

Assignment: Protocol Report

This assignment is to be done in a team of 2 students. Please choose a communications protocol of interest to you. For your chosen protocols you are to create a diagram on paper and make a short oral report to the class. Cover the six items below with enough detail to show that you really thought about the issue and got some traction (don't repeat an explanation that you yourself do not understand). Treat this report as if your boss has assigned you to report on a protocol that your team must implement in the next project, and you are giving an overview to the team. The report will be judged on the standards that would be expected in a realistic professional assignment of that type.

1. Identify the entities that communicate with one another using this protocol. In most cases there are two entities with one acting as the client and the other as the server, or caller and callee. But in some protocols there may be three kinds of entities with a third entity acting as a manager, facilitator, or go-between.
2. Describe how devices identify themselves on the network, and become known to other devices on the network. If initial connection involves a handshake, describe the handshake. If identities are given, describe how the identities are assured to be unique.
3. Discuss the issue of traffic and congestion., Describe how the network and protocol addresses the problem of either too many devices trying to use the network at the same time or trying to push too much data through the network. Do devices take turns (how do they know?). Do devices tell get told to stop or wait? Do devices get told to slow down or speed up? How are control signals separated from data?
4. Discuss the issues of security.
 - a. Does the protocol address the issue of privacy? If so, how? If not, what risks might exist?
 - b. Does the protocol protect against malicious interlopers on the network? If so how? If not, how might the network be exploited or compromised by someone who could connect a malicious device to the network?
 - c. How does the protocol recover after a failure, i.e. after a power outage or some other breakdown?
5. Is efficiency a concern? Does the protocol have features to optimize data transmission rates? What does it do to control or adjust speeds? What if different devices have different speed capabilities?
6. How does the protocol address communication failures? What kinds of failures are addressed? Suggest two kinds of failures that are not addressed, and discuss what could happen to senders and receivers in a failure of that kind.

As part of a verbal presentation, you should explain why the protocol does what it does, and mention additional details of the handshake messages that are significant (i.e. format or timing). Issues that might be important include signal quality, and processing or buffer limitations.

If there is a sequence, such as an initial handshake, create a diagram showing which messages are sent in which direction.

Choose from the following protocols. You may suggest others, but you will need instructor permission. See, for example, https://en.wikipedia.org/wiki/List_of_automation_protocols, <http://www.sunluxtech.com/downloads/protocols.pdf>, <https://www.link-labs.com/blog/complete-list-iot-network-protocols> https://en.wikipedia.org/wiki/List_of_interface_bit_rates,

Protocol	Student
5G (cellular - proposed)	
AFDX, ARINC 664-P7 (aircraft)	
ARINC 429 & 629 (plane sensors)	
Bluetooth	
Byteflight (cars)	
I2C, CAN/ISO 11898 (vehicle)	
DO-160,-178,-254 (certifications)	
DOCSIS (cable, microwave)	
DSL, ADSL (phone modem)	
Fibre Channel, FCoE	
Firewire (IEEE 1394)	
Frame Relay	
H323 (video)	
IEC 61375 (trains)	
IEEE 488, GPIB (instruments)	
Kerberos (security)	
LDAP (identity)	
LTE (cellular)	
MIL-1553B (military)	
NFC, RFID, Dash7 (near)	
NFS (remote files)	
PCIe (PC bus)	
SCSI, iSCSI (PC data & control)	
Thunderbolt	
TOR, BitTorrent (P2P)	
USB3.1, USBc	
Zigbee, Z-Wave (low power)	