.

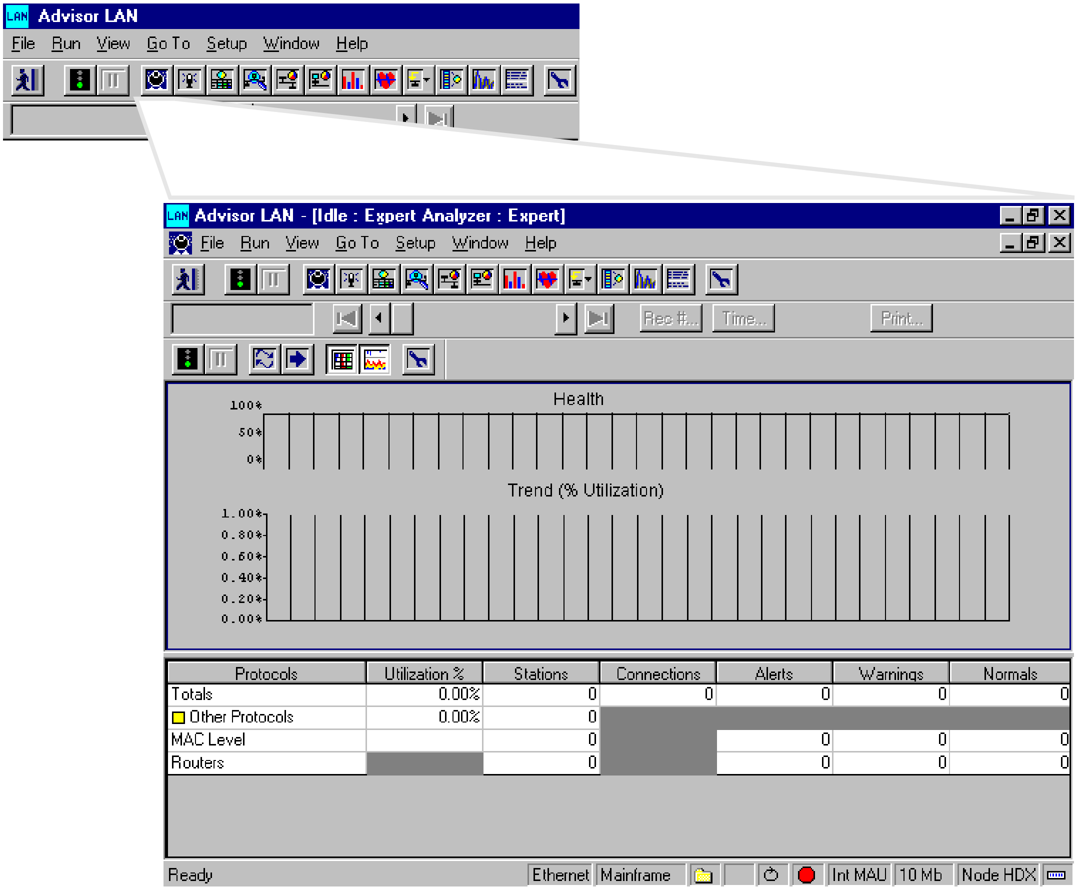
a. Use File | Open (Load Data) and the path: C:\ADVISOR\LAN\DATA\DEMO_1.DAT.

b. Click OK.

c. The Advisor SW Edition loads the file into the capture buffer and automatically opens the Decode measurement to display the file. This takes a few seconds.

d. Close the Decode measurement.

⑥ Open the Expert Analyzer measurement.


Advisor LAN
File Run View Go To Setup Window Help
Advisor LAN - [Idle : Expert Analyzer : Expert]
File Run View Go To Setup Window Help
Rec #... Time... Print...
Health
100%
50%
0%
Trend (% Utilization)
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
Ready
Ethernet
Mainframe
Int MAU
10 Mb
Node HDX

Protocols	Utilization %	Stations	Connections	Alerts	Warnings	Normals
Totals	0.00%	0	0	0	0	0
🟨 Other Protocols	0.00%	0				
MAC Level		0		0	0	0
Routers		0		0	0	0

⑦ Click the Run From Capture Button.

At the prompt, select Run All Frames.

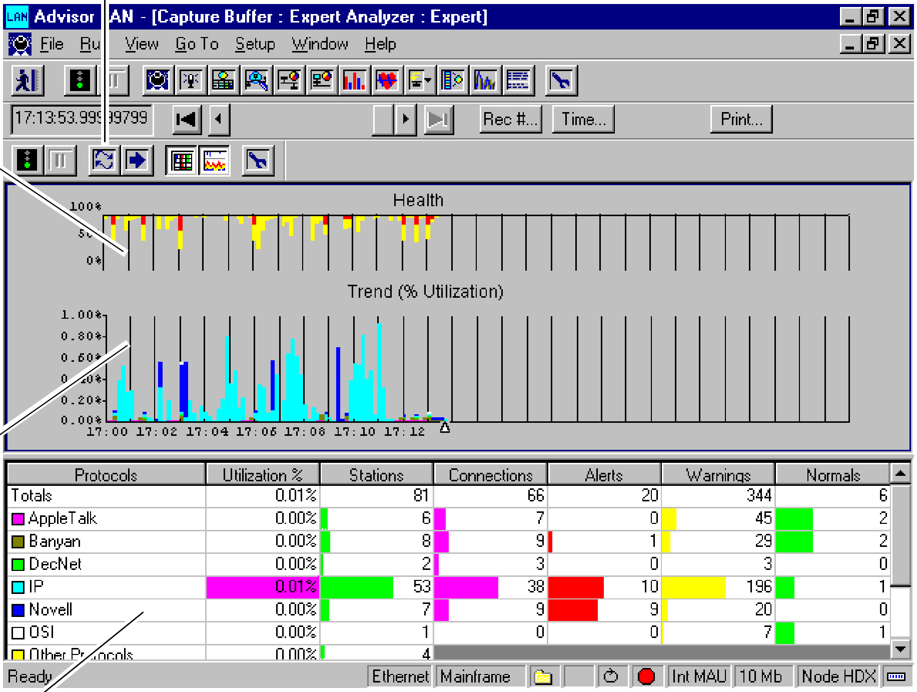
⑧ Wait while the Advisor reads the capture buffer (a Run from Capture Buffer dialog closes when the buffer is processed).

The Expert Analyzer shows three types of information:

Health -- shows quality of Alarm, Warning, and DLL frame events. When you see yellow or red on this graph, it means the Commentator and Vitals measurements will have more information about what the problem is.

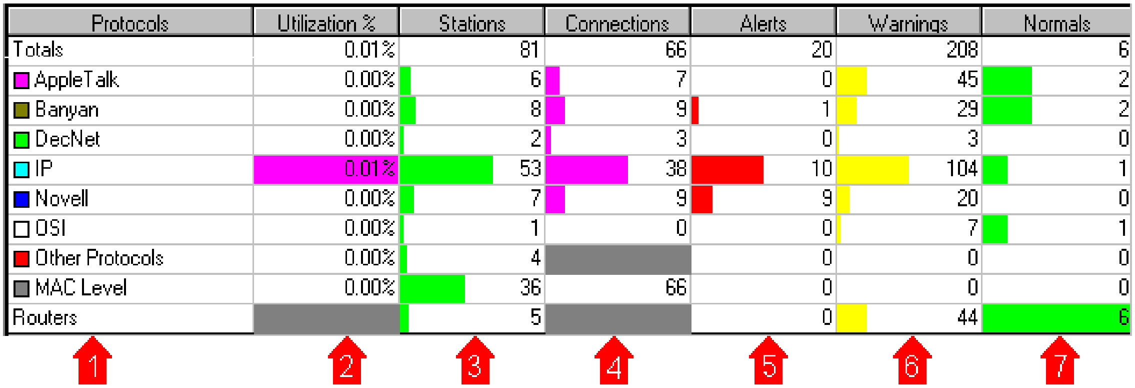
Trends -- shows history of network utilization as a default measurement. Click the right mouse button to display frame counts, errors, broadcasts, or other counts in this graph.

Spreadsheet -- shows summary counts for several network indicators.



Advisor LAN - [Capture Buffer : Expert Analyzer : Expert]
File
Run
View
Go To
Setup
Window
Help
17:13:53.99939799
Rec #...
Time...
Print...
Health
100%
50
0%
Trend (% Utilization)
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
17:00
17:02
17:04
17:06
17:08
17:10
17:12
Ready
Ethernet
Mainframe
Int MAU
10 Mb
Node HDX

Protocols	Utilization %	Stations	Connections	Alerts	Warnings	Normals
Totals	0.01%	81	66	20	344	6
🟪 AppleTalk	0.00%	6	7	0	45	2
🟫 Banyan	0.00%	8	9	1	29	2
🟩 DecNet	0.00%	2	3	0	3	0
🟦 IP	0.01%	53	38	10	196	1
🟦 Novell	0.00%	7	9	9	20	0
☐ OSI	0.00%	1	0	0	7	1
🟨 Other Protocols	0.00%	4				



Protocols	Utilization %	Stations	Connections	Alerts	Warnings	Normals
Totals	0.01%	81	66	20	208	6
🟪 AppleTalk	0.00%	6	7	0	45	2
🟫 Banyan	0.00%	8	9	1	29	2
🟩 DecNet	0.00%	2	3	0	3	0
🟦 IP	0.01%	53	38	10	104	1
🟦 Novell	0.00%	7	9	9	20	0
☐ OSI	0.00%	1	0	0	7	1
🟥 Other Protocols	0.00%	4		0	0	0
⬛ MAC Level	0.00%	36	66	0	0	0
Routers		5		0	44	6

1. Shows which protocols are being used on the network.
2. Shows the total network utilization and how much utilization is being used by each protocol.
3. Shows how many stations have transmitted in the current measurement.
4. Shows how many connections are established in the current measurement.
5 - 7. Shows how many problem and normal events are occurring on the network.

Conclusion:

The Expert Analyzer view shows the Utilization % of the network by protocol over time. This view also shows cumulative counts of active stations, connections, alerts (real problems on the network), and warnings (probable problems on the network).

Who Are the Top Talkers on the Network?

Your network is running slowly, you want to know if only a few stations are generating a majority of the traffic on the network. Things you may want to know include:

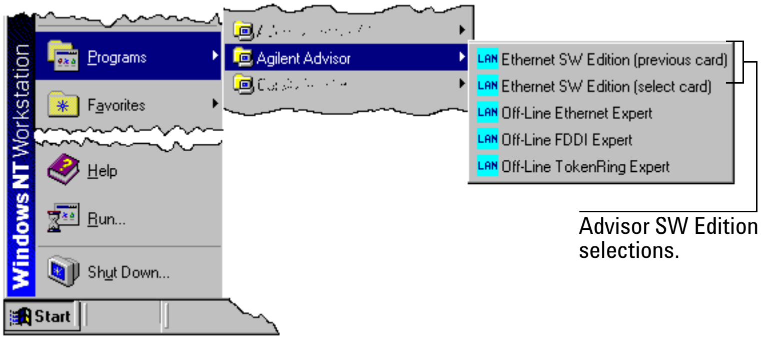
- who are the active stations on the network
- which connections are transmitting the most traffic
- what protocols are being used

Example equipment and menu choices

The Advisor SW Edition in this example can use either NIC or PCMCIA cards in a desktop or laptop PC. The cards can be for Ethernet or Fast Ethernet.

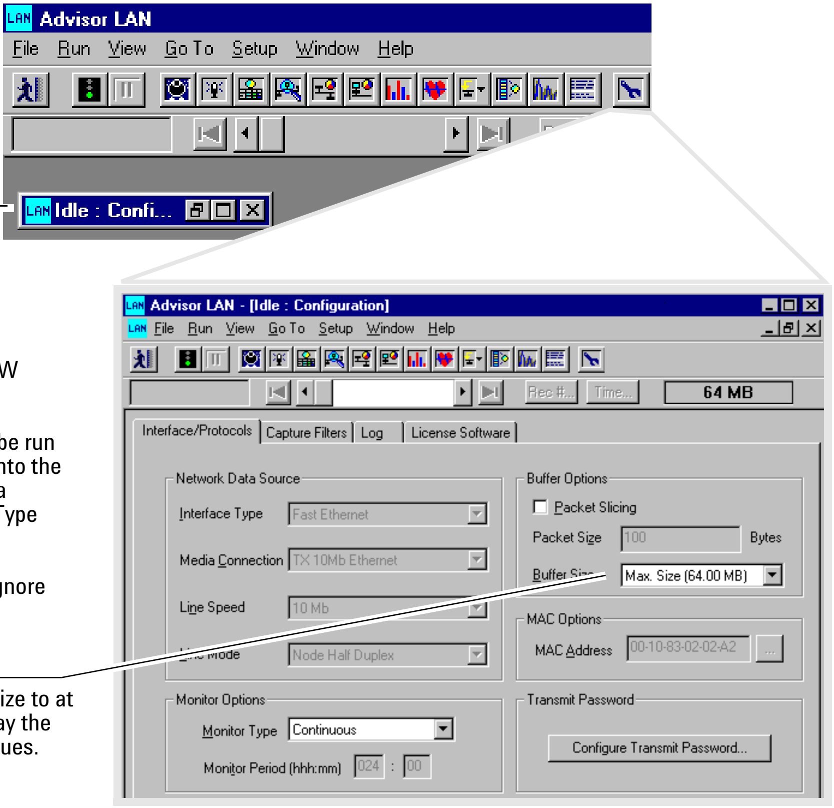
Several menu choices are made to configure the Advisor SW Edition for this example. These choices are usually the default selection or have been made for the easiest configuration. You can make these same choices or you can make different choices to observe how the Advisor SW Edition responds.

① Start the Advisor SW application.


Windows NT Workstation
Programs
Favorites
Help
Run...
Shut Down...
Start
Agilent Advisor
LAN Ethernet SW Edition (previous card)
LAN Ethernet SW Edition (select card)
LAN Off-Line Ethernet Expert
LAN Off-Line FDDI Expert
LAN Off-Line TokenRing Expert

Advisor SW Edition selections.

② If the Configure Instrument view is not open (the view is minimized), click the Configure Instrument button on the toolbar.


Advisor LAN
File Run View Go To Setup Window Help
Idle : Confi...
Advisor LAN - [Idle : Configuration]
Rec #... Time...
64 MB
Interface/Protocols
Capture Filters
Log
License Software
Network Data Source
Buffer Options
MAC Options
Monitor Options
Transmit Password
Configure Transmit Password...

Interface Type: Fast Ethernet
Media Connection: TX 10Mb Ethernet
Line Speed: 10 Mb
Mode: Node Half Duplex
☐ Packet Slicing
Packet Size: 100 Bytes
Buffer Siz: Max. Size (64.00 MB)
MAC Address: 00-10-83-02-02-A2
Monitor Type: Continuous
Monitor Period (hhh:mm): 024 : 00

Configure Instrument view minimized.

③ Configure the Advisor SW Edition.

Since this example will be run from a data file loaded into the capture buffer, no Media Connection or Monitor Type selection is required.

For this example, let's ignore filtering and logging.

④ Set the capture buffer size to at least 4 MBytes to display the following example's values.

⑤ If you are going to use the Demo_1.dat file and follow this example on your own Advisor SW, load the file now.

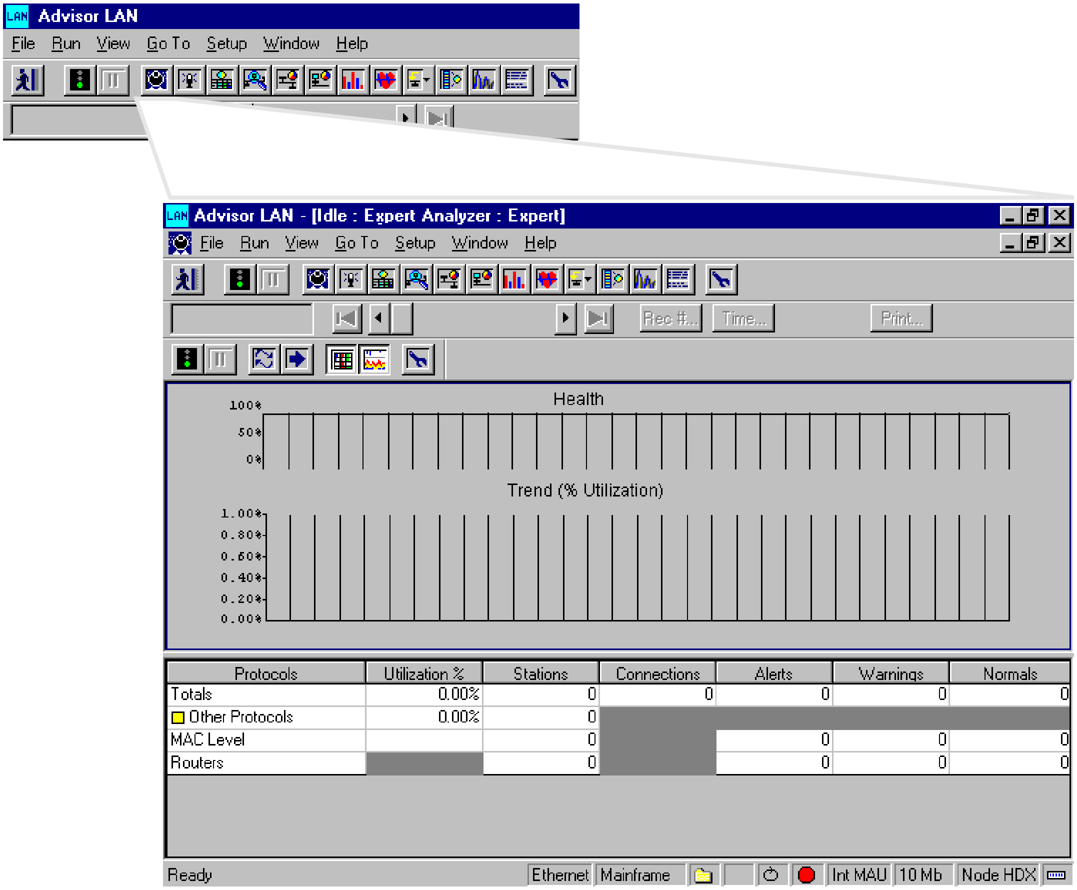
a. Use File | Open (Load Data) and the path: C:\ADVISOR\LAN\DATA\DEMO_1.DAT.

b. Click OK.

c. The Advisor SW loads the file into the capture buffer and automatically opens the Decode measurement to display the file. This takes a few seconds.

d. Close the Decode measurement.

⑥ Open the Expert Analyzer measurement.

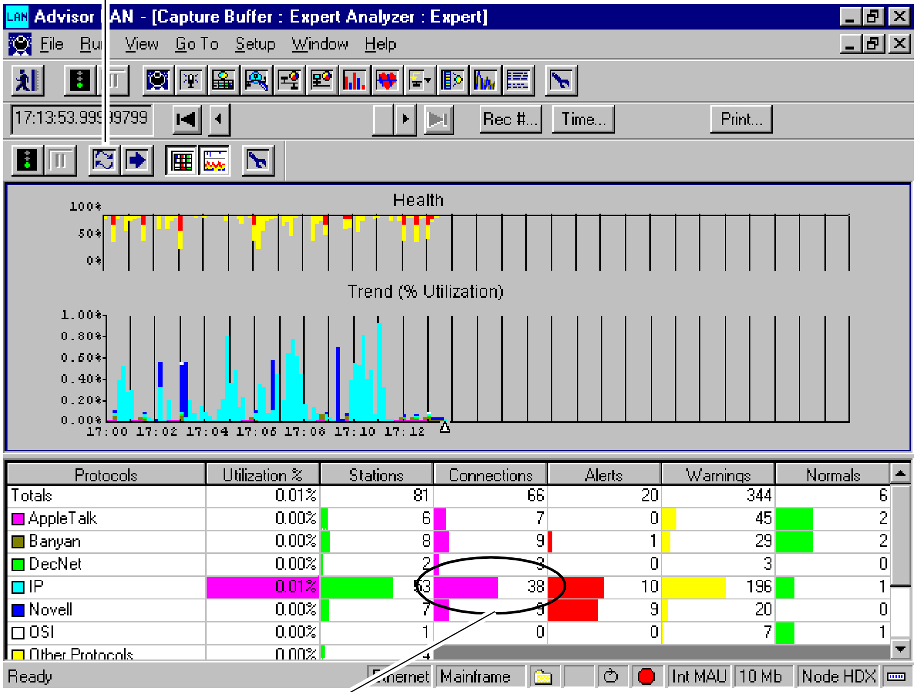

Advisor LAN
File Run View Go To Setup Window Help
Advisor LAN - [Idle : Expert Analyzer : Expert]
File Run View Go To Setup Window Help
Rec #... Time... Print...
Health
100%
50%
0%
Trend (% Utilization)
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
Ready
Ethernet
Mainframe
Int MAU
10 Mb
Node HDX

Protocols	Utilization %	Stations	Connections	Alerts	Warnings	Normals
Totals	0.00%	0	0	0	0	0
🟨 Other Protocols	0.00%	0				
MAC Level		0		0	0	0
Routers		0		0	0	0

⑦ Click the Run From Capture Button.

At the prompt, select Run All Frames.

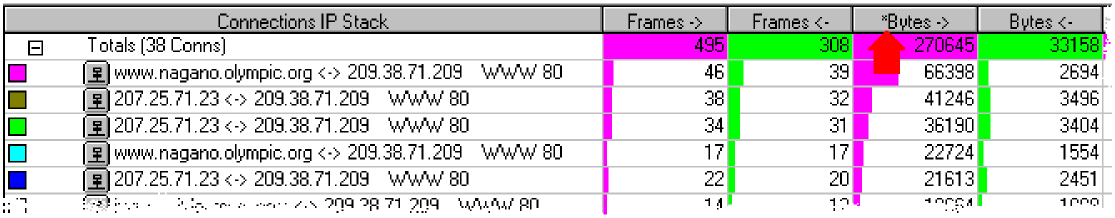
⑧ Wait while the Advisor reads the capture buffer (a Run from Capture Buffer dialog closes when the buffer is processed.)


Advisor LAN - [Capture Buffer : Expert Analyzer : Expert]
File Run View Go To Setup Window Help
17:13:53.99999799
Rec #...
Time...
Print...
Health
100%
50%
0%
Trend (% Utilization)
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
17:00 17:02 17:04 17:06 17:08 17:10 17:12
Ready
Ethernet
Mainframe
Int MAU
10 Mb
Node HDX

Protocols	Utilization %	Stations	Connections	Alerts	Warnings	Normals
Totals	0.01%	81	66	20	344	6
AppleTalk	0.00%	6	7	0	45	2
Banyan	0.00%	8	9	1	29	2
DecNet	0.00%	2	3	0	3	0
IP	0.01%	53	38	10	196	1
Novell	0.00%	7	9	9	20	0
OSI	0.00%	1	0	0	7	1
Other Protocols	0.00%	4				

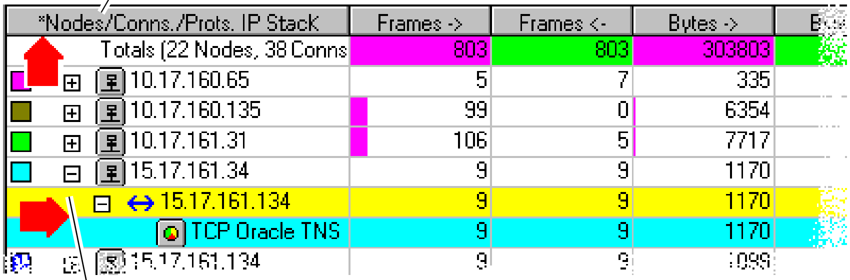
⑨ Notice that the IP protocol has the most connections and then double click on this count to open the Connection Statistics measurement.

⑩ Right click in the Bytes column and select Sort by this Column. Observe how many bytes are being transmitted by each connection pair.



	Connections IP Stack	Frames ->	Frames <-	*Bytes ->	Bytes <-
⊟	Totals (38 Conns)	495	308	270645	33158
🟪	www.nagano.olympic.org <-> 209.38.71.209 WWW 80	46	39	66398	2694
🟫	207.25.71.23 <-> 209.38.71.209 WWW 80	38	32	41246	3496
🟩	207.25.71.23 <-> 209.38.71.209 WWW 80	34	31	36190	3404
🟦	www.nagano.olympic.org <-> 209.38.71.209 WWW 80	17	17	22724	1554
🟦	207.25.71.23 <-> 209.38.71.209 WWW 80	22	20	21613	2451
[illegible]	[illegible] <-> 209.38.71.209 WWW 80	14	12	[illegible]	[illegible]

⑪ Right click in the first column and select View Nodes/Connections/Protocols. Observe how many bytes are being transmitted by each connection pair.



		*Nodes/Conns./Prots. IP Stack	Frames ->	Frames <-	Bytes ->
		Totals (22 Nodes, 38 Conns	803	803	303803
🟪	⊞	10.17.160.65	5	7	335
🟫	⊞	10.17.160.135	99	0	6354
🟩	⊞	10.17.161.31	106	5	7717
🟦	⊟	15.17.161.34	9	9	1170
	⊟	↔ 15.17.161.134	9	9	1170
		TCP Oracle TNS	9	9	1170
[illegible]	[illegible]	15.17.161.134	9	9	[illegible]

⑫ Click on the '+' to expand the view to see the protocol(s) used by a connection pair.

Conclusion:

The Connection Statistics measurement view shows the frame and byte counts for each connection pair on the network.
This measurement view can also show how many bytes or frames are being transmitted by the protocol(s) being used by a connection.

Are There Problems on the Network?

If you have early detection of problems occurring on your network, you can prevent problems from escalating. Things you may want to know include:

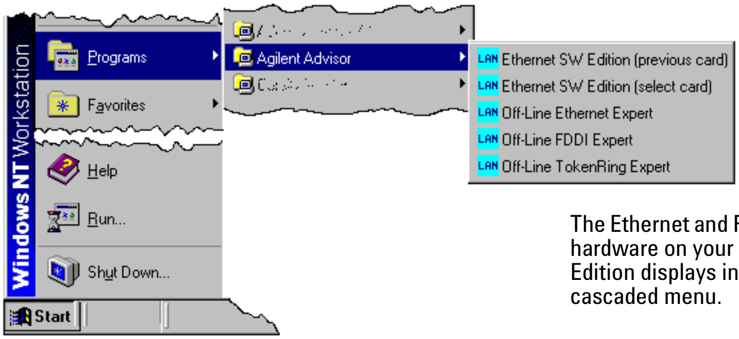
- are alert, warning, or normal protocol events occurring
- what protocols are having problems
- who is causing the problems

Example equipment and menu choices

The Advisor SW Edition in this example can use either NIC or PCMCIA cards in a desktop or laptop PC. The cards can be for Ethernet or Fast Ethernet.

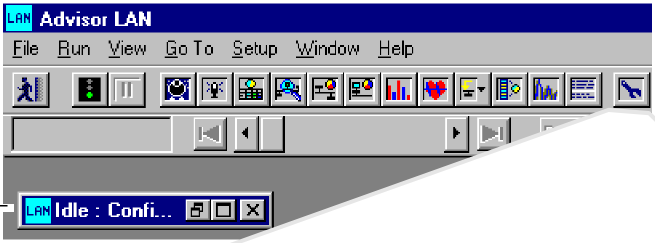
Several menu choices are made to configure the Advisor SW Edition for this example. These choices are usually the default selection or have been made for the easiest configuration. You can make these same choices or you can make different choices to observe how the Advisor SW Edition responds.

① Start the Advisor SW application.


Windows NT Workstation
Programs
Favorites
Help
Run...
Shut Down...
Start
Agilent Advisor
Ethernet SW Edition (previous card)
Ethernet SW Edition (select card)
Off-Line Ethernet Expert
Off-Line FDDI Expert
Off-Line TokenRing Expert

The Ethernet and Fast Ethernet hardware on your Advisor SW Edition displays in this cascaded menu.

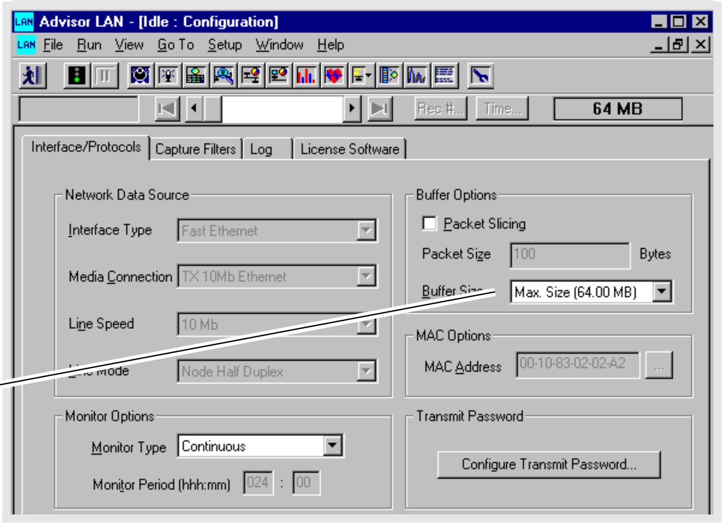
② If the Configure Instrument view is not open (the view is minimized), click the Configure Instrument button on the toolbar.


Advisor LAN
File Run View Go To Setup Window Help
Idle : Confi...

Configure Instrument view minimized.

③ Configure the Advisor SW.

Since this example will be run from a data file loaded into the capture buffer, no Media Connection or Monitor Type selection is required.
For this example, let's ignore filtering and logging.


Advisor LAN - [Idle : Configuration]
File Run View Go To Setup Window Help
Rec #... Time...
64 MB
Interface/Protocols
Capture Filters
Log
License Software
Network Data Source
Buffer Options
MAC Options
Monitor Options
Transmit Password
Configure Transmit Password...

Interface Type: Fast Ethernet
Media Connection: TX 10Mb Ethernet
Line Speed: 10 Mb
Line Mode: Node Half Duplex
☐ Packet Slicing
Packet Size: 100 Bytes
Buffer Size: Max. Size (64.00 MB)
MAC Address: 00-10-83-02-02-A2
Monitor Type: Continuous
Monitor Period (hhh:mm): 024 : 00

④ Set the capture buffer size to at least 4 MBytes to display the following example's values.

⑤ If you are going to use the Demo_1.dat file and follow this example on your own Advisor SW, load the file now.

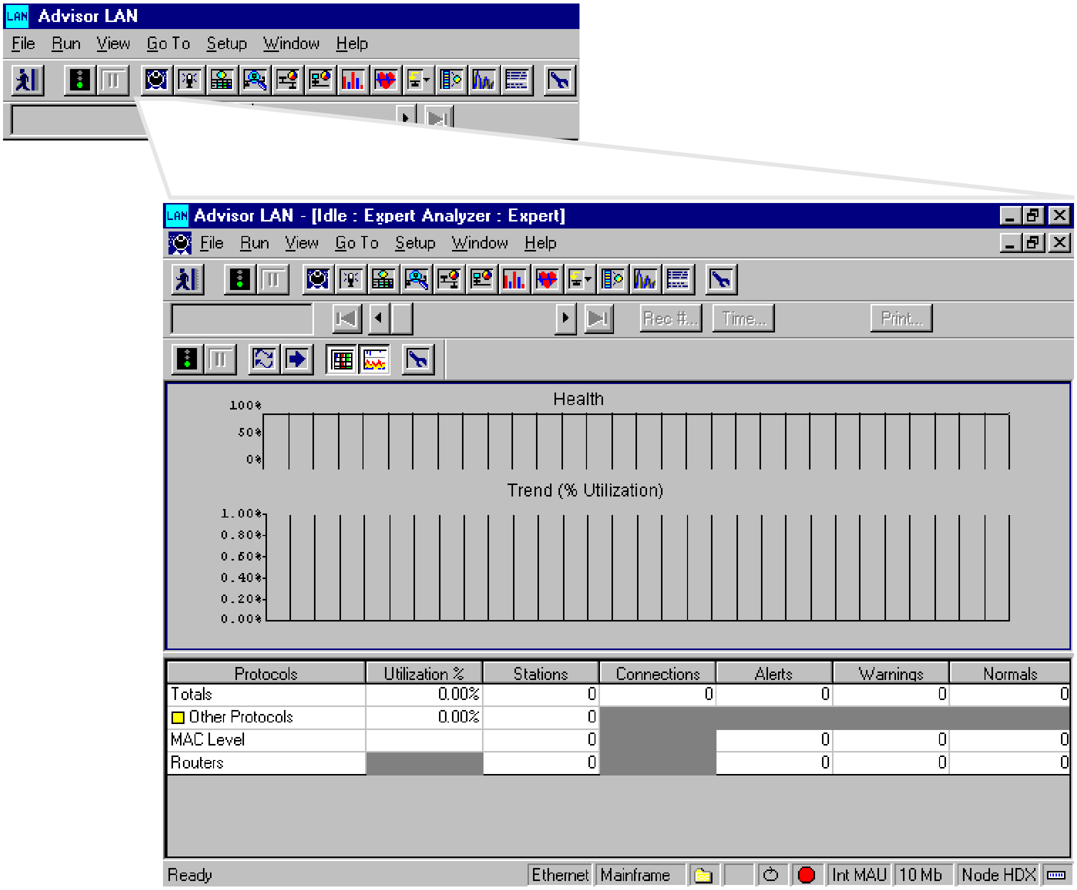
a. Use File | Open (Load Data) and the path: C:\ADVISOR\LAN\DATA\DEMO_1.DAT.

b. Click OK.

c. The Advisor SW loads the file into the capture buffer and automatically opens the Decode measurement to display the file. This takes a few seconds.

d. Close the Decode measurement.

⑥ Open the Expert Analyzer measurement.

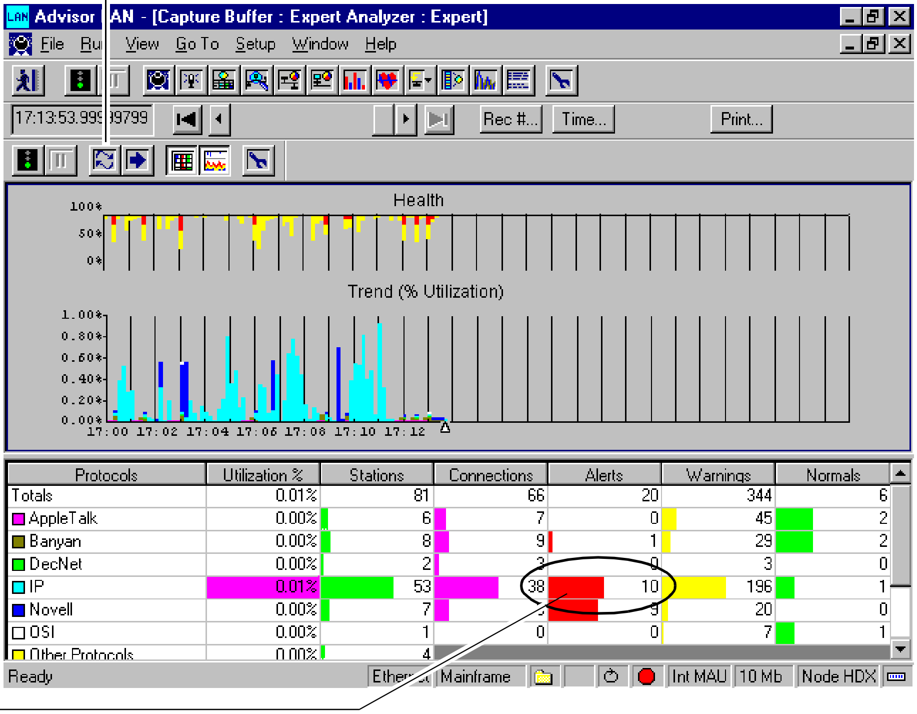

Advisor LAN
File Run View Go To Setup Window Help
Advisor LAN - [Idle : Expert Analyzer : Expert]
File Run View Go To Setup Window Help
Rec #...
Time...
Print...
Health
100%
50%
0%
Trend (% Utilization)
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
Ready
Ethernet
Mainframe
Int MAU
10 Mb
Node HDX

Protocols	Utilization %	Stations	Connections	Alerts	Warnings	Normals
Totals	0.00%	0	0	0	0	0
🟨 Other Protocols	0.00%	0				
MAC Level		0		0	0	0
Routers		0		0	0	0

⑦ Click the Run From Capture Button.

At the prompt, select Run All Frames.

⑧ Wait while the Advisor reads the capture buffer (a Run from Capture Buffer dialog closes when the buffer is processed.)

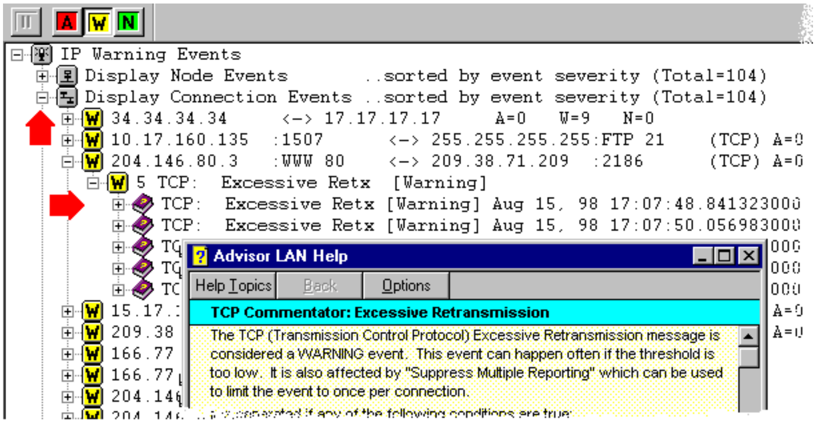

Advisor LAN - [Capture Buffer : Expert Analyzer : Expert]
File
Run
View
Go To
Setup
Window
Help
17:13:53.99999799
Rec #...
Time...
Print...
Health
100%
50%
0%
Trend (% Utilization)
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
17:00
17:02
17:04
17:06
17:08
17:10
17:12
Ready
Ethernet
Mainframe
Int MAU
10 Mb
Node HDX

Protocols	Utilization %	Stations	Connections	Alerts	Warnings	Normals
Totals	0.01%	81	66	20	344	6
🟪 AppleTalk	0.00%	6	7	0	45	2
■ Banyan	0.00%	8	9	1	29	2
🟩 DecNet	0.00%	2	3	0	3	0
■ IP	0.01%	53	38	10	196	1
🟦 Novell	0.00%	7	[illegible]	9	20	0
☐ OSI	0.00%	1	0	0	7	1
🟨 Other Protocols	0.00%	4				

⑨ Notice that the IP protocol has the most Alerts. Double click on this count to open the Commentator measurement.

⑩ Click on the '+' in front of the Display Connection Events row to expand the view.

Continue expanding an event to see details about that event.



```
IP Warning Events
  Display Node Events          ..sorted by event severity (Total=104)
  Display Connection Events  ..sorted by event severity (Total=104)
    34.34.34.34      <-> 17.17.17.17      A=0   W=9   N=0
    10.17.160.135   :1507      <-> 255.255.255.255:FTP 21     (TCP) A=0
    204.146.80.3    :WWW 80    <-> 209.38.71.209   :2186      (TCP) A=0
      5 TCP:  Excessive Retx  [Warning]
        TCP:  Excessive Retx [Warning] Aug 15, 98 17:07:48.841323000
        TCP:  Excessive Retx [Warning] Aug 15, 98 17:07:50.056983000
    15.17.
    209.38
    166.77
    166.77
    204.14
```

TCP Commentator: Excessive Retransmission

The TCP (Transmission Control Protocol) Excessive Retransmission message is considered a WARNING event. This event can happen often if the threshold is too low. It is also affected by "Suppress Multiple Reporting" which can be used to limit the event to once per connection.

⑪ Double click on a book icon to view help about that event.

Conclusion:

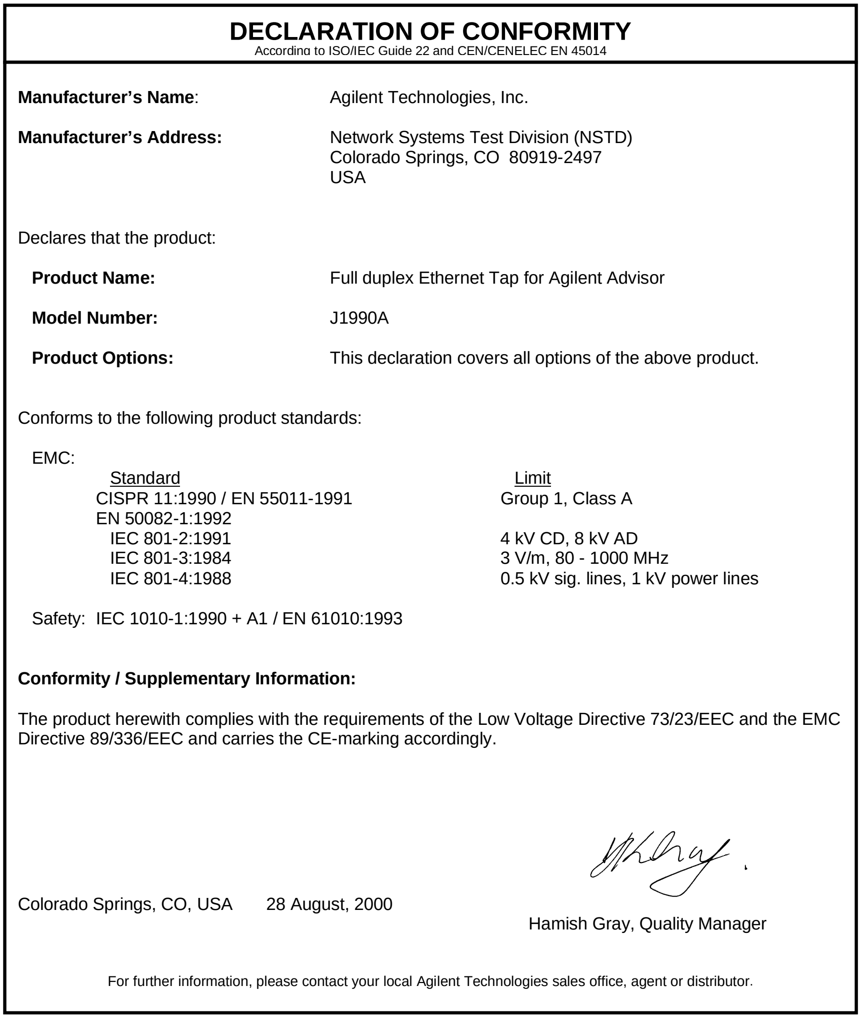
The Commentator measurement view shows the alert, warning, and normal events that are occurring for each connection pair on the network.
This measurement view can also display help information about events occurring on a connection.

A

Declaration of Conformity

J1990A Full Duplex Ethernet Tap for Your Agilent Advisor 60

J1990A Full Duplex Ethernet Tap for Your Agilent Advisor



DECLARATION OF CONFORMITY

According to ISO/IEC Guide 22 and CEN/CENELEC EN 45014

Manufacturer's Name: Agilent Technologies, Inc.

Manufacturer's Address:

Network Systems Test Division (NSTD)
Colorado Springs, CO 80919-2497
USA

Declares that the product:

Product Name: Full duplex Ethernet Tap for Agilent Advisor

Model Number: J1990A

Product Options: This declaration covers all options of the above product.

Conforms to the following product standards:

EMC:

Standard	Limit
CISPR 11:1990 / EN 55011-1991	Group 1, Class A
EN 50082-1:1992	
IEC 801-2:1991	4 kV CD, 8 kV AD
IEC 801-3:1984	3 V/m, 80 - 1000 MHz
IEC 801-4:1988	0.5 kV sig. lines, 1 kV power lines

Safety: IEC 1010-1:1990 + A1 / EN 61010:1993

Conformity / Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE-marking accordingly.

Colorado Springs, CO, USA 28 August, 2000

Hamish Gray, Quality Manager

For further information, please contact your local Agilent Technologies sales office, agent or distributor.

B
Accessories

J1990A Full Duplex Ethernet Tap for Your Agilent Advisor 62

J1990A Full Duplex Ethernet Tap for Your Agilent Advisor

The J1990A, Full Duplex Ethernet Tap for Agilent Advisor, is a single port device that provides a method of directly viewing traffic on a full-duplex or half-duplex 10/100 Ethernet segment using the Agilent Advisor SW Edition application in a PC with a NIC or PCMCIA card.

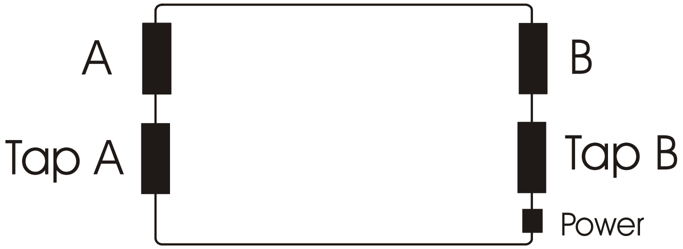
Typically, the tap is deployed on a critical link in a network where network monitoring and analysis capabilities are important. The Full Duplex Ethernet Tap for Your Agilent Advisor is also fault-tolerant, thus any lose of power to the device will not impact network connectivity or performance.

The Full Duplex Ethernet Tap for Your Agilent Advisor eliminates many of the problems commonly associated with the use of a switch mirror port, such as:

- Switch performance degradation
- Use of a port for analysis/monitoring rather than LAN traffic
- Inability to see physical-layer errors such as runt and oversize packets
- Lack of full-duplex support

Tap Connections

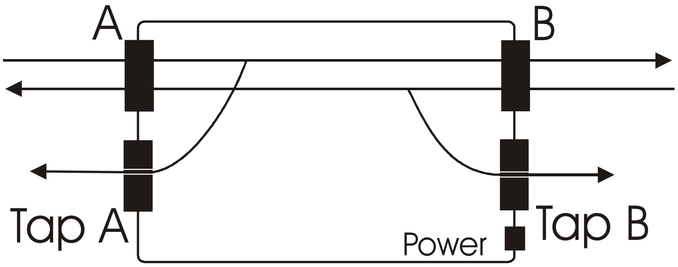
The diagram below represents the rear view of the Full Duplex Ethernet Tap for Your Agilent Advisor:



- Connect the A/B ports directly to the network segments to be monitored.
- Connect the Tap A/Tap B ports to the Agilent Advisor cards.
- Connect the power adapter to the Power connection.

Tap Cabling and Operation

The diagram below and the following tables show the information necessary to successfully install the Full Duplex Ethernet Tap for Your Agilent Advisor.



Operation

The Operation table shows how the Tap A/Tap B ports are able to monitor the A/B ports.

Tap A port mirrors traffic received into A port from the device(s) attached to the A port.

Tap B port mirrors traffic received into B port from the device(s) attached to the B port.

Cabling Guidelines

A port to Network Link:	Existing cable
B port to Network Link	Straight-through cable
Tap A port to Protocol Media Module:	Straight-through cable
Tap B port to Protocol Media Module:	Straight-through cable

NOTE

If no link light appears on the network devices, swap the cables between A port and B port.

Cabling Distances 90 meters maximum distance between:

Network device connected to the A port and Network device connected to the B port.

Network device connected to the A port and Protocol Media Module connected to the Tap A port.

Network device connected to the B port and Protocol Media Module connected to the Tap B port.

Index

A

Alignment Errors, 17
Are There Problems on the Network?, 53

C

Commentator, 14
configure
  instrument, 25, 35
  measurement, 26, 37
connect
  in Ethernet monitor thru mode, 30
  in Ethernet node mode, 30
connect to the network, 25
CRC Errors, 17

D

Declaration of Conformity
  J1990A, 60
Decodes, 16
Decoding Frames on Your Network, 16
Discovering What Nodes Are on the Network, 15

E

Error Reporting Specification, 17
errors, 14
Ethernet
  network connection, 30
Ethernet node connection, 30
Examining Physical Layer Activity, 11
Examining Protocol Errors, 14
Examining the Top Talkers, 12
Expert Analyzer, 10

F

frame decoding, 16
Full Duplex Ethernet Tap for Agilent Advisor (J1990A), 62

G

Getting Started, 24

H

How Busy Is The Network?, 43

I

installation, 24
  hardware, 27
  software, 27
instrument configure, 35

J

J1990A Ethernet Tap
  connect to network, 31
  Declaration of Conformity, 60
  tap description, 62

M

measurement
  Commentator, 14
  configure, 26, 37
  Connection Statistics, 12
  Decode, 16
  Expert Analyzer, 10
  Node Discovery, 15
  Protocol Vitals, 11
  select a measurement, 26, 36
monitor thru connection, Ethernet, 30

N

network connection
  Ethernet, 30
Node Discovery, 15
node list, 15

O

online help, 38

P

physical layer, 11
protocol Errors, 14
Protocol Vitals, 11

R

reporting errors, 17

S

sample file, 42, 45, 50, 55
sample tests
  Are There Problems on the Network?, 53
  How Busy Is The Network?, 43
  introduction, 42
  Who Are the Top Talkers on the Network?, 48
select a measurement, 26, 36
start
  LAN in Windows, 24
  LAN in Windows application, 32
starting
  with Expert Analyzer, 10
  with Troubleshooting Guider, 9
Starting with the Quickstart Expert Guide, 9
Symbol Errors, 17

T

tap (J1990A)
  connect to network, 31
  tap description, 62
tool bar
  measurement, 36
  top level, 36
top talkers, 12
troubleshooting
  Are There Problems on the Network?, 53
  How Busy Is The Network?, 43
  Who Are the Top Talkers on the Network?, 48
troubleshooting guide, 9

U

Using Online Help, 38

W

Who Are the Top Talkers on the Network?, 48
Windows help, 38