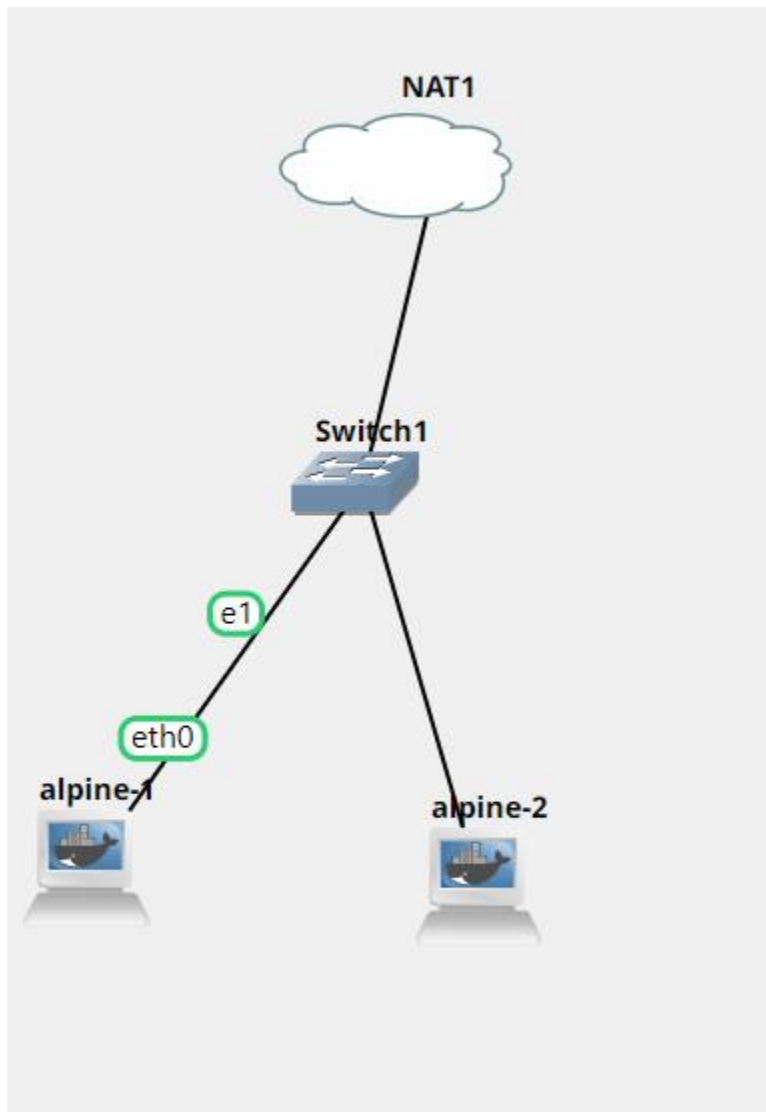


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Kelas: Pemrograman Jaringan – D

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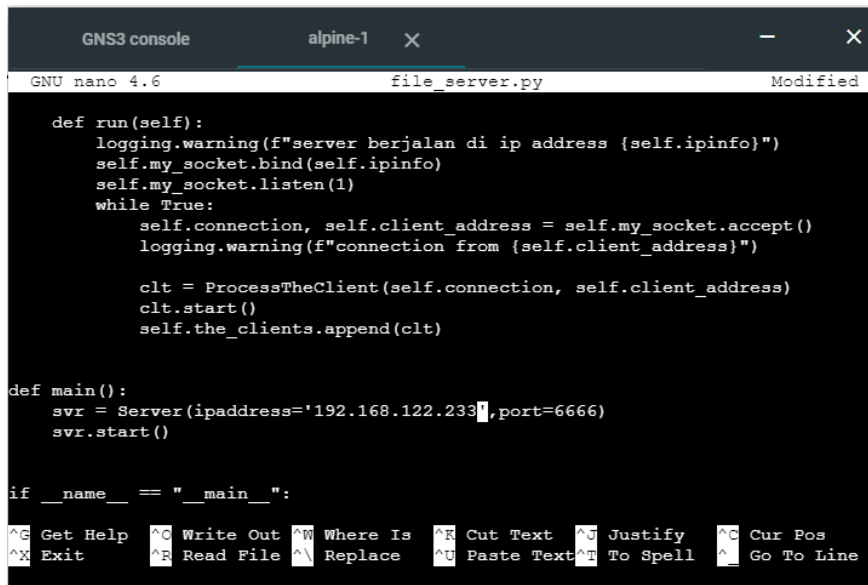
Topologi Jaringan:



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Langkah – langkah pengerjaan:

1. Memulai server agar proses pengiriman file dapat dilaksanakan. Pada file **file_server.py**, tuliskan IP yang sesuai dengan yang di-outputkan oleh command **ifconfig** pada fungsi **main()**. IP untuk alpine-1 adalah **192.168.122.233**. Maka, kolom **ipaddress** akan dituliskan IP tersebut.



```
GNU nano 4.6 file_server.py Modified

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}")

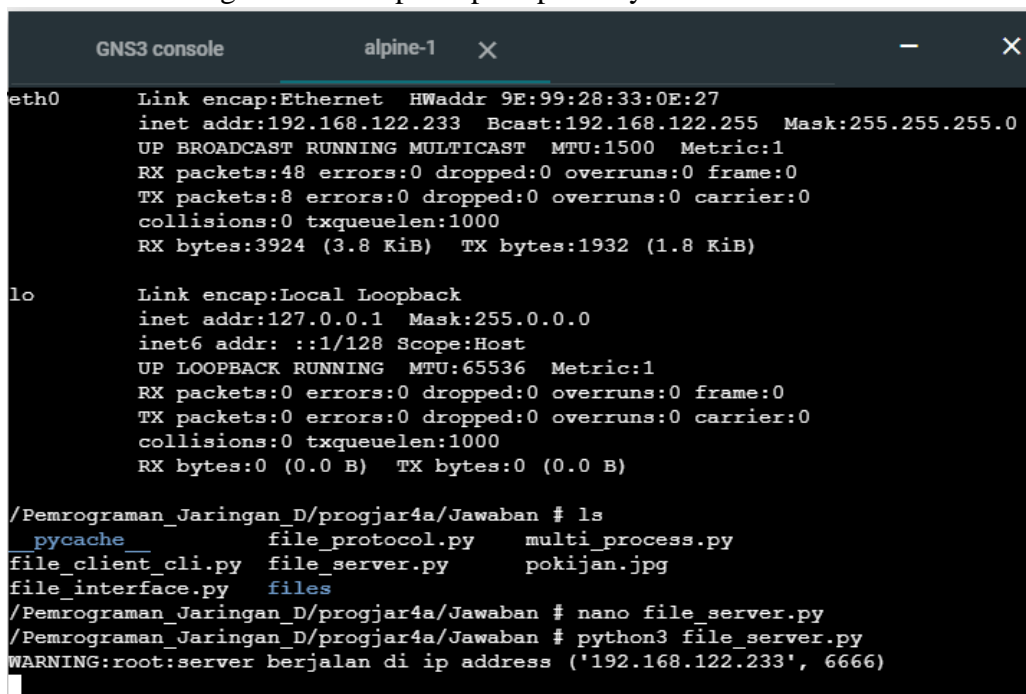
        clt = ProcessTheClient(self.connection, self.client_address)
        clt.start()
        self.the_clients.append(clt)

def main():
    svr = Server(ipaddress='192.168.122.233', port=6666)
    svr.start()

if __name__ == "__main__":
    main()

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

2. Memulai server dengan menjalankan script **file_server.py**. Apabila server berjalan, sistem akan mengeluarkan output seperti pada layar.



```
GNS3 console alpine-1 X

eth0      Link encap:Ethernet  HWaddr 9E:99:28:33:0E:27
          inet addr:192.168.122.233  Bcast:192.168.122.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:48 errors:0 dropped:0 overruns:0 frame:0
          TX packets:8 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:3924 (3.8 KiB)  TX bytes:1932 (1.8 KiB)

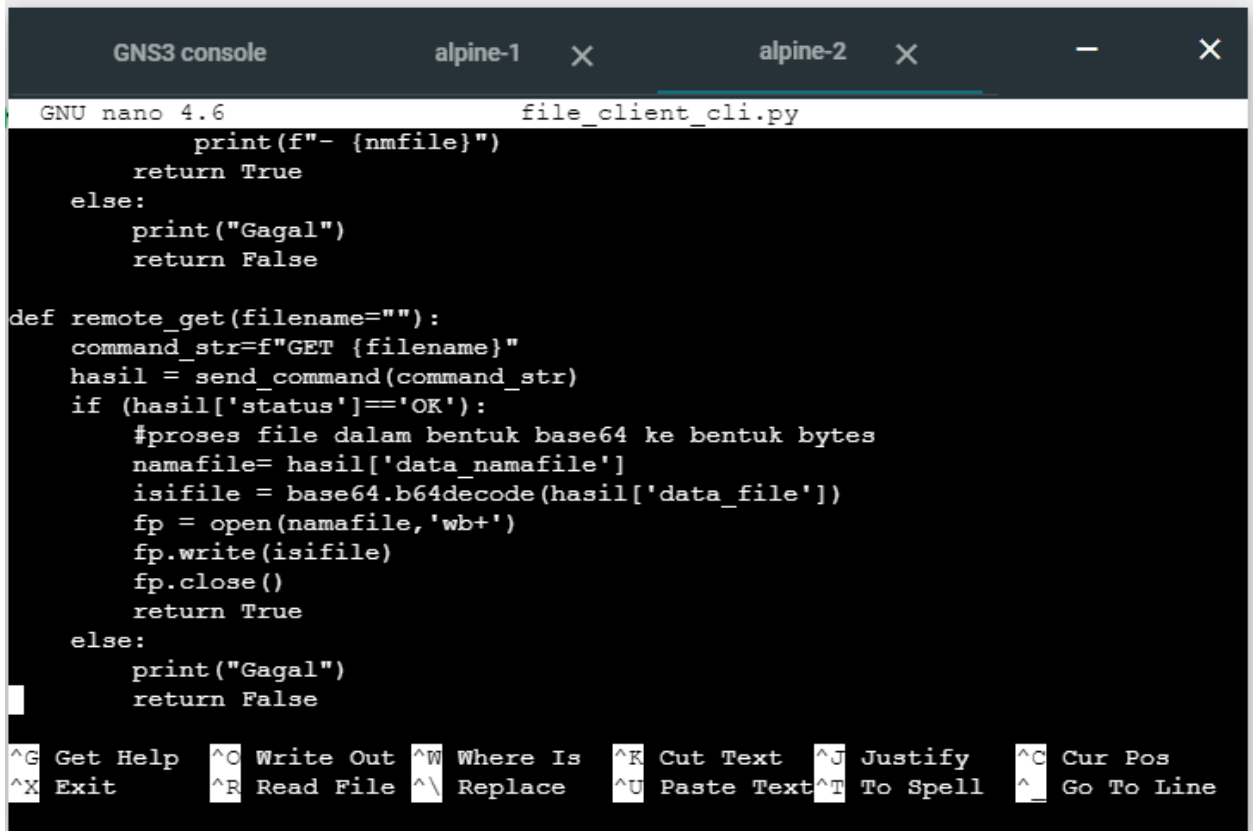
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
  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

/Pemrograman_Jaringan_D/progjar4a/Jawaban # ls
_pycache_      file_protocol.py  multi_process.py
file_client_cli.py  file_server.py    pokijan.jpg
file_interface.py  files

/Pemrograman_Jaringan_D/progjar4a/Jawaban # nano file_server.py
/Pemrograman_Jaringan_D/progjar4a/Jawaban # python3 file_server.py
WARNING:root:server berjalan di ip address ('192.168.122.233', 6666)
```

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3. Perlu diketahui, bahwa fungsi **remote_get** akan mengambil argumen berupa sebuah **filename**. Fungsi ini juga akan digunakan untuk pemindahan file **pokijan.jpg** nanti. Argumen ini akan kita gunakan untuk memodifikasi program **multi_process.py** yang akan dijelaskan selanjutnya



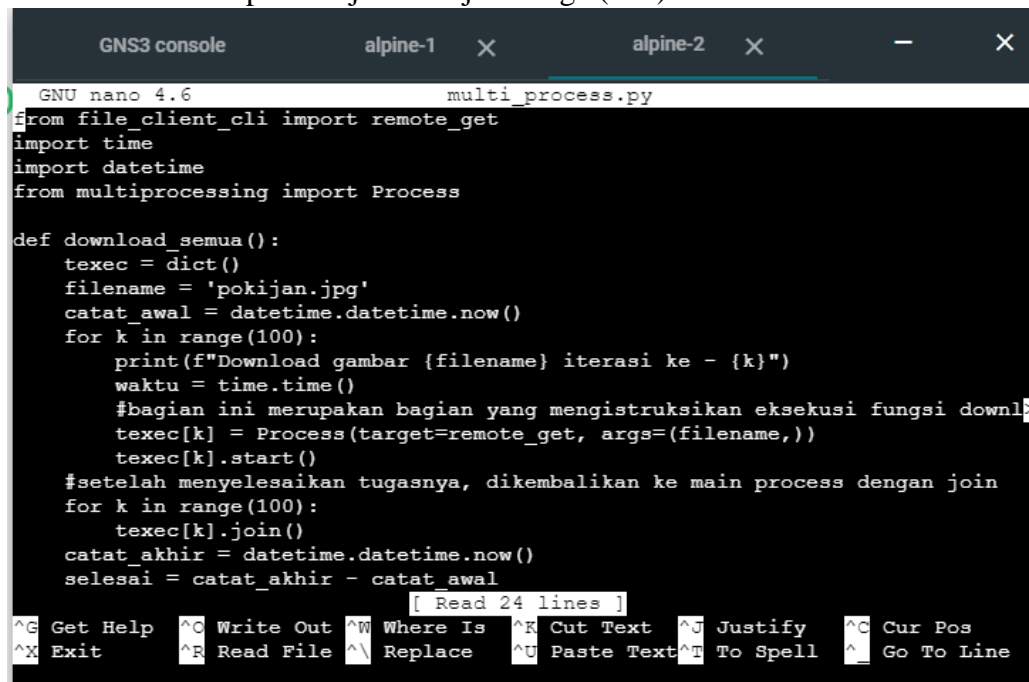
```
GNU nano 4.6 file_client_cli.py
    print(f"- {nmfile}")
    return True
else:
    print("Gagal")
    return False

def remote_get(filename=""):
    command_str=f"GET {filename}"
    hasil = send_command(command_str)
    if (hasil['status']=='OK'):
        #proses file dalam bentuk base64 ke bentuk bytes
        namafile= hasil['data_namafile']
        isifile = base64.b64decode(hasil['data_file'])
        fp = open(namafile,'wb+')
        fp.write(isifile)
        fp.close()
        return True
    else:
        print("Gagal")
        return False
```

^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

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4. Menggunakan file **multi_process.py** untuk menjalankan program sebanyak 100 kali, dilakukan perubahan untuk beberapa parameter pada program sebagai berikut:
- Mengimport fungsi **remote_get** melalui program **file_client_cli**
 - Filename = 'pokijan.jpg'
 - Merubah batas loop menjadi range (100)
 - Merubah output console menjadi: 'Download gambar <nama filename> iterasi ke – {k}'
 - Merubah **target multiprocessing** menjadi fungsi **remote_get**
 - Merubah batas loop untuk join menjadi range (100)



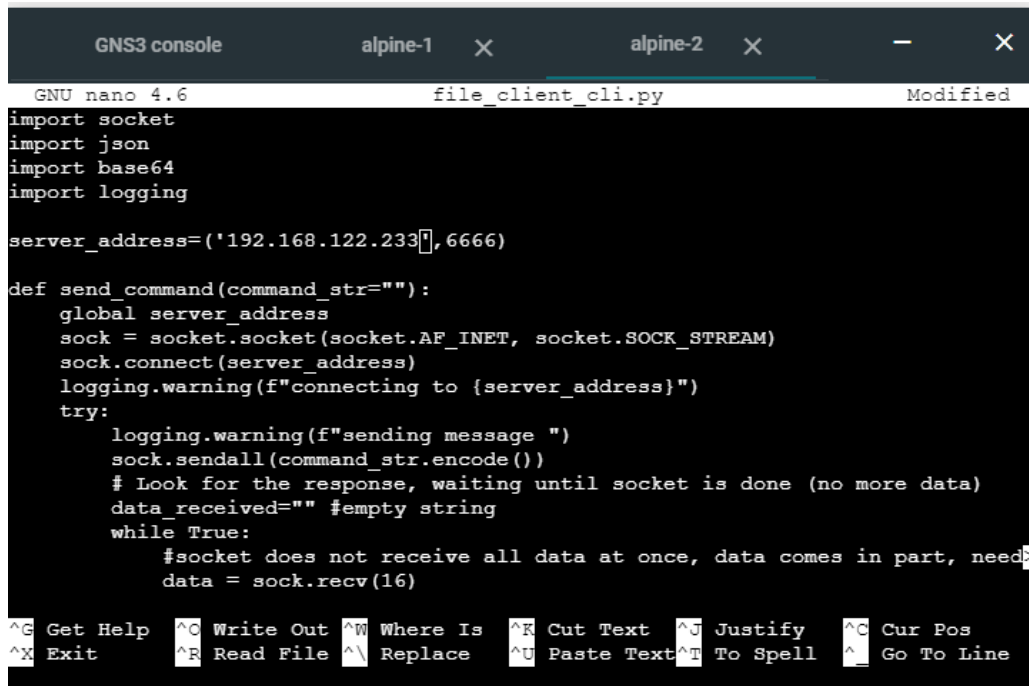
```
GNU nano 4.6 multi_process.py
from file_client_cli import remote_get
import time
import datetime
from multiprocessing import Process

def download_semua():
    texec = dict()
    filename = 'pokijan.jpg'
    catat_awal = datetime.datetime.now()
    for k in range(100):
        print(f"Download gambar {filename} iterasi ke - {k}")
        waktu = time.time()
        #bagian ini merupakan bagian yang menginstruksikan eksekusi fungsi downl
        texec[k] = Process(target=remote_get, args=(filename,))
        texec[k].start()
    #setelah menyelesaikan tugasnya, dikembalikan ke main process dengan join
    for k in range(100):
        texec[k].join()
    catat_akhir = datetime.datetime.now()
    selesai = catat_akhir - catat_awal

[ Read 24 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
```

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5. Pada **file_client_cli.py**, ganti variabel **server_address** agar sesuai dengan IP server yang telah di-**start** sebelumnya. IP untuk sebelumnya adalah: 192.168.122.233 pada port 6666, maka di-inputkan IP dan port tersebut pada variabel **server_address**



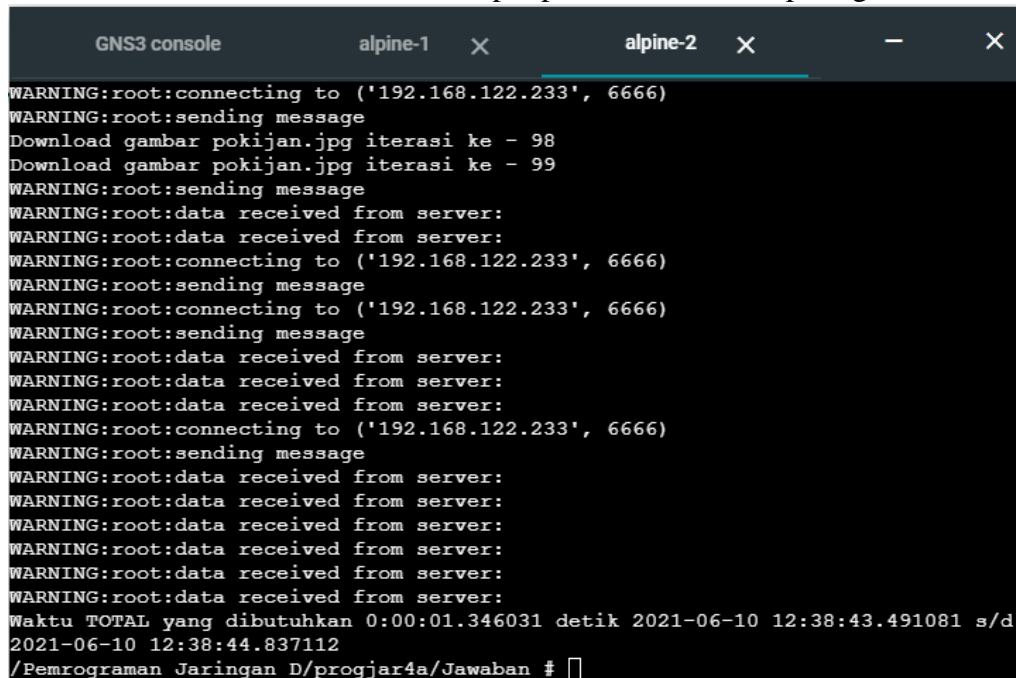
```
GNU nano 4.6 file_client_cli.py Modified
import socket
import json
import base64
import logging

server_address=('192.168.122.233',6666)

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)
```

^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

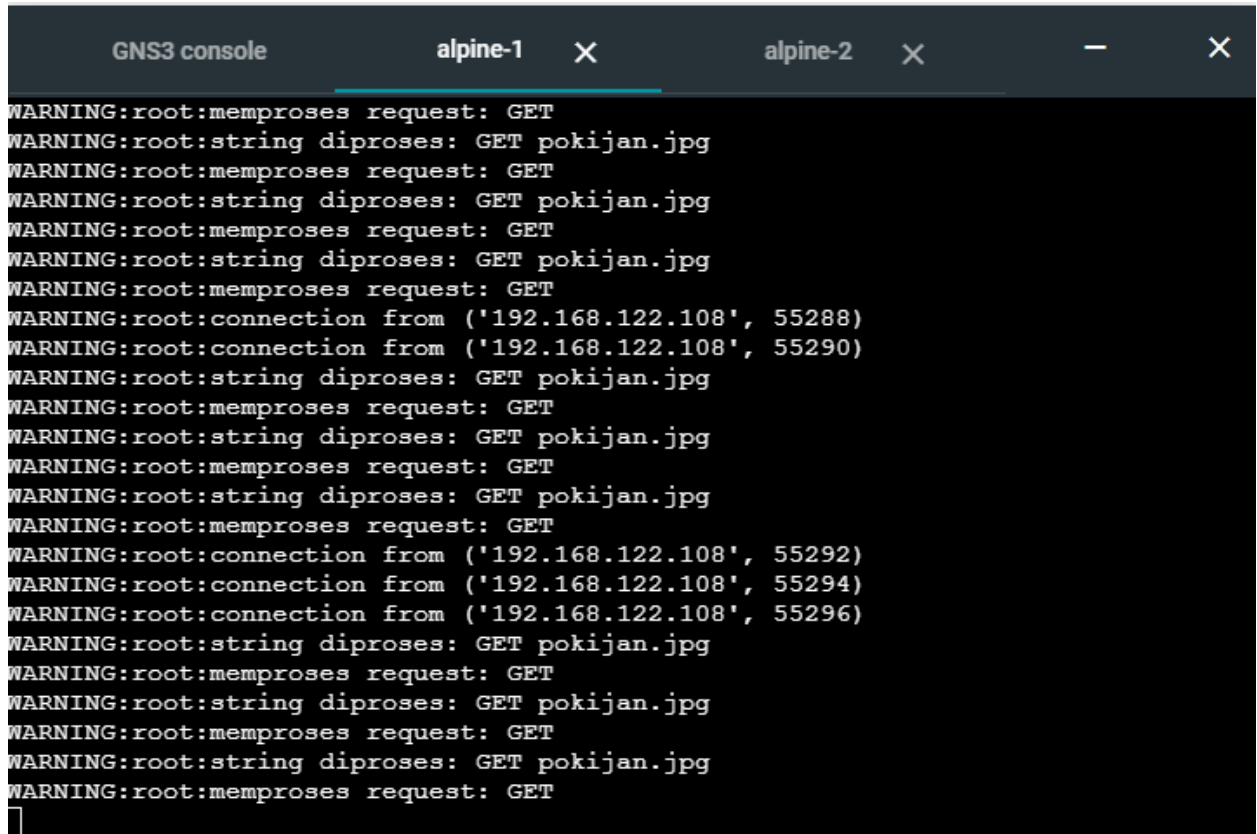
6. Menjalankan program **multi_process.py** agar proses dapat dimulai. Apabila sudah selesai, console akan memberikan output pada node client seperti gambar berikut.



```
GNS3 console alpine-1 alpine-2
WARNING:root:connecting to ('192.168.122.233', 6666)
WARNING:root:sending message
Download gambar pokijan.jpg iterasi ke - 98
Download gambar pokijan.jpg iterasi ke - 99
WARNING:root:sending message
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:connecting to ('192.168.122.233', 6666)
WARNING:root:sending message
WARNING:root:connecting to ('192.168.122.233', 6666)
WARNING:root:sending message
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:data received from server:
WARNING:root:connecting to ('192.168.122.233', 6666)
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:
Waktu TOTAL yang dibutuhkan 0:00:01.346031 detik 2021-06-10 12:38:43.491081 s/d
2021-06-10 12:38:44.837112
/Pemrograman_Jaringan_D/progjar4a/Jawaban #
```

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7. Pada server, akan terlihat bahwa operasi GET telah dilakukan berkali – kali. Proses ini dapat dilihat melalui output console pada node server seperti gambar berikut.



```
GNS3 console      alpine-1  X      alpine-2  X      -      X

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:string diproses: GET pokijan.jpg
WARNING:root:memproses request: GET
WARNING:root:connection from ('192.168.122.108', 55288)
WARNING:root:connection from ('192.168.122.108', 55290)
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 ('192.168.122.108', 55292)
WARNING:root:connection from ('192.168.122.108', 55294)
WARNING:root:connection from ('192.168.122.108', 55296)
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
```