THE THINGS NETWORK | LoRaWAN

The Things Summer Academy

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Integrations pre-requisites

To get the very best out of the Integrations session, please read these notes carefully and ensure you are all setup before the session starts. Any questions please ask on the forum or Slack.

As long as you understand the basics of any imperative programming language (C, C++, C#, VB, PHP, JavaScript, Java, Python, Lua, etc etc) you will be fine. We will not be using any object orientated constructs or anything that can only be found in any one language. Having been programming for 42+ years, I consider many common programming languages as just being a different dialect of the same idea in the same way European languages share a huge amount of similarities: welkom, bienvenue, willkommen, velkominn, benvenuta, velkommen, witamy, bem-vinda, bienvenidas.

All modules have JSON as a common data format that we read, so please ensure you have an overview of basic **JSON** syntax, particularly nesting of 'objects' and arrays.

This module is almost all online so having a stable internet connection is vital - it doesn't have to be fast, just reliable, so if you are working from an internet cafe, please choose a good one or if you have others in the office or house that stream video or play games, ask them to keep it reasonable.

On your computer you will need the following installed & run at least twice, once for it to ask about all the settings that always seem to pop up these days, the second to make sure it actually saved them!

MQTT

For the **MQTT integration** we will be using Python and an MQTT desktop app.

Python 3: https://www.python.org/downloads/

You can use v2 if you really must, but I will be typing Python 3, so you will need to be aware of any minor differences.

MQTT library: https://pypi.org/project/paho-mqtt/#installation

This provides support in Python for one of the common IoT communication protocols.

You can check you have installed these correctly by running this:

```
import paho.mqtt.subscribe as mqtt
print("This will show the server uptime")
message = mqtt.simple("$SYS/broker/uptime", msg_count=1, hostname="test.mosquitto.org")
print(str(message.payload))
```

For simplicity I will use the **Python 3 Idle IDE**. You can use anything you like as long as you are already familiar with it - this session will not be a good time for you to learn a new IDE.

To help visualise & debug MQTT messaging, please install MQTT Explorer: **http://mqtt-explorer.com**

Web hooks

For the **Webhook integration** that uses PHP, we will use an online editor that gives you access to some web server space.

One of the stretch (advanced) activities will require **a local copy of PHP (https://www.php.net/downloads** (7+) to be installed on your computer so you can run it at the command line - this allows you to test PHP before you upload it somewhere which is significantly more convenient than the normal code, upload, test cycles.

I generally direct people to https://w3schools.com to get a quick overview of a topic. Apart from the official sites for a language, which usually have a fast start tutorial that's just a bit too fast start or detailed for quick absorption, I find W3Schools useful to get people over the initial hump as W3S keep things simple.

There will be a section on the forum for you to ask questions related to the material. This session will be about giving you enough information to get going. The forum is not there to provide ready made solutions for people. I encourage everyone to use the forum search and to demonstrate their thinking & research when asking for help. If it's a particularly gritty problem you may find I'm inspired to write code. But mostly I'll give you pointers so you learn rather than just do what I say.

The online web space being used for the Webhook integration will be on a performant, ie well specified, ie costing a few £$€, server, so will only be available until the end of August. You will be provided with pointers on getting your own web space on a budget - my backup Webhook server costs me £7 a year.