



Over the air Programming

By

Muhammad Asadullah



ESP32 OVER-THE-AIR (OTA) PROGRAMMING – WEB UPDATER ARDUINO IDE

The OTA Web Updater allows you to update/upload new code to your ESP32 using a browser, without the need to make a serial connection between the ESP32 and your computer. The example we'll show here works when the ESP32 and your browser are on your local network and global. The only disadvantage of the OTA Web Updater is that you have to add the code for OTA in every sketch you upload, so that you're able to use OTA in the future.



HOW DOES OTA WEB UPDATER WORKS?

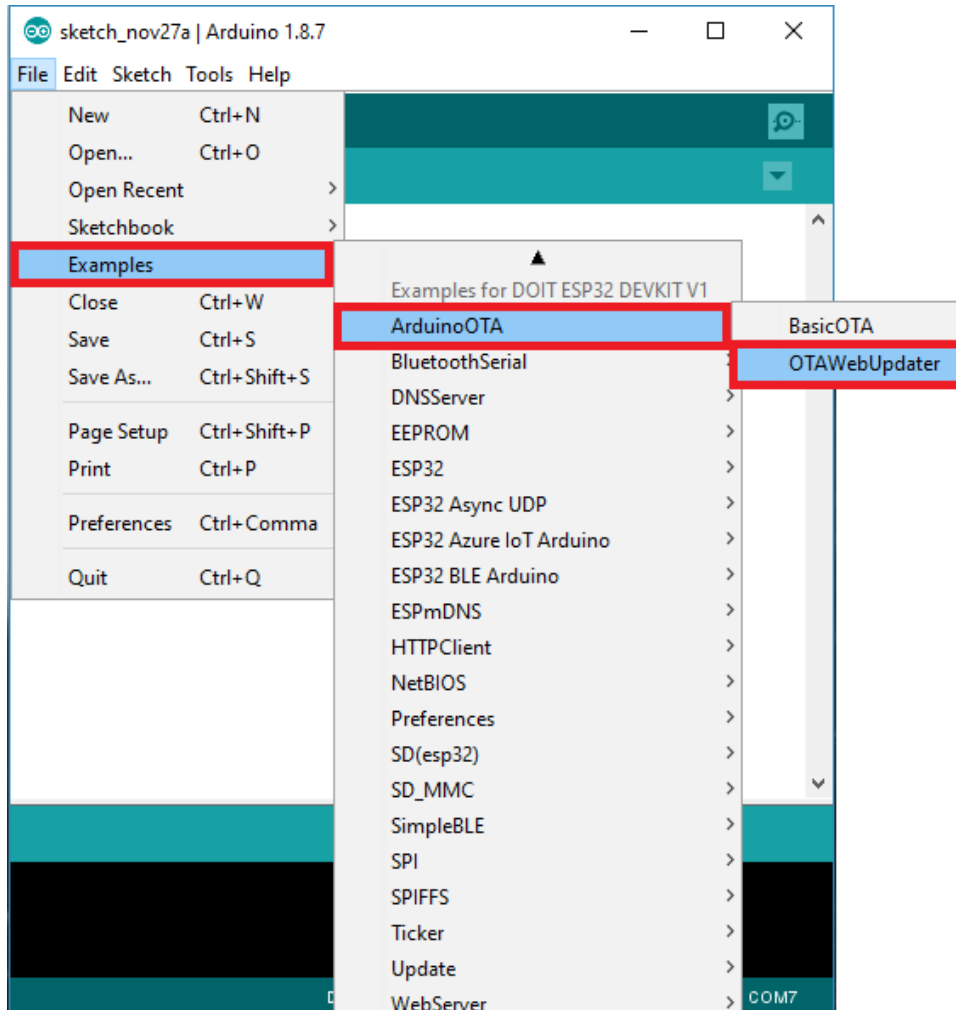
- The first sketch should be uploaded via serial port. This sketch should contain the code to create the OTA Web Updater, so that you are able to upload code later using your browser.
- The OTA Web Updater sketch creates a web server you can access to upload a new sketch via web browser.
- Then, you need to implement OTA routines in every sketch you upload, so that you're able to do the next updates/uploads over-the-air.

PREREQUISITES

Before proceeding with this tutorial you should have the ESP32 add-on installed in your Arduino IDE.

ESP32 OTA WEB UPDATER

When you install the ESP32 add-on for the Arduino IDE, it will automatically install the ArduinoOTA library. Go to File > Examples > ArduinoOTA > OTAWebUpdater.



You should change the following lines on the code to include your own network credentials:

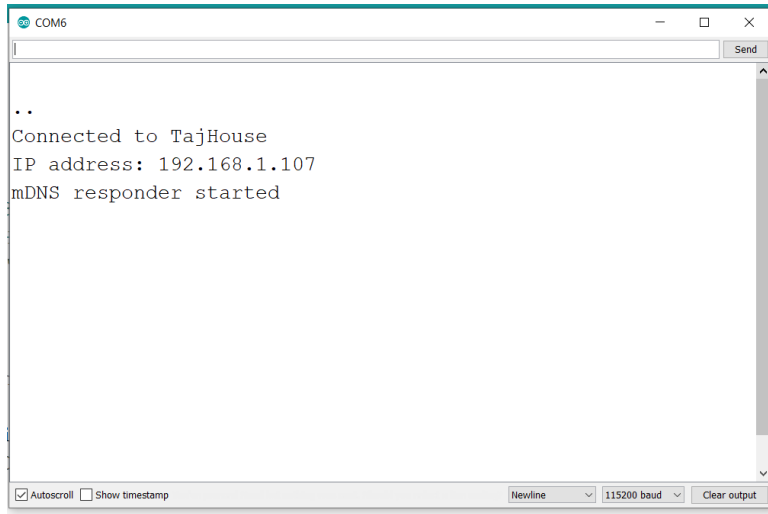
```
const char* ssid = "";
```

```
const char* password = "";
```

The OTAWebUpdater example for the ESP32 creates an asynchronous web server where you can upload new code to your board without the need for a serial connection.

Upload the previous code to your ESP32 board. Don't forget to enter your network credentials and select the right board and serial port.

After uploading the code, open the Serial Monitor at a baud rate of 115200, press the ESP32 enable button, and you should get the ESP32 IP address:



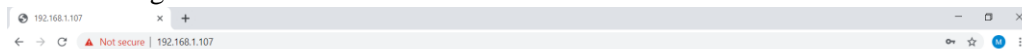
Now copy this ip address: and past on web browser.

Now, you can upload code to your ESP32 over-the-air using a browser on your local network.

To test the OTA Web Updater you can disconnect the ESP32 from your computer and power it using a power bank, for example (this is optional, we're suggesting this to mimic a situation in which the ESP32 is not connected to your computer).

UPDATE NEW CODE USING OTA WEB UPDATER LOCALLY

Open a browser in your network and enter the ESP32 IP address. You should get the following:



Enter the username and the password:

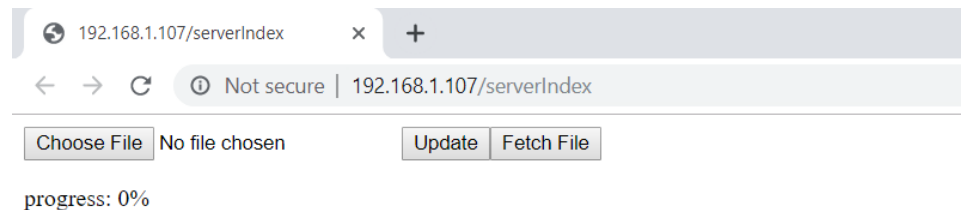
Username: admin

Password: admin

You can change the username and password on the code.

Note: After you enter the username and password, you are redirected to the /serverIndex URL. You don't need to enter the username and password to access the /serverIndex URL. So, if someone knows the URL to upload new code, the username and password don't protect the web page from being accessible from others.

A new tab should open on the /serverIndex URL. This page allows you to upload a new code to your ESP32. You should upload .bin files (we'll see how to do that in a moment).



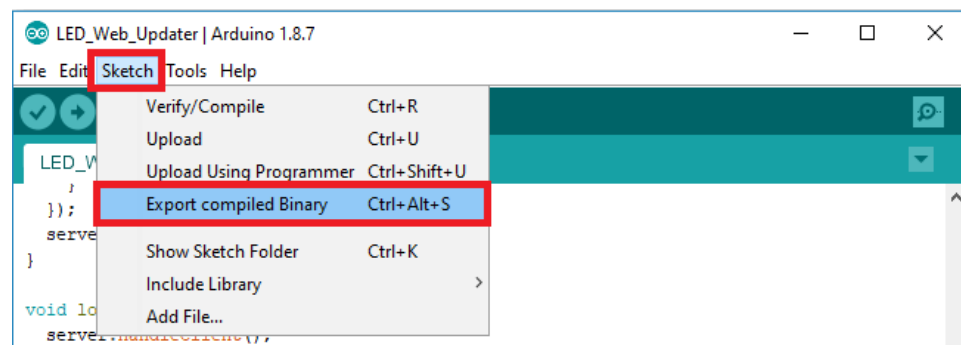
PREPARING THE NEW SKETCH

When uploading a new sketch over-the-air, you need to keep in mind that you need to add code for OTA in your new sketch, so that you can always overwrite any sketch with a new one in the future. So, we recommend that you modify the OTAWebUpdater sketch to include your own code.

Now update this code with blink code.

GENERATE A .BIN FILE IN ARDUINO IDE

To generate a .bin file from your sketch, go to Sketch > Export compiled Binary



A new file on the folder sketch should be created. Go to Sketch > Show Sketch Folder. You should have two files in your Sketch folder: the .ino and the .bin file. You should upload the .bin file using the OTA Web Updater.



UPLOAD A NEW SKETCH OVER-THE-AIR TO THE ESP32

In your browser, on the ESP32 OTA Web Updater page, click the Choose File button. Select the .bin file generated previously, and then click Update.

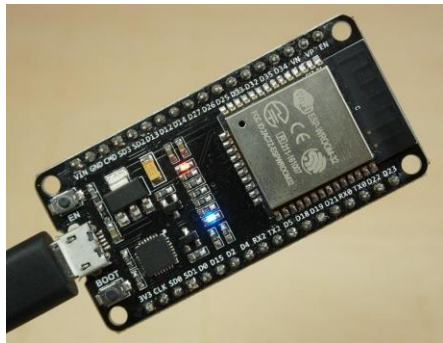
After a few seconds, the code should be successfully uploaded.

PREPARING THE NEW SKETCH

When uploading a new sketch over-the-air, you need to keep in mind that you need to add code for OTA in your new sketch, so that you can always overwrite any sketch with a new one in the future. So, we recommend that you modify the OTAWebUpdater sketch to include your own code.

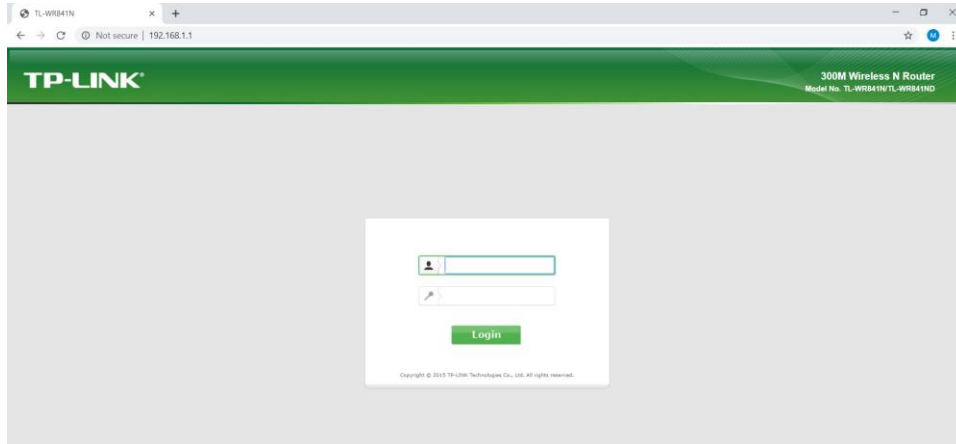
Now update this code with blink code.

The ESP32 built-in LED should be blinking.

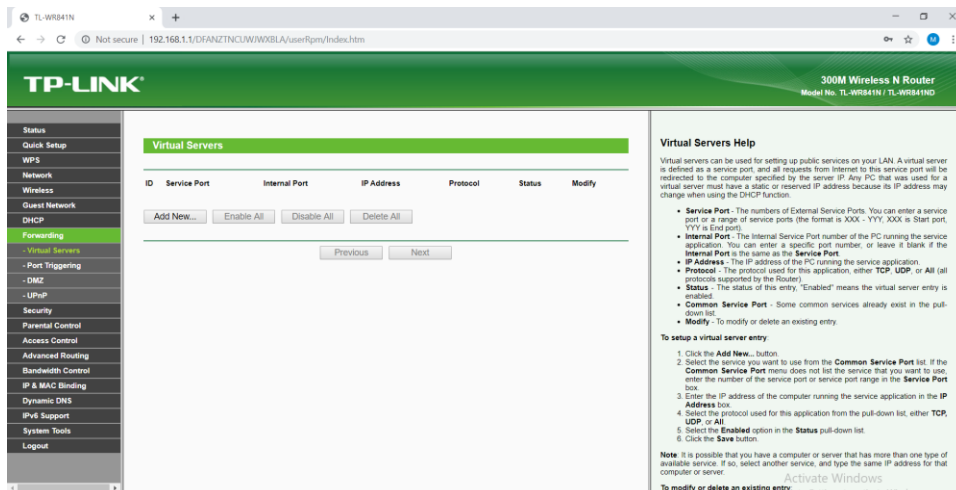


UPDATE NEW CODE USING OTA WEB UPDATER GLOBALLY

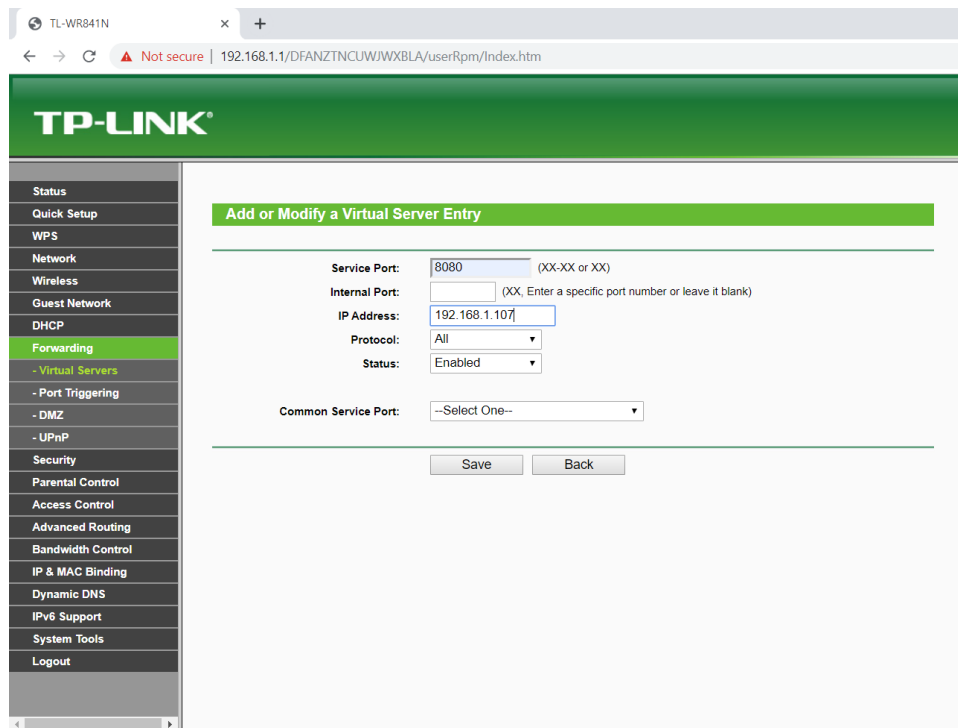
First of all you should to change in code from WebServer server(80); to WebServer server(8080); then upload the code in ES32 through USB cable, now follow the following step for port forwarding.



Then login your router.



After the login, Click on >> Forwarding then the following display will be show, Then click on >> Add New.

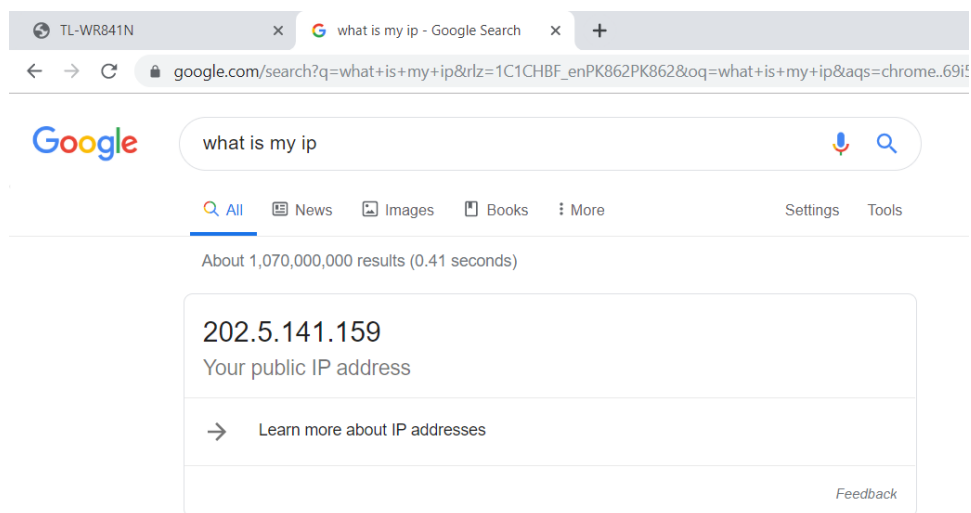


Here Service Port is 8080

And add your local Ip address which was showing on serial monitor.

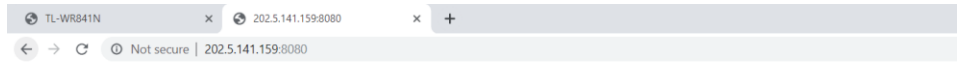
Then click on >> Save.

Now go to google.com and search What is my ip



Now copy this Ip address and past on new tab and add at the end of this ip :8080

(i.e, 202.5.141.159:8080)



ESP32 Login Page

Username:

Password:

Congratulations now you have accessed globally with ESP32.

Now you can upload the code on esp32 from any where in the world.