UNIVERSITY OF SCIENCE - VNUHCM
Faculty of Information Technology

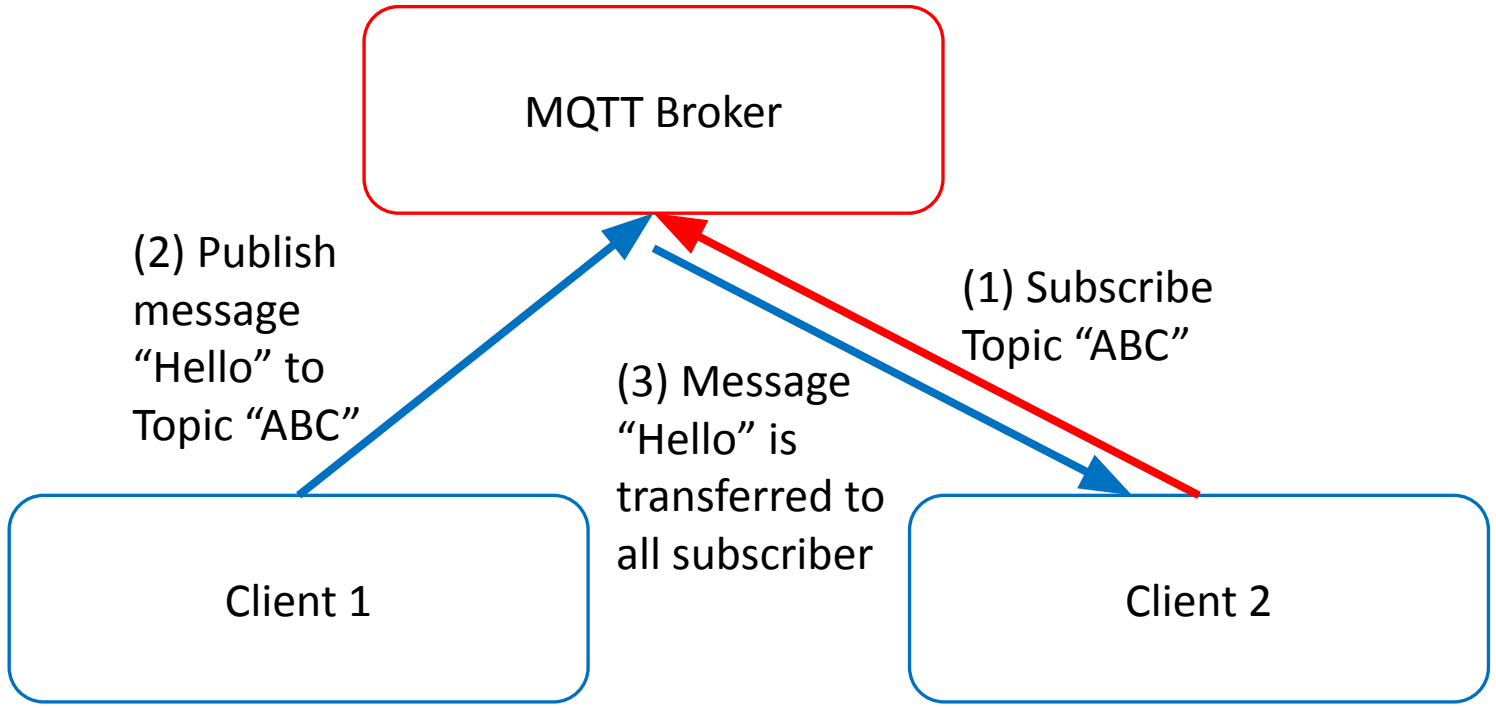
INTERNET OF THINGS

3.6

MQTT

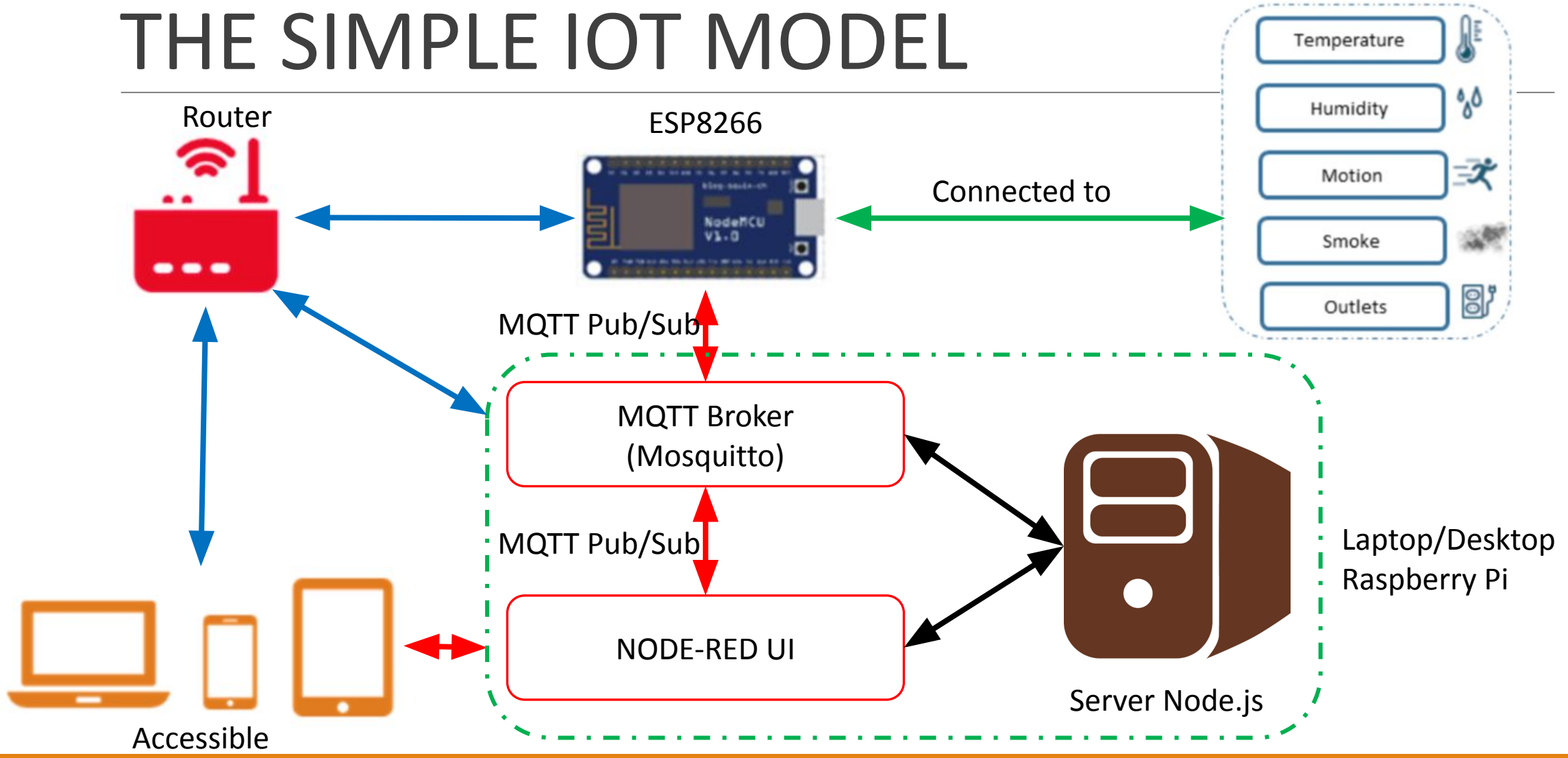
MQTT

WHAT IS MQTT?



- **MQTT (Message Queuing Telemetry Transport)** is a publish-subscribe network protocol that transports messages between devices.

THE SIMPLE IOT MODEL



INSTALL MOSQUITTO MQTT BROKEN

Install Mosquitto MQTT Broken following by this instruction:

https://mosquitto.org/download/

START MOSQUITTO

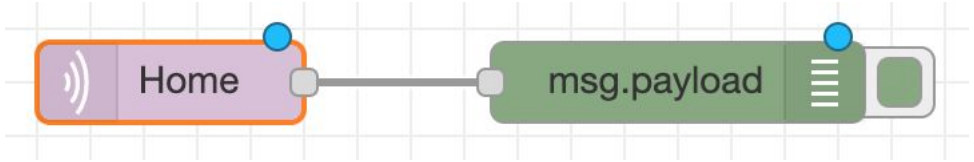
- On Windows:
  - Open Command Prompt
  - Navigate to the Mosquitto root folder, such as "**C:\Program Files (x86)\mosquitto**"
  - Running the command: **net start mosquitto**

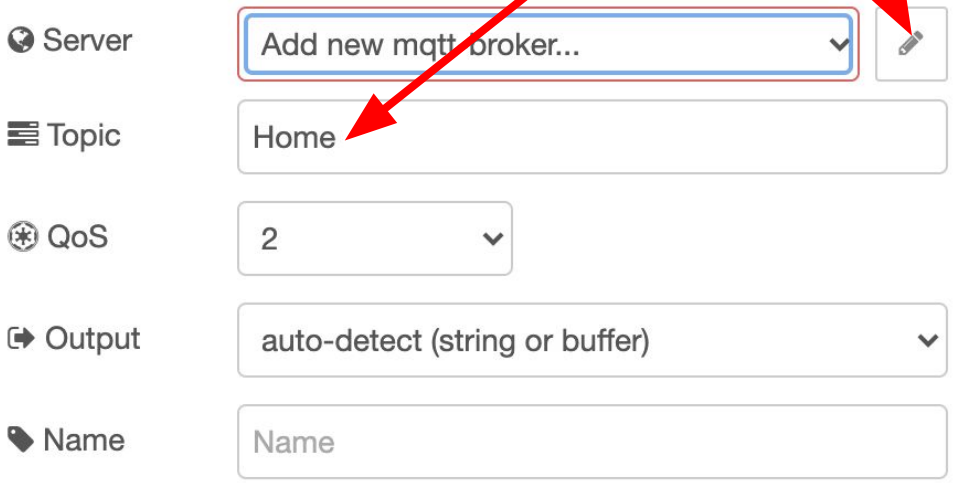
- On MacOS:
  - Open Terminal
  - Navigate to the Mosquitto root folder, such as **"/usr/local/sbin/"**
  - Running the command: **mosquitto –c /usr/local/etc/mosquitto/mosquitto.conf**

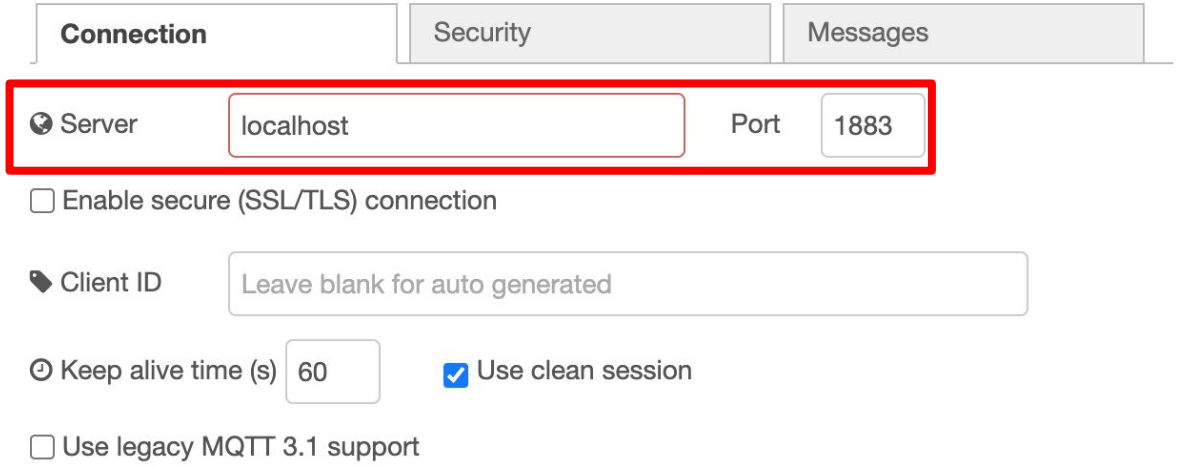
HELLO WORLD!

Sample Topic: **home/kitchen/lamp**

- Drag & Drop a "**mqtt in**" node and **Debug** node
- DoubleClick this node to **configure mqtt broker** and **subscribe a Topic**

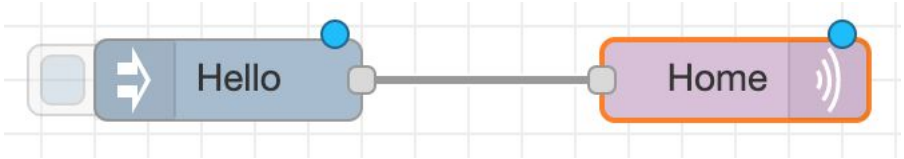


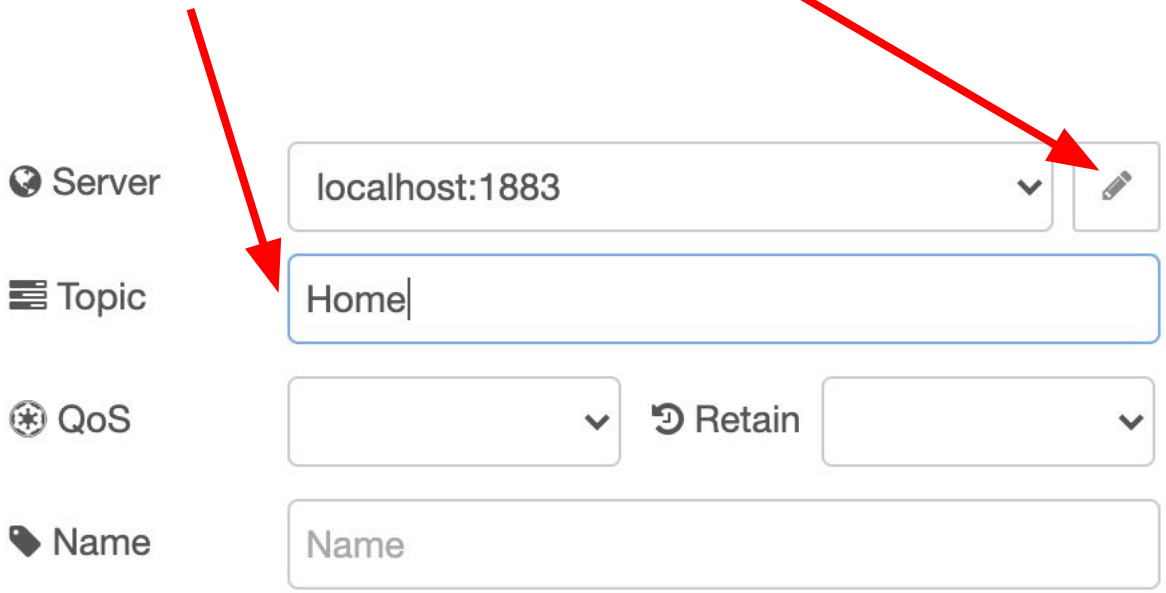




HELLO WORLD! (tt)

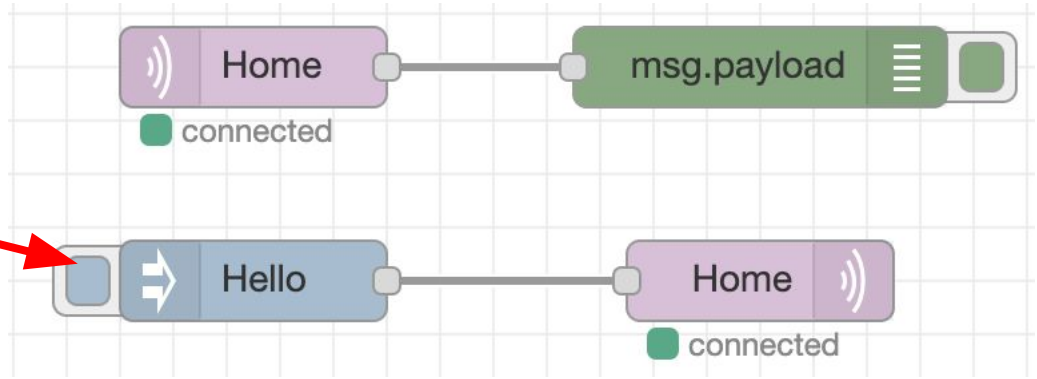
- Drag & Drop a "**mqtt out**" node and **Inject** node
- DoubleClick this mqtt node to **configure mqtt broker** and **publish a Topic**

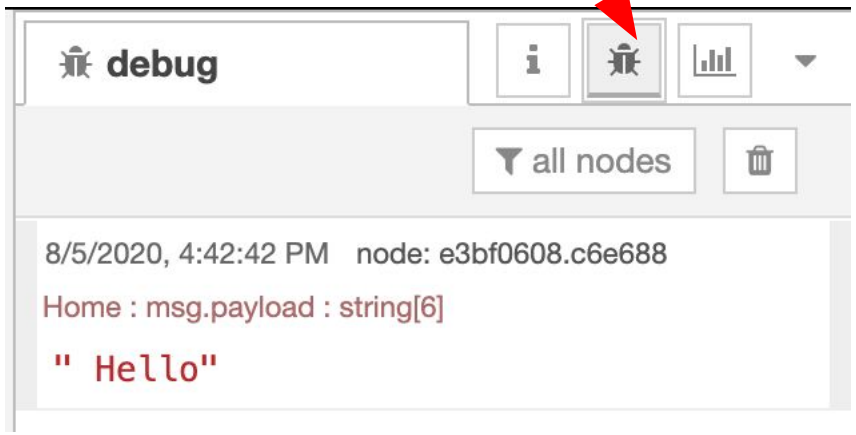




HELLO WORLD! (tt)

- Deploy
- Trigger Inject node
- View the result on Debug window

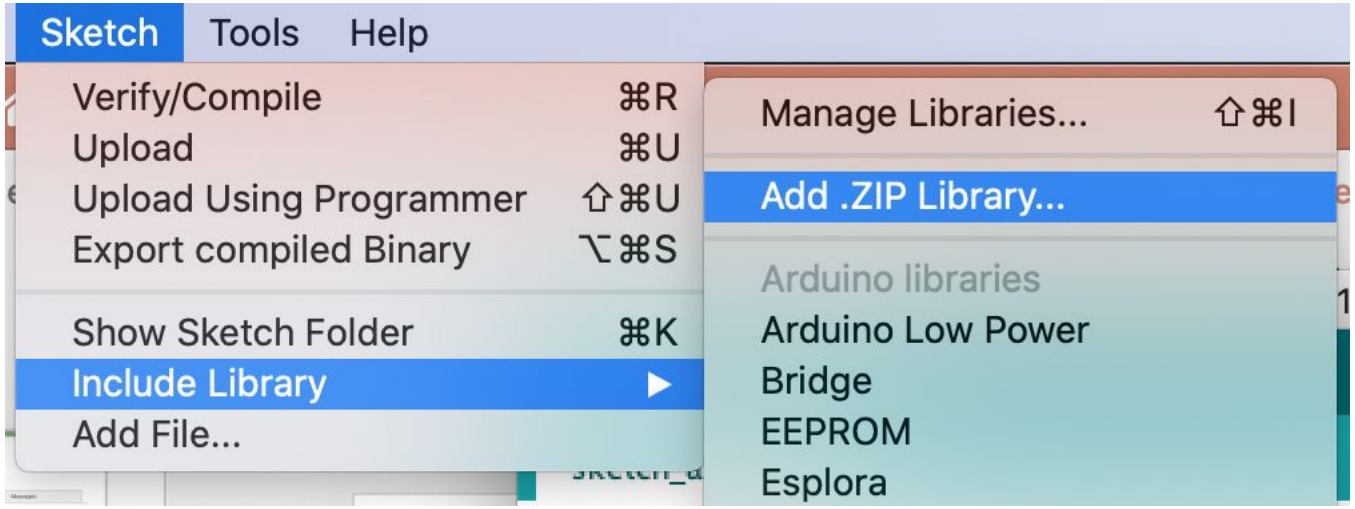




ESP8266 + NODERED

SETUP PUBSUBCLIENT LIBRARY

- **PubSubClient Library** provides a client for doing something publish/subscribe messaging with a server that supports MQTT.
- Download lib from here: https://github.com/knolleary/pubsubclient/archive/master.zip
- Import Zip file into the Arduino IDE.
- Restart Arduino IDE



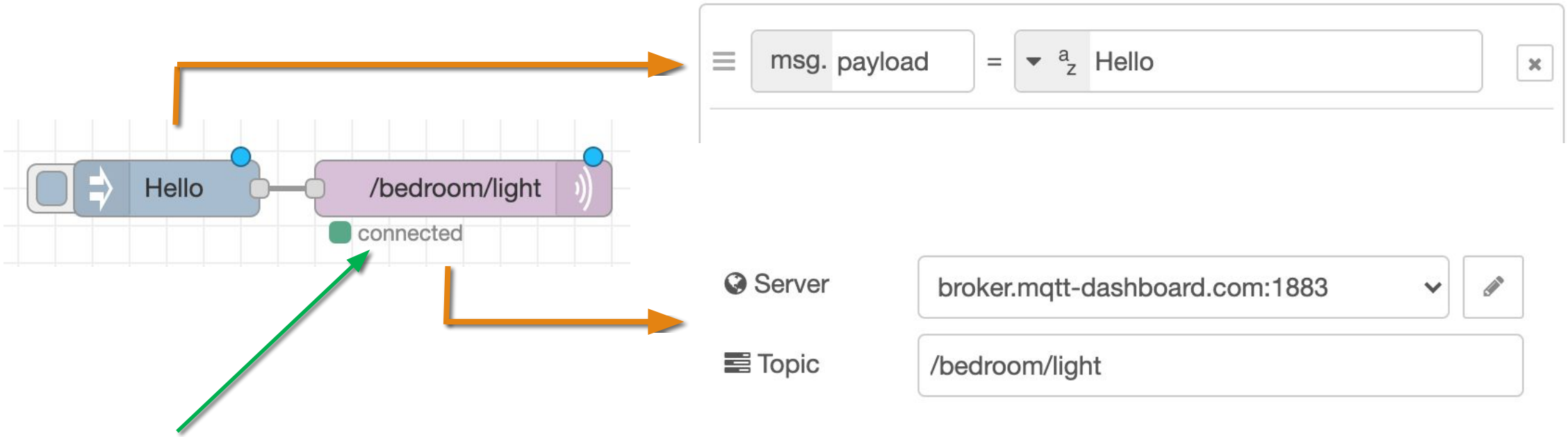
Programming Instructions

```
#include <ESP8266WiFi.h>
#include <PubSubClient.h>

const char* mqtt_server = "broker.mqtt-dashboard.com";



void mqttCallback(char* topic, byte* payload, unsigned int length) {
  Serial.println(topic);
  Serial.println((char*)payload);
}
```

```
void reconnect() {
  while (!client.connected()) {
    String clientId = "ESP8266Client-";
    clientId += String(random(0xffff), HEX);
    if (client.connect(clientId.c_str())) {
      Serial.println("connected");

      // Subscribe all topics that your system need
      client.subscribe("/bedroom/light");

    } else {
      Serial.println(" try again in 5 seconds");
      delay(5000);
    }
  }
}
```

```
void setup() {
  Serial.begin(9600);

  //Do it yourself. Connect to wifi by SSID or SoftAP

  client.setServer(mqtt_server, 1883);
  client.setCallback(mqttCallback);
}

void loop() {
  if (!client.connected()) {
    reconnect();
  }
  client.loop();

}
```

Node-RED config



Notice: *this topic name is exactly same in the ESP code*

Publish to Node-RED

```
char msg[50];
snprintf (msg, 50, "%ld", temperature);
client.publish("/bedroom/temperature", msg);
```

ESP8266

Node-RED