

University of Ain Temouchent Belhadj Bouchaib
Faculty of Science and Technology
Department of Mathematics and Computer Sciences
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Tutorial 5 / Network Architecture

Responsible for the course : Mr. A. BENZERBADJ

Exercise 1

1. Why is the IEEE 802.11 wireless technology capable of transmitting over greater distances than Bluetooth technology ?
 - It transmits at much lower frequencies
 - Its output power is higher
 - It transmits at much higher frequencies
 - It uses better encryption methods
2. What are the advantages (name three) of wireless technology compared to wired local area network technology ?
 - Lower maintenance costs
 - Longer transmission distance
 - Ease of installation
 - Ease of development
 - Higher security level
 - Less expensive host adapters
3. In which scenario is wireless network security more important ?
 - Your wireless mouse uses the IrDA port on your PC
 - The local café offers a wireless access point and provides free internet access
 - A real estate agent sends information about the sale of a house to a mobile phone
 - Two users create a peer-to-peer wireless network to share music
4. Which wireless technology standard offers the best compatibility with older wireless standards, but also provides the best performance ?
 - 802.11a
 - 802.11b
 - 802.11g
 - 802.11n
5. What is the CSMA/CA method in a network ?
 - An access method used by wireless technology to avoid duplicate SSIDs
 - An access method used by any technology with too many collisions
 - An access method used by wired Ethernet technology to avoid collisions
 - An access method used by wireless technology to avoid collisions
6. From the following list, match the statements that correspond to the *Ad Hoc mode* and those that correspond to the *Infrastructure mode*.
 - An access point controls who speaks and when

- Multiple wireless clients in a peer-to-peer network
 - STAs do not communicate directly with each other
 - Generally a less expensive network
 - Larger networks require this type of setup
 - Does not include an access point
7. From the following list, match the statements that correspond to a *wireless client*, those that correspond to an *access point*, and those that correspond to a *wireless bridge*.
- Allows long-distance point-to-point connections between networks.
 - Acts as a media converter
 - Is part of a wireless network as a host device
 - Connects two wired networks via a wireless link
 - Controls access between a wired network and a wireless network
 - Also called STA

Exercise 2

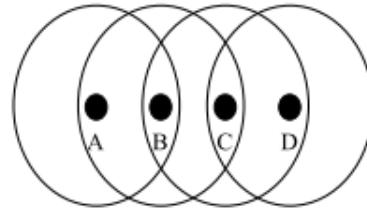


FIGURE 1 – Ad Hoc network

1. Describe the scenario in which A is a hidden terminal for C.
2. Now consider the following scenario : B transmits to A. C wants to transmit to D.
 - (a) Describe the scenario in detail.
 - (b) How could the encountered problem have been resolved ?

Exercise 3

1. Why, in your opinion, is the RTS/CTS mechanism reserved only for networks where there is a large message exchange ?
2. In your opinion, what is/are the most important field(s) in the RTS/CTS structure, aside from the source MAC address and destination MAC address ?

Exercise 4

1. Give the format of the CTS/RTS/ACK control packets.
2. Provide the transfer time in μ seconds of these control packets in an 802.11g network (Consider the theoretical throughput).

3. The exposed terminal problem impacts packet latency. Why ?
4. The hidden terminal problem has a dual impact, namely on energy and latency. Why ?