UNIVERSITY OF CALIFORNIA, LOS ANGELES
CS M117

CS M117 Student name _____DIS:

1A	1B	1C	1D	1E	1F

Pre-laboratory HW #2. (Due 04/18 or **04/19**) (HW must be typed)

Bluetooth Communications
(Lecture 3 + Reading 2)

Section A:

1. (4) Wireless nets:
   (a) What is the main similarity between a Wireless LAN and an Ad Hoc network
   (b) What is the main difference?

(a) Both of them are wireless, and enables connection between computers (nodes).
(b) Ad Hoc has independent communication between nodes, while wireless LAN connects to a central communication source (router). This central source functions as an infrastructural backbone.

2. (2) Why is multihopping used in Ad-Hoc nets?

Using multi-hopping in Ad-Hoc nets saves resource, and maximizes the channel utilization and performance. It enables Ad-Hoc nets to relay signals between intermediate nodes. Otherwise, Ad-Hoc won't have this feature.

3. (1) What is the principal difference between connectionless communication and connection-oriented communication? (See Reading 1).

Essentially, for connection-oriented communication, a dedicated communication channel is set up between sender and receiver (server/client) beforehead. After setting up the certain channel, the connection goes through the steps of initializing connection, data transmission, and closing down connection.
However, the connectionless communication does not require a dedicated communication link. The communication simply uses a data transmission protocol (such as UDP) to transfer data packets between sender and receiver (server/client).

Section B:
Bluetooth Communications
(T. Ch. 4. 310-317)

1). (4) From Figure 1 shown bellow; we see that a Bluetooth device can be in two piconets at the same time.

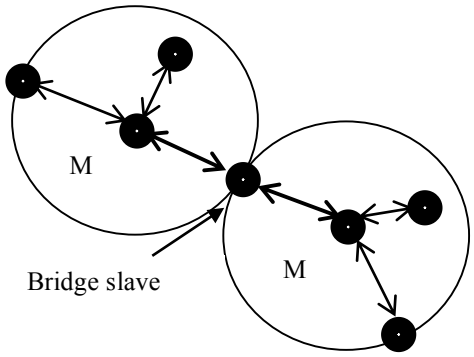

Figure 1

Is there any reason why one device cannot be the master in both of them at the same time?

There are two reasons in this situation.

1. In a master-slave system, slaves get the origin piconet of the message through the master-issued, unique, prefixing access code. Therefore, if a master device is shared between two piconets, the access code issued by the master would not be unique for the two piconets, and the slaves would not be able to determine which piconet the message is exactly from.
2. The header contains 3 bits, and thus each master-slave system has a maximum slave capacity of 7, which in this case seems not enough (to label each slave with a unique index).

2). (a) (4) Figure 2 shows several physical layer protocols. Which of these is closest to the Bluetooth physical layer protocol?

802.11 FHSS

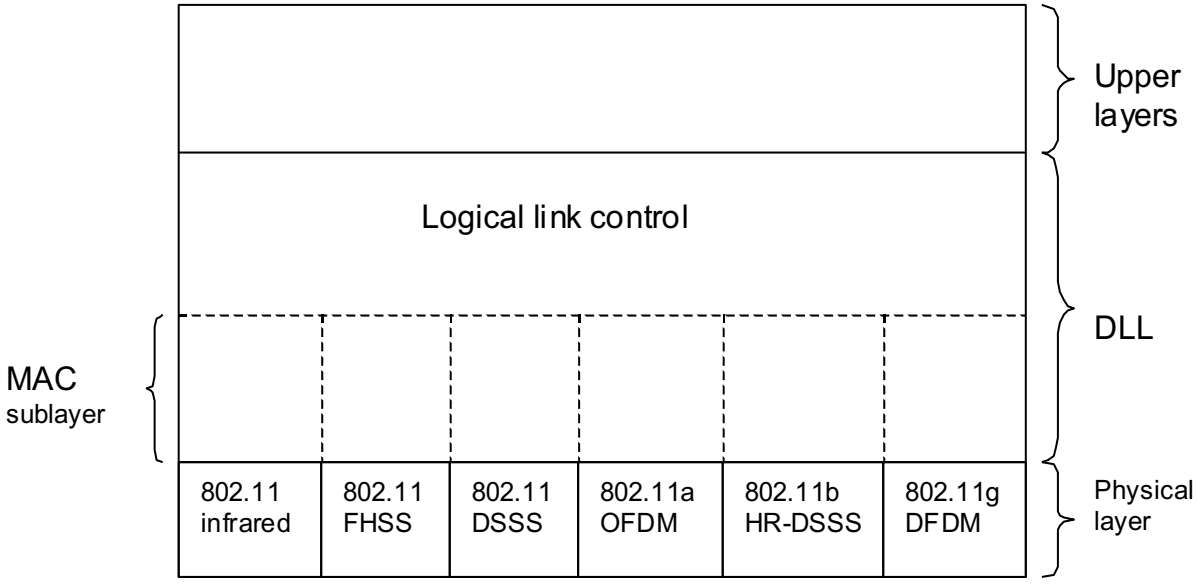

Figure 2

(b) (1). What is the biggest difference between the two?

The major difference between Bluetooth and 802.11 FHSS is that Bluetooth has much faster hops. Bluetooth's hopping rate is approximately 1600 hops/sec.

3). (4) Beacon frame in the frequency hopping spread spectrum variant of 802.11 contain the dwell time, Do you think the analogous beacon frame in Bluetooth also contain the dwell time? Discuss your answer.

No, it does not.
The dwell time of Bluetooth only allows transmission of single packets. The dwell time is defined as 625μs. Therefore, it is not contained in Beacon frame where dwell times vary frequently.