# Experiment 10

**Learning Objective**: Use of tools like Wireshark and Ettercap and it will help you to capture network packets and display them at a granular level and analyze it.

**Tools:** Wireshark, and Ettercap.

**Theory:**

**What Is Wireshark?**

Wireshark is a network protocol analyzer, or an application that captures packets from a network connection, such as from your computer to your home office or the internet. Packet is the name given to a discrete unit of data in a typical Ethernet network.

Wireshark is the most often-used packet sniffer in the world. Like any other packet sniffer, Wireshark does three things:

**Packet Capture**: Wireshark listens to a network connection in real time and then grabs entire streams of traffic – quite possibly tens of thousands of packets at a time.

**Filtering**: Wireshark is capable of slicing and dicing all of this random live data using filters. By applying a filter, you can obtain just the information you need to see.

**Visualization**: Wireshark, like any good packet sniffer, allows you to dive right into the very middle of a network packet. It also allows you to visualize entire conversations and network streams.

**What Is Wireshark Used For?**

Wireshark has many uses, including troubleshooting networks that have performance issues. Cybersecurity professionals often use Wireshark to trace connections, view the contents of suspect network transactions and identify bursts of network traffic. It's a major part of any IT pro's toolkit – and hopefully, the IT pro has the knowledge to use it.

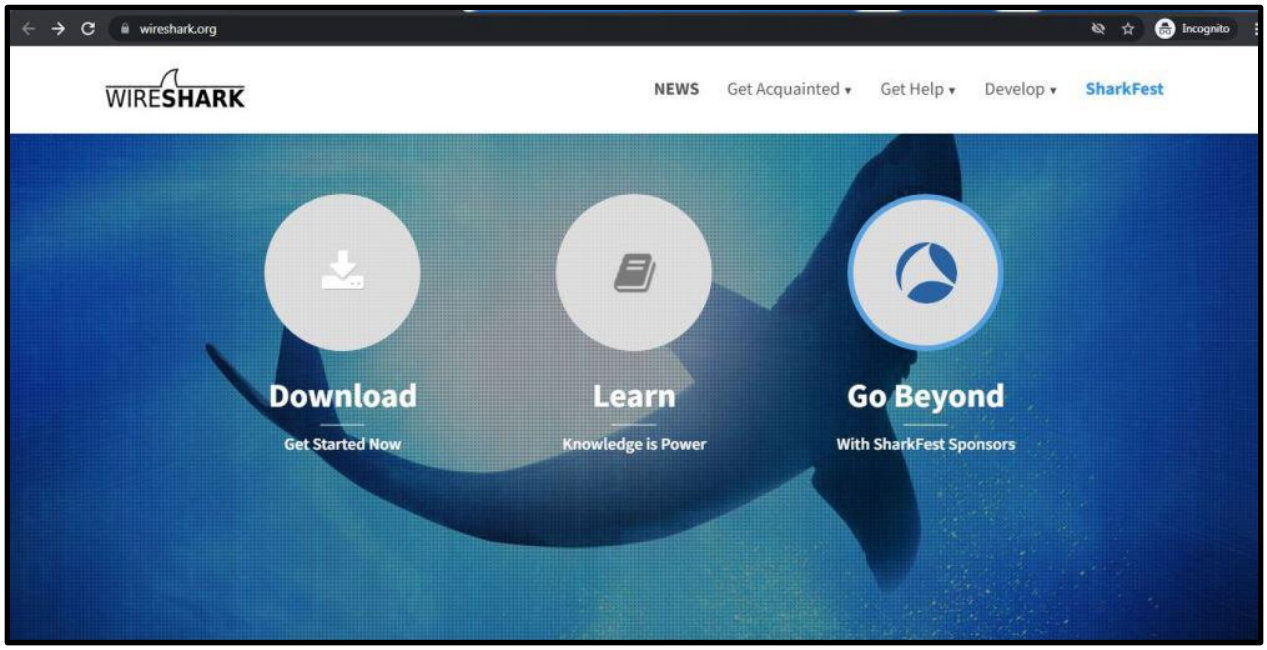
**Wireshark History.**

Wireshark is software that is widely used in the analysis of data packets in a network. Wireshark is completely free and open source. This packet analyzer is used for a variety of purposes like troubleshooting networks, understanding communication between two systems, developing new protocols, etc. The original name of Wireshark was Ethereal which was changed in 2006 due to some company's copyright issues. This software is written in C and C++, and its initial release was in the year 1998. Its latest release is 3.6.0 which got released on 22 November 2021. Wireshark is a cross-platform software, it can be run on Linux, windows, mac, and any other operating system.

**Learning Object 01: Installing Wireshark and Sniffing HTTP request.**

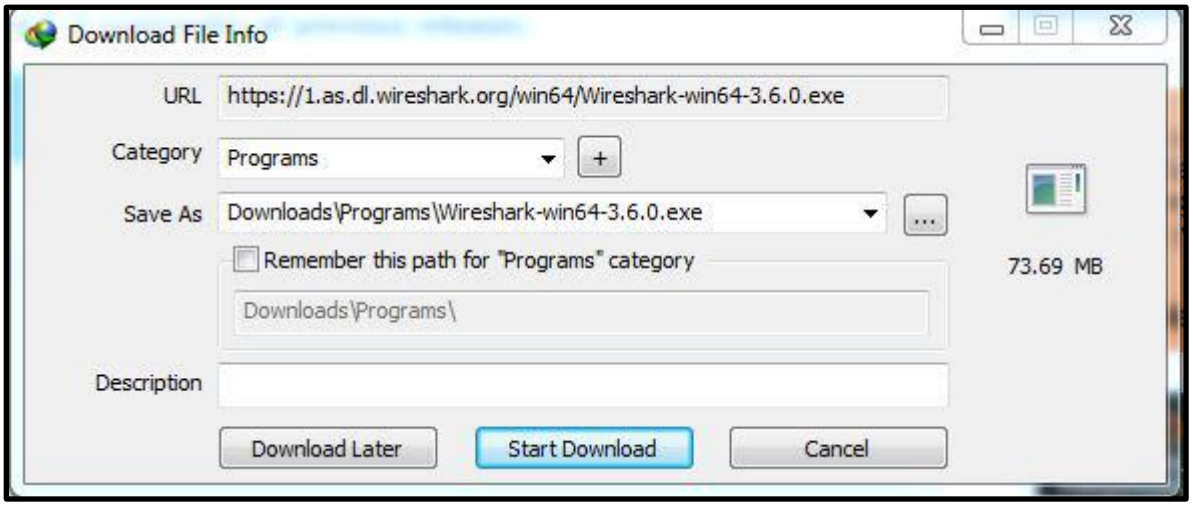
**Installing Wireshark on Windows:**

**Step 1:** Visit the official Wireshark website: - https://www.wireshark.org/



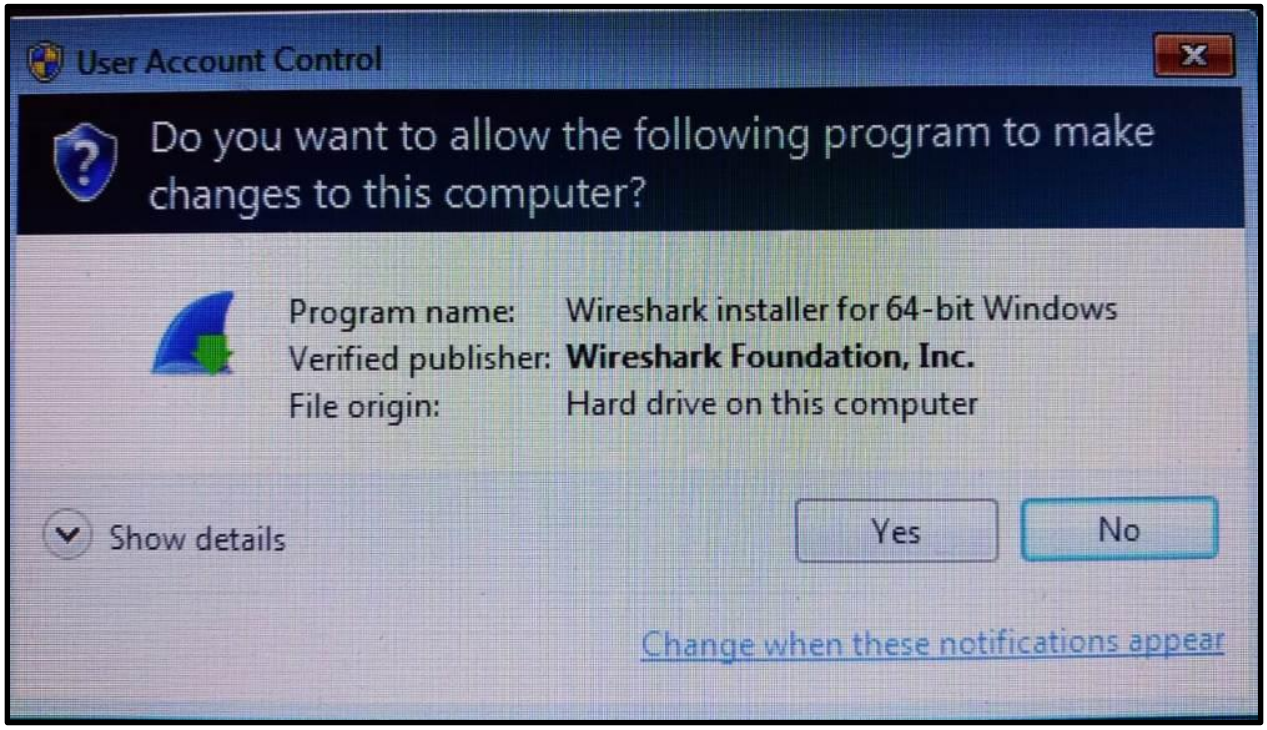

**Step 2:** Click on **Download**, a new webpage will open with different installers of Wireshark.

**Step 3:** Downloading of the executable file will start shortly. It is a small 73.69 MB file that will take some time.

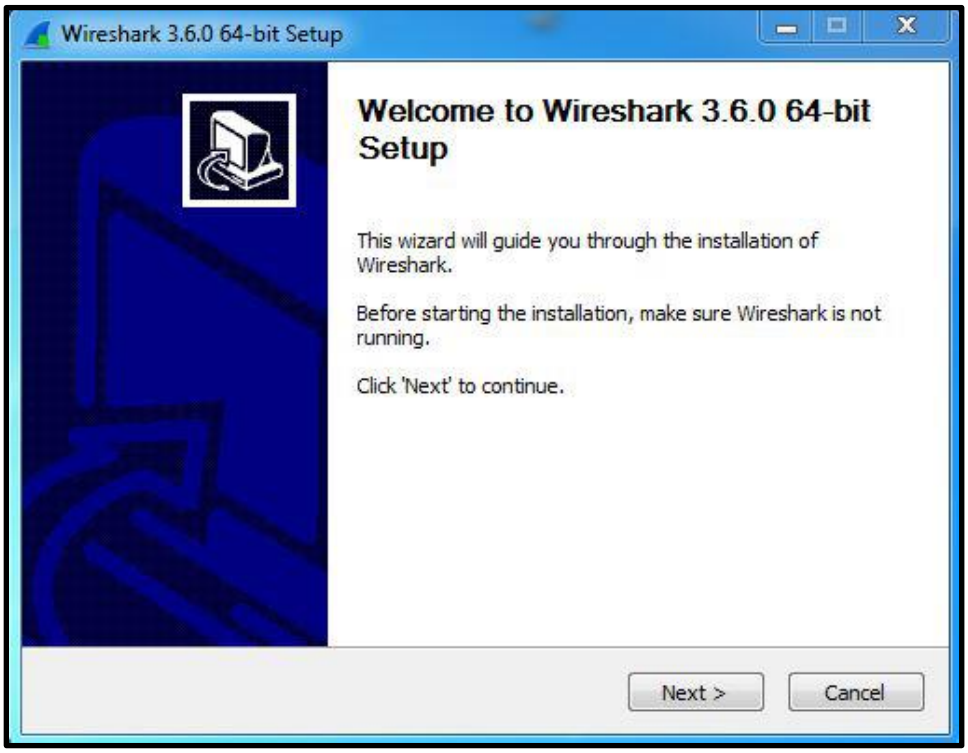



**Step 4:** Now check for the executable file in downloads in your system and run it.

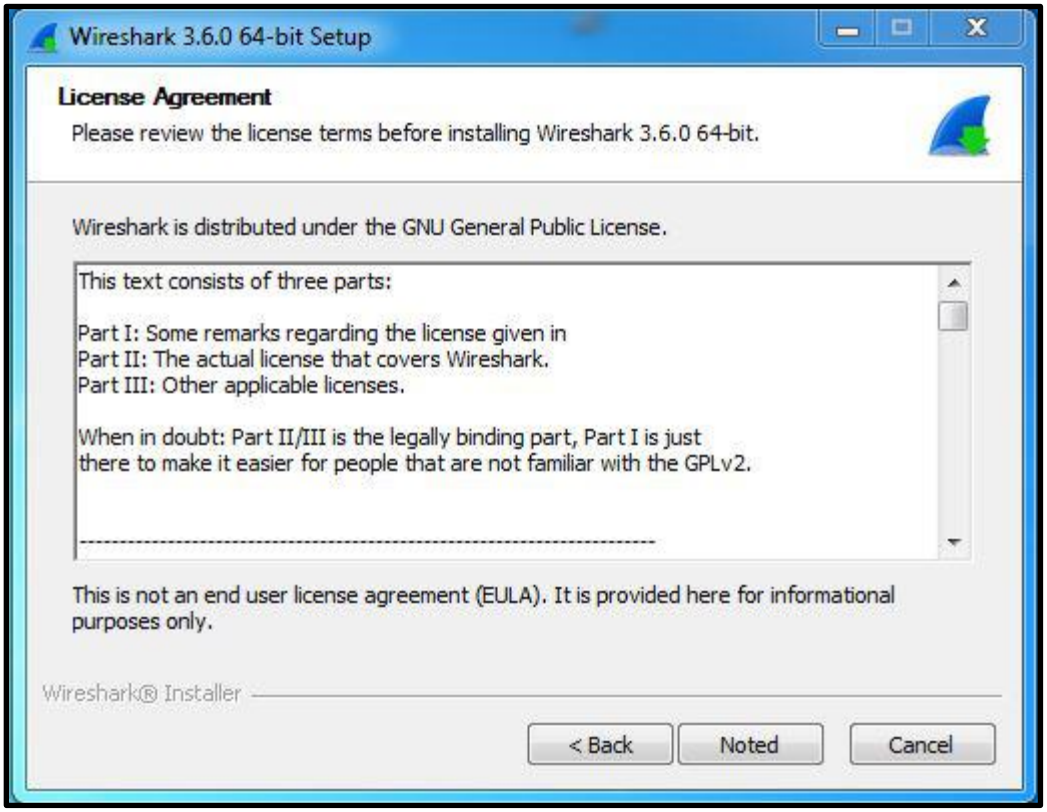
**Step 5:** It will prompt confirmation to make changes to your system. Click on **Yes**.



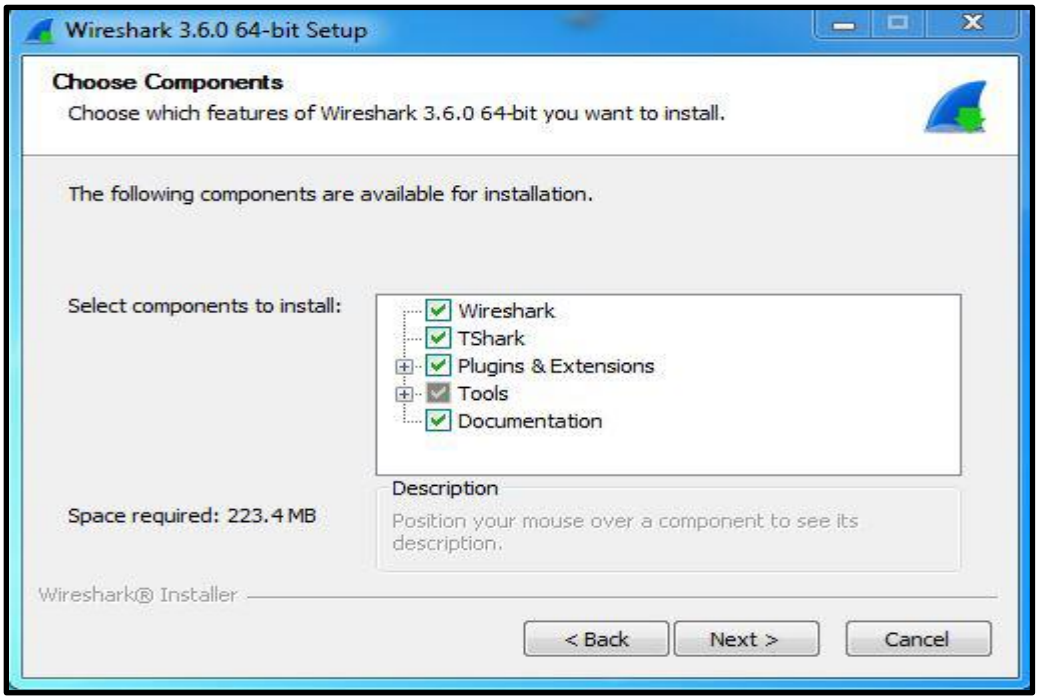

**Step 6:** Setup screen will appear, click on **Next.**



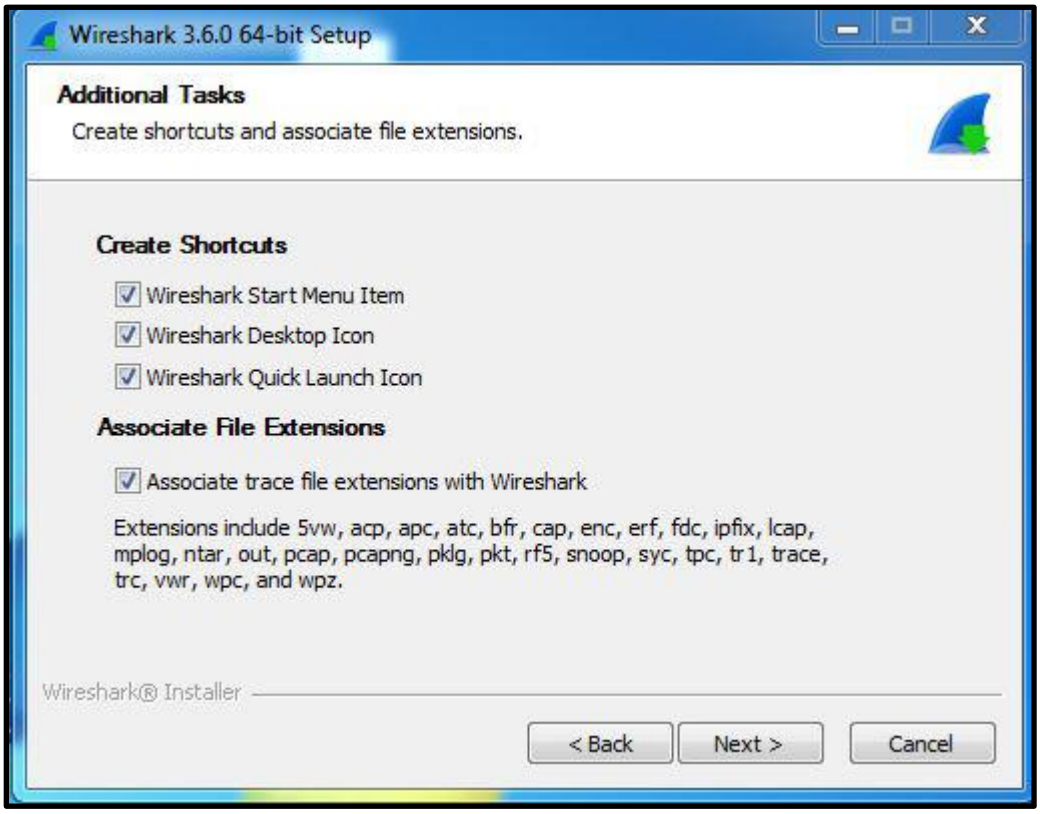
**Step 7:** The next screen will be of License Agreement, click on **Noted.**



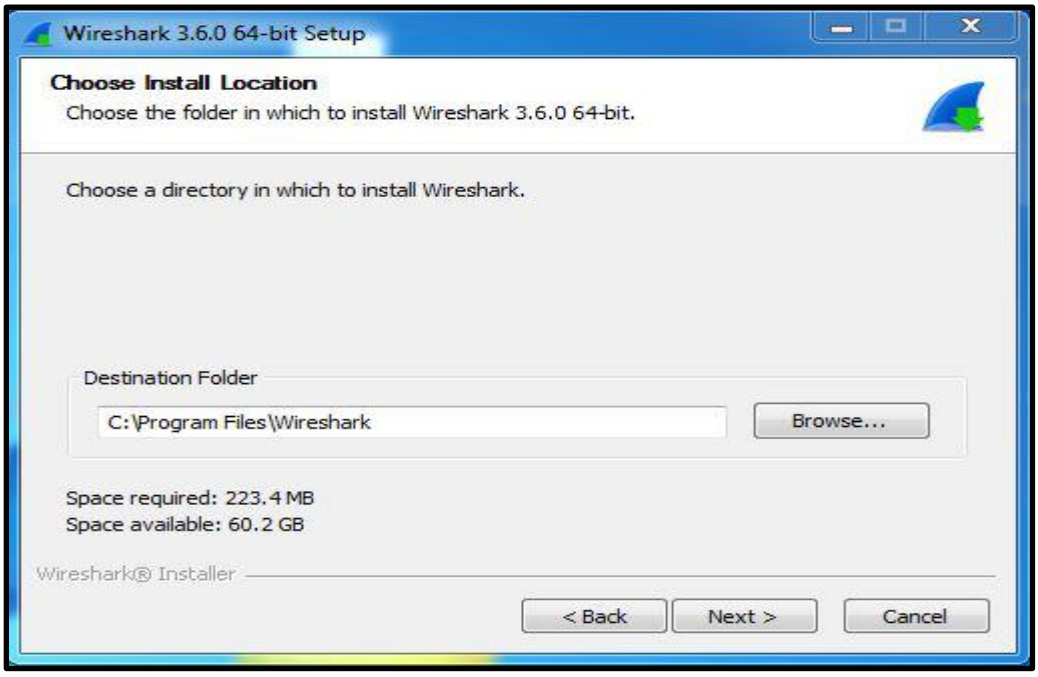

**Step 8:** This screen is for choosing components, all components are already marked so don't change anything just click on the **Next button**.



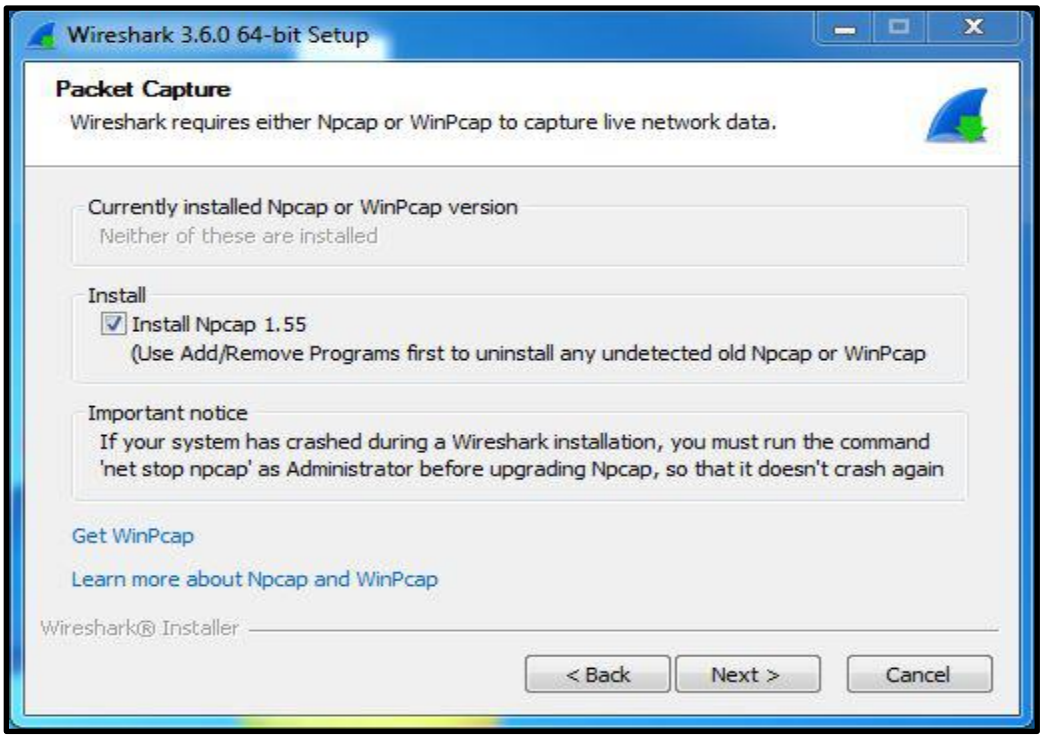
**Step 9:** This screen is of choosing shortcuts like start menu or desktop icon along with file extensions which can be intercepted by Wireshark, tick all boxes, and click on **Next button.**



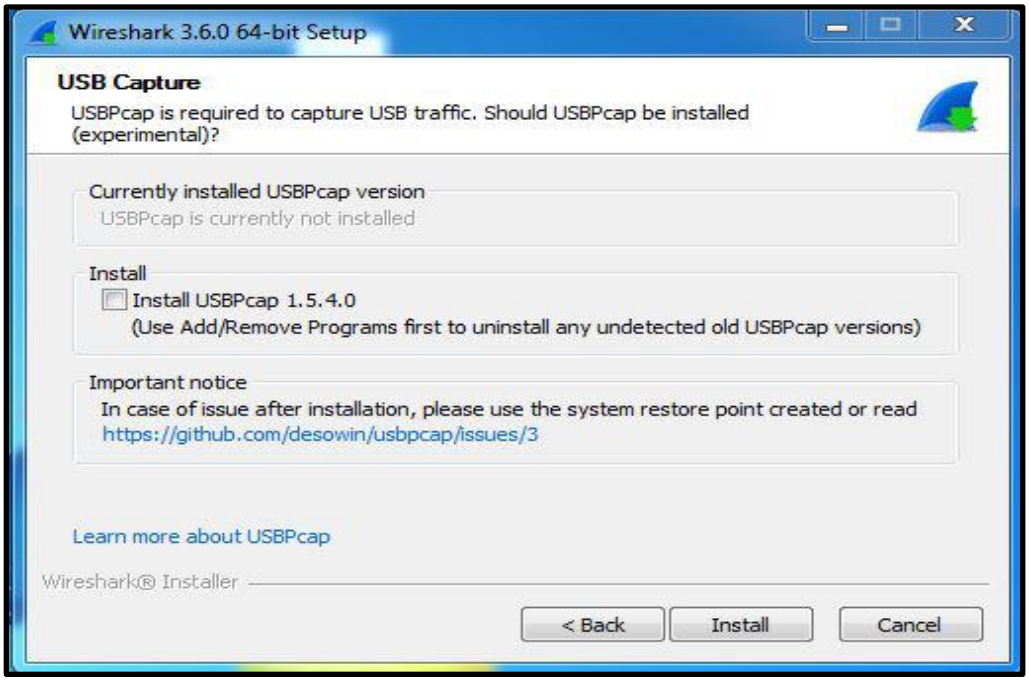

**Step 10:** The next screen will be of installing location so choose the drive which will have sufficient memory space for installation. It needed only a memory space of 223.4 MB.



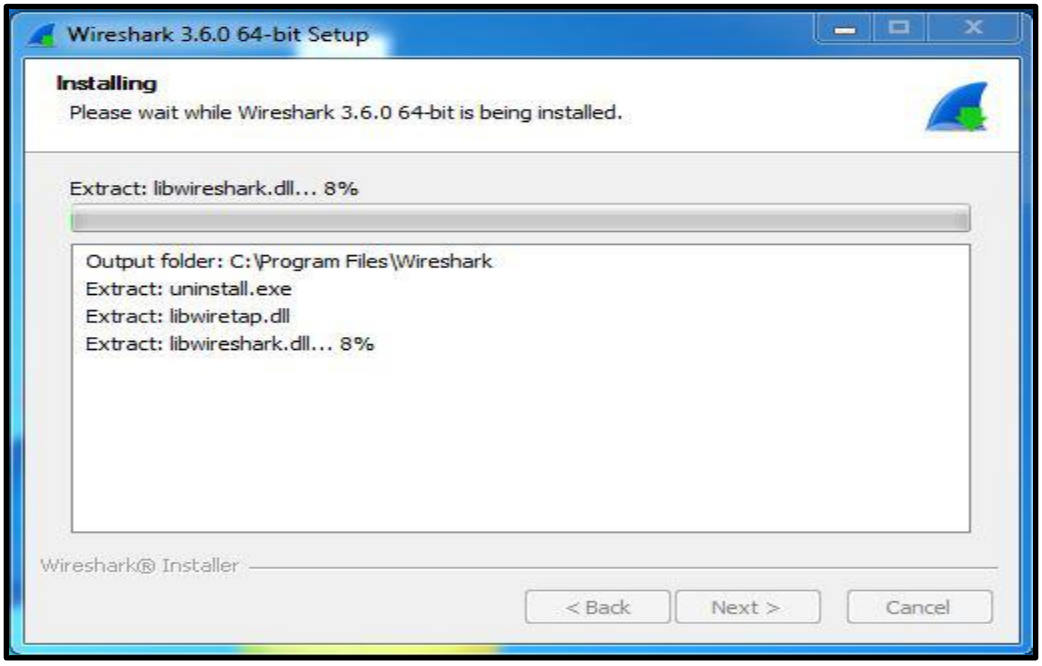
**Step 11:** Next screen has an option to install Npcap which is used with Wireshark to capture packets pcap means packet capture, so the install option is already checked don't change anything and click the next button.



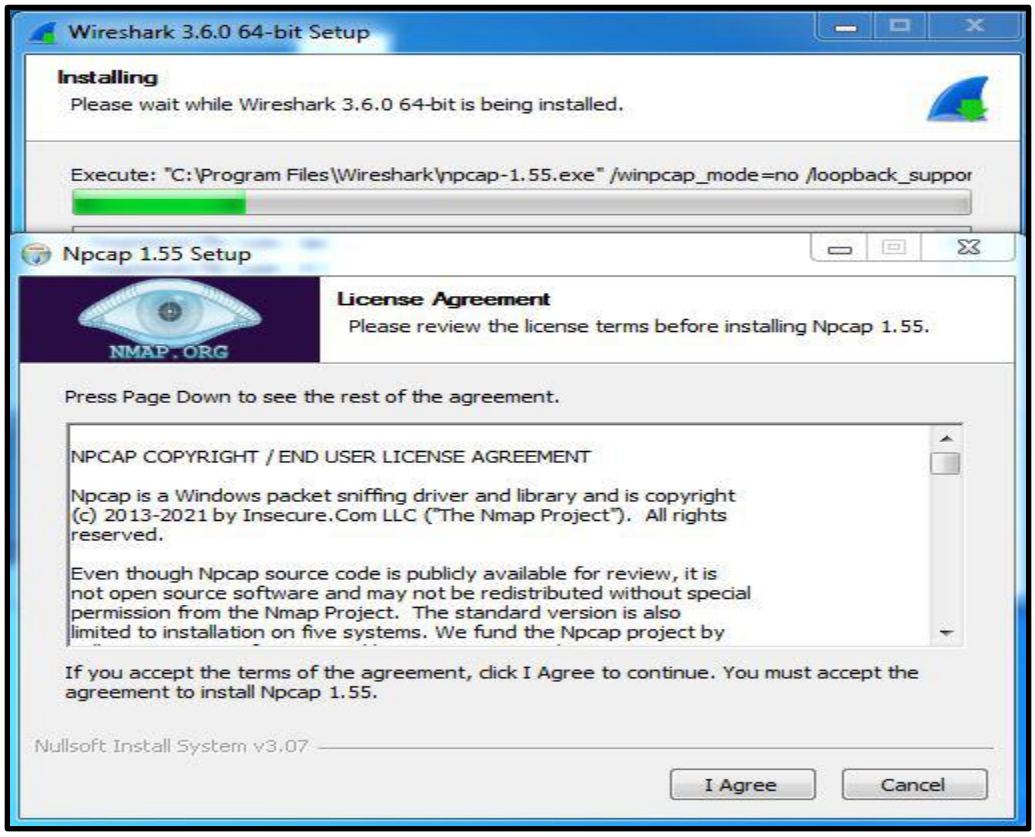

**Step 12:** Next screen is about USB network capturing so it is one's choice to use it or not, click on **Install.**



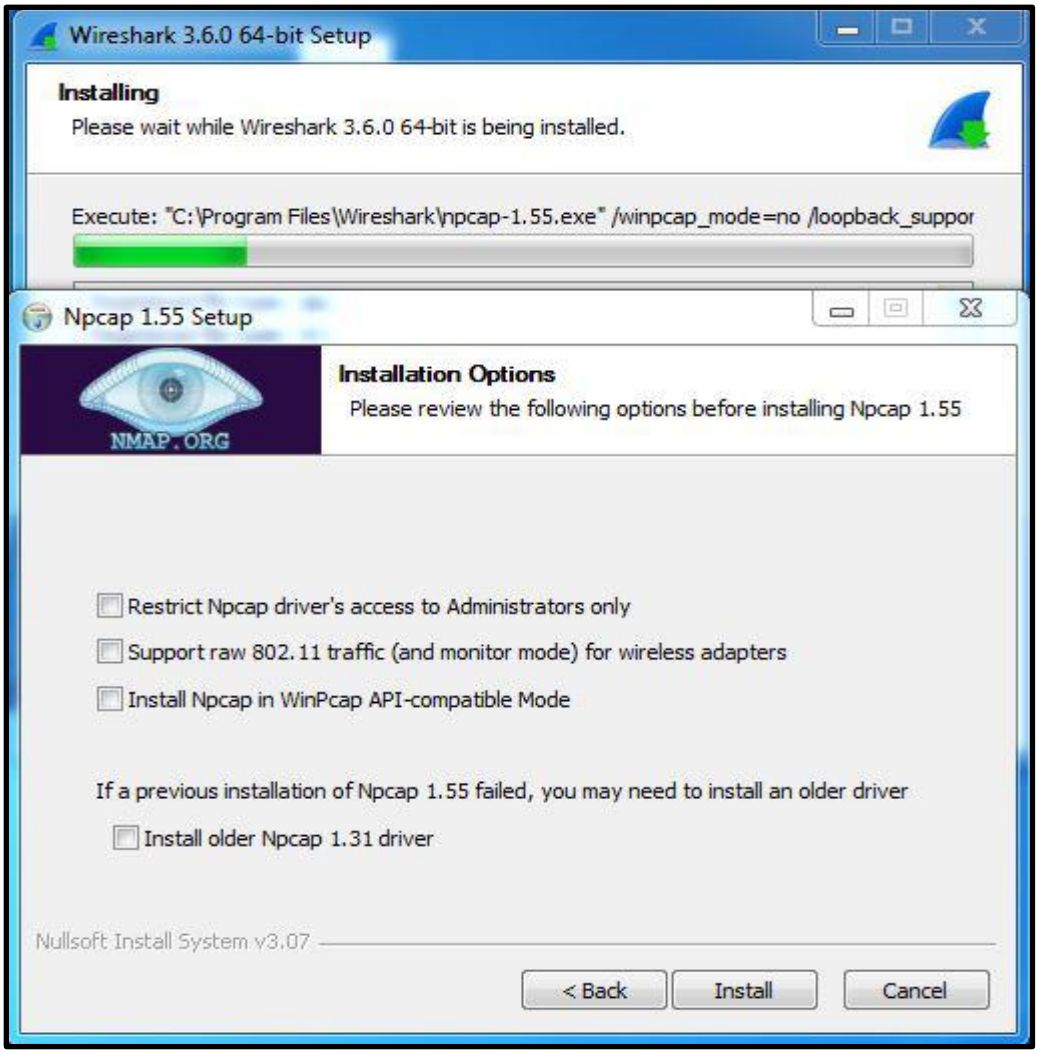
**Step 13:** After this, installation process will start.



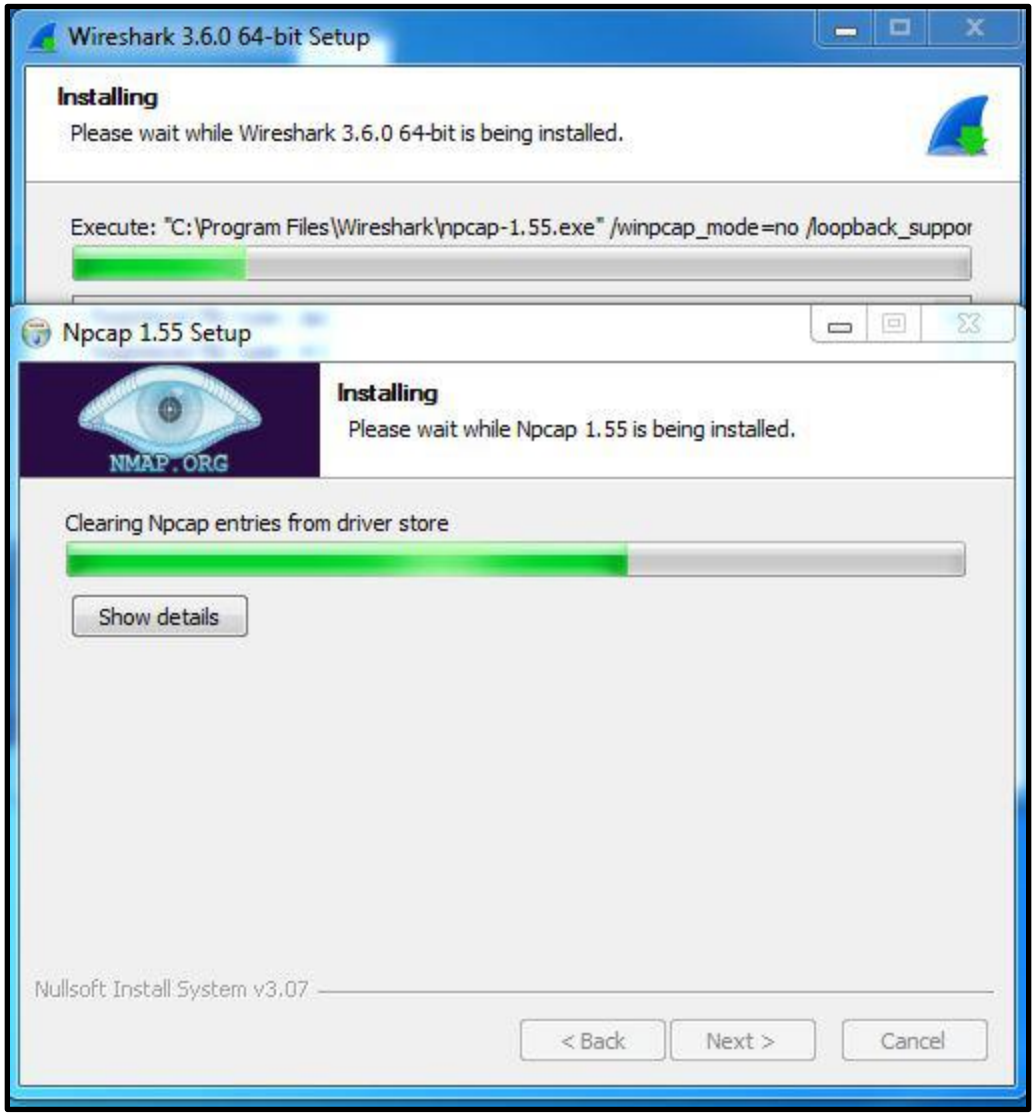

**Step 14:** This installation will prompt for Npcap installation as already checked so the license agreement of Npcap will appear to click on the **I Agree button.**



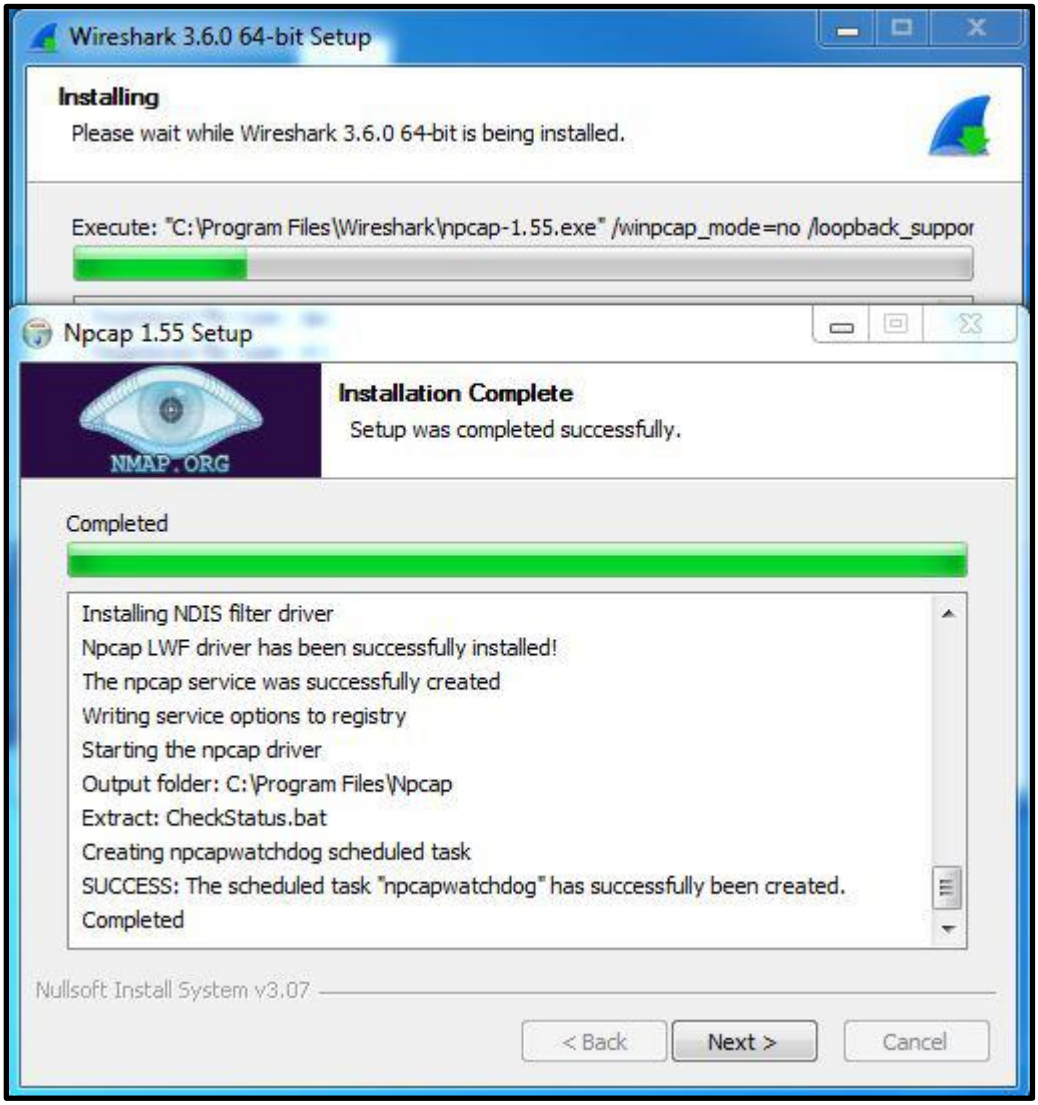
**Step 15:** Next screen is about different installing options of npcap, don't do anything click on Install.



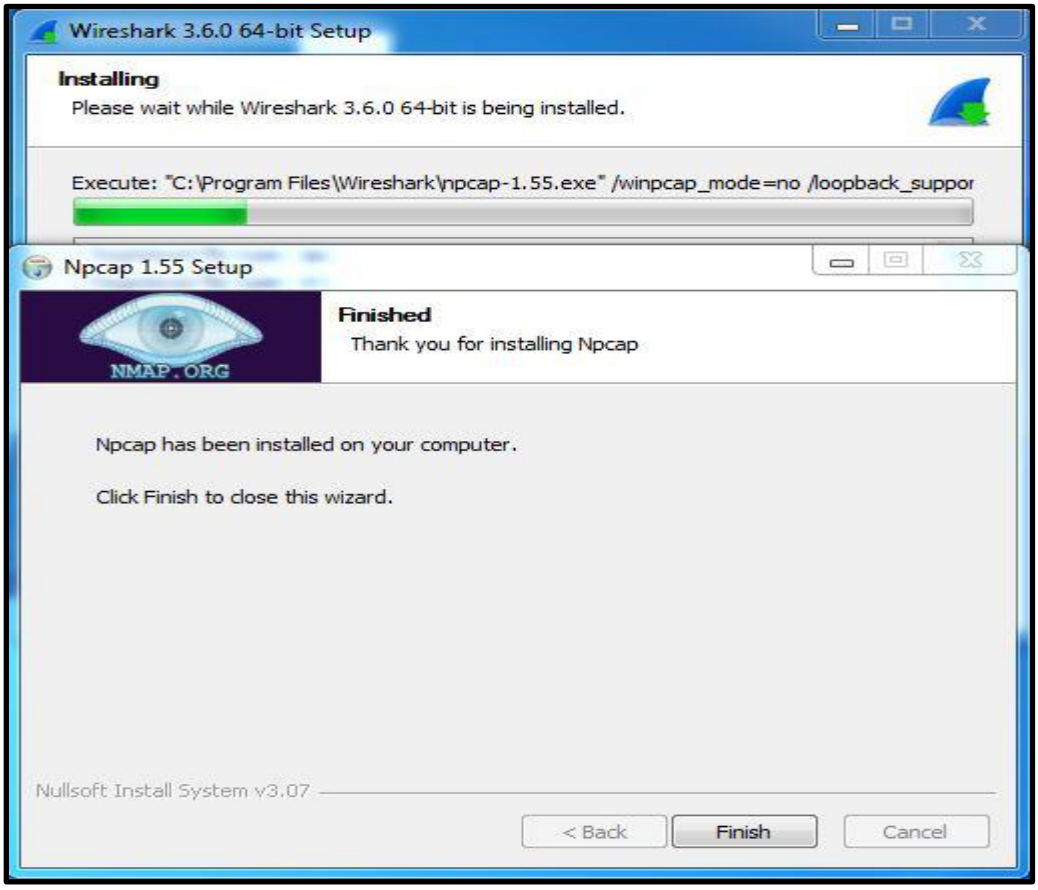
**Step 16:** After this, installation process will start which will take only a minute.



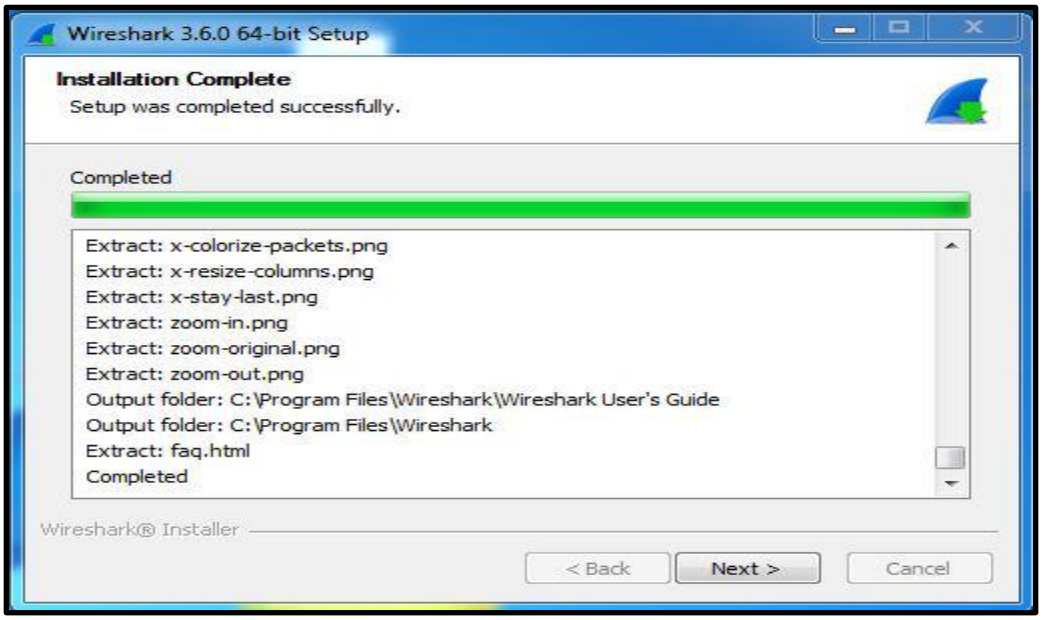
**Step 17:** After this, the installation process will be completed. Please click on the "**Next**" button.



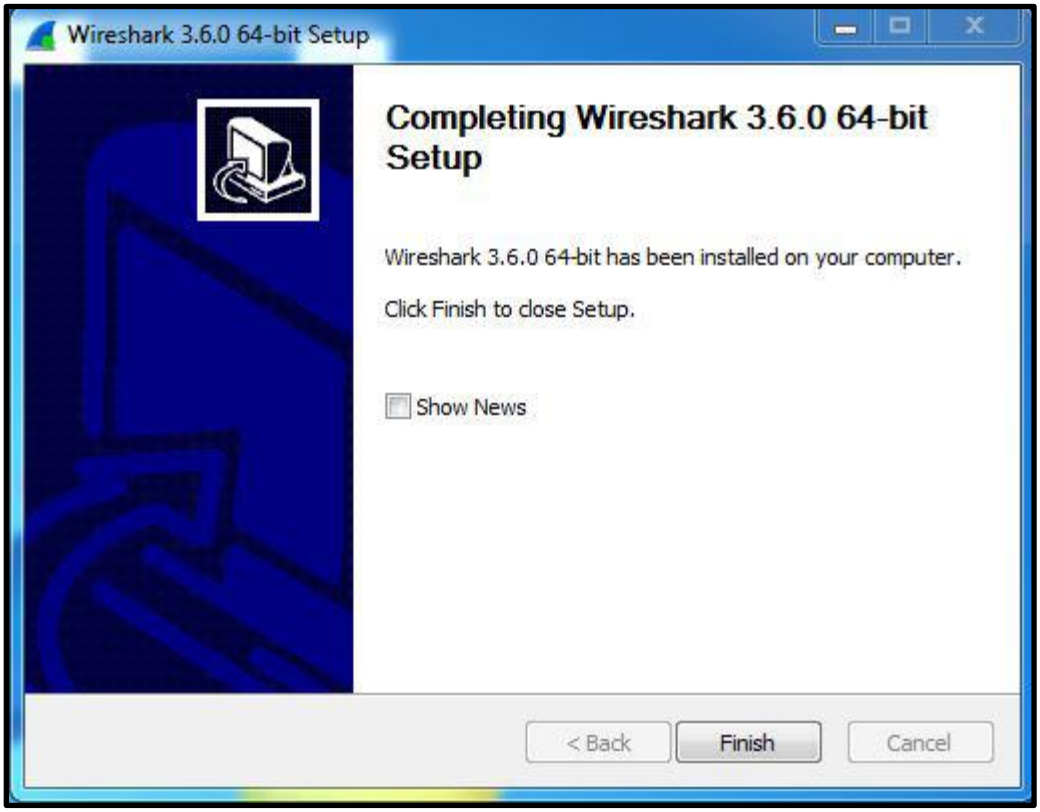
**Step 18:** Click on **Finish** after the installation process is completed.




**Step 19:** After this, the installation process of Wireshark will be completed. Please click on the "**Next**" button.

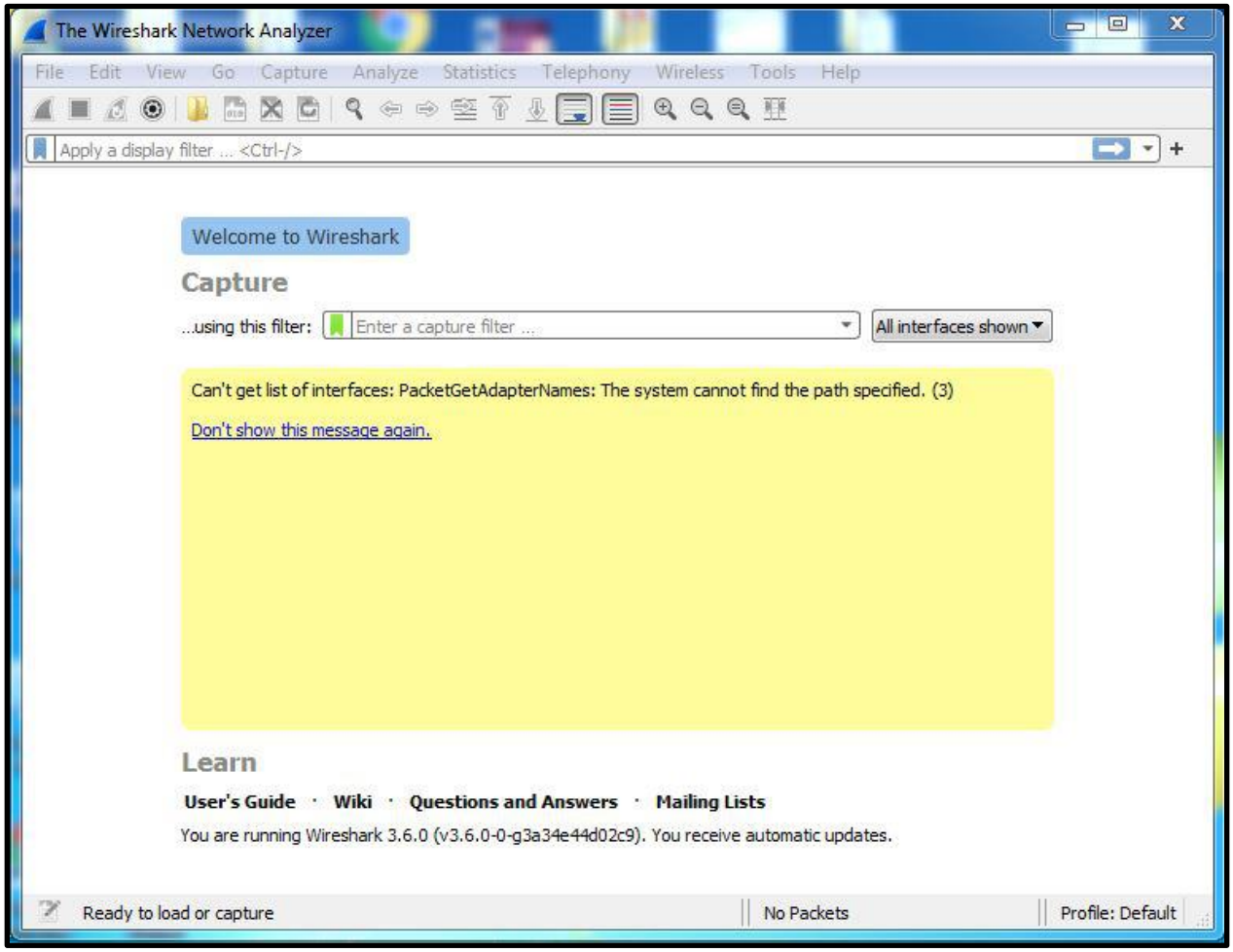


**Step 20:** Click on **Finish** after the installation process of Wireshark is completed.




Wireshark is successfully installed on the system and an icon is created on the desktop as shown below:

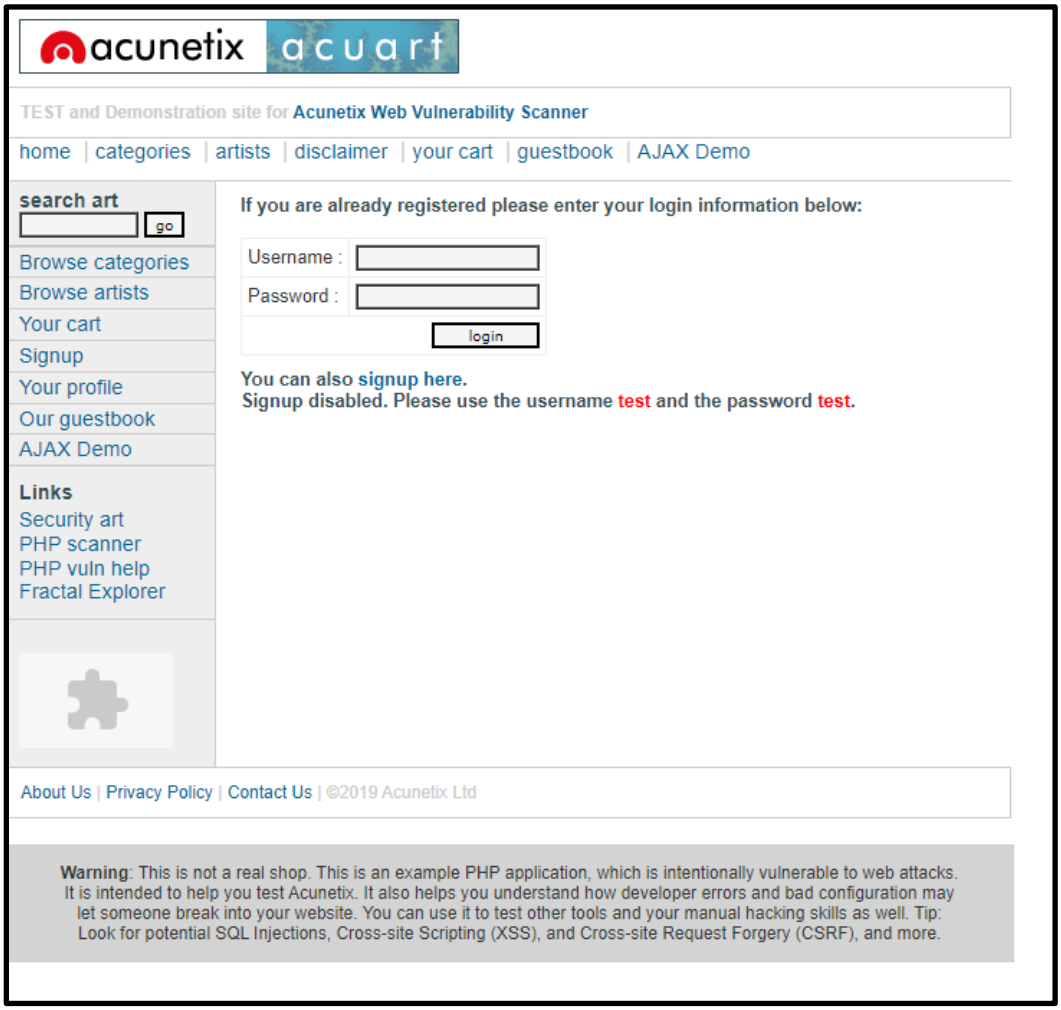
Now **run** the software and see the interface.



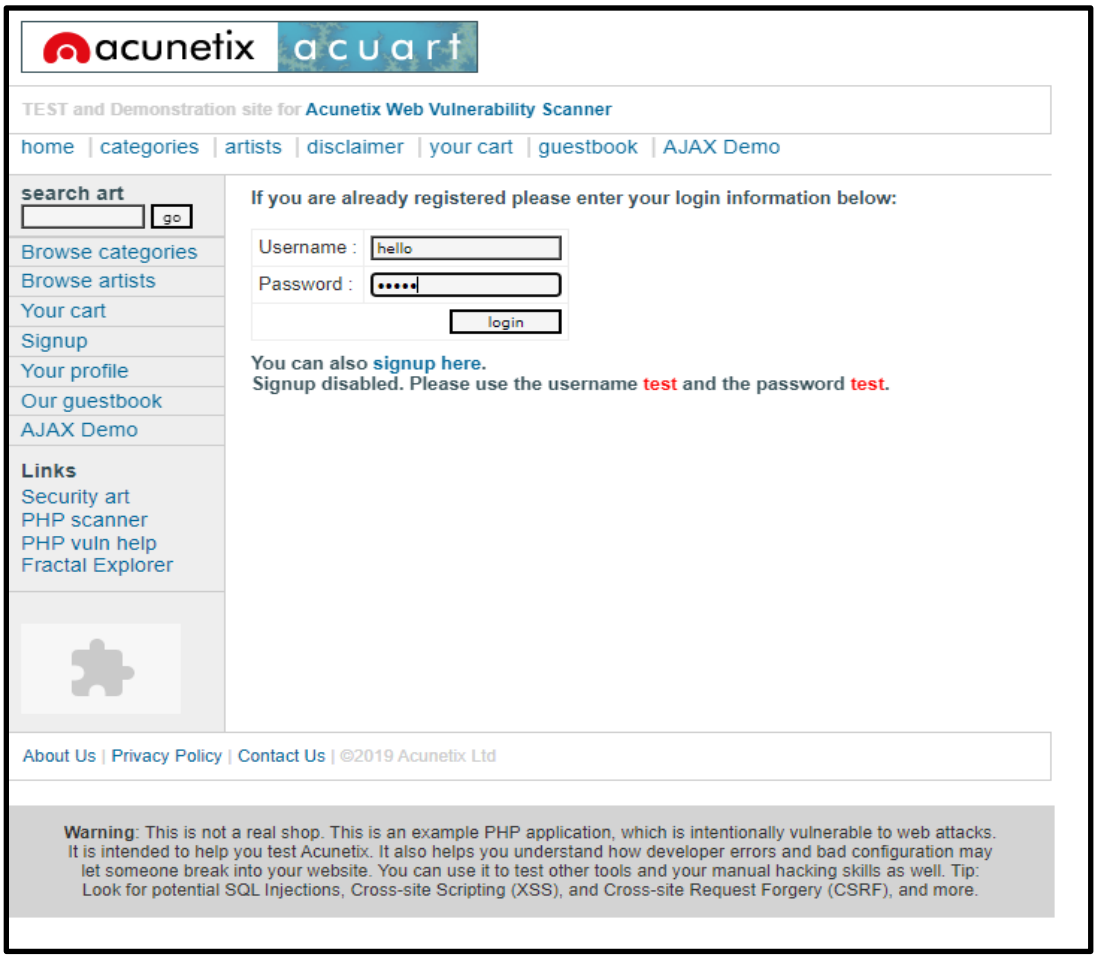

At this point, you have successfully installed Wireshark on your windows system.

## Sniffing HTTP Traffic

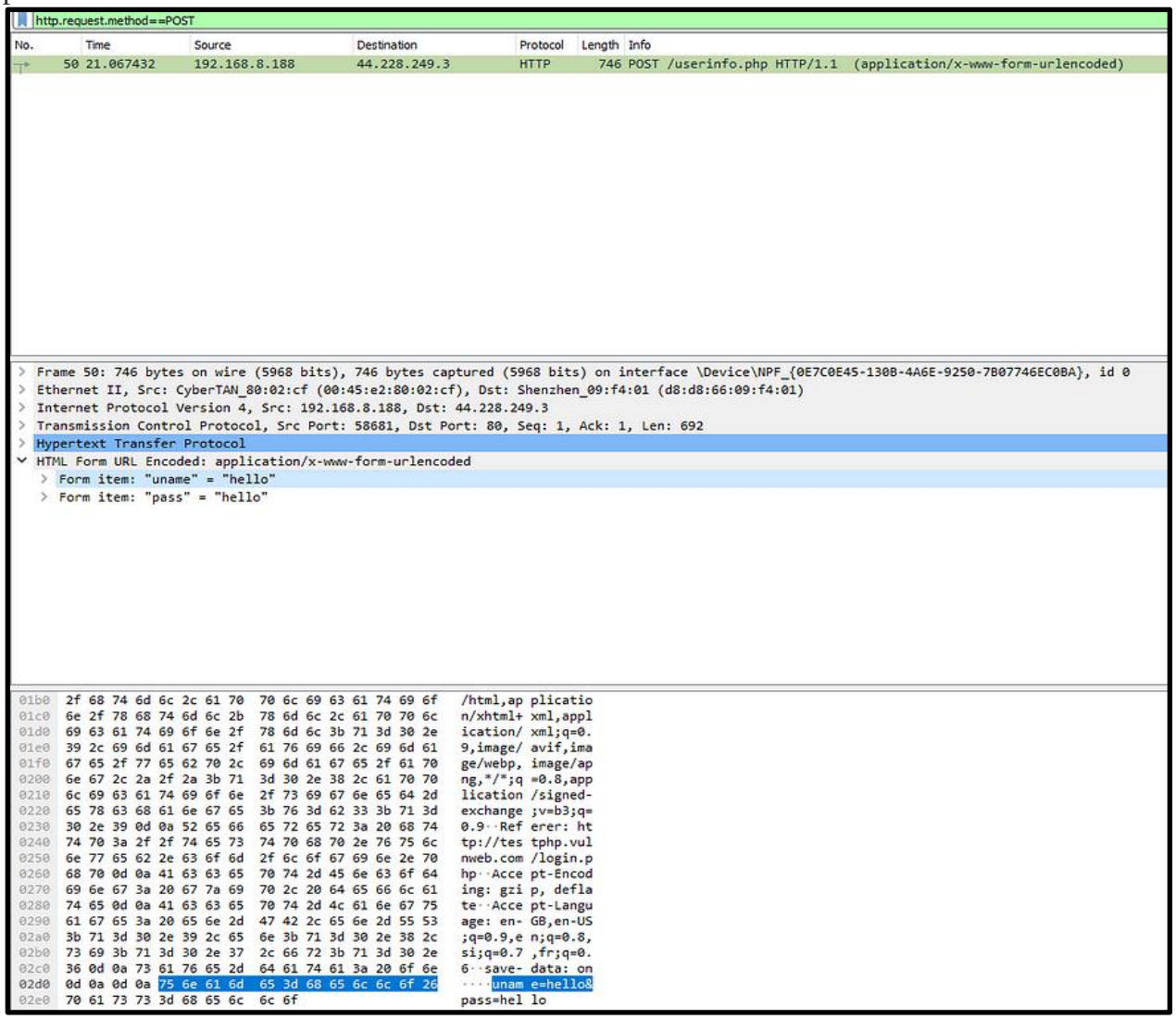
To test whether the sniffing works open the web browser and search for a random HTTP login website. For this demo, I have chosen http://testphp.vulnweb.com/login.php website to test.



Next, go to the test website and enter some login info and click on login button.



After submitting the login info, it will be captured by the Attacker through the Wireshark application. Under **HTML Form URL Encoded** you could observe the login username and password.



**Learning Object 02: Sniffing HTTP request using Ettercap.**

**Sniff Login Credentials using Ettercap.**

**What is Ettercap?**

Ettercap is an open-source tool that can be used to support man-in-the-middle attacks on networks. Ettercap can capture packets and then write them back onto the network. Ettercap enables the diversion and alteration of data virtually in real-time. Ettercap can also be used for the protocol analysis necessary to analyze network traffic.

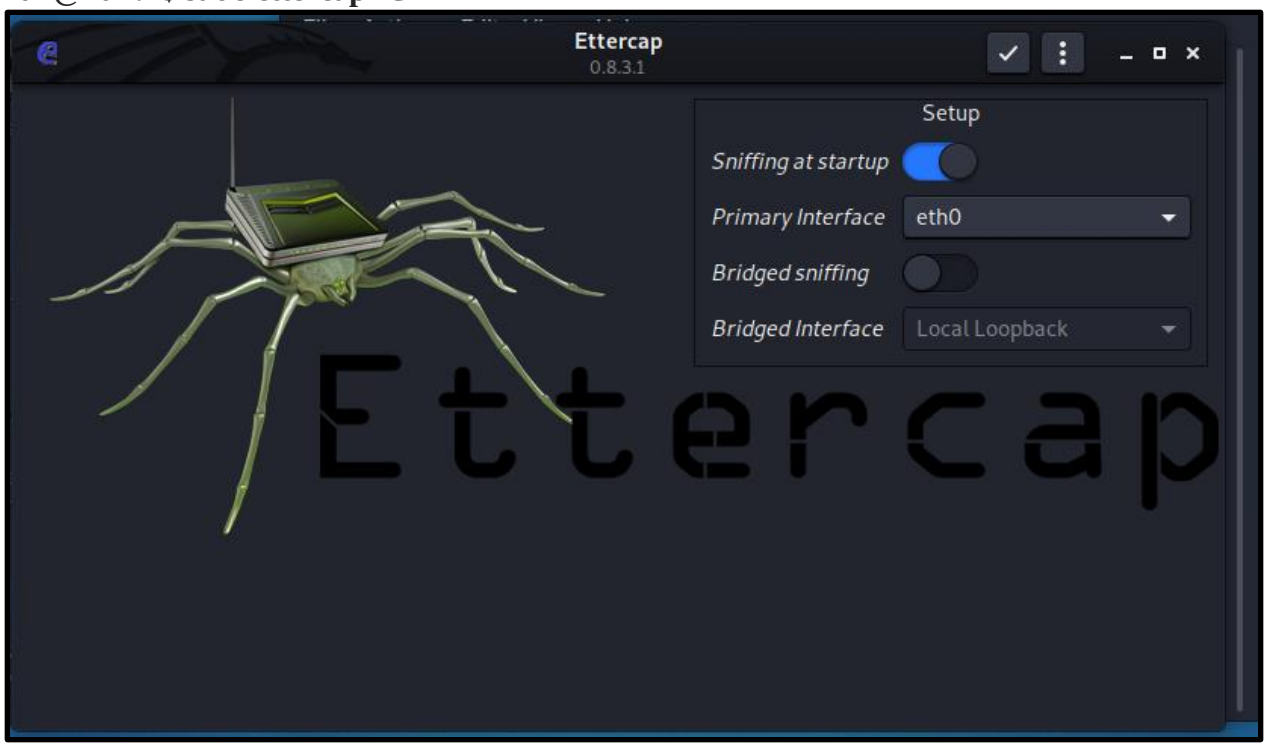
Ettercap has a nice Graphical User Interface (GUI) as well as a command line interface. While Ettercap can support network traffic analysis, the most frequent use of Ettercap is to set up man-in-the-middle attacks using ARP poisoning. Penetration testing you can emulate includes man-in-the-middle attacks, credentials capture, DNS spoofing, and DoS attack.

Ettercap also supports both active and passive deep analysis of many protocols and includes many features for network and host analysis. Many "sniffing" modes are available – this includes MAC based, IP based, ARP based (full duplex), and Public ARP based (half duplex). Ettercap can also detect a switched local area network (LAN) and use the OS fingerprints to determine the total geometry of the LAN.

**Perform the attack.**

**Step 01:** Start your Kali Linux and open the Terminal in your Kali Linux. Type the following Command to open Ettercap GUI as shown below.

**kali@kali:~$ sudo ettercap -G**

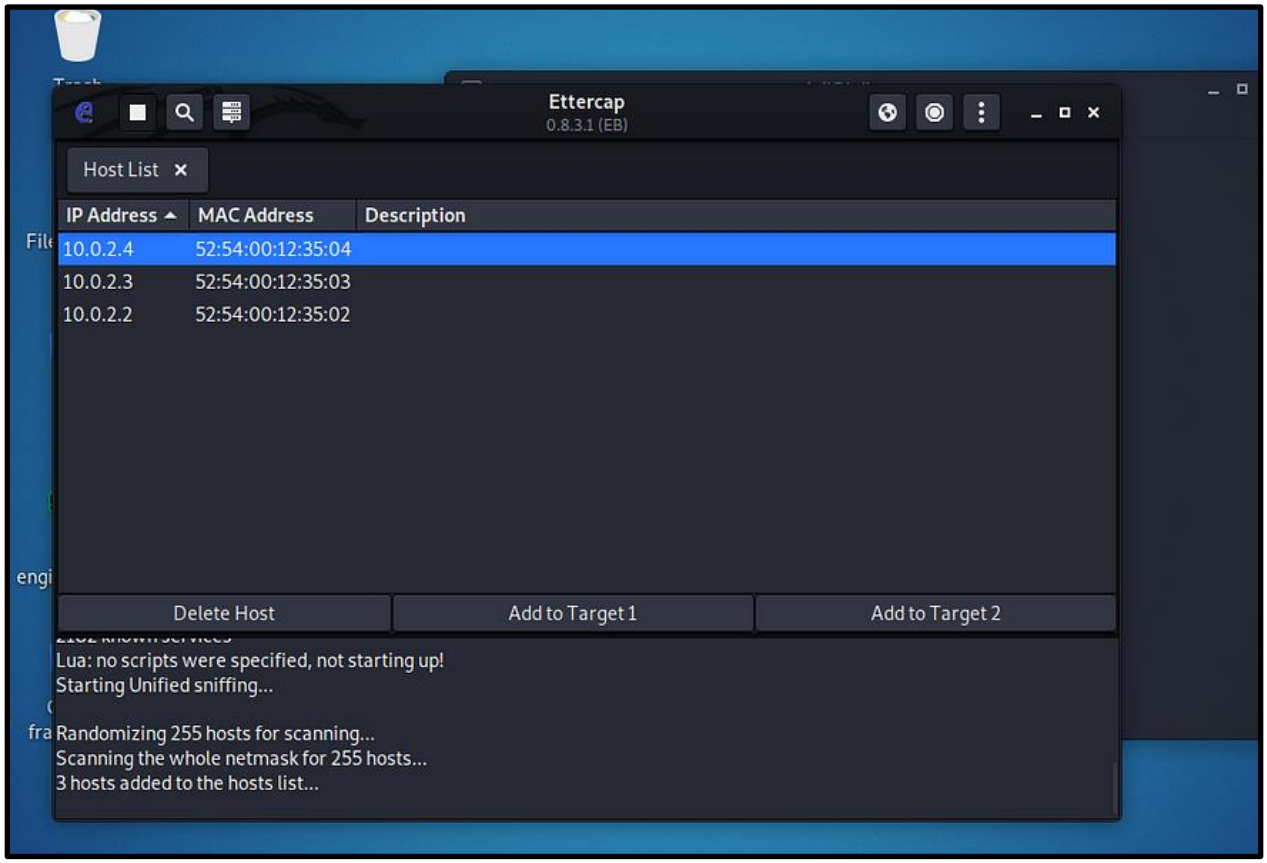


**Step 02:** Then Click on the **Tick icon** on the Top Bar and select Host.


**Step 03:** To find the hosts on the network. Click on the three dots and then **Host** you will see a menu that includes "**Scan for Hosts**". Click on it and Ettercap will begin scanning the network for hosts.

Now, using that same "**Hosts**" tab, click on "**Hosts List**". This will display all the hosts that Ettercap has discovered on your network.

So, you will see IP addresses and find your victims IP




**Step 04:** Go to the menu above and click on MITM tab and the drop-down menu will have a selection called.

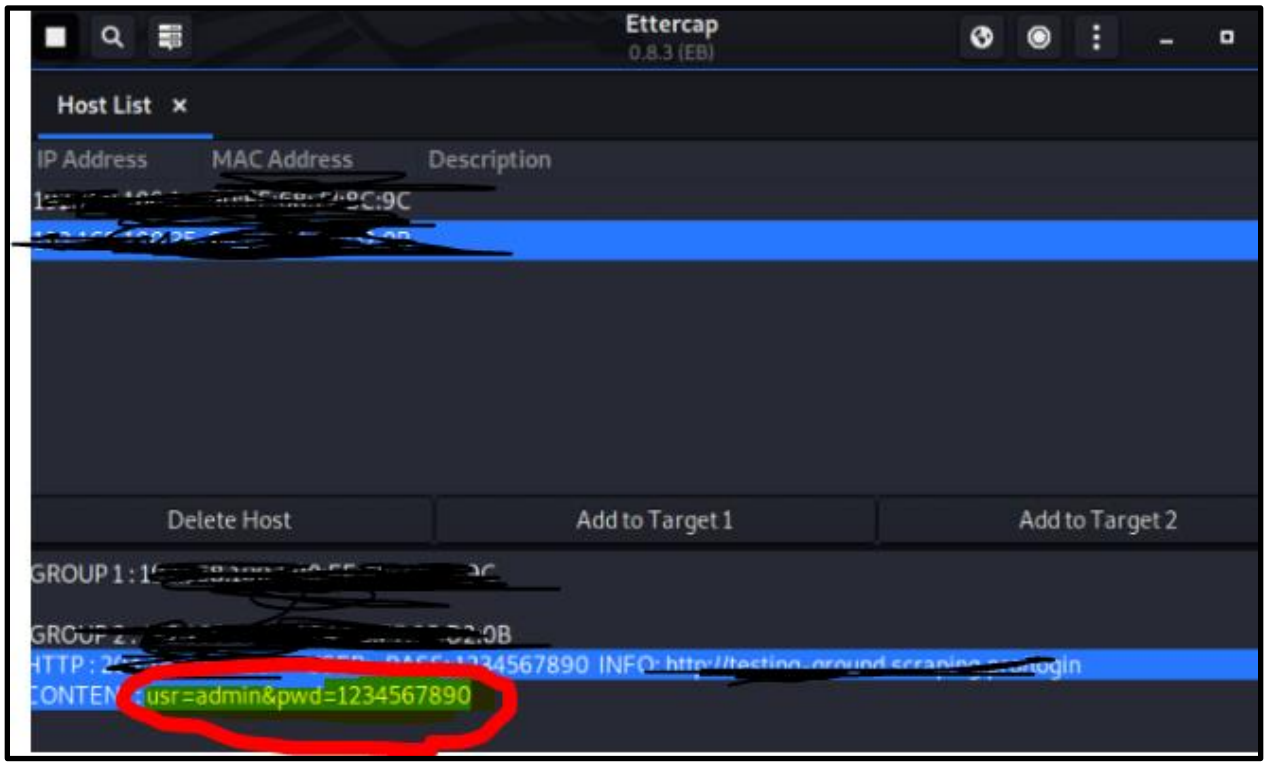
"**ARP Poisoning**"

**Step 05:** Select it and it will open a pop window like below. Select

"**Sniff remote connections**".

And Press **OK**

Ettercap will begin ARP poisoning and you will see Ettercap respond in its main windows with the message below.




Now, we have successfully placed ourselves between the two targets systems and all their traffic must flow through us. This is where we can now.

**1.Delete**

**2.Manipulate**

**3.Impersonate**

**4.View all their traffic**

We have Successfully attempted the Sniffing & MITM attack using the Ettercap Tool.

**Learning Outcomes:** The student should have the ability to:

LO1: Perform Sniffing using Wireshark tool.

LO2: Perform Sniffing using Ettercap tool.

**Course Outcomes:** Upon completion of the course students will be able to understand the concept of Sniffing and ARP poisoning.

**Conclusion:** Through this experiment we learned the concept of sniffing and we used the Wireshark and Ettercap to sniff HTTP request.

For Faculty Use:

| **Correction Parameters** | **Formative Assessment [40%]** | **Timely completion of Practical [40%]** | **Attendance / Learning Attitude [20%]** | |
|---|---|---|---|---|
| **Marks Obtained** | | | | |