## Part B

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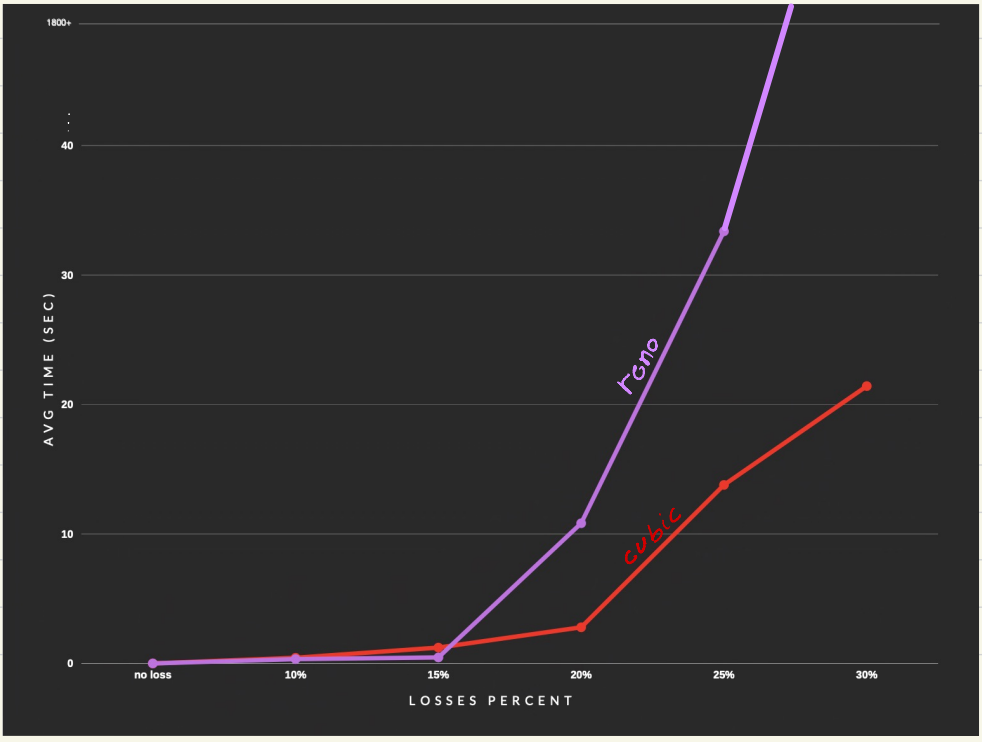
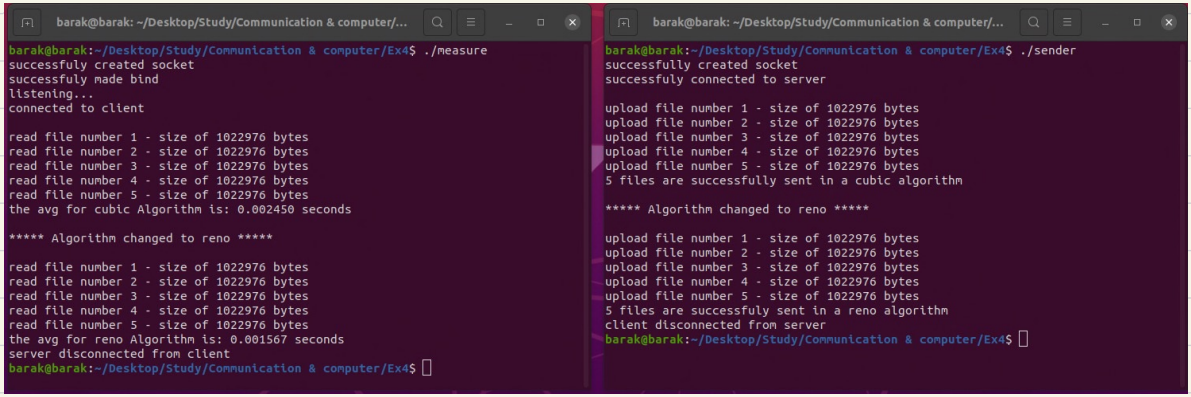
| Losses Percent | "Cubic" algorithm | "reno" algorithm |
|---|---|---|
| No loss | 0.002450 sec | 0.001567 sec |
| 10 % | 0.438419 sec | 0.335935 sec |
| 15 % | 1.225418 sec | 0.465378 sec |
| 20 % | 2.792240 sec | 10.829962 sec |
| 25 % | 13.790518 sec | 33.380596 sec |
| 30 % | 21.423521 sec | more then 40 m |



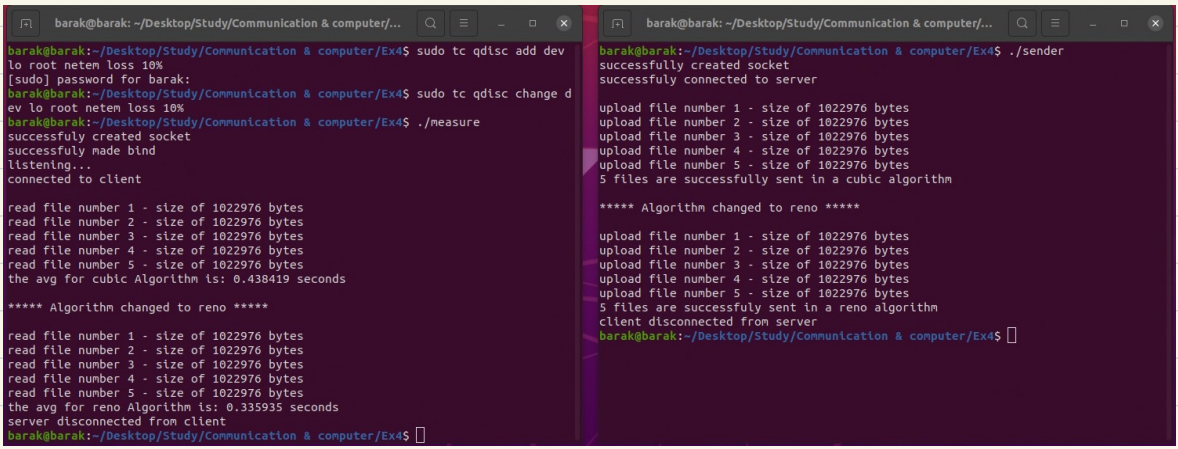
בניגוד לצפוי כי אלגוריתם "reno" יהיה מהיר יותר מאלגוריתם "cubic" עד 15% מאחוז הפקטות
אך הפרש התוצאות היה כי קטן, מ- 20% מאחוז הפקטות "cubic" היתרה יותר מאשר
ב "reno" ההפך כאשר בהפרש תוצאות גדולות משלוש

# Screen shots

## No loss




## 10% loss



## 15 % losses

```
barak@barak: ~/Desktop/Study/Communication & computer/...
barak@barak:~/Desktop/Study/Communication & computer/Ex4$ sudo tc qdisc change d
ev lo root netem loss 15%
barak@barak:~/Desktop/Study/Communication & computer/Ex4$ ./measure
successfuly created socket
successfuly made bind
listening...
connected to client

read file number 1 - size of 1022976 bytes
read file number 2 - size of 1022976 bytes
read file number 3 - size of 1022976 bytes
read file number 4 - size of 1022976 bytes
read file number 5 - size of 1022976 bytes
the avg for cubic Algorithm is: 1.225918 seconds

***** Algorithm changed to reno *****

read file number 1 - size of 1022976 bytes
read file number 2 - size of 1022976 bytes
read file number 3 - size of 1022976 bytes
read file number 4 - size of 1022976 bytes
read file number 5 - size of 1022976 bytes
the avg for reno Algorithm is: 0.465378 seconds
server disconnected from client
barak@barak:~/Desktop/Study/Communication & computer/Ex4$
```

```
barak@barak: ~/Desktop/Study/Communication & computer/...
barak@barak:~/Desktop/Study/Communication & computer/Ex4$ ./sender
successfully created socket
successfuly connected to server

upload file number 1 - size of 1022976 bytes
upload file number 2 - size of 1022976 bytes
upload file number 3 - size of 1022976 bytes
upload file number 4 - size of 1022976 bytes
upload file number 5 - size of 1022976 bytes
5 files are successfully sent in a cubic algorithm

***** Algorithm changed to reno *****

upload file number 1 - size of 1022976 bytes
upload file number 2 - size of 1022976 bytes
upload file number 3 - size of 1022976 bytes
upload file number 4 - size of 1022976 bytes
upload file number 5 - size of 1022976 bytes
5 files are successfuly sent in a reno algorithm
client disconnected from server
barak@barak:~/Desktop/Study/Communication & computer/Ex4$
```

עד כאן (15%) אלגוריתם "reno" יותר טוב מאלגוריתם "cubic"

## 20 % losses

```
barak@barak: ~/Desktop/Study/Communication & computer/...
barak@barak:~/Desktop/Study/Communication & computer/Ex4$ sudo tc qdisc change d
ev lo root netem loss 20%
barak@barak:~/Desktop/Study/Communication & computer/Ex4$ ./measure
successfuly created socket
successfuly made bind
listening...
connected to client

read file number 1 - size of 1022976 bytes
read file number 2 - size of 1022976 bytes
read file number 3 - size of 1022976 bytes
read file number 4 - size of 1022976 bytes
read file number 5 - size of 1022976 bytes
the avg for cubic Algorithm is: 2.792240 seconds

***** Algorithm changed to reno *****

read file number 1 - size of 1022976 bytes
read file number 2 - size of 1022976 bytes
read file number 3 - size of 1022976 bytes
read file number 4 - size of 1022976 bytes
read file number 5 - size of 1022976 bytes
the avg for reno Algorithm is: 10.829962 seconds
server disconnected from client
barak@barak:~/Desktop/Study/Communication & computer/Ex4$
```

```
barak@barak: ~/Desktop/Study/Communication & computer/...
barak@barak:~/Desktop/Study/Communication & computer/Ex4$ ./sender
successfully created socket
successfuly connected to server

upload file number 1 - size of 1022976 bytes
upload file number 2 - size of 1022976 bytes
upload file number 3 - size of 1022976 bytes
upload file number 4 - size of 1022976 bytes
upload file number 5 - size of 1022976 bytes
5 files are successfully sent in a cubic algorithm

***** Algorithm changed to reno *****

upload file number 1 - size of 1022976 bytes
upload file number 2 - size of 1022976 bytes
upload file number 3 - size of 1022976 bytes
upload file number 4 - size of 1022976 bytes
upload file number 5 - size of 1022976 bytes
5 files are successfuly sent in a reno algorithm
client disconnected from server
barak@barak:~/Desktop/Study/Communication & computer/Ex4$
```

מכאן ואילך (20%) אלגוריתם "cubic" יותר טוב מאלגוריתם "reno"

25 % losses

```
barak@barak: ~/Desktop/Study/Communication & computer/...
barak@barak:~/Desktop/Study/Communication & computer/Ex4$ sudo tc qdisc change d
ev lo root netem loss 25%
barak@barak:~/Desktop/Study/Communication & computer/Ex4$ ./measure
successfully created socket
successfuly made bind
listening...
connected to client

read file number 1 - size of 1022976 bytes
read file number 2 - size of 1022976 bytes
read file number 3 - size of 1022976 bytes
read file number 4 - size of 1022976 bytes
read file number 5 - size of 1022976 bytes
the avg for cubic Algorithm is: 13.790518 seconds

***** Algorithm changed to reno *****

read file number 1 - size of 1022976 bytes
read file number 2 - size of 1022976 bytes
read file number 3 - size of 1022976 bytes
read file number 4 - size of 1022976 bytes
read file number 5 - size of 1022976 bytes
the avg for reno Algorithm is: 33.380596 seconds
server disconnected from client
barak@barak:~/Desktop/Study/Communication & computer/Ex4$
```

```
barak@barak: ~/Desktop/Study/Communication & computer/...
barak@barak:~/Desktop/Study/Communication & computer/Ex4$ ./sender
successfully created socket
successfuly connected to server

upload file number 1 - size of 1022976 bytes
upload file number 2 - size of 1022976 bytes
upload file number 3 - size of 1022976 bytes
upload file number 4 - size of 1022976 bytes
upload file number 5 - size of 1022976 bytes
5 files are successfully sent in a cubic algorithm

***** Algorithm changed to reno *****

upload file number 1 - size of 1022976 bytes
upload file number 2 - size of 1022976 bytes
upload file number 3 - size of 1022976 bytes
upload file number 4 - size of 1022976 bytes
upload file number 5 - size of 1022976 bytes
5 files are successfuly sent in a reno algorithm
client disconnected from server
barak@barak:~/Desktop/Study/Communication & computer/Ex4$
```

30 % losses

```
barak@barak: ~/Desktop/Study/Communication & computer/...
barak@barak:~/Desktop/Study/Communication & computer/Ex4$ sudo tc qdisc change d
ev lo root netem loss 30%
barak@barak:~/Desktop/Study/Communication & computer/Ex4$ ./measure
successfuly created socket
successfuly made bind
listening...
connected to client

read file number 1 - size of 1022976 bytes
read file number 2 - size of 1022976 bytes
read file number 3 - size of 1022976 bytes
read file number 4 - size of 1022976 bytes
read file number 5 - size of 1022976 bytes
the avg for cubic Algorithm is: 21.423521 seconds

***** Algorithm changed to reno *****

read file number 1 - size of 1022976 bytes
read file number 2 - size of 1022976 bytes
```

```
barak@barak: ~/Desktop/Study/Communication & computer/...
barak@barak:~/Desktop/Study/Communication & computer/Ex4$ ./sender
successfully created socket
successfuly connected to server

upload file number 1 - size of 1022976 bytes
upload file number 2 - size of 1022976 bytes
upload file number 3 - size of 1022976 bytes
upload file number 4 - size of 1022976 bytes
upload file number 5 - size of 1022976 bytes
5 files are successfully sent in a cubic algorithm

***** Algorithm changed to reno *****

upload file number 1 - size of 1022976 bytes
upload file number 2 - size of 1022976 bytes
upload file number 3 - size of 1022976 bytes
upload file number 4 - size of 1022976 bytes
upload file number 5 - size of 1022976 bytes
5 files are successfully sent in a reno algorithm
client disconnected from server
barak@barak:~/Desktop/Study/Communication & computer/Ex4$
```

כי לפעמי אין שינוי בין האלגוריתמים מכיוון שהקובץ 30% loss.pcap - הוא בקובץ, ניתן לראות בקובץ