WiFi Connect Implementation

Connecting the ESP32 to an Access Point

Our Implementation

WiFi Connection

- About the Implementation
  - Credentials should be entered into text fields of the web page, where a “connect” button is available to kick off the connection process.
  - The web server will handle receiving the credentials and the application will update the WiFi configuration and then attempt the connection.
  - The application will let the user know by displaying the connection result on the web page; success for failure.
  - Connection details (AP name and IP information) will also be displayed on the web page (when there is a connection).
  - A “disconnect” button will also be available to the user for disconnecting from an active connection.
  - The RGB LED should indicate a connected status.

ESP-IDF WiFi Driver APIs Used for WiFi Connection, in Brief

Making a WiFi Connection Using the ESP-IDF

- ESP IDF APIs Used
  - Within the URI Handler for receiving credentials → Get header value length, using http_req_get_hdr_value_len.
    - Next, get the value string of a field from the request headers → httpd_req_get_hdr_value_str.
  - Next, we need to update the WiFi configuration → Update the **station** configuration data in the union wifi_config_t.
  - Set the configuration → For station mode esp_wifi_set_config the interface should be specified as ESP_IF_WIFI_STA.
  - Attempt the connection → Using esp_wifi_connect.
  - Disconnect from an active connection → Using esp_wifi_disconnect.

Making a WiFi Connection (ESP-IDF), Continued…

- ESP IDF APIs Used (Displaying Connection Information to the Web Page…)
  - Get the access point information (SSID) for display on the page → Using wifi_ap_record_t and pass it to esp_wifi_sta_get_ap_info.
  - Get the IP connection information (assigned to the ESP32) for display on the page → Using esp_netif_ip_info_t and pass it to esp_netif_get_ip_info.
  - Convert the numeric IP address into dotted decimal ASCII → Using esp_ip4addr_ntoa.

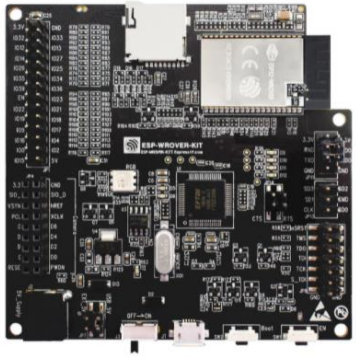
WiFi Application

Connecting Device

- Becomes “station” of ESP32’s SoftAP when connected.
- DHCP service from the ESP32’s SoftAP will dynamically assign an IP to your device.
- Interact with the ESP32 via the web page.

ESP32 SoftAP

- AP/STA combination mode.
- We assign an IP to the SoftAP; the interface of the ESP32 is statically configured.
- DHCP server dynamically assigns an IP for connecting stations.
- We set a maximum number of stations allowed to connect.



Connecting Device

- When the ESP32 connects to an AP, local time can be obtained utilizing SNTP (if the AP is connected to the internet).
- DHCP service from the AP, will dynamically assign an IP to the ESP32 in our application.

Let’s get started!