CSCI65103 Project #2 : Developing a Reliable Data Transfer Protocol

Implementing algorithms TCP TAHOE & TCP RENO

Components of the Project:

This project consists of 5 java files:

1. Receiver.java
2. Sender.java
3. Packet.java
4. Windowpacket.java
5. Fcntcp.java
6. Getchecksum.java (used CRC32 algorithm to compute the checksum)

Fcntcp.java is the main file which will be used to execute the program.

The message format is as follows:

Windowpacket: (1024 bytes)

Acknowledgement
Duplicateack count
Timestamp
Datapacket (512 bytes + header)

Each Datapacket has the following format: (512 bytes + header information added)

Source Port (16)
Destination Port (16)
Sequence number(32)
Acknowledgement number(32)
ControlField (1 byte each)
Checksum (16)
EOF (1 byte)
Data (512 bytes)

The program executes in 2 phases:

1. Slow start
2. Congestion avoidance

The congestion window is linearly increase during slow start and when it reached the ssthresh (threshold value);

In TCP TAHOE:

Ssthresh is reduced to half of the congestion window & congestion window is reduced to 1.

In TCP RENO:

Ssthresh is assigned the value of congestion window & Congestion window is reduced to half its size.

Program Flow:

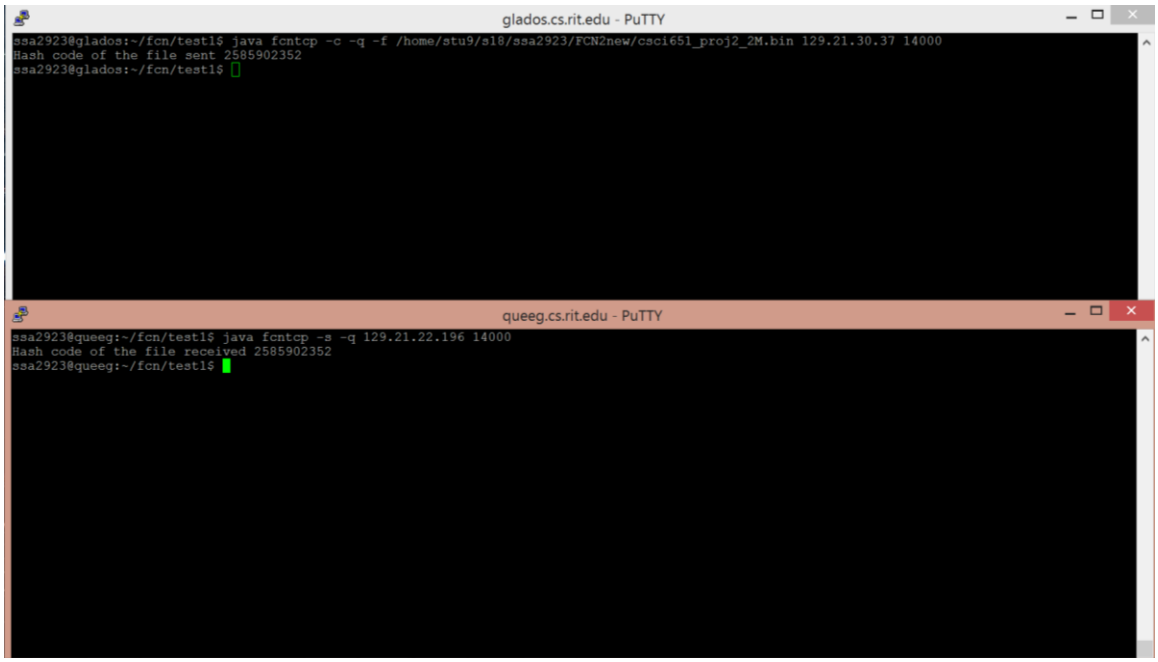
The program starts with class fcntcp.java which first starts the Receiver (simulated at queeg system) & then the Sender (simulated at Glados system).

Use Case:

1. Use case - ideal network

   Java fcntcp –s 129.21.22.196 14000 (receiver,queeg)

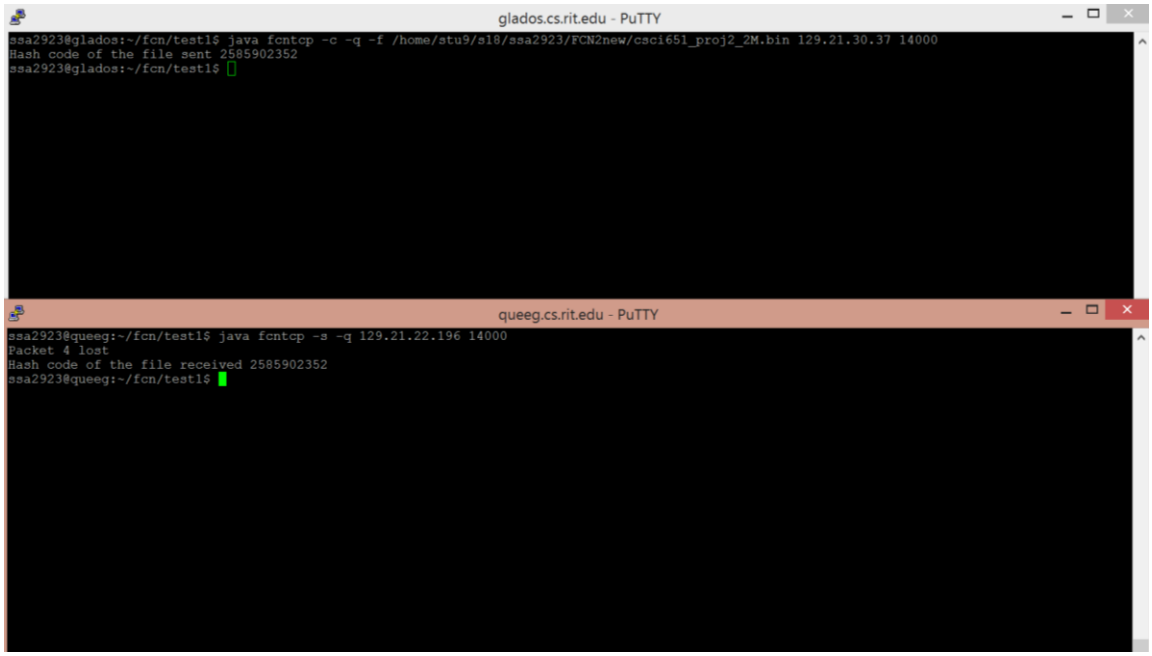
   Java fcntcp –c –f test.txt 129.21.30.37 14000 (sender,glados)



2) & 5) Use Case - network with loss and re-ordering of packets (Simulated by losing some packets on the way to the receiver)

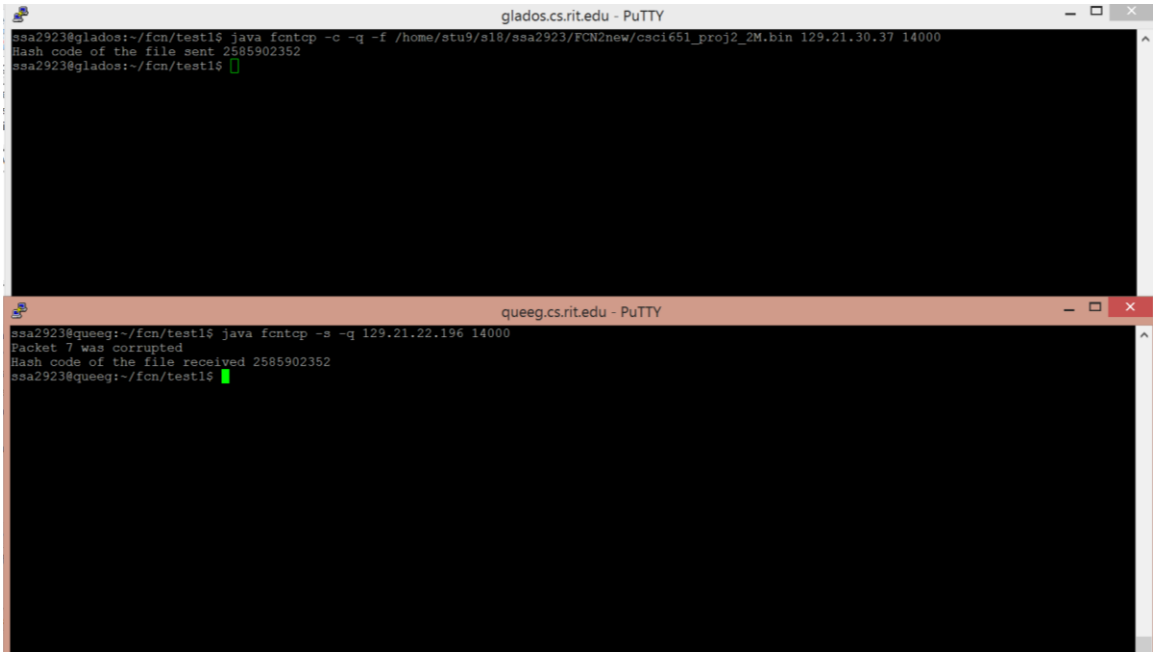
Java fcntcp –s 129.21.22.196 14000 (receiver,queeg)

Java fcntcp –c –f test.txt 129.21.30.37 14000 (sender,glados)



3) Use Case - network with corruption (Simulated by corrupting packets in the network)

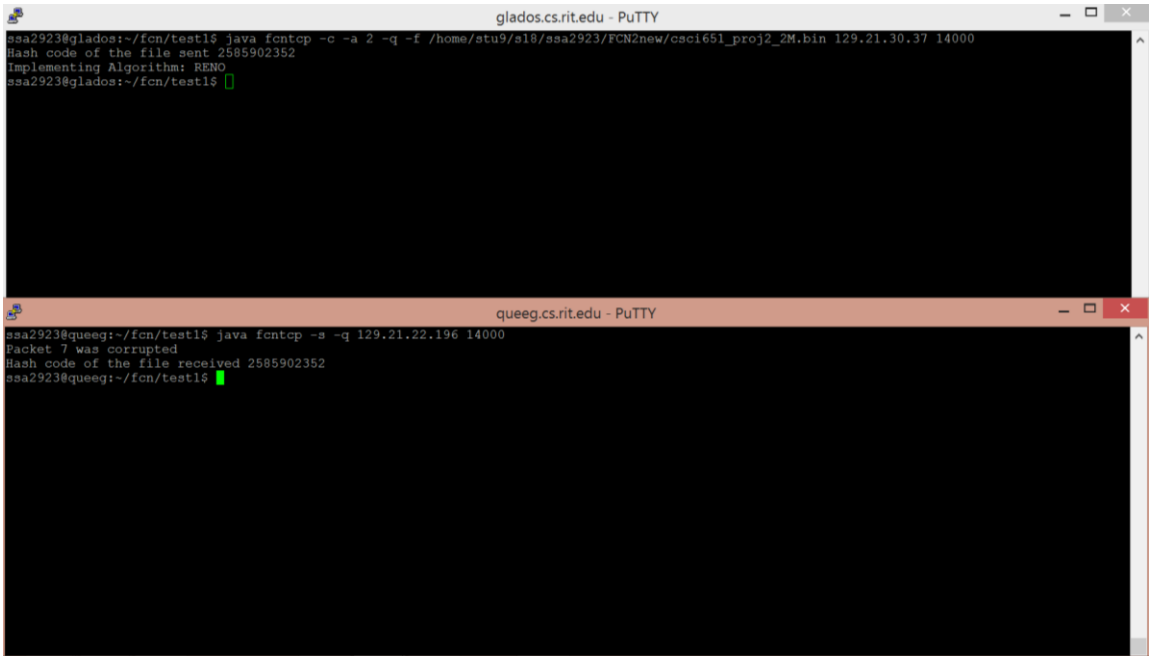
Using same commands to execute



4) Use Case – Using TCP Reno with network corruption and data loss (here packet 4 is lost and packet 7 is corrupted)

Java fcntcp –s **–a 2** 129.21.22.196 14000 (receiver,queeg)

Java fcntcp –c **–a 2** –f test.txt 129.21.30.37 14000 (sender,glados)


glados.cs.rit.edu - PuTTY
ssa2923@glados:~/fcn/test1$ java fcntcp -c -a 2 -q -f /home/stu9/s18/ssa2923/FCN2new/csci651_proj2_2M.bin 129.21.30.37 14000
Hash code of the file sent 2585902352
Implementing Algorithm: RENO
ssa2923@glados:~/fcn/test1$
queeg.cs.rit.edu - PuTTY
ssa2923@queeg:~/fcn/test1$ java fcntcp -s -q 129.21.22.196 14000
Packet 7 was corrupted
Hash code of the file received 2585902352
ssa2923@queeg:~/fcn/test1$