**Steps to Integrate ESP32 with ESP RainMaker**

1. **Install the Correct ESP32 Core and Libraries**  
   Ensure you have installed the ESP32 board core version **2.0.17** via the Arduino IDE Boards Manager. Install all the required libraries such as WiFi, ESP RainMaker, Preferences, and others as required by your project.
2. **Erase the Flash Memory Before Uploading Main Code**  
   It's crucial to erase flash memory (NVS) before uploading your main code to avoid conflicts with previous configurations. Use the following sketch to erase flash:

#include <esp\_flash.h>

void setup() {

Serial.begin(115200);

delay(1000);

Serial.println("Erasing flash (NVS)...");

for (int i = 0; i < 100; i++) {

esp\_flash\_erase\_region(nullptr, i \* 4096, 4096);

}

Serial.println("Flash erase complete. Now re-upload main code.");

}

void loop() {}

1. **Install the Correct Drivers and Select the Right COM Port**  
   Ensure that your system has the proper USB-to-UART drivers installed. Then, verify and select the correct COM port in the Arduino IDE for successful communication with the ESP32.
2. **Set the Correct Partition Scheme**  
   Navigate to **Tools > Partition Scheme** and select **RainMaker**. This step is essential to ensure compatibility with the ESP RainMaker framework.
3. **Retrieve the MAC Address**  
   To get your ESP32’s MAC address, upload the following sketch:

#include <WiFi.h>

void setup() {

Serial.begin(115200);

WiFi.mode(WIFI\_STA);

Serial.print("ESP32 MAC Address: ");

Serial.println(WiFi.macAddress());

}

void loop() {}

Current ESP32 MAC Address: 68:25:DD:34:3F:24

(Don’t Perform this step First ,Try with Personal Hotspot then only go with MAC)

1. **Test on Personal Hotspot Before Campus Wi-Fi**  
   Avoid registering your ESP32 MAC address with the campus network before testing. Campus routers may auto-connect and interfere with the provisioning process. Test with a personal mobile hotspot first.
2. **Upload the Main Code and Monitor Serial Output**  
   After uploading, open the **Serial Monitor** and set the **baud rate to 115200**. Press the **EN (reset)** button on the ESP32 to trigger provisioning. The QR code may not display clearly; instead, copy the generated URL and open it in a browser to view the QR code.

For factory reset: Hold the **BOOT** button for 5–7 seconds, then press **EN**.

1. **Check for Flash Issues If Device Not Found**  
   If RainMaker shows "device not found" or disconnection errors, the ESP32 is likely still bound to an old provisioning. Re-flash using the erase sketch above and upload the main code again.
2. **Connect to Wi-Fi Network During Provisioning**  
   During the provisioning step, available networks should appear. If not, enter the SSID and password manually.
3. **Troubleshooting Provisioning Errors**  
   Common issues during provisioning include:

* Incorrect SSID or password
* Flash not erased
* ESP auto-connected to a previous network
* Router using 5GHz (RainMaker only supports 2.4GHz)
* Partial/incomplete code upload (rare)

For additional troubleshooting, refer to this helpful guide:  
 [RainMaker Integration Video](https://youtu.be/pNJBaWZ_vj0?si=S_i40lt7KHA-TfNL)

**Note**: Integrating ESP RainMaker can be challenging. Be prepared to upload and test multiple times. Stay patient and methodical throughout the process. If needed, seek help from AI tools or your peers.

Note the observations and issues everytime which will help us to find the best optimal code