# **WIRESHARK**

Wireshark is a popular open-source network protocol analyzer used to capture and analyze network traffic in real time. It allows users to inspect the data flowing through their networks, troubleshoot network issues, and understand protocol behavior in-depth. Here's a breakdown of some key features and uses of Wireshark:

## **Key Features of Wireshark:**

- 1. **Packet Capture**: Wireshark can capture live network traffic from various network interfaces (Wi-Fi, Ethernet, etc.), allowing users to monitor network activity.
- Deep Protocol Inspection: It supports analysis of hundreds of protocols like TCP, UDP, HTTP, DNS, FTP, and more, displaying the structure of each packet down to the byte level.
- 3. **Filter Capabilities**: Wireshark provides powerful filtering options (e.g., display filters, capture filters) to narrow down captured traffic and focus on specific data of interest.
- 4. **Reassembly of Protocols**: Wireshark can reassemble higher-level protocols (e.g., HTTP or FTP) from the packets and display them as a whole stream, making it easier to understand complex network interactions.
- 5. **Live Capture and Offline Analysis**: You can capture network traffic in real-time or analyze previously saved capture files (PCAP files).
- 6. **Exporting Data**: Wireshark allows exporting captured data to various formats like CSV, JSON, or plain text for further analysis or reporting.
- 7. **Color Coding**: Users can apply color rules to distinguish packet types and status, which helps in quick identification of issues or anomalies.
- 8. **Statistics and Graphs**: Wireshark provides statistical tools to analyze traffic patterns, flow graphs, and protocol distribution over time.

## **Common Uses of Wireshark:**

- Network Troubleshooting: Network administrators and security professionals use Wireshark to troubleshoot network issues such as latency, packet loss, and protocol malfunctions.
- Security Auditing and Penetration Testing: Wireshark can be used to inspect traffic for malicious activity, unauthorized access, or data breaches by analyzing packets for unusual behavior.
- Protocol Analysis and Development: Developers use Wireshark to analyze network protocols for application development, debugging, or ensuring proper protocol implementation.
- 4. **Learning and Research**: Students and network professionals use Wireshark to understand how protocols work and to conduct network research.

#### **How Wireshark Works:**

1. **Capture Mode**: In this mode, Wireshark listens to a network interface and records all the packets traveling over the network.

- 2. **Display Mode**: After capturing packets, Wireshark displays them in a human-readable form, showing each packet's details such as source/destination IP, protocol, and contents.
- 3. **Filtering**: Users can apply filters (e.g., ip.addr == 192.168.0.1 to view all traffic from a specific IP) to focus on relevant data.
- 4. **Decoding**: Wireshark decodes various protocol headers and data formats, providing detailed information about each layer in the communication stack.

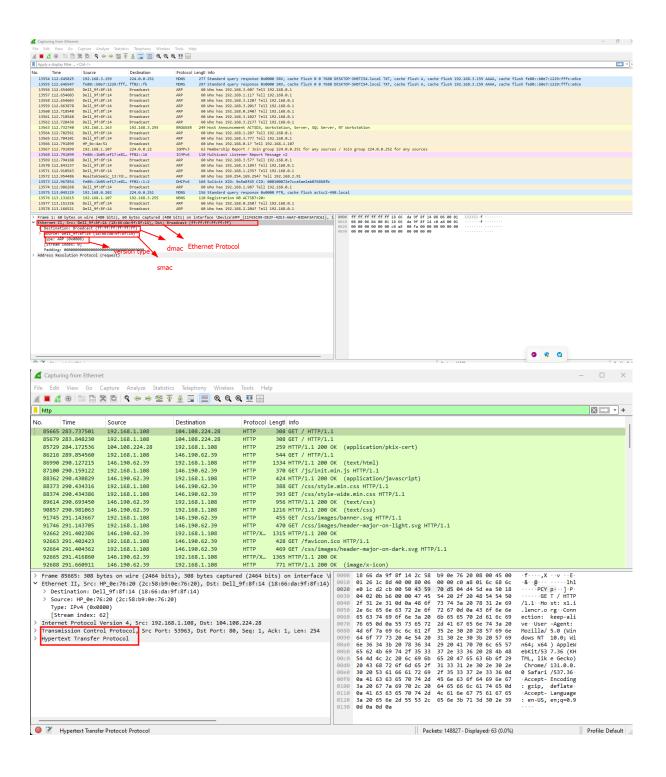
## **Example Workflow:**

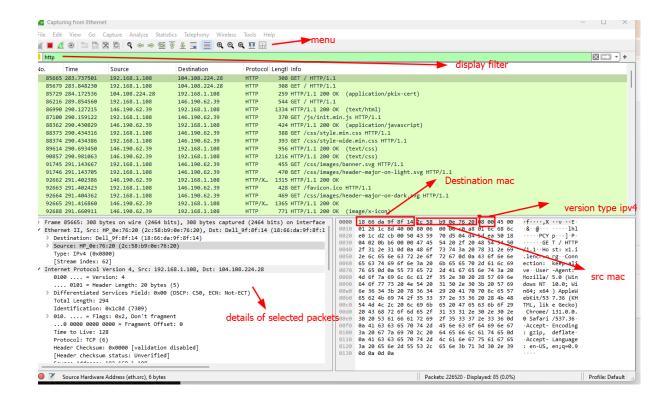
- 1. Open Wireshark and start a capture session on a specific network interface (e.g., Wi-Fi or Ethernet).
- 2. Analyze packets in real-time as they are captured, applying filters to focus on specific traffic (e.g., HTTP or DNS packets).
- 3. Use Wireshark's statistical tools to analyze network performance or detect unusual patterns.
- 4. Save the captured traffic as a . pcap file for later analysis or sharing.

#### **Considerations:**

- Legal and Ethical Issues: Capturing network traffic can violate privacy or legal boundaries. Always obtain permission before using Wireshark on networks that you don't own or administer.
- **Overhead**: Capturing a large volume of traffic, especially on high-speed networks, can introduce overhead on system performance.

Wireshark is widely considered a go-to tool for network engineers, administrators, and security experts for its powerful features and user-friendly interface.

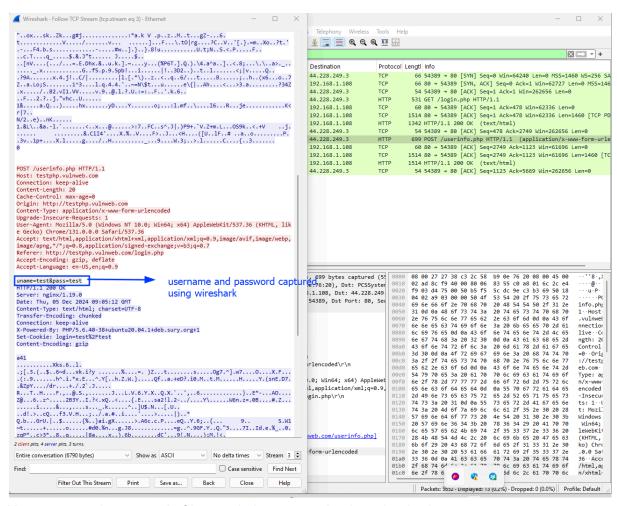






Transmission Control Protocol (tcp), 20 bytes

Packets: 592204 , Displayed: 998 (0.2%)



Username and password of http website captured using wireshark

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