Introduction to IoT and Cloud via A Guided Project
Build your own Weather Node with ESP-32

By The Developer Club Systems Community

Pre-Workshop Setup Documentation

Hello Everyone! First of all a warm welcome to the Systems Community Workshop. For a smooth experience and so that we spend much of the time working on the guided project itself, it would be great if you can have the following pre-requisite software installed beforehand. This will be covered again during the workshop for those who will come in person but to avoid the rush this would be really helpful.

Important: A pre-requisite for the workshop to use the hardware is, you need to have a Type-A slot available on your laptop which should be common enough but also not that uncommon in newer laptops where it's replaced by USB-C or thunderbolt connectors. In such a scenario, please bring your own adapter or dock for the same.

1. The IDE setup:

This is an integrated development environment by Arduino that provides a lot of utilities that are required for the workshop and also makes life a lot easier. When you become more familiar with Embedded Programming, you can check out some of the advanced tools such as the PlatformIO extension for VS Code, etc. But for the current workshop we will be using the Arduino IDE. The following link should take you to the webpage for downloading the Arduino IDE.

https://www.arduino.cc/en/software/

From here, you can download the installer for your platform such as Windows/Mac OS/Linux. Linux Users can either download the app image provided or install it from the SNAP/Flatpak store if you have that and it's also a best idea to see if it's already available in your package manager.

Please note. Any linux users that are running any other display manager than say Gnome/KDE/etc might face UI issues with the IDE so it's strongly encouraged that if you are using display managers such as Hyperland/BSPWM/i3/DWM/any tiling window manager, please kindly make sure your QT setup is working and dependencies installed even then it could cause some issues so please do mind that!

2. The USB Driver installation (CH340G):

When you connect your ESP-32 to your laptop, in most cases it should work right out of the box as it's packaged as standard in almost every operating system. However if your laptop isn't able to see the MCU and you know the data cable/dongle adapter isn't at fault, there's a high chance that you may need to install the CH340G driver. The following link should have all the instructions you need. If you still face issues, please let me know.

https://learn.sparkfun.com/tutorials/how-to-install-ch340-drivers/all

https://www.wch-ic.com/downloads/CH341SER_ZIP.html

You might be wondering what this CH340G even is and why we need a driver for it. CH340G is the name of the chipset that is used to translate and communicate with your host system which is your laptop. Without the driver, your pc wouldn't know what to do with the data it is receiving on the port and might not even know about its existence in some cases.

3. The Arduino Libraries Required:

For the workshop, we rely on various libraries that are used for various purposes such as connecting various sensors, translating signals for certain devices, providing wrapper functions that simplify our life, etc. We primarily are gonna use libraries from **Adafruit Industries**. They manufacture a lot of sensors, displays and various hardware equipment and their libraries are generic enough that any of the clones or devkit boards can use their libraries to communicate with the sensors and hardware. **(That's the power of open source people!)**

The why and how's of each library will be discussed in the workshop but for a smooth experience it is strongly recommended to install them beforehand. It usually doesn't even take more than 5 minutes to complete the installation. You need to go to each github link listed below and download the source code as a zip file.

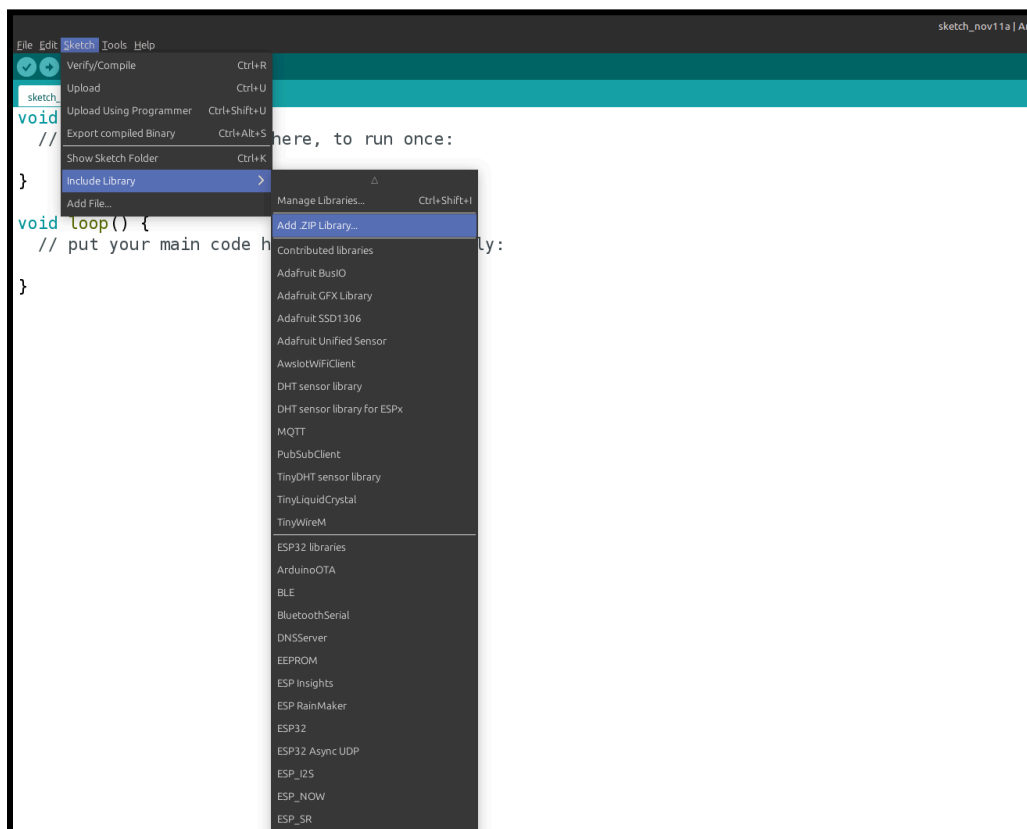Adafruit GFX: https://github.com/adafruit/Adafruit-GFX-Library

Adafruit SSD 1306: https://github.com/adafruit/Adafruit_SSD1306

Adafruit Bus IO: https://github.com/adafruit/Adafruit_BusIO

Adafruit Sensor: https://github.com/adafruit/Adafruit_Sensor

Adafruit DHT Sensor: https://github.com/adafruit/DHT-sensor-library

Arduino MQTT: https://github.com/256dpi/arduino-mqtt

To install these libraries, goto your **Arduino IDE > Sketch > Include Libraries > Add .zip library.** Then select one library at a time and click on install. Repeating this for all the libraries, you will have all your libraries ready for the workshop!

Know your Hardware Kit:

Each kit comes with the following hardware. They are:

- ESP-WROOM-32 Dev Board
- Mini Breadboard
- 33 ohm resistor
- 3V 20mA Blue LED
- DHT-22 sensor
- 0.96" 128x64 pixels Yellow-Blue I2C OLED Display Module
- 11 Male-Male Jumper Cables
- Micro USB to USB Type A data cable
- A note with your Node Specific AWS console login information

Note: If at any point of the workshop, if you find a defective hardware, please notify us and we will either substitute the entire kit (subject to availability), swap the defective part with a spare (or) in situations where we are all out of spares pair you with someone else to work on the workshop together.

Also please note that the AWS accounts will be deleted on 16th November, 2025 to avoid potential compromise. If you need further help, we can help you set up your own AWS account and help with it.

If you face any trouble with any part of the setup now or during the workshop. Do let me know and I will help you. Send me an email or a Teams ping or Discord!

Happy Coding!

"It's not about having enough resources. It's about being resourceful."

– Tony Robbins