

Assignment 1

Wireless Networks: Marks: 23

1. Connect your laptop to IIITD access point. Identify the SSID and BSSID of the AP connected to. Take measurements of your current received signal strength, bit rate, transmission power, and operating frequency band. Now, take your laptop and walk for 2 min, all this time, get the above measurement for every 10 sec (through a script). Plot how your signal strength and bitrate vary while you walk. [1+2+1+2]
2. Now, create a setup of 3 devices: D1: your phone as the AP, D2: another phone/tablet/laptop as client and D3: your laptop as monitor mode
Keep distance between D1 and D2. Place D3 close to D2.

D1 make it open (Go to settings->connections->Mobile Hotspot->configure->security->open).

D2: Forget the D1 credential if stored before, then connect to D1. From the browser, open IIITD webpage.

D3: Put your laptop in monitor mode and collect a packet trace for 2 min. [2]

- a. Identify the beacon frames, tell the SSID of all the APs you can see [2]
- b. Compute the average signal strength from each AP across all the beacons you have received for 2 min. [2]
- c. Compute the average bitrate from each AP across all the beacons you have received for 2 min [2]
- d. Find out the types of frames exchanged between D1 and D2. Write down all the types of frames, count the number of each type programmatically. Look at [this](#) to identify the types of frames [3].
- e. Identify the MAC layer acknowledgment, and identify which types of frames have MAC layer acknowledgements. Compute the bitrate of the MAC layer acknowledgments. [2]
- f. Compute average signal strength and bitrate across all frames between D1 and D2. [2]
- g. Take D2, now move closer to D1. Keep D3 as it is. Open IIITD page once again, take packet trace in monitor mode for 2 min at D3. Compute the average signal strength and bitrate of all frames between D1 and D2. Do you see any difference from f). Explain. [2]

Submit: a single zip file containing the packet captures, scripts written to analyze the packet captures and a report containing the the answers.