

Introduction

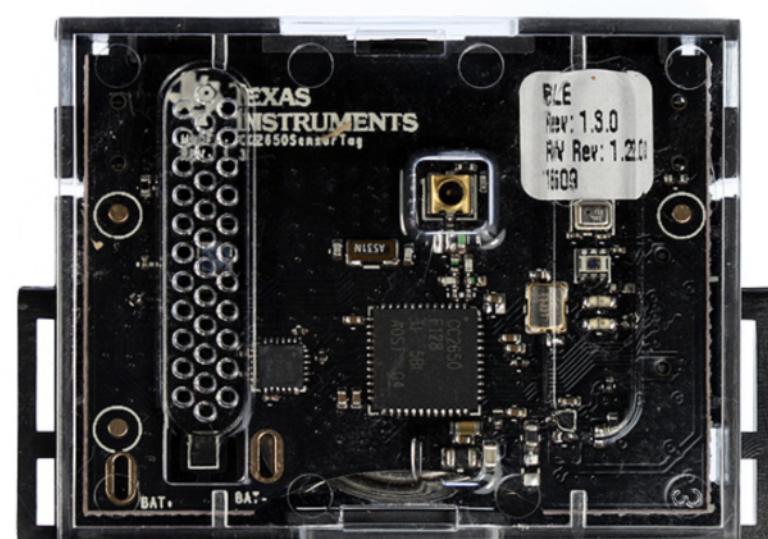
- Designed system for wireless Kirio Smart home.
- Focused on Internet, Transport, and Application layers in OSI model.
- We Developed a low-power wireless client-server system for Kirio smart home with connecting devices and sensors.
- <https://www.mykirio.com/>

Function of Wireless Smart Home

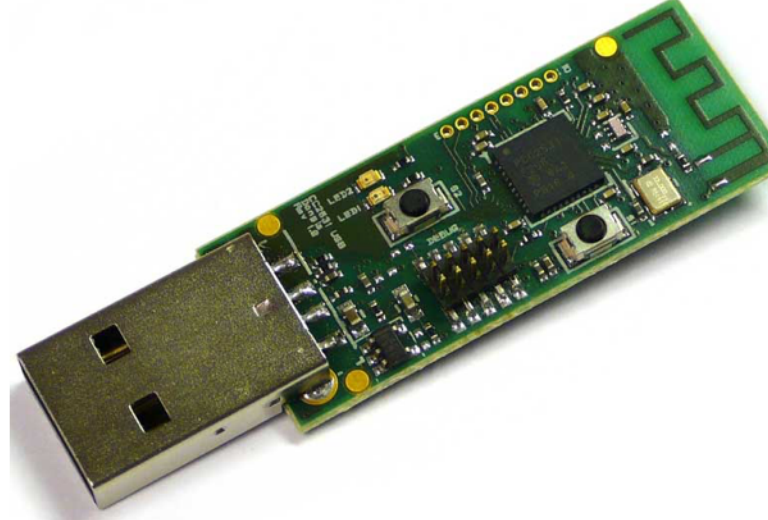
- Showing the temperature, humidity, and light Intensity of the environment of the house in The WebSocket.
- Reducing the electricity cost of the smart home devices with using low power TI sensors.

Devices

TI CC2560 Sensor



TI CC2531 Dongle



Software

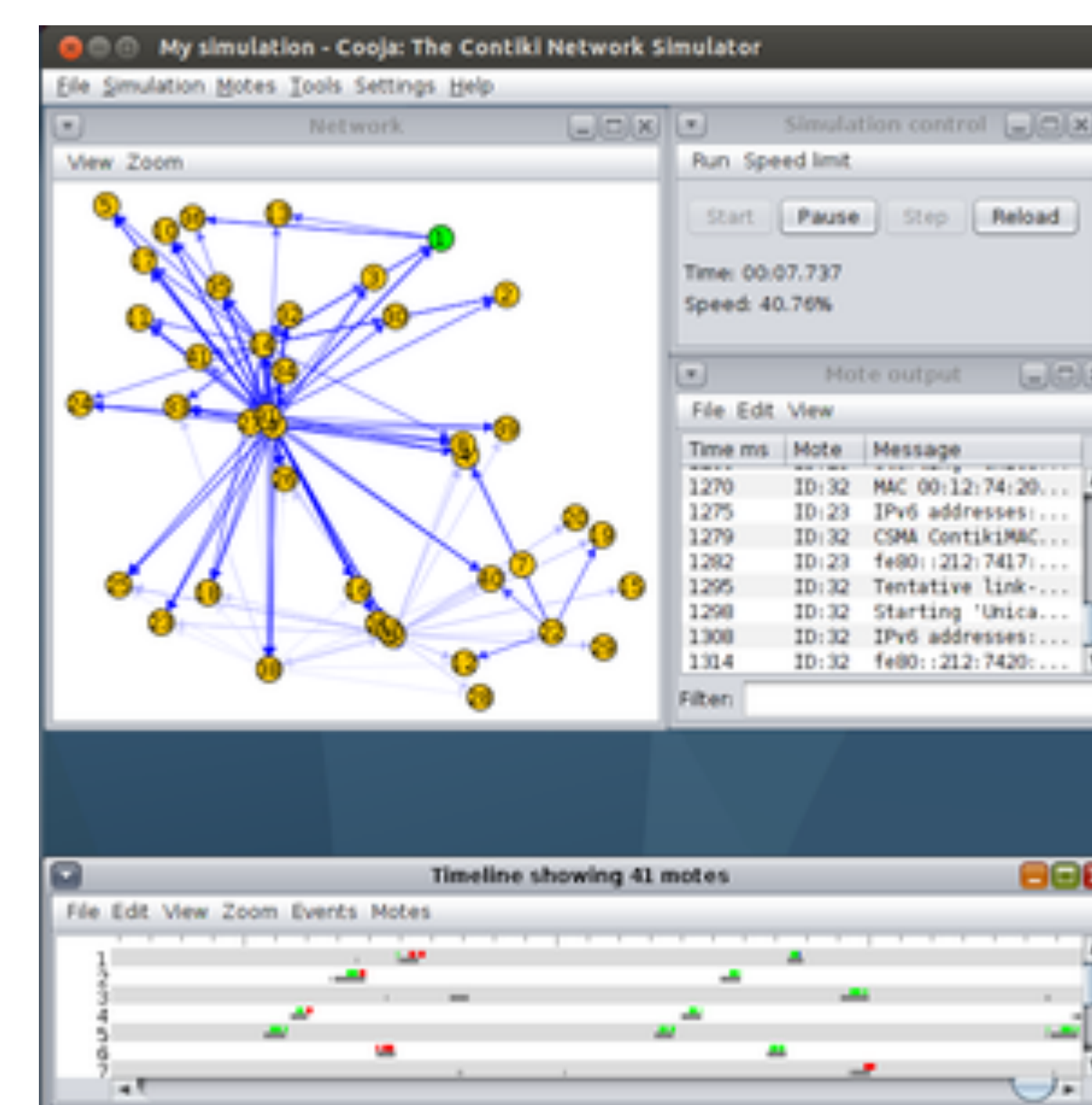
The software used to design Wireless Kirio Smart Home:

- Linux & Kernel
- C programming
- CCStudio (for Programming & transferring the code to the sensor)
- Uniflash
- Packet Sniffer
- Cooja simulation

Contiki

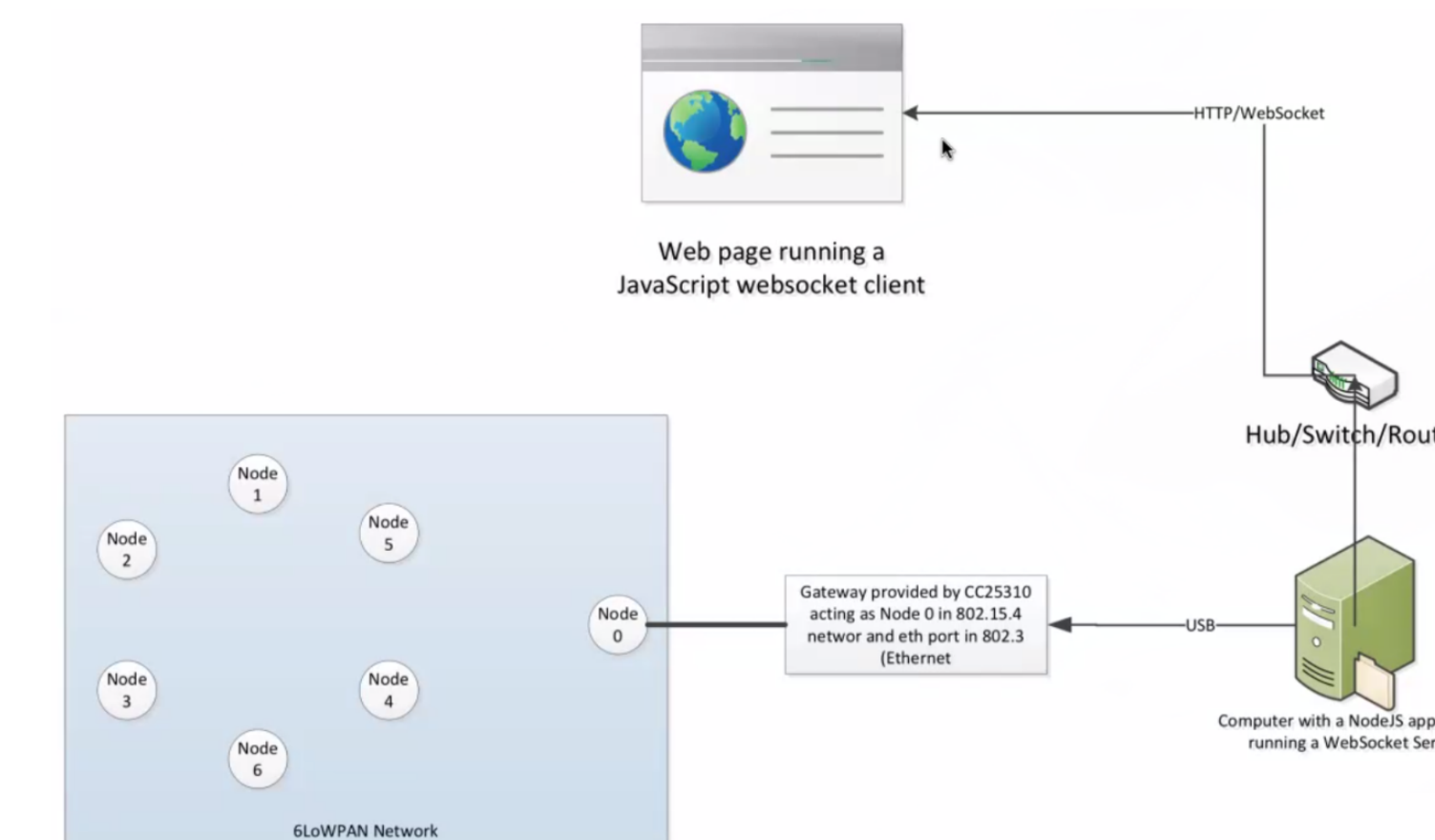
The Open Source OS for the Internet of Things

```
1 #include "contiki.h"
2 #include "contiki-lib.h"
3 #include "contiki-net.h"
4
5 #include <string.h>
6
7 #define DEBUG DEBUG_PRINT
8 #include "net/ip/uip-debug.h"
9
10 #define SEND_INTERVAL CLOCK_SECOND
11 #define MAX_PAYLOAD_LEN 40
12
13 static struct etimer et;
14 static uip_ipaddr_t addr;
15 static char *str;
16
```

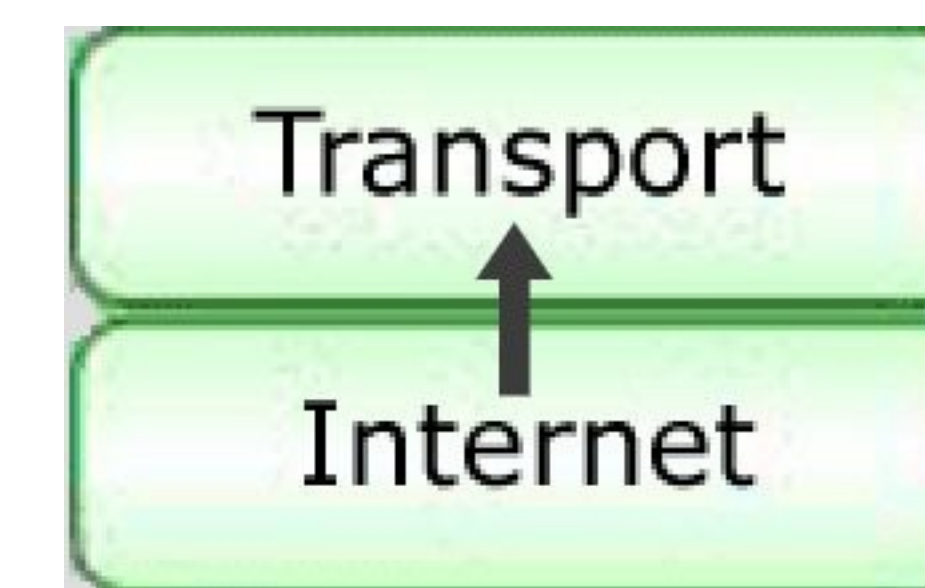


Architecture

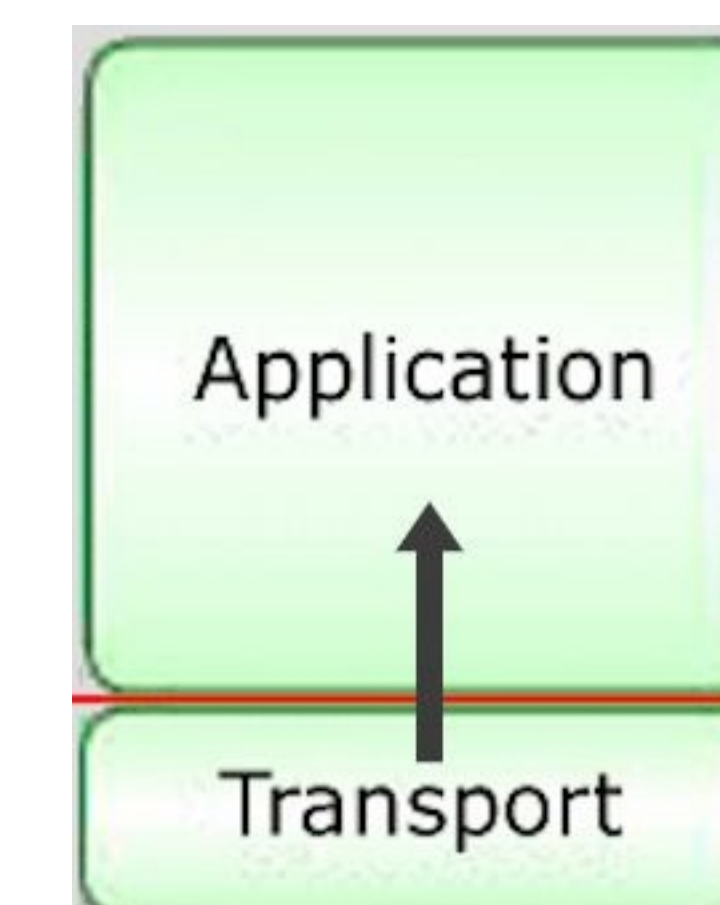
- Used TI CC2650 sensors as server.
- Used a TI CC2531DK Dongle as client.
- Client takes data from the servers and transfers it to WebSocket.



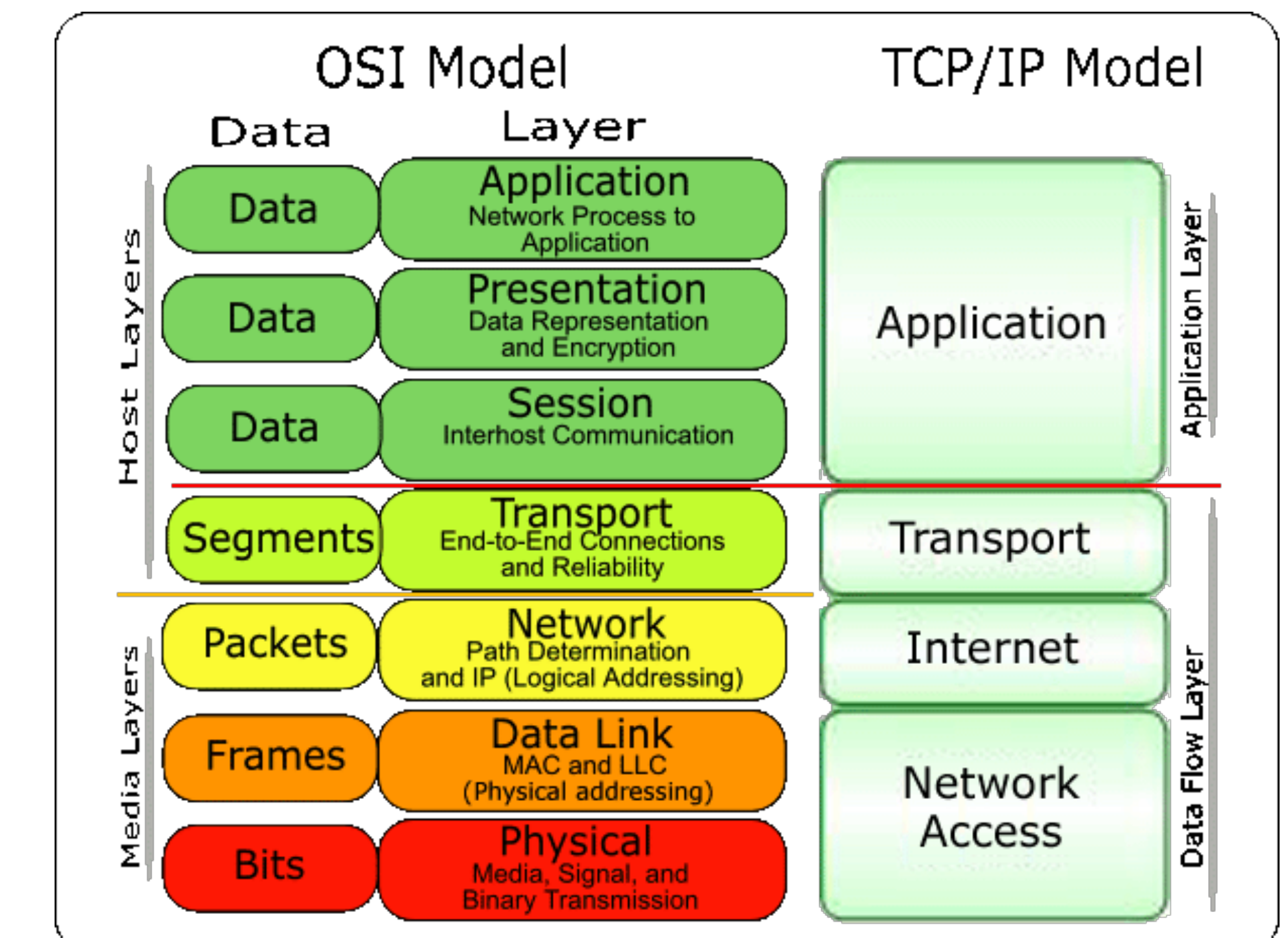
- Used UDP/IPv6 for transmission between Internet and Transport layers.



- Used Modbus over UDP for transmission between Transport and Application layers.



Overview of OSI Model



Result:

As the result, the connection in OSI layers were built and the wireless system for Kirio Smart Home were made. Information from the sensors with WebSocket was taken.

Reference: "Contiki." *Wikipedia*, Wikimedia Foundation, 23 May 2018, en.wikipedia.org/wiki/Contiki. contiki-os. "Contiki-Os/Contiki." *GitHub*, 8 Mar. 2018, github.com/contiki-os/contiki/.