# Data Communications

## Frame Structure in Ethernet Protocol

Assume you want to send a message using Ethernet protocol. The frame layout is as shown below:

***Preamble (7 Bytes), SOF (1 Byte), Destination Address (6 Bytes), Source Address (6 Bytes), Length (2 Bytes), Data (0-1500 Bytes), Pad (0-46 Bytes), CRC (4 Bytes)***

The message is “Hello”. The destination address is ***329910B4F10A***.

1. Find the source address (the MAC address of your computer) and fill in each field of the frame except for the CRC code ***in hexadecimal***.
2. Draw the signal graph for the first 4 bits of each field using Manchester encoding (Manchester encoding is used by standard Ethernet).
3. Compute the time needed to put the frame on the wire considering the date rate of the standard Ethernet (10 Mbps).
4. Assume the distance to destination is 200 meters. Compute the time needed for the signal to arrive at the destination host (propagation delay)
5. Now find the total transmission time which is the time when the first bit is put on the wire by the sender till the last bit is read by the receiver.