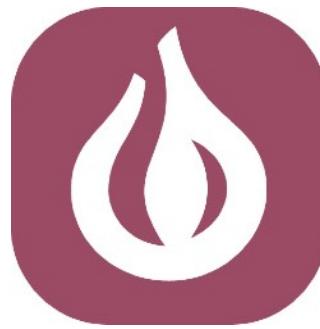
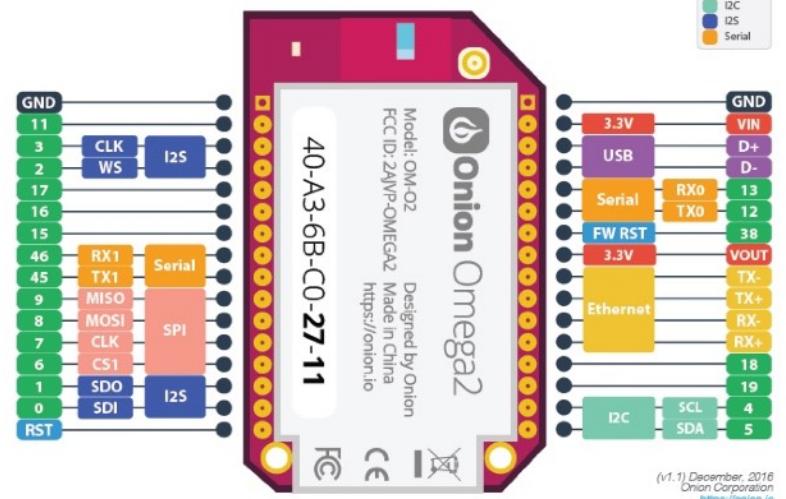


IoT Wearable Twitter Badge Workshop



onion

<https://onion.io>



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AMIE DANIELLE DANSBY

Additional Questions? Contact Me!

amie@amiedd.com

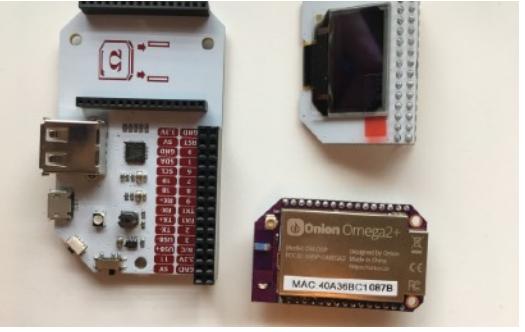
www.amiedd.com



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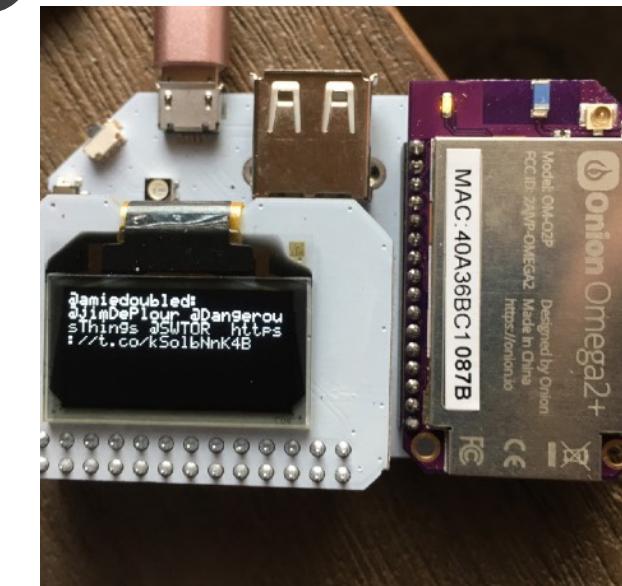
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IoT Twitter Wearable Badge Workshop



Display your latest Tweet on the OLED Display
Using Onion Omega2 IoT



Listen to my
instructions
before you
start putting
anything
together



What is the Onion Omega2?

Onion Omega2

An easy to use IoT computer. The Onion Omega2 is a linux computer designed specifically for building contact hardware applications. It combines the power and efficiency of Arduino and the power and flexibilities of the Raspberry Pi



Say hello to the **Omega2**

A Simple & Affordable Development Board for Everyone



Onion Omega 2 is Expandable

Dock and Expansion boards Arduino Dock, Ethernet Expansion Dock, Breadboard Dock, Power Dock, GPS Expansion, OLED Expansion, Proto Expansion, Relay Expansion, Servo (PWM) Expansion

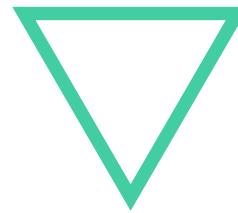
Onion Omega 2 is affordable

\$6



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What can it do?



Wi-Fi
802.11 b/g/n



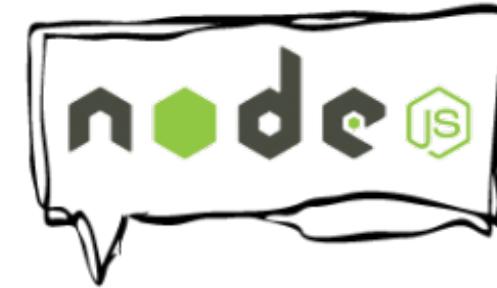
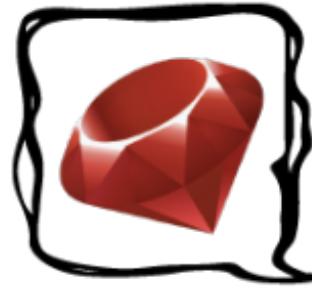
Cellular
2G/3G
(Cellular Expansion)



Bluetooth
4.0
(BLE Expansion)



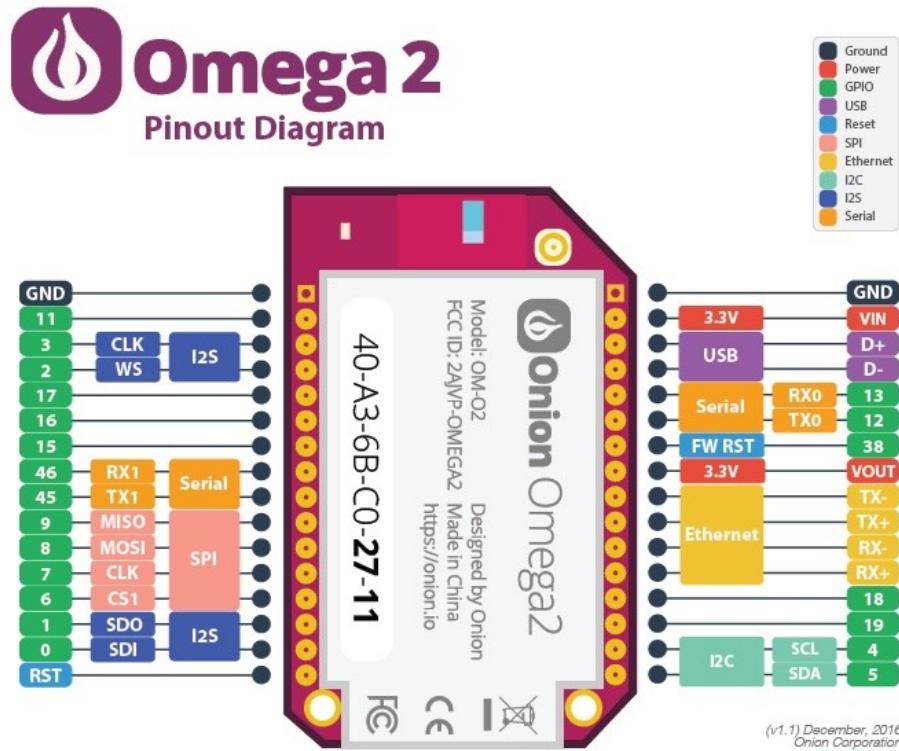
GPS
(GPS Expansion)



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Omega 2 Pinout Diagram

<https://onion.io>



Omega2 Pinout

Omega2
580 Mhz CPU
64 MB DDR2 Memory
16 MB Flash Storage
USB 2.0
-
b/g/n Wi-Fi
15 GPIO
2 PWM
2 UART
1 I ² C
1 SPI
1 I ² S

Omega2 Specs

IoT Twitter Wearable Badge Ingredients



Omega 2

Expandable IoT \$6 Linux Computer



OLED Expansion

Organic Light emitting diodes. Display black and white images and texts.



Expansion Dock



Twitter Account

Your account must have an associated phone number before Twitter will allow you to create an application.



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Computer Configuration

Linux

Zeroconfig services should already be installed

Windows

Install Apple's Bonjour Service

OS X

No additional installs needed



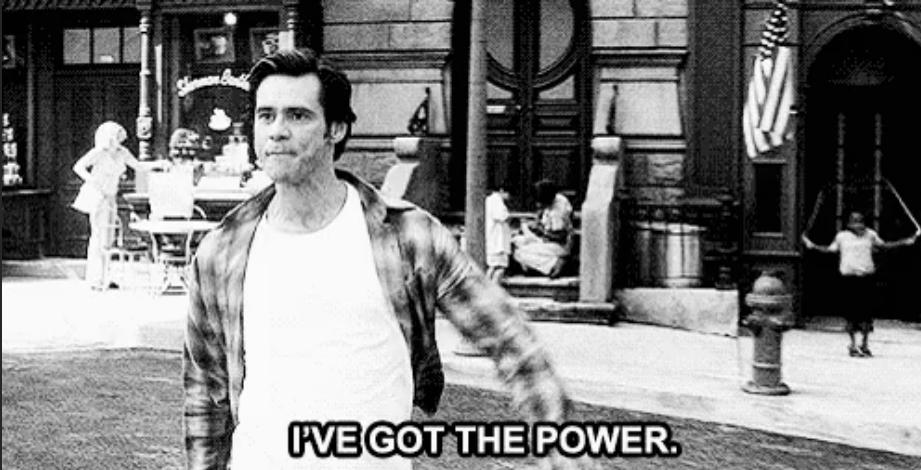
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Find Your Omega's Name

Sticker on your Omega 2 the text printed here in the Omega's unique MAC address.
We need the last four digits .
Example: Omega-4CD1



Power



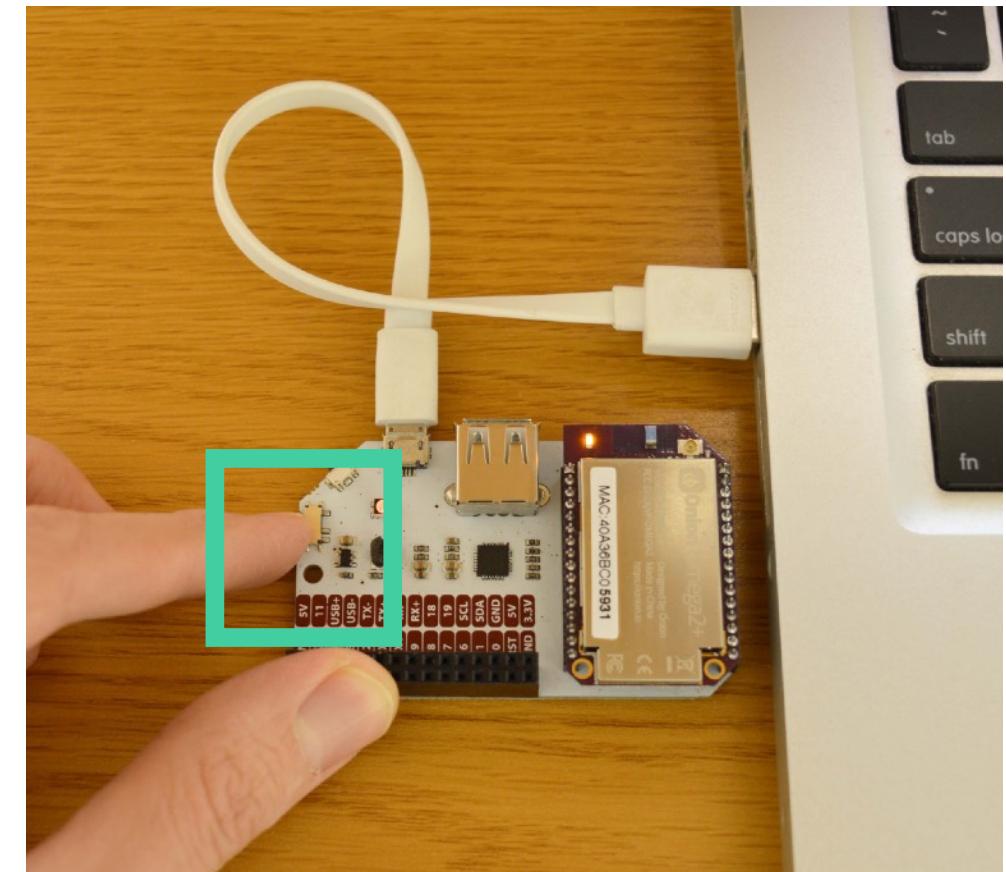
The Omega itself is powered by a 3.3V source. But all Omega Docks have voltage regulators so you can use any microUSB to power the Dock, Omega and OLED.

You can use your computer USB, or a wall adapter to power the Omega Dock.

Turn on the Omega using the switch

Wait for the Onion to boot. The amber LED on your Omega should turn on and then start blink after 10 seconds. In about a minute, the LED will stop blinking and remain solid, this means the Omega has completed its boot sequence.

<https://onion.io>



a2



Connect to the Omega's WiFi

The Omega hosts its own WiFi network access point. Lets connect your computer to it. The WiFi network is named the same as your Omega and the default password is **12345678**

<https://onion.io>

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Setup Wizard



Open your favorite browser and navigate to <http://omega-ABCD.local/> where ABCD are the same characters from the network name above. If the page doesn't load, you can also browse to <http://192.168.3.1>

Login with the Omega's default credentials:

username: root
password: onioneer

Welcome to the Omega2 Setup Wizard

Let's get your Omega2 configured and ready for you to make some amazing things!

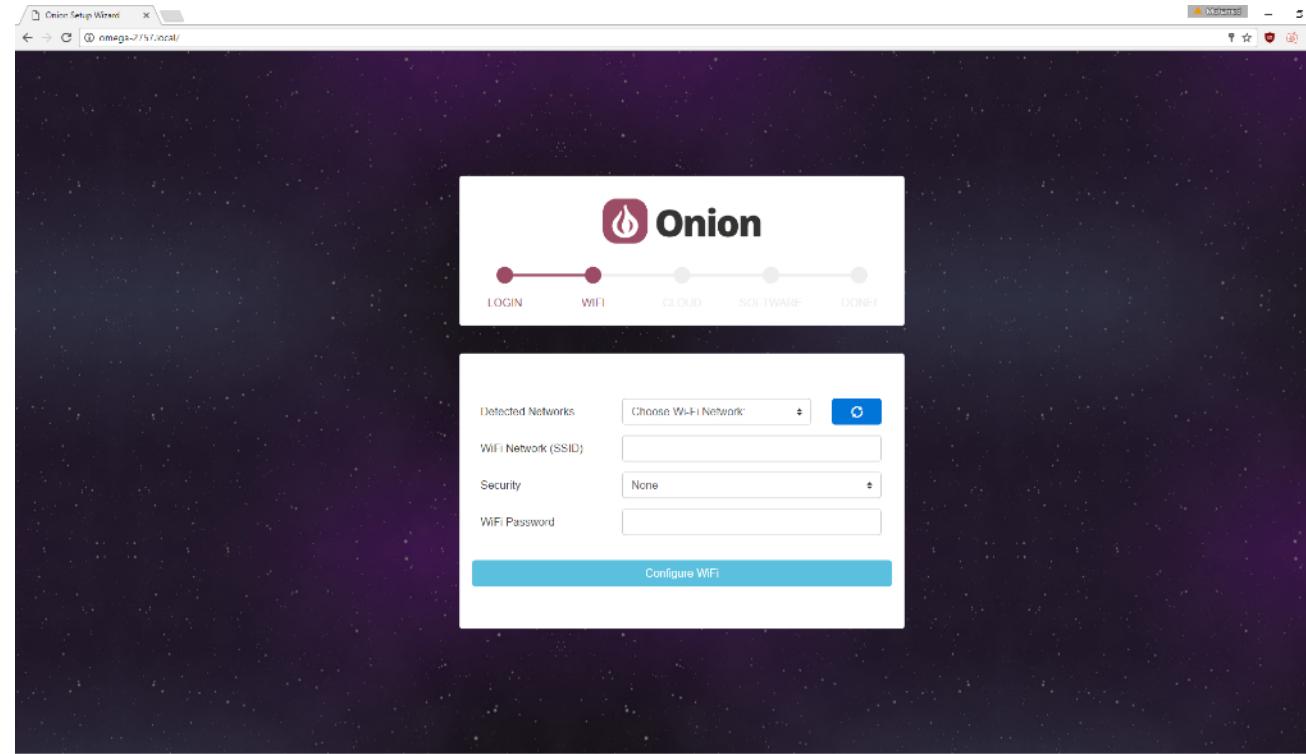
Start!

Username

Password

Log In

After you have logged in

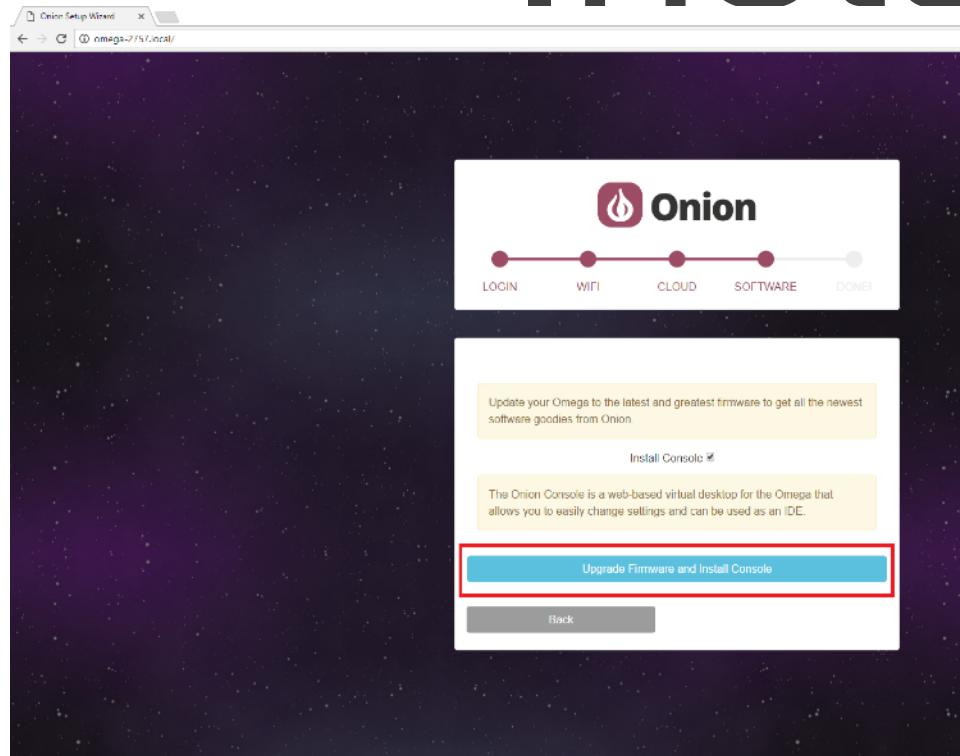


After you've logged in you'll be asked to connect to a Wireless Network. This is **MANDATORY** in order to complete the Setup Wizard.

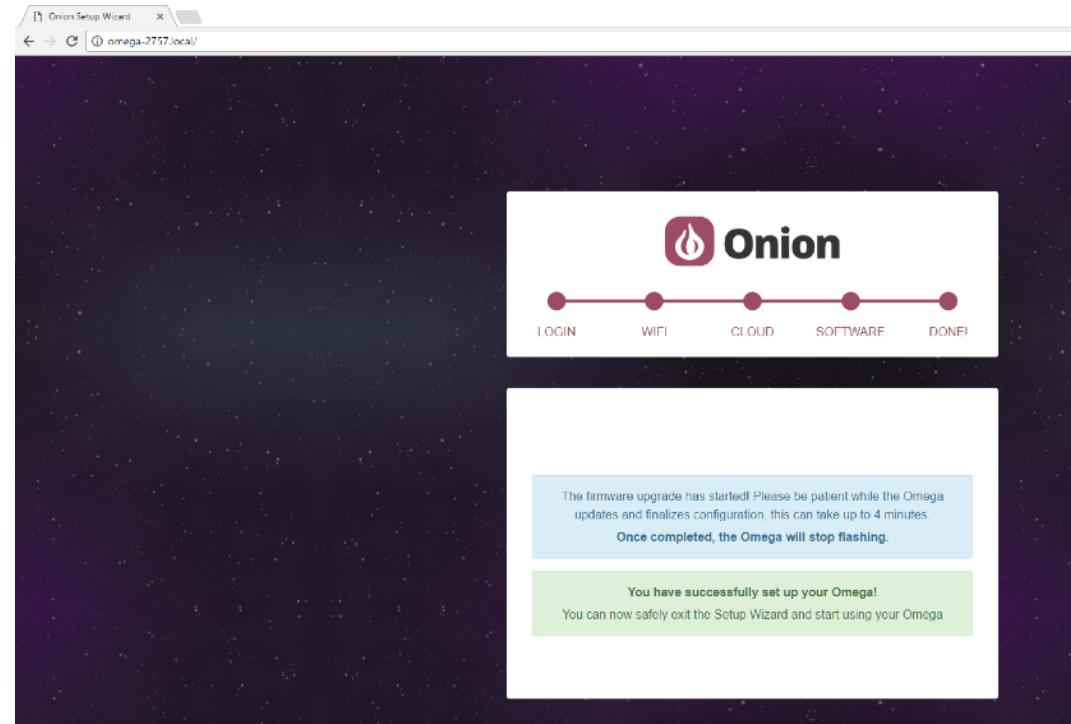
Enter your Wireless Network information and click Configure. Your Omega will attempt to connect to the network. This can take up to a minute to complete.

The Omega's AP will go down and not be accessible during this process, sit tight, it'll come back up when the configuration is done!

Upgrade Firmware and Install Console



Your Omega will download the latest firmware, and then begin installing it. This process takes several minutes, sometimes more depending on your Internet connection.



At the end of the installation process, the Omega will automatically reboot. It will be ready for use when the Omega's LED stops flashing and remains solid.

Twitter API Endpoint

All of Twitter API endpoints
require authentications



Your program doesn't include your Twitter username or password



It allows restricting access so your application can view and modify certain things



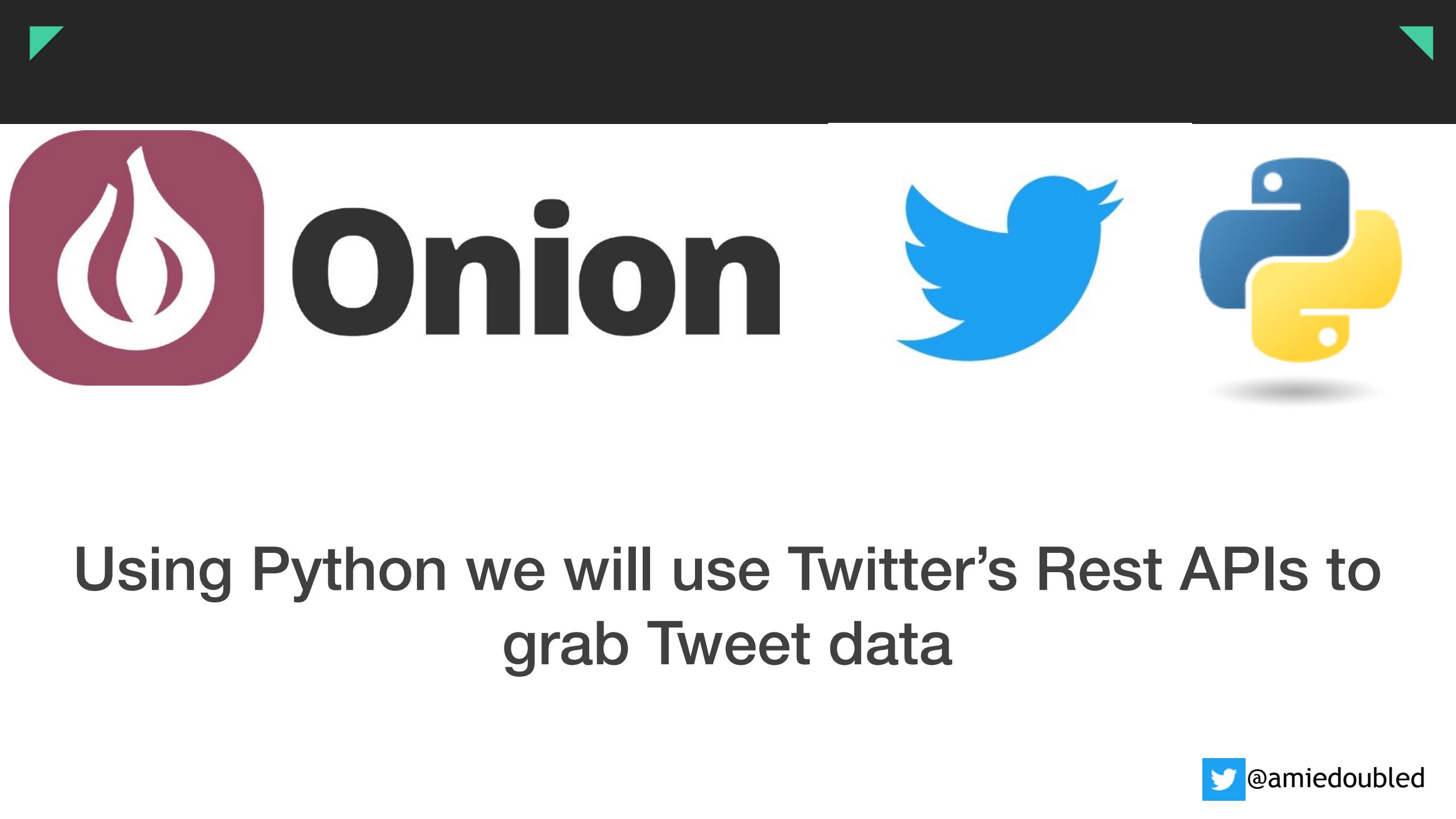
What it will not be able to do:

- Post Tweets or other resources
- Connect Streaming endpoints
- Search for users
- Use geo endpoints
- Access Direct Messages or account credentials

<https://dev.twitter.com/oauth/application-only>



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Using Python we will use Twitter's Rest APIs to
grab Tweet data



Connect to the Omega's command line

Install Python

Open your terminal from the Onion Console Home

Web browser <http://192.168.3.1/>

Install the light version to save on space. Light version is 2.5MB compared to the full version that is 6.3MB

Python 2.7

`opkg update`

`opkg install python-light python-urllib3 pyOledExp`

Note

Python-urllib3 package lets us make HTTP request in Python
pyOledExp package gives us control of the OLED Expansion

Download the Project Code

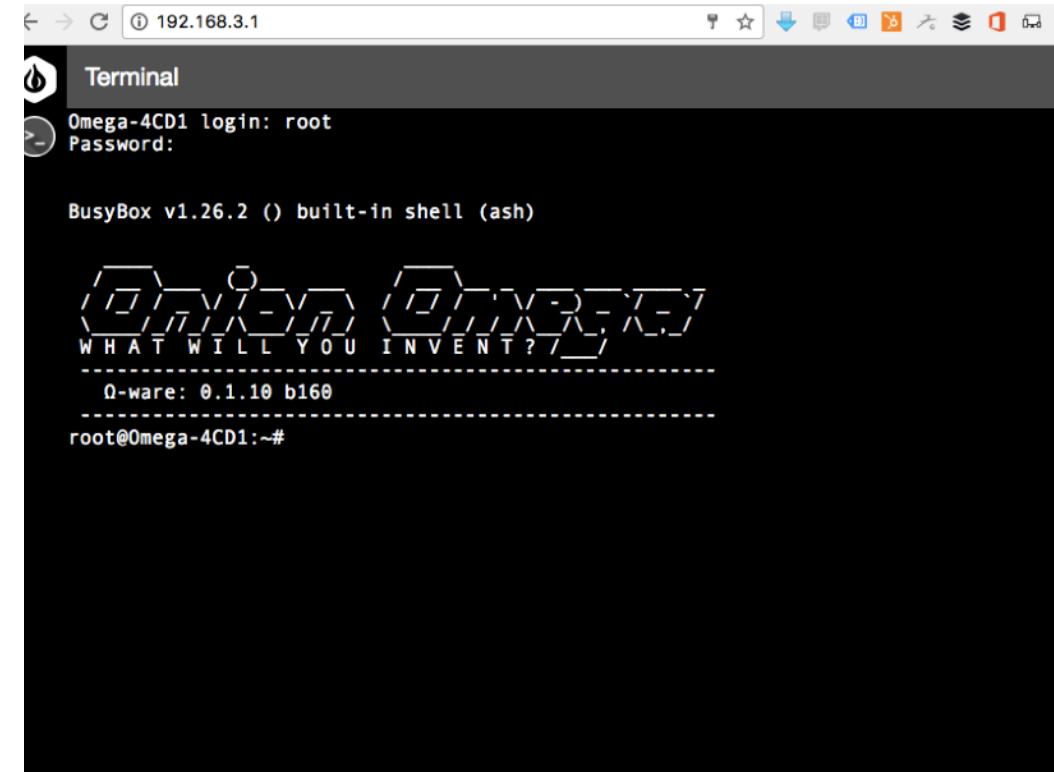
Code for this project is on Github

<https://github.com/AmieDD/oled-twitter-display>

Download the code directly
and avoid installing git

Note Python-urllib3 package lets us make HTTP request in Python
pyOledExp package gives us control of the OLED Expansion

```
mkdir /root/oled-twitter-display
cd /root/oled-twitter-display
wget https://raw.githubusercontent.com/OnionIoT/oled-
twitter-display/master/oledTwitterDisplay.py
wget https://raw.githubusercontent.com/OnionIoT/oled-
twitter-display/master/config.json
```



Note We can direct download from GitHub because the repo is public

Create a Twitter application

To use Twitter's API we have to create a Twitter Application. We will need a Twitter API Key and API Secret to authenticate with Twitter before we use the APIs

The screenshot shows the 'Create an application' page on the Twitter developer website. The 'Application Details' section contains fields for Name (set to 'Dansby Twitter Badge'), Description (set to 'Onion IoT Twitter Badge Skills Matter Workshop'), Website (set to 'www.amiedd.com'), and Callback URL (left blank). Below these fields is a 'Developer Agreement' checkbox labeled 'Yes, I have read and agree to the Twitter Developer Agreement.' At the bottom right is a 'Create your Twitter application' button.

Application Details

Name * Dansby Twitter Badge

Description * Onion IoT Twitter Badge Skills Matter Workshop

Website * www.amiedd.com

Callback URL

Where should we return after successfully authenticating? OAuth 1.0 applications should explicitly specify their oauth_callback_URL, or the request token step, regardless of the value given here. To restrict your application from using callbacks, leave this field blank.

Developer Agreement

Yes, I have read and agree to the Twitter Developer Agreement.

Create your Twitter application

1. Web Browser on computer go to <https://apps.twitter.com>
2. Fill in the Application Details
 - Name: YOURNAME Twitter Badge
 - Description: There isn't any specific required info, feel free to put what you want here
3. Read and agree to the Twitter Developer Agreement and click Create for your Twitter Application.

Twitter Keys and Access Tokens

Copy the Keys from your Twitter Application you just created.

1. Consumer Key(API Keys)
2. Consumer Secret(API Secret)

The screenshot shows the Twitter Application Management interface. At the top, there's a header with the Twitter logo and the text "Application Management". On the right side of the header is a user profile icon. Below the header, the application name "Twitter IoT Badge" is displayed. Underneath the application name, there are four tabs: "Details", "Settings", "Keys and Access Tokens" (which is the active tab), and "Permissions".

The "Keys and Access Tokens" section contains the following information:

- Consumer Key (API Key):** Xz0... (redacted)
- Consumer Secret (API Secret):** VJr... (redacted)
- Access Level:** Read and write (modify app permissions)
- Owner:** amiedoubleD
- Owner ID:** 18894039

Below this section is a box titled "Application Actions" containing two buttons: "Regenerate Consumer Key and Secret" and "Change App Permissions".

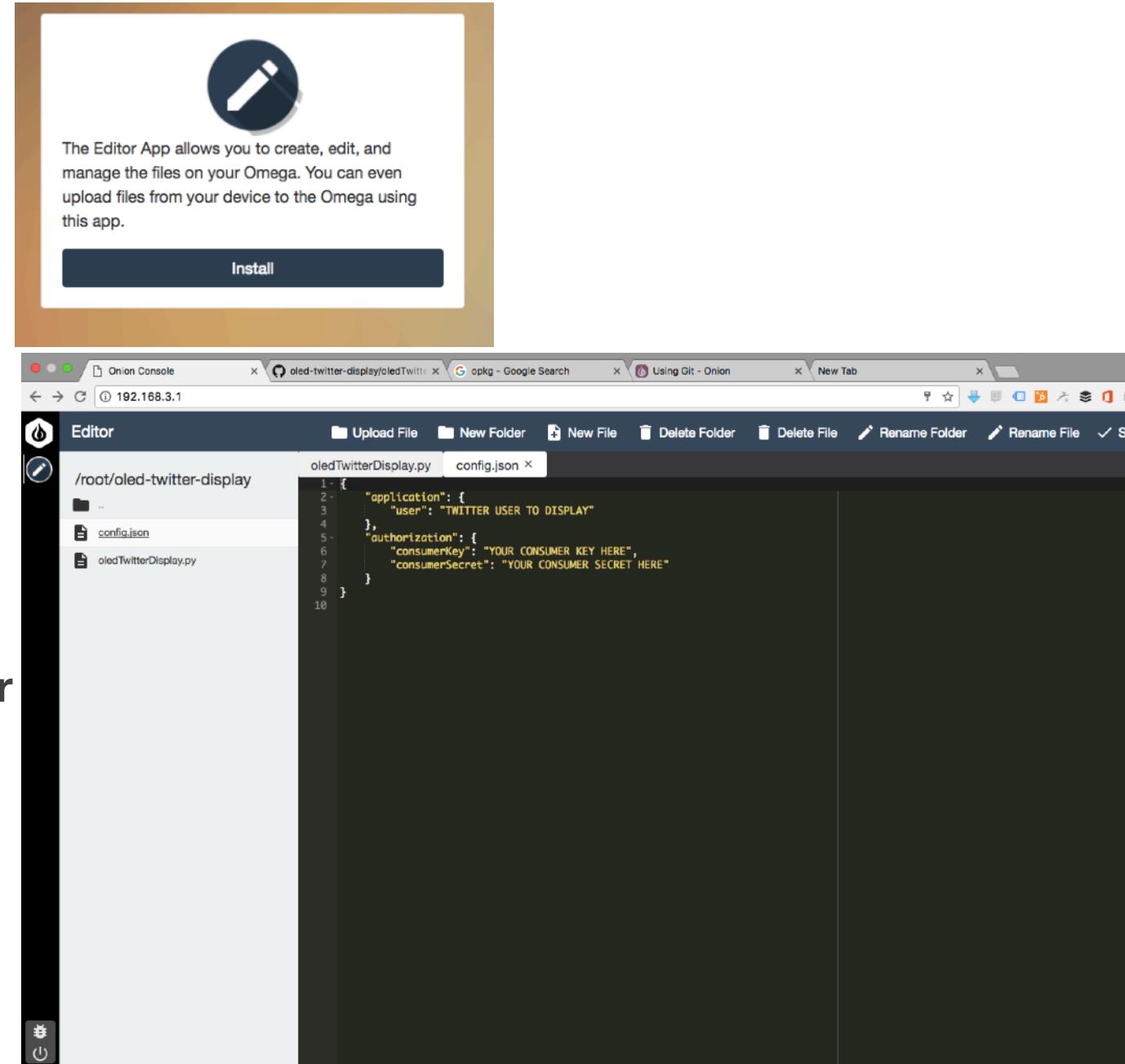
At the bottom of the page is a navigation bar with left and right arrows.

Setup and Run the Code

1. Onion Console Page
2. Install Editor
3. Open the Editor
4. Go to root> oled-twitter-display
>config.json

1. The config.json file holds all the setting for the project. Add your Twitter Application Consumer Key and Consumer Secret keys.
Save

1. From your Onion Terminal run the code python oledTwitterDisplay.py



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Optional Git installation Guide

Install Git

Make sure you have internet connection

- 1.Run the command opkg update
- 2.After update run opkg install git git-http ca-bundle
- 3.The ca-bundle package is required if you will be cloning private repositories.
4. A successful installation will show:
Configuring git
Configuring git-http
Configuring ca-bundle

Opkg to install

We won't be installing git for this workshop. These are the instructions for benefits to try later.

Troubleshooting: If the installation fails, check you're connected to the internet and that you have updated the opkg

You can check that you have internet connection by opening your terminal and run ping www.google.com