NUC472 uIP Client

Example Code Introduction for 32-bit NuMicro® Family

Information

Application	This code uses Ethernet function to report a message to a host periodically.
BSP Version	NUC472 Series BSP CMSIS V3.03.000
Hardware	NuTiny-SDK-NUC472

1 Function Description

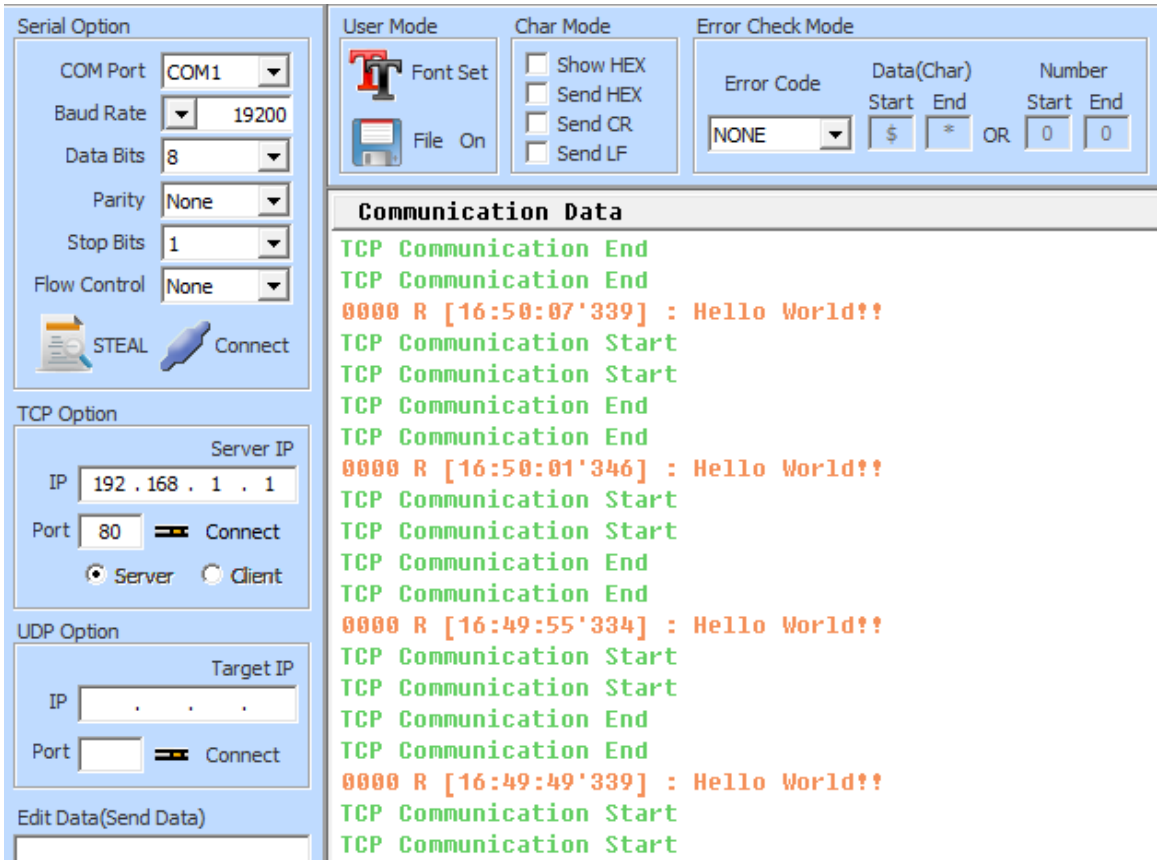
1.1 Introduction

This example code uses NUC472's Ethernet function to report a message to a host on the network periodically. The network data processing uses uIP stack. uIP is a simple network stack. It can directly call the API to perform various network actions, including connecting to a host, sending and receiving packets.

1.2 Principle

This example code connects to the host IP: 192.168.1.1 : 80 by tcp_client_appcall(). Then it will send the string "Hello World!!" every six seconds. Finally, it disconnects the TCP/IP communication. It can be applied to the system that needs to report the host periodically.

1.3 Demo Result



2 Code Description

Main function sets IP address :

```
int main(void)
{
    uip_ipaddr_t ipaddr = {0, 0};

    SYS_Init();
    UART_Open(UART0, 115200);

    printf("NUC472 uIP sample code start\n");

    /* Select RMII interface by default*/
    EMAC_Open(ethaddr.addr);
    NVIC_EnableIRQ(EMAC_TX_IRQn);
    NVIC_EnableIRQ(EMAC_RX_IRQn);
    EMAC_ENABLE_RX();
    EMAC_ENABLE_TX();
    /*Setting Timer*/
    TIMER_Open(TIMER0, TIMER_PERIODIC_MODE, 1);
    TIMER_EnableInt(TIMER0);
    NVIC_EnableIRQ(TMR0_IRQn);
    TIMER_Start(TIMER0);

    /* TCP/IP address setting*/
    uip_ipaddr(ipaddr, 192,168,1,2);
    uip_sethostaddr(ipaddr);
    uip_ipaddr(ipaddr, 192,168,1,10);
    uip_setdraddr(ipaddr);
    uip_ipaddr(ipaddr, 255,255,255,0);
    uip_setnetmask(ipaddr);

    /* MAC address setting*/
    uip_setethaddr(ethaddr);
    /*TCP connection*/
    tcp_client_connect();
    /*uIP network processing*/
    while(1) {
        uip_polling();
        if((uip_closed()||uip_aborted())&&((curTime-sendTime)>=6)) {
```

```
            tcp_client_connect();
            sendTime=curTime;
        }
    }
}
```

Use the port 80 to handle the message communication：

```
void httpd_appcall(void)
{
    switch(uip_conn->rport) {
        case HTONS(80):
            tcp_client_appcall();/*application callback*/
            break;
        default:
            break;
    }
}

void tcp_client_senddata(void)
{
    struct tcp_appstate *s = (struct tcp_appstate *)&uip_conn->appstate;
    if(s->textlen>0)uip_send(s->textptr, s->textlen);
}

void tcp_client_appcall(void)
{
    uint8_t string_pass[] = "Hello World!!";
    struct tcp_appstate *s = (struct tcp_appstate *)&uip_conn->appstate;

    if((curTime-sendTime)>=6) {
        s->textptr=string_pass;
        s->textlen=strlen((const char*)string_pass);
        tcp_client_senddata();/*Send the message*/
        sendflag=1;
        sendTime=curTime;
    }
    if((sendflag==1)&&(uip_acked()!=0)) {
        uip_close();/*Disconnect network*/
        sendflag=0;
```

```
    }
}
```

3 Software and Hardware Environment

Software Environment

- BSP version
  - NUC472 Series BSP CMSIS V3.03.000
- IDE version
  - Keil uVersion 5.26

Hardware Environment

- Circuit components
  - NuTiny-SDK-NUC472
- Diagram

NUC472		Ethernet jack
PC.1	←	RMII_RXERR
PC.2	←	RMII_ RXDV
PC.3	←	RMII_RXD1
PC.4	←	RMII_RXD0
PC.0	←	RMII_REFCLK
PB.14	→	RMII_MDC
PB.15	↔	RMII_MDIO
PC.6	→	RMII_TXD0
PC.7	→	RMII_TXD1
PC.8	→	RMII_TXEN

4 Directory Information

- EC_NUC472_uIP_Client_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
    - uip-0.9 — uIP is a very small implementation of the TCP/IP stack that is written by Adam Dunkels <adam@sics.se>. More information can be obtained from the uIP homepage at https://github.com/adamdunkels/uip

5 How to Execute Example Code

1. Browsing into sample code folder by Directory Information (section 4) and double click NUC472_uIP_Client.uvproj.
2. Enter Keil compile mode
   a. Build
   b. Download
   c. Start/Stop debug session
3. Enter debug mode
   a. Run

6 Revision History

Date	Revision	Description
Jul. 11, 2019	1.00	1. Initially issued.

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