ADVANCED COMPUTER NETWORKS
Assignment 4: Wireless Networks: Part 3

Assigned on: **20 March 2014**
Due by: **27 March 2014**

Question 1:

In slide 32 of lecture 4 we discussed the ARQ scheme of Bluetooth.

a) Assuming the red blizzard arrow means that the packet has been lost, explain the figure as it does not properly reflect the situation in an ACL link. Please re-draw the figure assuming all packet exchanges are part of an ACL link between the master and the slaves.

b) Assume the red blizzard arrow means the packet has in fact been received but could not properly be decoded. Would the figure on page 32 be correct in that case?

Question 2:

S-MAC reduces the power-consumption by synchronizing wake-up and sleep periods among nodes in the network. Explain why in practice this approach can lead to higher latencies for packet transmissions.

Question 3:

B-MAC achieves low power consumption without requiring nodes to be synchronized. One drawback of B-MAC, however, is that it is not suitable to small packets. Explain why?

Question 4:

Consider two rays each sends half a million symbols per second using conventional single-carrier modulation over a wireless channel, assume 1us symbol between rays.

- Discuss about inter symbol interference in this scenario.

- If the same million symbols per second are spread among 10 sub-channels, discuss again the inter symbol interference.

Question 5:

In the lecture, we explained basic loss estimation and rate change algorithm of "Robust Rate Adaptation for 802.11 Wireless Networks". In the paper, the author also proposed an improved algorithm with adaptive RTS filter. Explain briefly:

a) how that algorithm works

b) how it improves over the basic algorithm

Question 6:

The 802.11 MAC layer defines three intervals SIFS, PIFS, and DIFS. Thereby, SIFS is the smallest time interval. Imagine for the moment that SIFS is greater than DIFS. Explain why this would be a problem.

Question 7:

How is fairness problem regarding channel access solved in IEEE 802.11?

Hand In Instructions

This is a paper exercise. Please hand it in during the exercise session on the due date.