Heltec LoRa 32: Hands-On

Week 3 - Part 2
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Update

Starting today, we will move forward with the Heltec LoRa 32 device. This was a device you all received, and is capable of using LoRa technology.

This weeks assignment is adjusted to no longer focus on Internet Protocols.

LoRa 32 is a device developed by Heltec that can trasmit WiFi, BLE, and LoRa.

The chipset ESP32 used in it works with Arduino IDE after installing a few libraries.

WHAT IS HELTEC LORA 32

BASIC KNOW HOW

The device can be powered through usb or the batteries given to you. Plugging both a battery and usb in will charge the battery.
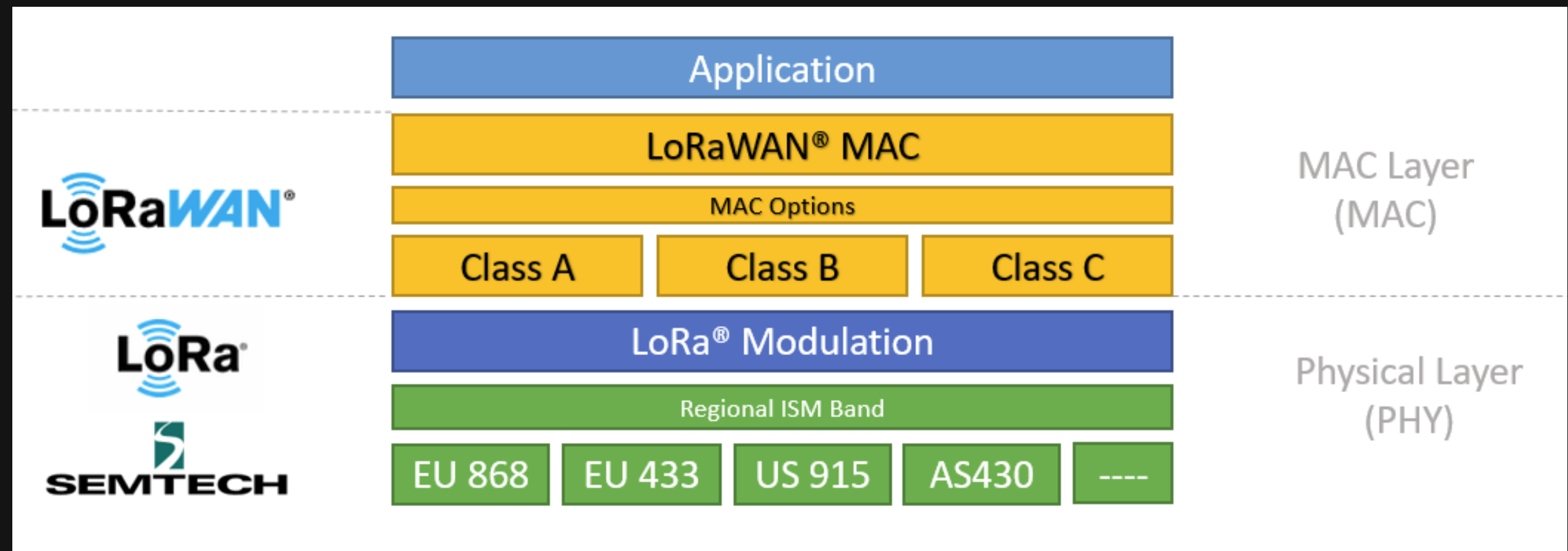
This device can be programmed with Arduino IDE, an open-source platform to develop boards.

After setup, this device uses standard LoRaWAN protocol, meaning it can communicate with almost any LoRa gateway.
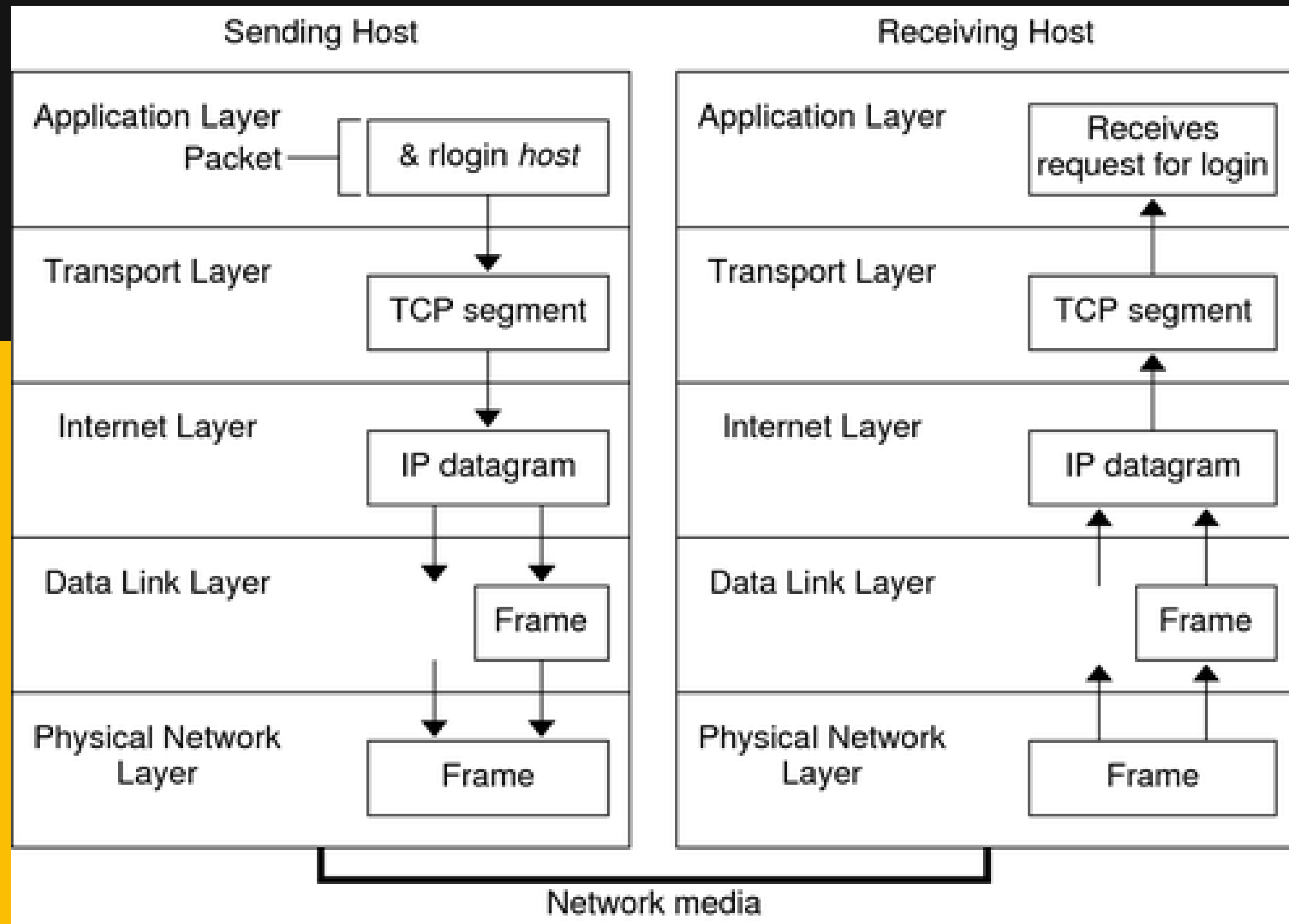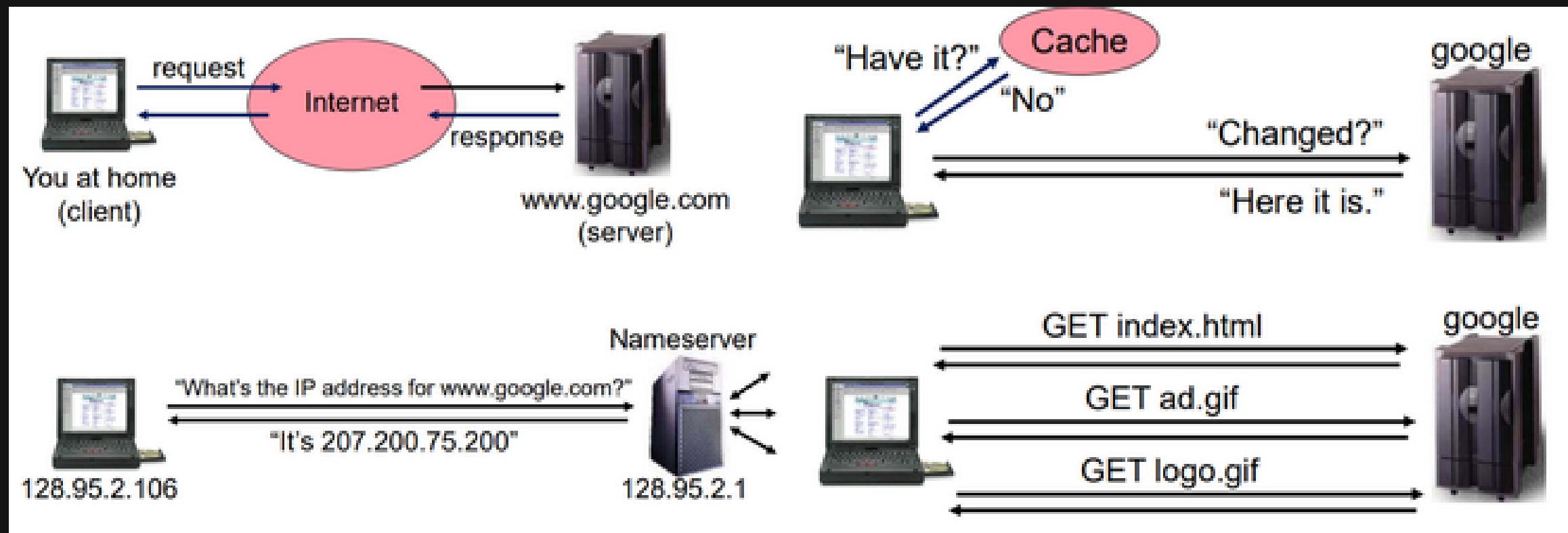
LORAWAN STACK

The LoRaWAN Stack better portrays the split between it and LoRa.
The physical layer contains the radio frequencies, ISM Bands, and LoRa's proprietary tech.
The MAC Layer contains the three Classes of End Nodes, MAC options, and finally the application/software.
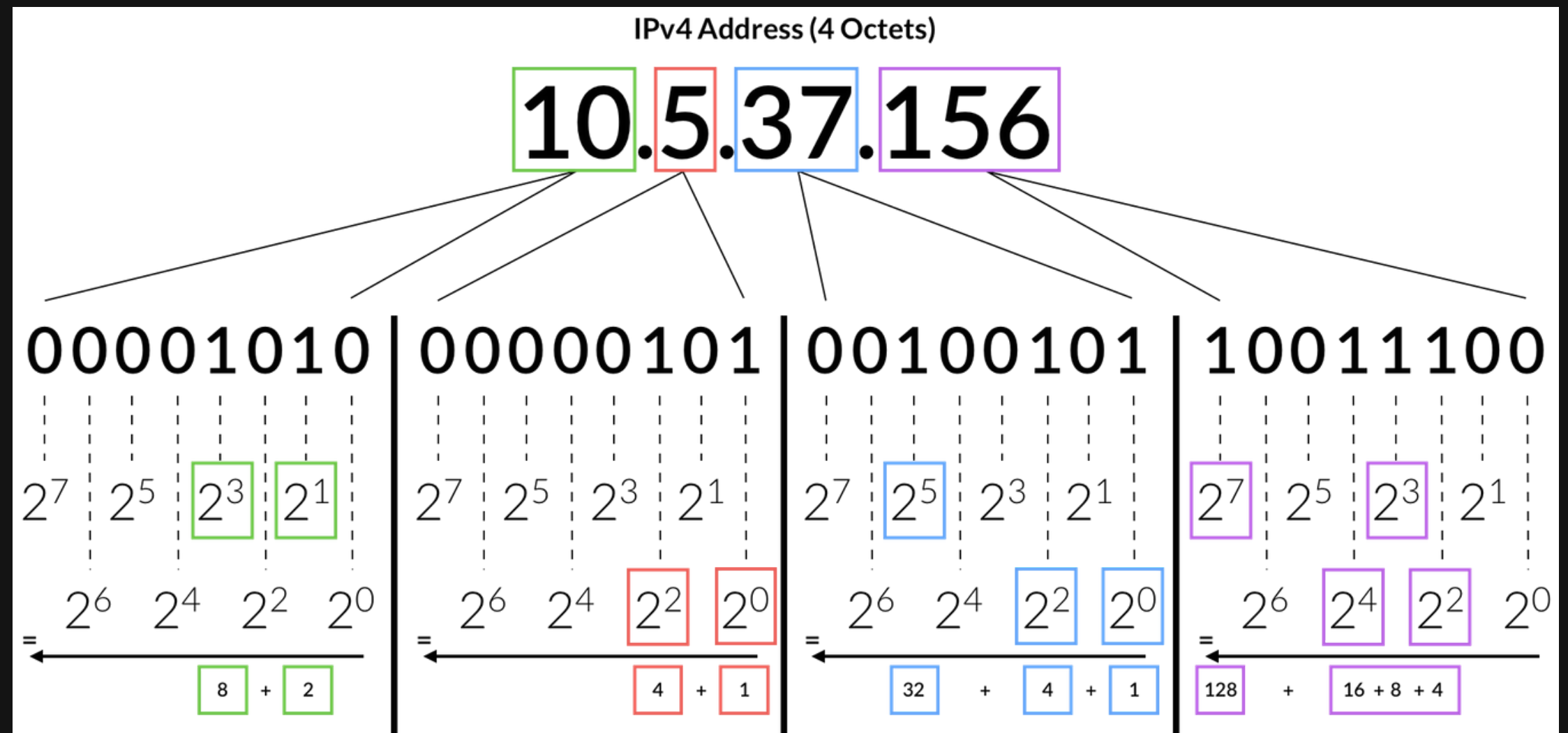
INTERNET STACK

The Internet Protocol Stack is a similar idea to the previous. There is a connection between a sender and receiver with layers breaking the message down to the physical layer.

BASICS OF THE INTERNET

The internet works on hardware to hardware communication. Your device sends wireless signal to a wired connection, and vice versa.

IP ADDRESSING

IPv4 Address (4 Octets)

10.5.37.156

00001010	00000101	00100101	10011100
2^7 2^5 2^3 2^1	2^7 2^5 2^3 2^1	2^7 2^5 2^3 2^1	2^7 2^5 2^3 2^1
2^6 2^4 2^2 2^0	2^6 2^4 2^2 2^0	2^6 2^4 2^2 2^0	2^6 2^4 2^2 2^0
= 8 + 2	= 4 + 1	= 32 + 4 + 1	= 128 + 16 + 8 + 4

Physical address assigned to each and every device connected to the internet.

Every device is uniquely identified. Allow us to send data to correct locations.

IP Addressing happens at the Internet Layer. The Physical Network Layer laters converts into hardware address.
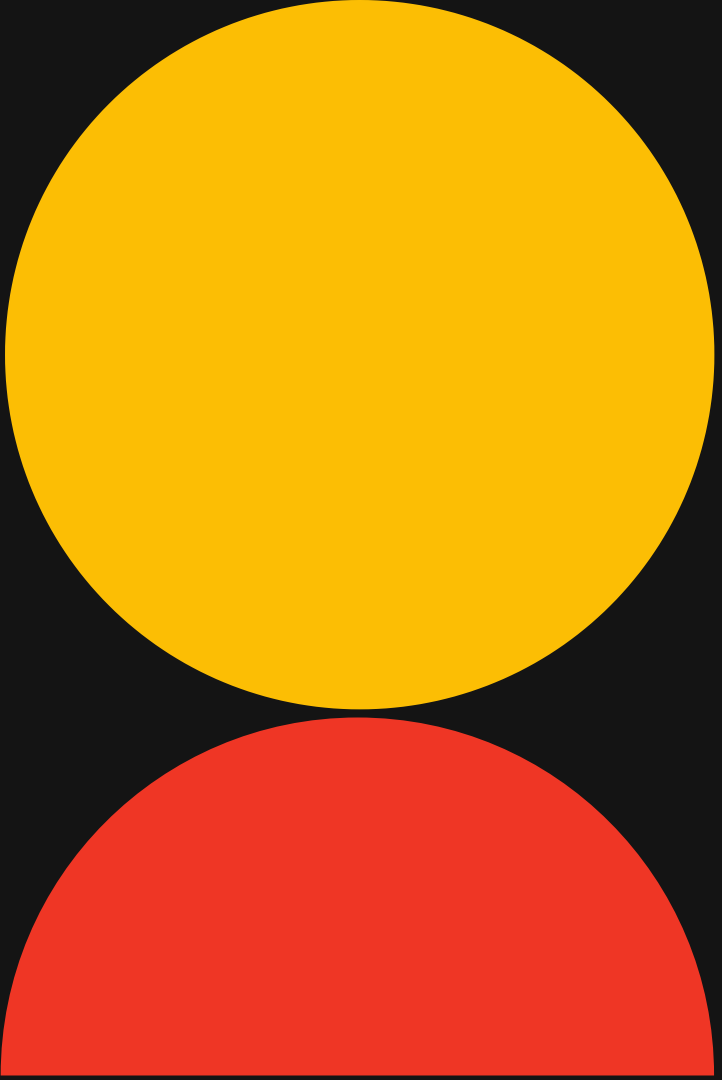
WEEK 3 ASSIGNMENT POSTED

This weeks assignment will have you work through setting up the Heltec device with Arduino IDE. You will need to have this done before next week, as we plan to delve into sending messages.

There will also be questions about basic internet protocol.

We will use Friday for troubleshooting and questions.

Questions