Data Transmission over 802.11b Wireless LAN

Raw Data Sheet

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Discussion 1D

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| --- | --- | --- |
| **#** | **Main Goals** | **Results** |
| **1**  **2**  **3** | Learn basic knowledge of various factors affecting data throughput in a wireless channel.  Get familiar with basic performance measurement tools  Observe the effect of sporadic losses on TCP throughput. | Distance and the presence of other waves such as microwave are the factors affect the throughput.  When data is sent further away, transmission is slower; signal to noise ratio is smaller; loss rate is higher. UDP generally has a higher transmission rate than TCP from the same distance.  When the data is sent in the presence of microwave. The transmission rate tends to be slower as the microwave signal gets stronger. |

PART A Table 1. TCP and UDP Throughput vs. Signal Strength

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Location | Approx. Distance from Access Point (feet) | Signal Strength (from PC)  (dBm) | Noise Power (from PC)  (dBm) | SNR (dB) | UDP Data Rate (Kbps) | TCP Data Rate (Kbps) | Observations |
| a. Wall across 3704 Entry | 30ft | -52 | -83 | 31 | 14600 | 8150 | 1 datagram out-of-order  0% loss |
| b. Next to 3428 Suite Main Entry | 60ft | -57 | -82 | 25 | 10400 | 3980 | 1 datagram out-of-order  0.67% loss |
| c. Next to 3424 Entry | 90ft | -69 | -87 | 18 | 1770 | 1560 | 1 datagram out-of-order  1.6% loss |

Part B Table 2. Noise and Throughput in presence of Microwave Oven

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Microwave Oven Level | Signal Strength  (From PC)  (dBm) | Noise Power  (From PC)  (dBm) | UDP Data Rate  (Kbps) | TCP Data Rate  (Kbps) | Spectrum Analyzer Display Observation | Other Observation |
| Off | -44 | -80 | 19600 | 6580 | Peak at 2.46GHz | 0% loss |
| High | -42 | -83 | 3490 | 2840 | Two peaks near 2.43GHz, one peak at 2.47GHz | 0.92% loss |
| Medium High | -42 | -80 | 3260 | 1980 | Two peaks near 2.43GHz,  one peak near 2.47Ghz | 2% loss |
| Medium | -48 | -80 | 4390 | 6150 | Two peaks near 2.43GHz,  one peak near 2.47Ghz | 55% loss |
| Defrost | -53 | -80 | 7440 | 7810 | One peak near 2.43GHz,  one peak near 2.47Ghz | 0.16% loss |
| Warm | -45 | -81 | 18700 | 4510 | Two peaks near 2.43GHz, one peak near 2.46GHz, one peak near 2.48Ghz | 0% loss |

Microwave power level: 0= off 1=Warm 2=Defrost 3=Medium 4=Medium High 5=High