Course: Computer Networks
Assignment 3

Fezile Manana

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Problem 3.1

After setting the MTU (Maximum Transmission Unit) from 1500 to 1400 we can observe that sending a packet that is 1490 which is above the 1400 MTU set for the link but below the initial 1500 Ethernet limit (Initialized as default and used in the first hop between h1 and r1) causes fragmenting. The following is observed from a tcpdump:

```
17:44:14.507725 IP6 2001:638:709:a::1 > 2001:638:709:b::1: frag (1352|146)
17:44:15.531184 IP6 2001:638:709:a::1 > 2001:638:709:b::1: frag (0|1352) ICMP6,
echo request, seq 4, length 1352
```

Fragmentation is a system in IPv6 networks that breaks down packets into smaller pieces at the host. 1352 and 146. Summing them together we see that they are 1498. The extra 8 bytes are part of the fragmentation extension header. Hence giving us our original packet of 1490.

Problem 3.2

Tracepath traces a path to a destination address, reporting on the time to live and maximum transmission units (MTU) on the path taken. Path MTU is measured by sending UDP packets. If a link MTU is lower than the tried path, the Internet Control Message Protocol error tells the new path MTU which is used in subsequent probes (ICMPv6 packet-too-big messages).
Reference: https://wiki.geant.org/display/public/EK/TracePath

Problem 3.3

After executing tracepath consecutively; it can be noted that the network has cached the MTU in the routing cache. The routing cache is then checked before using the forwarding table. This then allows the network to store the MTU for 600 secs.