**CS 6097 Wireless and Mobile Networking**

**Homework No. 6 dated Wednesday October 8, 2014**

**P9.6.** Assume that you just got out of an airplane and you switched on your cell phone. If the closest BS is located at a distance of  km, what are the minimum and the maximum delay before a contact is established between your cell phone and the nearest BS, given that the BS transmits beacon signals every one second?

**[Solution]**

The registration process including:

T1: Beacon signal exchange between BS and MS,

T2: MS request for registration,

T3: Visiting BS send authentication request to home BS,

T4: Home BS send authentication response back to the visiting BS, and

T5: Visiting BS send the authentication/rejection back to MS.

Suppose T3 and T4 are fixed, then the minimum delay is

T2 + T3 + T4 + T5 = 2 \* (5 km/ 3\*108 ) + T3 + T4;

and the maximum delay is

1 + T1 + T2 + T3 + T4 + T5 = 1 + 3 \* (5 km/ 3\*108 ) + T3 + T4.

**P9.8.** What is the use of “attachment points” from one network to another network? Explain their significance in wireless network routing?

**[Solution]**

They are the gateway routers which route the packets into/out of one network to another network. Gateway routers simply support routing within the backbone.

**P10.3.** Look at your favorite Web site and find the difference between interior and exterior routing protocols.

[Solution]

An interior routing protocol is used within an autonomous system (AS), whereas an exterior routing protocol is used for routing between autonomous systems. Every AS is free to choose its own routing protocol to handle the routing of packets within it-self, whereas exterior routing protocol is used to handle exterior routing.

**P10.8.** What are the disadvantages of using wireline TCP over wireless networks?

[Solution]

The main disadvantage of using wireline TCP over wireless networks is that wireline TCP attributes loss of packets during packet transmission to congestion in the network. However, this may not be the case in wireless networks, where packet losses occur mainly due to the physical nature of the medium such as attenuation, thermal effects and interference in the air medium. The wireline TCP thus goes into congestion control mechanism in these cases when there is no need to do this. This further reduces the throughput.