

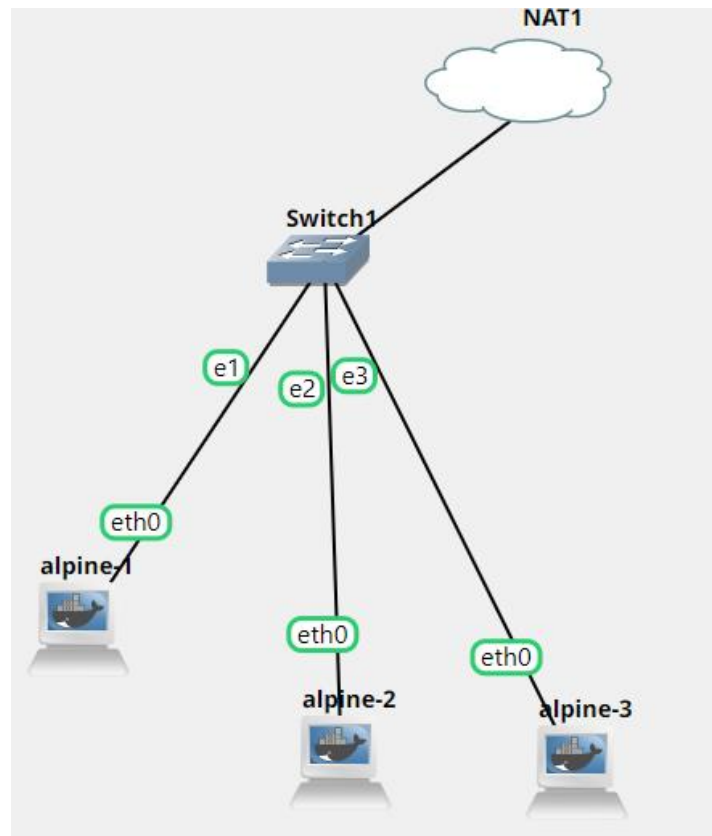
Tugas 3

Rifki Aulia Irawan – 05111840000142

Deskripsi Kasus

Terdapat 1 client dan 2 server, yang mana client mendownload 2 file terlebih dahulu, kemudian mengirimkan file kepada 2 server tersebut menggunakan protocol transport UDP. Terdapat 2 file gambar yang diunduh oleh client, 2 file tersebut dikirimkan masing-masing pada server 1 dan server 2, jadi masing-masing server mendapatkan 1 file gambar. Pengiriman dari client ke kedua server dilakukan dengan 5 program yang berbeda, yaitu multithread, multiprocessing, multithread async, multiprocessing async

Arsitektur Jaringan



Langkah Pengerjaan

- Mendapatkan IP dari alpine-1 yang akan dipakai sebagai server 1

```
< .ole alpine-1 x alpine-2 x alpine-3 > - x
Sending discover...
udhcpd failed to get a DHCP lease
No lease, forking to background
ok
/ # ifconfig
eth0      Link encap:Ethernet  HWaddr 36:3E:9E:FE:3C:18
          inet addr:192.168.122.220  Bcast:192.168.122.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:954 errors:0 dropped:5 overruns:0 frame:0
          TX packets:13 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:54216 (52.9 KiB)  TX bytes:3042 (2.9 KiB)
```

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- Mendapatkan IP dari alpine-2 yang akan dipakai sebagai server 2

```
< role alpine-1 x alpine-2 x alj > - X
Sending select for 192.168.122.14...
Lease of 192.168.122.14 obtained, lease time 3600
ok
/ # ifconfig
eth0      Link encap:Ethernet  HWaddr AA:13:8B:13:13:2D
          inet addr:192.168.122.14  Bcast:192.168.122.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:963 errors:0 dropped:1 overruns:0 frame:0
          TX packets:17 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:55002 (53.7 KiB)  TX bytes:3886 (3.7 KiB)
```

- Hasil Code:
 - udp_multi_process.py

```
udp_multi_process.py x udp_multi_process_async.py 1 udp_multi_thread_async.py 1 udp_single_thread.py 1 udp_multi
progjar3 > Answer > udp_multi_process.py > send_all
1  from library import download_gambar, get_url_list, send_image
2  import time
3  import datetime
4  from multiprocessing import Process
5
6  def send_all():
7      texec = dict()
8      urls = get_url_list()
9      z = 0
10     catat_awal = datetime.datetime.now()
11     for k in urls:
12         download_gambar(urls[k],k)
13         print(f"downloading {urls[k]}")
14         waktu = time.time()
15         #bagian ini merupakan bagian yang menginstruksikan eksekusi fungsi download gambar secara multiprocess
16         UDP_IP_ADDRESS = "192.168.122.220"
17         UDP_IP_ADDRESS2 = "192.168.122.14"
18         if z == 0:
19             texec[k] = Process(target=send_image, args=(UDP_IP_ADDRESS,5050,f"{k}.jpg"))
20             print('~Server 1~')
21             z = z+1
22         elif z == 1:
23             texec[k] = Process(target=send_image, args=(UDP_IP_ADDRESS2,5050,f"{k}.jpg"))
24             texec[k].start()
25         #setelah menyelesaikan tugasnya, dikembalikan ke main process dengan join
26     for k in urls:
27         texec[k].join()
28     catat_akhir = datetime.datetime.now()
29     selesai = catat_akhir - catat_awal
30     print(f"Total Time Needed : {selesai} seconds {catat_awal} - {catat_akhir}")
31     #fungsi download_gambar akan dijalankan secara multi process
32     if __name__ == '__main__':
33         send_all()
34
```

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- o udp_multi_process_async.py

```
udp_multi_process.py 1  udp_multi_process_async.py 1 x  udp_multi_thread_async.py 1  udp_single_thread.py 1  x
progjar3 > Answer > udp_multi_process_async.py > send_all
1  from library import download_gambar, get_url_list, send_image
2  import time
3  import datetime
4  from multiprocessing import Process, Pool
5
6  def send_all():
7      texec = dict()
8      urls = get_url_list()
9      z = 0
10     status_task = dict()
11     task_pool = Pool(processes=20)
12     catat_awal = datetime.datetime.now()
13     for k in urls:
14         download_gambar(urls[k],k)
15         print(f"downloading {urls[k]}")
16         UDP_IP_ADDRESS = "192.168.122.220"
17         UDP_IP_ADDRESS2 = "192.168.122.14"
18         if z == 0:
19             texec[k] = task_pool.apply_async(func=send_image, args=(UDP_IP_ADDRESS, 5050, f"{k}.jpg"))
20             print('~Server 1~')
21             z = z + 1
22         elif z == 1:
23             print('~Server 2~')
24             texec[k] = task_pool.apply_async(func=send_image, args=(UDP_IP_ADDRESS2, 5050, f"{k}.jpg"))
25
26     for k in urls:
27         status_task[k]=texec[k].get(timeout=10)
28
29     catat_akhir = datetime.datetime.now()
30     selesai = catat_akhir - catat_awal
31     print(f"Total Time Needed : {selesai} seconds {catat_awal} - {catat_akhir}")
32     print("status TASK")
33     print(status_task)
34
35 if __name__ == '__main__':
36     send_all()
```

- o udp_multi_thread.py

```
udp_multi_process.py 1  udp_multi_process_async.py 1  udp_multi_thread.py 1 x  udp_multi_thread_async.py 1  x
progjar3 > Answer > udp_multi_thread.py > send_all
1  from library import download_gambar, get_url_list, send_image
2  import time
3  import datetime
4  import threading
5
6  def send_all():
7      texec = dict()
8      urls = get_url_list()
9      z = 0
10     catat_awal = datetime.datetime.now()
11     for k in urls:
12         download_gambar(urls[k], k)
13         print(f"mendownload {urls[k]}")
14         waktu = time.time()
15         UDP_IP_ADDRESS = "192.168.122.220"
16         UDP_IP_ADDRESS2 = "192.168.122.14"
17         if z == 0:
18             texec[k] = threading.Thread(target=send_image, args=(UDP_IP_ADDRESS, 5050, f"{k}.jpg"))
19             print('~Server 1~')
20             z = z + 1
21         elif z == 1:
22             print('~Server 2~')
23             texec[k] = threading.Thread(target=send_image, args=(UDP_IP_ADDRESS2, 5050, f"{k}.jpg"))
24             texec[k].start()
25
26     for k in urls:
27         texec[k].join()
28
29     catat_akhir = datetime.datetime.now()
30     selesai = catat_akhir - catat_awal
31     print(f"Total Time Needed : {selesai} seconds {catat_awal} - {catat_akhir}")
32
33 if __name__ == '__main__':
34     send_all()
```

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- udp_multi_thread_async.py

```
udp_multi_process.py 1  udp_multi_process_async.py 1  udp_multi_thread.py 1  udp_multi_thread_async.py 1 X
progjar3 > Answer > udp_multi_thread_async.py > send_all
1  from library import download_gambar, get_url_list, send_image
2  import time
3  import datetime
4  import concurrent.futures
5
6  def send_all():
7      texec = dict()
8      urls = get_url_list()
9      z = 0
10     status_task = dict()
11     task = concurrent.futures.ThreadPoolExecutor(max_workers=4)
12     catat_awal = datetime.datetime.now()
13     for k in urls:
14         download_gambar(urls[k], k)
15         print(f"downloading {urls[k]}")
16         waktu = time.time()
17         UDP_IP_ADDRESS = "192.168.122.220"
18         UDP_IP_ADDRESS2 = "192.168.122.14"
19         if z == 0:
20             texec[k] = task.submit(send_image, UDP_IP_ADDRESS, 5050, f"{k}.jpg")
21             print('~Server 1~')
22             z = z + 1
23         elif z == 1:
24             print('~Server 2~')
25             texec[k] = task.submit(send_image, UDP_IP_ADDRESS2, 5050, f"{k}.jpg")
26
27     for k in urls:
28         status_task[k] = texec[k].result()
29
30     catat_akhir = datetime.datetime.now()
31     selesai = catat_akhir - catat_awal
32     print(f"Total Time Needed : {selesai} seconds {catat_awal} - {catat_akhir}")
33     print("hasil task yang dijalankan")
34     print(status_task)
35
36 if __name__ == '__main__':
37     send_all()
```

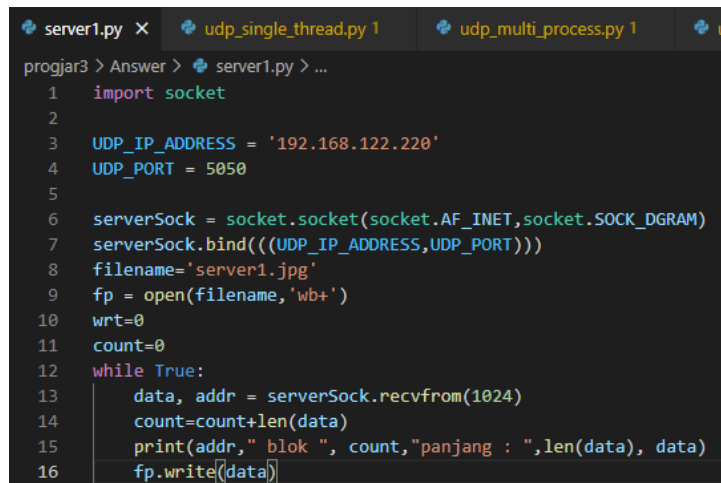
- udp_single_thread.py

```
udp_single_thread.py 1 X  udp_multi_process.py 1  udp_multi_process_async.py 1
progjar3 > Answer > udp_single_thread.py > send_all
1  from library import download_gambar, get_url_list, send_image
2  import time
3  import datetime
4
5  def send_all():
6      urls = get_url_list()
7      z = 0
8
9      catat = datetime.datetime.now()
10     for k in urls:
11         download_gambar(urls[k], k)
12         print(f"mendownload {urls[k]}")
13         waktu_proses = download_gambar(urls[k])
14         print(f"completed {waktu_proses} detik")
15         UDP_IP_ADDRESS = "192.168.122.220"
16         UDP_IP_ADDRESS2 = "192.168.122.14"
17         if z == 0:
18             send_image(UDP_IP_ADDRESS, 5050, f"{k}.jpg")
19             print('~Server 1~')
20             z = z + 1
21         elif z == 1:
22             print('~Server 2~')
23             send_image(UDP_IP_ADDRESS2, 5050, f"{k}.jpg")
24     selesai = datetime.datetime.now() - catat
25     print(f"Total Time Needed : {selesai} seconds")
26
27
28 #fungsi download_gambar akan dijalankan secara berurutan
29
30 if __name__ == '__main__':
31     send_all()
```

Tugas 3

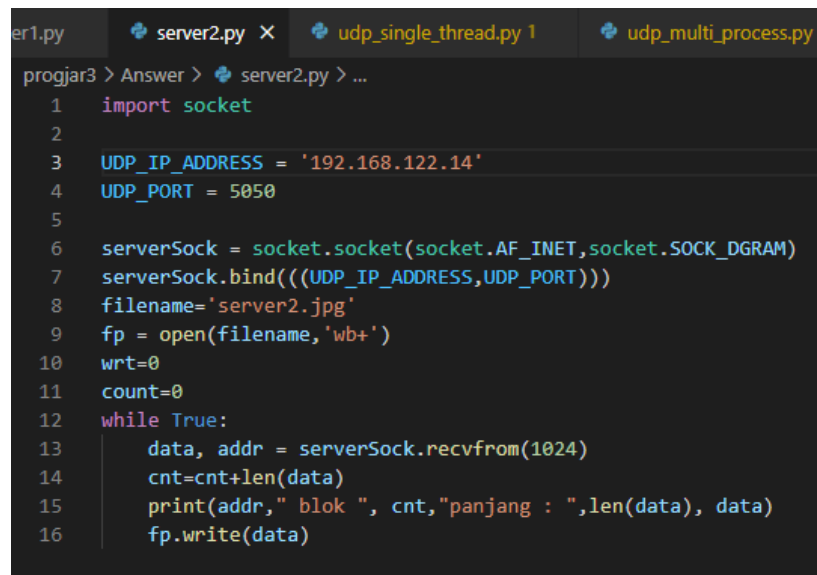
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- server1.py



```
server1.py x  udp_single_thread.py 1  udp_multi_process.py 1  u
progjar3 > Answer > server1.py > ...
1  import socket
2
3  UDP_IP_ADDRESS = '192.168.122.220'
4  UDP_PORT = 5050
5
6  serverSock = socket.socket(socket.AF_INET,socket.SOCK_DGRAM)
7  serverSock.bind(((UDP_IP_ADDRESS,UDP_PORT)))
8  filename='server1.jpg'
9  fp = open(filename,'wb+')
10 wrt=0
11 count=0
12 while True:
13     data, addr = serverSock.recvfrom(1024)
14     count=count+len(data)
15     print(addr," blok ", count,"panjang : ",len(data), data)
16     fp.write(data)]
```

- server2.py



```
er1.py  server2.py x  udp_single_thread.py 1  udp_multi_process.py
progjar3 > Answer > server2.py > ...
1  import socket
2
3  UDP_IP_ADDRESS = '192.168.122.14'
4  UDP_PORT = 5050
5
6  serverSock = socket.socket(socket.AF_INET,socket.SOCK_DGRAM)
7  serverSock.bind(((UDP_IP_ADDRESS,UDP_PORT)))
8  filename='server2.jpg'
9  fp = open(filename,'wb+')
10 wrt=0
11 count=0
12 while True:
13     data, addr = serverSock.recvfrom(1024)
14     cnt=cnt+len(data)
15     print(addr," blok ", cnt,"panjang : ",len(data), data)
16     fp.write(data)
```

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- library.py

```
library.py 1 x server.py udp_single_thread.py 1 udp_multi_process.py 1 udp_multi_process_async.py 1 udp_multi_thread.py 1 udp_multi_thre
progjar3 > Answer > library.py > get_url_list
9 def get_url_list():
10     urls = dict()
11     urls['kompas'] = 'https://asset.kompas.com/crops/qz_jJxyaZgGgboomdCEXsfb5pec~/0x0:998x665/740x500/data/photo/2020/03/01/5e5b52f4db896.jpg'
12     urls['detik'] = 'https://awscdn.detik.net.id/detik2/images/logo.jpg'
13     return urls
14
15
16 def download_gambar(url=None, tuliskefile='image'):
17     waktu_awal = datetime.datetime.now()
18     if (url is None):
19         return False
20     ff = requests.get(url)
21     tipe = dict()
22     tipe['image/png'] = 'png'
23     tipe['image/jpeg'] = 'jpg'
24     tipe['image/gif'] = 'gif'
25     tipe['image/jpeg'] = 'jpg'
26     tipe['application/zip'] = 'jpg'
27     tipe['video/quicktime'] = 'mov'
28
29     content_type = ff.headers['Content-Type']
30     logging.warning(content_type)
31     if (content_type in list(tipe.keys())):
32         namafile = os.path.basename(url)
33         ekstensi = tipe[content_type]
34         if (tuliskefile):
35             fp = open(f"{tuliskefile}.{ekstensi}", "wb")
36             fp.write(ff.content)
37             fp.close()
38             waktu_process = datetime.datetime.now() - waktu_awal
39             waktu_akhir = datetime.datetime.now()
40             logging.warning(f"writing {tuliskefile}.{ekstensi} dalam waktu {waktu_process} {waktu_awal} s/d {waktu_akhir}")
41             return waktu_process
42     else:
43         return False
44
45 def send_image(IP_ADDRESS, PORT, filename):
46     print(IP_ADDRESS, PORT, filename)
47     ukuran=os.stat(filename).st_size
48     sckclient = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
49     sent=0
50     fp=open(filename,'rb')
51     k=fp.read()
52     for x in k:
53         k_bytes=bytes([x])
54         sckclient.sendto(k_bytes,(IP_ADDRESS,PORT))
55     sent=sent+1
56
57 if __name__ == '__main__':
58     k = download_gambar('https://asset.kompas.com/crops/qz_jJxyaZgGgboomdCEXsfb5pec~/0x0:998x665/740x500/data/photo/2020/03/01/5e5b52f4db896.jpg')
59     print(k)
```

Hasil Menjalankan Program

1. Hasil Multi Process

- Client

```

< alpine-1 x alpine-2 x alpine-3 x > - x
| 138 kB 1.0 MB/s
Installing collected packages: urllib3, idna, chardet, certifi, requests
Successfully installed certifi-2021.5.30 chardet-4.0.0 idna-2.10 requests-2.25.1
urllib3-1.26.5
WARNING: You are using pip version 21.0.1; however, version 21.1.2 is available.
You should consider upgrading via the '/usr/bin/python3.8 -m pip install --upgra
de pip' command.
/Pemrograman_Jaringan_E/progjar3/Answer # python3 udp_multi_process.py
WARNING:root:image/jpeg
WARNING:root:writing kompas.jpg dalam waktu 0:00:00.778118 2021-06-13 10:00:16.7
64506 s/d 2021-06-13 10:00:17.542628
downloading https://asset.kompas.com/crops/qz_jXxyaZgGgboomdCEXsfbSpec=/0x0:998x
665/740x500/data/photo/2020/03/01/5e5b52f4db896.jpg
~Server 1~
192.168.122.220 5050 kompas.jpg
WARNING:root:image/jpeg
WARNING:root:writing detik.jpg dalam waktu 0:00:00.327935 2021-06-13 10:00:17.54
9702 s/d 2021-06-13 10:00:17.877642
downloading https://awscdn.detik.net.id/detik2/images/logo.jpg
~Server 2~
192.168.122.14 5050 detik.jpg
Total Time Needed : 0:00:01.342489 seconds 2021-06-13 10:00:16.764502 - 2021-06-
13 10:00:18.106991
/Pemrograman_Jaringan_E/progjar3/Answer # 

```

- Server1 (alpine-1)

```

< role alpine-1 x alpine-2 x alpine-3 x > -
('192.168.122.97', 33659) blok 5127 panjang : 1 b'@'
('192.168.122.97', 33659) blok 5128 panjang : 1 b' '
('192.168.122.97', 33659) blok 5129 panjang : 1 b'\xae'
('192.168.122.97', 33659) blok 5130 panjang : 1 b'\xcc'
('192.168.122.97', 33659) blok 5131 panjang : 1 b'3'
('192.168.122.97', 33659) blok 5132 panjang : 1 b'\xd5'
('192.168.122.97', 33659) blok 5133 panjang : 1 b'\xa9'
('192.168.122.97', 33659) blok 5134 panjang : 1 b'G'
('192.168.122.97', 33659) blok 5135 panjang : 1 b'\x01'
('192.168.122.97', 33659) blok 5136 panjang : 1 b'P'
('192.168.122.97', 33659) blok 5137 panjang : 1 b'r'
('192.168.122.97', 33659) blok 5138 panjang : 1 b'\x08'
('192.168.122.97', 33659) blok 5139 panjang : 1 b'\xd2'
('192.168.122.97', 33659) blok 5140 panjang : 1 b'\xe5'
('192.168.122.97', 33659) blok 5141 panjang : 1 b'\x18'
('192.168.122.97', 33659) blok 5142 panjang : 1 b'L'
('192.168.122.97', 33659) blok 5143 panjang : 1 b'o'
('192.168.122.97', 33659) blok 5144 panjang : 1 b'\xa5'
('192.168.122.97', 33659) blok 5145 panjang : 1 b'\x87'
('192.168.122.97', 33659) blok 5146 panjang : 1 b'O'
('192.168.122.97', 33659) blok 5147 panjang : 1 b'\x06'
('192.168.122.97', 33659) blok 5148 panjang : 1 b'_'
('192.168.122.97', 33659) blok 5149 panjang : 1 b'\x1b'

```

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- Server2 (alpine-2)

```
< role alpine-1 X alpine-2 X alpine-3 > -
('192.168.122.97', 33848) blok 956 panjang : 1 b'\x96'
('192.168.122.97', 33848) blok 957 panjang : 1 b'\xeb'
('192.168.122.97', 33848) blok 958 panjang : 1 b'\xd2'
('192.168.122.97', 33848) blok 959 panjang : 1 b'e'
('192.168.122.97', 33848) blok 960 panjang : 1 b'w'
('192.168.122.97', 33848) blok 961 panjang : 1 b'g'
('192.168.122.97', 33848) blok 962 panjang : 1 b'\xb1'
('192.168.122.97', 33848) blok 963 panjang : 1 b'\x11'
('192.168.122.97', 33848) blok 964 panjang : 1 b'y'
('192.168.122.97', 33848) blok 965 panjang : 1 b'@'
('192.168.122.97', 33848) blok 966 panjang : 1 b'i'
('192.168.122.97', 33848) blok 967 panjang : 1 b'\x9e'
('192.168.122.97', 33848) blok 968 panjang : 1 b'"
('192.168.122.97', 33848) blok 969 panjang : 1 b'\xfd'
('192.168.122.97', 33848) blok 970 panjang : 1 b'\xa1'
('192.168.122.97', 33848) blok 971 panjang : 1 b's'
('192.168.122.97', 33848) blok 972 panjang : 1 b'\xfe'
('192.168.122.97', 33848) blok 973 panjang : 1 b's'
('192.168.122.97', 33848) blok 974 panjang : 1 b'\xd7'
('192.168.122.97', 33848) blok 975 panjang : 1 b'\xd8'
('192.168.122.97', 33848) blok 976 panjang : 1 b'\xd3'
('192.168.122.97', 33848) blok 977 panjang : 1 b','
('192.168.122.97', 33848) blok 978 panjang : 1 b'O'
```

2. Hasil Multi Thread

- Client

```
< alpine-1 X alpine-2 X alpine-3 X > - X
/Pemrograman_Jaringan_E/progjar3/Answer # ls
_pycache_          udp_multi_process.py
detik.jpg           udp_multi_process_async.py
kompas.jpg          udp_multi_thread.py
library.py          udp_multi_thread_async.py
server1.py          udp_single_thread.py
server2.py
/Pemrograman_Jaringan_E/progjar3/Answer # python3 udp_multi_thread.py
WARNING:root:image/jpeg
WARNING:root:writing kompas.jpg dalam waktu 0:00:00.218678 2021-06-13 10:05:42.7
34305 s/d 2021-06-13 10:05:43.002988
mendownload https://asset.kompas.com/crops/qz_jJxyaZgGgboomdCEXsfbSpec=/0x0:998x
665/740x500/data/photo/2020/03/01/5e5b52f4db896.jpg
~Server 1~
192.168.122.220 5050 kompas.jpg
WARNING:root:image/jpeg
WARNING:root:writing detik.jpg dalam waktu 0:00:00.397289 2021-06-13 10:05:43.00
3220 s/d 2021-06-13 10:05:43.400515
mendownload https://awscdn.detik.net.id/detik2/images/logo.jpg
~Server 2~
192.168.122.14 5050 detik.jpg
Total Time Needed : 0:00:00.784865 seconds 2021-06-13 10:05:42.784301 - 2021-06-
13 10:05:43.569166
/Pemrograman_Jaringan_E/progjar3/Answer #
```


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- Server1(alpine-1)

< role	alpine-1	×	alpine-2	×	alpine-2	>	—	×
('192.168.122.97', 32946)	blok	16944	panjang :	1	b''			
('192.168.122.97', 32946)	blok	16945	panjang :	1	b'\xcf'			
('192.168.122.97', 32946)	blok	16946	panjang :	1	b'\xb1'			
('192.168.122.97', 32946)	blok	16947	panjang :	1	b'\x97'			
('192.168.122.97', 32946)	blok	16948	panjang :	1	b'\xa1'			
('192.168.122.97', 32946)	blok	16949	panjang :	1	b'E'			
('192.168.122.97', 32946)	blok	16950	panjang :	1	b't'			
('192.168.122.97', 32946)	blok	16951	panjang :	1	b'\xd7'			
('192.168.122.97', 32946)	blok	16952	panjang :	1	b'\$'			
('192.168.122.97', 32946)	blok	16953	panjang :	1	b'E'			
('192.168.122.97', 32946)	blok	16954	panjang :	1	b'\xf3'			
('192.168.122.97', 32946)	blok	16955	panjang :	1	b'\x10'			
('192.168.122.97', 32946)	blok	16956	panjang :	1	b'\xac'			
('192.168.122.97', 32946)	blok	16957	panjang :	1	b'Y'			
('192.168.122.97', 32946)	blok	16958	panjang :	1	b'a'			
('192.168.122.97', 32946)	blok	16959	panjang :	1	b'D'			
('192.168.122.97', 32946)	blok	16960	panjang :	1	b'G'			
('192.168.122.97', 32946)	blok	16961	panjang :	1	b'r'			
('192.168.122.97', 32946)	blok	16962	panjang :	1	b'\xa0'			
('192.168.122.97', 32946)	blok	16963	panjang :	1	b'J'			
('192.168.122.97', 32946)	blok	16964	panjang :	1	b'\x9c'			
('192.168.122.97', 32946)	blok	16965	panjang :	1	b'F'			
('192.168.122.97', 32946)	blok	16966	panjang :	1	b'\x10'			
('192.168.122.97', 32946)	blok	16967	panjang :	1	b'n'			

- Server2(alpine-2)

< role	alpine-1	×	alpine-2	×	alpine-2	>	—	×
('192.168.122.97', 46832)	blok	2000	panjang :	1	b'\x8f'			
('192.168.122.97', 46832)	blok	2001	panjang :	1	b'\x9e'			
('192.168.122.97', 46832)	blok	2002	panjang :	1	b'\xa1'			
('192.168.122.97', 46832)	blok	2003	panjang :	1	b'\x91'			
('192.168.122.97', 46832)	blok	2004	panjang :	1	b'\xb4'			
('192.168.122.97', 46832)	blok	2005	panjang :	1	b'\xb9'			
('192.168.122.97', 46832)	blok	2006	panjang :	1	b'\xee'			
('192.168.122.97', 46832)	blok	2007	panjang :	1	b'k'			
('192.168.122.97', 46832)	blok	2008	panjang :	1	b'\x18'			
('192.168.122.97', 46832)	blok	2009	panjang :	1	b'\xd1'			
('192.168.122.97', 46832)	blok	2010	panjang :	1	b'w'			
('192.168.122.97', 46832)	blok	2011	panjang :	1	b'9'			
('192.168.122.97', 46832)	blok	2012	panjang :	1	b'\xee'			
('192.168.122.97', 46832)	blok	2013	panjang :	1	b'r'			
('192.168.122.97', 46832)	blok	2014	panjang :	1	b'h'			
('192.168.122.97', 46832)	blok	2015	panjang :	1	b'\x1c'			
('192.168.122.97', 46832)	blok	2016	panjang :	1	b'I'			
('192.168.122.97', 46832)	blok	2017	panjang :	1	b'9'			
('192.168.122.97', 46832)	blok	2018	panjang :	1	b'\x05'			
('192.168.122.97', 46832)	blok	2019	panjang :	1	b'\xa8'			
('192.168.122.97', 46832)	blok	2020	panjang :	1	b'a'			
('192.168.122.97', 46832)	blok	2021	panjang :	1	b'\xfd'			
('192.168.122.97', 46832)	blok	2022	panjang :	1	b'\$'			

Tugas 3

Rifki Aulia Irawan – 05111840000142

3. Hasil Multi Process Async

- Client

```
< alpine-1 x alpine-2 x alpine-3 x > - x
detik.jpg          udp_multi_process_async.py
kompas.jpg         udp_multi_thread.py
library.py         udp_multi_thread_async.py
server1.py         udp_single_thread.py
server2.py
/Pemrograman_Jaringan_E/progjar3/Answer # python3 udp_multi_process_async.py
WARNING:root:image/jpeg
WARNING:root:writing kompas.jpg dalam waktu 0:00:00.215954 2021-06-13 10:04:22.9
84631 s/d 2021-06-13 10:04:23.200590
downloading https://asset.kompas.com/crops/qz_jJxyaZgGgboomdCEXsfbSpec=/0x0:998x
665/740x500/data/photo/2020/03/01/5e5b52f4db896.jpg
192.168.122.220 5050 kompas.jpg
~Server 1~
WARNING:root:image/jpeg
WARNING:root:writing detik.jpg dalam waktu 0:00:01.253215 2021-06-13 10:04:23.21
8493 s/d 2021-06-13 10:04:24.471714
downloading https://awscdn.detik.net.id/detik2/images/logo.jpg
~Server 2~
192.168.122.14 5050 detik.jpg
Total Time Needed : 0:00:01.559525 seconds 2021-06-13 10:04:22.984621 - 2021-06-
13 10:04:24.544146
status TASK
{'kompas': None, 'detik': None}
/Pemrograman_Jaringan_E/progjar3/Answer #
```

- Server1 (alpine-1)

```
< role alpine-1 x alpine-2 x alpine-3 x > - x
('192.168.122.97', 38966) blok 10734 panjang : 1 b'\\'
('192.168.122.97', 38966) blok 10735 panjang : 1 b'v'
('192.168.122.97', 38966) blok 10736 panjang : 1 b'<'
('192.168.122.97', 38966) blok 10737 panjang : 1 b'D'
('192.168.122.97', 38966) blok 10738 panjang : 1 b'\xaa'
('192.168.122.97', 38966) blok 10739 panjang : 1 b'\x94'
('192.168.122.97', 38966) blok 10740 panjang : 1 b' '
('192.168.122.97', 38966) blok 10741 panjang : 1 b'X'
('192.168.122.97', 38966) blok 10742 panjang : 1 b'\xc2'
('192.168.122.97', 38966) blok 10743 panjang : 1 b'\xa3'
('192.168.122.97', 38966) blok 10744 panjang : 1 b'\x1c'
('192.168.122.97', 38966) blok 10745 panjang : 1 b'\xd0'
('192.168.122.97', 38966) blok 10746 panjang : 1 b'f'
('192.168.122.97', 38966) blok 10747 panjang : 1 b'\\'
('192.168.122.97', 38966) blok 10748 panjang : 1 b'\xa3'
('192.168.122.97', 38966) blok 10749 panjang : 1 b'\x85'
('192.168.122.97', 38966) blok 10750 panjang : 1 b'\xcd'
('192.168.122.97', 38966) blok 10751 panjang : 1 b'\xdc'
('192.168.122.97', 38966) blok 10752 panjang : 1 b'\x03'
('192.168.122.97', 38966) blok 10753 panjang : 1 b'a'
('192.168.122.97', 38966) blok 10754 panjang : 1 b'\x18'
('192.168.122.97', 38966) blok 10755 panjang : 1 b'\x8b'
('192.168.122.97', 38966) blok 10756 panjang : 1 b'5'
```

Tugas 3

Rifki Aulia Irawan – 05111840000142

- Server2 (alpine-2)

```
< .ole alpine-1 ✕ alpine-2 ✕ alpine-3 ✕ > - ✕
('192.168.122.97', 42400) blok 1722 panjang : 1 b'='
('192.168.122.97', 42400) blok 1723 panjang : 1 b'\xf9'
('192.168.122.97', 42400) blok 1724 panjang : 1 b'v'
('192.168.122.97', 42400) blok 1725 panjang : 1 b'-'
('192.168.122.97', 42400) blok 1726 panjang : 1 b':'
('192.168.122.97', 42400) blok 1727 panjang : 1 b'E'
('192.168.122.97', 42400) blok 1728 panjang : 1 b'/'
('192.168.122.97', 42400) blok 1729 panjang : 1 b'\x8b'
('192.168.122.97', 42400) blok 1730 panjang : 1 b'?'
('192.168.122.97', 42400) blok 1731 panjang : 1 b'Y'
('192.168.122.97', 42400) blok 1732 panjang : 1 b'\xd7'
('192.168.122.97', 42400) blok 1733 panjang : 1 b'\xdb'
('192.168.122.97', 42400) blok 1734 panjang : 1 b'\xc7'
('192.168.122.97', 42400) blok 1735 panjang : 1 b'\xb7'
('192.168.122.97', 42400) blok 1736 panjang : 1 b'5'
('192.168.122.97', 42400) blok 1737 panjang : 1 b'\x0f'
('192.168.122.97', 42400) blok 1738 panjang : 1 b'"'
('192.168.122.97', 42400) blok 1739 panjang : 1 b'\xd5'
('192.168.122.97', 42400) blok 1740 panjang : 1 b'Q'
('192.168.122.97', 42400) blok 1741 panjang : 1 b'\x05'
('192.168.122.97', 42400) blok 1742 panjang : 1 b'n'
('192.168.122.97', 42400) blok 1743 panjang : 1 b'\xd4'
('192.168.122.97', 42400) blok 1744 panjang : 1 b'Q'
```

4. Hasil Multi Thread Async

- Client

```
< alpine-1 ✕ alpine-2 ✕ alpine-3 ✕ > - ✕
detik.jpg          udp_multi_process_async.py
kompas.jpg         udp_multi_thread.py
library.py         udp_multi_thread_async.py
server1.py         udp_single_thread.py
server2.py
/Pemrograman_Jaringan_E/progjar3/Answer # python3 udp_multi_thread_async.py
WARNING:root:image/jpeg
WARNING:root:writing kompas.jpg dalam waktu 0:00:00.272797 2021-06-13 10:07:49.1
67531 s/d 2021-06-13 10:07:49.440333
downloading https://asset.kompas.com/crops/qz_jJxyaZgGgboomdCEXsfbSpec=/0x0:998x
665/740x500/data/photo/2020/03/01/5e5b52f4db896.jpg
192.168.122.220 5050 kompas.jpg
~Server 1~
WARNING:root:image/jpeg
WARNING:root:writing detik.jpg dalam waktu 0:00:01.769915 2021-06-13 10:07:49.44
1073 s/d 2021-06-13 10:07:51.210995
downloading https://awscdn.detik.net.id/detik2/images/logo.jpg
~Server 2~
192.168.122.14 5050 detik.jpg
Total Time Needed : 0:00:02.085537 seconds 2021-06-13 10:07:49.167527 - 2021-06-
13 10:07:51.253064
hasil task yang dijalankan
{'kompas': None, 'detik': None}
/Pemrograman_Jaringan_E/progjar3/Answer #
```

Tugas 3

Rifki Aulia Irawan – 05111840000142

- Server1 (alpine-1)

< role	alpine-1	X	alpine-2	X	alpine-3	>	-	X
('192.168.122.97', 56341)	blok	20558	panjang : 1 b'\xbd'					
('192.168.122.97', 56341)	blok	20559	panjang : 1 b'-'					
('192.168.122.97', 56341)	blok	20560	panjang : 1 b'\xec'					
('192.168.122.97', 56341)	blok	20561	panjang : 1 b'W'					
('192.168.122.97', 56341)	blok	20562	panjang : 1 b'\x83'					
('192.168.122.97', 56341)	blok	20563	panjang : 1 b'e'					
('192.168.122.97', 56341)	blok	20564	panjang : 1 b'\xf8'					
('192.168.122.97', 56341)	blok	20565	panjang : 1 b'\xbd'					
('192.168.122.97', 56341)	blok	20566	panjang : 1 b'd'					
('192.168.122.97', 56341)	blok	20567	panjang : 1 b'\xdd'					
('192.168.122.97', 56341)	blok	20568	panjang : 1 b'\x07'					
('192.168.122.97', 56341)	blok	20569	panjang : 1 b'\x85'					
('192.168.122.97', 56341)	blok	20570	panjang : 1 b'\x86'					
('192.168.122.97', 56341)	blok	20571	panjang : 1 b'\xd8'					
('192.168.122.97', 56341)	blok	20572	panjang : 1 b'X'					
('192.168.122.97', 56341)	blok	20573	panjang : 1 b'm'					
('192.168.122.97', 56341)	blok	20574	panjang : 1 b'-'					
('192.168.122.97', 56341)	blok	20575	panjang : 1 b'~'					
('192.168.122.97', 56341)	blok	20576	panjang : 1 b'\xdf'					
('192.168.122.97', 56341)	blok	20577	panjang : 1 b'\xe6'					
('192.168.122.97', 56341)	blok	20578	panjang : 1 b'\xdd'					
('192.168.122.97', 56341)	blok	20579	panjang : 1 b'\xe9'					
('192.168.122.97', 56341)	blok	20580	panjang : 1 b'''					
('192.168.122.97', 56341)	blok	20581	panjang : 1 b'\xd9'					

- Server2 (alpine-2)

< alpine-1	X	alpine-2	X	alpine-3	X	>	-	X
('192.168.122.97', 45963)	blok	2820	panjang : 1 b'\xb3'					
('192.168.122.97', 45963)	blok	2821	panjang : 1 b'Q'					
('192.168.122.97', 45963)	blok	2822	panjang : 1 b'e'					
('192.168.122.97', 45963)	blok	2823	panjang : 1 b'\x9c'					
('192.168.122.97', 45963)	blok	2824	panjang : 1 b'\xb0'					
('192.168.122.97', 45963)	blok	2825	panjang : 1 b'\x88'					
('192.168.122.97', 45963)	blok	2826	panjang : 1 b'\x8b'					
('192.168.122.97', 45963)	blok	2827	panjang : 1 b'\xa2'					
('192.168.122.97', 45963)	blok	2828	panjang : 1 b'\x10'					
('192.168.122.97', 45963)	blok	2829	panjang : 1 b'\x88'					
('192.168.122.97', 45963)	blok	2830	panjang : 1 b'\x88'					
('192.168.122.97', 45963)	blok	2831	panjang : 1 b'\x00'					
('192.168.122.97', 45963)	blok	2832	panjang : 1 b'\x88'					
('192.168.122.97', 45963)	blok	2833	panjang : 1 b'\x88'					
('192.168.122.97', 45963)	blok	2834	panjang : 1 b'\x00'					
('192.168.122.97', 45963)	blok	2835	panjang : 1 b'\x88'					
('192.168.122.97', 45963)	blok	2836	panjang : 1 b'\x88'					
('192.168.122.97', 45963)	blok	2837	panjang : 1 b'\x00'					
('192.168.122.97', 45963)	blok	2838	panjang : 1 b'\x88'					
('192.168.122.97', 45963)	blok	2839	panjang : 1 b'\x88'					
('192.168.122.97', 45963)	blok	2840	panjang : 1 b'\x00'					
('192.168.122.97', 45963)	blok	2841	panjang : 1 b'\x88'					
('192.168.122.97', 45963)	blok	2842	panjang : 1 b'\x88'					