TUGAS PEMROGRAMAN JARINGAN

MULTITHREADED SERVER AND PROTOCOL

Oleh:

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Kelas Pemrograman Jaringan D

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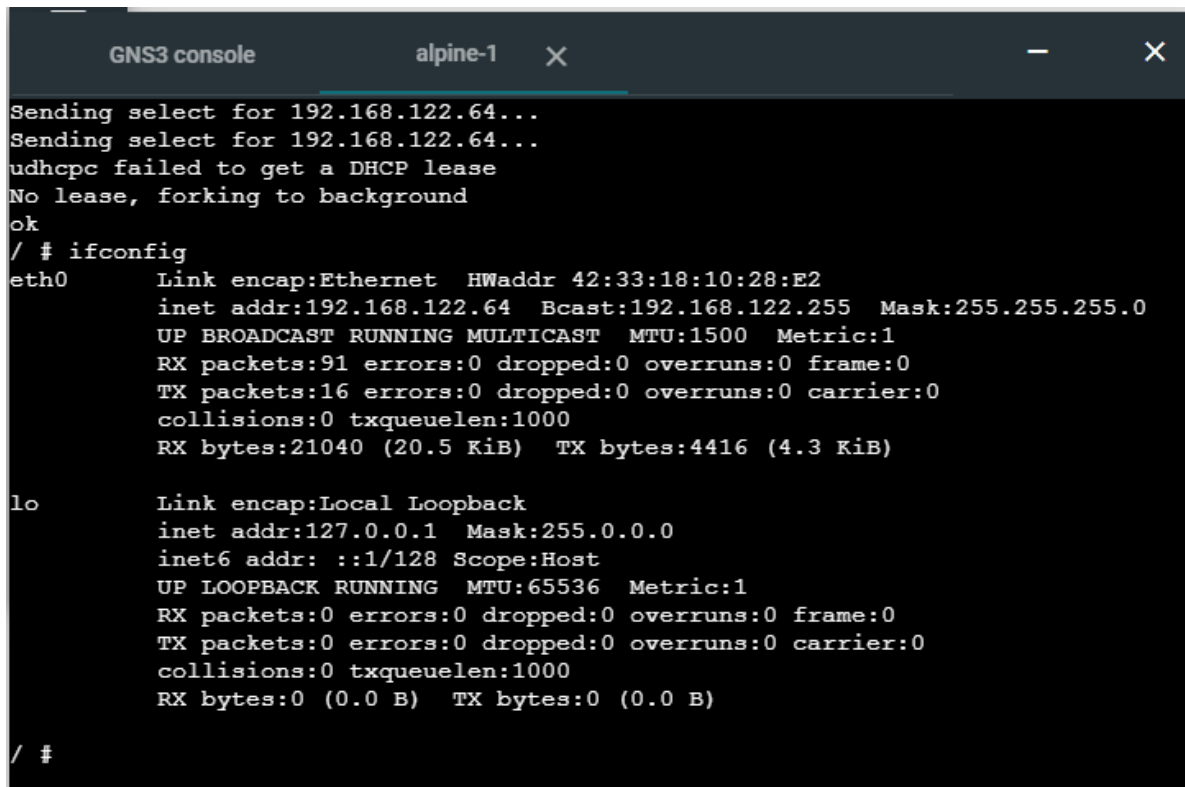Institut Teknologi Sepuluh Nopember (ITS) Surabaya

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Implementasi program server sesuai contoh.

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.

Jawab :

1. Jalankan program server seperti dalam pembahasan 2.
   - Cek IP Address alpine-1 dan alpine-2 dengan menggunakan command ifconfig

- Ubah IP Address pada file_server.py dengan IP Address dari alpine-1. Pastikan portnya sama.

```
GNU nano 4.6                    file_server.py                    Modified
        data = self.connection.recv(32)
        if data:
            d = data.decode()
            hasil = fp.proses_string(d)
            hasil=hasil+"\r\n\r\n"
            self.connection.sendall(hasil.encode())
        else:
            break
    self.connection.close()


class Server(threading.Thread):
    def __init__(self,ipaddress='192.168.122.64',port=5005):
        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):

^G Get Help    ^O Write Out  ^W Where Is   ^K Cut Text   ^J Justify    ^C Cur Pos
^X Exit        ^R Read File  ^\ Replace    ^U Paste Text ^T To Spell   ^_ Go To Line
```

```
GNU nano 4.6                    file_server.py                    Modified
        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}")

            clt = ProcessTheClient(self.connection, self.client_address)
            clt.start()
            self.the_clients.append(clt)


def main():
    svr = Server(ipaddress='192.168.122.64',port=5005)
    svr.start()




^G Get Help    ^O Write Out  ^W Where Is   ^K Cut Text   ^J Justify    ^C Cur Pos
^X Exit        ^R Read File  ^\ Replace    ^U Paste Text ^T To Spell   ^_ Go To Line
```

- Kemudian jalankan file_server.py pada alpine-1 dengan command python3 file_server.py


```
lo          Link encap:Local Loopback
            inet addr:127.0.0.1  Mask:255.0.0.0
            inet6 addr: ::1/128 Scope:Host
            UP LOOPBACK RUNNING  MTU:65536  Metric:1
            RX packets:0 errors:0 dropped:0 overruns:0 frame:0
            TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

/ # git clone https://github.com/natihdevayanti/progjar.git
Cloning into 'progjar'...
remote: Enumerating objects: 336, done.
remote: Counting objects: 100% (20/20), done.
remote: Compressing objects: 100% (18/18), done.
remote: Total 336 (delta 4), reused 14 (delta 2), pack-reused 316
Receiving objects: 100% (336/336), 770.43 KiB | 589.00 KiB/s, done.
Resolving deltas: 100% (152/152), done.
/ # cd progjar
/progjar # cd progjar4a
/progjar/progjar4a # nano file_server.py
/progjar/progjar4a # python3 file_server.py
WARNING:root:server berjalan di ip address ('192.168.122.64', 5005)
```

- Kemudian pada alpine-2 jalankan file_interface.py

```
/progjar/progjar4a # nano file_client_cli.py
/progjar/progjar4a # python3 file_interface.py
{'status': 'OK', 'data': ['file_interface.py', 'pokijan.jpg', 'PROTOKOL.txt', 'u
dp_multi_thread.py', 'file_client_cli.py', 'file_server.py', 'file_protocol.py']
}
{'status': 'OK', 'data_namafile': 'pokijan.jpg', 'data_file': '/9j/4AAQSkZJRgABA
QAAAQABAAD/2wCEAAkGBxITEhUSExMVFRUXGBkYFxgYGBgXHRgXFhgYGxgYGxgYHiggGCAlGxcXITElJ
SkrLi4uGiAzODMsNygtLisBCgoKDg0OGxAQGy0mHyYtLS0vLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tL
S0tLS0tLS0tLS0tLS0tLS0tLf/AABEIALwBDAMBEQACEQEDEQH/xAAcAAABBQEBAQAAAAAAAAAAAAAAAA
AAFAAMEBgcCAQj/xABJEAABAwIEAwQGBwUFBwQDAAABAgMRAAQFEiExBkFREyJhcQcygZGhsRQjJlyw
dFTYpLh8BUzg7KzJDRDc4KiwhYl0vEXNaP/xAAaAQACAwEBAAAAAAAAAAAAAAAAABAgADBAUG/8QAOxEA
AgECAMFBwIFBAIDAAAAAAECAAMEESEFEjFBUWEGEyJxgbHwkaETMkLB4fEjUmLRcvEUgpKi/9oADAMBAAI
RAxEAPwAaBh8/wIFBAIDAAAAAADAgMRAAQFEiExBkFREyJhcQcygZGhsRQjJlywdFTYpLh8BUzg7KzJDR
Dc4KiwhYl0vE
QACEQEDEQH8A1Ti7iJNkz2hTmUo5UJ+QGp8usYq4G7Gd/wDqDqC8cXmVdLAOuVKQgDwj+ZqyyK8zG/7
avNctw97VTRshczJthit6RBuHJ01J/rr8KV2DmYRbv7i4UlJ7dyee2tBsOo+3dXJXZOt7ydyee2tBsO
M9qsecH5CluHUccurgH+9V8P0pHIbvbvH/ANNor4fpS52FJktp97ms/D9KKDdjqHbvH/ANNor4fpS52F
Jktp97ms/D9KKDdjqHbvH/ANNor4fpS52FJktp97ms/D9KwLc+8fh+lDOxlAfK+ajalufe+VTtJEyIGYpc
vJU04A4RmXB21EHwqyEnrcXJqOre+aTOwZRhb737RVNnnYjTGnp9k6r+2k+dV8P0q8b++aTOwZRhb737
RVNnnYjTGnp9k6r+2k+dV8P0q8b++aTOwZRhb737RVNnnYjTGnp9k6r+2k+dV8P0qQU6t6mPU/TpKJLY
70A9nPsjNRshVUYxf0jYi0QAWNROrZ08PWplBMimwf/wDlbEhM/
Rzpp9Wf/lrRyIbOyVhHpiuULAuummltk94tgoWkdQCohUdNSDVhzPPSA8px1DSjGmyWd2262h1tQUha
QpKhsUkAgj3VhzPPSA8px1DSjGmyWd2262h1tQUhaQpKhsUkAgj3Vh
VhzPPSA8px1DSjIbbuI09aCJ8YYqyXXNgcISdR622h1tQUhaQpKhsUkAgj3Vh
LcnbKPPw5r1iZb256x4UtpE9i00MYaHao0QQ3jmi+7ndRHm7Wq7liiSOnJbdCwcwwMxdrVr/mfka
c4OxniG1tEy+8lPhjqJhaa0ZGEpHSFpSkPUGz2wt2yJMmekiaWwcyHJoKqJ8wt2yJMmekiaWwcyHJoK
```

- Kemudian jalankan file_protocol.py

fpUSSFc5S3bOhboAgITHSBRBc6DSfuj3ChYmZ9RFlP3R7hRI23uehAHIe6oA9qEPahBVCCqEOVD+pNQg
pqEPZqEI93ZNOCHG0LH76Qr5ioQr17wHhbh71kxz9VOTcifUijmZAO/6OcLgf7IgTI9ZZO8JUY9lHMyB
fhzhWytglxi3bbXEZwJVB3GYyr40GyB9xAoEP/Z'}
/progjar/progjar4a # python3 file_protocol.py
WARNING:root:string diproses: LIST
WARNING:root:memproses request: LIST
{"status": "OK", "data": ["file_interface.py", "pokijan.jpg", "PROTOKOL.txt", "u
dp_multi_thread.py", "file_client_cli.py", "file_server.py", "file_protocol.py"]
}
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
{"status": "OK", "data_namafile": "pokijan.jpg", "data_file": "/9j/4AAQSkZJRgABA
QAAAQABAAD/2wCEAAkGBxITEhUSExMVFRUXGBkYFxgYGBgXHRgXFhgYGxgYGhgYHiggGCAlGxcXITElJ
SkrLi4uGiAzODMsNygtLisBCgoKDg0OGxAQGy0mHyYtLS0vLS0tLy0tLS0tLS0tLS0tL
S0tLS0tLS0tLS0tLS0tLf/AABEIALwBDAMBEQACEQEDEQH/xAAcAAABBQEBAQAAAAAAAAAA
AAFAAMEBgcCAQj/xABJEAABAwIEAwQGwUFBwQDAAABAgMRAAQFEiExBkFREyJhcQcygZGsRQjQlJyw
dFTYpLh8BUzg7KzJDRDc4KiwhYl0vEXNaP/xAAaAQACAwEBAAAAAAAAAAAAAAAAABAgADBAUG/8QAOxEAA
gECBAMFBwIFBAIDAAAAAAECEAMBIIDAAQSITAEMFBwIFBAIDAAAAAAAECAxEEBAREcAAAECECAxEEBUFRE2FxsfAiMoGRocHRQuEUUI1Jy8BUzNLIkQwaCkv/aAAwDA
QACEQMRAD8A1Ti7iJNkz2hTMuo5UJ6qI+QGp8usUYq4G7Gd/wDqDqC8cXmVdLAOuVKQgDwj+ZqqyyyK8zG/7
avNctw97VTRshczJthit6RBuHJ01J/rr8KV2DmYRbv7r9u4dOo3pdCXZOt7i4UlJ7dyee2tBsOo+3dXJ
M9qsecH5CluHUccurgH+9V8P0pHIbU7bvH/ANNor4fpS52FJktp97ms/D9KGdjqqJJbdc+8Znw291TOw5R
wLc+8fh+lDOxlAfbK+ajRUmRxR6CrqaGZksj2VdamaXUlonozdTQzS86ktHoLvdTRzZ 6kt EXe60M0upLR
PJV1qZpdQ2iIIlXWjml1JaJwpS/vH4UM8iZYjalufe+VTtJEyIGYpcvJU0A4RmXXqqEnrcXJqqOre
d++aTOwZRhb737RVNnYjTGnrp/k6r3D9KbMK0yC5f3I2dV8D8xRUhXcaVxDdp+2k+aR+UU1wZmQLvjjK9

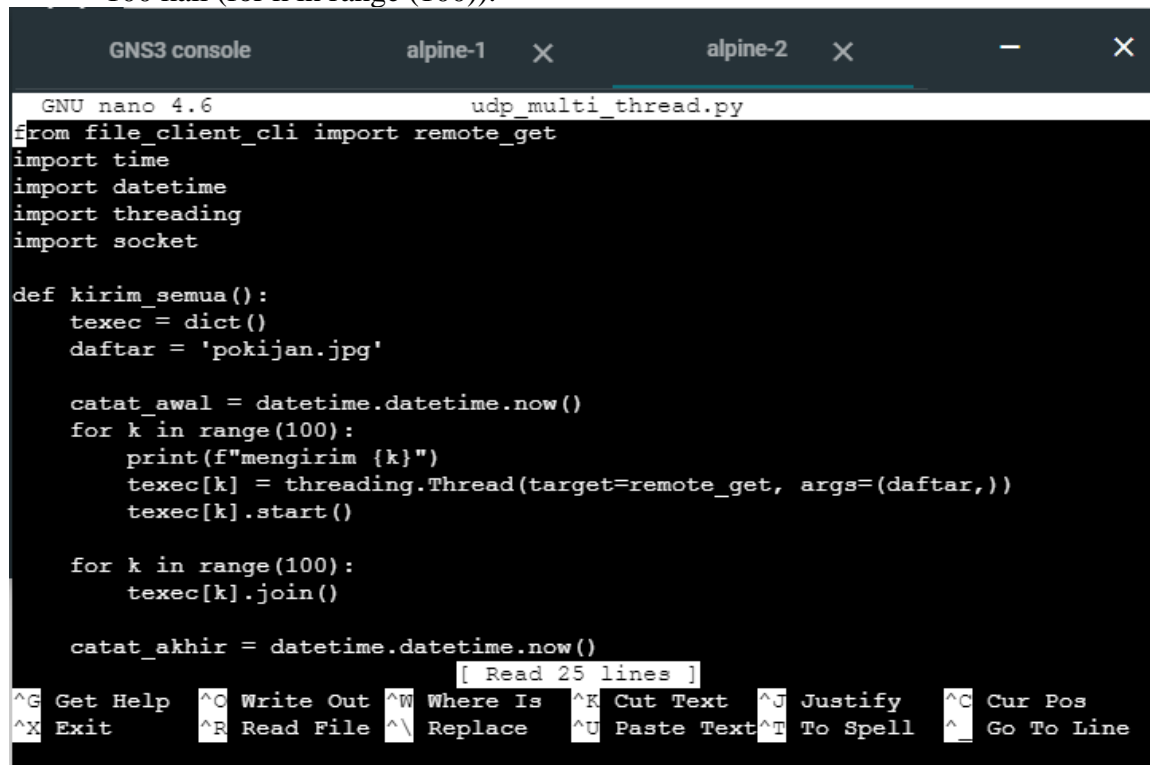- Kemudian jalankan file_client_cli.py


```
/progjar/progjar4a # nano file_protokol.py
/progjar/progjar4a # ls
PROTOKOL.txt          file_interface.py     files
__pycache__           file_protocol.py      pokijan.jpg
file_client_cli.py    file_server.py        udp_multi_thread.py
/progjar/progjar4a # nano file_protocol.py
/progjar/progjar4a # nano file_client_cli.py
/progjar/progjar4a # python3 file_client_cli.py
WARNING:root:connecting to ('192.168.122.64', 5005)
WARNING:root:sending message
WARNING:root:data received from server:
daftar file :
- pokijan.jpg
- donalbebek.jpg
- rfc2616.pdf
WARNING:root:connecting to ('192.168.122.64', 5005)
WARNING:root:sending message
WARNING:root:data received from server:
/progjar/progjar4a # ls
PROTOKOL.txt          file_interface.py     pokijan.jpg
__pycache__           file_protocol.py      udp_multi_thread.py
donalbebek.jpg        file_server.py
file_client_cli.py    files
/progjar/progjar4a #
```

- Maka hasilnya adalah sebagai berikut.

```
/progjar/progjar4a # ls
PROTOKOL.txt          file_interface.py      pokijan.jpg
__pycache__           file_protocol.py       udp_multi_thread.py
donalbebek.jpg        file_server.py
file_client_cli.py    files
```

2. Buatlah program client yang dapat melakukan 100 request get pada dalam satu saat untuk operasi get file "pokijan.jpg" 3.
   - Pada file_interface.py pada alpine-2, ubah path pada os.chdir('/files') menjadi os.chdir('/progjar/progjar4a'), sesuai dengan path dimana letak file_interface.py-nya.
   - Kemudian ubah IP Address pada file_client_cli.py menjadi IP Address alpine-1.
   - Lalu buat file udp_multi_thread.py untuk client yang melakukan 100 request get dengan kode program sebagai berikut. Pada program ini, daftar akan berisikan gambar pokijan.jpg (yang akan dikirim sebanyak 100 kali). Looping akan dilakukan sebanyak 100 kali (for k in range (100)).

```
GNU nano 4.6                    udp_multi_thread.py
from file_client_cli import remote_get
import time
import datetime
import threading
import socket

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

    catat_awal = 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()

    catat_akhir = datetime.datetime.now()
                            [ Read 25 lines ]
^G Get Help   ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit       ^R Read File ^\ Replace   ^U Paste Text^T To Spell  ^_ Go To Line
```

```
  GNU nano 4.6                    udp_multi_thread.py
def kirim_semua():
    texec = dict()
    daftar = 'pokijan.jpg'

    catat_awal = 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()

    catat_akhir = datetime.datetime.now()
    selesai = catat_akhir - catat_awal
    print(f"Waktu TOTAL yang dibutuhkan {selesai} detik {catat_awal} s/d {catat>

if __name__=='__main__':
    kirim_semua()




^G Get Help   ^O Write Out  ^W Where Is   ^K Cut Text   ^J Justify    ^C Cur Pos
^X Exit       ^R Read File  ^\ Replace    ^U Paste Text ^T To Spell   ^_ Go To Line
```

- Pada alpine-1, jalankan file_server.py dengan *command* python file_server.py


```
Resolving deltas: 100% (152/152), done.
/ # cd progjar
/progjar # cd progjar4a
/progjar/progjar4a # nano file_server.py
/progjar/progjar4a # python3 file_server.py
WARNING:root:server berjalan di ip address ('192.168.122.64', 5005)
WARNING:root:connection from ('192.168.122.204', 35116)
WARNING:root:connection from ('192.168.122.204', 35118)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.204', 35120)
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 ('192.168.122.204', 35122)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.204', 35124)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.204', 35126)
WARNING:root:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
```

- Kemudian jalankan program udp_multi_thread.py dengan command python3 udp_multi_thread.py. Berikut adalah hasilnya.

```
WARNING:root:connecting to ('192.168.122.64', 5005)
WARNING:root:sending message
WARNING:root:data received from server:
mengirim 99
WARNING:root:data received from server:
WARNING:root:connecting to ('192.168.122.64', 5005)
WARNING:root:sending message
WARNING:root:connecting to ('192.168.122.64', 5005)
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:data received from server:
Waktu TOTAL yang dibutuhkan 0:00:09.722275 detik 2021-07-12 19:01:20.051268 s/d
2021-07-12 19:01:29.773543
/progjar/progjar4a # 
```