Title: Observational Report on Developing a Packet Sniffer Tool

Introduction:
Packet sniffing is a crucial technique in network analysis, allowing us to inspect and understand the flow of data across networks. This report documents the process of developing a custom packet sniffer tool for capturing and analyzing network packets, with a focus on educational purposes and ethical considerations.

Objective:
The primary objective of this project was to create a packet sniffer tool using Python and Scapy to capture and analyze network traffic. The tool aimed to extract relevant information such as source and destination IP addresses, protocols, and payload data.

Methodology:

Setup and Environment:
Installed Python and Scapy on a Windows operating system.
Ensured Python was added to the system PATH during installation.
Used pip to install the Scapy library.

Development of Packet Sniffer Script:
Utilized a text editor to write the Python script.
Leveraged Scapy's packet sniffing capabilities to capture network packets.
Extracted pertinent information from each packet, including IP addresses, protocols, and payload data.
Implemented exception handling to ensure the script terminated gracefully.

Ethical Considerations:
Emphasized the ethical use of packet sniffing tools for educational purposes.
Discussed the importance of authorization, privacy protection, and legal compliance when analyzing network traffic.
Highlighted the need to handle captured data responsibly and ensure the confidentiality of sensitive information.

Results:
The developed packet sniffer tool successfully captured and analyzed network packets, displaying relevant information such as source and destination IP addresses, protocols, and payload data. The tool demonstrated the functionality of packet sniffing and provided insights into network communication patterns.

Conclusion:
In conclusion, the project enabled a hands-on exploration of packet sniffing techniques and the development of a custom packet sniffer tool. The experience deepened understanding of network protocols and data transmission, highlighting the importance of ethical considerations in network analysis.