EXPERIMENT 15 - DEMONSTRATE NETWORK FORENSICS USING PCAPXRAY TOOLS

Introduction:

Network forensics involves capturing, analyzing, and investigating network traffic to detect malicious activities or anomalies. PcapXray is a tool that visualizes packet capture (PCAP) files, showing hosts, connections, web/Tor traffic, and potentially malicious activities in a network. It helps investigators quickly identify suspicious traffic flows and extract relevant payloads for deeper analysis.

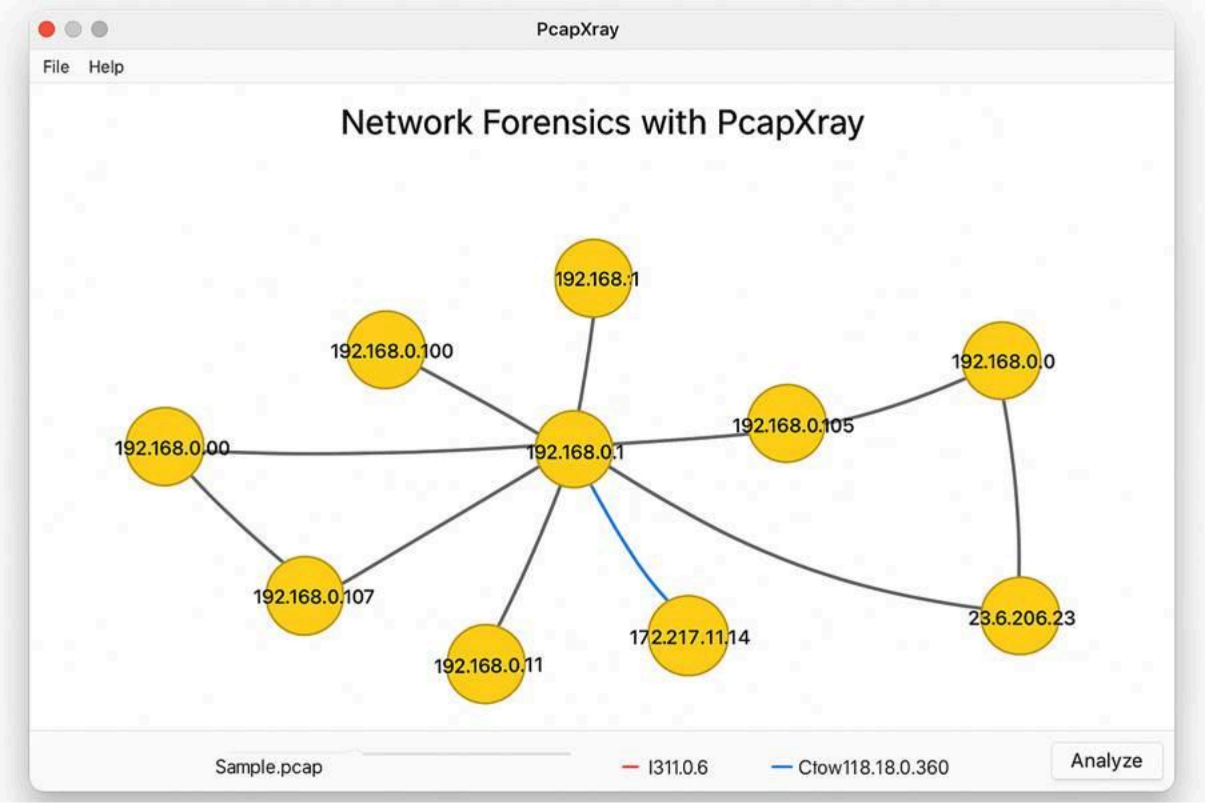
Aim:

To analyze captured network traffic using PcapXray and identify hosts, traffic patterns, and suspicious network activities for forensic investigation.

Algorithm:

1. Install prerequisites:
   - Install Python 3, pip, Graphviz, Tkinter, and required libraries.
   - Clone the PcapXray repository and install dependencies using pip install -r requirements.txt.
2. Prepare input:
   - Obtain a .pcap file containing network traffic to be analyzed.
   - Ensure the PCAP is from a safe/testing source for learning purposes.
3. Launch PcapXray:
   - Open main.py in the repository using Python.
   - Load the selected .pcap file via the GUI.
4. Analyze traffic:
   - Observe the network graph of hosts (nodes) and connections (edges).
   - Filter traffic based on Web, Tor, Malicious, DNS, or ICMP.
   - Click on nodes/edges to view traffic details, HTTP requests, or extracted payloads.
5. Record observations:
   - Note suspicious hosts, unusual ports, or Tor traffic.
   - Check extracted files or payloads for anomalies.
   - Optionally, cross-verify suspicious IPs with WHOIS or threat intelligence sources.
6. Document results:
   - Capture screenshots of network diagrams and significant flows.
   - Summarize the suspicious activities identified during analysis.

Output:



- Graphical visualization of network hosts and flows.
- Reports listing:
  - Host IPs
  - Connection types
  - Protocols used
  - Extracted payloads
  - Flags for Tor/malicious traffic
- Optional JSON or text files summarizing traffic analysis.

Result :

- Hosts with the most connections were identified as central nodes.
- Web traffic, Tor traffic, and DNS requests were visualized clearly.
- Suspicious or unusual traffic flows were highlighted for further investigation.
- Payload extraction revealed potential files or URLs of interest.
- PcapXray provided a clear, interactive overview of network activity, making it easier to identify anomalies or malicious patterns compared to raw packet inspection in Wireshark.