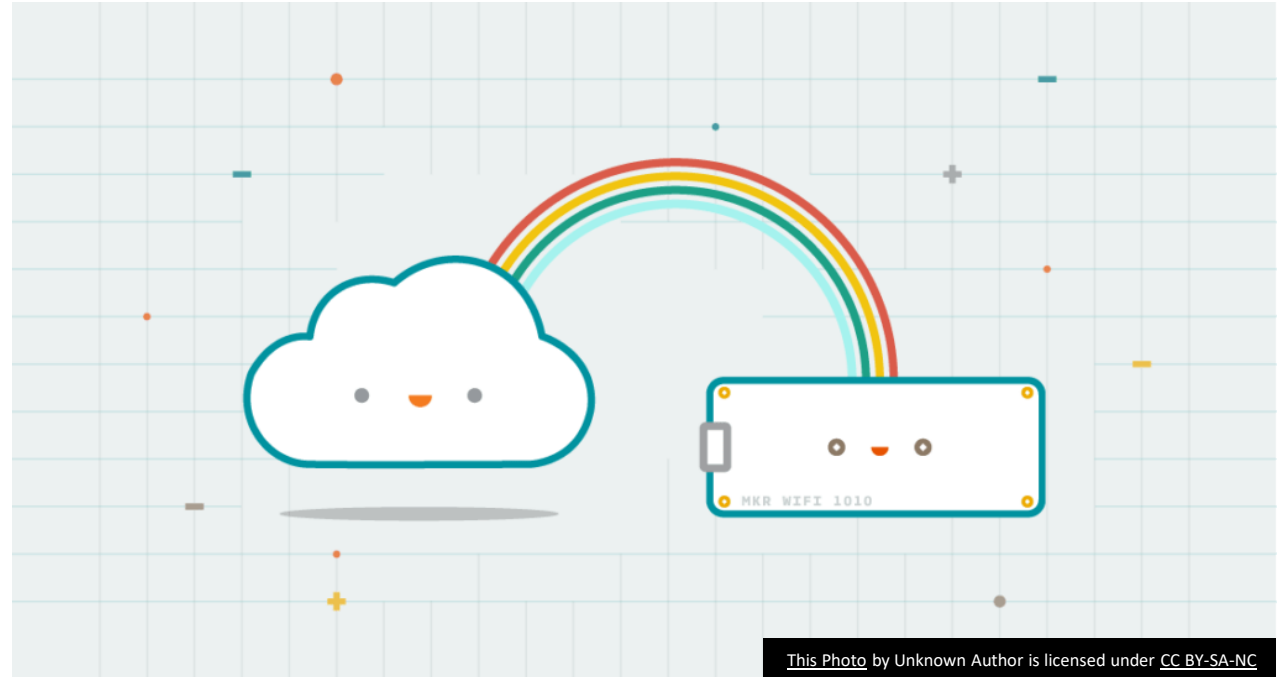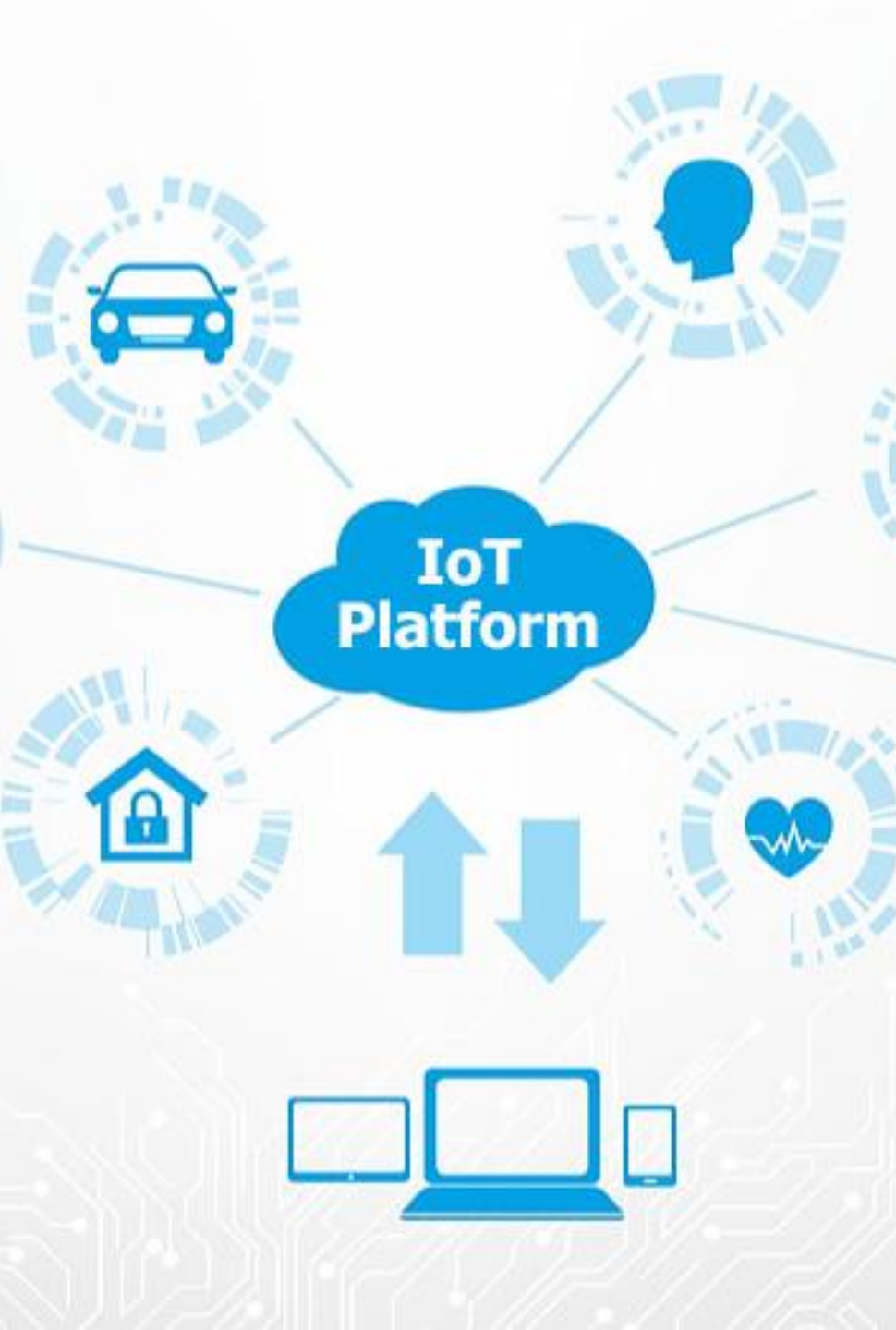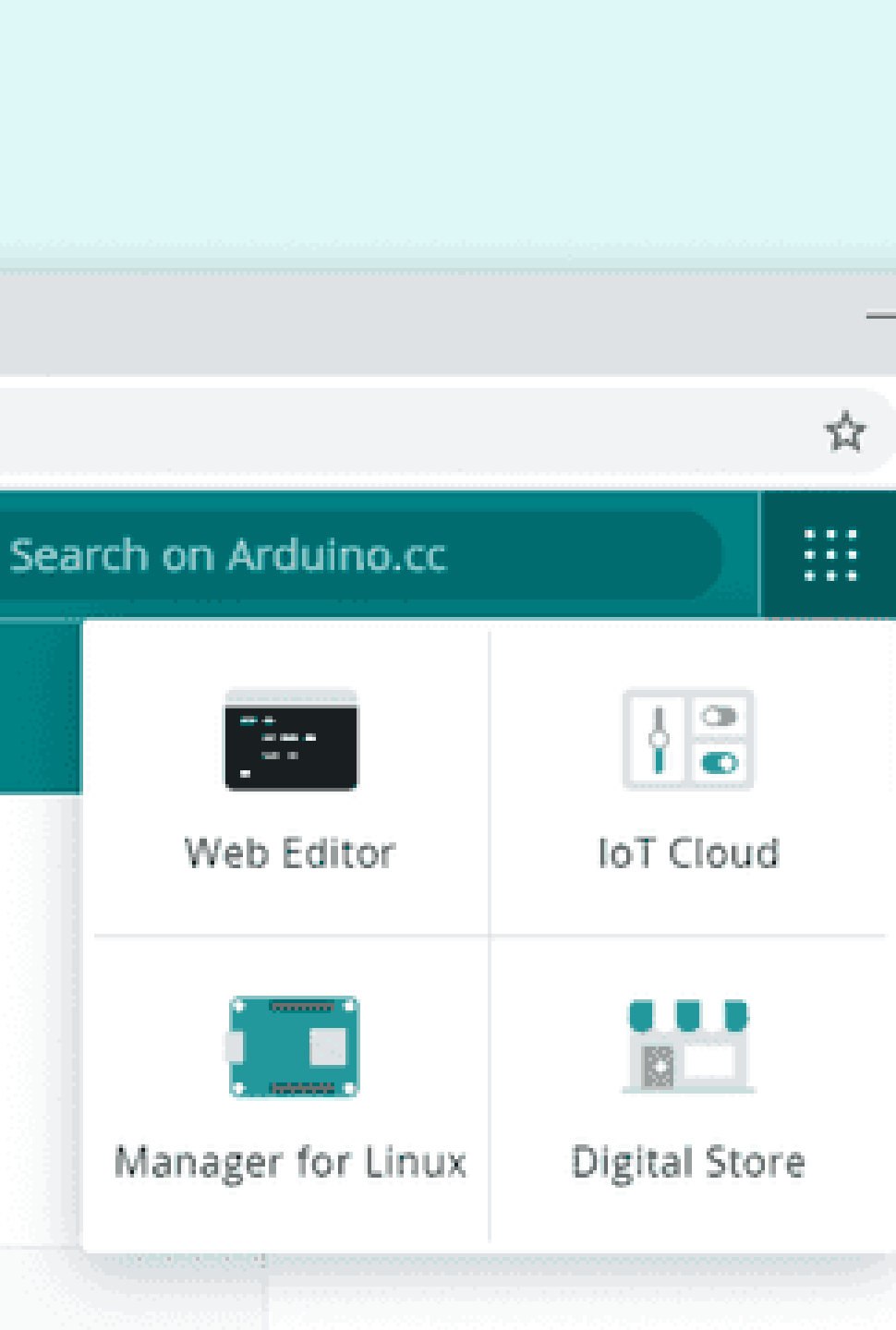# Arduino Cloud

What's Arduino Cloud

- Arduino Cloud is a **platform** which allows users to remotely manage, monitor and control IoT devices.
  - connect, monitor and control devices through the internet, anywhere, any time.
- Rapid set up IoT devices and applications, and manage data from multiple devices.

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What's an IoT Platform?

- IoT (Internet of Things) platform is a software/hardware infrastructure that enables the development, deployment, and management of IoT solutions and applications.
    - Similar to google drive(develop/deploy/manage documents and files)
    - Often cloud based(as in you don't host it on your own computers)
- Typical components of an IoT platform are:
    - managing and controlling connected devices (your Arduino)
    - Data Collection and Processing(e.g. collect data from environment)
    - Visualisation and analysis

Using the Arduino Cloud

- Use browser-based IDE
- You'll need to create an Arduino account
  - You can use Google, Guthub, Facebook, Apple ID if you wish
- Once signed in, you can access the IoT Cloud through the Menu

Devices in Arduino Cloud
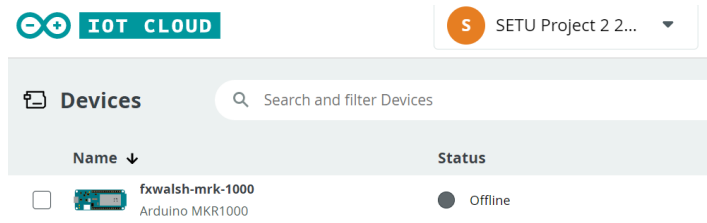
- Configuration is required once for every new device.
  - In our case the Arduino MKR 1000
- In Arduino IoT Cloud, add a device though the Devices menu option
- Once a device is successfully configured it can be used to create a "thing".
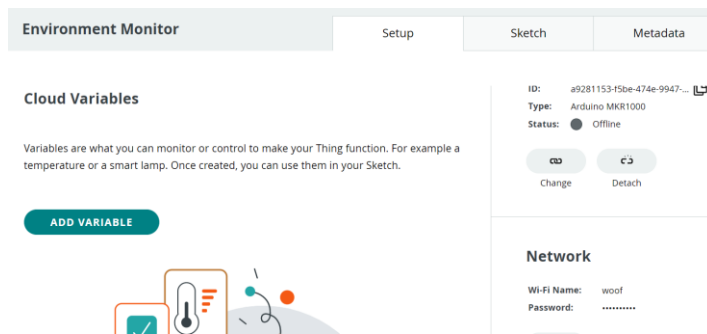
Things in Arduino Cloud

- A "Thing" is a combination of a Device and configuration details such as wifi config, variables, and other settings.

- Needs to be associated with a device to work

- Why are Devices and Things distinct concepts?
  - You can easily swap the actual hardware without reconfiguring everything from scratch: just detach a thing from a device, and ressign it to another device.(for example, you want to use another/different Arduino board
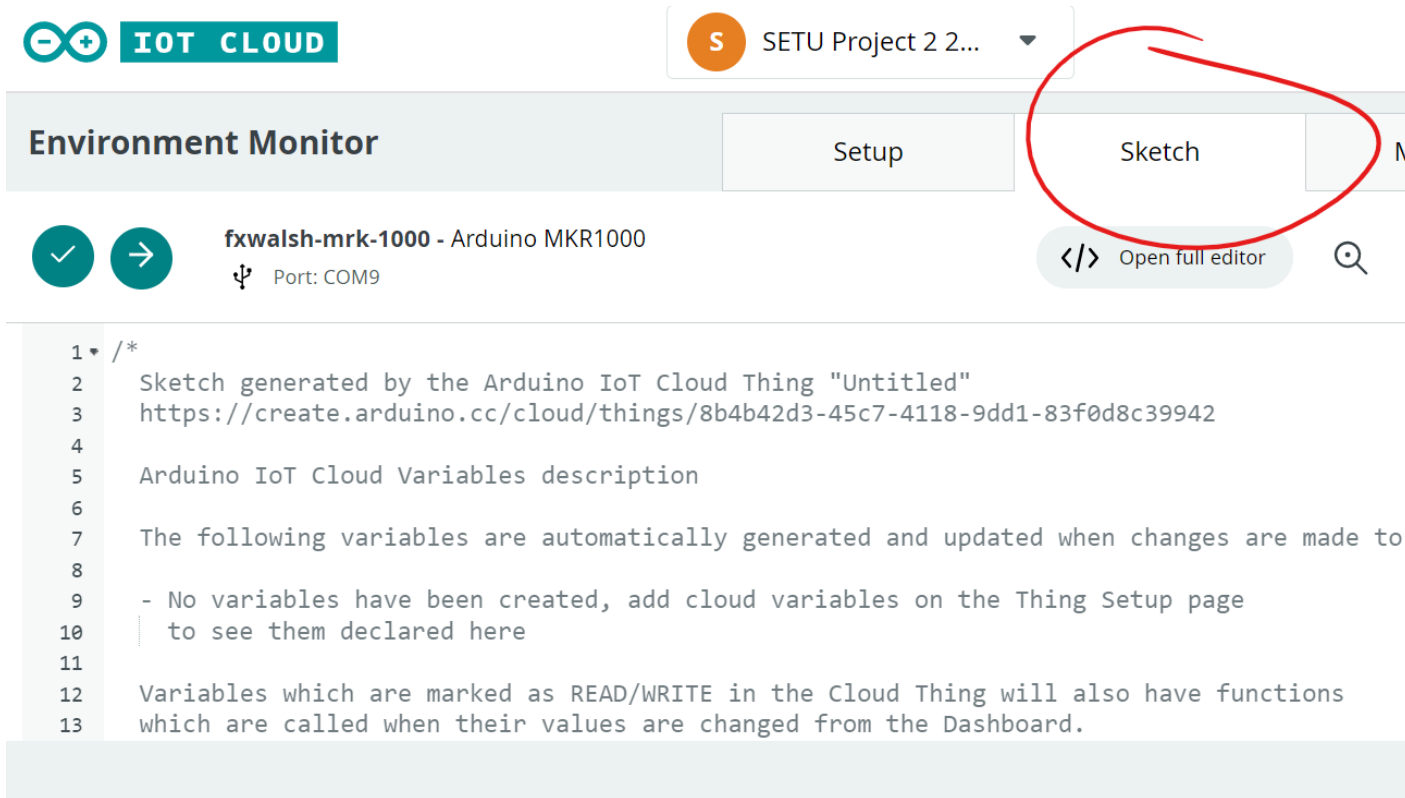
Variables in Arduino Cloud

- A thing can have one or more **variables**.
- A variable can be used for:
  - collecting data over time in the cloud (sensor readings)
  - show data in real-time in a dashboard
  - receive changes originated from a dashboard or other linked devices
- Arduino IoT Cloud will handle all the communication and synchronization behind the scenes.
- Variables can be used directly just like any other variables in an Arduino sketch.
- Can be used to share data with other devices/dashboards.

Network Configuration

- You need to connect your Arduino to the Wi-Fi network.
- The credentials entered are saved in the Secret file, inside the sketch.
- Part of the "Thing" configuration.

Coding in Arduino Cloud

- Clicking on "Sketch" tab in the Thing allows you to code
  - Works similar to IDE you've been using so far.

- Initially, automatically generated code is found in the editor

Coding in the Arduino Cloud

- The sketches generated automatically in IoT Cloud include four files:
    - thingProperties.h: This is a file containing the configuration details generated by the Arduino IoT Cloud. **it should not be edited**.
    - sketch.ino: This file includes the main Arduino sketch that you edit
    - Secret: This is a file conains sensitive data likepasswords and API keys that will be protected and hidden from public access. The network configuration details are saved in this file.
    - ReadMe.adoc: This is a Read Me file as a placeholder for adding a description of the project.
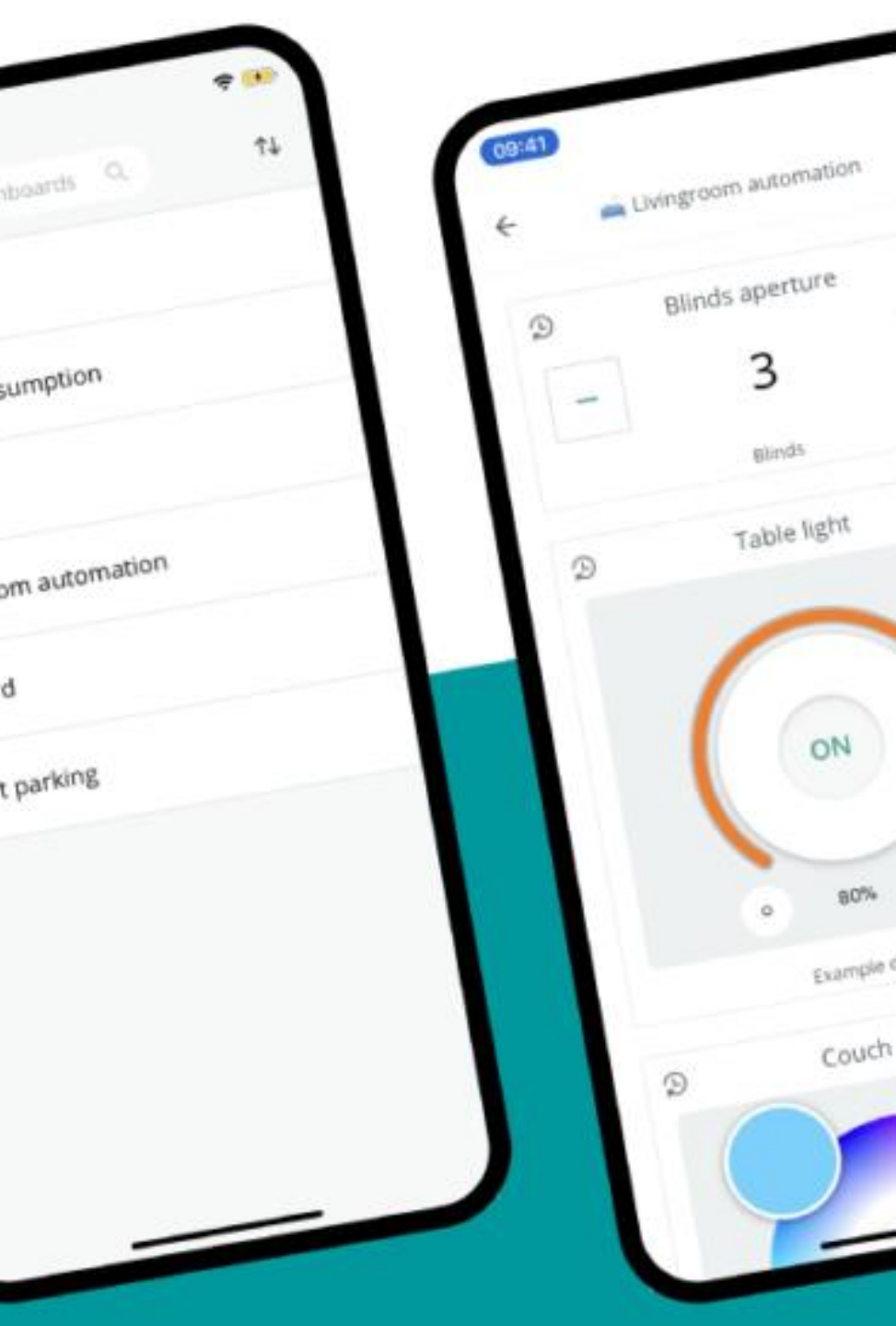
Arduino IoT Remote App

- App gives you access to Dashboards.
- Gives you with the ability to access, monitor or control your IoT projects from anywhere.
- IoS and Android apps available for installation.