

網路程式設計 HW-UDP 作業

一、執行畫面

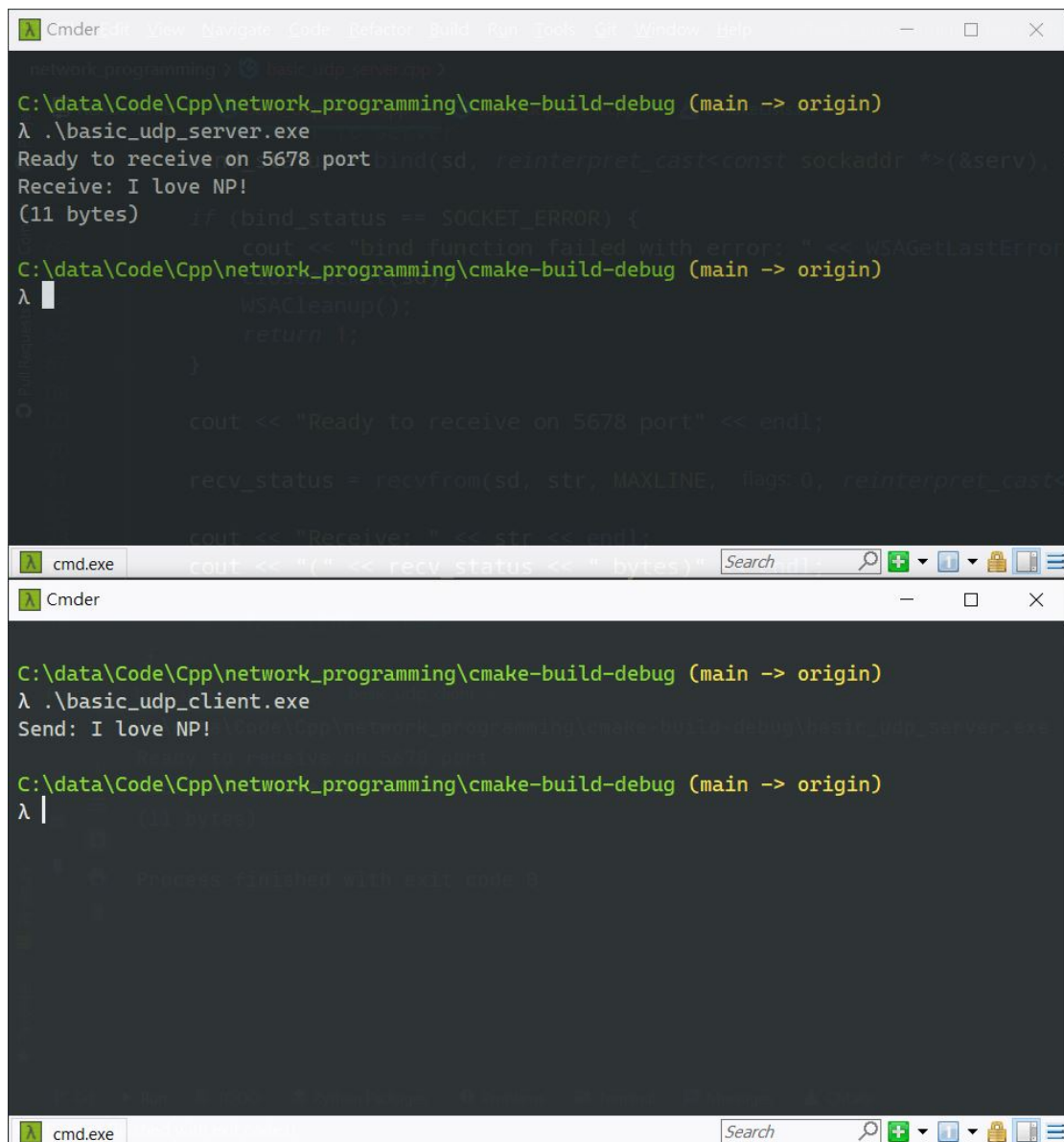
基本 UDP 連線，上方畫面為 server 端，下方畫面為 client 端。

- 基本 UDP 連線 client 端程式碼:

https://github.com/linwebs/network_programming/blob/main/basic_udp_client.cpp

- 基本 UDP 連線 client 端程式碼:

https://github.com/linwebs/network_programming/blob/main/basic_udp_server.cpp



The image shows two overlapping Windows Command Prompt windows. The top window, titled 'Cmder', shows the execution of a UDP server program. It displays the directory path 'C:\data\Code\Cpp\network_programming\cmake-build-debug', the command to run 'basic_udp_server.exe', and the output 'Ready to receive on 5678 port' and 'Receive: I love NP! (11 bytes)'. The bottom window, also titled 'Cmder', shows the execution of a UDP client program. It displays the same directory path, the command to run 'basic_udp_client.exe', and the output 'Send: I love NP!'. Both windows show the program paths and the 'main -> origin' status.

```
network_programming > basic_udp_server.cpp
C:\data\Code\Cpp\network_programming\cmake-build-debug (main -> origin)
λ .\basic_udp_server.exe
Ready to receive on 5678 port
Receive: I love NP!
(11 bytes)
C:\data\Code\Cpp\network_programming\cmake-build-debug (main -> origin)
λ

C:\data\Code\Cpp\network_programming\cmake-build-debug (main -> origin)
λ .\basic_udp_client.exe
Send: I love NP!
C:\data\Code\Cpp\network_programming\cmake-build-debug (main -> origin)
λ
```


UDP 協定 server 端一對多連線，右方畫面為 server 端，左上方畫面為 1 號 client 端，左下方畫面為 2 號 client 端。

- UDP server 多對一連線 1 號 client 端程式碼:

https://github.com/linwebs/network_programming/blob/main/udp_mult_client_client1.cpp

- UDP server 多對一連線 2 號 client 端程式碼:

https://github.com/linwebs/network_programming/blob/main/udp_mult_client_client2.cpp

- UDP server 多對一連線 server 端程式碼:

https://github.com/linwebs/network_programming/blob/main/udp_mult_client_server.cpp

[illegible]

UDP 協定 client 端傳送對象固定，右方畫面為 client 端，左方畫面為 server 端。

- UDP 傳送對象固定 client 端程式碼:

https://github.com/linwebs/network_programming/blob/main/udp_static_client_client.cpp

```

C:\data\Code\Cpp\network_programming\cmake-build-debug (main -> origin)
λ .\udp_static_client_client.exe
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!

C:\data\Code\Cpp\network_programming\cmake-build-debug (main -> origin)
λ |

C:\data\Code\Cpp\network_programming\cmake-build-debug (main -> origin)
λ .\udp_mult_client_server.exe
Ready to receive on 5678 port
Receive: I Love NP!(11 bytes) From: 127.0.0.1 (56106)
Receive: I Love NP!(11 bytes) From: 127.0.0.1 (56106)
Receive: I Love NP!(11 bytes) From: 127.0.0.1 (56106)
Receive: I Love NP!(11 bytes) From: 127.0.0.1 (56106)
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Receive: I Love NP!(11 bytes) From: 127.0.0.1 (56106)

```

UDP 協定 client 端固定連接埠(5680 port)，右方畫面為 client 端，左方畫面為 server 端。

● UDP 傳送端固定連接埠 client 端程式碼:

https://github.com/linwebs/network_programming/blob/main/udp_client_static_port_client.cpp

The screenshot shows two side-by-side Windows command prompt windows. The left window, titled 'cmd.exe', shows the execution of a UDP client program. The prompt is 'C:\data\Code\Cpp\network_programming\cmake-build-debug (main -> origin)'. The user runs the command 'λ .\udp_client_static_port_client.exe'. The output shows the client sending the message 'I love NP!' multiple times. The right window, titled 'cmd.exe - C:\data\Code\Cpp\network_programming', shows the execution of a UDP server program. The prompt is 'C:\data\Code\Cpp\network_programming\cmake-build-debug (main -> origin)'. The user runs the command 'λ .\udp_mult_client_server.exe'. The output shows the server receiving the message 'I Love NP!(11 bytes) From: 127.0.0.1 (5680)' multiple times. The taskbar at the bottom shows 'cmd.exe' and 'udp_mult_client_server.exe'.

```

C:\data\Code\Cpp\network_programming\cmake-build-debug (main -> origin)
λ .\udp_client_static_port_client.exe
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!
Client send: I love NP!

C:\data\Code\Cpp\network_programming\cmake-build-debug (main -> origin)
λ

```

```

C:\data\Code\Cpp\network_programming\cmake-build-debug (main -> origin)
λ .\udp_mult_client_server.exe
Ready to receive on 5678 port
Receive: I Love NP!(11 bytes) From: 127.0.0.1 (5680)
Receive: I Love NP!(11 bytes) From: 127.0.0.1 (5680)
Receive: I Love NP!(11 bytes) From: 127.0.0.1 (5680)
Receive: I Love NP!(11 bytes) From: 127.0.0.1 (5680)
Receive: I Love NP!(11 bytes) From: 127.0.0.1 (5680)
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Receive: I Love NP!(11 bytes) From: 127.0.0.1 (5680)
Receive: I Love NP!(11 bytes) From: 127.0.0.1 (5680)
Receive: I Love NP!(11 bytes) From: 127.0.0.1 (5680)
Receive: I Love NP!(11 bytes) From: 127.0.0.1 (5680)

```

UDP 協定接收端不關心傳送來源，右方畫面為 client 端，左方畫面為 server 端。

- UDP 接收端不關心傳送來源 server 端程式碼:

https://github.com/linwebs/network_programming/blob/main/udp_no_care_source_server.c

[illegible]

二、心得

這次的課程是 UDP 協定的實作，平常我們都使用 TCP 協定來進行傳輸，這是我第一次撰寫 UDP 協定的程式，感覺非常的新鮮。

這次課堂中有 6 個練習題，分別針對不同情況下的連線，有不同的作為，讓我熟悉 UDP 協定的語法。除此之外，老師還想了以下幾個延伸練習題：變速傳送、接收測速、錯誤偵測、錯誤重傳、主動多傳、錯序偵測與修正，這幾個練習題我將在之後有空閒時，實際實作出來。