



Inha University

P2P System with TCP protocol

Computer Networks[202302-ISE2232-001]
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<https://github.com/Anni-065/p2p-system.git>



OUR TEAM

Meet our amazing team



Athanasia Leontarakis

CEO OF PYTHON



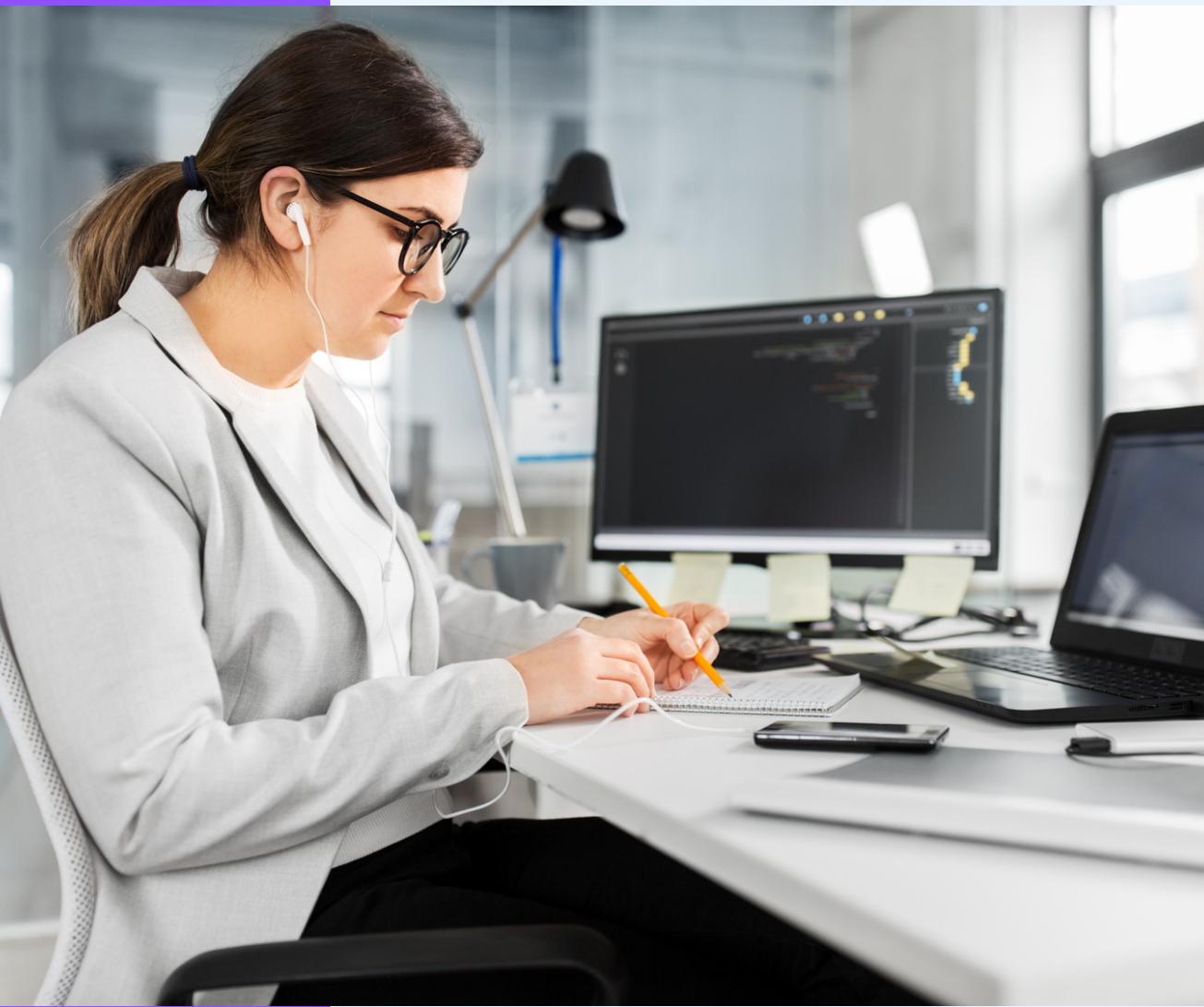
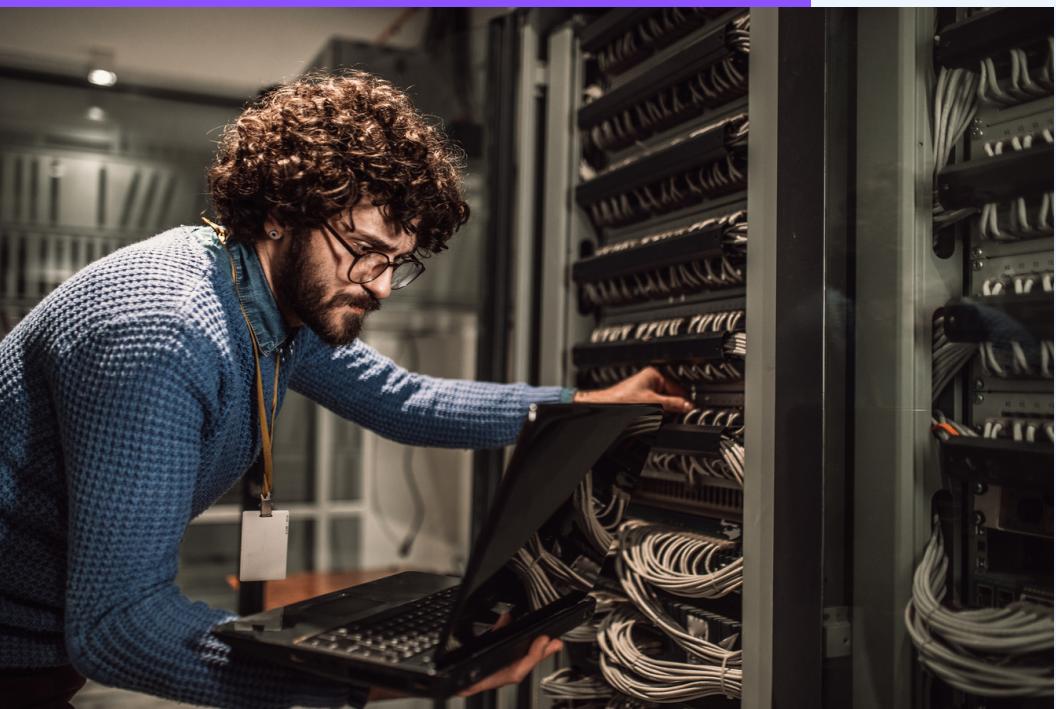
Botagoz Maya

CISCO PACKET TRACER /
PYTHON



Diyora Bobokulova

WIRESHARK / PYTHON



Content

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- 2. How to run the P2P system**
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- 5. Analysis of the network - Wireshark**

Tasks of our project:

Cisco packet tracer

WireShark

A client can send files such as images, CSV
and JSON files to other clients

A menu form selecting choices.

A client can broadcast messages
to all clients in the network

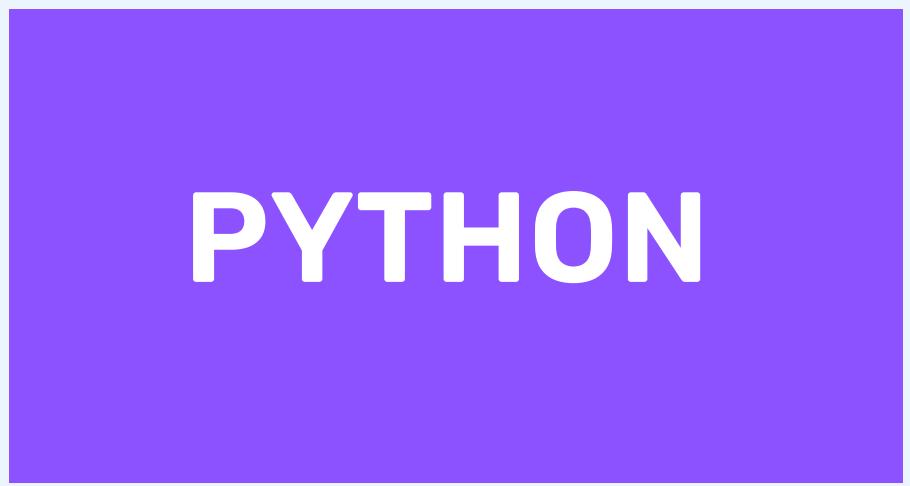
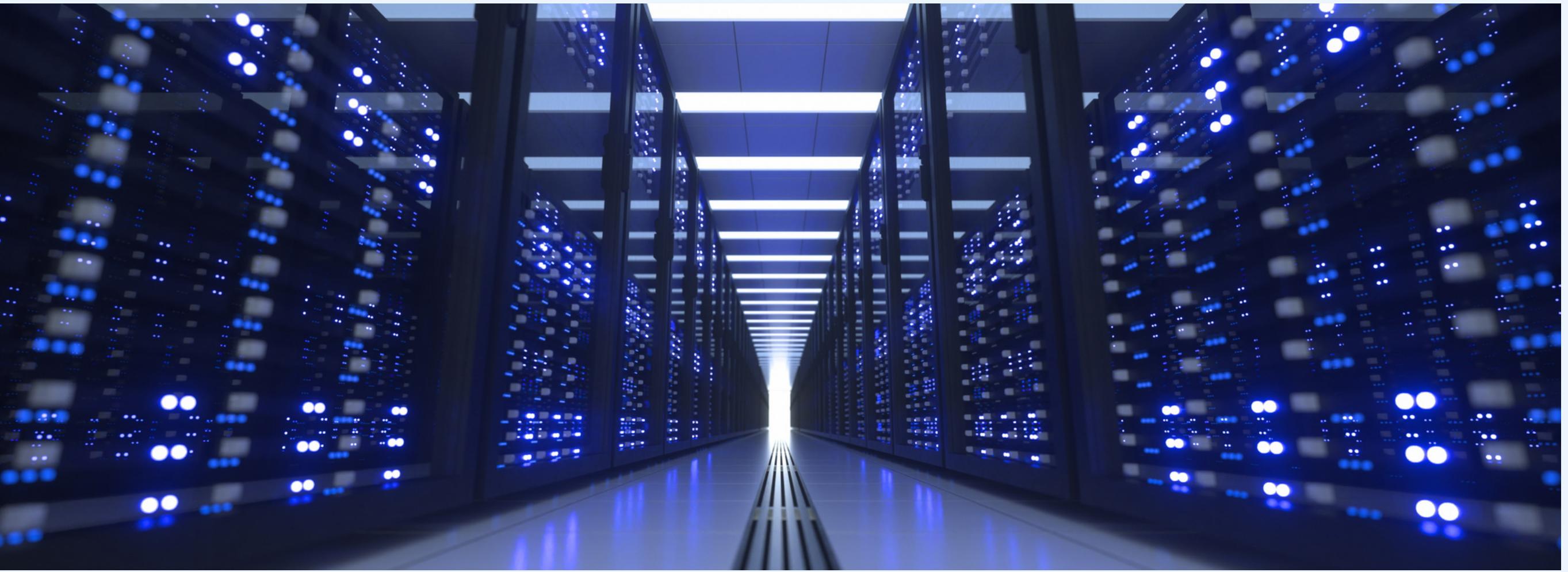
P2P System: Overview

Python 3 based on TCP protocol

Two main components:

1. P2P Tracker('tracker.py')
2. P2P Peer ('peer.py')

The system allows peers to register with a tracker, in order to connect to each other and exchange messages, and share files in an otherwise decentralized network.



P2P System: Code Output peer.py

port: 5001

```
Enter peer port: 5001
Peer localhost:5001 is now listening for connections.
Registered with tracker. Response: OK
Received from ('127.0.0.1', 60320): ''
New peer joined: localhost:5001
Enter command (ping, broadcast <message>, sendfile <filename>, exit): Peer started on
Received from ('127.0.0.1', 60330): ''
New peer joined: localhost:5003
Received from ('127.0.0.1', 60336): ''
New peer joined: localhost:5004
Received from ('127.0.0.1', 60372): 'Broadcast message: 'Hello' from localhost:5003'
File data.json received successfully
File data.json received successfully
File network.png received successfully
File wr_sensor_data.csv received successfully
|
```

port: 5003

```
Enter peer port: 5003
Peer localhost:5003 is now listening for connections.
Registered with tracker. Response: OK
Received from ('127.0.0.1', 60331): ''
New peer joined: localhost:5003'
```

port: 5004

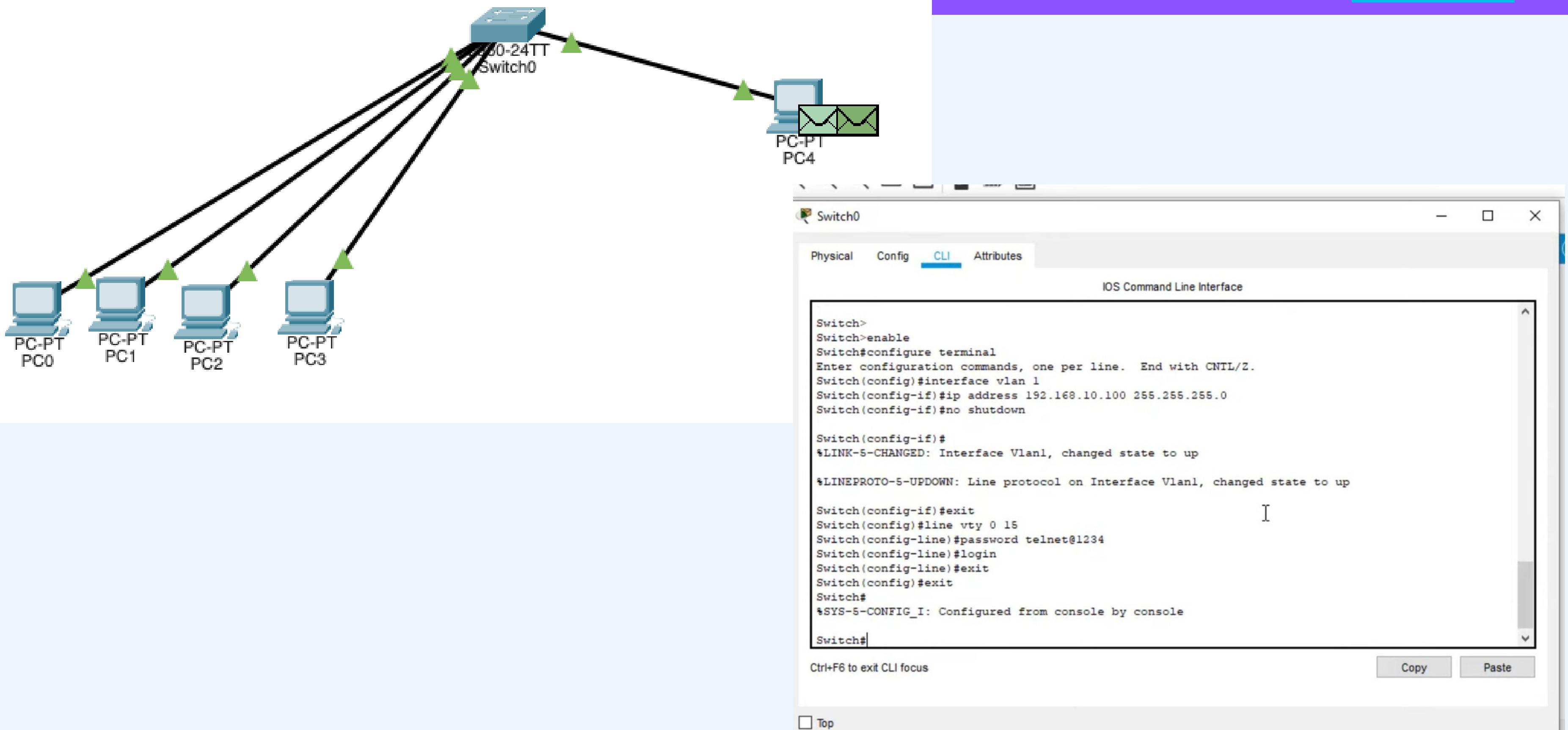
```
Enter peer port: 5004
Peer localhost:5004 is now listening for connections.
Registered with tracker. Response: OK
Received from ('127.0.0.1', 60338): ''
New peer joined: localhost:5004
|
```

P2P System: Code Output tracker.py

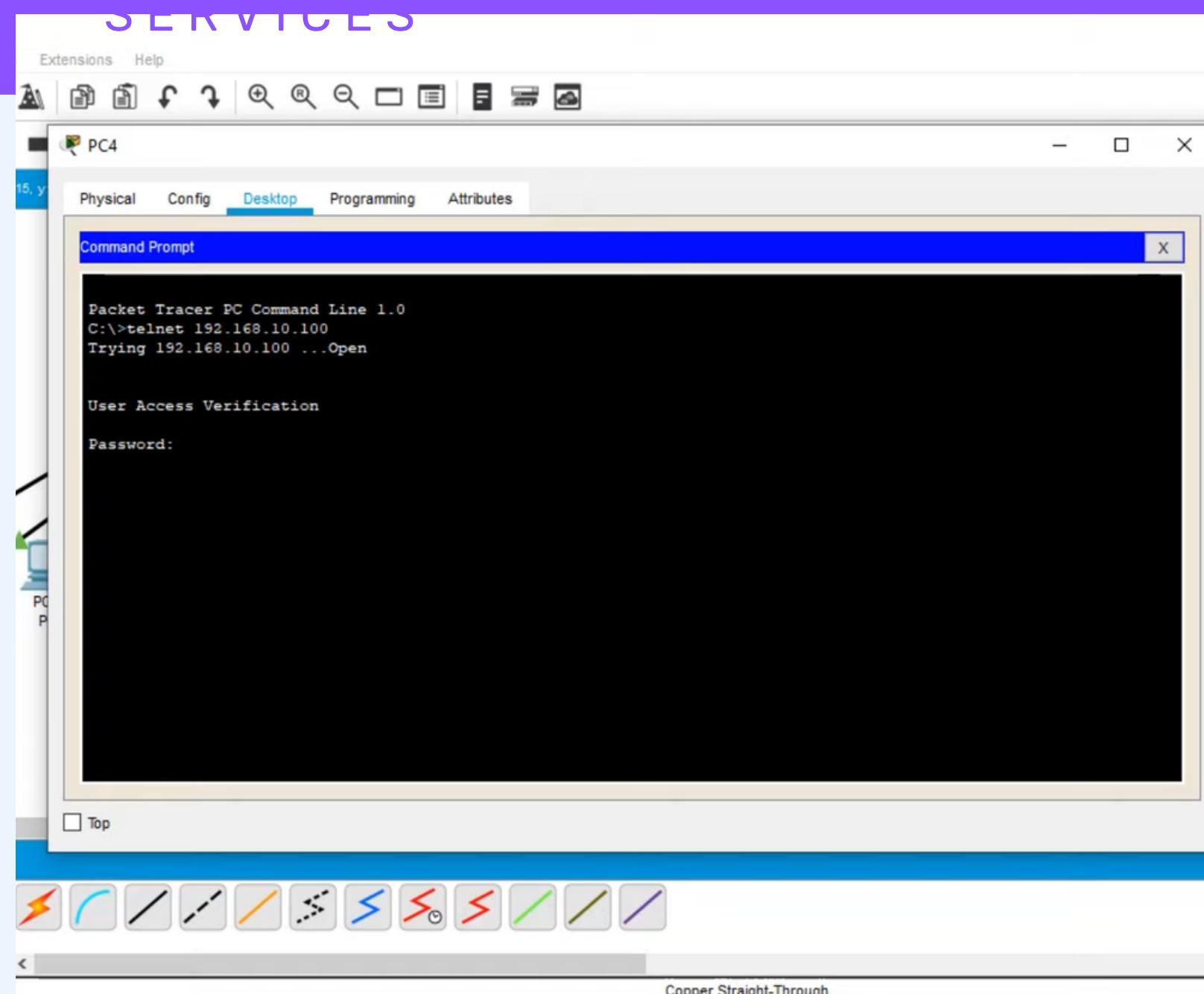
```
"C:\Users\HP Envy\PycharmProjects\pythonProject\ve
Tracker is listening on localhost:5000
New peer connected: localhost:5001
New peer connected: localhost:5003
New peer connected: localhost:5004
```

P2P System: Cisco Packet Tracer

SERVICES



P2P System: Cisco Packet Tracer



Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.001	PC4	Switch0	ARP
	0.002	Switch0	PC4	ARP
	0.002	Switch0	PC0	ARP
	0.002	Switch0	PC1	ARP
	0.002	Switch0	PC2	ARP
	0.002	Switch0	PC3	ARP
	0.002	--	PC4	TCP
	0.003	PC4	Switch0	TCP
	0.003	--	Switch0	ARP

Reset Simulation Constant Delay Captured to: 0.003 s

Wireshark

ip.addr == 127.0.0.1 && tcp.port == 5004						
lo.	Time	Source	Destination	Protocol	Length	Info
7887	99.526472	127.0.0.1	127.0.0.1	TCP	56	61518 → 5004 [SYN] Seq=0 Win=65535 Len=0 MSS=65495 WS=256 SACK_PERM
7888	99.526538	127.0.0.1	127.0.0.1	TCP	56	5004 → 61518 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=65495 WS=256 SACK_PERM
7889	99.526582	127.0.0.1	127.0.0.1	TCP	44	61518 → 5004 [ACK] Seq=1 Ack=1 Win=2161152 Len=0
7890	99.526824	127.0.0.1	127.0.0.1	TCP	76	61518 → 5004 [PSH, ACK] Seq=1 Ack=1 Win=2161152 Len=32
7891	99.526844	127.0.0.1	127.0.0.1	TCP	44	5004 → 61518 [ACK] Seq=1 Ack=33 Win=2161152 Len=0
7892	99.526872	127.0.0.1	127.0.0.1	TCP	44	61518 → 5004 [FIN, ACK] Seq=33 Ack=1 Win=2161152 Len=0
7893	99.526888	127.0.0.1	127.0.0.1	TCP	44	5004 → 61518 [ACK] Seq=1 Ack=34 Win=2161152 Len=0
7894	99.527481	127.0.0.1	127.0.0.1	TCP	44	5004 → 61518 [FIN, ACK] Seq=1 Ack=34 Win=2161152 Len=0
7895	99.527522	127.0.0.1	127.0.0.1	TCP	44	61518 → 5004 [ACK] Seq=34 Ack=2 Win=2161152 Len=0
7979	104.613240	127.0.0.1	127.0.0.1	TCP	56	61522 → 5004 [SYN] Seq=0 Win=65535 Len=0 MSS=65495 WS=256 SACK_PERM
7980	104.613352	127.0.0.1	127.0.0.1	TCP	56	5004 → 61522 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=65495 WS=256 SACK_PERM
7981	104.613486	127.0.0.1	127.0.0.1	TCP	44	61522 → 5004 [ACK] Seq=1 Ack=1 Win=2161152 Len=0
7982	104.614132	127.0.0.1	127.0.0.1	TCP	48	61522 → 5004 [PSH, ACK] Seq=1 Ack=1 Win=2161152 Len=4
7983	104.614183	127.0.0.1	127.0.0.1	TCP	44	5004 → 61522 [ACK] Seq=1 Ack=5 Win=2161152 Len=0
7984	104.615109	127.0.0.1	127.0.0.1	TCP	48	5004 → 61522 [PSH, ACK] Seq=1 Ack=5 Win=2161152 Len=4
7985	104.615144	127.0.0.1	127.0.0.1	TCP	44	61522 → 5004 [ACK] Seq=5 Ack=5 Win=2161152 Len=0
7986	104.615231	127.0.0.1	127.0.0.1	TCP	44	61522 → 5004 [FIN, ACK] Seq=5 Ack=5 Win=2161152 Len=0
7987	104.615254	127.0.0.1	127.0.0.1	TCP	44	5004 → 61522 [ACK] Seq=5 Ack=6 Win=2161152 Len=0
7988	104.615651	127.0.0.1	127.0.0.1	TCP	44	5004 → 61522 [FIN, ACK] Seq=5 Ack=6 Win=2161152 Len=0
7989	104.615695	127.0.0.1	127.0.0.1	TCP	44	61522 → 5004 [ACK] Seq=6 Ack=6 Win=2161152 Len=0
9536	124.648055	127.0.0.1	127.0.0.1	TCP	56	61529 → 5004 [SYN] Seq=0 Win=65535 Len=0 MSS=65495 WS=256 SACK_PERM
9537	124.648127	127.0.0.1	127.0.0.1	TCP	56	5004 → 61529 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=65495 WS=256 SACK_PERM
9538	124.648132	127.0.0.1	127.0.0.1	TCP	44	61529 → 5004 [ACK] Seq=1 Ack=1 Win=2161152 Len=0

Wireshark

Apply a display filter...

Packet list Case sensitive

No.	Time	Source	Destination	Protocol	Length	Info
11984	184.720797	127.0.0.1	127.0.0.1	TCP	56	5001 → 61543 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=65495 WS=256 SACK_PERM
11985	184.720842	127.0.0.1	127.0.0.1	TCP	44	61543 → 5001 [ACK] Seq=1 Ack=1 Win=2161152 Len=0
11986	184.721083	127.0.0.1	127.0.0.1	TCP	48	61543 → 5001 [PSH, ACK] Seq=1 Ack=1 Win=2161152 Len=4
11987	184.721122	127.0.0.1	127.0.0.1	TCP	44	5001 → 61543 [ACK] Seq=1 Ack=5 Win=2161152 Len=0
11988	184.721863	127.0.0.1	127.0.0.1	TCP	48	5001 → 61543 [PSH, ACK] Seq=1 Ack=5 Win=2161152 Len=4
11989	184.721891	127.0.0.1	127.0.0.1	TCP	44	61543 → 5001 [ACK] Seq=5 Ack=5 Win=2161152 Len=0
11990	184.721940	127.0.0.1	127.0.0.1	TCP	44	61543 → 5001 [FIN, ACK] Seq=5 Ack=5 Win=2161152 Len=0
11991	184.721964	127.0.0.1	127.0.0.1	TCP	44	5001 → 61543 [ACK] Seq=5 Ack=6 Win=2161152 Len=0
11992	184.722028	127.0.0.1	127.0.0.1	TCP	44	5001 → 61543 [FIN, ACK] Seq=5 Ack=6 Win=2161152 Len=0
11993	184.722075	127.0.0.1	127.0.0.1	TCP	44	61543 → 5001 [ACK] Seq=6 Ack=6 Win=2161152 Len=0
11994	184.722633	127.0.0.1	127.0.0.1	TCP	56	61544 → 5003 [SYN] Seq=0 Win=65535 Len=0 MSS=65495 WS=256 SACK_PERM
11995	184.722699	127.0.0.1	127.0.0.1	TCP	56	5003 → 61544 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=65495 WS=256 SACK_PERM
11996	184.722735	127.0.0.1	127.0.0.1	TCP	44	61544 → 5003 [ACK] Seq=1 Ack=1 Win=2161152 Len=0
11997	184.722992	127.0.0.1	127.0.0.1	TCP	48	61544 → 5003 [PSH, ACK] Seq=1 Ack=1 Win=2161152 Len=4
11998	184.723026	127.0.0.1	127.0.0.1	TCP	44	5003 → 61544 [ACK] Seq=1 Ack=5 Win=2161152 Len=0
11999	184.723344	127.0.0.1	127.0.0.1	TCP	48	5003 → 61544 [PSH, ACK] Seq=1 Ack=5 Win=2161152 Len=4
12000	184.723364	127.0.0.1	127.0.0.1	TCP	44	61544 → 5003 [ACK] Seq=5 Ack=5 Win=2161152 Len=0
12001	184.723403	127.0.0.1	127.0.0.1	TCP	44	61544 → 5003 [FIN, ACK] Seq=5 Ack=5 Win=2161152 Len=0
12002	184.723419	127.0.0.1	127.0.0.1	TCP	44	5003 → 61544 [ACK] Seq=5 Ack=6 Win=2161152 Len=0
12003	184.723487	127.0.0.1	127.0.0.1	TCP	44	5003 → 61544 [FIN, ACK] Seq=5 Ack=6 Win=2161152 Len=0
12004	184.723532	127.0.0.1	127.0.0.1	TCP	44	61544 → 5003 [ACK] Seq=6 Ack=6 Win=2161152 Len=0
12005	187.071901	127.0.0.1	127.0.0.1	TCP	56	61545 → 5001 [SYN] Seq=0 Win=65535 Len=0 MSS=65495 WS=256 SACK_PERM
12006	187.072034	127.0.0.1	127.0.0.1	TCP	56	5001 → 61545 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=65495 WS=256 SACK_PERM
12007	187.072105	127.0.0.1	127.0.0.1	TCP	44	61545 → 5001 [ACK] Seq=1 Ack=1 Win=2161152 Len=0
12008	187.083401	127.0.0.1	127.0.0.1	TCP	90	61545 → 5001 [PSH, ACK] Seq=1 Ack=1 Win=2161152 Len=46
12009	187.083524	127.0.0.1	127.0.0.1	TCP	44	5001 → 61545 [ACK] Seq=1 Ack=47 Win=2161152 Len=0
12010	187.083929	127.0.0.1	127.0.0.1	TCP	44	61545 → 5001 [FIN, ACK] Seq=47 Ack=1 Win=2161152 Len=0
12011	187.083994	127.0.0.1	127.0.0.1	TCP	44	5001 → 61545 [ACK] Seq=1 Ack=48 Win=2161152 Len=0
12012	187.084235	127.0.0.1	127.0.0.1	TCP	44	5001 → 61545 [FIN, ACK] Seq=1 Ack=48 Win=2161152 Len=0
12013	187.084369	127.0.0.1	127.0.0.1	TCP	44	61545 → 5001 [ACK] Seq=48 Ack=2 Win=2161152 Len=0
12014	190.914944	127.0.0.1	127.0.0.1	TCP	45	49690 → 49691 [PSH, ACK] Seq=2906 Ack=1 Win=8442 Len=1
12015	190.915017	127.0.0.1	127.0.0.1	TCP	44	49691 → 49690 [ACK] Seq=1 Ack=2907 Win=8197 Len=0
12016	190.915486	127.0.0.1	127.0.0.1	TCP	45	49693 → 49692 [PSH, ACK] Seq=2906 Ack=1 Win=8442 Len=1
12017	190.915547	127.0.0.1	127.0.0.1	TCP	44	49692 → 49693 [ACK] Seq=1 Ack=2907 Win=8197 Len=0
12018	190.915792	127.0.0.1	127.0.0.1	TCP	45	49693 → 49692 [PSH, ACK] Seq=2907 Ack=1 Win=8442 Len=1
12019	190.915855	127.0.0.1	127.0.0.1	TCP	44	49692 → 49693 [ACK] Seq=1 Ack=2908 Win=8197 Len=0
12020	190.916367	127.0.0.1	127.0.0.1	TCP	45	10600 → 10601 [PSH, ACK] Seq=2907 Ack=1 Win=8442 Len=1

Thank you for your
attention!