Netze und Verteilte Systeme

Programmierprojekt

Dmitrii Polianskii, Lukas Lamminger

Universität Salzburg

Description

Usage TX

C:

```
./TX portTX portRX packet_size packet_block_size send_delay file_name
```

java:

```
java TX portTX portRX packet_size packet_block_size send_delay file_name
```

- **portTX** - port to recieve acknowlegments (default: 4700)
- **portRX** - port to send datagrams (default: 4711)
- **packet_size** - size of a packet in Bytes (default: 1000)
- **packet_block_size** - amount of packets between delay (default: 100)
- **send_delay** - delay in microsec between blocks (default: 200)
- **file_name** - name of a file to transmit (default: to_send.jpg)

Usage RX

C:

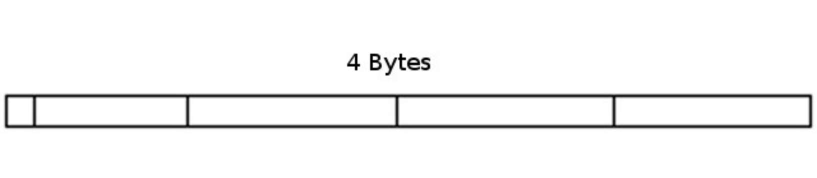
```
./RX portTX portRX
```

java:

```
java portRX portRX
```

- **portTX** - port to send acknowlegments (default: 4700)
- **portRX** - port to recieve datagrams (default: 4711)

Header structure



A header consists of 4 bytes.

First bit is used to indicate the last packet.

31 bits left for sequence number

TX description

TX description

1. Read file
    1.1 Read file in buffer
    1.2 Calculate CRC32 and add to filebytes
    1.3 Split filebytes in packages
2. Initialize UPD Socket
3. Initialize Acknowlegments array to obtain transmitted packets
4. Transmit one block of packets
    4.1 For every packet in block check if acknolegment was recieved, if not - send a packet.
    4.2 If last packet is reached, then start with first again,
5. Wait for acknowlegments {DELAY} microseconds.
    5.1 Write every sequence number from acknowlegment packet in Acknowlegments array,
    5.2 If all packets were acknowlegment - end transmission. Else - goto punkt 4.

RX description

RX description

1. Initialize UPD Socket
2. Listen for incomming packages
   2.1 Write databits from package in a memory
   2.2 If last-package-bit was seen, the size of file and Amount of packets can be defined.
   2.3 If not all of package were recieved, then goto punkt 2.
3. Assemble a file
4. Calculate CRC32 and compare with recieved one.

Tests

TX.c to RX.c: Manipulate delays

File size	Packet size (Bytes)	Block size (packets)	Delay (microseconds)	Elapsed time (s)	Speed (Mbps)
100Kb	1000	100	200	0.023	62,8
100Kb	1000	100	50	0,009	111,1
100Kb	1000	100	10	0.01	124,2
1Mb	1000	100	200	0,118	76,5
1Mb	1000	100	50	0,087	103,1
1Mb	1000	100	10	0,127	71,3
10Mb	1000	100	200	1,863	45,7
10Mb	1000	100	50	1,618	52,1
10Mb	1000	100	10	1,813	48,8

TX.c to RX.c

TX.c to RX.c: Manipulate with size of packet

File size	Packet size (Bytes)	Block size (packets)	Delay (microseconds)	Elapsed time (s)	Speed (Mbps)
100Kb	1000	100	50	0,009	111,1
100Kb	10000	100	50	0.001	278,2
1Mb	1000	100	50	0,087	103,1
1Mb	10000	100	50	0,020	432,4
1Mb	65000	100	50	0,010	1003,7
10Mb	1000	100	50	1,618	52,1
10Mb	10000	100	50	0,170	498,1
10Mb	65000	100	50	0,079	1065,4

TX.c to RX.c

TX.c to RX.c: Manipulate with size of block

File size	Packet size (Bytes)	Block size (packets)	Delay (microseconds)	Elapsed time (s)	Speed (Mbps)
100Kb	1000	100	50	0,009	111,1
100Kb	1000	500	50	0,010	96,8
1Mb	1000	50	50	0,122	79,3
1Mb	1000	100	50	0,087	103,1
1Mb	1000	500	50	0,112	81,3
10Mb	1000	50	50	2,773	30,9
10Mb	1000	100	50	1,618	52,1
10Mb	1000	500	50	1,380	63,7
10Mb	1000	2000	50	1,307	67,7

TX.c to RX.c

TX.c to RX.c: Best results

File size	Packet size (Bytes)	Block size (packets)	Delay (microseconds)	Elapsed time (s)	Speed (Mbps)
100Kb	65000	100	50	0,001	511,7
1Mb	65000	100	50	0,010	1003,7
10Mb	65000	200	50	0,069	1100,5