Network Design : Principles, Protocols and Applications

EECE.5830 – 201

Instructor: *Prof. Dr. Vinod Vokkarane*

Programming Project Phase 3: Implementing RDT 2.2 over an unreliable UDP channel with bit-errors

By,

- *Naga Ganesh Kurrapati*
- *Ritesh Dumpala Basaveswara*

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I. UDP Client

Class name: UDPClient

Purpose: The purpose of this class is to send data (.bmp file) from the client to server which is read through a input file stream, send the file through a UDP datagram socket, to receive the response (.bmp file) from the server and to write it to an output file stream.

Data types:

ByteBuffer: Stores a copy of bytes of the file from the file channel.

Byte[]: It is an array of bytes of a file used to pass the data through the datagram channel.

Int[]: It is a primitive data type and holds a 32 bit signed integer value.

Boolean[]: Expression when evaluated returns a Boolean value: either a true or a false.

Short[]: It is a 16-bit signed two's compliment integer.

Methods used :

make_pkt() : Creates a packet containing the data

udt_send() : Packet is sent using this operation (Unreliable)

rdt_send() : Packet is sent using this operation (Reliable)

notcorrupt(): This method is used to find whether the received packet is corrupted or not.

isACK(): To check if the correct acknowledgement is received.

CheckSum(): To calculate Checksum. Purpose is to detect errors which may have been introduced during transmission (here errors are introduced in the Client or server).

rdt_rcv(): Packet is received using this operation (In this case, the ACK packet is received) (Reliable).

II. UDP Server

Class name: UDPServer

Purpose: The purpose of this file is to receive data (.bmp file) from the client through an UDP data gram socket which is written to an output file stream, send the response (.bmp file) to the client which is read from output file stream.

Data types:

ByteBuffer: Stores a copy of bytes of the file from the file channel.

Byte[]: It is an array of bytes of a file used to pass the data through the datagram channel.

Int[]:It is a primitive data type and holds a 32 bit signed integer value.

Boolean[]:Expression when evaluated returns a Boolean value: either a true or a false.

Long[]: It is a 64-bit two's compliment integer. We use this data type when we need a range of values wider than those provided by int.

Short[]: It is a 16-bit signed two's compliment integer.

Methods used :

extract() : Removes the data from the packet.

rdt_rcv() : Receives a packet from the underlying channel (Here the data packet is received) (Reliable).

deliver_data() : Passes the data to the upper layer.

Notcorrupt():This method is used to find whether the received packet is corrupted or not.

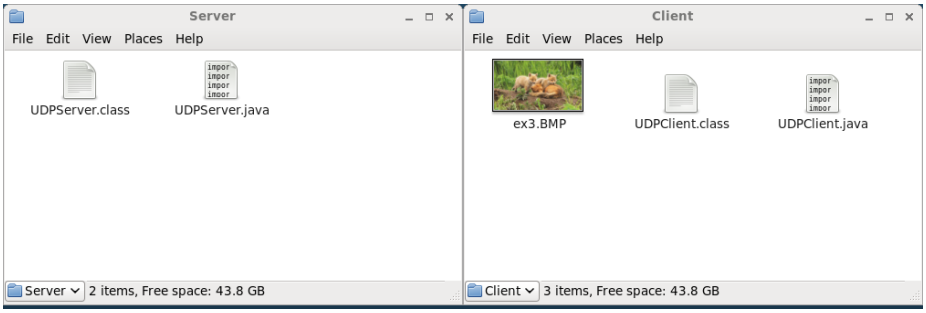
CheckSum(): To calculate Checksum. Purpose is to detect errors which may have been introduced during transmission (here errors are introduced in the Client or server).

make_pkt(): Creates a packet containing the data(Here ACK)

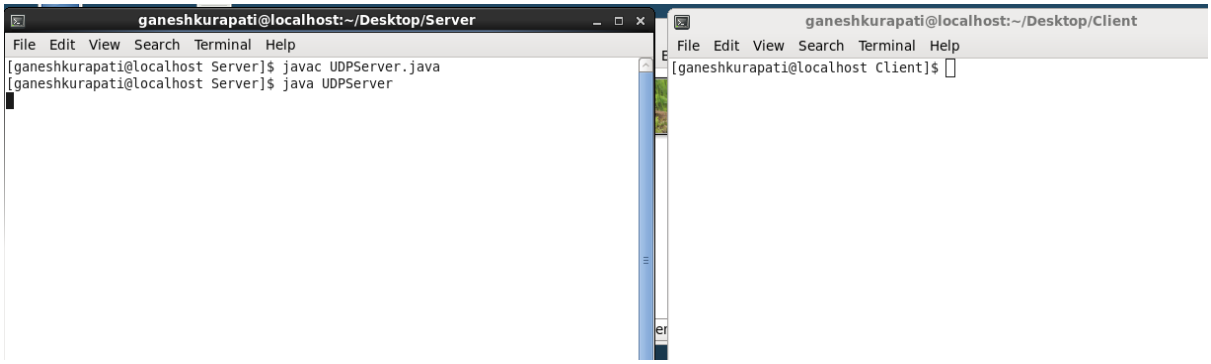
udt_send(): Packet is sent using this operation (Unreliable)

III. Execution of the program

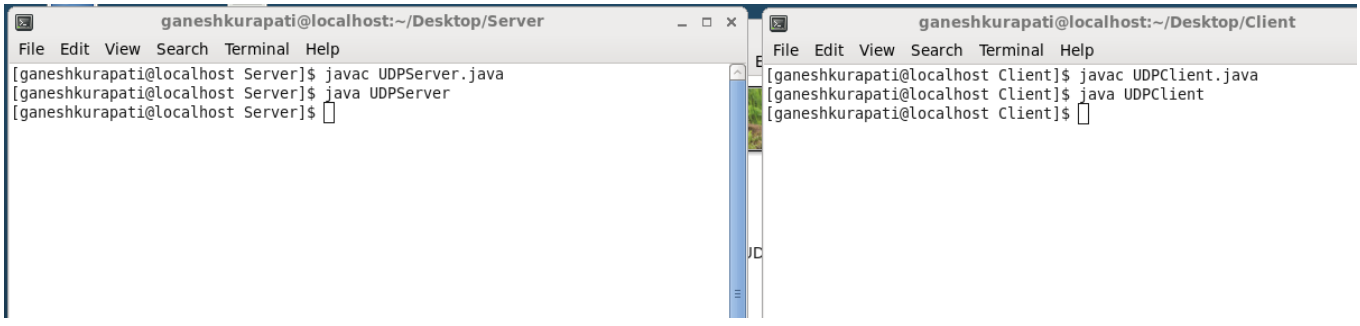
1. Initial contents of the Client and Server folders



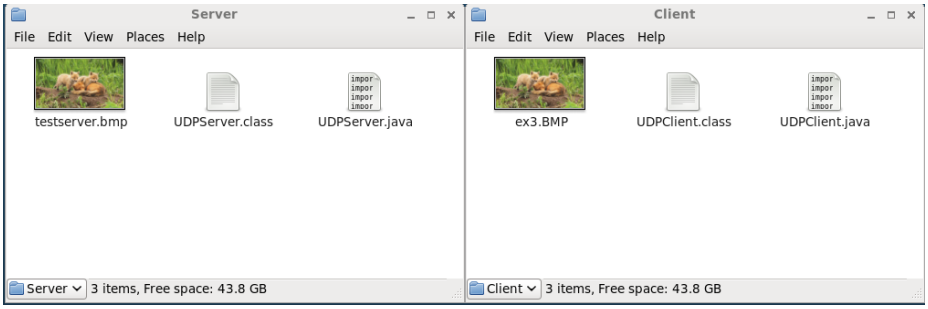
2. Setting up the server by executing the UDPServer program



3. Setting up the client by executing the UDPClient program



4. Final contents of the folder after sending and receiving the .bmp file



5. Graphs showing the % Packet loss and % ACK Loss