Lab 8.3.2 Conducting a Network Capture with Wireshark

Objectives

- Perform a network traffic capture with Wireshark to become familiar with the Wireshark interface and environment.
- Analyze traffic to a web server
- Create a filter to limit the network capture to ICMP packets.
- Ping a remote host to observe how the ICMP packet filter operates during the network capture.

Background / Preparation

In this lab, you will install Wireshark, a well-known network protocol analyzer and monitoring tool. Wireshark captures all packets sent or received by the computer NIC. It can be installed either in the lab or on a PC at home. You will use it to trace and view various types of network protocols and traffic. Wireshark was formerly known as Ethereal.

Wireshark software is freeware and is available from www.wireshark.org. The software installer, wireshark-setup-0.99.5.exe, should be available on the local Networking Academy server.

You can perform this lab individually, in pairs, or in teams.

The following resources are required:

- A Windows XP-based PC with an Ethernet network and at least two hosts
- Wireshark Version 0.99.5 software (or most current version)
- Internet connectivity (optional but desirable)
- Access to the PC command prompt
- Access to PC network TCP/IP configuration

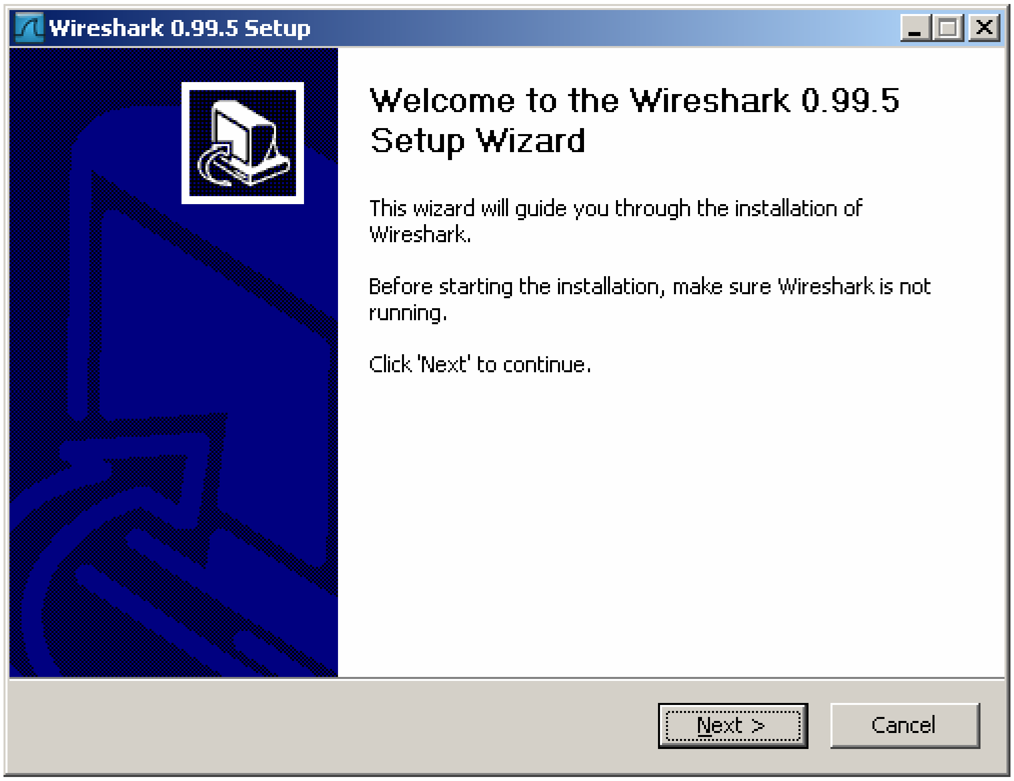
Step 1: Install and launch Wireshark

If Wireshark has been loaded on the PC previously, go to the Wireshark program folder **Start > All Programs > Wireshark > Wireshark** and click the application icon.

If Wireshark has not been installed, follow these steps:

a. Given the local network path to the Wireshark software installer, wireshark-setup-0.99.5.exe, download the installer to the PC desktop.

b. Double-click the installer and follow the installation prompts, accepting the defaults.



Wireshark 0.99.5 Setup

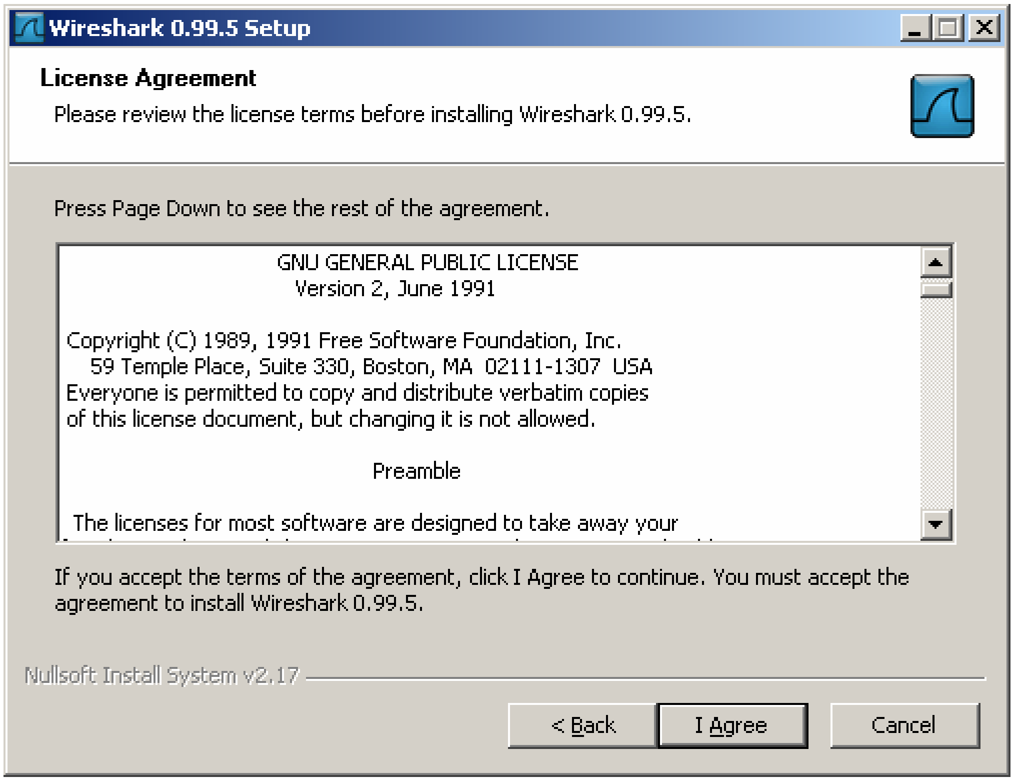
Welcome to the Wireshark 0.99.5 Setup Wizard

This wizard will guide you through the installation of Wireshark.

Before starting the installation, make sure Wireshark is not running.

Click 'Next' to continue.

1) Click **I Agree**.



Wireshark 0.99.5 Setup

License Agreement

Please review the license terms before installing Wireshark 0.99.5.

Press Page Down to see the rest of the agreement.

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                    GNU GENERAL PUBLIC LICENSE
                       Version 2, June 1991

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                            Preamble

 The licenses for most software are designed to take away your
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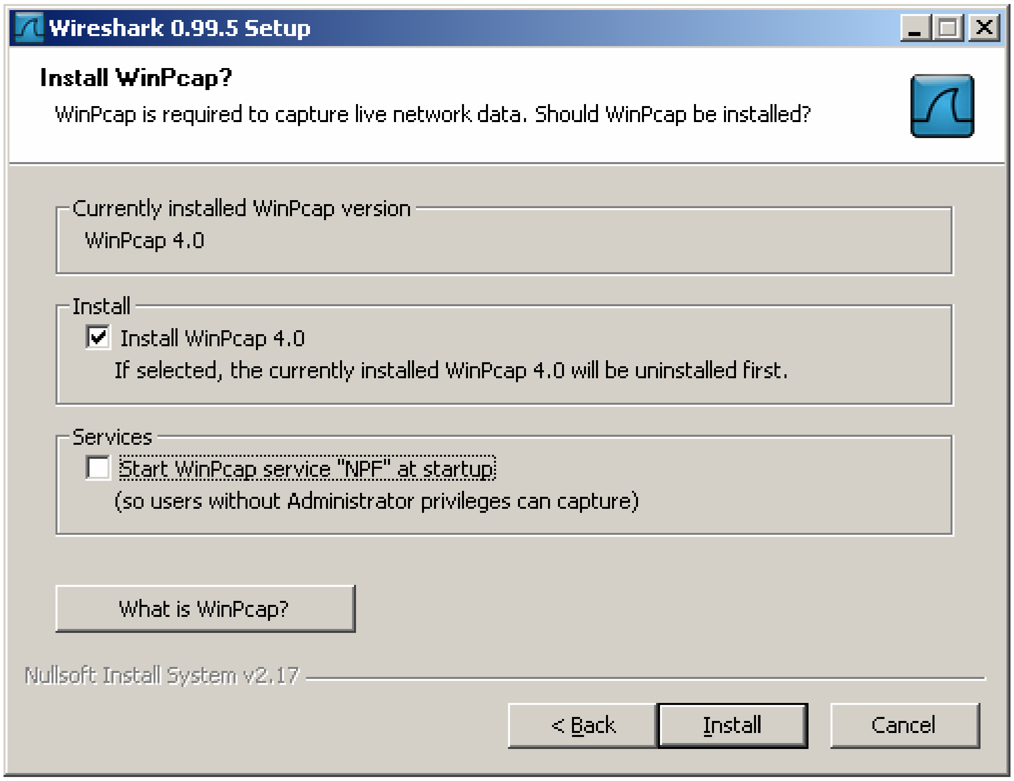
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install Wireshark 0.99.5.

2) Make sure to install WinPcap on the PC. WinPcap includes a driver to support packet capture. Wireshark uses this library to capture live network data with Windows.



Wireshark 0.99.5 Setup

Install WinPcap?

WinPcap is required to capture live network data. Should WinPcap be installed?

Currently installed WinPcap version
WinPcap 4.0

Install
☑ Install WinPcap 4.0
If selected, the currently installed WinPcap 4.0 will be uninstalled first.

Services
☐ Start WinPcap service "NPF" at startup
(so users without Administrator privileges can capture)

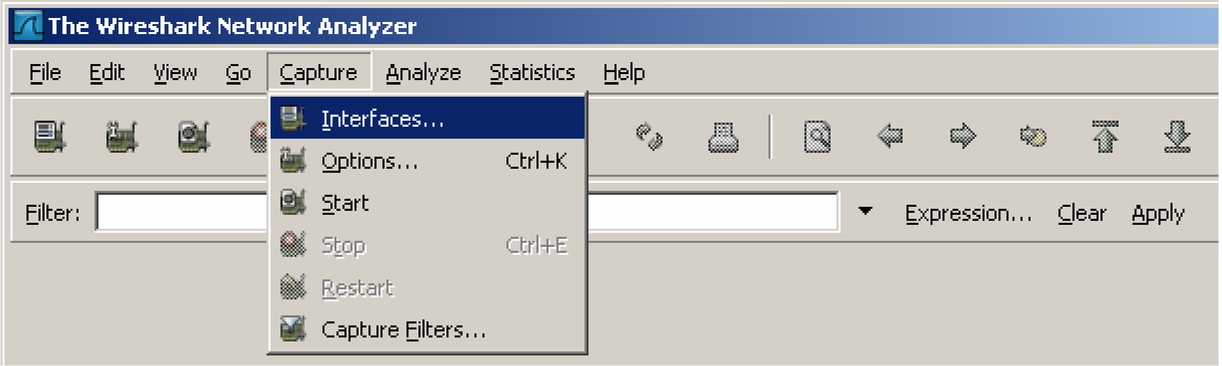
c. Click **Install** and follow the remaining prompts to the end of the installation process.

d. After the software is installed, click the checkbox to launch Wireshark.

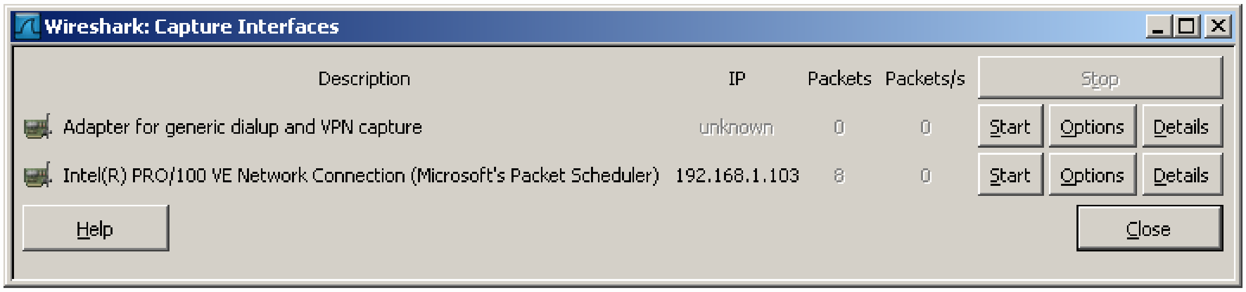
Step 2: Select an interface to use for capturing packets

a. Start the Wireshark application.

b. From the **Capture** menu, click **Interfaces**.



3) Click the **Start** button for the Ethernet interface (NIC) that you want to use to capture network traffic.

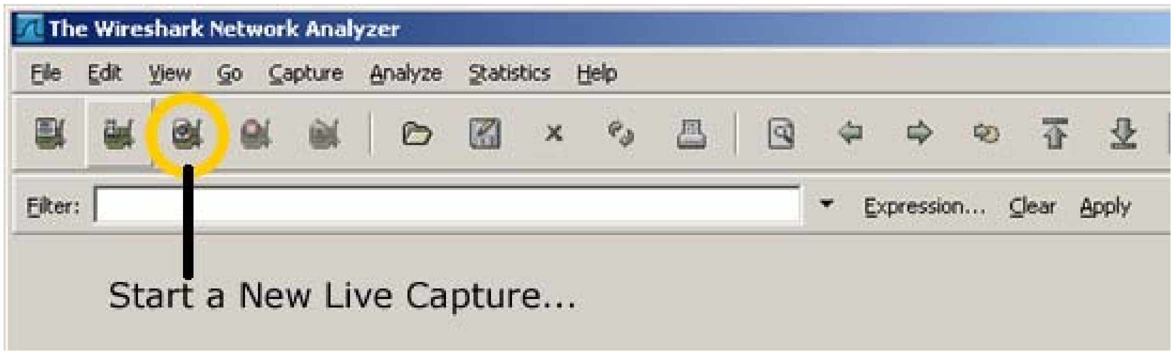


Description	IP	Packets	Packets/s			
Adapter for generic dialup and VPN capture	unknown	0	0	Start	Options	Details
Intel(R) PRO/100 VE Network Connection (Microsoft's Packet Scheduler)	192.168.1.103	8	0	Start	Options	Details

Step 3: Start a network capture

a. Scroll through the menus and view the toolbar on the Wireshark startup Interface.

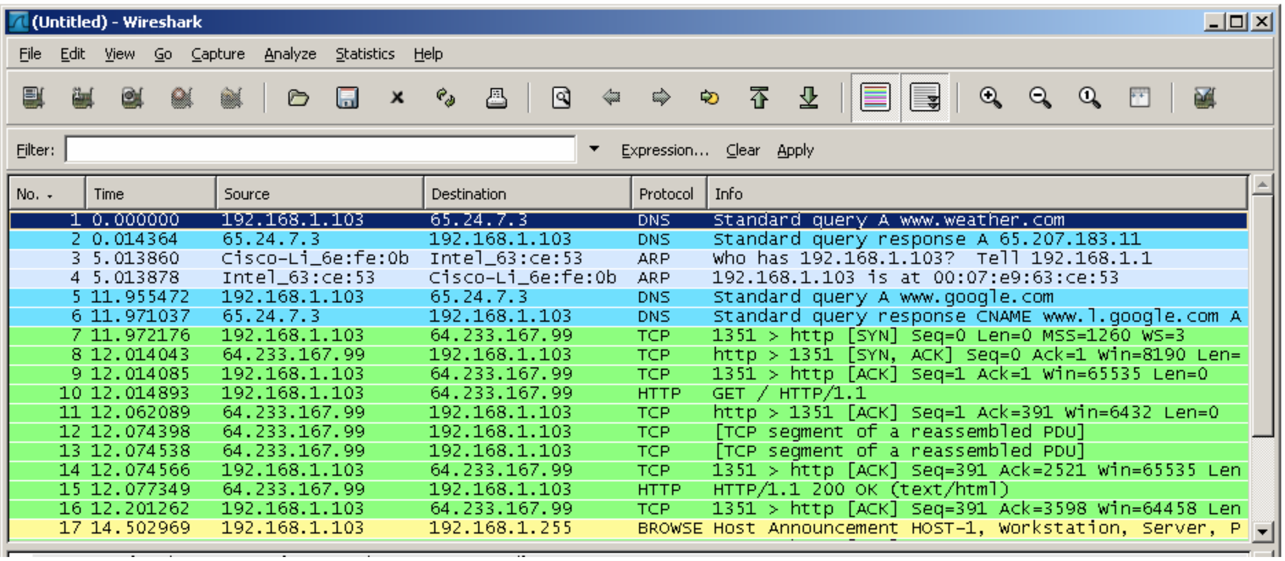
b. Click the **New Live Capture** button and observe the information gathered by Wireshark. Allow the capture to continue for a few minutes so that you can observe the different types of traffic on the network.



Start a New Live Capture...

Step 4: Analyze Web traffic information (optional)

a. If Internet connectivity is available, open a browser and go to www.google.com. Minimize the Google window and return to Wireshark. You should see captured traffic similar to that shown below. Locate the **Source**, **Destination**, and **Protocol** columns on the Wireshark display screen.


(Untitled) - Wireshark
File Edit View Go Capture Analyze Statistics Help
Filter:
Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Info
1	0.000000	192.168.1.103	65.24.7.3	DNS	Standard query A www.weather.com
2	0.014364	65.24.7.3	192.168.1.103	DNS	Standard query response A 65.207.183.11
3	5.013860	Cisco-Li_6e:fe:0b	Intel_63:ce:53	ARP	Who has 192.168.1.103? Tell 192.168.1.1
4	5.013878	Intel_63:ce:53	Cisco-Li_6e:fe:0b	ARP	192.168.1.103 is at 00:07:e9:63:ce:53
5	11.955472	192.168.1.103	65.24.7.3	DNS	Standard query A www.google.com
6	11.971037	65.24.7.3	192.168.1.103	DNS	Standard query response CNAME www.l.google.com A
7	11.972176	192.168.1.103	64.233.167.99	TCP	1351 > http [SYN] Seq=0 Len=0 MSS=1260 WS=3
8	12.014043	64.233.167.99	192.168.1.103	TCP	http > 1351 [SYN, ACK] Seq=0 Ack=1 Win=8190 Len=
9	12.014085	192.168.1.103	64.233.167.99	TCP	1351 > http [ACK] Seq=1 Ack=1 Win=65535 Len=0
10	12.014893	192.168.1.103	64.233.167.99	HTTP	GET / HTTP/1.1
11	12.062089	64.233.167.99	192.168.1.103	TCP	http > 1351 [ACK] Seq=1 Ack=391 Win=6432 Len=0
12	12.074398	64.233.167.99	192.168.1.103	TCP	[TCP segment of a reassembled PDU]
13	12.074538	64.233.167.99	192.168.1.103	TCP	[TCP segment of a reassembled PDU]
14	12.074566	192.168.1.103	64.233.167.99	TCP	1351 > http [ACK] Seq=391 Ack=2521 Win=65535 Len
15	12.077349	64.233.167.99	192.168.1.103	HTTP	HTTP/1.1 200 OK (text/html)
16	12.201262	192.168.1.103	64.233.167.99	TCP	1351 > http [ACK] Seq=391 Ack=3598 Win=64458 Len
17	14.502969	192.168.1.103	192.168.1.255	BROWSE	Host Announcement HOST-1, Workstation, Server, P

4) The connection to the Google server will start with a query to the DNS server to look up the server IP address. The destination server IP address will most likely start with 64.x.x.x. What is the source and destination of the first packet sent to the Google server?

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b. Open another browser window and go to the **ARIN Whois** database http://www.arin.net/whois/ or use another **whois** lookup tool and enter the IP address of the destination server. To what organization is this IP address assigned?

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c. What are the protocols used to establish the connection to the web server and deliver the web page to your local host? _________________________

d. What is the color used to highlight the traffic between your host and the Google web server?

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Step 5: Filter a network capture

a. Open a command prompt window by clicking **Start > All Programs > Run** and typing **cmd**. Alternatively, click **Start > All Programs > Accessories** and select **Command Prompt**.

b. Ping a host IP address on your local network and observe the Wireshark capture window. Scroll up and down the window in which the traffic is displayed. What types of protocols are in use?

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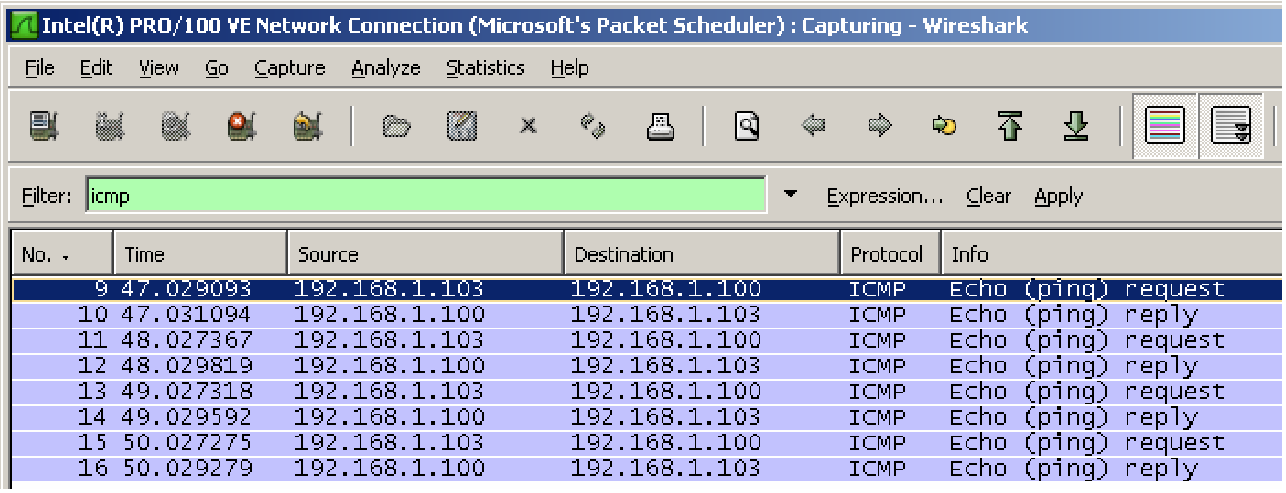
c. In the **Filter** text box, type **icmp** and click **Apply**. Internet Control Message Protocol (ICMP) is the protocol that **ping** uses to test network connectivity to another host.


Intel(R) PRO/100 VE Network Connection (Microsoft's Packet Scheduler) : Capturing - Wireshark
File
Edit
View
Go
Capture
Analyze
Statistics
Help
Expression...
Clear
Apply

Filter: icmp

No.	Time	Source	Destination	Protocol	Info
9	47.029093	192.168.1.103	192.168.1.100	ICMP	Echo (ping) request
10	47.031094	192.168.1.100	192.168.1.103	ICMP	Echo (ping) reply
11	48.027367	192.168.1.103	192.168.1.100	ICMP	Echo (ping) request
12	48.029819	192.168.1.100	192.168.1.103	ICMP	Echo (ping) reply
13	49.027318	192.168.1.103	192.168.1.100	ICMP	Echo (ping) request
14	49.029592	192.168.1.100	192.168.1.103	ICMP	Echo (ping) reply
15	50.027275	192.168.1.103	192.168.1.100	ICMP	Echo (ping) request
16	50.029279	192.168.1.100	192.168.1.103	ICMP	Echo (ping) reply

d. When icmp is typed in the **Filter** text box, what kind of traffic is was displayed?

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e. Click the **Filter: Expression** button on the Wireshark window. Scroll down the list and view the filter possibilities there. Are TCP, HTTP, ARP and other protocols listed? ____________________

Step 6: Reflection

a. There are hundreds of filters listed in the Filter: Expression option. It may be possible that, in a large network, there would be enormous amounts and many different types of traffic. Which three filters in the long list do you think might be most useful to a network administrator?

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b. Is Wireshark a tool for out-of-band or in-band network monitoring? ___________ Explain your answer.

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