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ESP8266 RTOS SDK Programming Guide Windows doesn't have a built-in "make" environment, so as well as installing the toolchain you will need a GNU-compatible environment. We use the MSYS2 environment to provide this. You don't need to use this environment all the time (you can use Eclipse or some other front-end), but it runs behind the scenes. Open a MSYS2 MINGW32 terminal window by running C:\msys32\mingw32.exe. The environment in this window is a bash shell. Create a directory named esp that is a default location to develop ESP8266 applications. To do so, run the following shell command: By typing cd ~/esp you can then move to the newly created directory. If there are no error messages you are done with this step. MSYS2 MINGW32 shell window Use this window in the following steps setting up development environment for ESP8266. © Copyright 2020, Espressif Systems (Shanghai) Co., Ltd. Revision ea598f11. Built with Sphinx using a theme provided by Read the Docs. Feather is the new development board from Adafruit, and like it's namesake it is thin, light, and lets you fly! We designed Feather to be a new standard for portable microcontroller cores. This is the Adafruit Feather HUZZAH ESP8266 - our take on an 'all-in-one' ESP8266 WiFi development board with built in USB and battery charging. Its an ESP8266 WiFi module with all the extras you need, ready to rock! We have other boards in the Feather family, check'em out here. At the Feather HUZZAH's heart is an ESP8266 WiFi microcontroller clocked at 80 MHz and at 3.3V logic. This microcontroller contains a Tensilica chip core as well as a full WiFi stack. You can progam the microcontroller using the Arduino IDE for an easy-to-run Internet of Things core. We wired up a USB-Serial chip that can upload code at a blistering 921600 baud for fast development time. It also has auto-reset so no noodling with pins and reset button pressings. To make it easy to use for portable projects, we added a connector for any of our 3.7V Lithium polymer batteries and built in battery charging. You don't need a battery, it will run just fine straight from the micro USB connector. But, if you do have a battery, you can take it on the go, then plug in the USB to recharge. The Feather will automatically switch over to USB power when its available. Here's some handy specs! Measures 2.0" x 0.9" x 0.28" (51mm x 23mm x 8mm) without headers soldered in Light as a (large?) feather - 6 grams ESP8266 @ 80MHz or 160 MHz with 3.3V logic/power 4MB of FLASH (32 MBit) 3.3V regulator with 500mA peak current output CP2104 USB-Serial converter onboard with 921600 max baudrate for uploading Auto-reset support for getting into bootload mode before firmware upload 9 GPIO pins - can also be used as I2C and SPI 1 x analog inputs 1.0V max Built in 100mA lipoly charger with charging status indicator LED Pin #0 red LED for general purpose blinking. Pin #2 blue LED for bootloading debug & general purpose blinking Power/enable pin 4 mounting holes Reset button Comes fully assembled and tested, with a USB interface that lets you quickly use it with the Arduino IDE or NodeMCU Lua. (It comes preprogrammed with the Lua interpretter) We also toss in some header so you can solder it in and plug into a solderless breadboard. Lipoly battery and USB cable not included (but we do have lots of options in the shop if you'd like!) Page 2 GND - this is the common ground for all power and logic BAT - this is the positive voltage to/from the JST jack for the optional Lipoly battery USB - this is the positive voltage to/from the micro USB jack if connected EN - this is the 3.3V regulator's enable pin. It's pulled up, so connect to ground to disable the 3.3V regulator 3V - this is the output from the 3.3V regulator, it can supply 500mA peak (try to keep your current draw under 250mA so you have plenty for the ESP8266's power requirements!) This is the general purpose I/O pin set for the microcontroller. All logic is 3.3V The ESP8266 runs on 3.3V power and logic, and unless otherwise specified, GPIO pins are not 5V safe! The analog pin is also 1.0V max! RX and TX are the serial control and bootloading pins, and are how you will spend most of your time communicating with the ESP module The TX pin is the output from the module and is 3.3V logic. The RX pin is the input into the module and is 5V compliant (there is a level shifter on this pin) These are connected through to the CP2104 USB-to-Serial converter so they should not be connected to or used unless you're super sure you want to because you will also be getting the USB traffic on these! You can use the ESP8266 to control I2C and SPI devices, sensors, outputs, etc. While this is done by 'bitbanging', it works quite well and the ESP8266 is fast enough to match 'Arduino level' speeds. In theory you can use any pins for I2C and SPI but to make it easier for people using existing Arduino code, libraries, sketches we set up the following: I2C SDA = GPIO #4 (default) I2C SCL = GPIO #5 (default) If you want, you can connect to I2C devices using other 2 pins in the Arduino IDE, by calling Wire.pins(sda, scl) before any other Wire code is called (so, do this at the begining of setup() for example Likewise, you can use SPI on any pins but if you end up using 'hardware SPI' you will want to use the following: SPI SCK = GPIO #14 (default) SPI MOSI = GPIO #13 (default) SPI MISO = GPIO #12 (default) This breakout has 9 GPIO: #0, #2, #4, #5, #12, #13, #14, #15, #16 arranged at the top edge of the Feather PCB All GPIO are 3.3V logic level in and out, and are not 5V compatible. Read the full spec sheet to learn more about the GPIO pin limits, but be aware the maximum current drawn per pin is 12mA. These pins are general purpose and can be used for any sort of input or output. Most also have the ability to turn on an internal pullup. Many have special functionality: GPIO #0, which does not have an internal pullup, and is also connected a red LED. This pin is used by the ESP8266 to determine when to boot into the bootloader. If the pin is held low during power-up it will start bootloading! That said, you can always use it as an output, and blink the red LED - note the LED is reverse wired so setting the pin LOW will turn the LED on. GPIO #2, is also used to detect boot-mode. It also is connected to the blue LED that is near the WiFi antenna. It has a pullup resistor connected to it, and you can use it as any output (like #0) and blink the blue LED. GPIO #15, is also used to detect boot-mode. It has a pulldown resistor connected to it, make sure this pin isn't pulled high on startup. You can always just use it as an output GPIO #16 can be used to wake up out of deep-sleep mode, you'll need to connect it to the RESET pin Also note that GPIO #12/13/14 are the same as the SCK/MOSI/MISO 'SPI' pins! There is also a single analog input pin called A. This pin has a ~1.0V maximum voltage, so if you have an analog voltage you want to read that is higher, it will have to be divided down to 0 - 1.0V range We have a few other pins for controlling the ESP8266 RST - this is the reset pin for the ESP8266, pulled high by default. When pulled down to ground momentarily it will reset the ESP8266 system. This pin is 3.3V logic only EN (CH_PD) - This is the enable pin for the ESP8266, pulled high by default. When pulled down to ground momentarily it will reset the ESP8266 system. This pin is 3.3V logic only The rest of the pins are labeled NC which means Not Connected - they are not connected to anything and are there as placeholders only, to maintain physical compatibility with the other boards in the Feather line! Page 3 Save Subscribe This guide was first published on Nov 25, 2015. It was last updated on 2022-07-27 15:18:41 -0400. This page (Assembly) was last updated on Aug 15, 2022. Text editor powered by tinymce. Page 4 Don't power the Huzzah ESP8266 with a CanaKit 5V power supply, these power supplies have been destroying the CP2104 chip. We wanted to make our Feather boards easy to power both when connected to a computer as well as via battery. There's two ways to power a Feather: You can connect with a USB cable (just plug into the jack) and the Feather will regulate the 5V USB down to 3.3V. You can also connect a 4.2/3.7V Lithium Polymer (LiPo/LiPoly) or Lithium Ion (LiIon) battery to the JST jack. This will let the Feather run on a rechargeable battery. When the USB power is powered, it will automatically switch over to USB for power, as well as start charging the battery (if attached). This happens 'hot-swap' style so you can always keep the LiPoly connected as a 'backup' power that will only get used when USB power is lost. The JST connector polarity is matched to Adafruit LiPoly batteries. Using wrong polarity batteries can destroy your Feather. The above shows the Micro USB jack (left), LiPoly JST jack (top left), as well as the 3.3V regulator and changeover diode (just to the right of the JST jack) and the LiPoly charging circuitry (right below the regulator). There's also a CHG LED next to the USB jack, which will light up while the battery is charging. This LED might also flicker if the battery is not connected, it's normal. You have a lot of power supply options here! We bring out the BAT pin, which is tied to the LiPoly JST connector, as well as USB which is the +5V from USB if connected. We also have the 3V pin which has the output from the 3.3V regulator. We use a 500mA peak regulator. While you can get 500mA from it, you can't do it continuously from 5V as it will overheat the regulator. We use this to power the ESP8266 which can draw spikes of 250+mA (although its not continuous). You should be able to budget about 250mA current available from the regulator, which will leave plenty for the WiFi module. If you're running off of a battery, chances are you wanna know what the voltage is at! That way you can tell when the battery needs recharging. LiPoly batteries are 'maxed out' at 4.2V and stick around 3.7V for much of the battery life, then slowly sink down to 3.2V or so before the protection circuitry cuts it off. By measuring the voltage you can quickly tell when you're heading below 3.7V. Since the ESP8266 does not have multiple ADC pins, we didn't want to 'sacrifice' one for LiPoly battery monitoring. However we do have a tutorial that mentions how to do it, using two resistors. You can check out the wiring diagram here (use the VBat pin to measure) and the code here. If you'd like to turn off the 3.3V regulator, you can do that with the EN(able) pin. Simply tie this pin to Ground and it will disable the 3V regulator. The BAT and USB pins will still be powered. The two primary ways for powering a feather are a 3.7/4.2V LiPo battery plugged into the JST port or a USB power cable. If you need other ways to power the Feather, here's what we recommend: Here's what you cannot do: Do not use alkaline or NiMH batteries and connect to the battery port - this will destroy the LiPoly charger and there's no way to disable the charger Do not use 7.4V RC batteries on the battery port - this will destroy the board The Feather is not designed for external power supplies - this is a design decision to make the board compact and low cost. It is not recommended, but technically possible: Connect an external 3.3V power supply to the 3V and GND pins. Not recommended, this may cause unexpected behavior and the EN pin will no longer work. Also this doesn't provide power on BAT or USB and some Feathers/Wings use those pins for high current usages. You may end up damaging your Feather. Connect an external 5V power supply to the USB and GND pins. Not recommended, this may cause unexpected behavior when plugging in the USB port because you will be back-powering the USB port, which could confuse or damage your computer. Page 5 Each Feather HUZZAH ESP8266 breakout comes pre-programmed with NodeMCU's Lua interpreter. As of this writing, we ship with NodeMCU 0.9.5 build 20150318 powered by Lua 5.1.4 but it may be more recent Lua is still a work in progress, so we strongly recommend visiting NodeMCU and updating your Lua version to the very latest as they have the ability to make you the latest continuous build. Then follow their guide on how to update Lua! The Lua interpreter runs on the ESP8266 and you can type in commands and read out the results over serial. In order to upload code to the ESP8266 and use the serial console, connect any data-capable micro USB cable to the Feather HUZZAH and the other side to your computer's USB port. Install the required CP2104 USB driver to have the COM/Serial port appear properly Don't forget to visit esp8266.com for the latest and greatest in ESP8266 news, software and gossip! Don't forget to install the USB driver for the CP2104 USB-to-Serial chip! Next up, on your computer, use a serial console program such as CoolTerm (Mac) or Putty (Windows) or screen (linux). Teraterm seems to dislike the initial 74400bps data stream from the ESP8266 so you can try it but you'll possibly need to reset the terminal software. Connect up to the COM or Serial port used by your cable, at 9600 Baud Make sure you have turned off any hardware handshake or flow control Putty isn't good with pasting code in, so you may not be able to copy-n-paste! Also make sure you have line endings set to CRLF "\r" Use any serial console program you like, we just happen to be used to Putty! Once the terminal software is connected, click the Reset button on the Feather HUZZAH ESP8266 board to reset it and have it print out the welcome message: If you don't get this message, first check that the red/blue leds flickered when you press the reset button. If they didnt, make sure you've got the right baud rate selected in the software (9600) Ok we can now turn on an LED. There is a red LED on each board, connected to GPIO #0 NodeMCU Lua's pinouts are not the same as the Arduino/gcc pinouts. We print the Arduino pinouts on the board so watch out! Pin Notes PCB/Arduino NodeMCU/Lua No pullups! 0 3 2 4 CHPD (Note, don't use this pin or set it to be an output!) 3 9 4 1 5 2 9 11 10 12 12 6 13 7 14 5 15 8 16 0 So to set the pin #0 LED on and off (which would be pin #3 in Lua) first make it an output: gpio.mode(3, gpio.OUTPUT) gpio.mode(3, gpio.OUTPUT) gpio.write(3, gpio.LOW) gpio.write(3, gpio.LOW) gpio.write(3, gpio.HIGH) gpio.write(3, gpio.HIGH) You can make this a little more automated by running a longer script. For longer text, pasting can be difficult as the lua interpreter needs a little delay time between characters and also require CR-LF settings. For that reason you may want to paste each line and then hit return manually. while 1 do gpio.write(3, gpio.HIGH) tmr.delay(1000000) -- wait 1,000,000 us = 1 second gpio.write(3, gpio.LOW) tmr.delay(1000000) -- wait 1,000,000 us = 1 second end while 1 do gpio.write(3, gpio.HIGH) tmr.delay(1000000) -- wait 1,000,000 us = 1 second gpio.write(3, gpio.LOW) tmr.delay(1000000) -- wait 1,000,000 us = 1 second end The LED will now be blinking on and off. Note that since its in a loop, its not possible to get it to stop via the interpreter. To stop it, click the Reset button again! This code halts the processor during the tmr.delay, a smarter way to blink an LED is to use the timer capability to set off the LED control (code from here) -- Pin definition local pin = 3 local status = gpio.LOW local duration = 1000 -- 1 second duration for timer -- Initialising pin gpio.mode(pin, gpio.OUTPUT) gpio.write(pin, status) -- Create an interval tmr.alarm(0, duration, 1, function () if status == gpio.LOW then status = gpio.HIGH else status = gpio.LOW end gpio.write(pin, status) end) -- Pin definition local pin = 3 local status = gpio.LOW local duration = 1000 -- 1 second duration for timer -- Initialising pin gpio.mode(pin, gpio.OUTPUT) gpio.write(pin, status) -- Create an interval tmr.alarm(0, duration, 1, function () if status == gpio.LOW then status = gpio.HIGH else status = gpio.LOW end gpio.write(pin, status) end) We'll continue with a quick demo of scanning for WiFi and connecting. Once you're back at the Lua prompt, set the ESP8266 into WiFi Client mode with Then you can run the scanner and have it print out the available AP's -- print ap list function listap(t) for k,v in pairs(t) do print(k.." : "..v) end end wifi.sta.getap(listap) -- print ap list function listap(t) for k,v in pairs(t) do print(k.." : "..v) end end wifi.sta.getap(listap) -- print ap list function listap(t) for ssid,v in pairs(t) do authmode, rssi, bssid, channel = string.match(v, "(%d),(-?%d+),(%x%x:%x%x:%x%x:%x%x:%x%x:%x%x),(%d+)") print(ssid,authmode,rssi,bssid,channel) end end wifi.sta.getap(listap) -- print ap list function listap(t) for ssid,v in pairs(t) do authmode, rssi, bssid, channel = string.match(v, "(%d),(-?%d+),(%x%x:%x%x:%x%x:%x%x:%x%x:%x%x),(%d+)") print(ssid,authmode,rssi,bssid,channel) end end wifi.sta.getap(listap) We can connect to the access point with wifi.sta.config and wifi.sta.connect - it will take a second or two to complete the connection, you can query the module to ask the status with wifi.sta.status() - when you get a 5 it means the connection is completed and DHCP successful wifi.sta.config("accesspointname","yourpassword") wifi.sta.connect() tmr.delay(1000000) -- wait 1,000,000 us = 1 second print(wifi.sta.status()) print(wifi.sta.getip()) wifi.sta.config("accesspointname","yourpassword") wifi.sta.connect() tmr.delay(1000000) -- wait 1,000,000 us = 1 second print(wifi.sta.status()) print(wifi.sta.getip()) Once you're got the IP address you can connect to adafruit, for example, and read a webpage and print it out: sk=net.createConnection(net.TCP, 0) sk:on("receive", function(sck, c) print(c) end) sk:connect(80,"207.58.139.247") sk:send("GET /testwifi/index.html HTTP/1.1\r\nHost: www.adafruit.com\r\nConnection: keep-alive\r\nAccept: */*\r\n\r\n") sk=net.createConnection(net.TCP, 0) sk:on("receive", function(sck, c) print(c) end) sk:connect(80,"207.58.139.247") sk:send("GET /testwifi/index.html HTTP/1.1\r\nHost: www.adafruit.com\r\nConnection: keep-alive\r\nAccept: */*\r\n\r\n") You can also have the module do DNS for you, just give it the hostname instead of IP address: sk=net.createConnection(net.TCP, 0) sk:on("receive", function(sck, c) print(c) end) sk:connect(80,"www.adafruit.com") sk:send("GET /testwifi/index.html HTTP/1.1\r\nHost: www.adafruit.com\r\nConnection: keep-alive\r\nAccept: */*\r\n\r\n") sk=net.createConnection(net.TCP, 0) sk:on("receive", function(sck, c) print(c) end) sk:connect(80,"www.adafruit.com") sk:send("GET /testwifi/index.html HTTP/1.1\r\nHost: www.adafruit.com\r\nConnection: keep-alive\r\nAccept: */*\r\n\r\n") This is just a light overview of testing out your HUZZAH ESP breakout! For much more, check out NodeMCU's documentation page for the details on what functions are available to you, as well as to learn more about the Lua scripting language Page 6 While the Feather HUZZAH ESP8266 comes pre-programmed with NodeMCU's Lua interpretter, you don't have to use it! Instead, you can use the Arduino IDE which may be more familar. This will write directly to the firmware, erasing the NodeMCU firmware, so if you want to go back to Lua, use the flasher to re-install it Don't forget to visit esp8266.com for the latest and greatest in ESP8266 news, software and gossip! In order to upload code to the ESP8266 and use the serial console, connect any data-capable micro USB cable to the Feather HUZZAH and the other side to your computer's USB port. Don't forget you will also need to install the SiLabs CP2104 Driver: Click here to download the CP2104 USB Driver On Mac OS 10.13 and higher, in addition to installing, you will have to give the CP2104 kernel driver permission to load. You can find out if you need to give additional permission by visiting your Security & Privacy settings system preferences screen after installing and looking for the message that says, 'System software from developer "SiLabs" was blocked from loading', like in the picture below. To allow the driver to load, click the lock icon, enter your password, and click "Allow" next to the warning message. After that, you may have to restart your computer before following the steps below and connecting to your Huzzah in the Arduino app. If you are using Mac OS 10.12.6 (Sierra) and you cannot upload with the latest Mac OS VCP driver, please try the legacy v4 driver below. Note you will need to uninstall the v5 driver using uninstall.sh (in the driver package) Download the CP2104 Legacy USB Driver Enter into Additional Board Manager URLs field in the Arduino v1.6.4+ preferences. Next, use the Board manager to install the ESP8266 package. If you want to use this board with Adafruit IO Arduino - make sure you're on version 2.5.1 or ABOVE. After the install process, you should see that esp8266 package is marked INSTALLED. Close the Boards Manager window once the install process has completed. When you've restarted, select Adafruit Feather HUZZAH ESP8266 from the Tools->Board dropdown 80 MHz as the CPU frequency You can keep the Flash Sizeat "4M (3M SPIFFS) For Upload Speed, select 115200 baud (You can also try faster baud rates, we were able to upload at a blistering 921600 baud but sometimes it fails & you have to retry) The matching COM port for your FTDI or USB-Serial cable On a mac, you should look for the "SLAB_USBtoUART" port We'll begin with the simple blink test Enter this into the sketch window (and save since you'll have to) void setup() { pinMode(0, OUTPUT); } void loop() { digitalWrite(0, HIGH); delay(500); digitalWrite(0, LOW); delay(500); } void setup() { pinMode(0, OUTPUT); } void loop() { digitalWrite(0, HIGH); delay(500); digitalWrite(0, LOW); delay(500); } Now you can simply upload! The Feather HUZZAH has built in auto-reset that puts it into bootloading mode automagically The sketch will start immediately - you'll see the LED blinking. Hooray! OK once you've got the LED blinking, lets go straight to the fun part, connecting to a webserver. Create a new sketch with this code: /* * Simple HTTP get webclient test */ #include const char* ssid = "yourssid"; const char* password = "yourpassword"; const char* host = "wifitest.adafruit.com"; void setup() { Serial.begin(115200); delay(100); // We start by connecting to a WiFi network Serial.println(); Serial.println(); Serial.print("Connecting to "); Serial.println(ssid); WiFi.begin(ssid, password); while (WiFi.status() != WL_CONNECTED) { delay(500); Serial.print("."); } Serial.println(""); Serial.println("WiFi connected"); Serial.println("IP address: "); Serial.println(WiFi.localIP()); } int value = 0; void loop() { delay(5000); ++value; Serial.print("connecting to "); Serial.println(host); // Use WiFiClient class to create TCP connections WiFiClient client; const int httpPort = 80; if (!client.connect(host, httpPort)) { Serial.println("connection failed"); return; } // We now create a URI for the request String url = "/testwifi/index.html"; Serial.print("Requesting URL: "); Serial.println(url); // This will send the request to the server client.print(String("GET ") + url + " HTTP/1.1\r\n" + "Host: " + host + "\r\n" + "Connection: close\r\n\r\n"); delay(500); // Read all the lines of the reply from server and print them to Serial while(client.available()){ String line = client.readStringUntil('\r'); Serial.print(line); } Serial.println(); Serial.println("closing connection"); } /* * Simple HTTP get webclient test */ #include const char* ssid = "yourssid"; const char* password = "yourpassword"; const char* host = "wifitest.adafruit.com"; void setup() { Serial.begin(115200); delay(100); // We start by connecting to a WiFi network Serial.println(); Serial.println(); Serial.print("Connecting to "); Serial.println(ssid); WiFi.begin(ssid, password); while (WiFi.status() != WL_CONNECTED) { delay(500); Serial.print("."); } Serial.println(""); Serial.println("WiFi connected"); Serial.println("IP address: "); Serial.println(WiFi.localIP()); } int value = 0; void loop() { delay(5000); ++value; Serial.print("connecting to "); Serial.println(host); // Use WiFiClient class to create TCP connections WiFiClient client; const int httpPort = 80; if (!client.connect(host, httpPort)) { Serial.println("connection failed"); return; } // We now create a URI for the request String url = "/testwifi/index.html"; Serial.print("Requesting URL: "); Serial.println(url); // This will send the request to the server client.print(String("GET ") + url + " HTTP/1.1\r\n" + "Host: " + host + "\r\n" + "Connection: close\r\n\r\n"); delay(500); // Read all the lines of the reply from server and print them to Serial while(client.available()){ String line = client.readStringUntil('\r'); Serial.print(line); } Serial.println(); Serial.println("closing connection"); } Dont forget to update const char* ssid   = "yourssid";const char* password = "yourpassword"; to your access point and password, then upload the same way: get into bootload mode, then upload code via IDE Open up the IDE serial console at 115200 baud to see the connection and webpage printout! That's it, pretty easy! This page was just to get you started and test out your module. For more information, check out the ESP8266 port github repository for much more up-to-date documentation! Page 7 The WipperSnapper firmware and ecosystem are in BETA and are actively being developed to add functionality, more boards, more sensors, and fix bugs. We encourage you to try out WipperSnapper with the understanding that it is not final release software and is still in development. If you encounter any bugs, glitches, or difficulties during the beta period, or with this guide, please contact us via WipperSnapper is a firmware designed to turn any WiFi-capable board into an Internet-of-Things device without programming a single line of code. WipperSnapper connects to Adafruit IO, a web platform designed (by Adafruit!) to display, respond, and interact with your project's data. Simply load the WipperSnapper firmware onto your board, add credentials, and plug it into power. Your board will automatically register itself with your Adafruit IO account. From there, you can add components to your board such as buttons, switches, potentiometers, sensors, and more! Components are dynamically added to hardware, so you can immediately start interacting, logging, and streaming the data your projects produce without writing code. You will need an Adafruit IO account to use WipperSnapper on your board. If you do not already have one, head over to io.adafruit.com to create a free account. Log into your Adafruit IO account. Click the New Device button at the top of the page. After clicking New Device, you should be on the board selector page. This page displays every board that is compatible with the WipperSnapper firmware. In the board selector page's search bar, search for the Feather HUZZAH ESP8266. Once you've located the board you'd like to install WipperSnapper on, click the Choose Board button to bring you to the self-guided installation wizard. Follow the step-by-step instructions on the page to install Wippersnapper on your device and connect it to Adafruit IO. If the installation was successful, a popover should appear displaying that your board has successfully been detected by Adafruit IO. Give your board a name and click "Continue to Device Page". You should be brought to your board's device page. The next step, WipperSnapper Usage, will teach you how to configure and control your development board over the Internet. Adafruit.io WipperSnapper is in beta and you can help improve it! If you have suggestions or general feedback about the installation process - visit click "Contact Adafruit IO Support" and select "I have feedback or suggestions for the WipperSnapper Beta". If you encountered an issue during installation, please try the steps below first. If you're still unable to resolve the issue, or if your issue is not listed below, get in touch with us directly at . Make sure to click "Contact Adafruit IO Support" and select "There is an issue with WipperSnapper. Something is broken!" WipperSnapper firmware is an application that is loaded onto your board. There is nothing to "uninstall". However, you may want to "move" your board from running WipperSnapper to running Arduino or CircuitPython. You also may need to restore your board to the state it was shipped to you from the Adafruit factory. Follow the steps on the Installing CircuitPython page to install CircuitPython on your board running WipperSnapper. If you are unable to double-tap the RST button to enter the UF2 bootloader, follow the "Factory Resetting a WipperSnapper Board" instructions below. Uploading this sketch will overwrite WipperSnapper. If you want to re-install WipperSnapper, follow the instructions at the top of this page. If you want to use your board with Arduino, you will use the Arduino IDE to load any sketch onto your board. First, follow the page below to set up your Arduino IDE environment for use with your board. Then, follow the page below to upload the "Arduino Blink" sketch to your board. Upload Arduino "Blink" Sketch Uploading this sketch will overwrite WipperSnapper. If you want to re-install WipperSnapper, follow the instructions at the top of this page. Sometimes, hardware gets into a state that requires it to be "restored" to the original state it shipped in. If you'd like to get your board back to its original factory state, follow the guide below. Note: This board does not have a factory reset firmware file. You should upload the Arduino blink sketch by following the instructions above. Page 8 Now that you've installed WipperSnapper on your board - let's learn how to use Adafruit IO to interact with your board! There's a large number of components (physical parts like buttons, switches, sensors, actuators) supported by the WipperSnapper firmware, this page will get you started with the core concepts to build an IoT project with Adafruit IO. This page assumes that you have installed WipperSnapper on your Feather and registered it with the Adafruit.io WipperSnapper web page. If you have not done this yet, please go back to the previous page in this guide and connect your Feather. One of the first programs you typically write to get used to embedded programming is a sketch that repeatably blinks an LED. IoT projects are wireless so after completing this section, you'll be able to turn on (or off) the LED built into your Feather from anywhere in the world. Navigate to the device page, io.adafruit.com/wippersnapper. You should see the Feather you just connected to Adafruit IO listed on this page. Verify that your Feather is online and ready to communicate with Adafruit IO by checking that the device tile says Online in green text. If the Feather appears offline on the website but was previously connected, press the Reset (RST) button to force the board to reboot. Once verified that the device is online, click the device tile to navigate to the device's interface page. Add a new component to your Feather by clicking the + button or the + New Component button on the device interface. The Component Picker lists all the available components, sensors, and parts, which can be used with the WipperSnapper firmware. Your Feather board already has a LED built-in, so there's no wiring for you to configure. Click the LED component. Feathers contain GPIO pins that can be configured either as an input or an output. The "Create LED Component" screen tells WipperSnapper to configure a general-purpose output pin connected to the LED on your Feather as a digital output so you can turn the LED on or off. The Feather ESP8266 has a built-in LED located at GPIO #0. Select this pin as the LED Pin and click Create Component Behind the scenes, Adafruit IO sends send a command to your board running WipperSnapper telling it to configure the GPIO pin as a digital output. Your Feather's interface shows the new LED component. On the device interface, toggle the LED component by clicking the toggle switch. This should turn your Feather's built-in LED on or off. Note - the Feather Huzzah ESP8266's LED is reverse wired, so setting the pin LOW will turn the LED on. Therefore, toggling the switch low off will turn the LED on. Your browser does not support the video tag. You can also configure a board running WipperSnapper to wirelessly read data from standard input buttons, switches, or digital sensors, and send the value to Adafruit IO. Let's wire up a push button to your Feather and configure it with Adafruit IO to publish a value to Adafruit IO when the button has been pressed or depressed. We'll be using the Feather's internal pull-up resistors instead of a physical resistor. On the device interface, add a new component to your Feather by clicking the + button or the + New Component button on the device interface. From the component picker, select the Push Button. The next screen presents you with options for configuring the push button. Start by selecting the Feather's digital pin you connected to the push button. Under Push Button Pin, select pin D13. The Return Interval dictates how frequently the value of the push-button will be sent from the Feather to Adafruit IO. For this example, the push-button's value should only be sent when its pressed. Select On Change Finally, check the Specify Pin Pull Direction checkbox and select Pull Up to turn on the Feather's internal pullup resistor. Make sure the form's settings look like the following screenshot. Then, click Create Component. Adafruit IO should send a command to your board (running WipperSnapper), telling it to configure the GPIO pin you selected to behave as a digital input pin and to enable it to pull up the internal resistor. Your Feather's interface should also show the new push-button component. Press the button to change the value of the push button component on Adafruit IO. Your browser does not support the video tag. Inter-Integrate Circuit, aka I2C, is a two-wire protocol for connecting sensors and "devices" to a microcontroller. A large number of sensors, including the ones sold by Adafruit, use I2C to communicate. Typically, using I2C with a microcontroller involves programming. Adafruit IO lets you configure a microcontroller to read data from an I2C sensor and publish that data to the internet without writing code. The WipperSnapper firmware supports a number of I2C sensors, viewable in list format here. If you do not see the I2C sensor you're attempting to use with WipperSnapper - we have a guide on adding a component to Adafruit IO WipperSnapper here. The process for adding an I2C component to your board running WipperSnapper is similar to most sensors. For this section, we're using the Adafruit AHT20, an inexpensive sensor that can read ambient temperature and humidity. First, wire up an AHT20 sensor to your board exactly as follows. Here is an example of the AHT20 wired to a Feather using I2C with a STEMMA QT cable (no soldering required). First, ensure that you've correctly wired the AHT20 sensor to your Feather by performing an I2C scan to detect the I2C device on the bus. On the upper right-hand corner of the device interface, click Start I2C Scan. If you do not see this button, double-check that your Feather shows as Online. You should see a new pop-up showing a list of the I2C addresses detected by an I2C scan. If wired correctly, the AHT20's default I2C address of 0x38 appear in the I2C scan list. I don't see the I2C sensor's address in the list First, double-check the connection and/or wiring between the sensor and the board. Then, reset the board and let it re-connect to Adafruit IO WipperSnapper. Now that you know the sensor can be detected by the Feather, it's time to configure and create the sensor on Adafruit IO. On the device interface, add a new component to your Feather by clicking the + button or the + New Component button on the device interface. The Component Picker lists all the available components, sensors, and parts that can be used with WipperSnapper. Under the I2C Components header, click AHT20. On the component configuration page, the AHT20's I2C sensor address should be listed along with the sensor's settings. The AHT20 sensor can measure ambient temperature and relative humidity. This page has individual options for reading the temperature and the relative humidity. This comes in handy in the case where you have multiple I2C sensors connected to your Feather which read the same value. You may choose to enable or disable a specific sensor type on this page. The Send Every option is specific to each sensor measurements . This option will tell the Feather how often it should read from the AHT20 sensor and send the data to Adafruit IO. Measurements can range from every 30 seconds to every 24 hours. For this example, set the Send Every interval for both seconds to Every 30 seconds and click Create Component. The device interface should now show the AHT20 component you created. After the interval you configured elapses, WipperSnapper automatically reads values from the sensor and sends them to Adafruit IO. Want to learn more about Adafruit IO WipperSnapper? We have more complex projects on the Adafruit Learning System. Page 9 Save Subscribe This guide was first published on Nov 25, 2015. It was last updated on 2022-07-27 15:18:41 -0400. This page (Downloads) was last updated on Aug 16, 2022. Text editor powered by tinymce.

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