

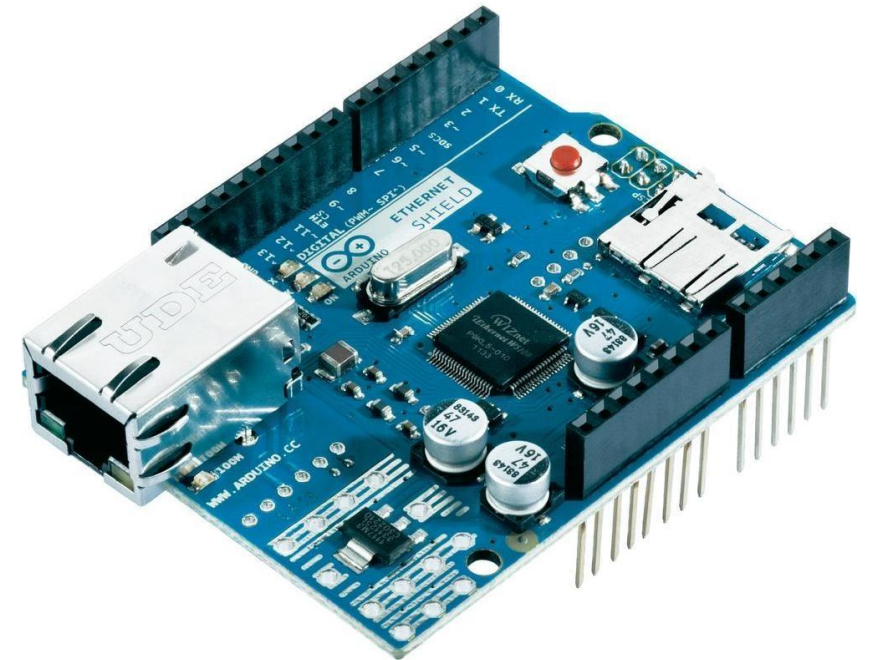
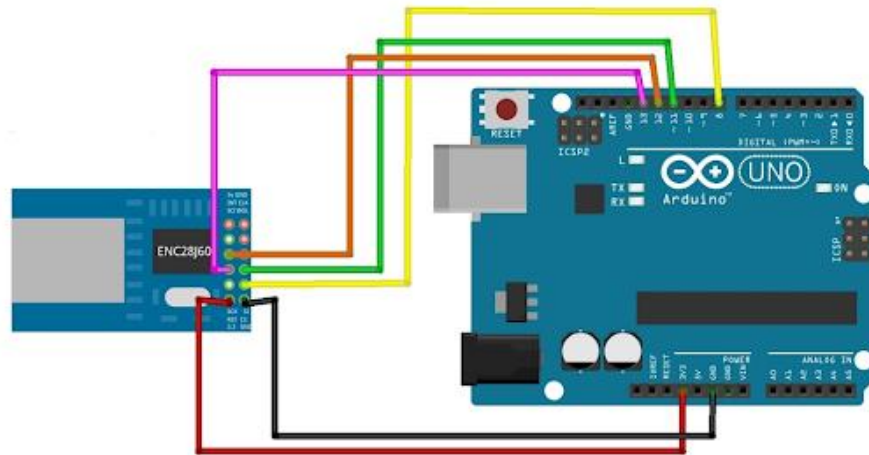
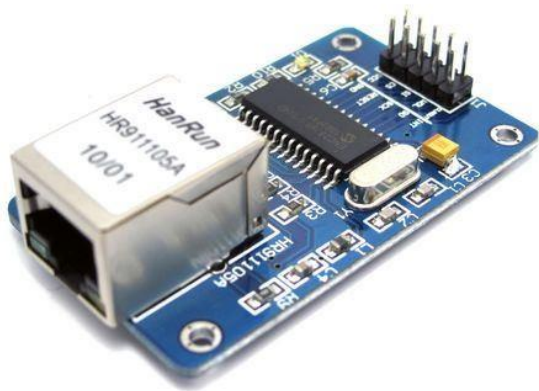


UNIVERSIDAD
DE LIMA

INTEGRACIÓN EN LA NUBE

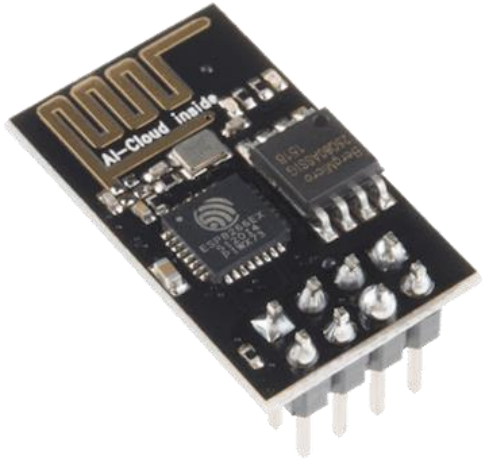
Integración cableada

- Módulo Ethernet
 - El Arduino no tiene conexión cableada directa, necesitamos módulos o shields

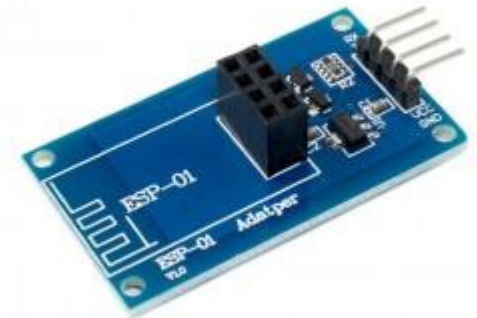


Integración inalámbrica

- Módulo Wifi ESP8266 para arduino
- Programación por comandos AT para conseguir la integración con la nube



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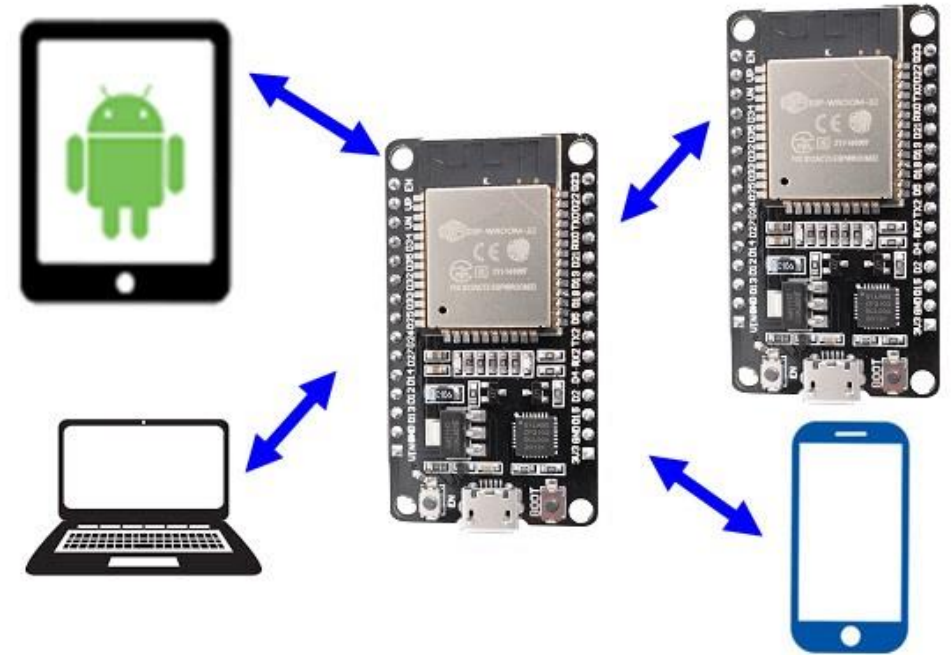
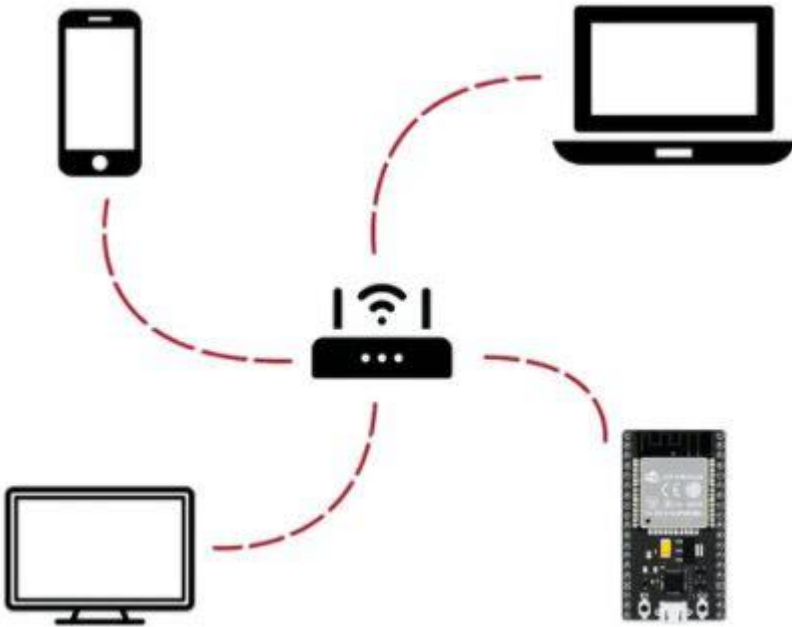
ESP8266 sin librería

- Lista de comandos AT

Commands	Description	Type	Set/Execute	Inquiry	test	Parameters	Examples
AT+RST	restart the module	basic	-	-	-	-	
AT+CWMODE	wifi mode	wifi	AT+CWMODE=<mode>	AT+CWMODE?	AT+CWMODE=?	1= Sta, 2= AP, 3=both	
AT+CWJAP	join the AP	wifi	AT+ CWJAP = <ssid>,<pwd >	AT+ CWJAP?	-	ssid = ssid, pwd = wifi password	
AT+CWLAP	list the AP	wifi	AT+CWLAP				
AT+CWQAP	quit the AP	wifi	AT+CWQAP	-	AT+CWQAP=?		
AT+ CWSAP	set the parameters of AP	wifi	AT+ CWSAP= <ssid>,<pwd>,<chl>,<ecn>	AT+ CWSAP?		ssid, pwd, chl = channel, ecn = encryption	Connect to your router: : AT+CWJAP="YOURSSID","helloworld"; and check if connected: AT+CWJAP?
AT+ CIPSTATUS	get the connection status	TCP/IP	AT+ CIPSTATUS				
AT+CIPSTART	set up TCP or UDP connection	TCP/IP	1)single connection (+CIPMUX=0) AT+CIPSTART= <type>,<addr>,<port>; 2) multiple connection (+CIPMUX=1) AT+CIPSTART= <id> <type>,<addr>,<port>	-	AT+CIPSTART=?	id = 0-4, type = TCP/UDP, addr = IP address, port= port	Connect to another TCP server, set multiple connection first: AT+CIPMUX=1; connect: AT+CIPSTART=4,"TCP","X1.X2.X3.X4",9999
AT+CIPSEND	send data	TCP/IP	1)single connection(+CIPMUX=0) AT+CIPSEND= <length>; 2) multiple connection (+CIPMUX=1) AT+CIPSEND= <id>,<length>		AT+CIPSEND=?		send data: AT+CIPSEND=4,15 and then enter the data
AT+CIPCLOSE	close TCP or UDP connection	TCP/IP	AT+CIPCLOSE=<id> or AT+CIPCLOSE		AT+CIPCLOSE=?		
AT+CIFSR	Get IP address	TCP/IP	AT+CIFSR		AT+ CIFSR=?		
AT+ CIPMUX	set mutiple connection	TCP/IP	AT+ CIPMUX=<mode>	AT+ CIPMUX?		0 for single connection 1 for mutiple connection	
AT+ CIPSERVER	set as server	TCP/IP	AT+ CIPSERVER= <mode>[,<port>]			mode 0 to close server mode, mode 1 to open; port = port	turn on as a TCP server: AT+CIPSERVER=1,8888, check the self server IP address: AT+CIFSR=?

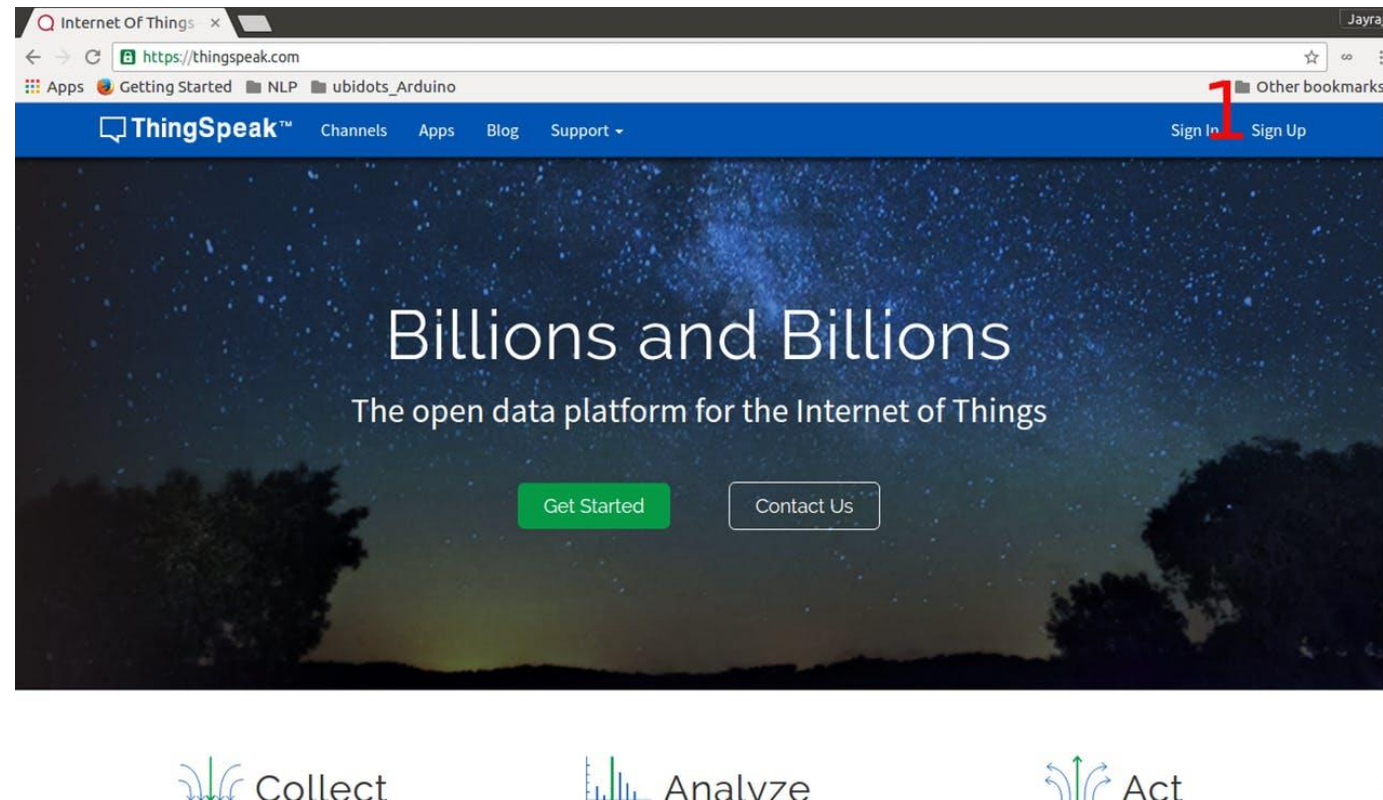
ESP32

- Funciona como estación
- Funciona como un access point

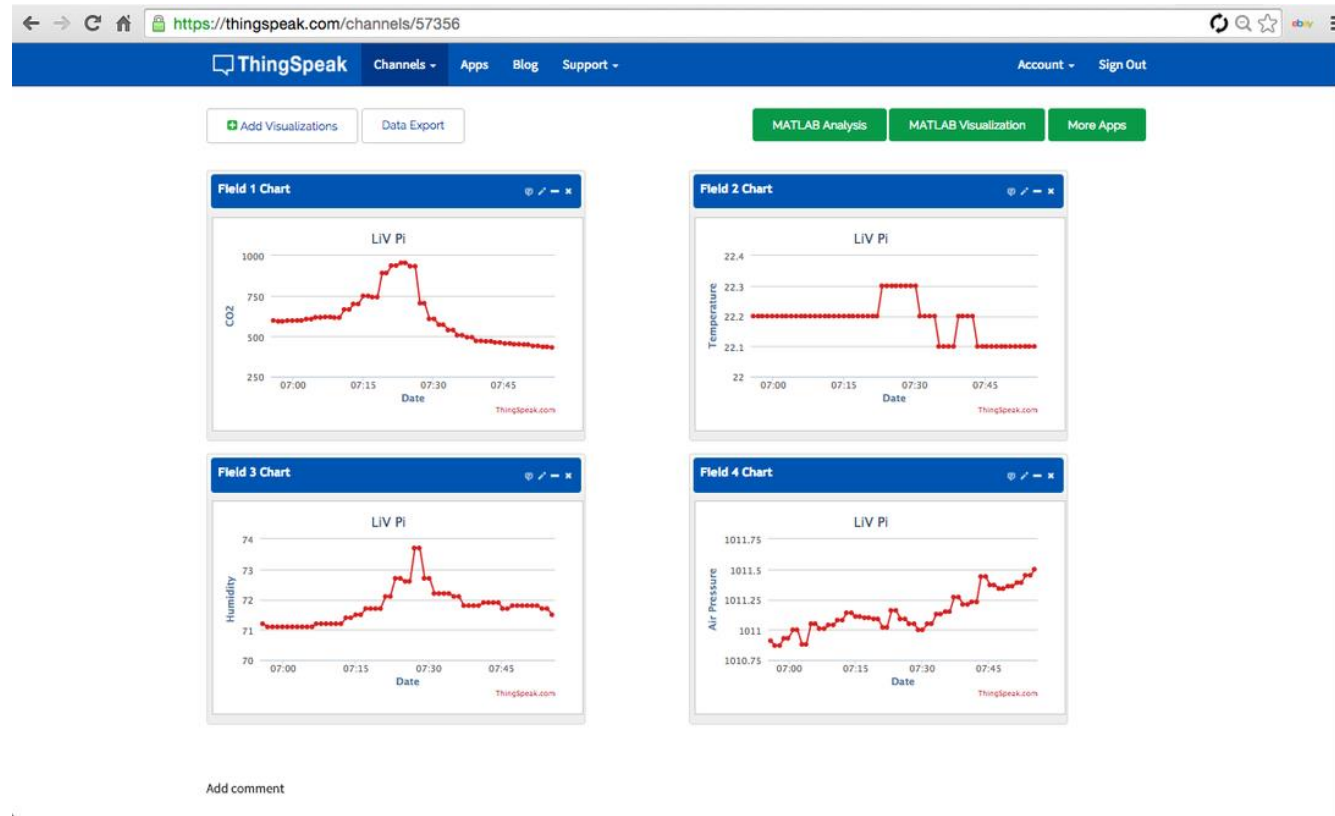


SERVIDORES WEB

Thingspeak



Ejemplos

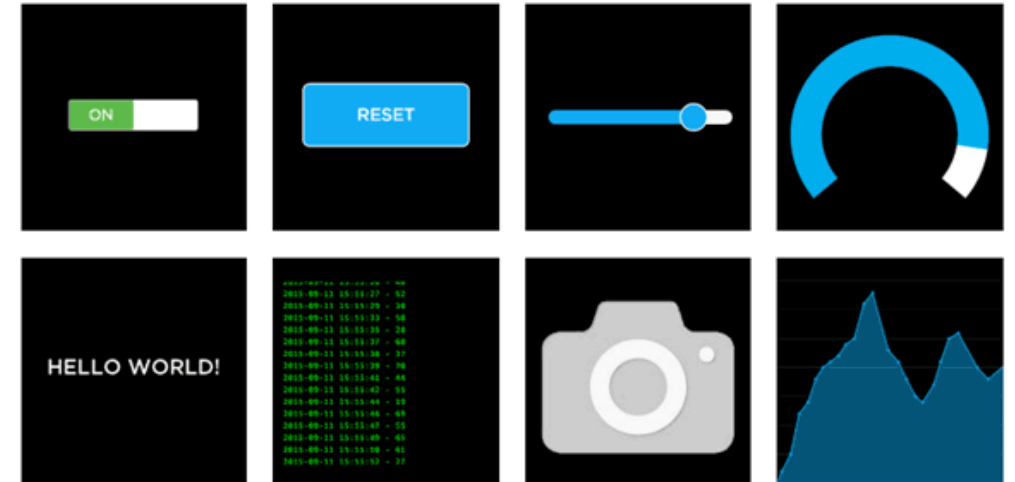


ADAFRUIT IO



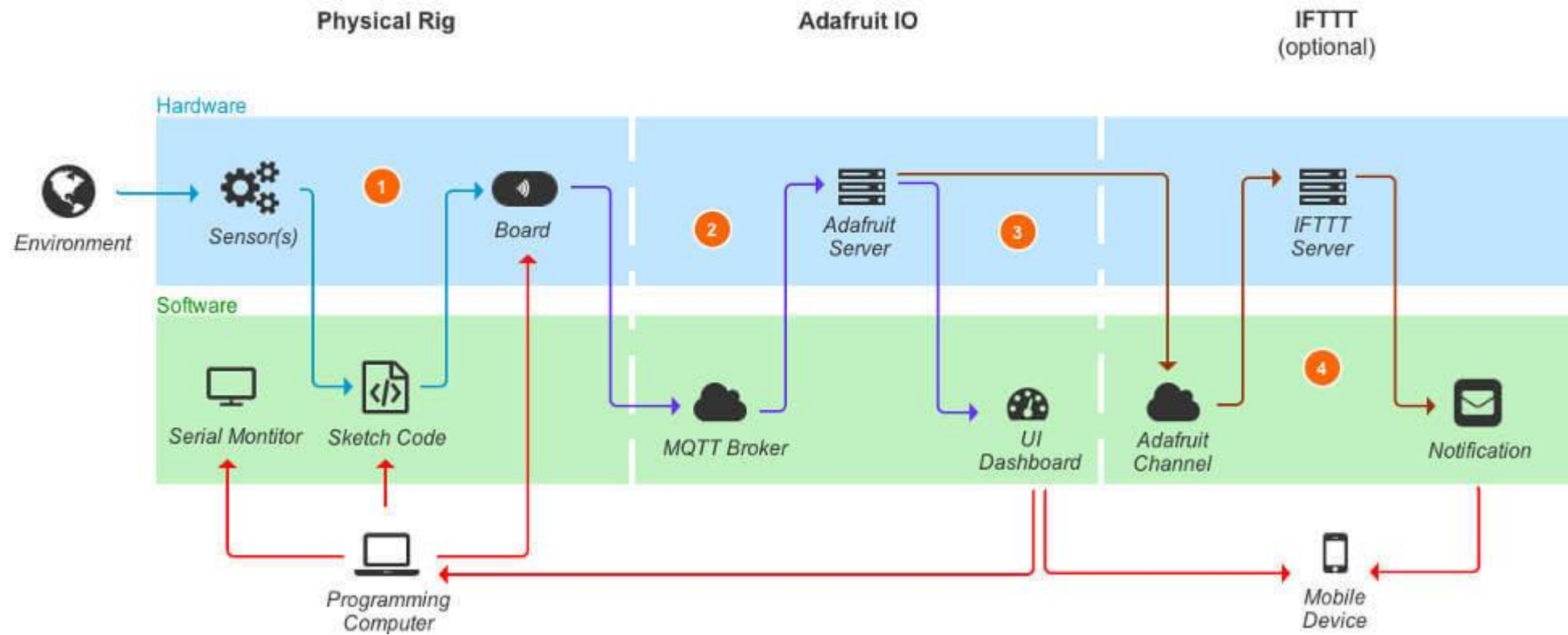
Create a new block

Click on the block you would like to add to your dashboard. You can always come back and switch the block type later if you change your mind.



ADAFRUIT IFTTT

- IFTTT (if-this-then-that)



ADAFRUIT IFTTT

- Ejemplo
- <https://cdn-learn.adafruit.com/downloads/pdf/using-ifttt-with-adafruit-io.pdf>



- Amazon Web Service

The screenshot displays the AWS IoT console interface. On the left, a navigation sidebar includes links for Policies, CAs, Role Aliases, Authorizers, Defend, Act, Test, Device Advisor, Test suites, Test runs and results, MQTT test client (highlighted), Software, Settings, and Learn. The main content area is titled 'Subscriptions' and shows a list of subscriptions for the 'sensor' topic. Two subscriptions are visible, each with a timestamp and a JSON payload. The top subscription is from May 01, 2022, 19:15:39 (UTC-0500) with a temperature of 25 and humidity of 44. The bottom subscription is from May 01, 2022, 19:15:32 (UTC-0500) with a temperature of 26 and humidity of 31. A mouse cursor is hovering over the 'mac_Id' field in the bottom subscription's payload. At the top right of the console, there are buttons for Pause, Clear, Export, and Edit, along with a search bar and user information (N. Virginia, henrymera).

Subscription	Timestamp	Payload
sensor	May 01, 2022, 19:15:39 (UTC-0500)	<pre>{ "mac_Id": "84:cc:a8:64:fb:0c", "Temperatura": 25, "Humedad": 44 }</pre>
sensor	May 01, 2022, 19:15:32 (UTC-0500)	<pre>{ "mac_Id": "84:cc:a8:64:fb:0c", "Temperatura": 26, "Humedad": 31 }</pre>