1. Consider the single-sender CDMA example in Figure 7.5. What would be the sender’s output for the data bits +1 +1 +1 -1 if the sender’s CDMA code were -1 +1 -1 +1 +1 +1 -1 -1?

First 2 bits

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| data | 1 | | | | | | | | 1 | | | | | | | |
| code | -1 | 1 | -1 | 1 | 1 | 1 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 1 | -1 | -1 |
| DataCode | -1 | 1 | -1 | 1 | 1 | 1 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 1 | -1 | -1 |

Second 2 bits

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| data | 1 | | | | | | | | -1 | | | | | | | |
| code | -1 | 1 | -1 | 1 | 1 | 1 | -1 | -1 | -1 | 1 | -1 | 1 | 1 | 1 | -1 | -1 |
| DataCode | -1 | 1 | -1 | 1 | 1 | 1 | -1 | -1 | 1 | -1 | 1 | -1 | -1 | -1 | 1 | 1 |

1. Suppose there are two ISPs providing Wi-Fi access in a particular café, with each ISP operating its own AP and having its own IP address block.
   1. Further suppose that by accident, each ISP has configured its AP to operate over channel 11.  Will the 802.11 protocol completely break down in this situation?  Discuss what happens when two stations, each associated with a different ISP, attempt to transmit at the same time.
      1. 802.11 will not completely break down, the two ISP can still operate, but they cannot send at the same time or else there will be a collision and data will become corrupted. This is because they are on the same channel and the collision cannot be avoided.
   2. Now that one AP operates over channel 1 and the other over channel 11.  How do your answers change?
      1. The ISPs are now separate with their Aps, so they can now work independently and not interfere with one another; so collisions between the two APs are avoided.
2. Suppose an 802.11g station is configured to always reserve the channel with the RTS/CTS sequence. Suppose this station suddenly wants to transmit 1,300 bytes of data, and all other stations are idle at this time. As a function of SIFS and DIFS, and ignoring propagation delay and assuming no bit errors, calculate the time required to transmit the frame and receive the acknowledgement.
   1. Time to transmit RTS is 256bits / 54Mb = 5 usec
   2. Time to transmit the frame is 10656 bits / 54Mb = 197 usec
   3. DIFs + RTS + SIFS + CTS + SIFS + FRAME + ACK
   4. DIFS + 5 + (3)SIFS + 197 +5
   5. =DIFS + (3)SIFS + 207
3. In mobile IP, what effect will mobility have on end-to-end delays of datagrams between the source and destination?
   1. The delays tend to be longer than a direct connection.
4. In our discussion of how the VLR updated the HLR with information about the mobile’s current location, what are the advantages and disadvantages of providing the MSRN as opposed to the address of the VLR to the HLR?
   1. One advantage of using an MSRN is the security that comes with masking the actual subscriber number. Another advantage is MSRN allows the user to get calls while roaming. One disadvantage is that the location cannot be determined by the MSRN, but it can be by the HLR and VLR