Networks Sub-module Assignment

Answers for Part 2 and Part 3

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Part 2: Analyse a simple wireless network

1)See below ***figure 1****.*

X

***Figure 1.*** A wireless network topology including wireless nodes X, A and B, and their coverage. Wireless nodes A and B cannot hear each other’s transmissions, X can hear A and B.

2)Analysis and description of the transmission procedure for the wireless network:

Time 0 µs:

* X is sending a packet to some other node which takes 100 µs.

Time 20 µs:

* A is ready to transmit a packet so begins sensing the channel. Node X is found, and the channel is busy so the backoff timer of 40 µs begins.

Time 60 µs:

* Node A backoff time finishes and begins sensing channel. Node X is found, and the channel is busy so the backoff timer of 40 µs is started.
* Node B is ready to transmit a packet so begins sensing the channel. Node X is found, and the channel is busy so the backoff timer of 60 µs begins.

Time 100 µs:

* X finishes packet transmission. Node A backoff timer finishes and begins sensing the channel. Node X is found, and the channel is free, so A begins sending the packet which takes 150 µs.

Time 120 µs:

* Node B backoff timer finishes and B begins sensing the channel. Node X is found, and B finds the channel to be free so begins sending the packet which takes 100 µs.
* At node X transmission from A and B collide but since A and B cannot hear each other interference is not detected, and transmission continues.

Time 220 µs:

* Transmission from B finishes.

Time 250 µs:

* Transmission from A finishes.

Part 3: Understand switch operations

1)See below ***Table 1****,* showing which frames are sent when monitoring ports 0-3.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | **Port Monitored** | | | |
| **0** | **1** | **2** | **3** |
| **Frame(s) Sent** | **0** | Tick with solid fill |  |  |  |
| **1** |  |  |  | Tick with solid fill |
| **2** | Tick with solid fill |  |  |  |
| **3** |  | Tick with solid fill |  |  |
| **4** | Tick with solid fill |  |  |  |
| **5** |  |  |  |  |

***Table 1***

2)See below ***Table 2****,* showing the switching table formed after forwarding the 5 frames.

|  |  |
| --- | --- |
| **MAC Address** | **Port** |
| 40-4A-18-B2-63-DA | 0 |
| AC-D9-D6-57-24-A3 | 3 |
| 00-0C-2B-AF-18-7B | 1 |
| 04-5D-56-3E-A3-B4 | 4 |

***Table 2***

Device 2 with MAC address 00-1D-D1-BC-DF-73 is connected to port 2. In the 5 frames forwarded this MAC address is never the source address therefore never added to the switching table.