

Lab3: socket programming

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1 Introduction

In this lab we are required to implement a simple file share application using TCP Socket APIs and use Mininet to compare the overall file downloading time.

2 How to run the code

1. Place `server.py` and `client.py` in different directories.
2. Change the `FILE_PATH` in `server.py` to the absolute path where `server.py` belongs to. You will find the variable at **line 10**.

```
ftp > server.py > ...
1  #!/usr/bin/env python3
2
3  from socket import *
4  import sys,os
5  from threading import Thread
6  import time
7
8  HOST = '0.0.0.0'
9  PORT = 12345
10 FILE_PATH = '/home/thy/ftp/'
```

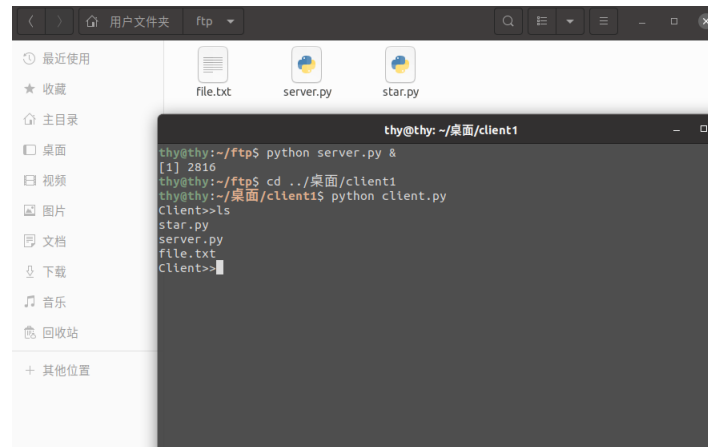
3. Direct the terminal to the path above. Type `python server.py &` in a terminal to run the server in the background.
4. Direct the terminal to the directory where `client.py` belongs to. Type in `python client.py` to start a client.

```
thy@thy: ~/桌面/client1
thy@thy:~/ftp$ python server.py &
[1] 2816
thy@thy:~/ftp$ cd ../桌面/client1
thy@thy:~/桌面/client1$ python client.py
client>>
```

3 Evaluation

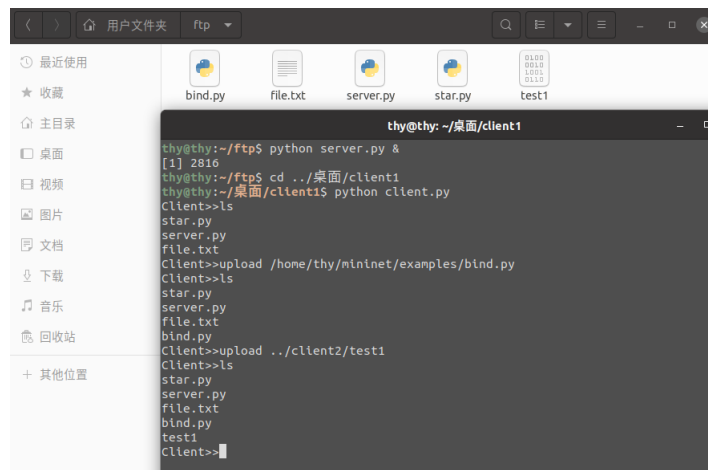
3.1 ls

The `ls` command is used to see what file is available on the server.



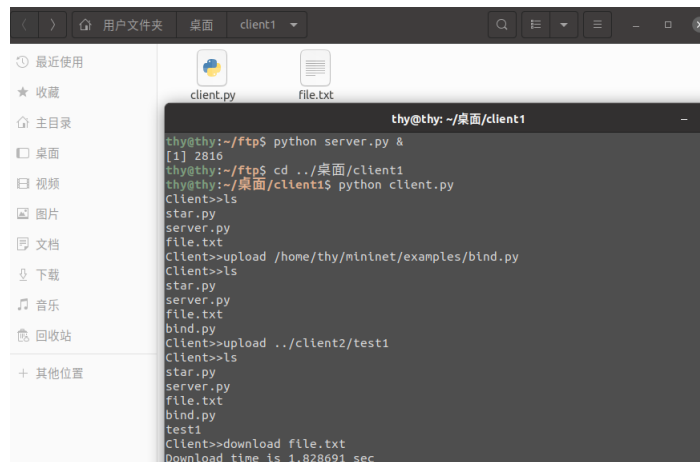
3.2 upload + filename

The command is used to upload a file from client to server. You can either use absolute path or relative path.



3.3 download + filename

The command is used to download a file from server to client. The filename should be available on the server. The file will be downloaded towards the same directory where the `client.py` is.



3.4 Use Mininet to test

The star topology is created using `star.py`. The target file `test1` is a 1GB binary file.

3.4.1 1 client

The average time cost is **3.68 sec**.

```

mininet> h4 python server.py &
mininet> h1 python client1/client1.py
Download time is 3.548042 sec
mininet> h1 python client1/client1.py
Download time is 2.892396 sec
mininet> h1 python client1/client1.py
Download time is 4.605372 sec

```

3.4.2 3 clients

The average time cost is **11.36 sec**.

```

Download time is 11.219310 sec
[3] 31087
[4] 31088
Download time is 11.404356 sec
Download time is 11.466110 sec
mininet>

```

3.4.3 6 clients

The average time cost is **41.97 sec**.

```

Download time is 41.789824 sec
Download time is 41.877294 sec
Download time is 42.244946 sec
mininet>

```

We can see that as the number of peers increases, the time cost will increase simultaneously, which means that the performance of the C/S mode network decreases.