Lab 5-0-0-Arduino Internet of Things Programming

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Credits

- https://www.arduino.cc/
- https://www.simulide.com/p/home.html
- http://simonmonk.org/

Arduino Internet of Things Programming

- The Internet of Things (IoT) is the concept that more and <mark>more devices will become connected to the Internet.</mark> That doesn't just mean more and more computers using browsers, but actual appliances and wearable and portable technology.
- This includes all sorts of home automation from smart appliances and lighting, to security systems and even Internet-operated pet feeders as well as lots of less practical but fun projects.

Arduino Internet of Things Programming

- Arduinos are used a lot to create IoT projects, but require either a specialized Arduino or shields to provide the network capabilities that will allow you to measure and control things over your local network and the Internet. The network interface might be in the form of a cabled Ethernet connection or a WiFi connection.
- In this lecture, we will explore the use of an Arduino with an Ethernet shield, or a combined device like the EtherTen from Freetronics, as well as the increasingly popular ESP8266 WiFi boards that can be programmed in Arduino C and are wonderfully low cost, starting at $5 or less.

Left to right: Arduino Uno + Ethernet shield, EtherTen, and Node MCU ESP8266 boards

Wifi Modules

https://www.robotistan.com/wifi
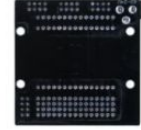

NodeMCU V3 LoLin ESP8266 Geliştirme Kartı - USB Chip CH340	NodeMCU V3 LoLin ESP8266 Geliştirme Kartı - CP2102	ESP-12E ESP8266 WiFi Modül	NodeMCU LoLin ESP8266 Base Shield - NodeMCU CH340 Uyumlu
36,18 TL	37,18 TL	26,12 TL	19,94 TL

ESP32-CAM WiFi Bluetooth Geliştirme Kartı + OV2640 Kamera Modül	USB - ESP8266 Wifi Adaptör	ESP8266 ESP-13 Wifi Shield	ESP8266-03 Dahili Antenli Wifi Serial Transceiver Module (SMD)
139,55 TL	10,96 TL	89,71 TL	34,89 TL

IOT Connection Types

IOT Connection Types
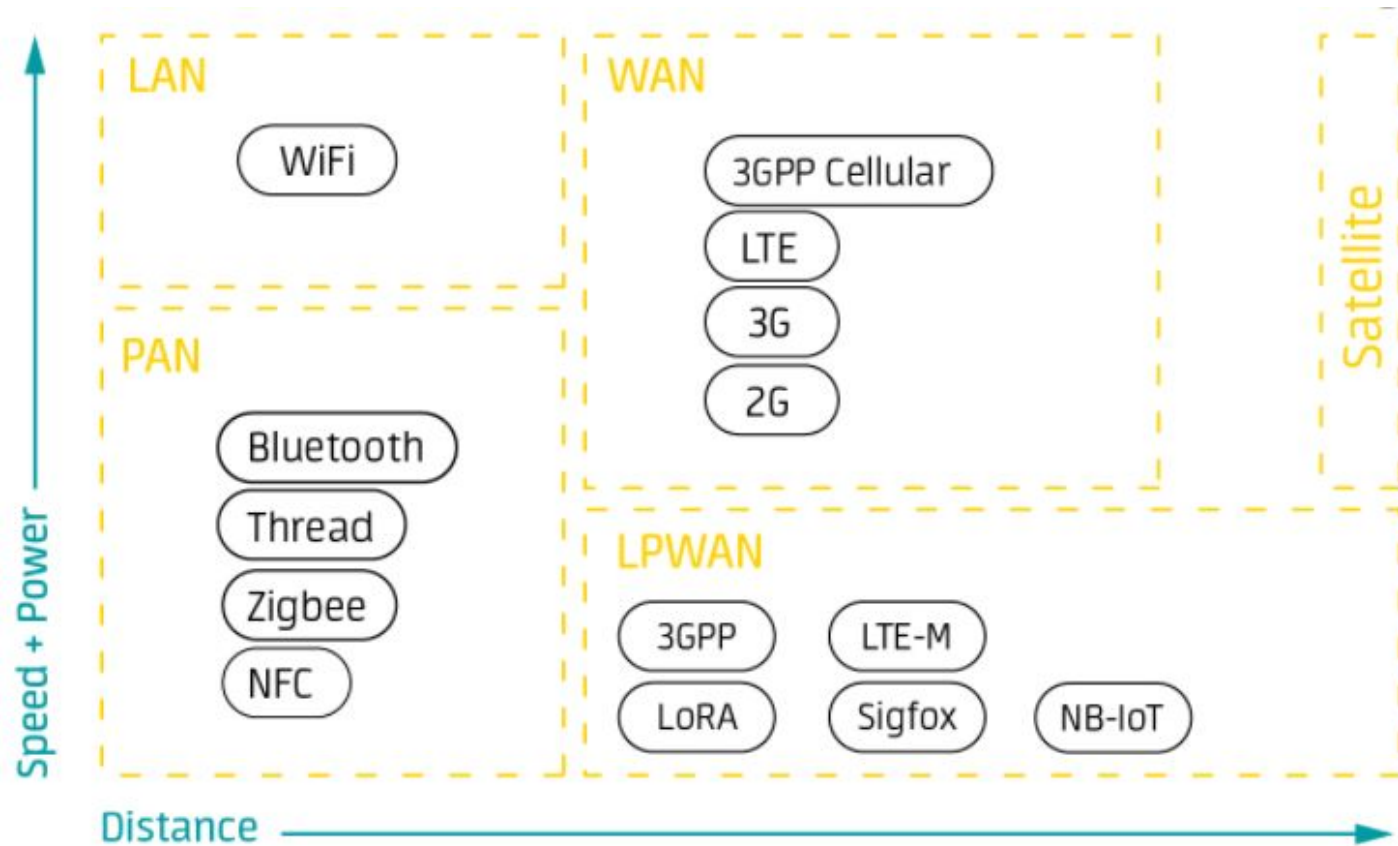
IOT Connection Types

Connection Types

As an Edge Device
Connect to Server through IoT Gateway

As a Connectivity Module
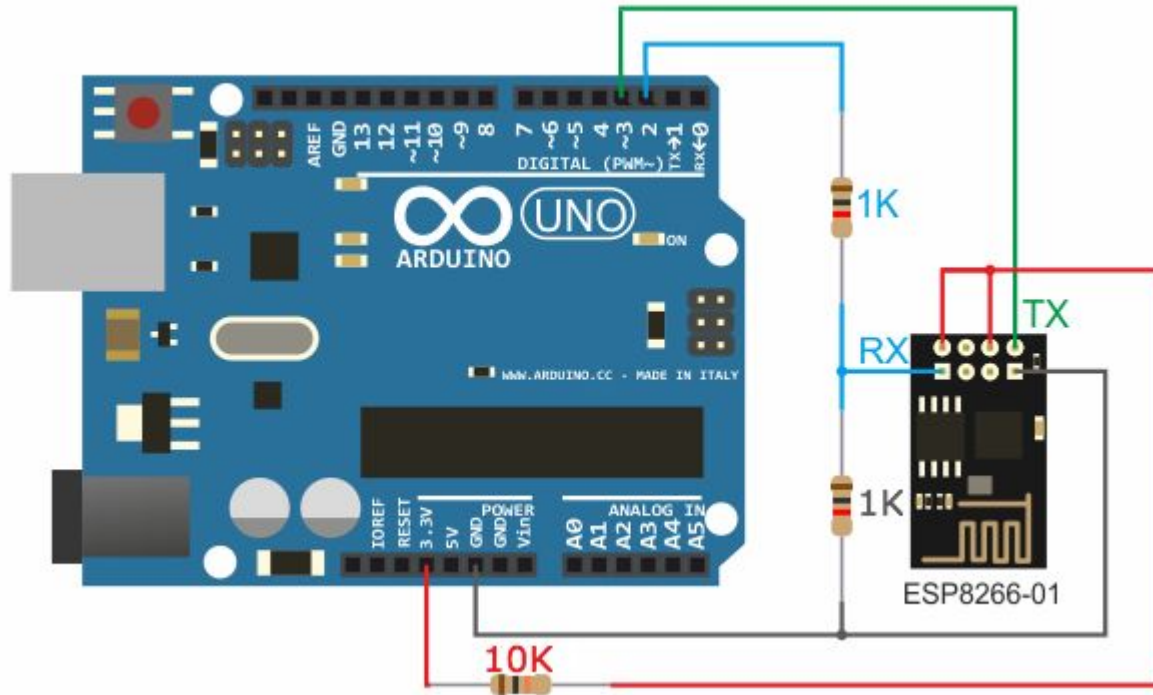Connect to Server without IoT Gateway

Device-to-device Security
Connect to other devices

IoT Server

IoT Server

Internet / Intranet

Internet / Intranet

Internet / Intranet

IoT GateWay

Wireless Access Point

Neo-SP1

Neo-SP1

ESP8266 WiFi module

Simple Solution

ESP8266 WiFi module
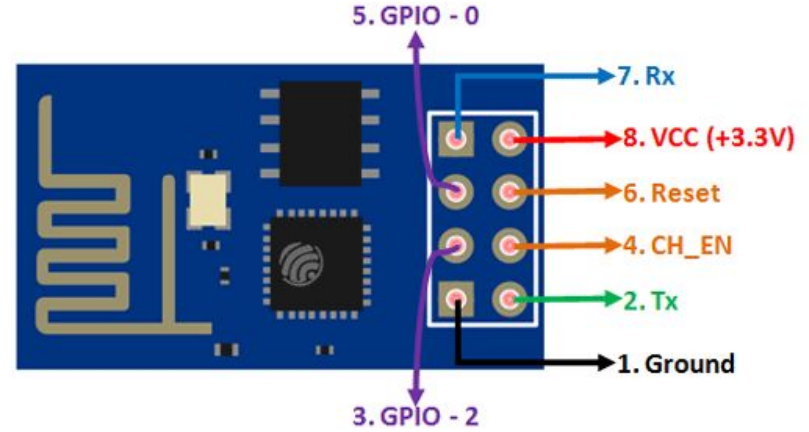
Used to receive (**RX**) and transmit (**TX**) TTL serial data

Communication Process

Sends a String Message via TCP → ESP8266 ← Arduino reads the message ← Arduino

Arduino parses the message and execute commands

5. GPIO - 0
7. Rx
8. VCC (+3.3V)
6. Reset
4. CH_EN
2. Tx
1. Ground
3. GPIO - 2