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Jurusan : S2 TIK by Riset

1.a. Create a web server application that can serve a single client request first

File name server3.py

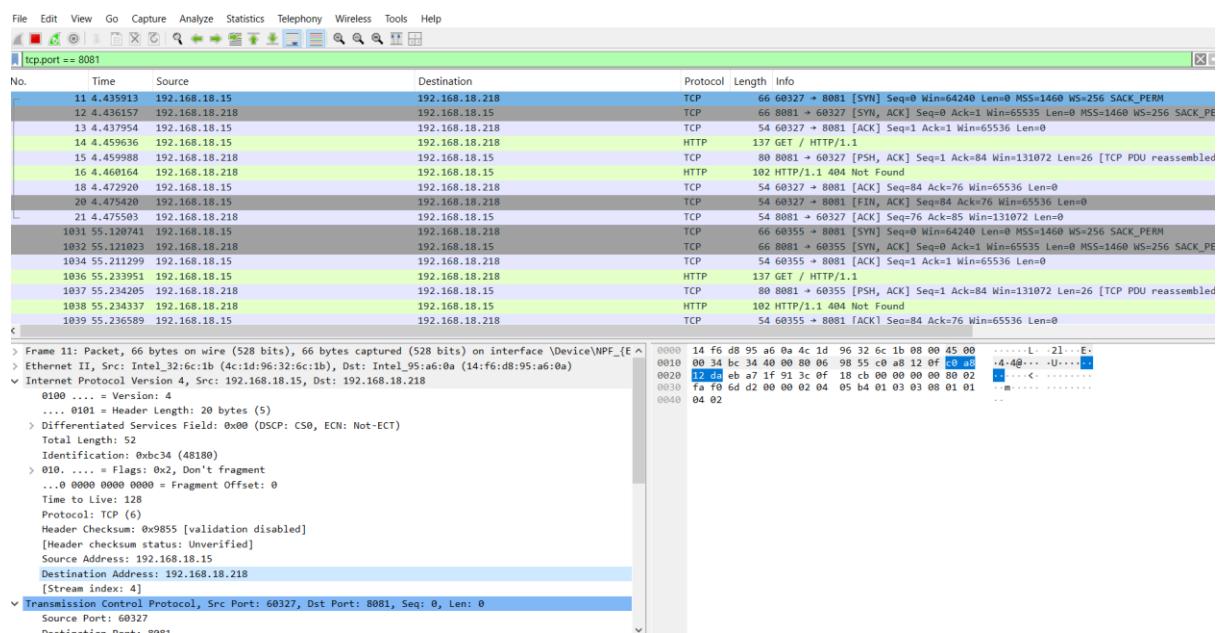
Menggunakan port 8081

```
D:\CodingProgramming\Socketprog>python server3.py
Traceback (most recent call last):
  File "D:\CodingProgramming\Socketprog\server3.py", line 8, in <module>
    serverSocket.bind(('', 6789))
               ^^^^^^^^^^
OSError: [WinError 10048] Only one usage of each socket address (protocol/network address/port) is normally permitted

D:\CodingProgramming\Socketprog>python server3.py
Ready to serve...

C:\Users\Admin>curl localhost:8081
<html><body><h1>404 Not Found</h1></body></html>
C:\Users\Admin>curl localhost:8081
<html><body><h1>404 Not Found</h1></body></html>
C:\Users\Admin>curl localhost:8081
<html><body><h1>404 Not Found</h1></body></html>
C:\Users\Admin>
```

Tampak packets melalui wireshark



1b. modify your web server application to serve multiple (concurrent) requests.

Menggunakan port 8085

The image shows two Command Prompt windows. The left window displays the output of a Python socket-based web server (server4.py) running on port 8085. It logs multiple concurrent connections from the same IP address (192.168.18.15) on different ports (60779, 60783, 60828). The right window shows a curl command being run on port 8085, which returns a 404 Not Found error page.

```
D:\CodingProgramming\Socketprog>python server4.py
D:\CodingProgramming\Socketprog>cd Socketprog
D:\CodingProgramming\Socketprog>python server4.py
[2025-12-02 16:01:23] Multithreaded Web Server is ready...
[2025-12-02 16:01:31] Thread started for ('192.168.18.15', 60779)
[2025-12-02 16:01:31] New connection from ('192.168.18.15', 60779) handled in thread Thread-1 (handle_client)
[2025-12-02 16:01:31] 404 Not Found for ('192.168.18.15', 60779) (/)
[2025-12-02 16:01:31] Connection closed for ('192.168.18.15', 60779)
[2025-12-02 16:01:37] Thread started for ('192.168.18.15', 60783)
[2025-12-02 16:01:37] New connection from ('192.168.18.15', 60783) handled in thread Thread-2 (handle_client)
[2025-12-02 16:01:37] 404 Not Found for ('192.168.18.15', 60783) (/)
[2025-12-02 16:01:37] Connection closed for ('192.168.18.15', 60783)
[2025-12-02 16:01:39] Thread started for ('192.168.18.15', 60785)
[2025-12-02 16:01:39] New connection from ('192.168.18.15', 60785) handled in thread Thread-3 (handle_client)
[2025-12-02 16:01:39] 404 Not Found for ('192.168.18.15', 60785) (/)
[2025-12-02 16:01:39] Connection closed for ('192.168.18.15', 60785)
[2025-12-02 16:01:40] Thread started for ('127.0.0.1', 54355)
[2025-12-02 16:01:40] New connection from ('127.0.0.1', 54355) handled in thread Thread-4 (handle_client)
[2025-12-02 16:01:40] 404 Not Found for ('127.0.0.1', 54355) (/)
[2025-12-02 16:01:40] Connection closed for ('127.0.0.1', 54355)
[2025-12-02 16:02:46] Thread started for ('192.168.18.15', 60828)
[2025-12-02 16:02:46] New connection from ('192.168.18.15', 60828) handled in thread Thread-5 (handle_client)
[2025-12-02 16:02:46] 404 Not Found for ('192.168.18.15', 60828) (/?param=tes)
[2025-12-02 16:02:46] Connection closed for ('192.168.18.15', 60828)
```

```
Microsoft Windows [Version 10.0.19045.6466]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Admin>curl localhost:8085
<html><body><h1>404 Not Found</h1></body></html>
C:\Users\Admin>
```

The image shows a Wireshark capture of TCP traffic on port 8085. The list view shows numerous SYN and ACK segments between the client (192.168.18.15) and the server (192.168.18.218). The details and bytes panes provide the raw binary and ASCII representations of the captured packets.

No.	Time	Source	Destination	Protocol	Length	Info
16125	696.868423	192.168.18.15	192.168.18.218	TCP	54	60785 → 8085 [ACK] Seq=1 Ack=1 Win=65536 Len=0
16126	696.868702	192.168.18.15	192.168.18.218	HTTP	237	POST / HTTP/1.1 (application/x-www-form-urlencoded)
16127	696.870277	192.168.18.218	192.168.18.15	TCP	80	8085 → 60785 [PSH, ACK] Seq=1 Ack=184 Win=131072 Len=26 [TCP PDU reass
16128	696.870923	192.168.18.218	192.168.18.15	HTTP	102	HTTP/1.1 404 Not Found
16129	696.873209	192.168.18.15	192.168.18.218	TCP	54	60785 → 8085 [ACK] Seq=184 Ack=76 Win=65536 Len=0
16130	696.873478	192.168.18.15	192.168.18.218	TCP	54	60785 → 8085 [FIN, ACK] Seq=184 Ack=76 Win=65536 Len=0
16131	696.873546	192.168.18.218	192.168.18.15	TCP	54	8085 → 60785 [ACK] Seq=76 Ack=185 Win=31072 Len=0
16957	763.939802	192.168.18.15	192.168.18.218	TCP	66	60828 → 8085 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
16958	763.940062	192.168.18.218	192.168.18.15	TCP	66	8085 → 60828 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460 WS=256 S
16959	763.942777	192.168.18.15	192.168.18.218	TCP	54	60828 → 8085 [ACK] Seq=1 Ack=1 Win=65536 Len=0
16960	763.954109	192.168.18.15	192.168.18.218	HTTP	147	GET /?param=tes HTTP/1.1
16961	763.954604	192.168.18.218	192.168.18.15	TCP	80	8085 → 60828 [PSH, ACK] Seq=1 Ack=94 Win=65536 Len=26 [TCP PDU reass
16962	763.955445	192.168.18.218	192.168.18.15	HTTP	102	HTTP/1.1 404 Not Found
16963	763.958124	192.168.18.15	192.168.18.218	TCP	54	60828 → 8085 [ACK] Seq=94 Ack=76 Win=65536 Len=0
16964	763.958925	192.168.18.15	192.168.18.218	TCP	54	60828 → 8085 [FIN, ACK] Seq=94 Ack=76 Win=65536 Len=0
16965	763.958986	192.168.18.218	192.168.18.15	TCP	54	8085 → 60828 [ACK] Seq=76 Ack=95 Win=65536 Len=0

2. membuat aplikasi Client, mengirim file ke server

Menggunakan port 8085, Melakukan test dengan mengirim sebuah file ke server

Command Prompt - python server4.py

```

IndexError: list index out of range
  File "C:\Users\Admin\AppData\Local\Programs\Python\Python313\Lib\threading.py", line 1041, in _bootstrap_inner
    self._run()
  File "C:\Users\Admin\AppData\Local\Programs\Python\Python313\Lib\threading.py", line 992, in run
    self._target(*self._args, **self._kwargs)
  File "D:\CodingProgramming\Socketprog\server4.py", line 15, in handle_client
    filename = message.split()[1]
  IndexError: list index out of range
[2025-12-02 16:24:02] Thread started for ('127.0.0.1', 54690)
[2025-12-02 16:24:02] New connection from ('127.0.0.1', 54690) handled in thread Thread-17 (handle_client)
[2025-12-02 16:24:02] 404 Not Found for ('127.0.0.1', 54690) (/)
[2025-12-02 16:24:02] Connection closed for ('127.0.0.1', 54690)
[2025-12-02 16:24:10] Thread started for ('127.0.0.1', 54700)
[2025-12-02 16:24:10] New connection from ('127.0.0.1', 54700) handled in thread Thread-18 (handle_client)
[2025-12-02 16:24:10] 404 Not Found for ('127.0.0.1', 54700) (/)
[2025-12-02 16:24:10] Connection closed for ('127.0.0.1', 54700)
[2025-12-02 16:26:28] Thread started for ('127.0.0.1', 54718)
[2025-12-02 16:26:28] New connection from ('127.0.0.1', 54718) handled in thread Thread-19 (handle_client)
[2025-12-02 16:26:28] Served file '/testkirim.txt' to ('127.0.0.1', 54718)
[2025-12-02 16:26:28] Connection closed for ('127.0.0.1', 54718)

```

Microsoft Windows [Version 10.0.19045.6466]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Admin>:

D:>cd CodingProgramming

D:\CodingProgramming>cd Socketprog

D:\CodingProgramming\Socketprog>python client.py localhost 8005 testkirim.txt

HTTP/1.1 200 OK

test kirim ke web server

D:\CodingProgramming\Socketprog>

tcp.port == 8085						
No.	Time	Source	Destination	Protocol	Length	Info
181	21.715277	192.168.18.15	192.168.18.218	TCP	54	61673 → 8085 [ACK] Seq=1 Ack=1 Win=65536 Len=0
182	21.715554	192.168.18.15	192.168.18.218	HTTP	137	GET / HTTP/1.1
183	21.717212	192.168.18.218	192.168.18.15	TCP	80	8085 → 61673 [PSH, ACK] Seq=1 Ack=84 Win=65536 Len=26 [TCP PDU read]
184	21.721733	192.168.18.218	192.168.18.15	HTTP	102	HTTP/1.1 404 Not Found
185	21.729208	192.168.18.15	192.168.18.218	TCP	54	61673 → 8085 [ACK] Seq=84 Ack=76 Win=65536 Len=0
186	21.729478	192.168.18.15	192.168.18.218	TCP	54	61673 → 8085 [FIN, ACK] Seq=84 Ack=76 Win=65536 Len=0
187	21.729562	192.168.18.218	192.168.18.15	TCP	54	8085 → 61673 [ACK] Seq=76 Ack=85 Win=65536 Len=0
274	26.305470	192.168.18.15	192.168.18.218	TCP	66	61676 → 8085 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
275	26.305596	192.168.18.218	192.168.18.15	TCP	66	8085 → 61676 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460 WS=256
276	26.307364	192.168.18.15	192.168.18.218	TCP	54	61676 → 8085 [ACK] Seq=1 Ack=1 Win=65536 Len=0
277	26.308018	192.168.18.15	192.168.18.218	HTTP	101	GET /tes.txt HTTP/1.1
278	26.308311	192.168.18.218	192.168.18.15	TCP	80	8085 → 61676 [PSH, ACK] Seq=1 Ack=48 Win=65536 Len=26 [TCP PDU read]
279	26.312572	192.168.18.218	192.168.18.15	HTTP	102	HTTP/1.1 404 Not Found
280	26.330347	192.168.18.15	192.168.18.218	TCP	54	61676 → 8085 [ACK] Seq=48 Ack=76 Win=65536 Len=0
281	26.330347	192.168.18.15	192.168.18.218	TCP	54	61676 → 8085 [FIN, ACK] Seq=48 Ack=76 Win=65536 Len=0
282	26.330406	192.168.18.218	192.168.18.15	TCP	54	8085 → 61676 [ACK] Seq=76 Ack=49 Win=65536 Len=0

<

Frame 277: Packet, 101 bytes on wire (808 bits), 101 bytes captured (808 bits) on interface \Device\NPF_{...}

> Ethernet II, Src: Intel_Proc [4c:1d:96:32:6c:1b], Dst: Intel_95:a6:0a [14:f6:d8:95:a6:0a]

> Internet Protocol Version 4, Src: 192.168.18.15, Dst: 192.168.18.218

> Transmission Control Protocol, Src Port: 61676, Dst Port: 8085, Seq: 1, Ack: 1, Len: 47

HyperText Transfer Protocol

GET /tes.txt HTTP/1.1\r\n

Request Method: GET

Request URI: /tes.txt

Request Version: HTTP/1.1

Host: 192.168.18.218\r\n

\r\n

[Response in frame: 279]

[Full request URI: http://192.168.18.218/tes.txt]

0000 14 f6 d8 95 a6 0a 4c 1d 96 32 6c 1b 08 00 45 00L-21--E

0010 00 57 bc a3 40 00 80 06 97 c0 a8 12 0f c0 a8 W-@-----

0020 12 da f0 ec 1f 95 9a f3 e5 3d 51 f2 4e f8 50 18=Q.N.P-

0030 01 00 48 1b 00 00 47 45 54 20 2f 74 65 73 2e 74 .-H..GE T /tes.t

0040 78 74 20 48 54 54 50 2f 31 2e 31 0d 0a 48 6f 73 x! HTTP/ 1.1-Hos

0050 74 3a 20 31 39 32 2e 31 36 38 2e 31 38 2e 32 31 t: 192.1 68.18.21

0060 38 0d 0a 0d 0a B---