**I O T**

**Using**

**Python**

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# Introduction

This document is meant to provide an introduction to IOT/IIOT and the use of Python to build state of the art business and technical solutions in which there is a great synergy between hardware and software.

# Glossary

|  |  |  |  |
| --- | --- | --- | --- |
|  | IOT |  |  |
|  | Sensor |  |  |
|  | Sockets |  |  |
|  | Rasbian |  |  |
|  | Raspberry PI |  |  |
|  | MQTT protocol | **MQ Telemetry Transport** |  |
|  | Pulse Width Modulation (PWM) |  |  |
|  | LED |  |  |
|  | Analog |  |  |
|  | Accelerometers |  |  |
|  | LCD |  |  |
|  | Microcontrollers |  |  |
|  | Beacons |  |  |
|  | IOT Data Platforms |  |  |
|  | Industry 4.0 |  |  |
|  | Telemetry |  |  |
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# IOT – A general Overview

## Basic introduction

<https://www.iotforall.com/what-is-iot-simple-explanation/>

## Visual representations



Source - <https://pixabay.com/vectors/network-iot-internet-of-things-782707/> - high level visualization

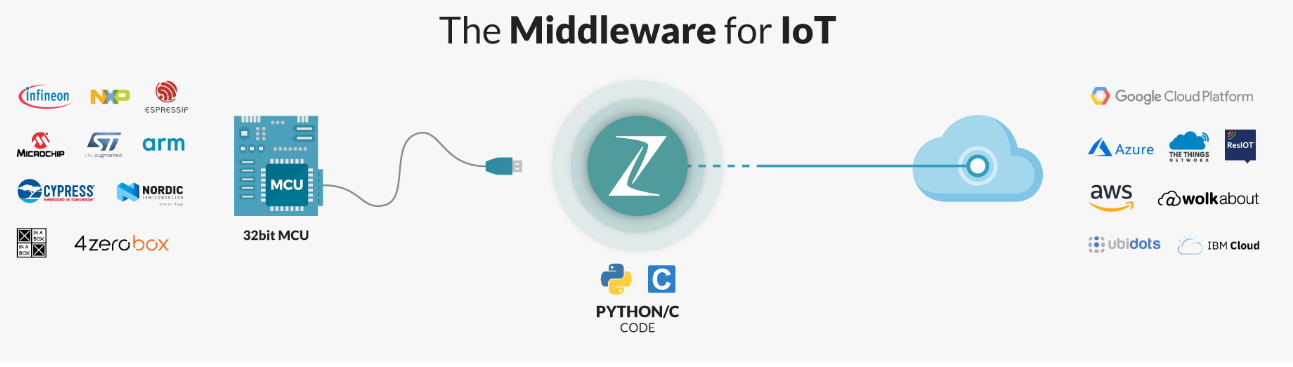


Figure – Source –

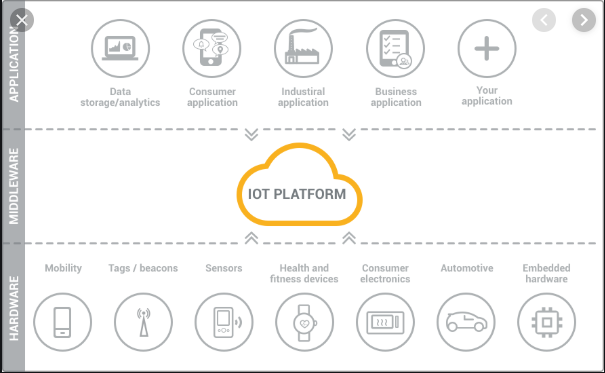


Figure – Source - <https://www.kaaproject.org/what-is-iot-platform>

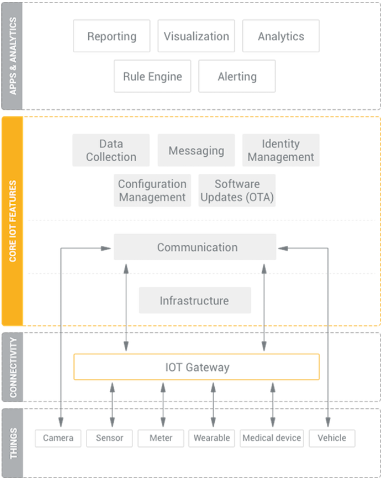


Figure – Source - <https://www.kaaproject.org/what-is-iot-platform>

# Industrial IOT – IIOT

## Industry 4.0

<https://en.wikipedia.org/wiki/Industry_4.0>

## Vendors in this space

## Key Features offered by vendors in their IIOT products

|  |  |  |  |
| --- | --- | --- | --- |
| Connectivity | As cellular technology provides global coverage and long-term sustainability, a growing number of commercial IoT devices include a wireless module or gateway and a SIM to enable bi-directional communications through mobile networks. Connectivity management is another key capability that you will need from your IoT platform. |  |  |
| Managing devices | An IoT platform should allow you to remotely provision, configure, monitor, diagnose and send commands to your IoT devices. It should also release software and firmware updates for your devices in batches over-the-air, so you can keep your connected service competitive and secure over time, without the high cost of servicing with truck rolls. |  |  |
| Data collection |  |  |  |
| Data processing and analytics |  |  |  |
|  |  |  |  |
|  |  |  |  |

# Python’s IOT Ecosystem (Links)

|  |  |  |  |
| --- | --- | --- | --- |
| # | Item |  |  |
| 1 | <https://github.com/adobe/SimpleSensor> |  |  |
| 2 | <https://www.element14.com/community/groups/internet-of-things/blog/2017/02/17/iot-with-python-essential-packages> |  |  |
| 3 | <https://iot.mozilla.org/framework/> |  |  |
| 4 | <https://www.hackster.io/bobbyleonard84/python-micropython-iot-framework-example-auto-irrigation-6286ae> |  |  |
| 5 | <https://pythonforundergradengineers.com/flask-iot-server-motivation.html> |  |  |
| 6 | <https://micropython.org/> |  |  |
| 7 | <https://pypi.org/project/google-cloud-iot/> |  |  |
| 8 | <https://pypi.org/project/azure-iot-device/> |  |  |
| 9 | <https://pythonprogramming.net/introduction-raspberry-pi-tutorials/> |  |  |
| 10 |  |  |  |
| 11 |  |  |  |
| 12 |  |  |  |

# IOT using Raspberry PI

| **MAIN TOPIC** | **SUB TOPIC** | **DETAILS**  **/**  **(LINKS FOR FURTHER STUDY)**  **/**  **(FEEDBACK)**  **/**  **(SAMPLE PROGRAMS)** | **(CLASSROOM EXERCISES)**  **/**  **(ASSIGNMENTS)** | **TRACKING DATA** |
| --- | --- | --- | --- | --- |
| **OVERALL CONTEXT** | WHAT ARE YOU EXPECTING ? | <Update after feedback from the students> | **N/A** | DAY 1  (<=15 mins) |
|  | MY EXPECTATIONS FROM THE STUDENTS/YOU | * Be aware of the course content (*Have all of you gone through the course details [separate doc] ?)* * Do the class room exercises * Complete your assignments * Make notes *(I do it and it helps me)* * Don’t just nod your head to what I say. Digest it slowly. Stop me if I am going too fast | **N/A** | DAY 1  (<= 15 mins) |

## 