Assignment - Distributed Systems

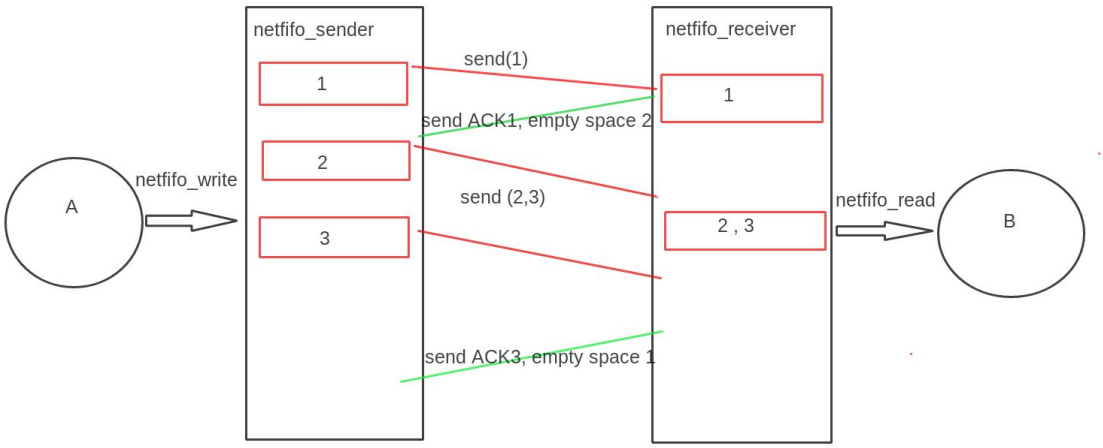
##Design a protocol for transfer data under a FIFO pipe with UDP/IP connection##

API:

1. int netfifo_rcv_open(int *port, int bufsize) : open reading side of the pipe,returns file descriptor.
2. int netfifo_read(int fd, void *buf, int len) : Read data from pipe.
3. int netfifo_rcv_close(int fd) : close reading side of pipe.
4. int netfifo_snd_open(char *ipaddr, int port, int bufsize): open writing side of the pipe, returns file descriptor.
5. int netfifo_write(int fd, void *buf, int len): write data to pipe.
6. int netfifo_snd_close(int fd): close writing side of pipe .

Protocol:

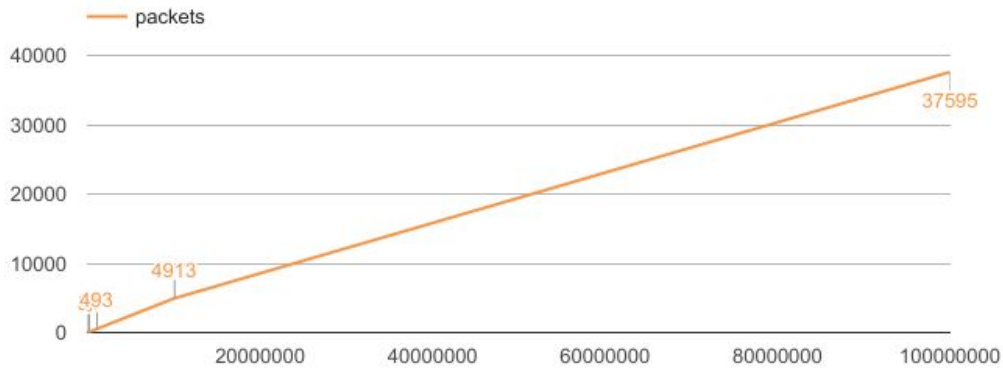
- Send 1 packet (for the first time)
- Wait for ACK
- Receiver send ACK and advertise free buffer space
- Sender send -free buffer space- number of packets!

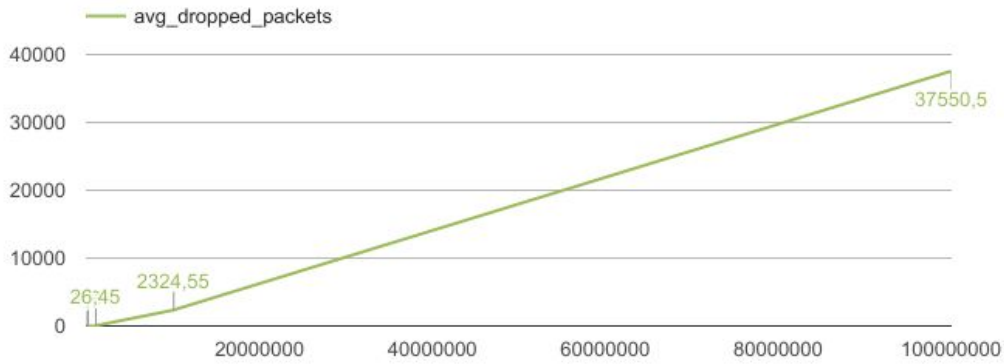


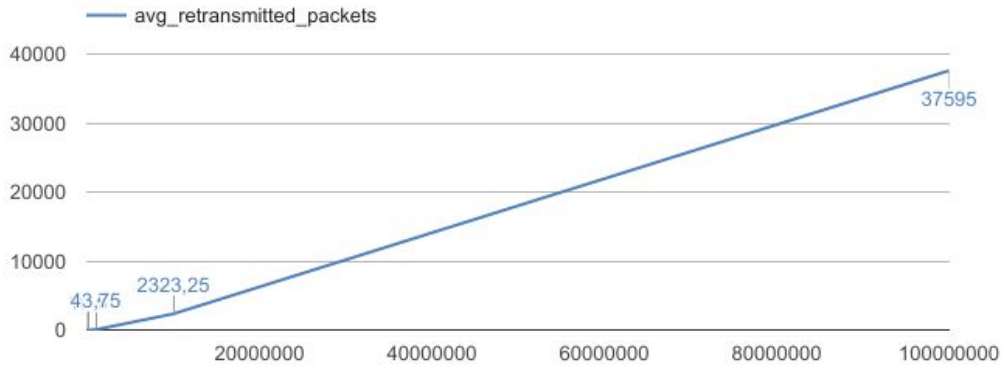
*****protocol conventions:***

1. receive timeout: 0.4 second
2. Max -free buffer space-: 15 packets

Measurements and Graphs:







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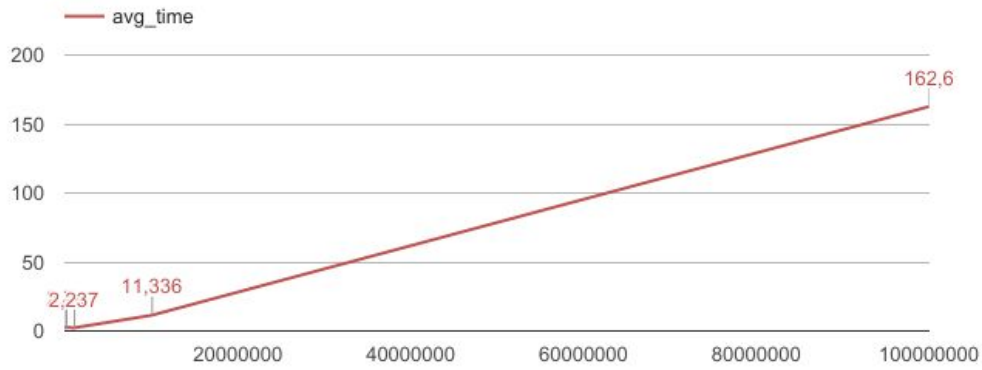

3 things that matter for a quick and reliable data transfer over network.

1. Size of slicing window
2. timeout
3. busy or not network (downloading,streaming parallel with transfer in fifo pipe etc..)

Each of them play a decisive role, but a 10% increase of slicing window does not mean 10% decrease of time for the file to transfer between two clients.

Conclusion:

after many measurements in busy/not busy network:

1. *losses packets/ application running time more effective for timeout ~= 0.4 s.*
2. *Free buffer space >> 15 means more retransmitted and dropped packets.*
3. *Free buffer space << 15 → increase application running time.*