Data Communication and Computer Network Laboratory

Master of Computer Application
Second Year, First Semester
Session: 2023-24

Assignment - VII

Date: 20/09/2023

Traceroute Implementation

Traceroute is a network diagnostic tool used to track the route that packets take from the source to a destination. It sends packets with increasing Time-to-Live (TTL) values and observes the ICMP "Time Exceeded" responses from intermediate routers. Scapy allows you to implement traceroute easily by sending ICMP packets with varying TTL values and analyzing the responses.

- Write a Python program that implements the traceroute functionality using Scapy.
- The program should take a destination IP address as input and send a series of ICMP packets with varying Time-to-Live (TTL) values to trace the route to the destination.
- Display the IP addresses of the routers along the path.

In your code, define a function `traceroute()` that takes the destination IP address and the maximum number of hops as inputs. Run a loop from TTL 1 to `max_hops`, creating ICMP echo request packets with the corresponding TTL values and sending them using `sr1()` (send and receive in one function) from Scapy. Consider a timeout period of 1 second for the response.

- If you receive no response within the timeout, we print * to indicate no response from that hop.
- If you receive an ICMP Echo Reply, it means we have reached the destination, and we print the destination IP address.
- If you receive an ICMP Time Exceeded, it indicates that the packet has reached an intermediate router, and we print the router's IP address.

Please note that the actual number of hops may be less than `max_hops`, depending on the network topology and firewall configurations. Also, some routers might be configured to not respond to ICMP Time Exceeded messages, which can result in incomplete traceroute information.

Your report should contain at least the following sections:

1. Problem Statement
2. Your design of the solution
3. Source code (with comments)
4. Screen shots of sample run