M480 WiFi TCP服务器

NuMicro® 32 位系列微控制器范例代码介绍

文件信息

代码简述	本范例使用 M480 UART 驱动 ESP8266，实现 TCP 服务器功能
BSP 版本	M480 Series BSP CMSIS V3.04.000
开发平台	NuMaker-IoT-M487 v1.3

1 功能介绍

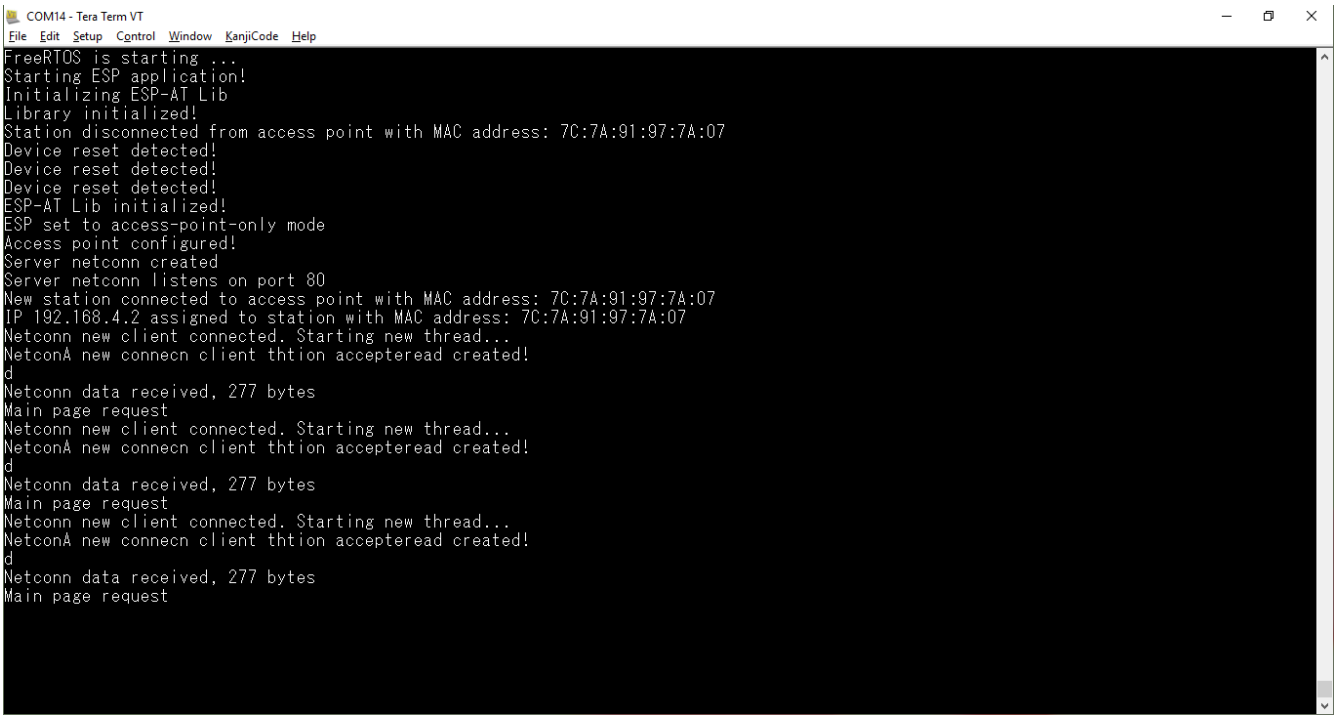
1.1 简介

本范例程序代码使用M480系列芯片，通过UART1驱动ESP8266 WiFi模块，建立无线存取点，并提供TCP服务器功能。当计算机透过WiFi连接到ESP8266无线存取点后，可以开启浏览器观察NuMaker-IoT-M487 SW2(GPIO F11) 和 SW3(GPIO G5) 按键的状态。

1.2 原理

范例程序核心使用了ESP-AT Lib函式库。ESP-AT Lib是一个AT命令解析器，用于使用AT命令与ESP8266 WiFi模块通信。ESP-AT Lib提供了Station和Access point无线网络管理API，并提供了BSD socket相似的API，方便应用程序建立主从式架构的网络应用。
程序里一开始让ESP8266模块进入Access point模式，接着开启HTTP 80端口，等待网络连接。此时可以让计算机接入SSID为”ESP_AccessPoint”且Key为”12345678”的无线存取点，并自动取得IP。最后打开浏览器，连接80埠，取得目前NuMaker-IoT-M487 SW2和SW3按键的状态。

1.3 执行结果



2 代码介绍

设置 ESP8266 模块为 Access point 模式：

```
    /* Enable access point only mode */
    if ((res = esp_set_wifi_mode(ESP_MODE_AP, 1, NULL, NULL, 1)) == espOK)
    {
        printf("ESP set to access-point-only mode\r\n");
    }
    else
    {
        printf("Problems setting ESP to access-point-only mode: %d\r\n", (int)res);
    }

    /* Configure access point */
    res = esp_ap_configure("ESP_AccessPoint", "12345678", 10, ESP_ECN_WPA2_PSK, 5, 0, 0,
NULL, NULL, 1);

    if (res == espOK)
    {
        printf("Access point configured!\r\n");
    }
```

开启 80 埠服务：

```
    /*
     * First create a new instance of netconn
     * connection and initialize system message boxes
     * to accept clients and packet buffers
     */
    server = esp_netconn_new(ESP_NETCONN_TYPE_TCP);

    if (server != NULL)
    {
        printf("Server netconn created\r\n");

        /* Bind network connection to port 80 */
        res = esp_netconn_bind(server, 80);
```

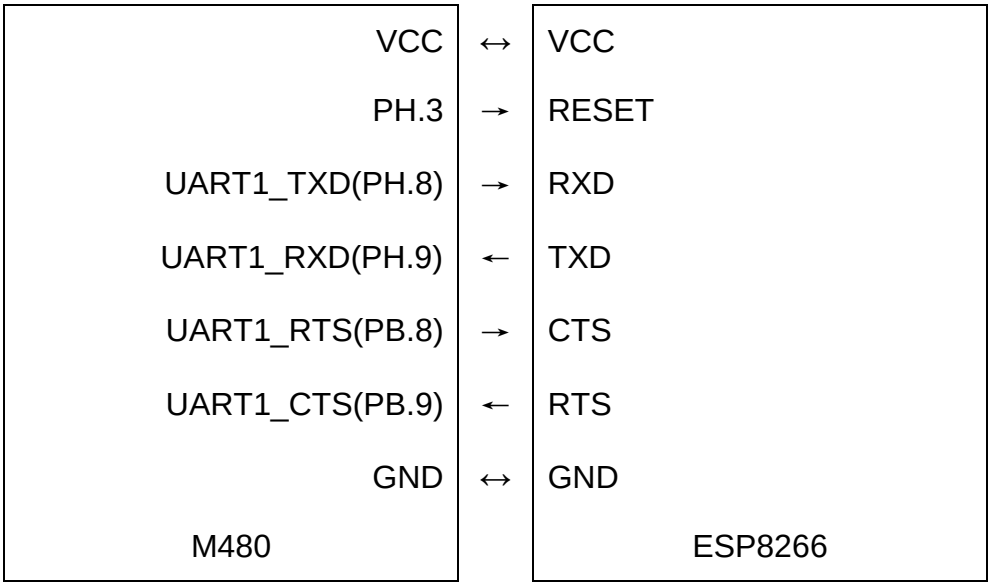
```
        if (res == espOK)
        {
            printf("Server netconn listens on port 80\r\n");
            /*
             * Start listening for incoming connections
             * on previously binded port
             */
            res = esp_netconn_listen(server);

            while (1)
            {
                /*
                 * Wait and accept new client connection
                 *
                 * Function will block thread until
                 * new client is connected to server
                 */
                res = esp_netconn_accept(server, &client);

                if (res == espOK)
                {
                    printf("Netconn new client connected. Starting new thread...\r\n");

                    /*
                     * Start new thread for this request.
                     *
                     * Read and write back data to user in separated thread
                     * to allow processing of multiple requests at the same time
                     */
                    if (esp_sys_thread_create(NULL, "client",
(esp_sys_thread_fn)netconn_server_processing_thread, client, 512, ESP_SYS_THREAD_PRIO))
                    {
                        printf("Netconn client thread created\r\n");
                    }
                    else
                    {
                        printf("Netconn client thread creation failed!\r\n");

                        /* Force close & delete */
                        esp_netconn_close(client);
```

```
                    esp_netconn_delete(client);
                }
            }
            else
            {
                printf("Netconn connection accept error!\r\n");
                break;
            }
        }
    }
    else
    {
        printf("Netconn server cannot bind to port\r\n");
    }
}
else
{
    printf("Cannot create server netconn\r\n");
}
```

3 软件与硬件环境

- 软件环境
  - BSP 版本
    - M480 Series BSP CMSIS V3.04.000
  - IDE 版本
    - Keil uVersion 5.26
- 硬件环境
  - 电路组件
    - NuMaker-IoT-M487
    - ESP8266 模块
  - 示意图

M480 通过 UART1 接口与 ESP8266 模块连接。

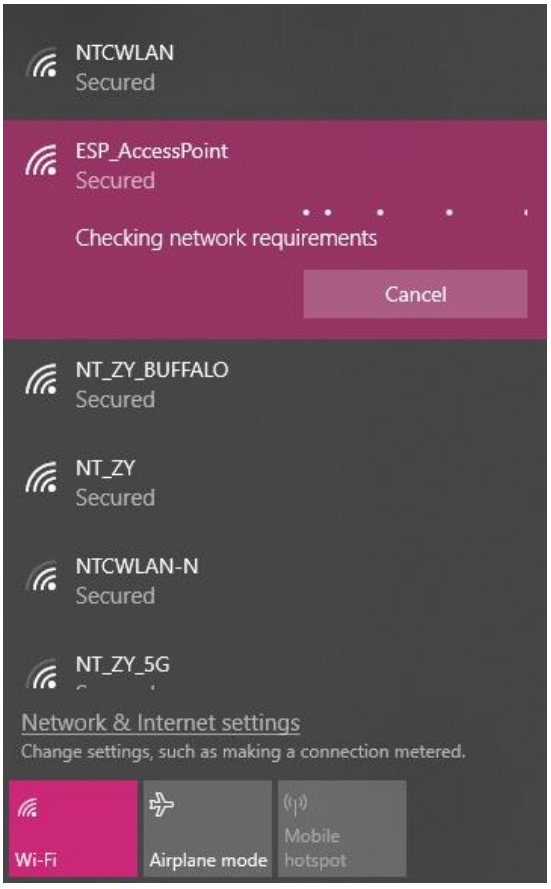


4 目录信息

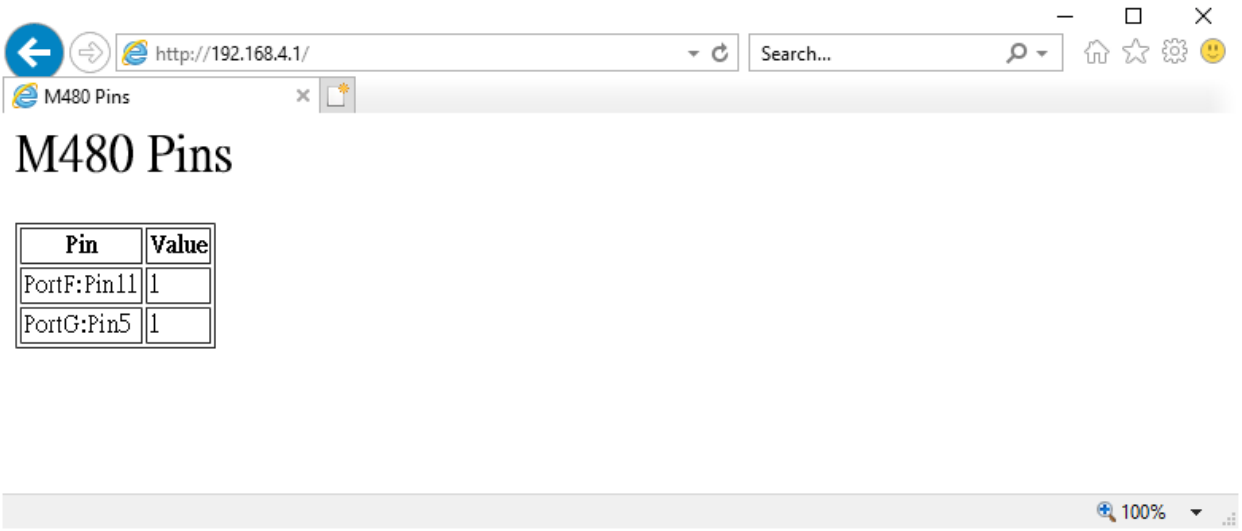
- EC_M480_WiFi_TCPServer_V1.00
  - Library — Sample code header and source files
    - CMSIS — Cortex® Microcontroller Software Interface Standard (CMSIS) by Arm® Corp.
    - Device — CMSIS compliant device header file
    - StdDriver — All peripheral driver header and source files
  - SampleCode
    - ExampleCode — Source file of example code
  - ThirdParty
    - FreeRTOS — A real time operating system available for free download. Its official website is: http://www.freertos.org/
    - ESP_AT_Lib — ESP_AT Library commands parser is generic, platform independent, library for communication with ESP8266 WiFi module using AT commands. Its official website is https://majerle.eu/documentation/esp_at/html/index.html

5 如何执行范例程序

1. 根据目录信息章节进入 ExampleCode 路径中的 KEIL 文件夹，双击 M480_WiFi_TCPServer.uvproj。
2. 进入编译模式接口
   a. 编译
   b. 下载代码至内存
   c. 进入 / 离开除错模式
3. 进入除错模式接口
   a. 执行代码
4. 计算机连接“ESP_AccessPoint”无线存取点 (key:12345678)



5. 打开浏览器，并输入 http://192.168.4.1/



6 修订纪录

Date	Revision	Description
Oct. 7, 2019	1.00	1. 初始发布.

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