Final Project

An Ad-Hoc Publish/Subscribe System Over Zigbee Sensor Network

Xinyu & Tao
What we do

Bluetooth -> topic: /user_present
Coffe <= topic: /user_present

Thermometer -> topic: /temperature
Light <= topic: /temperature

Alarm -> topic: /get_up
Bed <= topic: /get_up

MQTT-SN

Publish/Subscribe

More!
Hardware Architecture

What we plan to do

Based on the Pub/Sub system:

- Bluetooth publishes `/user_present` topic
- Pi subscribes `/user_present` and control the light.
- Laptop monitor all data by subscription.

`Bluetooth = Zigbee => Proxy
Pi <= Zigbee = Proxy`
Hardware Architecture

What we really do… (lack of time)

Bluetooth $\rightarrow$ wifi $\rightarrow$ Proxy

Laptop $\leftarrow$ Zigbee $\rightarrow$ Proxy

Laptop $\leftarrow$ Zigbee $\rightarrow$ Proxy

Pi $\leftarrow$ Wifi $\rightarrow$ Proxy
Software Architecture

Tools

MQTT-SN

MQTT

C++

Python

MQTT-SN

MQTT-SN client

MQTT-SN Gateway

MQTT-SN Forwarder

MQTT-SN Gateway

MQTT

client

gw

CONNECT

CONN ACK

DISCONNECT

PING REQ

PING REPLY

client active

client asleep

client awake

client asleep

DISCONNECT (sleep duration)
Result

Conclusion

- System works as expected.

Limitation

- Do not take deadline into consideration.
- Network Bandwidth is restricted by gateway.