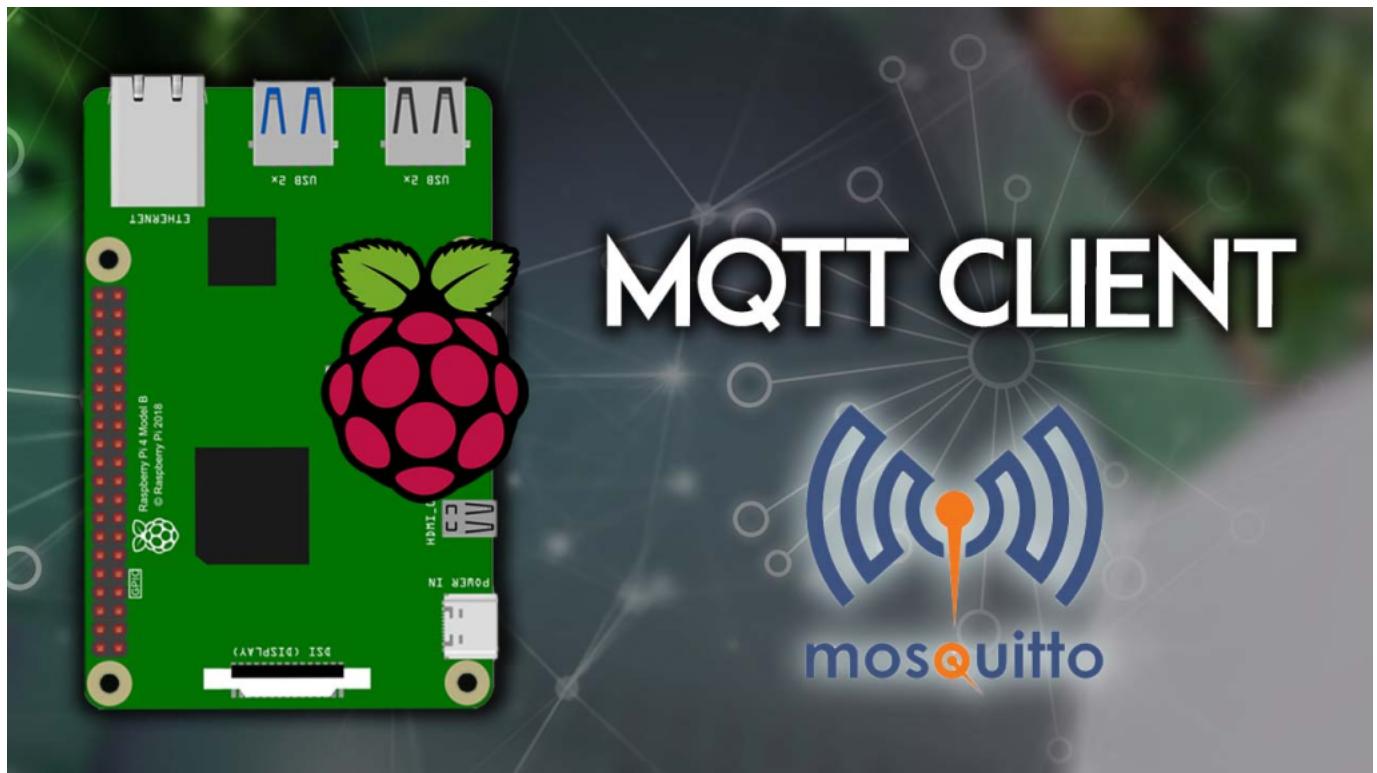


# Testing Mosquitto Broker and Client on Raspberry Pi

In this tutorial, you're going to test the Mosquitto MQTT Broker and MQTT Client on a Raspberry Pi. You'll subscribe the MQTT client to an MQTT topic and publish sample messages.



*Updated 15 December 2021*

## Recommended resources:

- You need a [Raspberry Pi board](#) – read [Best Raspberry Pi Starter Kits](#)
- [Install Raspberry Pi OS, Set Up Wi-Fi, Enable and Connect with SSH](#)
- [How to Install Mosquitto Broker on Raspberry Pi](#)
- [What is MQTT and How It Works](#)
- [Getting Started with Node-RED on Raspberry Pi](#)

# Testing MQTT Broker Installation

After [installing MQTT Broker](#), I recommend installing an MQTT Client to test the Broker installation and publish sample messages.

Run the following command to install MQTT Mosquitto Client:

```
pi@raspberry:~ $ sudo apt install -y mosquitto mosquitto-clients
```

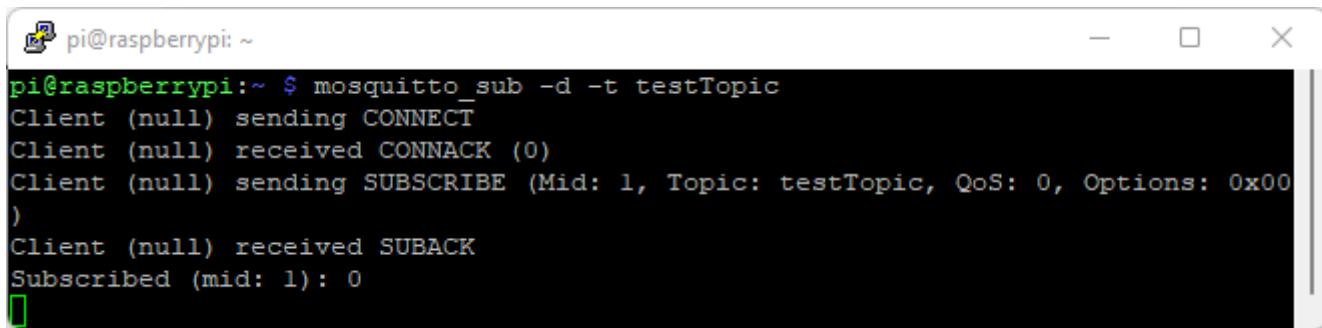
Run Mosquitto on the background as a daemon:

```
pi@raspberry:~ $ mosquitto -d
```

## Subscribing to **testTopic** Topic

To subscribe to an MQTT topic with Mosquitto Client open a terminal Window #1 and enter the command:

```
pi@raspberry:~ $ mosquitto_sub -d -t testTopic
```

A screenshot of a terminal window titled "pi@raspberrypi: ~". The window shows the command "mosquitto\_sub -d -t testTopic" being run. The output of the command is displayed, showing the client connecting, receiving a CONNACK, sending a SUBSCRIBE message, receiving a SUBACK, and finally being subscribed to the topic with Mid: 1. The terminal has a standard Linux-style interface with a title bar and scroll bars.

You're now subscribed to a topic called **testTopic**.

## Publishing “Hello World!” Message to **testTopic** Topic

To publish a sample message to **testTopic**, open a terminal Window #2 and run the following command:

```
pi@raspberry:~$ mosquitto_pub -d -t testTopic -m "Hello world!"
```

The figure displays two terminal windows, labeled Window #1 and Window #2, illustrating MQTT communication between a client and a broker.

**Window #1:**

```
pi@raspberrypi:~ $ mosquitto_sub -d -t testTopic
Client mosqsub/867-raspberrypi sending CONNECT
Client mosqsub/867-raspberrypi received CONNACK
Client mosqsub/867-raspberrypi sending SUBSCRIBE (Mid: 1, Topic: testTopic, QoS: 0)
Client mosqsub/867-raspberrypi received SUBACK
Subscribed (mid: 1): 0
Client mosqsub/867-raspberrypi received PUBLISH (d0, q0, r0, m0, 'testTopic', ... (12 bytes))
Hello world!
```

**Window #2:**

```
pi@raspberrypi:~ $ mosquitto_pub -d -t testTopic -m "Hello world!"
Client mosqpub/868-raspberrypi sending CONNECT
Client mosqpub/868-raspberrypi received CONNACK
Client mosqpub/868-raspberrypi sending PUBLISH (d0, q0, r0, m1, 'testTopic', ... (12 bytes))
Client mosqpub/868-raspberrypi sending DISCONNECT
pi@raspberrypi:~ $
```

The message “Hello World!” is received in Window #1 as illustrated in the figure above.

## Publishing a Message to Multiple Clients

Having Window #1 still subscribed to topic **testTopic**, open a new terminal Window #3 and run this command to subscribe to **testTopic** topic:

```
pi@raspberry:~ $ mosquitto_sub -d -t testTopic
```

On Window #2 publish the “Hello World!” message:

```
pi@raspberry:~$ mosquitto_pub -d -t testTopic -m "Hello world!"
```

 pi@raspberrypi: ~
**Window #1**

```
pi@raspberrypi:~ $ mosquitto_sub -d -t testTopic
Client mosqsub/919-raspberrypi sending CONNECT
Client mosqsub/919-raspberrypi received CONNACK
Client mosqsub/919-raspberrypi sending SUBSCRIBE (Mid: 1, Topic: testTopic, QoS: 0)
Client mosqsub/919-raspberrypi received SUBACK
Subscribed (mid: 1): 0
Client mosqsub/919-raspberrypi received PUBLISH (d0, q0, r0, m0, 'testTopic', ... (12 bytes))
Hello world!
Client mosqsub/919-raspberrypi received PUBLISH (d0, q0, r0, m0, 'testTopic', ... (12 bytes))
Hello world!
```

█

 pi@raspberrypi: ~
**Window #2**

```
pi@raspberrypi:~ $ mosquitto_pub -d -t testTopic -m "Hello world!"
Client mosqpub/920-raspberrypi sending CONNECT
Client mosqpub/920-raspberrypi received CONNACK
Client mosqpub/920-raspberrypi sending PUBLISH (d0, q0, r0, m1, 'testTopic', ... (12 bytes))
Client mosqpub/920-raspberrypi sending DISCONNECT
pi@raspberrypi:~ $ mosquitto_pub -d -t testTopic -m "Hello world!"
Client mosqpub/922-raspberrypi sending CONNECT
Client mosqpub/922-raspberrypi received CONNACK
Client mosqpub/922-raspberrypi sending PUBLISH (d0, q0, r0, m1, 'testTopic', ... (12 bytes))
Client mosqpub/922-raspberrypi sending DISCONNECT
pi@raspberrypi:~ $
```

█

 pi@raspberrypi: ~
**Window #3**

```
pi@raspberrypi:~ $ mosquitto_sub -d -t testTopic
Client mosqsub/921-raspberrypi sending CONNECT
Client mosqsub/921-raspberrypi received CONNACK
Client mosqsub/921-raspberrypi sending SUBSCRIBE (Mid: 1, Topic: testTopic, QoS: 0)
Client mosqsub/921-raspberrypi received SUBACK
Subscribed (mid: 1): 0
Client mosqsub/921-raspberrypi received PUBLISH (d0, q0, r0, m0, 'testTopic', ... (12 bytes))
Hello world!
```

█

Since two clients are subscribed to **testTopic** topic, they will both receive the “Hello world!” message.

This simple example shows how MQTT works and how your devices (for example: ESP8266 or ESP32, etc.) can be subscribed to the same topic to receive messages, or a device can publish messages to multiple devices.

## Wrapping Up

In this tutorial, you checked that your Mosquitto Broker installed on the Raspberry Pi is running properly. Now, you can experiment with MQTT in your ESP32/ESP8266 IoT projects. We have several MQTT practical examples that you can experiment with. Here are some examples:

- [ESP32 MQTT – Publish and Subscribe with Arduino IDE](#)
- [ESP8266 and Node-RED with MQTT \(Publish and Subscribe\)](#)
- [ESP32 MQTT – Publish DS18B20 Temperature Readings \(Arduino IDE\)](#)
- [ESP8266 NodeMCU MQTT – Publish DS18B20 Temperature Readings \(Arduino IDE\)](#)
- [All MQTT related projects...](#)

You can also run Mosquitto MQTT broker on the cloud. Running an MQTT Mosquitto Broker in the cloud allows you to connect several ESP32/ESP8266 boards and other IoT devices from anywhere using different networks as long as they have an Internet connection. Check the tutorial below:

- [Run Your Cloud MQTT Mosquitto Broker \(access from anywhere using Digital Ocean\)](#)

Like home automation? Learn more about Node-RED, Raspberry Pi, ESP8266, and Arduino with our course: [Build a Home Automation System for \\$100.](#)

**Do you have any questions? Leave a comment down below!**

Thanks for reading. If you like this post probably you might like my next ones, so please support me by [subscribing to my blog](#).

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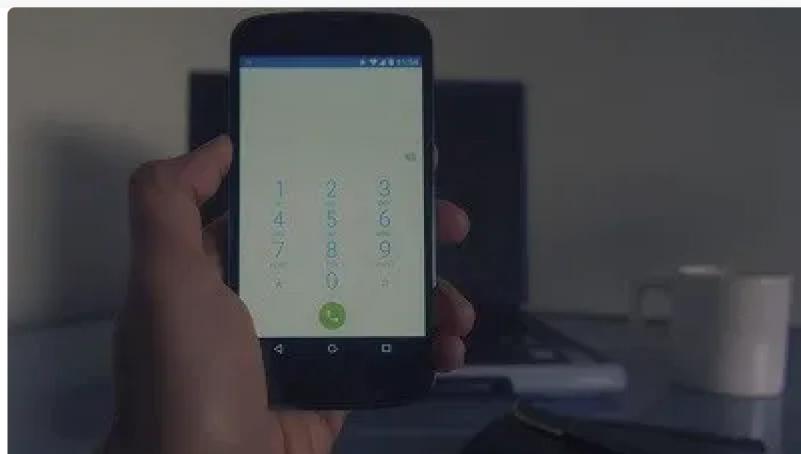
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## [eBook] Build Web Servers with ESP32 and ESP8266 (2nd Edition)

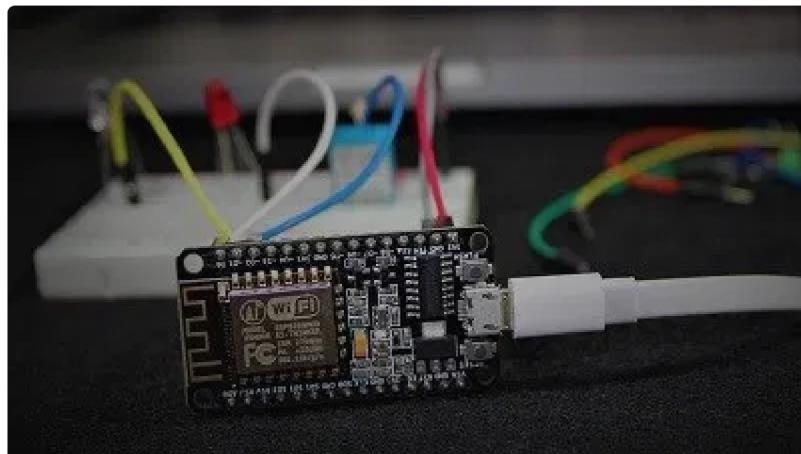


Build Web Server projects with the ESP32 and ESP8266 boards to control outputs and monitor sensors remotely. Learn HTML, CSS, JavaScript and client-server communication protocols [DOWNLOAD »](#)

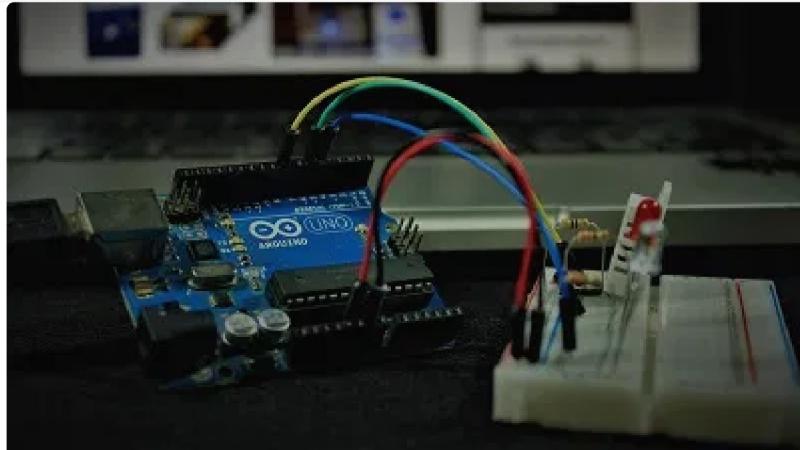
## Recommended Resources



[Build a Home Automation System from Scratch »](#) With Raspberry Pi, ESP8266, Arduino, and Node-RED.



[\*\*Home Automation using ESP8266 eBook and video course »\*\*](#) Build IoT and home automation projects.



[\*\*Arduino Step-by-Step Projects »\*\*](#) Build 25 Arduino projects with our course, even with no prior experience!

## What to Read Next...

## ESP32: K-Type Thermocouple with MAX6675 Amplifier

## ESP32 HTTP GET with Arduino IDE (OpenWeatherMap.org and ThingSpeak)

[MicroPython: MQTT – Publish BME680 Sensor Readings \(ESP32/ESP8266\)](#)

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# 13 thoughts on “Testing Mosquito Broker and Client on Raspberry Pi”

**John**

January 30, 2018 at 4:19 am

Hi Rui, Odd things happening for me on this one. I am using a Rpi2b, Raspian Pixel, Mosquitto ver 1.4.14. When I type in the second terminal window “mosquitto\_pub -d -t testTopic -m “Hello World” the following occurs:

- 1 I receive an Error: Unknown option ‘world’
- 2 I noticed when I typed the command again on the first depression of the quote (shift + ‘) the quote did not show. (it does show in text editor).

AND if I type “mosquitto\_pub -d -t testTopic -m Hello World (without the quotes) I get the same error, but if I type mosquitto\_pub -d -t testTopic -m Hello, the message “Hello” is transmitted. Any thoughts on this?

[Reply](#)**Ronney**

May 23, 2021 at 5:40 pm

Put double quotes around “Hello World” and it should work.

[Reply](#)**Ayanle Ali**

November 5, 2018 at 7:51 am

I have tried using my PC with a virtual machine and linux installed and it works, Thanks!

[Reply](#)



**David**

April 24, 2019 at 4:29 pm

awesome tutorial, thanks. So many questions answered in my head, going through it and seeing it work really helps the understanding.

[Reply](#)



**Michael**

February 6, 2020 at 1:26 am

Hi Rui,

This is a very helpful tutorial series for someone starting with MQTT. May I suggest that the flow of the process would be easier to follow if the order of the Terminal window images was changed. The window where the command is entered should appear first, followed by the windows where the message is received.

Also, in the paragraph before Wrapping Up, you mention “a device could publish messages to multiple devices”. This contradicts your earlier explanation that messages are published to TOPICS, and devices must subscribe to topics to receive messages.

I've been following RNT for a few years and learned a lot. Keep up the great work.

[Reply](#)



**Rui Santos**

February 6, 2020 at 12:23 pm

Hello Michael. Thanks for the helpful feedback!

Both statements are true. Multiple boards can be subscribed to the same topic. So, one board can publish readings to all devices subscribed to that topic.

I'm glad you've found our content helpful.

Regards,

Rui

[Reply](#)



**Joseph Tannenbaum**

March 28, 2020 at 7:34 pm

This was helpful, but not real clear how to get mosquitto to respond to a different machine.

[Reply](#)



**Joseph Tannenbaum**

March 28, 2020 at 10:26 pm

To clarify to myself, I did this between two RaspberryPi's. Then tried to Node-RED to help me understand.

[Reply](#)



**Shahana Gunasekaran**

January 9, 2021 at 10:32 am

explanation methodology is well:)

[Reply](#)



**Bob Wareham**

August 5, 2021 at 5:01 pm

Thank yo so much for this instruction I have a raspberry pi 3 so installed raspberry OS as standard then followed your instructions, I then installed Mosquito then opened two terminal windows and followed your instructions for Hello world and job done

it appeared in the other window I was amazed that it all just worked as I want to learn MQTT for my Wemose D1 min and ESP32 and ESP8266 and ESP32-cam that I have and would like to make up some sort of small system I can then get away from Ewe link and China but I did not want to use HA as it is to big for me and two complicated and all the cloud services are slow the latency takes too long with Ewe Link and this was instant I have tried Telegram tutorial that you provided and that worked for two days then just stopped so gave up with that.

I would like to take this opportunity to thank you for a wonderful YouTube channel and all your hard work you are the best at describing a project and your written word is second to none you go the extra mile to explain it all and make it very easy to follow.

I would like to purchase your book but I am not sure of the best one?  
Many thanks Bob in the UK

[Reply](#)



**Sara Santos**

August 6, 2021 at 11:26 am

Hi Bob.

Thank you for your nice words.

We have courses related to ESP32, ESP8266, Web Servers, MicroPython, and more.

You can check all our courses here:

<https://randomnerdtutorials.com/courses/>

If you have any doubts about any of those courses, you can send a message to support, asking for more information:

<https://randomnerdtutorials.com/support/>

Regards,

Sara

[Reply](#)



**Bob Wareham**

August 6, 2021 at 10:23 pm

Thank you Sara for your reply I will have a look

[Reply](#)**JEAN-LOU**

February 21, 2022 at 6:28 pm

Bonjour,

Je découvre MQTT pour la première fois. Les explications et les tests me permettent de vraiment mieux comprendre les commandes exécutées pas à pas.

Merci encore de votre implication

[Reply](#)

## Leave a Comment

 Name \* Email \*

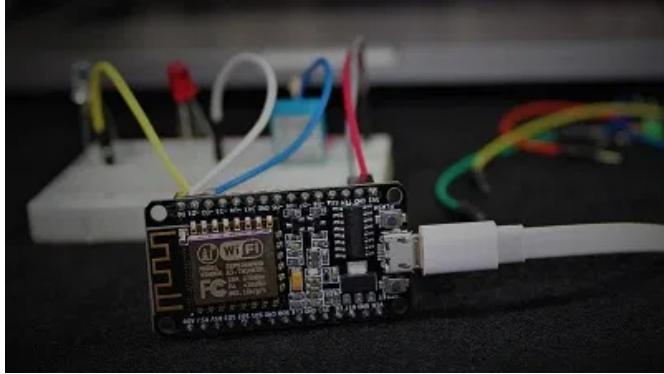
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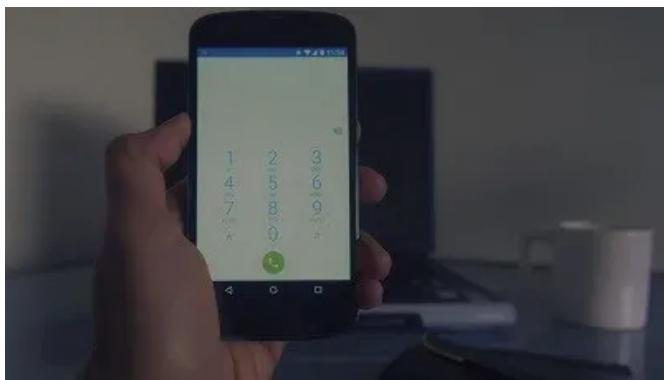
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