CSE 473 – *Introduction to Computer Networks*

Review Questions 22

Your Name:

Please print out this form (two-sided, if you can) and write your answers *legibly* in the spaces provided. If you can't write legibly, type.

1. Consider two mobile hosts in a foreign network having a foreign agent. Can the two mobile hosts use the same care-of address in mobile IP? Explain your answer.

Two mobile hosts in a foreign network with a foreign agent will indeed share the same care-of-address, namely, that of the foreign agent. The foreign agent would decapsulate all packets sent to that address, which would then reveal the address of the mobile for which the packet is actually destined, so that they can be forwarded and received appropriately by the two mobile hosts.

2. List two important differences between 2G cellular networks and 3G. List two important differences between 3G and 4G networks.

The original 2G networks offered only marginal data support, e.g., for text messaging, while 3G networks introduced Internet access. In addition, 2G networks relied on a combination of FDM and TDM for network access, while 3G networks rely on the use of WCDMA in TDMA slots, with TDMA slots themselves available on multiple frequency bands.

The two main differences between 3G and 4G networks is that 4G networks boast an IP-based core network that integrates both voice and data over the same network, as opposed to distinct networks, and the use of OFDM technology for radio access.

3. Mobile IP involves what is called "triangular routing" with packets from the source node to the mobile node transiting through the mobile node's home agent, but return packets sent from the mobile node to the source node proceeding directly. There have been proposals for making packet delivery symmetric, *i.e.,* have packets from the mobile node and destined for the source node also transit through the home agent using a reverse tunnel. Identify possible motivations for suggesting such an approach and what benefits might it offer. **Note:** You will need to do some research on the web to answer this question.

One major problem that mobile IP can encounter is that is susceptible to address filtering by Internet Service Providers, i.e., the enforcement of packet filtering rules that drop packets with sources addresses that do not belong to the local subnet (to combat address spoofing). This will result in return packets sent from the mobile host (with its original home IP address) to be dropped since they do not carry a source address that belong to the local subnet.

Tunneling return packets to the home agent would eliminate this problem, and was proposed in RFC 2344. RFC 2344 mentions several advantages, including being able to easily join a multicast group in its home domain and send packets to it, as well as overcoming possible problems caused by low TTL values when sending packets to its home domain.