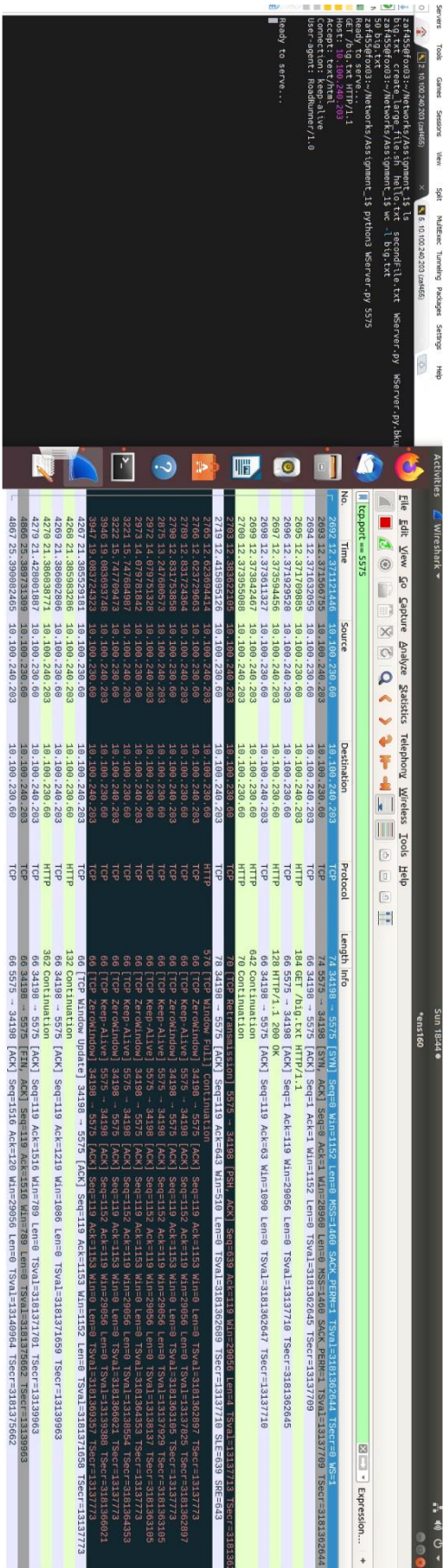


# Trial 1.

No.	Time	Source	Destination	Protocol	Length	Info
8652	36.416877193	10.100.230.60	10.100.240.203	TCP	74	50872 → 5571 [SYN] Seq=0 Win=1152 Len=0 MSS=1460 SACK_PERM=1 TSval=3180742908 TSecr=0 WS=1
8653	36.417261785	10.100.240.203	10.100.230.60	TCP	74	5571 → 50872 [SYN, ACK] Seq=0 Ack=1 Win=28960 Len=0 MSS=1460 SACK_PERM=1 TSval=12982763 TSecr=3180742908
8654	36.417317138	10.100.230.60	10.100.240.203	TCP	66	50872 → 5571 [ACK] Seq=1 Ack=1 Win=1152 Len=0 TSval=3180742909 TSecr=12982763
8655	36.417428887	10.100.230.60	10.100.240.203	HTTP	184	GET /big.txt HTTP/1.1
8658	36.417715772	10.100.240.203	10.100.230.60	TCP	66	5571 → 50872 [ACK] Seq=1 Ack=119 Win=29056 Len=0 TSval=12982763 TSecr=3180742909
8662	36.418889266	10.100.240.203	10.100.230.60	HTTP	128	HTTP/1.1 200 OK
8663	36.418983403	10.100.230.60	10.100.240.203	TCP	66	50872 → 5571 [ACK] Seq=119 Ack=63 Win=1090 Len=0 TSval=3180742910 TSecr=12982763
8665	36.419087676	10.100.240.203	10.100.230.60	HTTP	530	Continuation
8666	36.419246671	10.100.240.203	10.100.230.60	HTTP	642	Continuation
8676	36.432336182	10.100.240.203	10.100.230.60	TCP	642	[TCP Retransmission] 5571 → 50872 [ACK] Seq=527 Ack=119 Win=29056 Len=576 TSval=12982767 TSecr=3180742910
8693	36.461021099	10.100.230.60	10.100.240.203	TCP	78	50872 → 5571 [ACK] Seq=119 Ack=1103 Win=50 Len=0 TSval=3180742953 TSecr=12982763 SLE=527 SRE=1103
8733	36.668322919	10.100.240.203	10.100.230.60	HTTP	116	[TCP Window Full] Continuation
8734	36.668354638	10.100.230.60	10.100.240.203	TCP	66	[TCP ZeroWindow] 50872 → 5571 [ACK] Seq=119 Ack=1153 Win=0 Len=0 TSval=3180743160 TSecr=12982826
8755	36.876398175	10.100.240.203	10.100.230.60	TCP	66	[TCP Keep-Alive] 5571 → 50872 [ACK] Seq=1152 Ack=119 Win=29056 Len=0 TSval=12982878 TSecr=3180743160
8756	36.876427861	10.100.230.60	10.100.240.203	TCP	66	[TCP ZeroWindow] 50872 → 5571 [ACK] Seq=119 Ack=1153 Win=0 Len=0 TSval=3180743368 TSecr=12982826
8832	37.292393789	10.100.240.203	10.100.230.60	TCP	66	[TCP Keep-Alive] 5571 → 50872 [ACK] Seq=1152 Ack=119 Win=29056 Len=0 TSval=12982882 TSecr=3180743368
8878	38.124374887	10.100.240.203	10.100.230.60	TCP	66	[TCP Keep-Alive] 5571 → 50872 [ACK] Seq=1152 Ack=119 Win=29056 Len=0 TSval=12983190 TSecr=3180743368
8879	38.124481166	10.100.230.60	10.100.240.203	TCP	66	[TCP ZeroWindow] 50872 → 5571 [ACK] Seq=119 Ack=1153 Win=0 Len=0 TSval=3180744616 TSecr=12982826
9233	39.792373879	10.100.240.203	10.100.230.60	TCP	66	[TCP Keep-Alive] 5571 → 50872 [ACK] Seq=1152 Ack=119 Win=29056 Len=0 TSval=12983607 TSecr=3180744616
9234	39.792404790	10.100.230.60	10.100.240.203	TCP	66	[TCP ZeroWindow] 50872 → 5571 [ACK] Seq=119 Ack=1153 Win=0 Len=0 TSval=3180746284 TSecr=12982826
9811	43.124439206	10.100.240.203	10.100.230.60	TCP	66	[TCP Keep-Alive] 5571 → 50872 [ACK] Seq=1152 Ack=119 Win=29056 Len=0 TSval=12984440 TSecr=3180746284
9812	43.124463368	10.100.230.60	10.100.240.203	TCP	66	[TCP ZeroWindow] 50872 → 5571 [ACK] Seq=119 Ack=1153 Win=0 Len=0 TSval=3180749615 TSecr=12982826
10144	45.429106129	10.100.230.60	10.100.240.203	TCP	66	[TCP Window Update] 50872 → 5571 [ACK] Seq=119 Ack=1153 Win=1152 Len=0 TSval=3180751920 TSecr=12982826
10145	45.429468448	10.100.240.203	10.100.230.60	HTTP	428	Continuation
10149	45.473051403	10.100.230.60	10.100.240.203	TCP	66	50872 → 5571 [ACK] Seq=119 Ack=1516 Win=789 Len=0 TSval=3180751964 TSecr=12985016
11007	49.434513681	10.100.230.60	10.100.240.203	TCP	66	50872 → 5571 [FIN, ACK] Seq=119 Ack=1516 Win=789 Len=0 TSval=3180755925 TSecr=12985016
11008	49.434866006	10.100.240.203	10.100.230.60	TCP	66	5571 → 50872 [ACK] Seq=1516 Ack=120 Win=29056 Len=0 TSval=12986017 TSecr=3180755925

Figure 1. Wireshark Output.

Figure 2. Server/Wireshark output.



```
install@cs65438: ~/Desktop/Assignment_2
File Edit View Search Terminal Help

install@cs65438:~/Desktop/Assignment_2$ clear

install@cs65438:~/Desktop/Assignment_2$ python3 Wclient.py 10.100.240.203 5575 big.txt
-----The client is ready to send-----
('10.100.230.60', 34198)-->('10.100.240.203', 5575)
HTTP/1.1 200 OK
Date: 2/13/2022
Server: RoadRunnerServer

This is a really big file...
This is a really big file...
This is a really big file...
This is a really big file...
This is a really big file...
This is a really big file...
This is a really big file...
This is a really big file...
This is a really big file...
```

Figure 3. Web Client output.

Trial 2.

The figure displays a Wireshark packet capture and two terminal windows. The top window shows the Wireshark interface with a packet list table. The bottom-left window shows a terminal with the command to run the web server, and the bottom-right window shows the web client's output.

No.	Time	Source	Destination	Protocol	Length	Info
2115	8.535918802	10.100.230.60	10.100.240.203	TCP	74	37340 → 5575 [SYN] Seq=0 Win=1152 Len=0 MSS=1460 SACK_PERM=1 TSval=3421875817 TSecr=0 WS=1
2116	8.536389374	10.100.240.203	10.100.230.60	TCP	74	5575 → 37340 [SYN, ACK] Seq=0 Ack=1 Win=28960 Len=0 MSS=1460 SACK_PERM=1 TSval=8471051 TSecr=3421875817 WS=128
2117	8.536404411	10.100.230.60	10.100.240.203	TCP	66	37340 → 5575 [ACK] Seq=1 Ack=1 Win=1152 Len=0 TSval=3421875818 TSecr=8471051
2118	8.537431919	10.100.230.60	10.100.240.203	HTTP	184	GET /big.txt HTTP/1.1
2119	8.537676609	10.100.240.203	10.100.230.60	TCP	66	5575 → 37340 [ACK] Seq=1 Ack=119 Win=29056 Len=0 TSval=8471052 TSecr=3421875819
2120	8.540881479	10.100.240.203	10.100.230.60	HTTP	128	HTTP/1.1 200 OK
2121	8.540899937	10.100.230.60	10.100.240.203	TCP	66	37340 → 5575 [ACK] Seq=119 Ack=63 Win=1090 Len=0 TSval=3421875821 TSecr=8471052
2122	8.540324583	10.100.240.203	10.100.230.60	HTTP	501	Continuation
2127	8.540692328	10.100.240.203	10.100.230.60	HTTP	642	Continuation
2145	8.583615691	10.100.230.60	10.100.240.203	TCP	66	37340 → 5575 [ACK] Seq=119 Ack=1074 Win=79 Len=0 TSval=3421875864 TSecr=8471052
2198	8.788759754	10.100.240.203	10.100.230.60	HTTP	145	[TCP Window Full] Continuation
2199	8.788791277	10.100.230.60	10.100.240.203	TCP	66	[TCP ZeroWindow] 37340 → 5575 [ACK] Seq=119 Ack=1153 Win=0 Len=0 TSval=3421876970 TSecr=8471115
2220	8.890721390	10.100.240.203	10.100.230.60	TCP	66	[TCP Keep-Alive] 5575 → 37340 [ACK] Seq=1152 Ack=119 Win=29056 Len=0 TSval=3421876070 TSecr=3421876070
2221	8.890752255	10.100.230.60	10.100.240.203	TCP	66	[TCP ZeroWindow] 37340 → 5575 [ACK] Seq=119 Ack=1153 Win=0 Len=0 TSval=3421876278 TSecr=8471115
2455	10.244881748	10.100.240.203	10.100.230.60	TCP	66	[TCP Keep-Alive] 5575 → 37340 [ACK] Seq=1152 Ack=119 Win=29056 Len=0 TSval=8471479 TSecr=3421876278
2456	10.244906971	10.100.230.60	10.100.240.203	TCP	66	[TCP ZeroWindow] 37340 → 5575 [ACK] Seq=119 Ack=1153 Win=0 Len=0 TSval=3421877526 TSecr=8471115
2675	11.912835281	10.100.240.203	10.100.230.60	TCP	66	[TCP Keep-Alive] 5575 → 37340 [ACK] Seq=1152 Ack=119 Win=29056 Len=0 TSval=8471696 TSecr=3421877526
2676	11.912806627	10.100.230.60	10.100.240.203	TCP	66	[TCP ZeroWindow] 37340 → 5575 [ACK] Seq=119 Ack=1153 Win=0 Len=0 TSval=3421879194 TSecr=8471115
3359	15.248747882	10.100.240.203	10.100.230.60	TCP	66	[TCP Keep-Alive] 5575 → 37340 [ACK] Seq=1152 Ack=119 Win=29056 Len=0 TSval=8472730 TSecr=3421879194
3360	15.248775203	10.100.230.60	10.100.240.203	TCP	66	[TCP ZeroWindow] 37340 → 5575 [ACK] Seq=119 Ack=1153 Win=0 Len=0 TSval=3421882529 TSecr=8471115
4841	17.551062046	10.100.230.60	10.100.240.203	TCP	66	[TCP Window Update] 37340 → 5575 [ACK] Seq=119 Ack=1153 Win=1152 Len=0 TSval=3421884832 TSecr=8471115
4842	17.551563945	10.100.240.203	10.100.230.60	HTTP	428	Continuation
4857	17.559046235	10.100.230.60	10.100.240.203	TCP	66	37340 → 5575 [ACK] Seq=119 Ack=1516 Win=789 Len=0 TSval=3421884876 TSecr=8473305
4858	21.555782712	10.100.230.60	10.100.240.203	TCP	66	37340 → 5575 [FIN, ACK] Seq=119 Ack=1516 Win=789 Len=0 TSval=3421888836 TSecr=8473305
4886	21.556298934	10.100.240.203	10.100.230.60	TCP	66	5575 → 37340 [ACK] Seq=1516 Ack=120 Win=29056 Len=0 TSval=84734306 TSecr=3421888836

```
install@cs65438: ~/Desktop/Assignment_2
File Edit View Search Terminal Help

rafa455@fox03:~/Networks$ cd Assignment_1/
rafa455@fox03:~/Networks/Assignment_1$ ls
big.txt  create_large_file.sh  hello.txt  secondFile.txt  WServer.py  WServer.py.bkup  zserver.py
rafa455@fox03:~/Networks/Assignment_1$ stat --format="%s" big.txt
Source:
Dest:
Size:
Permissions:
rafa455@fox03:~/Networks/Assignment_1$ python3 WServer.py 5575
[+]Ready to serve...
Seq: GET /big.txt HTTP/1.1
Host: 10.100.240.203
New:
Accept: text/html
Connection: keep-alive
User-agent: RoadRunner/1.0
[+]Ready to serve...

0800 08
0810 08
0820 08
0830 08
0840 08
```

```
install@cs65438: ~/Desktop/Assignment_2
File Edit View Search Terminal Help

This is a really big file...
This is a really big file...
This is a really big file...
This is a really big file...
This is a really big file...

install@cs65438:~/Desktop/Assignment_2$ python3 Wclient.py 10.100.240.203 5575 big.txt
-----The client is ready to send-----
('10.100.230.60', 37340)-->('10.100.240.203', 5575)
HTTP/1.1 200 OK
Date: 2/13/2022
Server: RoadRunnerServer

This is a really big file...
This is a really big file...
This is a really big file...
This is a really big file...
This is a really big file...
This is a really big file...
```

Figure 4. Output for Wireshark, the Web Server, and the Web Client.



### Trial 3.

The figure displays three components related to a network trial:

- Wireshark Packet Capture:** A packet capture showing a series of TCP and HTTP packets between 10.100.230.60 and 10.100.240.203. The capture is filtered on 'tcp.port == 5576'. The packets include SYN, ACK, GET, and HTTP responses, with various sequence numbers and window sizes.
- Web Server Terminal:** A terminal window titled 'install@cs65438: ~/Desktop/Assignment\_2' showing the output of running 'python3 WServer.py 5576'. It displays the server's readiness to serve, the received GET request for '/big.txt', and the response headers (HTTP/1.1 200 OK, text/html).
- Web Client Terminal:** A terminal window titled 'install@cs65438: ~/Desktop/Assignment\_2' showing the output of running 'python3 Wclient.py 10.100.240.203 5576 big.txt'. It displays the client's readiness to send, the connection details, and the received response headers (HTTP/1.1 200 OK, text/html).

Figure 5. Output for Wireshark, the Web Server, and the Web Client.