WildPackets

EtherPeek NX™

real-time expert protocol analysis

Quick Tour

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EtherPeek NX ™ Quick Tour

Welcome to EtherPeek NX™, WildPackets' real-time Expert Analysis tool that combines EtherPeek's advanced set of troubleshooting and monitoring features with Expert problem detection heuristics and diagnostic capabilities. The Quick Tour is intended to help you become familiar with some key program features, including the ***Expert*** and ***Peer Map*** views.

EtherPeek NX works by capturing traffic from one or more adapters, providing the tools to filter, analyze and interpret traffic patterns, data packet contents, statistics, and protocol types. EtherPeek NX is an excellent diagnostic tool for determining the source of network problems as they occur. EtherPeek NX is the first analyzer to allow multiple simultaneous capture sessions, each using a different adapter. This ability is limited only by the number of adapters available and the processing power of the local host.

EtherPeek NX provides a wealth of features to explore. This Quick Tour begins with a brief overview of central program functions, then introduces a selection of key capabilities, walking you through each feature with step-by-step examples.

Program overview

EtherPeek NX is built around two distinct ways of looking at the network: Monitor statistics and packet capture. The next sections introduce these two approaches. Monitor statistics, Capture windows and Packet File windows provide EtherPeek NX with the foundations for fast, intuitive, and comprehensive network analysis in Ethernet environments.

Monitor statistics

The Monitor statistics function never saves packets, it only collects data. That data is always based on all the traffic found on the adapter selected in the ***Adapter*** view of the **Monitor Options** dialog. There can only be one instance of Monitor statistics at one time. From the **Monitor** menu, Monitor statistics provides the following views of network traffic:

- **Node Statistics**
- **Protocol Statistics**
- **Network Statistics**
- **Size Statistics**
- **Summary Statistics**
- **History Statistics**

Capture windows and Packet File windows

Packet capture is done in Capture windows. Packet File windowS. are used to open saved packet files. You can save packets into a new packet file from either a Capture window or a Packet File window. You can have multiple Capture windows and/or Packet File windows open at the same time, up to the limits of your system resources.

A Packet File window has all the statistical and analytical features of a Capture window, but none of the features required for packet capture. With that exception, everything said here about Capture windows applies equally to Packet File windows.

All the capture-related properties of a Capture window are defined in the **Capture Options** dialog. Each Capture window must be assigned an adapter from which to capture (in the ***Adapter*** view), and a memory allocation called a capture buffer (in the ***General*** view). You can assign each Capture window a different adapter, choose the same adapter for multiple Capture windows, or any combination of shared and unique, so long as each Capture window has one valid adapter.

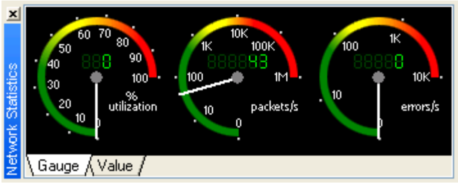
A Capture window or Packet File window provides the same types of statistics found in Monitor statistics (in the ***Nodes***, ***Protocols***, and ***Summary*** views), or provides near equivalents in the ***Graphs*** view. There is one crucial difference, however, between the statistics in these windows and the ones in Monitor statistics. The statistics in these windows are based only on the packets seen in the buffer of the particular Capture window or Packet File window. In a Packet File window (or in a Capture window, when capture is stopped), you can, for example, select a group of packets in the ***Packets*** view and choose **Hide Selected Packets** from the **Edit** menu to temporarily alter the apparent contents of the capture buffer. This forces a recalculation of statistics based on the remaining packets.

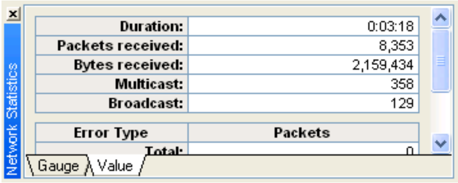
All the functions related to packet decodes—viewing, saving, and searching by the decoded contents of packets—are unique to Capture windows and Packet File windows.

Feature # 1: MONITOR STATISTICS

Real-time statistics monitor traffic patterns

Monitor statistics provide insight into the overall flow of network traffic. They are like the view from a traffic helicopter and can indicate bottlenecks and anomalies. Use these windows to identify trends and current conditions that may signal unexpected network problems.



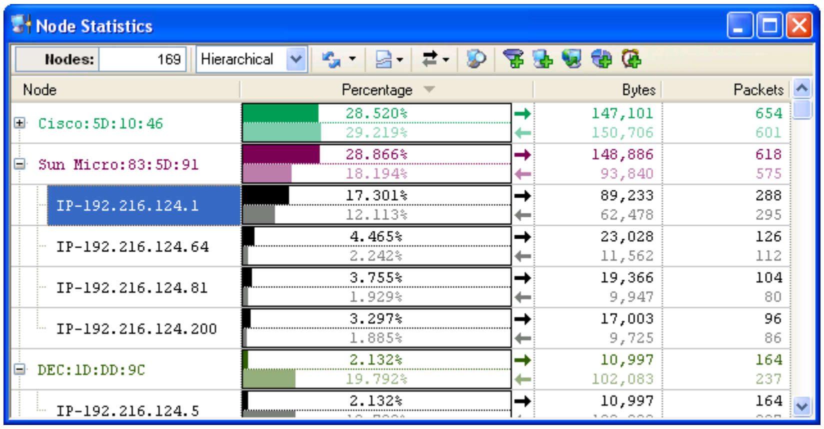


Network Statistics

Duration:	0:03:18
Packets received:	8,353
Bytes received:	2,159,434
Multicast:	358
Broadcast:	129

Error Type	Packets
Total:	0

The Monitor statistics functions keep only the aggregate information needed to provide an updated tally of all the tracked parameters. Data collection for Monitor statistics is independent of any Capture windows, and cannot be altered by filters, triggers, or any other function.



Node Statistics

Nodes: 169 Hierarchical

Node	Percentage		Bytes	Packets
⊞ Cisco:5D:10:46	28.520% 29.219%	→ ←	147,101 150,706	654 601
⊟ Sun Micro:83:5D:91	28.866% 18.194%	→ ←	148,886 93,840	618 575
IP-192.216.124.1	17.301% 12.113%	→ ←	89,233 62,478	288 295
IP-192.216.124.64	4.465% 2.242%	→ ←	23,028 11,562	126 112
IP-192.216.124.81	3.755% 1.929%	→ ←	19,366 9,947	104 80
IP-192.216.124.200	3.297% 1.885%	→ ←	17,003 9,725	96 86
⊟ DEC:1D:DD:9C	2.132% 19.792%	→ ←	10,997 102,083	164 237
IP-192.216.124.5	2.132%	→	10,997	164

Selecting an adapter for monitor statistics

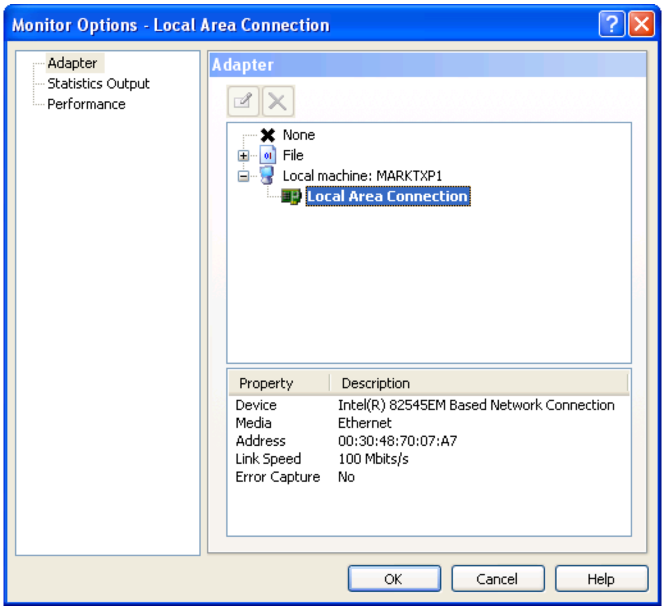
The first time you start EtherPeek NX, you will be asked to select an adapter to be used to collect Monitor statistics. By default, Monitor statistics begin calculation based on the traffic that is passed to EtherPeek NX from the adapter selected in the ***Adapter*** view of the **Monitor Options** dialog and continue to accumulate while EtherPeek NX is running.

To begin collecting Monitor statistics:

1. Launch the program by choosing **WildPackets EtherPeek NX** from the **Start** menu.
2. Choose any supported Ethernet adapter from the list displayed in the ***Adapter*** view of the **Monitor Options** dialog.
3. EtherPeek NX will use this adapter, placing it in a “promiscuous” mode in which the adapter captures all traffic seen by the selected adapter, regardless of its destination address.

Note: As an alternative, you can choose a *File* as your adapter. If you choose *New File Adapter*, you can open any EtherPeek (*.pkt) packet file, such as those in the Samples directory in the main program directory. EtherPeek NX will cycle through the packets in the chosen file, allowing you to simulate most aspects of “live” functionality.

4. Under the **Monitor** menu, make sure the **Monitor Statistics** item has a check mark beside it, showing that it is enabled. If it does not, click the item to enable it.



Property	Description
Device	Intel(R) 82545EM Based Network Connection
Media	Ethernet
Address	00:30:48:70:07:A7
Link Speed	100 Mbits/s
Error Capture	No

5. EtherPeek NX will begin calculating Monitor statistics based on all the traffic seen on the selected adapter and will continue to collect Monitor statistics from the selected adapter until you quit the program or reset statistics.

Monitoring with Summary Statistics

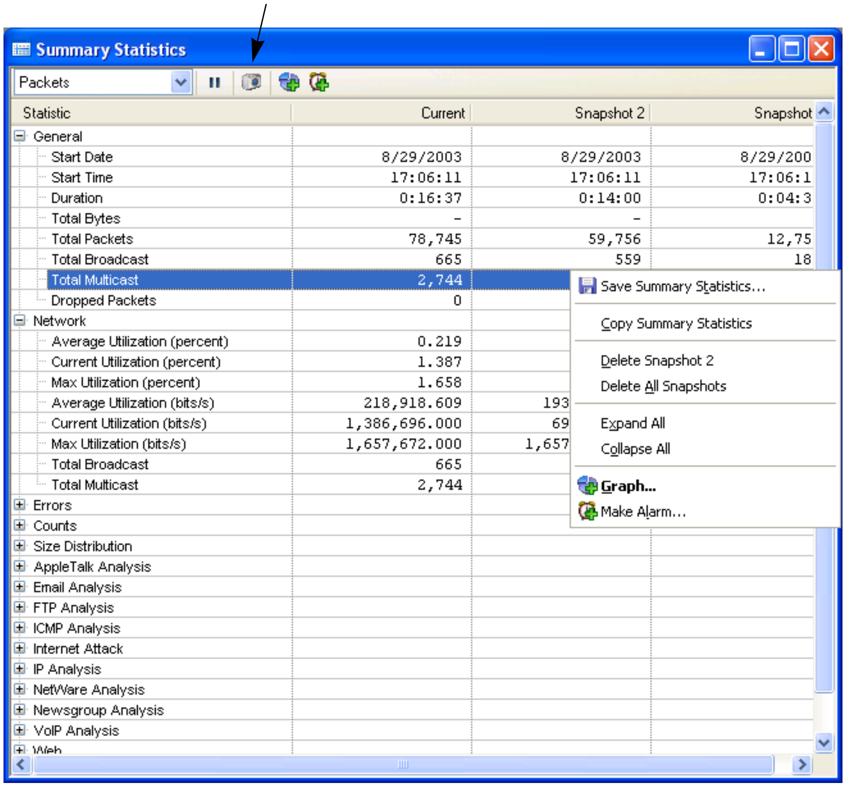
The **Summary Statistics** feature allows you to monitor key network statistics in real time and save these statistics for later comparison. Use this feature to baseline “normal” network activity, save the data, then compare saved statistics with those observed during periods of erratic network behavior to help pinpoint the cause of the problem.

Summary statistics are also extremely valuable in comparing the performance of two different network segments. For example, a field support engineer could compare the real-time statistics on a client's network with a saved “healthy” router snapshot and easily diagnose or eliminate the source of inconsistent or poor router performance.

To view **Summary Statistics**:

1. Choose **Summary** from the **Monitor** menu to open the **Summary Statistics** window.

Snapshot button



Statistic	Current	Snapshot 2	Snapshot
⊟ General			
Start Date	8/29/2003	8/29/2003	8/29/200
Start Time	17:06:11	17:06:11	17:06:1
Duration	0:16:37	0:14:00	0:04:3
Total Bytes	-	-	
Total Packets	78,745	59,756	12,75
Total Broadcast	665	559	18
Total Multicast	2,744		
Dropped Packets	0		
⊟ Network			
Average Utilization (percent)	0.219		
Current Utilization (percent)	1.387		
Max Utilization (percent)	1.658		
Average Utilization (bits/s)	218,918.609	193	
Current Utilization (bits/s)	1,386,696.000	69	
Max Utilization (bits/s)	1,657,672.000	1,657	
Total Broadcast	665		
Total Multicast	2,744		
⊞ Errors			
⊞ Counts			
⊞ Size Distribution			
⊞ AppleTalk Analysis			
⊞ Email Analysis			
⊞ FTP Analysis			
⊞ ICMP Analysis			
⊞ Internet Attack			
⊞ IP Analysis			
⊞ NetWare Analysis			
⊞ Newsgroup Analysis			
⊞ VoIP Analysis			
⊞ Web			

2. Click the **Snapshot** button in the window header. The real-time network traffic data displayed in the ***Current*** column will be copied to a new column identified as “***Snapshot #***” (where **#** is the sequence number of the snapshot). The new snapshot column will also show the date and start time at which the snapshot was made.

3. Choose **Save Summary Statistics** from the **File** menu (or the context menu) to save the information to a text file.

4. You can also periodically save **Summary Statistics** from Monitor statistics or from the ***Summary*** view of an open Capture window using the *CSV Row Report* in the ***Statistics Output*** views of (respectively) the **Monitor Options** or the **Capture Options** dialogs. Each time this report is saved, it adds a single row to the output text file. Each row contains the whole contents of the ***Current*** column as comma separated values (csv).

Feature # 2: CAPTURING PACKETS FROM MULTIPLE ADAPTERS

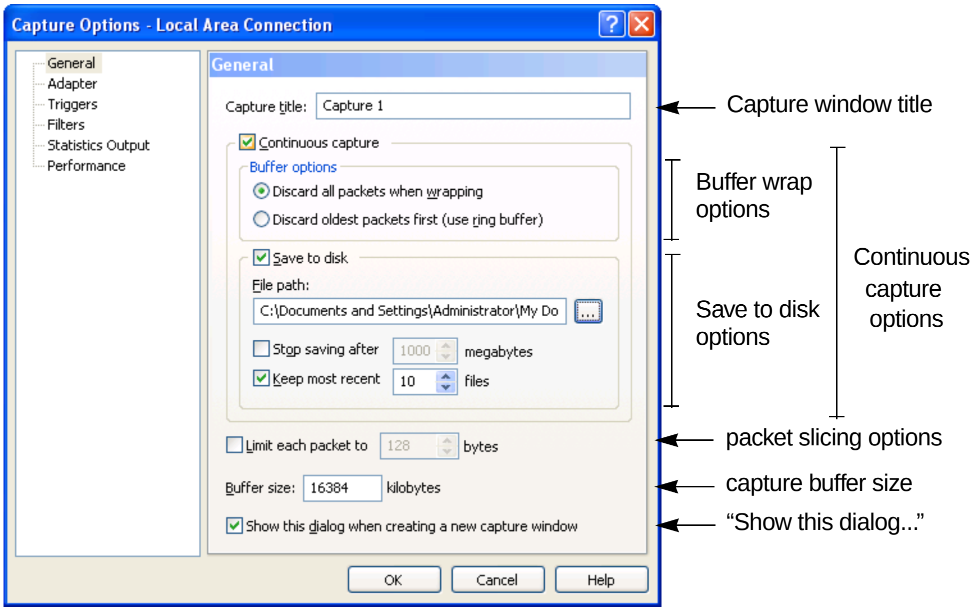
Sampling network traffic in detail

To capture packets in EtherPeek NX, you create a Capture window, set its parameters (including the adapter to be used by that particular Capture window), and click the **Start Capture** button. It’s as simple as that.

Start capture

To create a new Capture window:

1. Choose **New…** from the **File** menu to open the **Capture Options** dialog.
2. In the ***General*** view of the **Capture Options** dialog, set the *Capture title* (name) of the new Capture window.
3. Set the size of its capture buffer or accept the default in *Buffer size: … kilobytes*.
4. Use the *Continuous capture* section to determine how the buffer will be used during capture. When *Continuous capture* is unchecked, capture stops when the buffer becomes full. When *Continuous capture* is checked, use the radio buttons to *Discard all packets when wrapping* the buffer or *Discard oldest packets first (use ring buffer)*.



General

Capture title: Capture 1

☑ Continuous capture

Buffer options

● Discard all packets when wrapping

○ Discard oldest packets first (use ring buffer)

☑ Save to disk

File path: C:\Documents and Settings\Administrator\My Do

□ Stop saving after 1000 megabytes

☑ Keep most recent 10 files

□ Limit each packet to 128 bytes

Buffer size: 16384 kilobytes

☑ Show this dialog when creating a new capture window

Capture window title

Buffer wrap options

Save to disk options

Continuous capture options

packet slicing options

capture buffer size

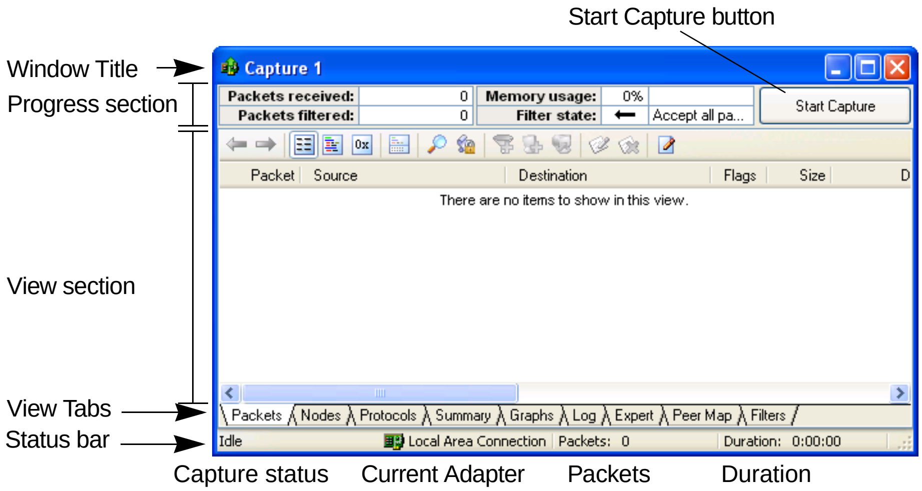
“Show this dialog...”

5. Choose any supported Ethernet adapter from the list displayed in the ***Adapter*** view of the **Capture Options** dialog.
6. You can set any other options in the ***Triggers***, ***Filters***, ***Statistics Output***, and/or ***Performance*** views, either when you first create the Capture window, or later, by returning to the **Capture Options** dialog for that window. Make the Capture window the active (frontmost) window and choose **Capture Options…** from the **Capture** menu to open the **Capture Options** dialog for an open Capture window.
7. When you have set the capture options, click **OK** to open the new Capture window.
8. Click **Start Capture**. You will see packets from your selected adapter processed and displayed in the new Capture window.

Packets view

In separate views, a Capture window provides many ways of looking at the traffic captured into that window. These views are accessible by clicking the view tabs across the bottom of the Capture window. For an overview, see “Capture windows and Packet File windows” on page 1.

The ***Packets*** view is the heart of a Capture window. The view has three optional panes: Packet List (a table showing all packets, each on a single line), Decode (showing a decode of the packet selected in the Packet List) and Hex (raw hex and ASCII contents of the selected packet). You can display any or all of these panes simultaneously by using the buttons in the Capture window toolbar.

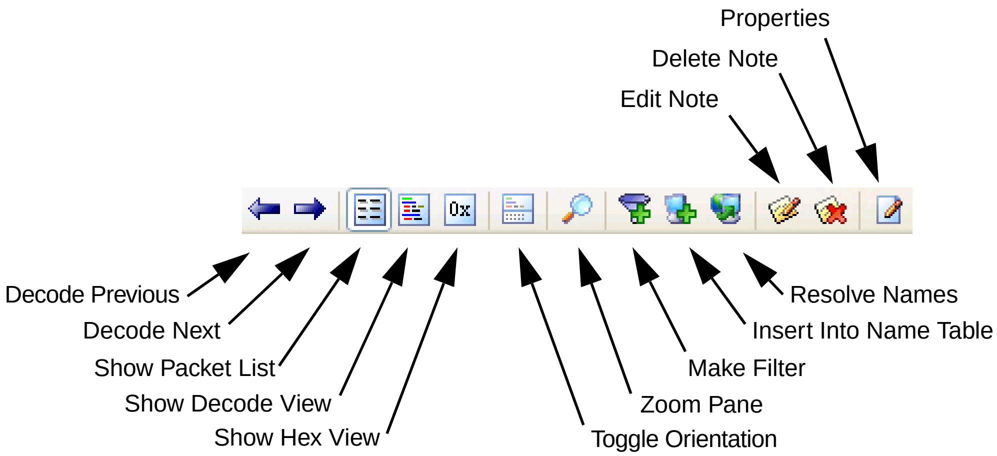


Packets received: 0
Packets filtered: 0
Memory usage: 0%
Filter state: Accept all pa...

There are no items to show in this view.

Idle | Local Area Connection | Packets: 0 | Duration: 0:00:00

The statistics and information displayed in other views is based on the packets in the ***Packets*** view. Similarly, **Select** operations performed in other views actually take effect in the ***Packets*** view. The **Select** features, in combination with the **Hide Selected Packets**, **Hide Unselected Packets**, and **Unhide All Packets** commands from the **Edit** menu, are powerful tools for sophisticated analysis.

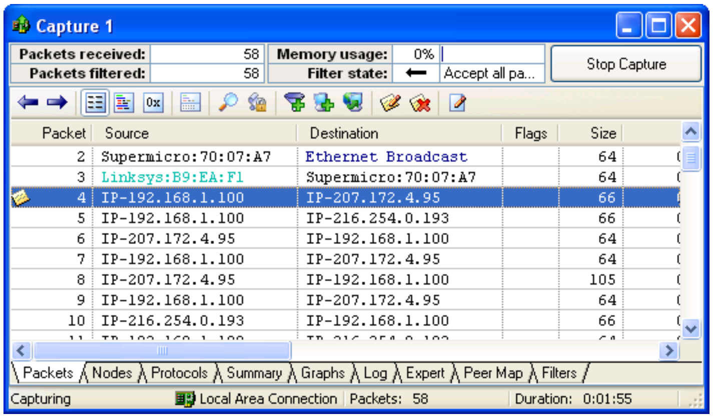


The default Packet List shows data for each packet in the following columns: ***Packet*** (showing the sequential number assigned at capture, plus a Note icon if you have made a note on the packet), ***Source*** address, ***Destination*** address, a ***Flags*** column (showing packets flagged as errors, trigger packets, and so forth), packet ***Size*** (length in bytes), packet ***Protocol***, the ***Relative Time*** of packet capture (relative to EtherPeek NX program start), a ***Summary*** column showing additional information provided about the packet by any enabled Analysis Modules, and an ***Expert*** column, logging information provided by the Expert Analysis features.

Many other columns are also available. To add to or change the mix of columns, click in the column headings to open the **Packet List Options** dialog. To change column order, use drag and drop.

Pane View Options
Column Headings

this packet has a note



Packets received: 58
Packets filtered: 58
Memory usage: 0%
Filter state: Accept all pa...

Packet	Source	Destination	Flags	Size
2	Supermicro:70:07:A7	Ethernet Broadcast		64
3	Linksys:B9:EA:F1	Supermicro:70:07:A7		64
4	IP-192.168.1.100	IP-207.172.4.95		66
5	IP-192.168.1.100	IP-216.254.0.193		66
6	IP-207.172.4.95	IP-192.168.1.100		64
7	IP-192.168.1.100	IP-207.172.4.95		64
8	IP-207.172.4.95	IP-192.168.1.100		105
9	IP-192.168.1.100	IP-207.172.4.95		64
10	IP-216.254.0.193	IP-192.168.1.100		66

Capturing | Local Area Connection | Packets: 58 | Duration: 0:01:55

Feature # 3: SETTING FILTERS IN CAPTURE WINDOWS

Pinpointing traffic of interest

Filters let you focus on specific traffic. If you want to check a problem between two particular devices, perhaps a computer and a printer, address filters can capture just the traffic between these two devices. If you are having a problem with a particular function on your network, a protocol filter can help you home in on traffic related to that particular function.

Filters work by testing packets against the criteria specified in the filter. Packets whose contents or other attributes meet these criteria are said to “match” the filter. Filters are discrete individual tools that can be saved, imported, exported, edited, and used in combination with one another. You can build filters to test for just about anything found in a packet: addresses, protocols, sub-protocols, ports, error conditions, and more.

Filters are so easy to create in EtherPeek NX that you can often create a custom filter on-the-fly while analyzing suspect traffic on your network and use that filter to narrow your search in real time.

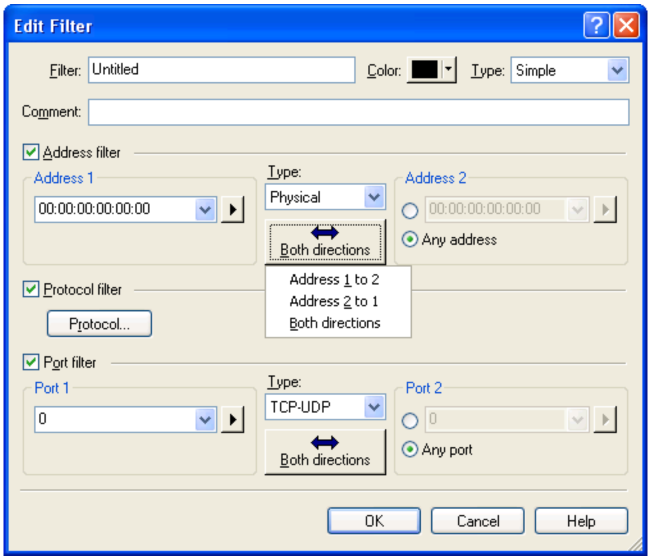
Define and set a filter based on address and protocol

An address filter matches traffic between specific network devices, or traffic between one specific device and all others. Protocol filters let you focus on particular types of traffic or network functions. In this example, we define a simple filter that matches all the traffic in a particular protocol (Kerberos) travelling to or from one interface (physical address) of a server.

To create a new simple filter defining an address and protocol:

1. Open the ***Filters*** view of a Capture window, or choose **View** > **Filters** from the main menu to open the **Filters** window.
2. Click the **Insert** button to open the **Edit Filter** dialog in its default ***Simple*** filter view.

Note: The *Type* drop-down list at the upper right of the **Edit FIlter** dialog allows you to choose between ***Simple*** and ***Advanced*** views. The ***Advanced*** view provides additional filter parameters and the ability to nest multiple tests in a single named filter using logical AND, OR and NOT. For this example, the ***Simple*** view does everything we need to do.



Filter: Untitled   Color: ■   Type: Simple

Comment:

☑ Address filter

Address 1: 00:00:00:00:00:00   Type: Physical   Address 2: ○ 00:00:00:00:00:00 ● Any address

☑ Protocol filter

☑ Port filter

Port 1: 0   Type: TCP-UDP   Port 2: ○ 0 ● Any port

3. Enter a name in the *Filter* field. This will appear in all filter lists.

4. Click in the *Color* control to choose a color for the filter, or accept the default (black).

5. Optionally, enter a comment in the *Comment* field. You can sort filter lists by the ***Filter*** or the ***Comment*** column.

6. Check *Address filter* to enable the address section of the filter.

7. Choose *Physical* from the address *Type* drop-down list to define the type of addresses to be entered. (Your other choices are: *IP*, *IPv6*, *AppleTalk*, *DECnet*, or *IPX*.)

8. In *Address 1*, enter the physical address (MAC address) of the server NIC. Physical addresses are entered in pairs of hexadecimal characters (0-9, a-f) separated by colon characters. If this address is already entered in the Name Table, you can click the button to the right of the field and choose the entry from there.

9. Under *Address 2*, click the radio button labelled *Any address*.

10. Click the button in the center of the *Address filter* section and choose *Both directions* from the drop-down list.

11. Check *Protocol filter* to enable the definition of that aspect of the filter.

12. Click the **Protocol…** button to open the **Protocol Filter** dialog.

13. Choose *ProtoSpecs* from the drop-down list at the top to choose that method of defining your protocol.

14. Navigate the nested hierarchy of protocols to select Kerberos (*Ethernet Type 2* > *IP* > *TCP* > *Kerberos*), then click **OK** to accept your selection and close the **Protocol Filter** dialog, returning to the **Edit Filter** dialog.

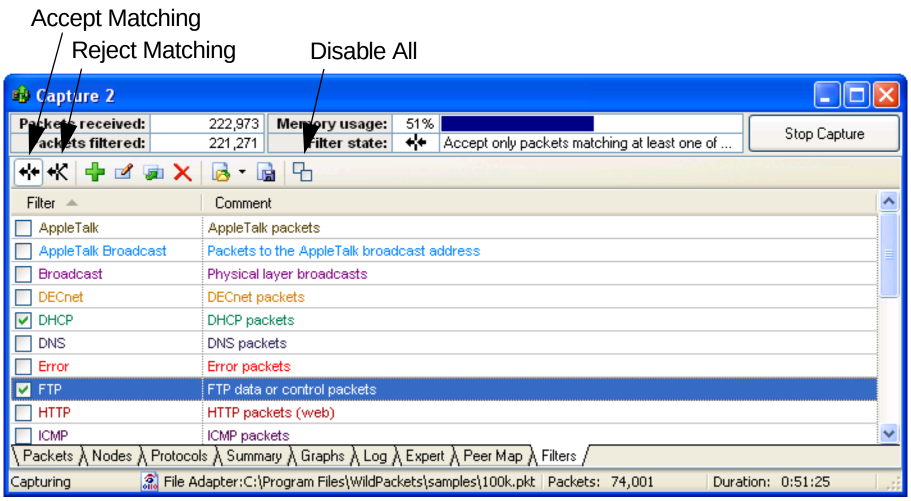
Note: Most IP stacks are implemented as Ethernet Type 2. If your network uses versions of IP implemented under 802.3 instead, choose *IEEE 802.3* > *SNAP* > *IP* > *TCP* > *Kerberos*.

15. Click **OK** to accept your changes and close the **Edit Filter** dialog. The new filter will appear in all filter lists.

16. To activate the new filter in your Capture window, open its ***Filters*** view, and check the checkbox beside the new filter's name. To capture only traffic matching the filter -- in this case, Kerberos traffic moving to or from the physical address or your server, click the

Accept Matching button in the ***Filters*** view. The filter takes effect immediately, even if capture is already under way.

To match all the traffic on any of the interfaces of a multi-homed server, you could create a separate simple filter matching each interface. When capturing from a segment that could have traffic to or from any of these interfaces, enable these filters and click **Accept Matching**. A packet matching any of the enabled filters is considered a match, and accepted into the capture buffer.



Accept Matching

Reject Matching

Disable All

Capture 2

Packets received: 222,973
Packets filtered: 221,271
Memory usage: 51%
Filter state: Accept only packets matching at least one of ...

Filter	Comment
□ AppleTalk	AppleTalk packets
□ AppleTalk Broadcast	Packets to the AppleTalk broadcast address
□ Broadcast	Physical layer broadcasts
□ DECnet	DECnet packets
☑ DHCP	DHCP packets
□ DNS	DNS packets
□ Error	Error packets
☑ FTP	FTP data or control packets
□ HTTP	HTTP packets (web)
□ ICMP	ICMP packets

Capturing | File Adapter:C:\Program Files\WildPackets\samples\100k.pkt | Packets: 74,001 | Duration: 0:51:25

Make Filter

An easy way to create a new filter is to use the **Make Filter** command, available as the **Make Filter** button in many windows, or from the context menu (right-click) where applicable. The **Make Filter** command creates a filter based on the selected packet or statistics item. **Make Filter** can also be used in the Name Table to create a filter based on the selected named node, protocol, or port. It can also be used in the **Packet Decode** window (or the decode panes of the ***Packets*** view of a Capture window or Packet File window) to create a filter based on the selected data item.

When you use the **Make Filter** command, an unnamed filter is created matching the parameters of the selected packet, node, protocol, conversation, or packet decode item. An **Edit Filter** dialog will open with the parameters for your selection already loaded. Use this dialog to make any additional changes, and save the filter under a new name.

If multiple items are selected, the **Make Filter** command will attempt to create a filter for each one.

Feature # 4:

VIEWING DECODED PACKETS

Network traffic, decoded in detail

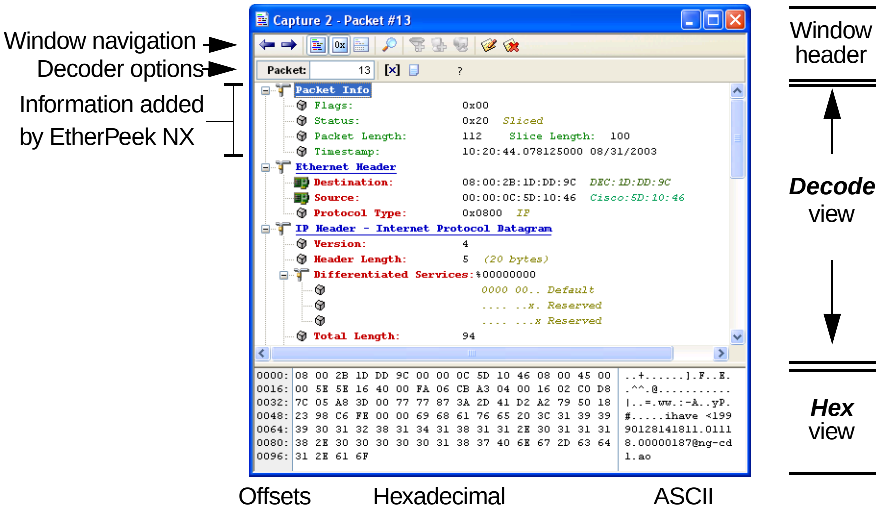
Some network problems are revealed more quickly by looking at the detailed information contained in individual packets. Protocol decoders and the **Packet Decode** window allow you to open packets and look inside, pinpoint sources of problems, track down faulty hardware, and learn about and examine protocol structure and compliance.

Packet decode window

A **Packet Decode** window (or the decode pane of the ***Packets*** view) presents the detailed structure and contents of a single packet. EtherPeek NX can decode thousands of protocols and sub-protocols, and can display the individual elements of Ethernet packets, along with their meanings, expressed in plain English. This example demonstrates some of the features of packet decodes.

To view the decode of a packet:

1. Open the Decode and Hex panes of the ***Packets*** view of a Capture window or Packet File window. Alternatively, you can double-click on any packet in the ***Packets*** view to open it in a separate **Packet Decode** window.
2. Notice the items in green at the top of the ***Decode*** view. This section includes information on the *Flags*, *Status*, *Packet Length*, and *Timestamp* of the packet. If packet slicing was in effect when this packet was captured, the *Slice Length* will also be shown here.
3. Notice the body of the ***Decode*** view. The information is laid out in the same order as it appears in the packet itself. Each protocol is nested or framed within the higher level protocols. Each line shows the ASCII representation of the packet data for a particular field within the packet and the interpretation of that data, based on the protocol. A quick glance at this section often reveals the source of trouble. Problems like a misconfigured client, or incompatible versions of the same protocol from different vendors can be easily understood when you can see and compare the packets themselves.
4. Notice the ***Hex*** view at the bottom of the packet decode window. This view shows the raw hex contents of the packet on the left, with the offset of the first character in each line ()optionally) shown at the far left. In alignment with this, line for line, the ASCII version of the raw packet data is shown on the right.



```
Packet Info
    Flags:                    0x00
    Status:                   0x20   Sliced
    Packet Length:            112     Slice Length:  100
    Timestamp:                10:20:44.078125000 08/31/2003
Ethernet Header
    Destination:              08:00:2B:1D:DD:9C   DEC:1D:DD:9C
    Source:                   00:00:0C:5D:10:46   Cisco:5D:10:46
    Protocol Type:            0x0800   IP
IP Header - Internet Protocol Datagram
    Version:                  4
    Header Length:            5   (20 bytes)
    Differentiated Services:%00000000
                                 0000 00.. Default
                                 .... ..x. Reserved
                                 .... ...x Reserved
    Total Length:             94

0000: 08 00 2B 1D DD 9C 00 00 0C 5D 10 46 08 00 45 00  ..+......].F..E.
0016: 00 5E 5E 16 40 00 FA 06 CB A3 04 00 16 02 C0 D8  .^^.@...........
0032: 7C 05 A8 3D 00 77 77 87 3A 2D 41 D2 A2 79 50 18  |..=.ww.:-A..yP.
0048: 23 98 C6 FE 00 00 69 68 61 76 65 20 3C 31 39 39  #.....ihave <199
0064: 39 30 31 32 38 31 34 31 38 31 31 2E 30 31 31 31  90128141811.0111
0080: 38 2E 30 30 30 30 30 31 38 37 40 6E 67 2D 63 64  8.00000187@ng-cd
0096: 31 2E 61 6F                                      1.ao
```

Figure 4.1 Parts of a Packet Decode window

5. When you highlight an item in one part of the window, the same bytes of the packet are highlighted in all the other views or panes as well. The highlight matches in the Decode, Hex, and ASCII panes.
6. Click the **Decode Previous** or **Decode Next** buttons at the top of the window to step through the packets shown in the Packet List of the active Capture window or Packet File window.

Feature # 5: EXPERT VIEW AND EXPERT EVENTFINDER

Expert analysis of peer-to-peer communications

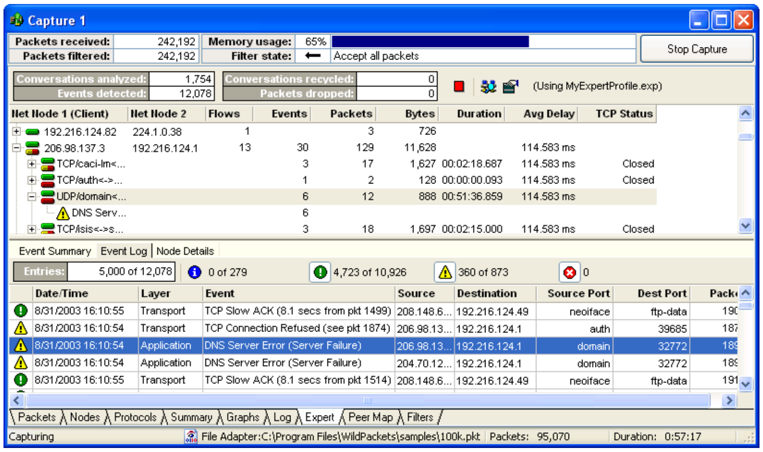
The ***Expert*** view provides expert analysis of delay, throughput and a wide variety of network events and potential problems in a conversation-centered view of traffic in a Capture window or Packet File window.

The Expert EventFinder not only helps identify key events, but it also helps you understand the meaning, the typical causes, and the typical solutions to the problems it uncovers. Detailed information is only a click away.

Using the Expert view

To see the ***Expert*** view in action:

1. Open a new Capture window and capture a sample of packets.
2. Click the *Expert* tab to open the ***Expert*** view.
3. Watch the ***Events*** column for a conversation with some number of events. Alternatively, you can watch the LED lights at the far left of the Conversations pane. The colors of the LEDs indicate the presence and severity of events within a particular conversation.
4. Stop capture when you have a sample containing identified events.
5. Scroll in the Conversations pane (the upper pane) of the ***Expert*** view and select a conversation or flow with one or more events.
6. Expand the view of that flow by clicking on the + (plus) sign at the left margin.
7. Expand the descriptions of the individual events encountered, by clicking on the + (plus) sign at the left margin.



Packets received: 242,192
Packets filtered: 242,192
Memory usage: 65%
Filter state: ← Accept all packets

Conversations analyzed: 1,754
Events detected: 12,078
Conversations recycled: 0
Packets dropped: 0
(Using MyExpertProfile.exp)

Net Node 1 (Client)	Net Node 2	Flows	Events	Packets	Bytes	Duration	Avg Delay	TCP Status
192.216.124.82	224.1.0.38	1		3	726			
206.98.137.3	192.216.124.1	13	30	129	11,628		114.583 ms	
TCP/caci-lm<...			3	17	1,627	00:02:18.687	114.583 ms	Closed
TCP/auth<->...			1	2	128	00:00:00.093	114.583 ms	Closed
UDP/domain<...			6	12	888	00:51:36.859	114.583 ms	
⚠ DNS Serv...			6					
TCP/isis<->s...			3	18	1,697	00:02:15.000	114.583 ms	Closed

Entries: 5,000 of 12,078
0 of 279
4,723 of 10,926
360 of 873
0

	Date/Time	Layer	Event	Source	Destination	Source Port	Dest Port	Packe
!	8/31/2003 16:10:55	Transport	TCP Slow ACK (8.1 secs from pkt 1499)	208.148.6...	192.216.124.49	neoiface	ftp-data	190
⚠	8/31/2003 16:10:54	Transport	TCP Connection Refused (see pkt 1874)	206.98.13...	192.216.124.1	auth	39685	187
⚠	8/31/2003 16:10:54	Application	DNS Server Error (Server Failure)	206.98.13...	192.216.124.1	domain	32772	189
⚠	8/31/2003 16:10:54	Application	DNS Server Error (Server Failure)	204.70.12...	192.216.124.1	domain	32772	189
!	8/31/2003 16:10:55	Transport	TCP Slow ACK (8.1 secs from pkt 1514)	208.148.6...	192.216.124.49	neoiface	ftp-data	191

Capturing | File Adapter:C:\Program Files\WildPackets\samples\100k.pkt | Packets: 95,070 | Duration: 0:57:17

8. Select an individual event.
9. Right-click on the event and choose **EventFinder Setting** from the context menu to open the **Expert EventFinder Settings** dialog with this particular class of event highlighted.
10. Notice that the **Expert EventFinder Settings** dialog tells you not only what sensitivity or setting value was used to flag this event as significant, but it also provides a more complete *Description* of the event and identifies *Possible Causes* and *Possible Remedies*.
11. Close the **Expert EventFinder Settings** dialog, but do not close the ***Expert*** view.

The ***Expert*** view makes it easy to get to the source of trouble. When the ***Expert*** view identifies an event as significant, you have a variety of ways to get to the packets involved. You can select all the packets in a conversation or an individual packet or group of packets with a particular event. Where a diagnosis is based on a change or an unexpected response, you can select the pair of packets that allowed the diagnosis.

To review all the packets in a conversation diagnosed with one or more events:

1. In the Conversations pane (the upper pane) of the ***Expert*** view, select a conversation with one or more events.
2. Click the **Express Select** button in the ***Expert*** view header section.
3. In the **Selection Results** dialog which appears, choose **Hide Unselected**, and click **OK**.
4. In the resulting ***Packets*** view, scroll to the ***Expert*** column. Notice that individual packets have entries here, provided by the Expert Analysis function.
5. You can scroll through the ***Expert*** column entries to choose a packet to open (by double-clicking on its entry in the ***Packets*** view), or

To see the pair(s) of packets associated with a problem diagnosis:

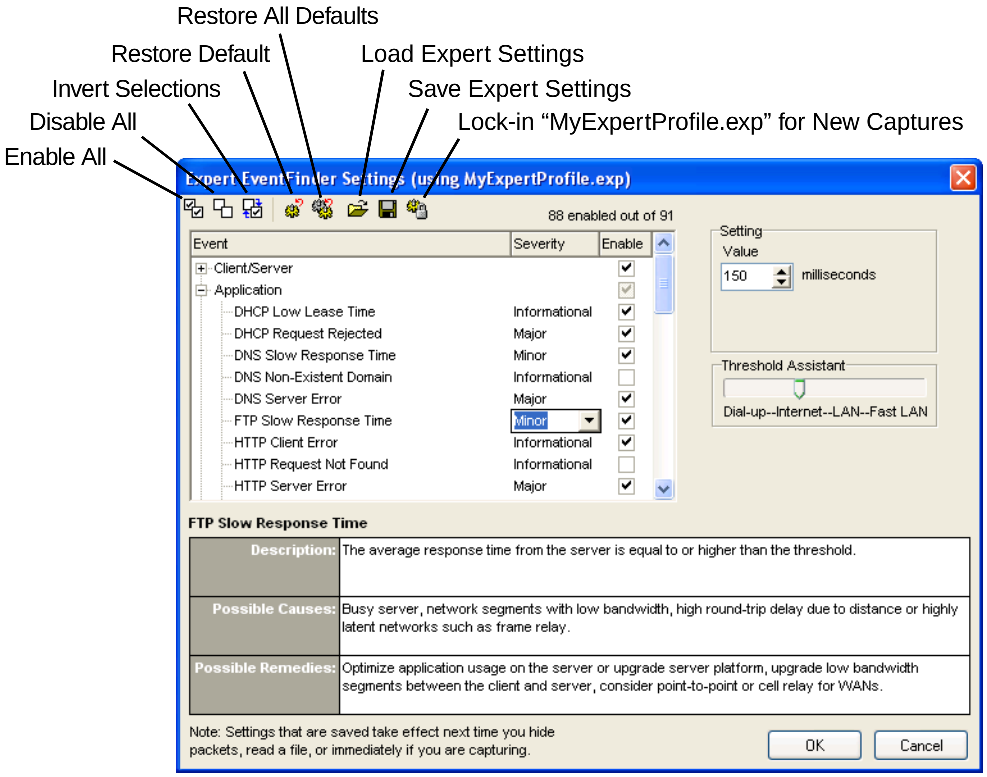
1. In the supplemental information panes area at the bottom of the ***Expert*** view, click the *Event Log* tab to open the *Event Log*.
2. Click in the header of the ***Event*** column to sort by that column. You can sort the *Event Log* by any of its columns. The ***Event*** column of the *Event Log* shows the same information as is provided in the ***Expert*** column of the ***Packets*** view.
3. Each log entry is a single packet. Select one or more log entries containing a reference to a second packet, such as *(see packet 503)*. Events related to transmission retries, response times, rate changes, and so forth may reference a second packet.
4. Right-click on the entry or entries and choose **Select Related Packets** > **Selected Entries + "See" or "From Pkt"** from the context menu.
5. From the **Selection Results** dialog which appears, you have a number of options for displaying decodes of the packets selected.

Expert EventFinder

The Expert EventFinder scans traffic in a Capture window or Packet File window, looking for key events. The EventFinder's 91 separate events cover anomalies, sub-optimal performance and other significant events at all layers of the network from application to physical. The Expert monitors Client/Server delay and throughput as well.

You can enable and disable each test individually. In addition, many of the events have user-defined settings and thresholds, allowing you to fine-tune the Expert system to precisely fit your needs. You can save and reload Expert EventFinder settings for use in particular environments.

In addition, the **Expert EventFinder Settings** window shows the *Description*, *Possible Causes*, and *Possible Remedies* for each event it can diagnose.



Expert EventFinder Settings (using MyExpertProfile.exp)

88 enabled out of 91

Event	Severity	Enable
⊞ Client/Server		☑
⊟ Application		☑
DHCP Low Lease Time	Informational	☑
DHCP Request Rejected	Major	☑
DNS Slow Response Time	Minor	☑
DNS Non-Existent Domain	Informational	☐
DNS Server Error	Major	☑
FTP Slow Response Time	Minor	☑
HTTP Client Error	Informational	☑
HTTP Request Not Found	Informational	☐
HTTP Server Error	Major	☑

Setting
Value
150 milliseconds

Threshold Assistant
Dial-up--Internet--LAN--Fast LAN

FTP Slow Response Time

Description:	The average response time from the server is equal to or higher than the threshold.
Possible Causes:	Busy server, network segments with low bandwidth, high round-trip delay due to distance or highly latent networks such as frame relay.
Possible Remedies:	Optimize application usage on the server or upgrade server platform, upgrade low bandwidth segments between the client and server, consider point-to-point or cell relay for WANs.

Note: Settings that are saved take effect next time you hide packets, read a file, or immediately if you are capturing.

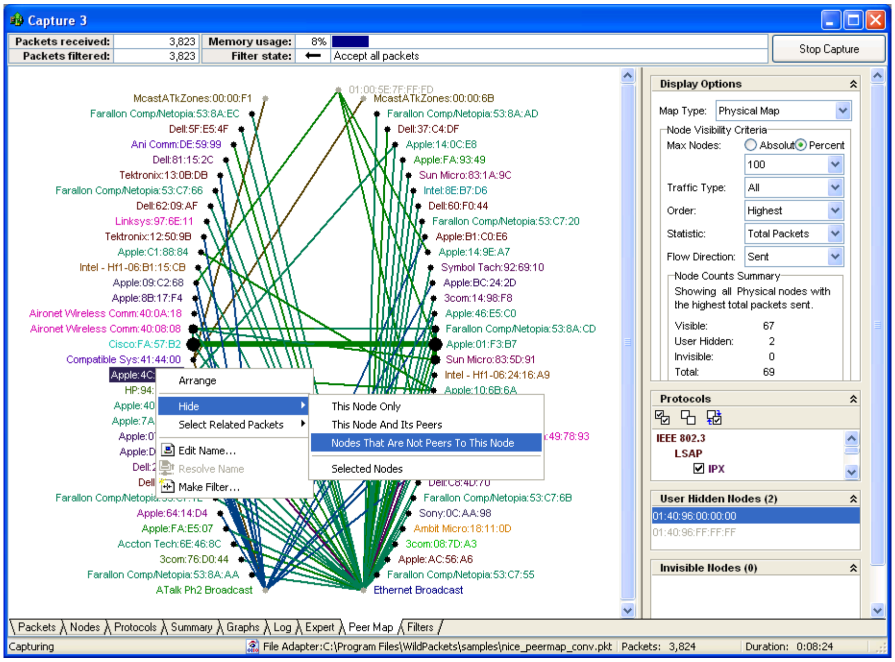
Feature # 6: PEER MAP

Visualizing traffic patterns

The ***Peer Map*** view is a powerful tool for visualizing network traffic in a Packet File window or Capture window. The Peer Map uses line weight and line color to show the volume and protocol of traffic between nodes. The nodes themselves can be color-coded for protocol and size-coded for traffic volume and can show icons for node type, based on Name Table entries.

The Peer Map displays only the packets visible in the ***Packets*** view. Hiding and unhiding packets in the ***Packets*** view can be used to alter the Peer Map. In addition, the ***Peer Map*** view contains its own tools to control the display of nodes and types of network traffic. This lets you quickly create a picture of all the traffic in a particular protocol, for example, or all the nodes sending or receiving multicast traffic.

The Peer Map displays the nodes around an elongated ellipse. Communications are shown by a line connecting each two peers. The color of the line denotes the protocol, its thickness the volume of traffic. When you drag nodes to new positions, the lines rubber-band.



Capture 3

Packets received: 3,823 Memory usage: 8%

Packets filtered: 3,823 Filter state: ⟵ Accept all packets

Display Options

Map Type: Physical Map

Node Visibility Criteria

Max Nodes: ○ Absolut ● Percent

100

Traffic Type: All

Order: Highest

Statistic: Total Packets

Flow Direction: Sent

Node Counts Summary

Showing all Physical nodes with the highest total packets sent.

Visible: 67

User Hidden: 2

Invisible: 0

Total: 69

Protocols

IEEE 802.3

LSAP

☑ IPX

User Hidden Nodes (2)

01:40:96:00:00:00

01:40:96:FF:FF:FF

Invisible Nodes (0)

Capturing | File Adapter:C:\Program Files\WildPackets\samples\nice_peermap_conv.pkt | Packets: 3,824 | Duration: 0:08:24

To use the Peer Map:

1. Open a Capture window and begin capturing traffic.
2. Click the ***Peer Map*** tab to open the ***Peer Map*** view.
3. In the *Display Options* section at the right of the ***Peer Map*** view, choose *IP Map* from the *Map Type* drop-down list.
4. Notice that only nodes using the IP protocol are displayed.
5. Change the *Traffic Type* setting, using the drop-down list, from the default *All* to *Unicast* or *Multicast*. Notice how the Peer Map changes to display only the nodes sending or receiving these types of traffic.
6. Restore the *Traffic Type* setting to *All*.
7. Go to the *Protocols* section and deselect some of the protocols shown there. Notice that the lines indicating traffic between nodes in the Peer Map disappear as their protocol is disabled (unchecked) in the *Protocols* settings pane.

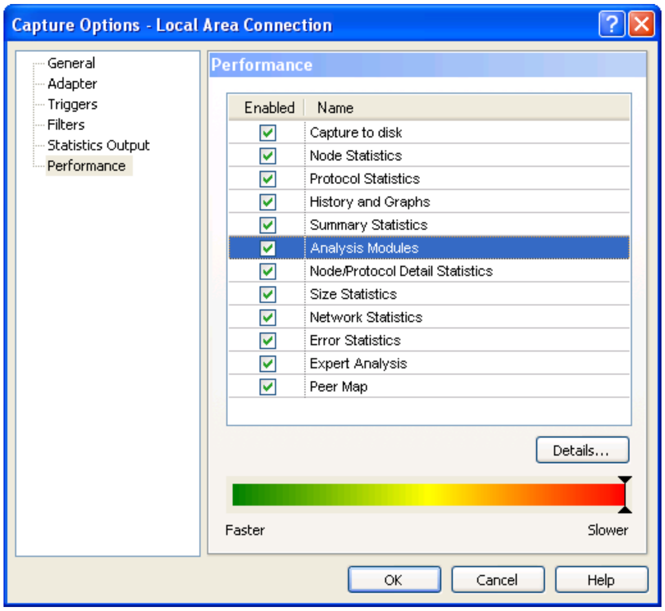
Feature # 7: PERFORMANCE VIEWS

Streamline monitor and capture

It's important to balance the need to perform real-time monitoring with post capture analysis. The ***Performance*** view of the **Monitor Options** or **Capture Options** dialog allows you to specify the processing required for the task at hand by selectively enabling or disabling individual program functions. At the bottom of the ***Performance*** view is a spectral band labeled *Faster* at the left and *Slower* at the right. As you enable and disable program functions, an indicator moves along this band to give you a rough estimate of the relative impact of various combinations of features on the performance of Monitor statistics or the particular Capture window.

To change the performance settings:

1. Open the ***Performance*** view of the **Monitor Options** or **Capture Options** dialog. By default, all items are enabled.



Enabled	Name
☑	Capture to disk
☑	Node Statistics
☑	Protocol Statistics
☑	History and Graphs
☑	Summary Statistics
☑	Analysis Modules
☑	Node/Protocol Detail Statistics
☑	Size Statistics
☑	Network Statistics
☑	Error Statistics
☑	Expert Analysis
☑	Peer Map

2. Uncheck the check box beside *Size Statistics.* Disabling this function has little impact on performance, and the indicator will barely move to the left.

3. Uncheck the check boxes beside the *Expert* and *Peer Map* functions. Disabling these functions substantially increases performance, and the indicator will move over half of the way to the left.

   The fewer functions enabled, the faster the performance; the more functions, the slower.

Feature # 8: ALARMS

Monitoring for multiple possible problems simultaneously

Alarms query a specified Monitor statistics function approximately once per second, testing for user-defined alarm and alarm resolution conditions. On matching any of these tests, the alarm function sends a notification of a user-specified severity.

You can create an alarm for any individual statistics item in the **Node**, **Protocol**, or **Summary Statistics** windows. You can also create an alarm from any open statistics **Graph** window that is based on Monitor statistics. To create a new alarm, highlight the statistics item and click the **Make Alarm** button, or right-click and choose **Make Alarm…** from the context menu. In the **Make Alarm** dialog, you can set the parameters defining two levels of alarm (*Suspect Condition* and *Problem Condition*) and define the *Resolve Condition* that signals a return to normal.

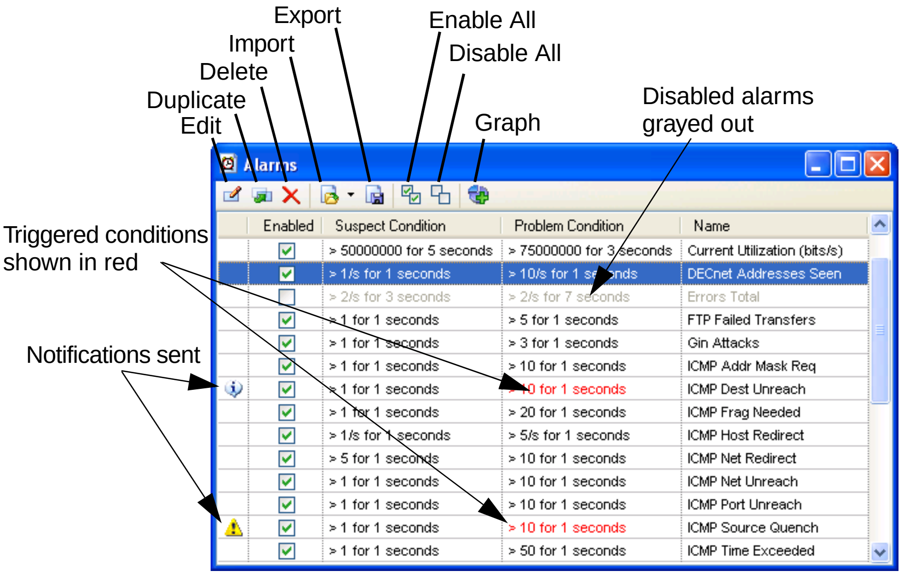
To review the installed Alarms:

1. Choose **Alarms** from the **View** menu to open the **Alarms** window.
2. Notice that any enabled alarm has a checkmark in the ***Enabled*** column.
3. Notice that any alarm which has been tripped is shown in red.

4. To edit any alarm, highlight it and click the **Edit** button at the left of the **Alarms** window to open the **Edit Alarm** dialog for that alarm.

Predefined alarms

EtherPeek NX includes two sets of ready-made alarms for your convenience, located in the Alarms directory where you installed EtherPeek NX. The set of alarms loaded on installation is stored in a file called Default Alarms.alm. A second, larger set of alarms is included in a file called Additional Alarms.alm. The default set of alarms covers the most frequently encountered network problem conditions. The additional alarms generally include normal network conditions which you may want to monitor for particular purposes. You can load these or any other saved set of alarms using the **Import** button in the **Alarms** window.

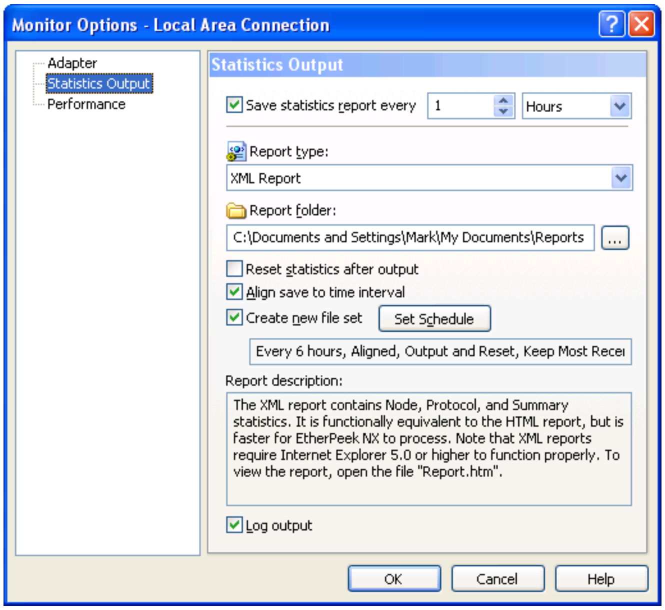


	Enabled	Suspect Condition	Problem Condition	Name
	☑	> 50000000 for 5 seconds	> 75000000 for 3 seconds	Current Utilization (bits/s)
	☑	> 1/s for 1 seconds	> 10/s for 1 seconds	DECnet Addresses Seen
	□	> 2/s for 3 seconds	> 2/s for 7 seconds	Errors Total
	☑	> 1 for 1 seconds	> 5 for 1 seconds	FTP Failed Transfers
	☑	> 1 for 1 seconds	> 3 for 1 seconds	Gin Attacks
	☑	> 1 for 1 seconds	> 10 for 1 seconds	ICMP Addr Mask Req
ⓘ	☑	> 1 for 1 seconds	> 10 for 1 seconds	ICMP Dest Unreach
	☑	> 1 for 1 seconds	> 20 for 1 seconds	ICMP Frag Needed
	☑	> 1/s for 1 seconds	> 5/s for 1 seconds	ICMP Host Redirect
	☑	> 5 for 1 seconds	> 10 for 1 seconds	ICMP Net Redirect
	☑	> 1 for 1 seconds	> 10 for 1 seconds	ICMP Net Unreach
	☑	> 1 for 1 seconds	> 10 for 1 seconds	ICMP Port Unreach
⚠	☑	> 1 for 1 seconds	> 10 for 1 seconds	ICMP Source Quench
	☑	> 1 for 1 seconds	> 50 for 1 seconds	ICMP Time Exceeded

Feature # 9: OUTPUT FROM STATISTICS

Building a history of your network's performance

You can periodically save statistics from open Capture windows or open Monitor statistics windows to any of a variety of Statistics Report formats. Each report format includes a particular selection of statistics, and saves data in XML HTML *.csv (comma separated values text in ASCII encoding), or *.txt (tab-delimited text in UTF-8 encoding) file formats. Alternatively you can choose the *CSV Row Report* to append each new output from **Summary Statistics** to the same set of *.csv files.



☑ Save statistics report every 1 Hours

Report type: XML Report

Report folder: C:\Documents and Settings\Mark\My Documents\Reports

□ Reset statistics after output

☑ Align save to time interval

☑ Create new file set

Every 6 hours, Aligned, Output and Reset, Keep Most Recei

Report description:

The XML report contains Node, Protocol, and Summary statistics. It is functionally equivalent to the HTML report, but is faster for EtherPeek NX to process. Note that XML reports require Internet Explorer 5.0 or higher to function properly. To view the report, open the file "Report.htm".

☑ Log output

To periodically output current statistics:

1. Open the ***Statistics Output*** view of the dialog appropriate to the source of the statistics you wish to output; **Monitor Options** (for Monitor statistics) or **Capture Options** (for a particular Capture window). The ***Statistics Output*** views are identical, and only the source of statistics is different.
2. Check the checkbox in the upper left to enable saving statistics. Use the combo boxes at right to set the frequency with which you want to update the statistics files. With the exceptions noted below, each new report is written over the previous report, replacing it.
3. Choose the type of statistics to be output and the file format to be used from the *Report type* drop-down list. A description of the selected report type is shown in the lower part of the ***Statistics Output*** view.
4. In *Report folder*, enter the location to which these periodic reports should be saved, You can click the **...** ellipsis button to navigate to the location.
5. Check *Reset statistics after output* to return statistics counts to zero after each report is written. This allows you to create a series of reports, always starting at zero.
6. Check *Align save to time interval* to synchronize the output of reports to the nearest whole unit of time. For example, if your interval is set to some number of *Hours*, output will occur on the hour when this option is checked.
7. Check *Create new file set* to create a series of statistics output reports, rather than a single report which is overwritten (or, in the case of the *CSV Row Report* only, appended to). When this item is checked, reports are written to new file folders, created at an interval you specify in the **New File Set Schedule** dialog, available by clicking the **Set Schedule** button.
8. Check *Log output* to send a notice sent to the log file when a statistics report is updated.
9. Click **OK** to enable your choices.

There's more!

There are many more features to explore with EtherPeek NX, but not enough space here to document them all. We suggest you look at these additional features:

Name Table and name resolver options

The Name Table lets you assign your own symbolic names to addresses, ports and protocols. It is easy to create and update Name Table entries in EtherPeek NX. You can also save and restore (export and import) the contents of the Name Table. This allows you to keep separate Name Tables for different network segments or office locations.

Providing names in place of logical or physical addresses makes the task of identifying packets of interest much simpler.

EtherPeek NX can scan all traffic, searching for logical and symbolic names in the contents of passing packets. You can control how and whether EtherPeek NX adds these passively discovered names to the Name Table, and tell it how to automatically age these entries, deleting those that remain unused after a certain time.

Analysis Modules

Analysis Modules are external modules that provide expert analysis features to the program. An Analysis Module tests network traffic and provides detailed summaries and counts of key parameters of one specific type of traffic, posting its results in the **Summary Statistics** window and/or in the ***Summary*** column of the ***Packets*** view of Capture windows and Packet File windows.

The Analysis Modules shipped with EtherPeek NX cover a wide range of the most common protocols and network applications. You can enable and disable Analysis Modules individually. In addition, many Analysis Modules have user-configurable options, which can be used to further refine the data you collect about your network.

Triggers

Automate the start and stop of capture using triggers. Any filter can be specified as a trigger criterion. You can also set a trigger to start or stop packet capture based on time and date settings, so you can focus captures with pinpoint accuracy. Look for trigger options in the ***Triggers*** view of the **Capture Options** dialog.

ProtoSpecs™ and protocol definitions

WildPackets' ProtoSpecs technology offers a very fine level of protocol layer detail by identifying the top-level “parent” protocol and breaking-out each subprotocol layer in a hierarchical view. Look for ProtoSpecs in EtherPeek NX's Capture windows, **Filters** and **Protocol Statistics** windows. Display protocol information based on a total of the subprotocols under the parent protocol, or by each subprotocol broken-out by individual layers.

EtherPeek NX provides a definition of what a protocol abbreviation stands for and a concise description of how a protocol is used. This on-line help mechanism will assist you in determining the purpose of previously unseen packets on the network as well as help to increase your knowledge of LAN/WAN protocols. To view the definition for any particular protocol or subprotocol from any packet list view or **Protocol Statistics** window, click on your selection and then choose the **Protocol Info** command from the context menu.

Selecting, hiding and unhiding packets

The statistical, ***Expert***, and ***Peer Map*** views of Capture windows and Packet File windows are recalculated and redrawn each time there is a change in the visible packets in the ***Packets*** view. By selecting, hiding and unhiding packets, a user can perform sophisticated analysis on captured traffic quickly and easily.

The **Select…** command from the **Edit** menu brings up the **Select** dialog that allows you to apply existing filters to captured packets, to select based on string content or packet length, or to select based on Analysis Modules. You can select either all packets matching your criteria or all those not matching.

Demonstration version of EtherPeek NX

The demonstration version of EtherPeek NX differs from the full-featured version in the following ways:

- Each Capture window is limited to 30 seconds of capture and no more than 250 packets.
- Only 5 Capture windows can be opened per launch.
- Only the first 250 packets of a saved file will be loaded into Packet File windows.
- Monitor statistics are captured for only 5 minutes.
- Printing and Saving are disabled.
- Does not open packet files created by other products.
- Send is limited to 100 packets.

System Requirements

The recommended configurations for systems running EtherPeek NX are:

- 1.7 GHz processor (600 MHz minimum)
- 512 MB RAM or higher (256 MB minimum)
- Windows XP or Windows 2000
- Microsoft Internet Explorer 5.5 or later required

Please see the Readme file for additional information about any special requirements for particular operating systems. Please see the installation instructions shipped with your hardware and software for additional information regarding network drivers, program file locations and uninstall instructions.

Additional product information

Please check our web site at www.wildpackets.com for product demos, literature, technical references, FAQs, system requirements and more.

AiroPeek NX™ - Expert 802.11 Wireless LAN network analyzer

AiroPeek™ - 802.11 Wireless LAN protocol analyzer

EtherPeek NX™ - Expert 10/100/1000 Ethernet network analyzer

EtherPeek™ - 10/100/1000 Ethernet protocol analyzer

EtherPeek™ for Macintosh - Ethernet packet analyzer

GigaPeek NX™ - Expert Gigabit Ethernet network analyzer

iNetTools™ - Menu-driven testing tools for Internet and IP-based networks

NetDoppler™ - Performance and application analysis tool

NetSense™ - Post-capture expert network analyzer

PacketGrabber™ - Remote packet capture application

PacketScrubber™ - Selective trace file data removal tool

ProConvert™ - Packet trace conversion tool

RFGrabber™ - Distributed WLAN analysis probe for AiroPeek NX

RMONGrabber™ - RMON capture module for EtherPeek NX

EtherPeek NX Product Maintenance

EtherPeek NX is available with two levels of maintenance. Standard Maintenance is available for twelve or twenty-four months and can be purchased with your product on our Web site. Premium Maintenance is available for twelve months and can be purchased by contacting sales@WildPackets.com.

WildPackets Academy

WildPackets Academy offers a structured educational curriculum centered on practical applications of protocol analysis techniques. Introductory courses in the basic concepts of protocol analysis provide the foundation for a full range of advanced offerings in specialized topics. See www.wildpackets.com/services for a full course catalog, current public course scheduling, web-delivered courses, and on-site course delivery information.

Network Analysis Courses

WP-100	Foundations of Network Protocol Analysis
WP-101	Network Troubleshooting Methods
WP-102	Emerging Ethernet Technologies: VoIP, Full Duplex, Gigabit, and Switching
WP-103	TCP/IP Protocol Analysis Methods
WP-104	Advanced TCP/IP Protocol Analysis
WP-105	AppleTalk, AppleShare IP, and Mac OS/X Network Analysis
WP-106	Wireless LAN Administration

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Since 1990, WildPackets has built affordable and easy to use network analysis tools. Our customers rely on WildPackets tools to help them design, maintain, troubleshoot, and optimize their networks. For information about our company, its products and partners, please see our website at www.wildpackets.com. See the WildPackets Academy site, www.wildpackets.com/services, for information on courses and Professional Services offerings. WildPackets' Network Analysis Expert (NAX) Certification Program details can be found at www.nax2000.com.

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