Ty Valencia

Dr. Freitas

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Networks and Internets - E2E Reflection

End-to-end arguments are policies implemented in multiple layers in order to establish data reliability. Dilemmas are brought up about which level to put each of these arguments in order to maximize optimization. One can be too safe, and this not only makes the transfer slower but also wastes some of the coder’s work effort. There is also the case where the same enhancement can be performed more optimally at a higher level. Sometimes, it is sometimes even better to accept slightly damaged packets than slow down the system. Therefore, these engineers are looking for where to place these policies while upholding a level of balance between effort and safety. The issues brought up that these end-to-end arguments attempt to fix include encryption, duplicate messages, message transience, guaranteed message delivery, and crashes.

One of the ways to fix these guaranteed message delivery is for computers to communicate with each other to check to see if the data is intact and if not, send it again. This was first implemented in ARPANET per message but has since been optimized. Encryption can be optimized with an end-to-end argument to eliminate automatic encryption of all traffic. For this, new issues arise, as it would need to obtain keys securely, data would still be vulnerable as they pass into the target node, and authenticity would still need to be checked. Duplicate messages are hard to suppress at the lower level and are usually managed at a higher one. For message orders, FIFO can be used, but getting multiple requests still requires a higher-level implementation.

I found the duplicate message suppression example interesting to learn about because I would find myself getting impatient and opening another tab sometimes. I also found the MIT example fascinating because such an error such as a byte pair being interchanged one every million bytes passed is such an obscure one, yet it still destroys the system.

I found the encryption portion of the End to End argument a little bit confusing because I still didn’t understand how our data is transferred safely.