

Homework III

Third Mini-Program

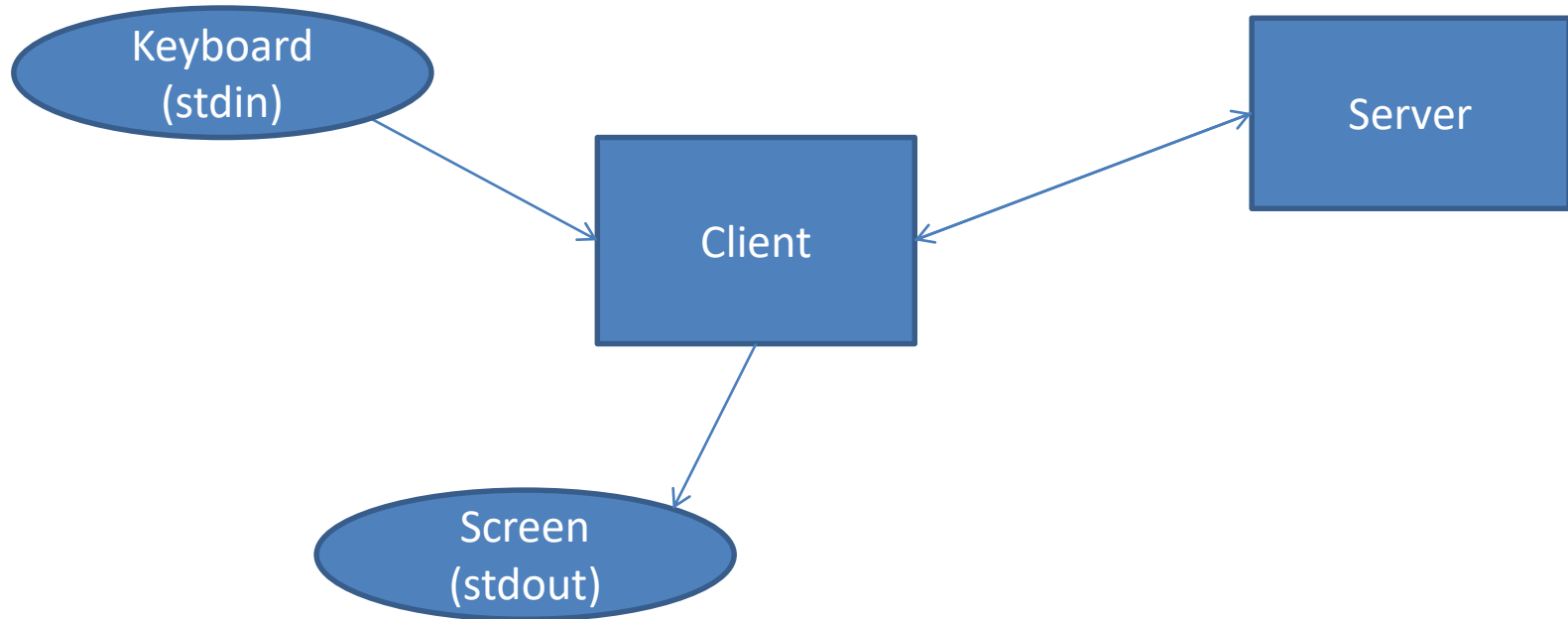
Non-blocking TCP Server & Client

Overview

- Similar to a chat room system
 - Echo client
 - Broadcast echo server
 - Using non-blocking TCP

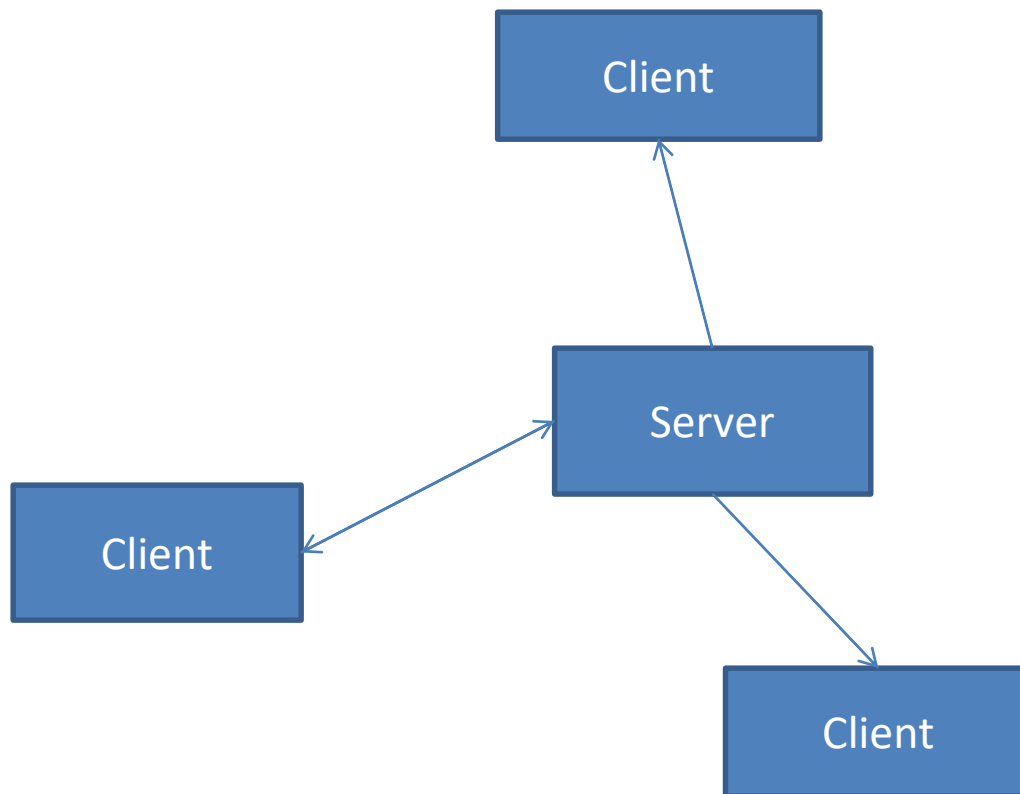
Client

- Sends what it got from stdin to server.
- Prints all it received from server to stdout.

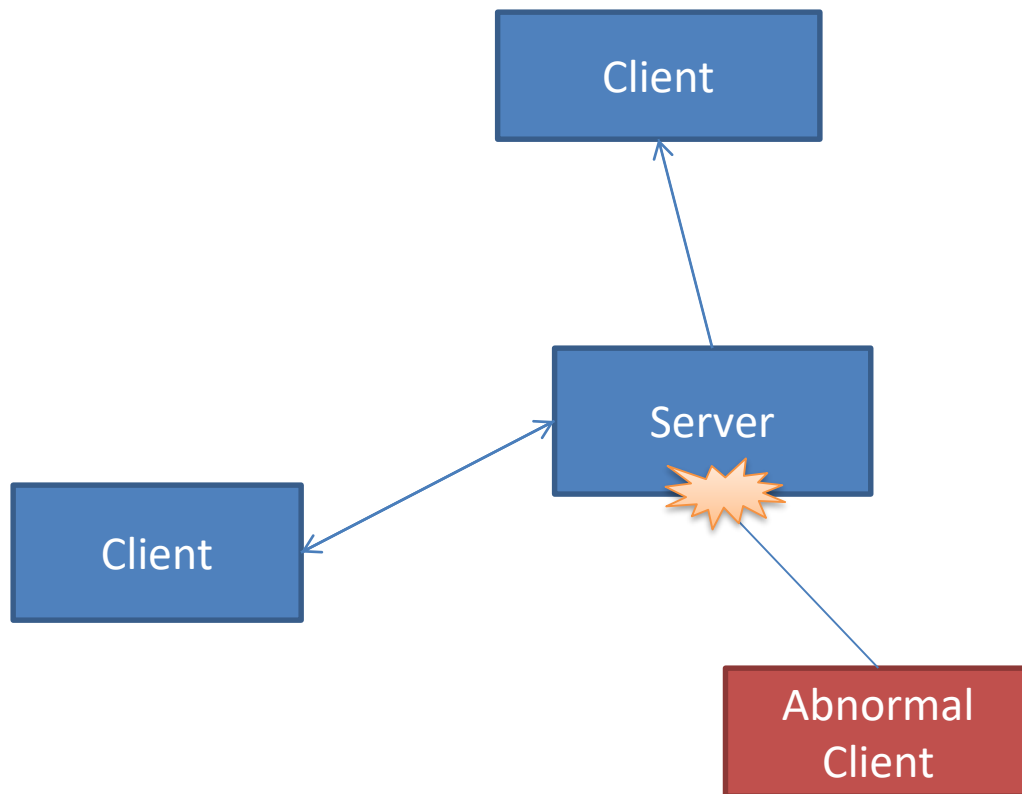


Server

- Besides sending messages back to the sender, sending to all connected clients.

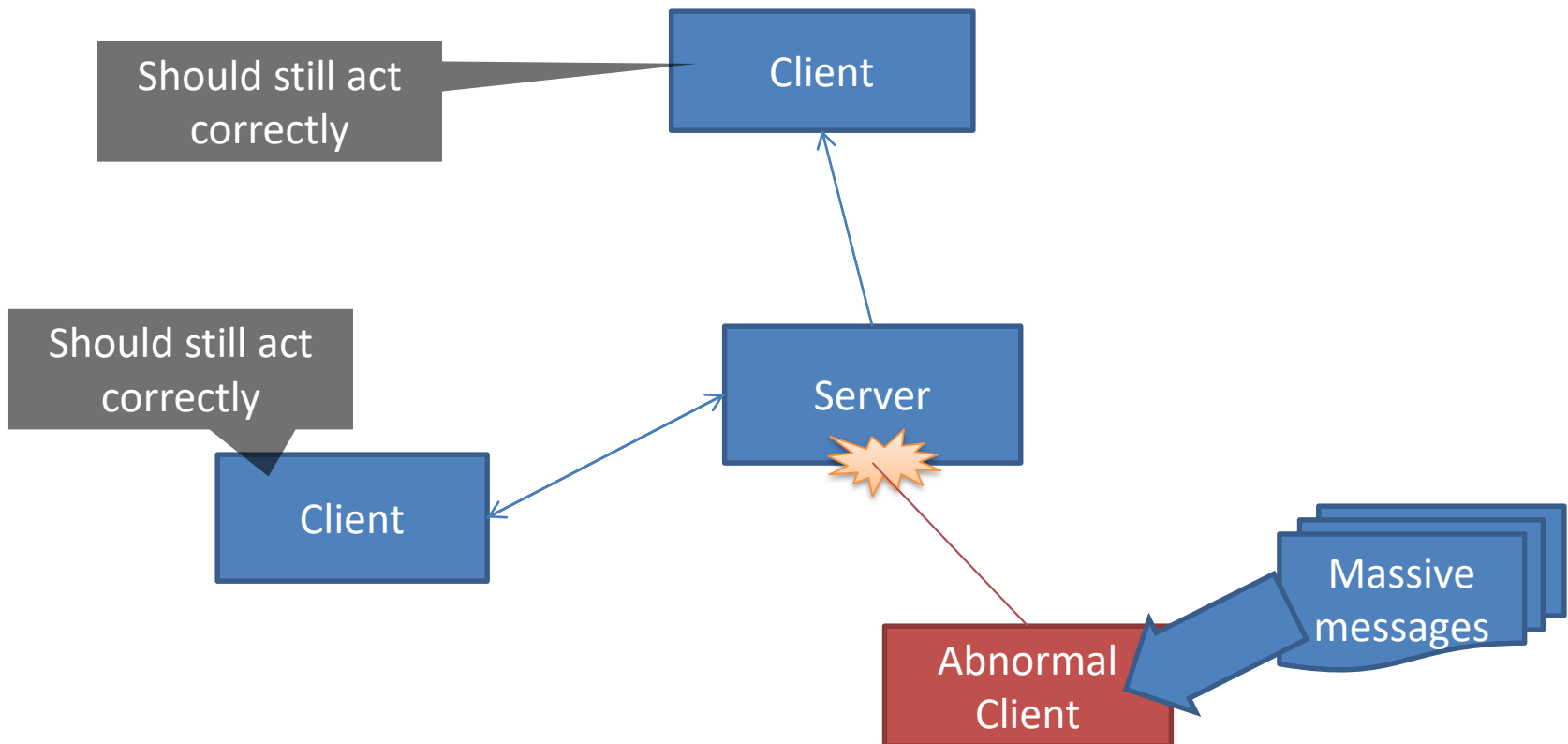


You can deal with...



Test case (1)

- TA will provide the abnormal client for testing.



Test case (2)

- You may download the abnormal client and massive messages here:
 - Abnormal client
 - http://www.cs.nctu.edu.tw/~lwcheng/no_read_client.c
[pp](#)
 - Massive messages
 - http://www.cs.nctu.edu.tw/~lwcheng/a_big_file

Test case (3)

- Get all needed files:
 - Your client and server
 - a_big_file

```
5:29pm liyl@linux3 [~/tmp/2012np_hw3_testcase] [W2] >wget http://www.cs.nctu.edu.tw/~lwcheng/a_big_file
```

- no_read_client.cpp

```
5:25pm liyl@linux3 [~/tmp/2012np_hw3_testcase] [W2] >wget http://www.cs.nctu.edu.tw/~lwcheng/no_read_client.cpp
```

```
5:29pm liyl@linux3 [~/tmp/2012np_hw3_testcase] [W2] >ls  
a_big_file client client_nonblock.c ctcp.c ctcp.h ctcp.o Makefile no_read_client.cpp server server_nonblock.c  
5:30pm liyl@linux3 [~/tmp/2012np_hw3_testcase] [W2] >
```

```
0 IRC 1 HW3 2 SERVER 3 CLIENT1 4 CLIENT2 5 CLIENT3  
[0.00 0.01 0.05]
```

@linux3

- Compile the source of the given client:
 - make no_read_client

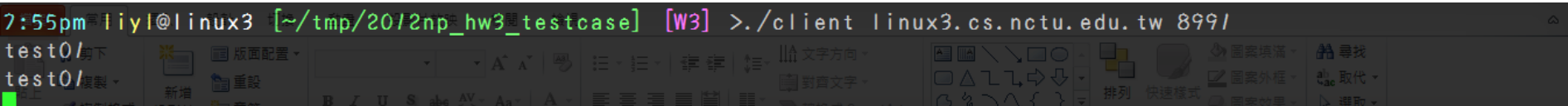
```
5:30pm liyl@linux3 [~/tmp/2012np_hw3_testcase] [W2] >make no_read_client
```

```
g++ no_read_client.cpp -o no_read_client
```

```
5:31pm liyl@linux3 [~/tmp/2012np_hw3_testcase] [W2] >ls  
a_big_file client client_nonblock.c ctcp.c ctcp.h ctcp.o Makefile no_read_client no_read_client.cpp server server_nonblock.c
```


Test case (4)

- Execute server and a client (CLIENT1)

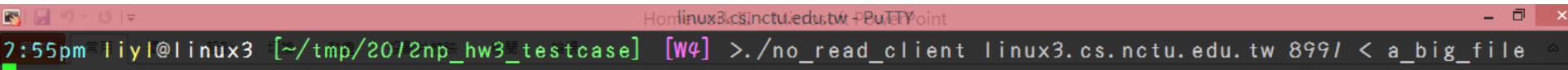


```
7:55pm ~ | iyl@linux3 [~/tmp/2012np_hw3_testcase] [W3] > ./client linux3.cs.nctu.edu.tw 8991
test0/
test0/
```

A terminal window with a dark background. The prompt is 7:55pm ~ | iyl@linux3 [~/tmp/2012np_hw3_testcase] [W3]. The command ./client linux3.cs.nctu.edu.tw 8991 has been executed. The output shows test0/ on two lines.

- Run no_read_client (CLIENT2)

– View of CLIENT2




```
7:55pm ~ | iyl@linux3 [~/tmp/2012np_hw3_testcase] [W4] > ./no_read_client linux3.cs.nctu.edu.tw 8991 < a_big_file
```

A terminal window with a dark background. The prompt is 7:55pm ~ | iyl@linux3 [~/tmp/2012np_hw3_testcase] [W4]. The command ./no_read_client linux3.cs.nctu.edu.tw 8991 < a_big_file has been executed.

– View of CLIENT1

- Growing numbers were sent from CLIENT2 to CLIENT1.
- You can still type messages and get the echo then (Eg. test01) .

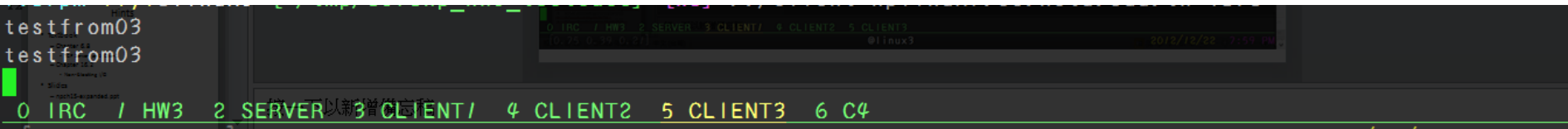


```
499998
499999
test0/
test0/
```

A terminal window with a dark background. The prompt is 499998. The output shows 499999, test0/, and test0/ on four lines.

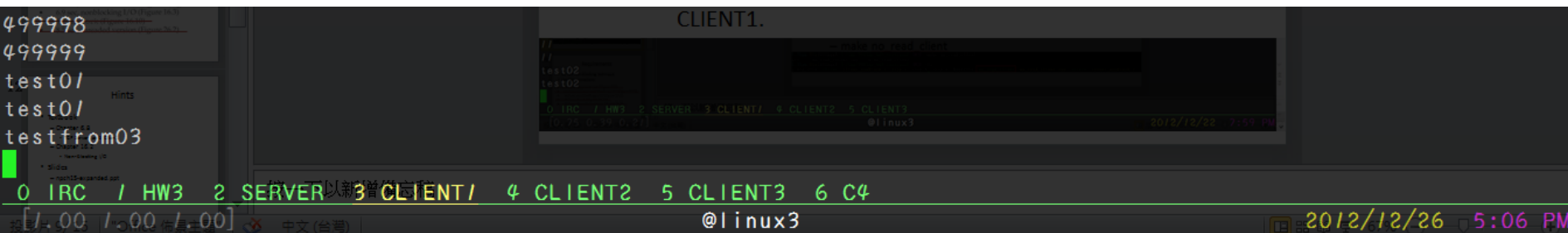
Test case (5)

- Open another client (CLIENT3)
 - View of CLIENT3
 - You can type “testfrom03” and get the echo.



```
testfrom03
testfrom03
0 IRC 1 HW3 2 SERVER 3 CLIENT1 4 CLIENT2 5 CLIENT3 6 C4
```

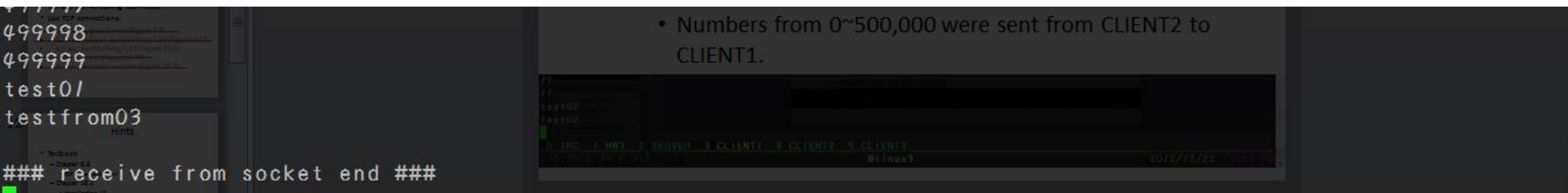
- View of CLIENT1
 - Messages from CLIENT3 be shown.



```
499998
499999
test0/
test0/
testfrom03
0 IRC 1 HW3 2 SERVER 3 CLIENT1 4 CLIENT2 5 CLIENT3 6 C4
```

Test case (6)

- Server can resend the buffered messages.
 - View of no_read_client (CLIENT2)
 - It receives some numbers and shows them on the screen. Then, it suspends for a while.
 - It repeats the action above until the number increases to 499,999, which is the end of “a_big_file”.
 - “test01” from CLINET1 and “testfrom03” from CLIENT3 be shown in the same time order as they were sent (It may take a long time before accomplished).



Requirements

- A server program and a client program.
- DO USE non-blocking technique.
- Use TCP connections.

- ~~• 354.0 sec, stop-and-wait (Figure 5.5)~~
- ~~• 12.3 sec, select and blocking I/O (Figure 6.13)~~
- 6.9 sec, nonblocking I/O (Figure 16.3)
- ~~• 8.7 sec, fork (Figure 16.10)~~
- ~~• 8.5 sec, threaded version (Figure 26.2)~~

Hints

- Textbook
 - Chapter 6.8
 - TCP Server and Client
 - Chapter 16.2
 - Non-blocking I/O
- Slides
 - npch15-expanded.ppt

Useful links

- Specification
 - <http://people.cs.nctu.edu.tw/~lwcheng/spec.txt>
- Course forum
 - <http://nsl22.cs.nctu.edu.tw>

HW2 Demonstration Reminder

- Please choose your coming time for hw2 demonstration.
 - Detail
 - <http://nsl22.cs.nctu.edu.tw/viewtopic.php?f=2&t=84>

Programming Contest Reminder

- Due date: 2013/01/18
- “Tar” and upload your file to the directory “programming_contest” on the ftp server.