Pemrograman Multi-threaded Server dan Protocol

semua tugas berikut ini HARUS dijalankan di SIMULATOR

1. jalankan program server seperti dalam pembahasan

2. buatlah program client yang dapat melakukan 100 request get pada dalam satu saat untuk operasi get file "pokijan.jpg"

3. capture dan submitlah poin 1 dan 2 dalam satu dokumen pdf. berikan DESKRIPSI dan PENJELASAN

1. Jalankan program server seperti dalam pembahasan
   - Membuat alpine-1 dan alpine-2
   - Mengecek IP Address pada alpine-1 dan alpine-2 dengan 'ifconfig'.
   Menghasilkan IP alpine-1 192.168.122.76 dan alpine-2 192.168.122.220
   - Merubah IP file_server.py dengan IP alpine-1

```
class Server(threading.Thread):
    def __init__(self,ipaddress='192.168.122.76',port=8889):
        self.ipinfo=(ipaddress,port)
        self.the_clients = []
        self.my_socket = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
        self.my_socket.setsockopt(socket.SOL_SOCKET, socket.SO_REUSEADDR, 1)
        threading.Thread.__init__(self)

    def run(self):
        logging.warning(f"server berjalan di ip address {self.ipinfo}")
        self.my_socket.bind(self.ipinfo)
        self.my_socket.listen(1)
        while True:
            self.connection, self.client_address = self.my_socket.accept()
            logging.warning(f"connection from {self.client_address}")
```

   - Run python3 file_server.py pada alpine-1

```
                                  file_client_cli.py  file_protocol.py    files
/Pemrograman_Jaringan_E/progjar4a # nano file_server.py
/Pemrograman_Jaringan_E/progjar4a # nano file_server.py
/Pemrograman_Jaringan_E/progjar4a # python3 file_server.py
WARNING:root:server berjalan di ip address ('192.168.122.76', 6666)
```

- Merubah file_server.py pada alpine-1 dengan IP SERVER alpine-1
- Merubah file_client_cli.py pada alpine-2 dengan IP SERVER alpine-1

```python
import base64
import logging

server_address=('192.168.122.76',7777)

def send_command(command_str=""):
    global server_address
    sock = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
    sock.connect(server_address)
    logging.warning(f"connecting to {server_address}")
    try:
        logging.warning(f"sending message ")
        sock.sendall(command_str.encode())
        # Look for the response, waiting until socket is done (no more data)
        data_received="" #empty string
        while True:
            #socket does not receive all data at once, data comes in part, need
            data = sock.recv(16)
```

- Run python3 file_interface.py pada alpine-2

```
/Pemrograman_Jaringan_E/progjar4a # nano file_client_cli.py
/Pemrograman_Jaringan_E/progjar4a # python3 file_interface.py
{'status': 'OK', 'data': ['pokijan.jpg', 'donalbebek.jpg', 'rfc2616.pdf']}
{'status': 'OK', 'data_namafile': 'pokijan.jpg', 'data_file': '/9j/4AAQSkZJRgABAQAAAQABAAD/2wCEAAkGBxITEhUSExMVFRUXGBkYFxgYGBgXHRgXFhgYGxgYGhgYHiggGCAlGxcXITElJSkrLi4uGiA
ODMsNygtLisBCgoKDg0OGxAQGy0mHyYtLS0vLS0tLy0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLf/AABEIALWBDAMBEQACEQEDEQH/xAAcAAABBQEBAQAAAAAAAAAAAAAFAAMEBgcCAQj/xABJEA
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```

- Run python3 file_protocol.py pada alpine-2

```
/Pemrograman_Jaringan_E/progjar4a # python3 file_protocol.py
WARNING:root:string diproses: LIST
WARNING:root:memproses request: LIST
{"status": "OK", "data": ["pokijan.jpg", "donalbebek.jpg", "rfc2616.pdf"]}
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
{"status": "OK", "data_namafile": "pokijan.jpg", "data_file": "/9j/4AAQSkZJRgABAQAAAQABAAD/2wCEAAkGBxITEhUSExMVFRUXGBkYFxgYGBgXHRgXFhgYGxgYGhgYHiggGCAlGxcXITElJSkrLi4uGiA
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+dEhpXo3wsOWKFGB33AJO4zn3ak0k3qWxWhb+1G5L26Zj/lqthkGGW/YOgpMyJElhFJcdIntoXHSH0pqBuOhNERs6oABPFGPN2Vuq4cBIBAAG5UdhRjFydkCUrHy9xdjJvLpy4Iy5yO7OwAiK3KNlYqirE0lVlGs+GnLrUGJl
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```

- Run file_client_cli.py

```
/Pemrograman_Jaringan_E/progjar4a # python3 file_client_cli.py
WARNING:root:connecting to ('192.168.122.76', 6666)
WARNING:root:sending message
WARNING:root:data received from server:
daftar file :
- pokijan.jpg
- donalbebek.jpg
- rfc2616.pdf
/Pemrograman_Jaringan_E/progjar4a #
```

- Maka dari hasil yang dijalankan adalah

```
/Pemrograman_Jaringan_E/progjar4a # ls
PROTOKOL.txt          file_interface.py    files
__pycache__           file_protocol.py
file_client_cli.py    file_server.py
/Pemrograman_Jaringan_E/progjar4a #
```

2. Buatlah program client yang dapat melakukan 100 request get pada dalam satu saat untuk operasi get file "pokijan.jpg"
   - Sebelumnya kita harus clone
     https://github.com/Rivadhli16/Pemrograman_Jaringan_E.git
   - File file_interface.py pada alpine-2, di path os.chdir('/files') menjadi
   - os.chdir('/Pemrogrman_Jaringan_E/progjar4a').
   - Kemudian ubah IP Address pada file_client_cli.py menjadi IP Address alpine-1.
   - Membuat file testing.py agar client yang melakukan 100 request get dengan kode program dibawah ini. Di program kali ini, daftar akan berisikan gambar pokijan.jpg yang akan dikirim sebanyak 100 kali dengan perulangan dilakukan sebanyak 100 kali.

```python
from file_client_cli import remote_get
import time
import datetime
import threading
import socket

def kirim_semua():
    texec = dict()
    daftar = 'pokijan.jpg'

    catatan_start = datetime.datetime.now()
    for k in range(100):
        print(f"mengirim {k}")
        texec[k] = threading.Thread(target=remote_get, args=(daftar,))
        texec[k].start()

    for k in range(100):
        texec[k].join()

    catatan_end = datetime.datetime.now()
    selesai = catatan_end - catatan_start
    print(f"TOTAL waktu yang dibutuhkan yaitu {selesai} detik {catatan_start} sampai {catatan_end}")

if __name__=='__main__':
    kirim_semua()
```

- Di alpine-1 menjalankan file_server.py

```
/Pemrograman_Jaringan_E/progjar4a # python3 file_server.py
WARNING:root:server berjalan di ip address ('192.168.122.76', 7777)
WARNING:root:connection from ('192.168.122.220', 38046)
WARNING:root:connection from ('192.168.122.220', 38048)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38050)
WARNING:root:connection from ('192.168.122.220', 38052)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38056)
WARNING:root:connection from ('192.168.122.220', 38054)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38058)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38060)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38062)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38064)
WARNING:root:connection from ('192.168.122.220', 38066)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38068)
```

```
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38242)
WARNING:root:connection from ('192.168.122.220', 38244)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38178)
WARNING:root:connection from ('192.168.122.220', 38174)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38228)
WARNING:root:connection from ('192.168.122.220', 38216)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38186)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38224)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38218)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38214)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.220', 38180)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
```

- Selanjutnya jalankan program udp_multi_thread.py dengan command python3 udp_multi_thread.py. Hasilnya seperti dibawah:

```
/Pemrograman_Jaringan_E/progjar4a # nano file_client_cli.py
/Pemrograman_Jaringan_E/progjar4a # python3 testing.py
mengirim 0
mengirim 1
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
mengirim 2
mengirim 3
mengirim 4
mengirim 5
mengirim 6
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
WARNING:root:connecting to ('192.168.122.76', 7777)
mengirim 7
WARNING:root:sending message
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
WARNING:root:data received from server:
mengirim 8
WARNING:root:data received from server:
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
mengirim 9
WARNING:root:data received from server:
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
mengirim 10
```

```
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
WARNING:root:data received from server:
mengirim 98
WARNING:root:data received from server:
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
mengirim 99
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
WARNING:root:data received from server:
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:connecting to ('192.168.122.76', 7777)
WARNING:root:sending message
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
TOTAL waktu yang dibutuhkan yaitu 0:00:03.370953 detik 2021-07-15 16:46:00.947796 sampai 2021-07-15 16:46:04.318749
/Pemrograman_Jaringan_E/progjar4a #
```