ESP32 and ESP8266 using W5100 and W5500 ethernet modules

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ESP8266 uses W5100 and W5500 Ethernet modules

Overview

In the experimental project, I hope to use an Ethernet module to realize Ethernet communication, instead of using WiFi network, but using wired Ethernet.
An ESP8266 module is used as the main processor, and Arduino IDE is used as the development environment. First, a W5500 module was selected to connect to the Ethernet. As a result, the W5500 is connected through SPI, which is unsuccessful. The program cannot run. No other libraries have been added. I feel that the current Arduino is not very friendly, and the download program is very slow. I bought another W5100 module on a certain treasure. (Because looking at Ethernet.h and Ethernet.cpp, I found that the library is compatible with the W5100 module. In this experiment, everything is normal. Share the usage here.

program

```
/*
  A simple server that answer the ping message.
  Using an ESP8266 .
*/

/* Circuit:
 *  Ethernet shield attached to pins :
 *  D6: GPIO12 - MISO
 *  D7: GPIO13 - MOSI
 *  D8: GPIO15 - CS
 *  D5: GPIO14 - SCLK
 */

#include <SPI.h>
#include <Ethernet.h>

#define MACADDRESS 0xDE, 0xAD, 0xBE, 0xEF, 0xDE, 0xED
IPAddress ip(192,168,6,29);
IPAddress gateway(192, 168, 6, 1);
IPAddress subnet(255, 255, 255, 0);

// telnet defaults to port 23
EthernetServer server(23);

#define RST     4    //W5100 RST
void setup()
{
  pinMode(BUILTIN_LED, OUTPUT);
  Ethernet.init(5);             // 初始化Ethernet板子
  pinMode(RST, OUTPUT);
  digitalWrite(RST,HIGH);  //Reset this module
  delay(200);
  digitalWrite(RST,LOW);
  delay(200);
  digitalWrite(RST,HIGH);
  delay(200);

  Serial.begin(115200);
  Serial.println();

  byte mac[] = { MACADDRESS };

  Ethernet.begin(mac, ip, gateway, subnet);

  // print your local IP address:
  Serial.print("My IP address: ");
  Serial.println(Ethernet.localIP());

  server.begin();
}

void loop()
{
}
```

connect

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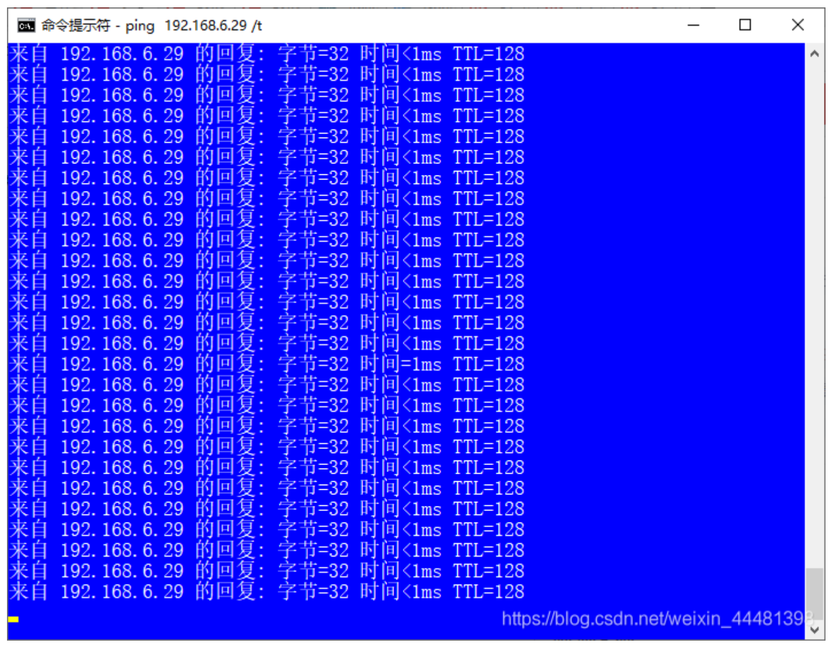
The connection between the module and ESP8266 should not make an error, and it will succeed once

W5100	ESP8266
+5V	
NSS	SS
MO	MOSI
GND	GND
RST	GPIO4
SCK	SCLK
MI	MISO

result



The experiment is successful, you can use Ethernet to communicate with ESP8266.

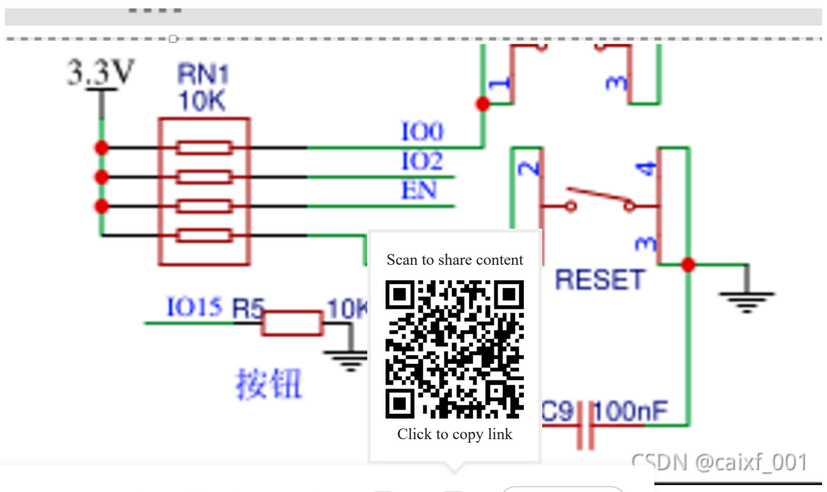
experience

I don't know why the W5500 keeps crashing. Nothing happens. Neither watchdog works. Experimented with ESP32 and W5500, ESP32 cannot be used as the host because the library used is the header file in the C:\install Arduino IDE\libraries\Ethernet directory, and EthernetServer myServer(23); cannot be used to define variables. Compilation fails. Another experience is that when you don't know the SPI wiring, you can use the printing method to get the SPI port.
In the past few days, I have tested the ESP32 using the W5500. The ESP32 can be used as a client and communicate with the server, but I don't know why it still cannot be used as a server.

postscript

Recently, some netizens discussed the board communication between ESP8266 and W5500, and experimented. You can use ESP8266 to connect W5500 to realize Ethernet wired communication, just add Ethernet.init(5) in the initialization program; this command selects GPIO5 as the chip select signal. Also note:

- **The default GPIO15 cannot be used as the chip select CS signal. If GPIO15 is used, it will crash. It may be related to a 10KΩ grounding resistance connected to GPIO15 of our board.**
- **The chip select signal selects other ones that can communicate and realize the transmission of TCP and so on.**
- **Just add Ethernet.Inti(5); in initialization, this CS can be chosen arbitrarily**



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The problem that the server of ESP32+W5500 cannot run is solved. You can use ESP32 and W5500 to realize wired Ethernet communication. The key is that there is a problem with the library function, and the Server.h library needs to be used when compiling. The address of my library is the following location on the machine:

```
C:\Users\□□□□□□\Documents\ArduinoData\packages\esp32
\hardware\esp32\1.0.6\cores\esp32/Server.h:28:18: note:
      virtual void Server::begin(uint16_t)
   virtual void begin(uint16_t port=0) =0;
```

Change this header file to the following form to compile and communicate with W5500.

```
class Server: public Print
{
public:
    //virtual void begin(uint16_t port=0) =0;   modified by CAI at 2021-12-13
    virtual void begin() = 0;
};
```

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