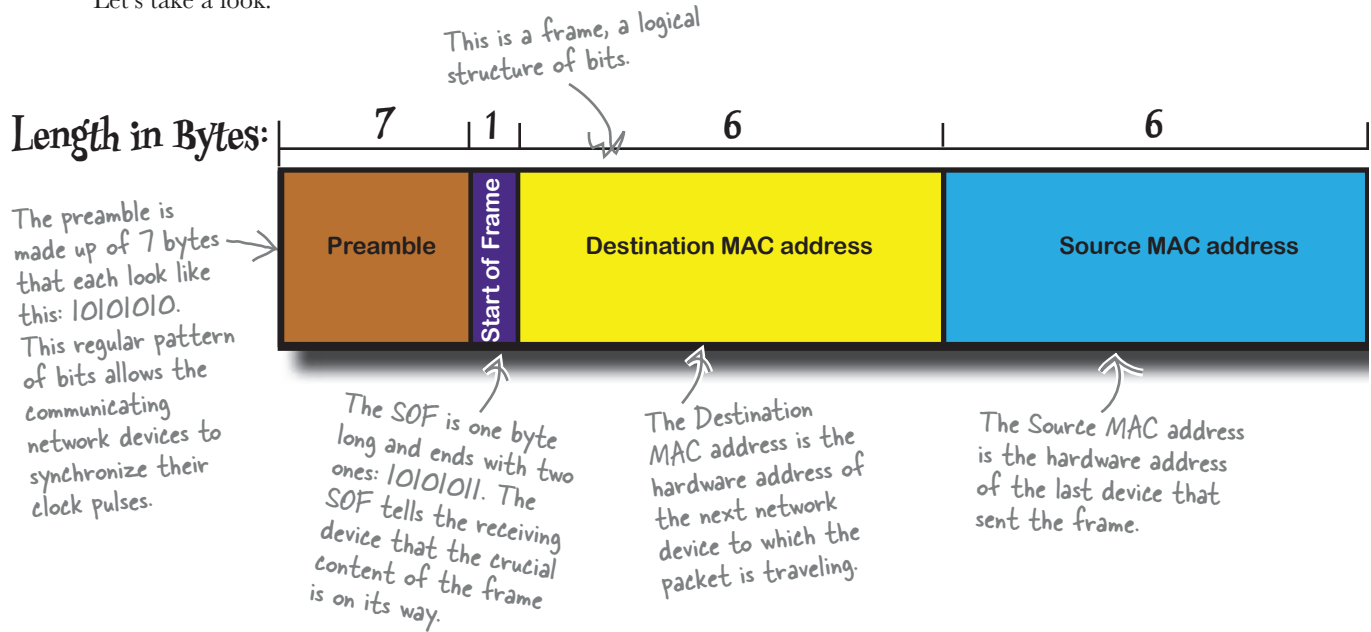# Frames and Packets Up Close

A frame is a logical structure of bits that organizes network traffic so every device knows how to read the information inside of it. Inside the frame is another structure called a packet. It's the real meat of the frame.

Let's take a look:

This is a frame, a logical structure of bits.

Length in Bytes:

7	1	6	6
Preamble	Start of Frame	Destination MAC address	Source MAC address

The preamble is made up of 7 bytes that each look like this: 10101010. This regular pattern of bits allows the communicating network devices to synchronize their clock pulses.

The SOF is one byte long and ends with two ones: 10101011. The SOF tells the receiving device that the crucial content of the frame is on its way.

The Destination MAC address is the hardware address of the next network device to which the packet is traveling.

The Source MAC address is the hardware address of the last device that sent the frame.

To give you a sense of how much information is packed into ONE frame, we've written a frame in binary below.

Preamble   Start of Frame

Destination MAC address

10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101011 00000000 00100101 01000010 11111111 00

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Ethertype tells what
is being transported
in the payload.

The Cyclic Redundancy Check (CRC)
is a number that allows the receiving
hardware (the NIC) to check if the
frame contains any errors.

2	46 – 1500	4
Ether Type	Payload	CRC

The payload is the meat of the
frame. It holds the data being sent.

The payload of a frame is actually
another structure called a packet.

IP Header	IP Destination Address	IP Source Address	TCP Destination Port	TCP Source Port	TCP Header and Data	TCP CRC	IP CRC
12	4	4	2	2	14+	4	4

Length in Bytes

Source MAC address

EtherType

Payload

Keep going!

llloll loollooo ooooοooo ooolooΙo oollolll ooIlllll olloIΙoo loloIoΙo loΙΙΙllo ΙllolΙlo loΙoΙoΙo loloΙoΙo