

# Assignment 10

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**Title: Write a program using UDP Sockets to enable file transfer (Script, Text, Audio and Video one file each) between two machines.**

## Theory:

UDP (User Datagram Protocol) is a connectionless transport layer protocol used in computer networking. It's one of the core members of the Internet Protocol Suite, alongside TCP (Transmission Control Protocol). UDP provides a way for applications to send messages (datagrams) to other hosts on an IP network without requiring prior communication to set up special transmission channels or data paths

## Code:

### udp\_server.py

```
import socket
MTU = 1500
ext = [".py", ".txt", ".mp3", ".mp4"]
s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)

port = 123

s.bind(('', port))

idx = 0
while True:
    data, addr = s.recvfrom(MTU)

    if data == b"END":
        break

    if data == b"transmission started":
        with open(f"output{ext[idx]}", "wb") as file:
            while True:
                data, addr = s.recvfrom(MTU)
                if data == b"transmission completed":
                    break
                file.write(data)
        print("File received!")
        c_msg = 'File transferred successfully!'
```

```

        s.sendto(c_msg.encode(), addr)
        idx += 1
    else:
        c_msg = "File transfer failed: No data received"
        s.sendto(c_msg.encode(), addr)

s.close()

```

## udp\_client.py

```

import socket

MTU = 1500
file_paths = []
print("Enter path of script file, text file, audio file and video file one by one")

for idx in range(0, 4):
    file_paths.append(input())

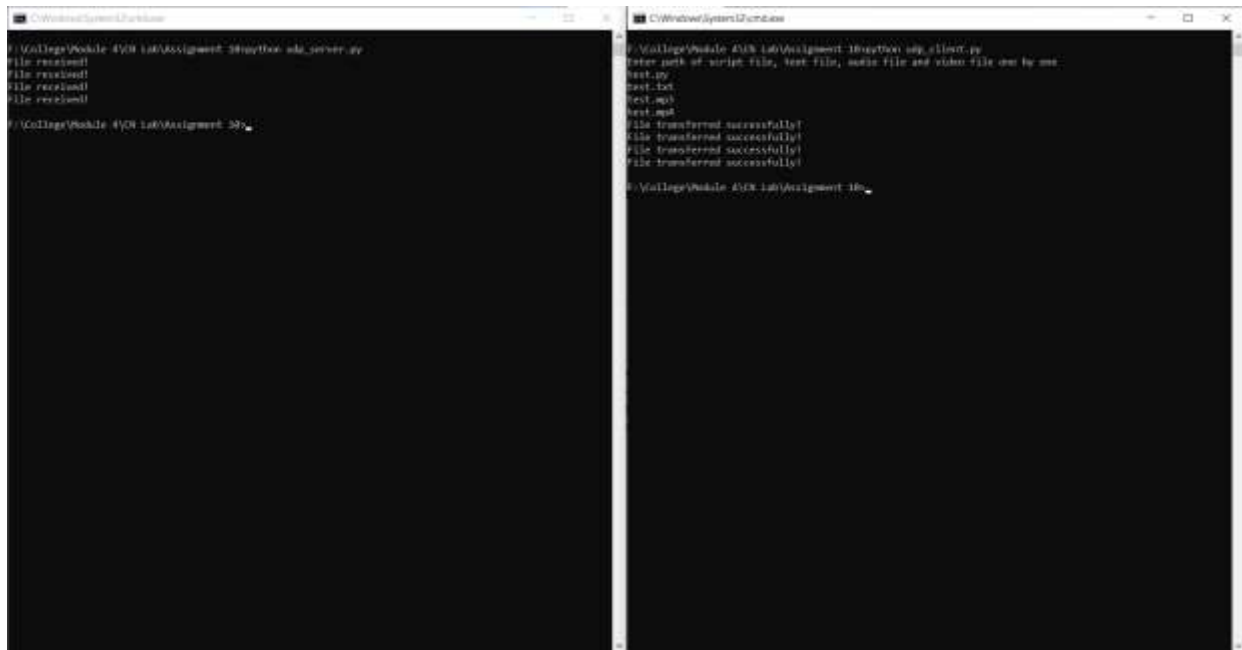
for file_path in file_paths:
    with open(file_path, "rb") as file:
        data = file.read()

    port = 123
    if data:
        s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
        start_msg = "transmission started".encode()
        end_msg = "transmission completed".encode()
        s.sendto(start_msg, ("127.0.0.1", port))
        if len(data) <= MTU:
            s.sendto(data, ("127.0.0.1", port))
            s.sendto(end_msg, ("127.0.0.1", port))
        else:
            num_packets = (len(data) - 1) // MTU + 1
            for packet_num in range(num_packets):
                start = packet_num * MTU
                end = min((packet_num + 1) * MTU, len(data))
                packet = data[start:end]
                s.sendto(packet, ("127.0.0.1", port))
            s.sendto(end_msg, ("127.0.0.1", port))

        s_msg, addr = s.recvfrom(MTU)
        print(s_msg.decode())
    else:
        print("Empty File!")
s.sendto("END".encode(), ("127.0.0.1", port))
s.close()

```

## Output:



The image shows two side-by-side terminal windows. The left window, titled 'C:\Windows\System32\cmd.exe', displays the output of a Python script 'udp\_server.py'. It shows four 'File received!' messages, indicating successful reception of four files. The right window, also titled 'C:\Windows\System32\cmd.exe', displays the output of a Python script 'udp\_client.py'. It prompts the user to enter the path of four files: 'script file', 'test file', 'audio file', and 'video file'. After each path is entered, it shows 'File transferred successfully!' messages, indicating successful transmission of all four files.

```
C:\College\Module 4\ON lab\Assignment 10>python udp_server.py
File received!
File received!
File received!
File received!
C:\College\Module 4\ON lab\Assignment 10>
```

```
C:\College\Module 4\ON lab\Assignment 10>python udp_client.py
Enter path of script file, test file, audio file and video file one by one.
test.py
test.txt
test.mp3
test.mp4
File transferred successfully!
File transferred successfully!
File transferred successfully!
File transferred successfully!
C:\College\Module 4\ON lab\Assignment 10>
```

## Conclusion:

In this assignment, we have successfully implemented file transfer using UDP and also learned about packetizing.