UNIVERSITY OF CALIFORNIA, LOS ANGELES
CS M117

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Pre-laboratory HW #3 Due 10/29
(HW must be typed)

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) On the most basic level, wireless LAN and Ad Hoc network both operate wirelessly to connect computers/nodes.
(b) Wireless LAN connects nodes to a network backbone (infrastructure) while an Ad Hoc network involves independent node communication.

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

Multihopping is used in Ad Hoc networks in order to relay signals through intermediate nodes where otherwise impossible. In addition, it can help maximize channel utilization and efficiency, prevent resources and energy from being wasted, etc.

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.

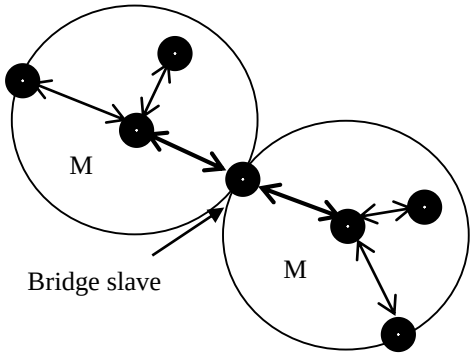

Figure 1

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

A device cannot be the master in both piconets simultaneously since the frame's prefixing access code is used by slaves to determine a message's originating piconet. Unfortunately, this access code depends on the master, and sharing a master between two piconets would make the access codes no longer unique (and so slaves can't distinguish between messages from the different piconets – or rather, it becomes a single piconet). In addition, a limit of 3 bits in the header address allows up to 7 slaves in the piconet, which may be insufficient to label each slave uniquely.

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

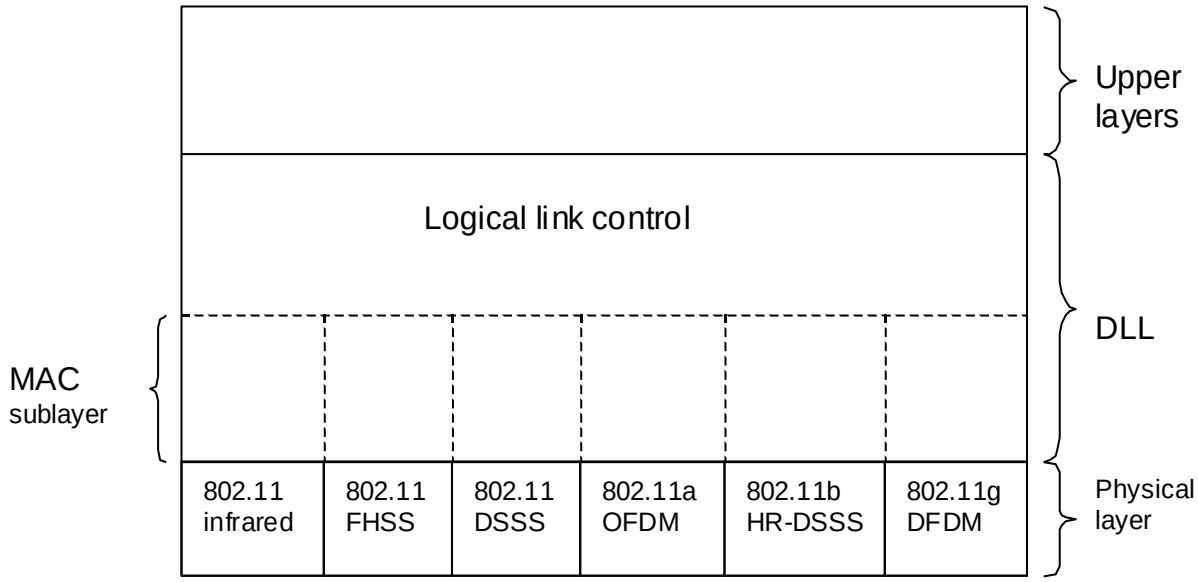

Figure 2

What is the biggest difference between the two?

Since Bluetooth also uses Frequency-Hopping Spread Spectrum, it is most similar to the 802.11 FHSS layer. However, it is known that Bluetooth hops much faster than 802.11 (1600 hops/seconds).

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, I do not think the dwell time is contained in the beacon frame for Bluetooth. Since Bluetooth's dwell time is always constant (and basically fixed) at $625\ \mu s$, it is not included within the beacon frame.