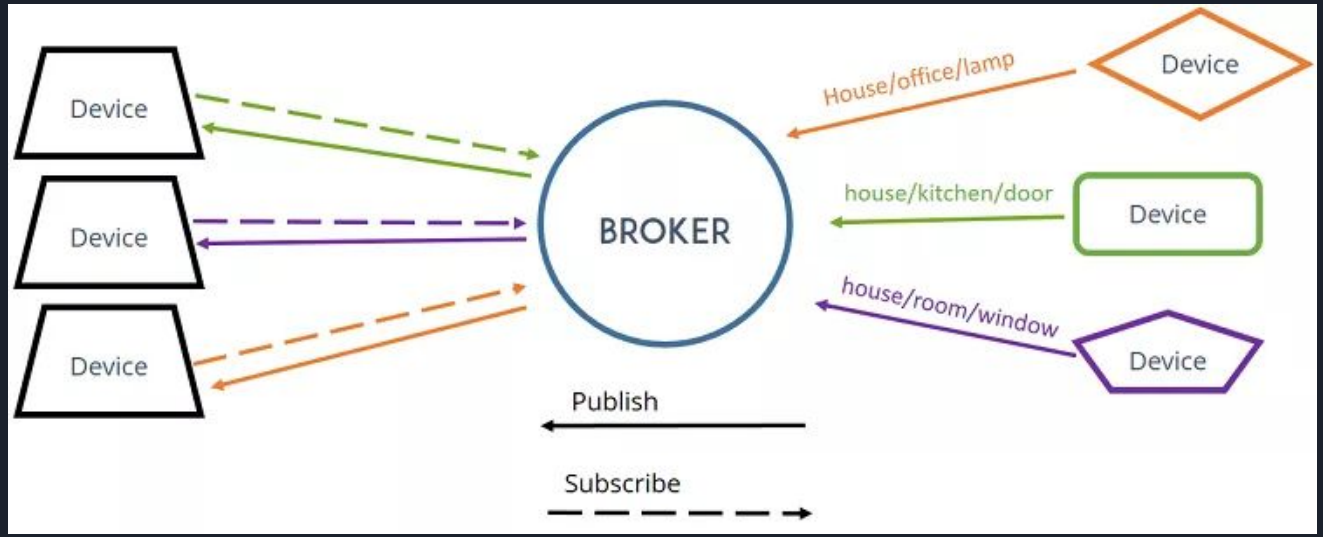
IOT Lab Assignment 3

mqtt

What is MQTT?



MQTT is messaging protocol

h/t https://www.youtube.com/watch?v=EIxdz-2rhLs (Video explaining mqtt that i took diagrams from)

MQTT - **MQ T**elemetry Transport

Simple communication between multiple devices → Simple **messaging protocol**

- Constrained devices
- Low bandwidth

Perfect solution for Internet of Things applications

MQTT Basic Concepts

- → Publish/Subscribe
- → Messages
- → Topics
- → Broker

MQTT Broker

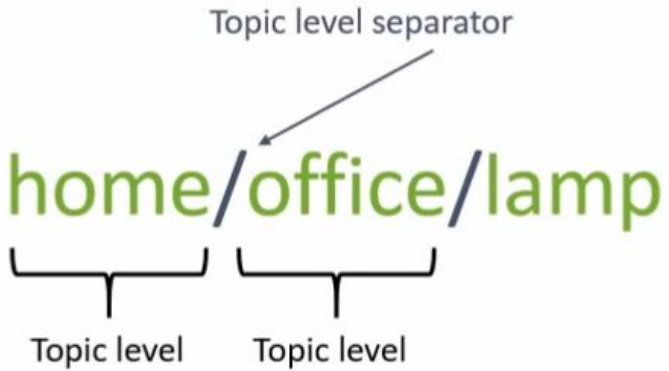
- Receives all the messages
- Filters the messages
- Publishes the messages to all subscribed clients

Topics

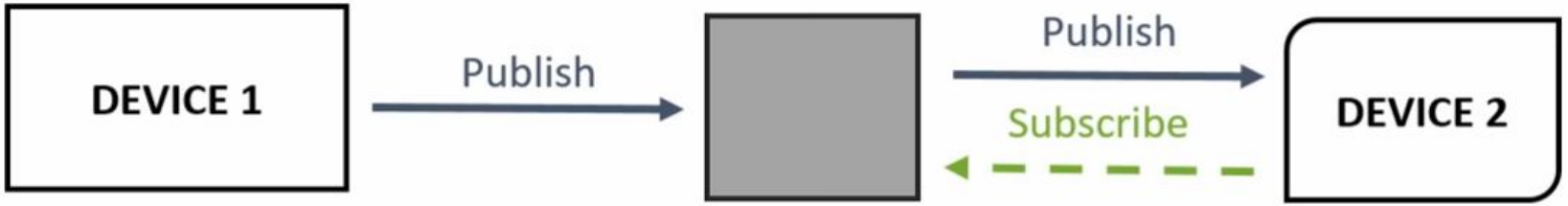
- Interest for **incoming messages**
- Specify **where** you want to **publish**

Topics are represented with **strings** separated by **slashes “/”**
Slashes indicate the **topic level**

Topics - Example



Publish/Subscribe



- Device 1 publishes on a **topic**

- Device 2 is subscribed to the **same topic** in which device 1 is publishing in

- Device 2 receives the **message**

Messages: information exchanged between your devices – **command** or **data**

Setting up the broker on your pi

sudo dnf install mosquitto (install mqtt software)

sudo firewall-cmd --permanent --add-port=1883/tcp (let it through firewall)

service firewalld restart (restart firewall)

systemctl enable mosquitto (enable service on reboot)

systemctl start mosquitto (start mqtt)

systemctl status mosquitto (make sure it’s running)

Test the broker

HOST = you pi's ip address (use the command 'ip a' to get this)

Run this command in one terminal mosquitto_sub -h HOST -t /test

Run this command in another terminal mosquitto_pub -h HOST -t /test -m 'im a message'

You should see 'im a message' show up in the first terminal

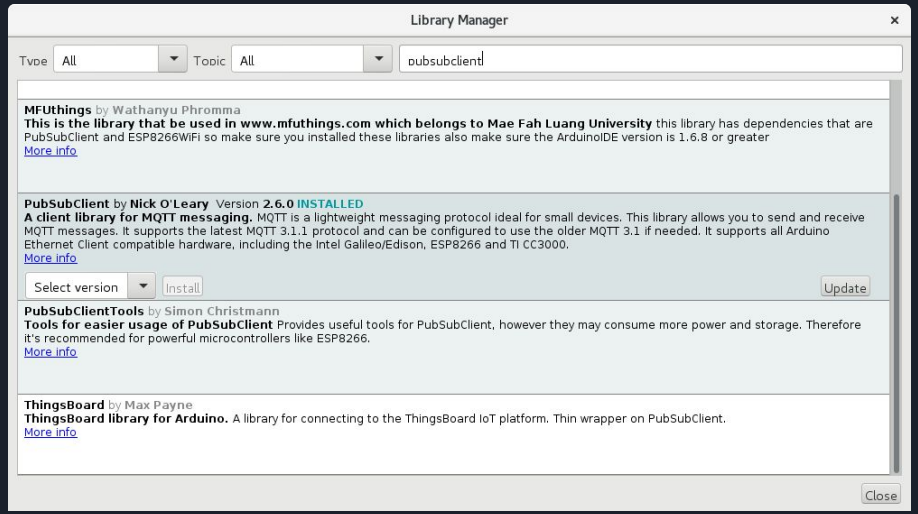
Install paho-mqtt library on pi

Sudo pip install paho-mqtt

Docs: https://github.com/eclipse/paho.mqtt.python

Install PubSubClient in arduino ide

Sketch -> Include Library -> Manage Libraries -> PubSubClient



Docs: https://pubsubclient.knolleary.net/api.html

Send message from pi to arduino

Sendtoarduino.py & getmessagefrompi.ino

Send message from arduino to pi

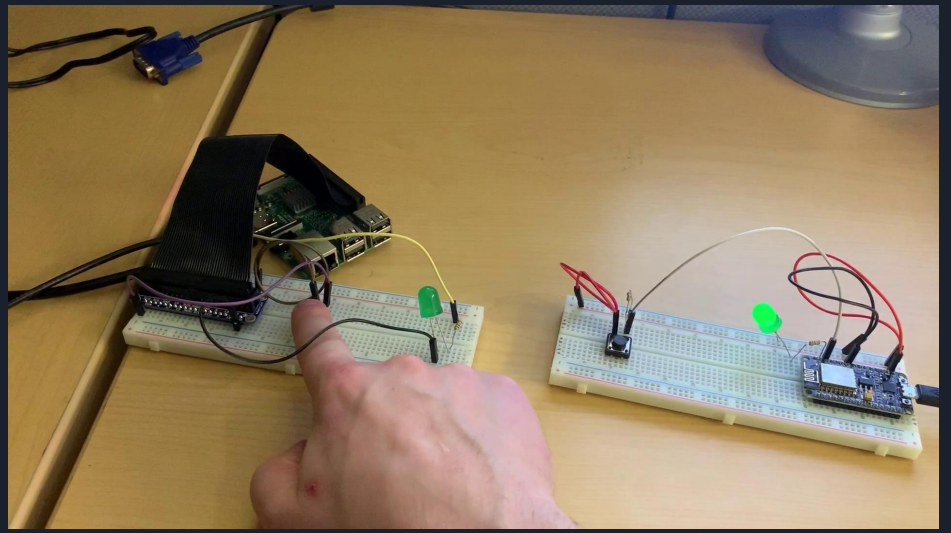
Getmessagefromarduino.py & sendtopi.ino

Do something with the message

Blinklight.py & blinklight.ino

Assignment

- Set up mqtt broker on pi
- Create a python and rduino program that communicate with mqtt to allow you to click and button on the pi to toggle the state of the led on the arduino and vise versa.
- Take a video of yours and send it to me before next class dpivonka@redhat.com



Wifi you can use in the lab

Ssid: dan_2

Pw: supersecretpassword

How to use wifi on pi: https://fedoraproject.org/wiki/Architectures/ARM/Raspberry_Pi#Using_Wi-Fi_on_CLI