

CSC 361
Assignment 3

This assignment is done as the “modified P3” with both the client and server running on a terminal on the same IP address. The packet loss is done using random number instead of mininet.

The version of python used is python2.

RDP Header:

	Possible Value	Meaning
Packet type (Name)	GET	Get request packet
	SYN	Synchronisation packet
	ACK	Acknowledgment packet
	FIN	Finish packet
	MD5	MD5SUM packet
Sequence Number		Packet sequence number
Acknowledgment Number		Packet acknowledgement number
Payload		Payload data

Working mechanism:

The server and client are set running on the same IP address. The UDP sockets are used for both ends. The packets are created using strings and the different values are separated using commas (the commas in the file itself are handled by combining the separated chunks of payload with commas).

The client sends a SYN packet to the server. The server responds back with an ACK. The client sends back another ACK. This completes our three-way handshake.

The client sends a GET request for a file from the server. This is taken from the command line argument. The server locates the file and sends it to the client by creating a list of words of size 1000 bytes from the file. The 1000 bytes serves as the payload length. The payload along with the name, sequence number and acknowledgment number form the header. The packets are sent continuously to the client till all the data is sent and received. After the sending is complete the server sends a FIN packet telling the client that it is the end of the transmission. The client sends back an ack telling the server that all the data has been received successfully.

The server takes the argument “TRUE” for the packet loss. If the argument does not equal “TRUE” then packet loss does not exist on the network.

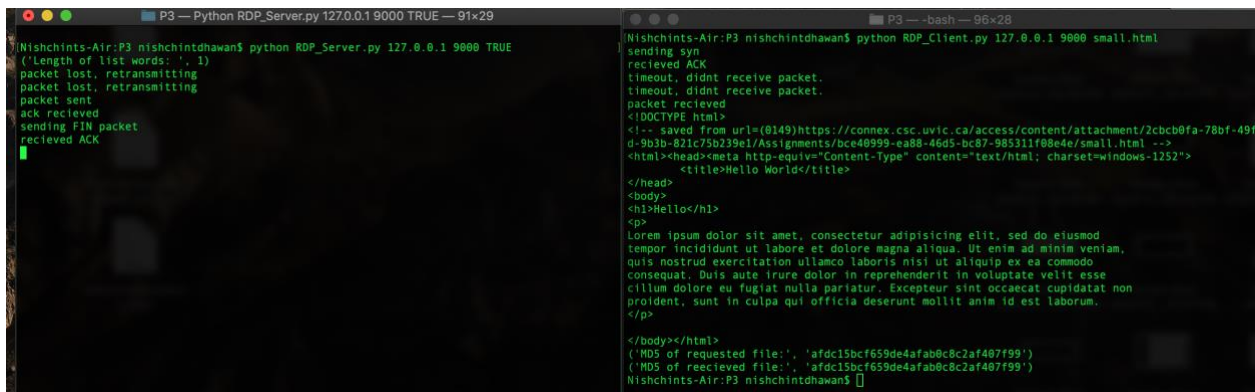
The client creates the file “received_file.txt” to store the server’s content.

PACKET LOSS:

The socket timeout is used to handle lost packets. On the server side, the packet is lost when the random number is less than 5. In such case, the server does not send a packet to the client but waits for the acknowledgment of that packet. As the client keeps waiting for the packet, it doesn’t send any acknowledgement back. The client and then the server times out which indicates the packet is lost. The server retransmits the packet.

FILE CHECKING:

The file is checked to be equal using the md5sum. The server sends the md5 sum before sending the file to the client. This is in form of a md5 packet. After receiving the entire file, the client evaluates the md5 of its own and compares it with the md5 of the original file. If the values are equal, then the contents are same. Hence, the data is successfully received.



```
Nishchints-Air:P3 nishchintdhawan$ python RDP_Server.py 127.0.0.1 9000 TRUE
('Length of list words:', 1)
packet lost, retransmitting
packet lost, retransmitting
packet sent
ack received
sending FIN packet
received ACK

Nishchints-Air:P3 nishchintdhawan$ python RDP_Client.py 127.0.0.1 9000 small.html
receiving syn
received ACK
timeout, didnt receive packet.
timeout, didnt receive packet.
packet received
<!DOCTYPE html>
<!-- saved from url=(0149)https://connex.csc.uvic.ca/access/content/attachment/2c9cb0fa-78bf-49f1-d-9b3b-821c75b239e1/Assignments/bce40999-ea88-46d5-bc87-985311f08e4e/small.html -->
<html><head><meta http-equiv="Content-Type" content="text/html; charset=windows-1252">
<title>Hello World</title>
</head>
<body>
<h1>Hello</h1>
<p>
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod
tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam,
quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo
consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse
cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non
proident, sunt in culpa qui officia deserunt mollit anim id est laborum.
</p>
</body></html>
('MD5 of requested file:', 'afdc15bcf659de4afab0c8c2af407f99')
('MD5 of received file:', 'afdc15bcf659de4afab0c8c2af407f99')
Nishchints-Air:P3 nishchintdhawan$
```

The server side on the left takes in the argument TRUE for packet loss.

Link to the video :

<https://drive.google.com/file/d/1-fieOhi87RmpEbL5noa7oU3ojPjj5Jrl/view?usp=sharing>