MAC Address

MAC Address stands for **M**edia **A**ccess **C**ontrol Address and it is a hardware unique identifier that identifies each device on a network.

MAC Addresses are made up of six groups of two hexadecimal digits, separated by colons, for example: 30:AE:A4:07:0D:64.

OUI :(Organizational Unique Identifier) The part of the MAC address that identifies the vendor of the network adapter. The OUI is the first three bytes of the six-byte field and is administered by the IEEE.

MAC addresses for each network interface are generated or derived from a single base MAC address. If the number of universal MAC addresses is four, all four interfaces (WiFi station, WiFi softap, Bluetooth and Ethernet) receive a universally administered MAC address. These are generated sequentially by adding 0, 1, 2 and 3 (respectively) to the final octet of the base MAC address.

Available options:

- Two (ESP32_UNIVERSAL_MAC_ADDRESSES_TWO)
- Four (ESP32_UNIVERSAL_MAC_ADDRESSES_FOUR)

Interface	**MAC address (4 universally administered, default)**	**MAC address (2 universally administered)**
Wi-Fi Station	base_mac	base_mac
Wi-Fi SoftAP	base_mac, +1 to the last octet	Local MAC derived from Wi-Fi Station MAC)
Bluetooth	base_mac, +2 to the last octet	base_mac, +1 to the last octet
Ethernet	base_mac, +3 to the last octet	Local MAC (derived from Bluetooth MAC)

eFuse Manager

The ESP32 has a number of eFuses which can store system and user parameters. ESP32 has 4 eFuse blocks each of the size of 256 bits. Each block is divided into 8 32-bits registers (not all bits are available)

- EFUSE_BLK0 is used entirely for system purposes;
- EFUSE_BLK1 is used for flash encrypt key. If not using that Flash Encryption feature, they can be used for another purpose;
- EFUSE_BLK2 is used for security boot key. If not using that Secure Boot feature, they can be used for another purpose;
- EFUSE_BLK3 can be partially reserved for the custom MAC address, or used entirely for user application. Note that some bits are already used in IDF.

  - Default base MAC address stored in BLK0 of EFUSE.
  - Custom base MAC address stored in BLK3 of EFUSE
  - Here it is possible to write the custom MAC address into two locations they are
    1.BLK3 of EFUSE 2. External storage (flash , EEPROM)

API'S

esp_efuse_mac_get_custom() : To get the base MAC address which is stored in BLK3 of EFUSE

esp_base_mac_addr_set() : To set the base MAC address for system to generate the MAC used by the networking interfaces(WiFI/BT/Ethernet)

References

https://docs.espressif.com/projects/esp-idf/en/release-v3.0/api-reference/system/base_mac_address.html

https://github.com/espressif/esp-idf/tree/f3704f027/examples/system/base_mac_address