Offers a monitoring architecture and real-time alerts to connect to this system.

Précise les technologies utilisées ainsi que l'implémentation de chaque composant. Specifies the technologies used and the implementation of each component.

Hardware Specification:

1. Sensors
2. Analog to Digital converters “ ADC”
3. Microcontroller
4. Hub “Access point”
5. Wireless Internet connection
6. Wi-Fi chips ‘[ESP8266](https://en.wikipedia.org/wiki/ESP8266)”
7. SingleBoard PC “[raspberryPi](https://www.raspberrypi.org/)” as Hub

Software/Protocol requirements:

1. TCP/IP
2. [MQTT](https://mosquitto.org/) protocol “Broker / Client”
3. [SSL certification](https://www.globalsign.com/en/ssl-information-center/what-is-an-ssl-certificate/)
4. [mDNS](https://en.wikipedia.org/wiki/Multicast_DNS) service or [ARP scanning](http://www.nta-monitor.com/wiki/index.php/Arp-scan_User_Guide)
5. [Local Webpage](https://ws.apache.org)

Procedure:

Procedure is quite simple and it is as follow:

* We will connect sensors to microcontroller and connect microcontroller to Wi-Fi chips. I will recommend ESP8266-12E or latest version as Wi-Fi modules. And any microcontroller with 12 bit ADC.
* We will configure Wi-Fi modules using TCP/IP protocol before deployment. And we will be doing that through our Hub. And as a result our ESP8266 Wi-Fi chips will get connect to local Hub via Wi-Fi router acting as a bridge.
* After that a MQTT client will run on ESP8266 Wi-Fi chips while simultaneously a MQTT broker will already will be running on our Hub. Thus our hub will act as local server.
* Our local server is going to be connected to our main server using our company domain after authentication via MQTT.
* Each MQTT topic will identify the device name and type of data it is sending, we can add other details if needed.
* Thus little bit processing will be done at microcontroller site while majority of processing is going to be done at local Hub and Main Hub at our office.
* MQTT is able to send sensor data in real time or in form of stack to local hub and same goes from local hub to main hub.
* Data is secured because MQTT required authentication and we can further add SSL certification.
* MQTT is open source thus will just deploy and configure.
* In case of power loss for a moment and internet disconnection we will program the hub and ESP8266 Wi-Fi modules in such a way that will they will be able to identify each other in a few moment using mDNS service or ARP scanning using MAC addresses.
* We can view data and do analysis of data through a web page or Smartphone app in real time and simultaneously send data to services if needed, again using MQTT protocol.

