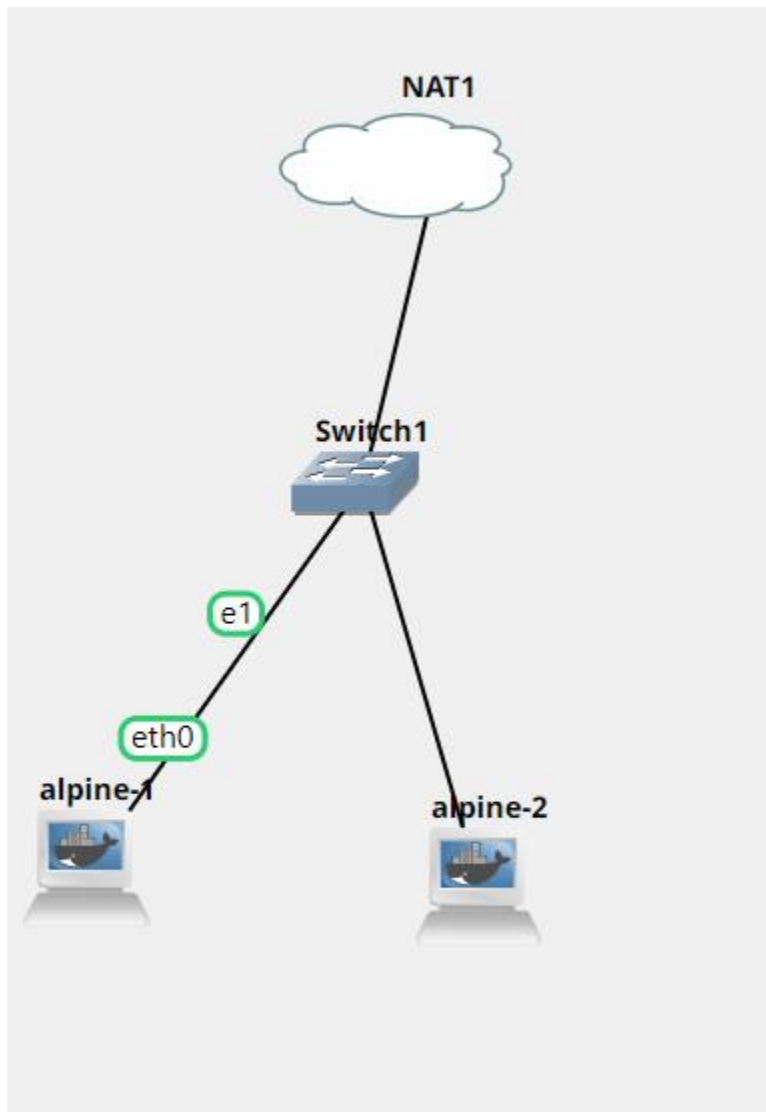


Nama: Kinasihurrabb Moralluhung

Kelas: Pemrograman Jaringan – D

NRP: 05111840000161

Topologi Jaringan:



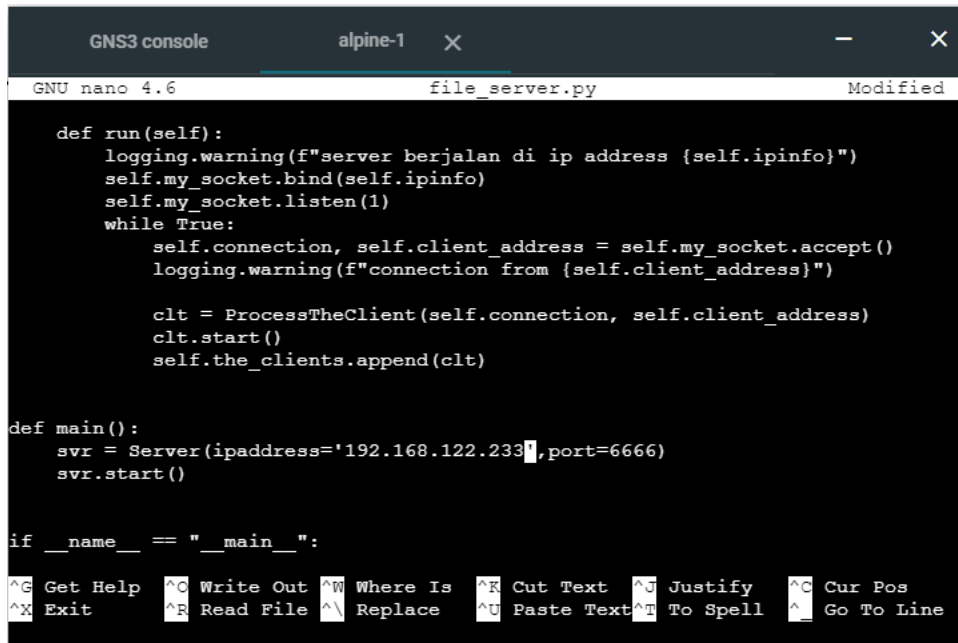
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Langkah – langkah pengerjaan:

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

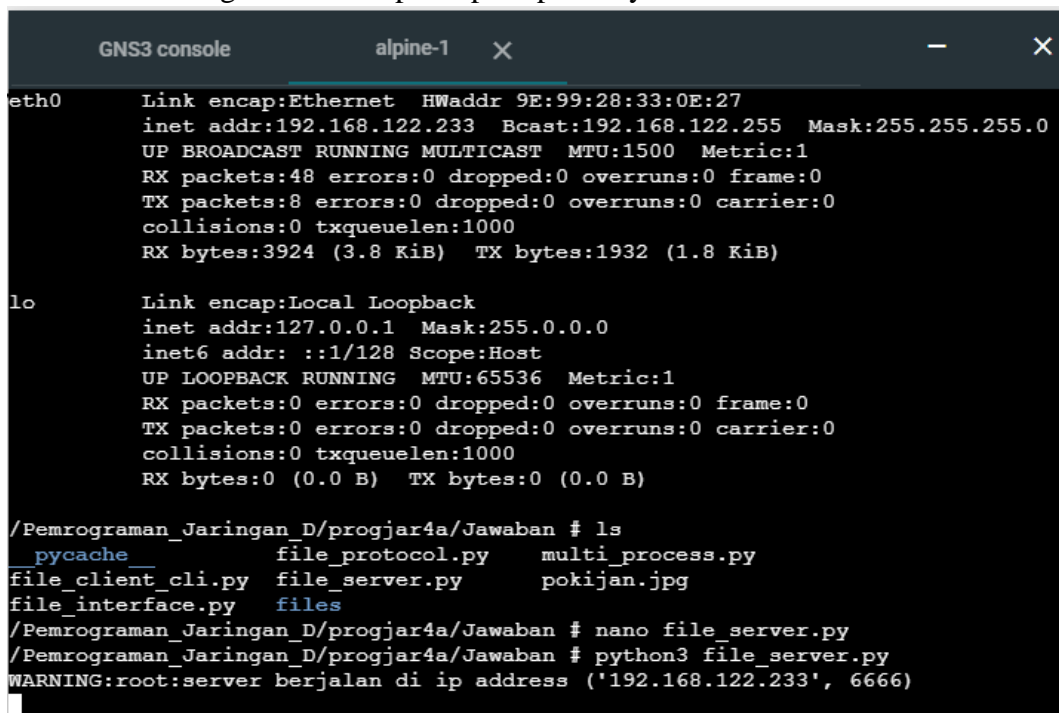
def run(self):
    logging.warning(f"server berjalan di ip address {self.ipinfo}")
    self.my_socket.bind(self.ipinfo)
    self.my_socket.listen(1)
    while True:
        self.connection, self.client_address = self.my_socket.accept()
        logging.warning(f"connection from {self.client_address}")

        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__":
    ^G Get Help    ^C 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
```

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



```
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)

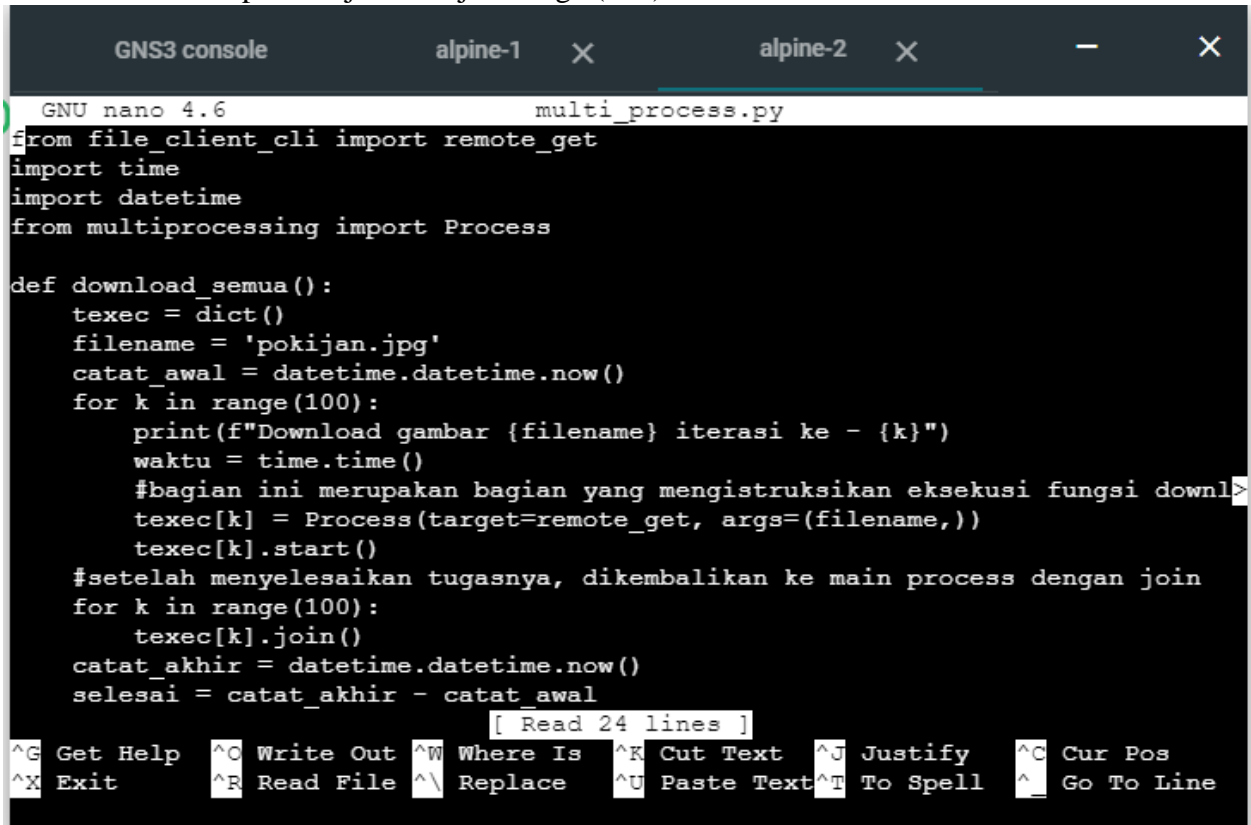
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          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. Menggunakan file **multiprocess.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)



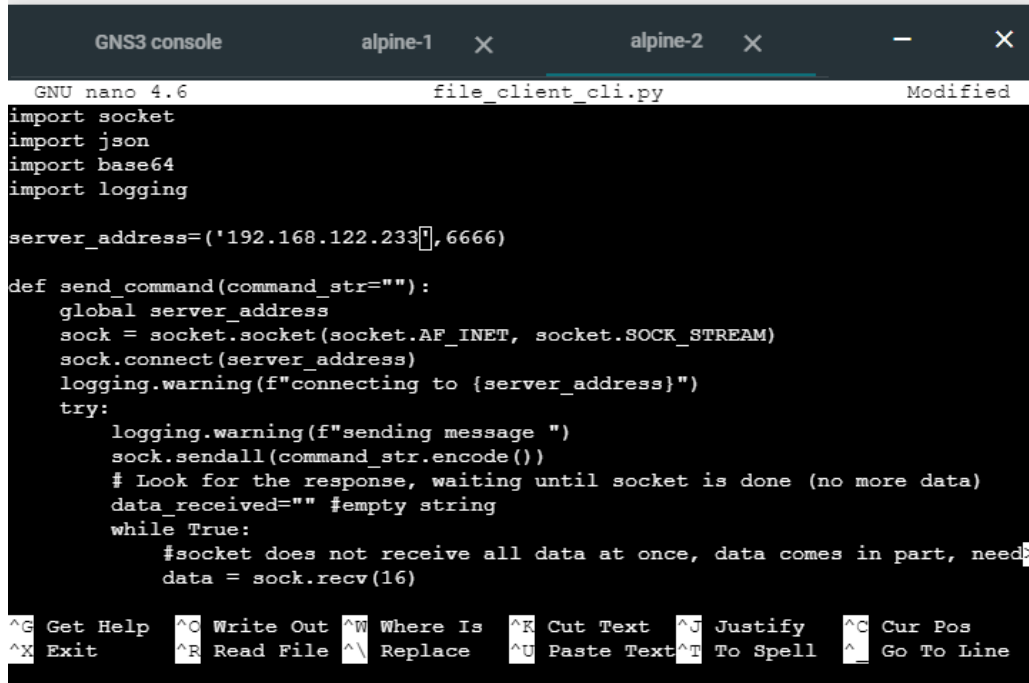
```
GNU nano 4.6 multi_process.py
from file_client_cli import remote_get
import time
import datetime
from multiprocessing import Process

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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4. 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 tersebut pada variabel **server\_address**



The screenshot shows a GNS3 console window with two tabs: 'alpine-1' and 'alpine-2'. The 'alpine-2' tab is active, displaying a nano editor window for the file 'file\_client\_cli.py'. The script content is as follows:

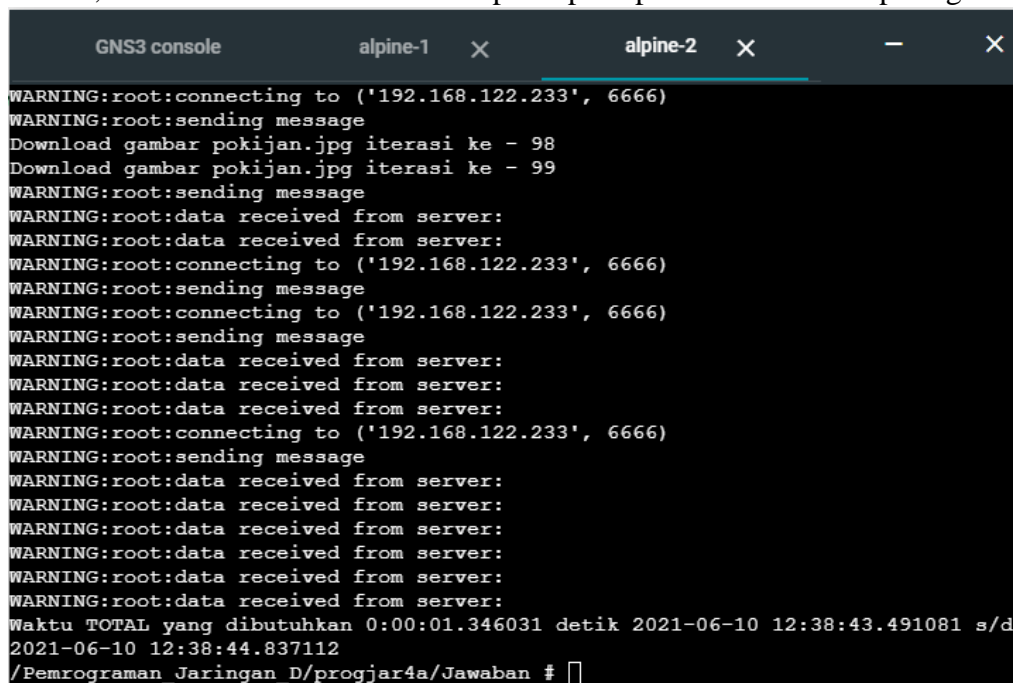
```
GNU nano 4.6 file_client_cli.py Modified
import socket
import json
import base64
import logging

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)
```

The bottom of the window shows nano editor shortcuts: ^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.

5. Menjalankan program **multi\_process.py** agar proses dapat dimulai. Apabila sudah selesai, console akan memberikan output seperti pada node client seperti gambar.

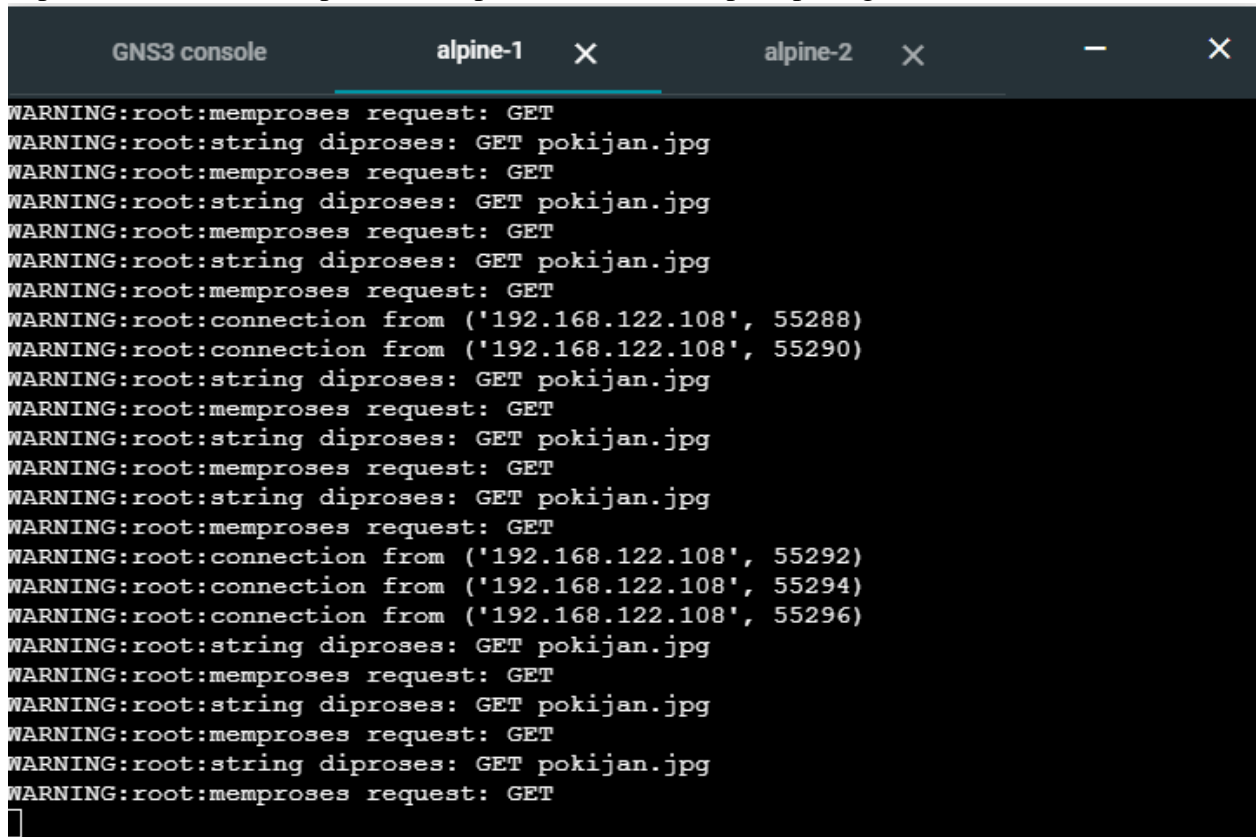


The screenshot shows the same GNS3 console window, but now displaying the output of a program. The output consists of multiple warning messages indicating connections and data exchanges between a client and a server at 192.168.122.233:6666. The messages include 'connecting to', 'sending message', and 'data received from server'. At the bottom, a timestamp and file path are shown:

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



```
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:string diproses: GET pokijan.jpg
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: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
```