TECHNICAL REPORT

WIRELESS PROTOCOL

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1 Observations

1.1 Design

Our biggest observation is that good design of the protocol will help a lot in the long run. When problems started to occur because of the original design of the protocol, it was hard to change the design because a lot of groups were already in the middle of coding. For example, the checksum algorithm was not firmly decided which caused many problems for groups when they started to try implement the checksum. These problems should have been addressed in the design process and not in the middle of development.

1.2 Debugging

Debugging was tremendously tedious and we had to use many breakpoints and step through line by line to see what was causing the problem. The protocol analyzer can help with timing issues, but many other issues took a lot of time to find the core issue.

Multiple groups testing with the wireless modem made it difficult for us to accurately produce our test cases. Even if we are rooms apart, the modems still were able to receive ACKs and ENQs.

Often times certain tasks may seem trivial at first but actually took up a lot of time. For example, as a team we had troubles getting check sum to work properly as it will keep on returning undefined behavior.

Timeouts are difficult to accurately synchronize between devices. In order help synchronize better the protocol analyzer was helpful to solve this problem.

1.3 Inconsistent Results

We observed that using different mediums (wireless modem, physical serial cable, and virtual ports) produce different results. The wireless modem and physical serial cable gives the most consistent results but the virtual port often gives randomly corrupted packets.

One observation on packets were that it was either fully corrupted or never corrupted. This could be cause of using the wireless modems in such a close proximity.

2 Conclusion & Recommendations

To conclude, ***design*** is extremely important for the success of any large-scale project. As a team, we were caught off guard on how difficult it was to debug the wireless protocol. There were often mistakes that would takes just one line to fix or the protocol was not well designed so there was a lot of confusion amongst groups.

Some recommendations that we suggest as a team is to be allocated more time to be able to complete the project. With more time in the design period, things can be more cleared before groups started to jump into coding. Everyone needed to be on the exact same page in order for the wireless protocol to work properly.