

System Programming Programming hw1

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IRLAB

TA Information

- ntucsiesp@gmail.com
- TA hours
 - 13:00 ~ 14:00 Wed.
 - 11:00 ~ 12:00 Thu.
 - R302 CSIE building

Outline

- ◎ Goal
- ◎ Problem description
- ◎ Sample server execution
- ◎ Grading
- ◎ Submission
- ◎ Reminder

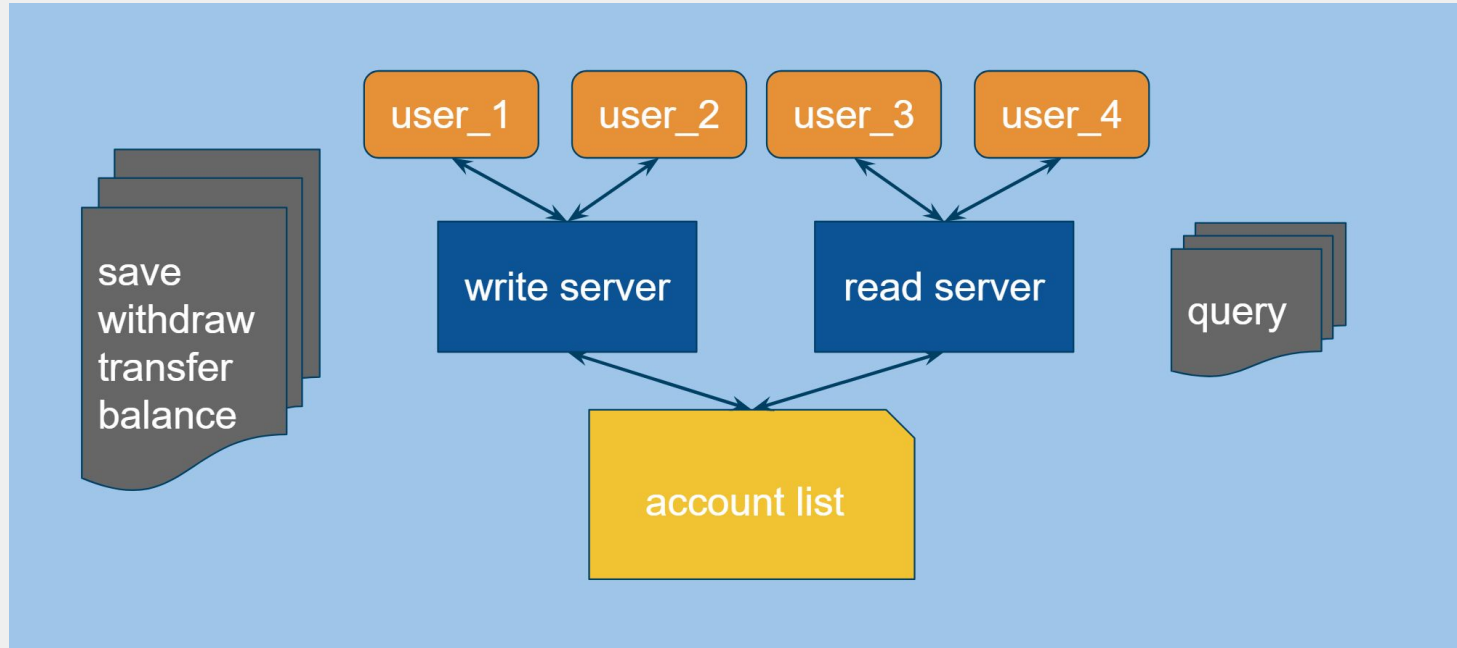
Goal

- This assignment is designed for you to ...
 - Get familiar with Linux system call `select()` and `advisory file lock` technique.
 - Have a basic understanding in Server & Client interaction.
 - Compile and run program on UNIX-like environment.

Problem Description

- Given a simple server, you have to modify it to a banking system supporting **I/O Multiplexing** and **content protection**.
- There are four operations you should implement on the banking system :
 - Save
 - Withdraw
 - Transfer
 - Balance

Banking System Structure



Sample server execution

- Decompress the sample code :
 - `$ tar -xzf sp_hw1_code.tar.gz`
- Compile the program :
 - `$ make`
- Run the sample system :
 - (Server side) : `$./[server_name] [port]`
 - (Client side) : `$ telnet [server_address] [port]`

Sample server execution

- Server side :

```
r07922044@linux1 [~/sp_hw1] ./read_server 12345  
  
starting on linux1, port 12345, fd 3, maxconn 1024...  
getting a new request... fd 4 from 140.112.30.32  
|
```

- Client side:

```
r07922044@linux1 [~/sp_hw1] telnet linux1.csie.org 12345  
Trying 140.112.30.32...  
Connected to linux1.csie.org.  
Escape character is '^]'.  
|
```


Tasks you should do

- Handle multiple requests simultaneously.
 - using `select()` function to monitor all connection to the server.
- Set file lock to guarantee the correctness when executing some operations.
 - You may use `fcntl()` this function to implement advisory file lock.
- Implement a banking system to handle any reasonable cases and recheck the correctness of your system.

Grading

- Produce the executable files successfully. (1 point)
- read_server returns the details of specific item. (1 point)
- write_server can change item correctly. (1 point)
- Two requests issued to read_server. (1 point)
- Two requests issued to write_server. (1 point)
- Protection on single write_server. (1 point)
- Protection on multi-server. (2 point)

Submission

- Due : 23:59 Tue, Oct 22, 2019
- Submit SP_HW1_{student id}.tar.gz to CEIBA
 - No other file types allowed!
- The compressed file should include three files in a folder :
 - ◆ {student_id}/
 - server.c (as well as other .c files)
 - Makefile
 - readme.txt

Punishment

- You will get NO credits for plagiarism
- Late submission
 - 5% for each day
- Error format
 - wrong file name/format
 - wrong output format

Reminder

- Read the specification file carefully.
- Run and Test your program on CSIE workstation (linux1~linux20).
- If you have any question, please feel free to ask TAs directly.
- Start your home work ASAP !

DEMO

Questions?