

EEL 4781 - Homework 2

Due November 10, 2009

Problem 1:

Let us assume that in a MAC protocol are participating three nodes A, B, and C. We shall assume that the time is measured in units which are necessary to transmit one byte (eg 100 bytes are transmitted in 100 time units). The delay from A to B, B to C, and C to A is 20 time units each.

Now, assume that at time 0

- A wants to send a frame 50 bytes long
- B wants to send a frame 100 bytes long
- C wants to send a frame 150 bytes long

Trace what is happening on the network if the MAC protocol used is:

- (a) Simple ALOHA (the nodes discover that there was a collision only at the end of the transmission)
- (b) CSMA/CD (Ethernet)
- (c) CSMA/CA (RTS/CTS, 802.11 with DCF)

Problem 2:

Somebody proposes to replace Bluetooth, WiFi (a,b,g and n) and WiMax with a single technology. Give three reasons for and three reasons against. (One reason: an item in an itemized list, one or two sentences)

Problem 3:

Somebody proposes to replace all the repeaters, hubs and switches with IP routers. Give three reasons for and three reasons against. (One reason: an item in an itemized list, one or two sentences)

Problem 4:

Show the string 11011101 in Manchester encoding.

Problem 5:

A router has the following CIDR entries in its routing table:

Address/Mask	Next hop
10.10.8.0/21	Interface 0
10.10.10.0/22	Interface 1
192.53.40.0/23	Interface 3
Default	Interface 4

For each of the following IP addresses, what does the router do if a packet with that address arrives

- (a) 10.10.10.10
- (b) 10.10.8.14
- (c) 10.10.12.45
- (d) 192.53.40.7
- (e) 192.53.56.7