CS4222 HW#3 Report

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1. The received file is well formed.

The data received on the sensor tag is complete and in sequence without duplicates. However, when tested on the testbed, the first few seconds of the data is missing, thus the first five lines of the data is not printing out in both the .csv and MQTT.

1. Time of Experiment: 3:16PM.

Channel Occupancy are concentrated at 2, 6, and 10 on the Wi-Fi channels.

We can use the channels 4 or 8 on the Wi-Fi channel or 11, 14, 20, and 26 on the ZigBee channel, which are far enough away from the concentrated area.

From the experiment in varying the channels, we can observe that channel 11 has the highest throughput, and channel 18 has the lowest throughput. The low throughput result can be explained by the high concentration on Wi-Fi channel 6, which we believe is the default for most Wi-Fi application.

From the experiment in varying packet size, we can see that the payload of 100Bytes provides a drastically higher output of 1330B/s as opposed to a payload of 10Bytes. We hypothesized that sending 100B will have lesser throughput than 10B, but this was not the case. We suspect that the channel was under-utilized and therefore have lesser collision, thus being faster, while the 10B suffered greatly from its overhead.

**The data can be verified in the spreadsheet in the same folder.**



1)

Figure : Throughput vs Channel in the Morning/Afternoon

2)

Figure : Throughput vs Payload Size in the Morning/Afternoon

1. Time of Experiment: 8:19PM.

Channel Occupancy are concentrated at 4 and 6 on the Wi-Fi channels.

We can use the channels 1 or 10 on the Wi-Fi channel or 11 and 26 on the ZigBee channel, which are far enough away from the concentrated area.

From the experiment in varying the channels, we can observe that channel 11 has the highest throughput, and channel 18 has the lowest throughput, as per task 2. The low throughput result can be explained by the high concentration on Wi-Fi channel 6, the peak of channel 6 is much higher at this time too.

From the experiment in varying packet size, we can see that the payload of 100Bytes provides a drastically higher output of 1336B/s as opposed to a payload of 10Bytes, this is also 0.5% higher than the previous experiment. Similarly, we hypothesized that sending 100B will have lesser throughput than 10B, but this was not the case. We suspect that the channel was under-utilized and therefore have lesser collision, thus being faster, while the 10B suffered greatly from its overhead. On both payload, the throughput was slightly higher than the previous experiment. It should be due to the lesser collision as there was lesser devices.

**The data can be verified in the spreadsheet in the same folder.**

1)

Figure : Throughput vs Channel in the Evening/Night

2)

Figure : Throughput vs Payload Size in the Evening/Night