

Raport z wykonania zadania laboratoryjnego z ćwiczenia nr.1

2.1.1 Optymalizacja MTU w wadliwym łączy

Przebieg ćwiczenia:

- Ustalenie BER (*bit error rate*) na wartość 10^{-5}
- Wyznaczenie wartości FER dla badanych MTU (tabela poniżej)

MTU	FER
1500	0,114923
1200	0,093424
900	0,071403
600	0,048847
400	0,033506
300	0,025743
200	0,017918
150	0,013981
100	0,010029

- Wprowadzenie wyliczonych FER w polu *loss* funkcji *addLink*
- Dokonanie pomiaru programem iPerf (korzystając z opcji -M)

Przykładowe wyniki:

```
"Node: pc2"
root@ubuntu:/home/student# iperf -c 10.0.0.1 -i 1 -t 10 -M 1460
WARNING: attempt to set TCP maximum segment size to 1460, but got 536

Client connecting to 10.0.0.1, TCP port 5001
TCP window size: 144 KByte (default)

[ 9] local 10.0.0.2 port 44428 connected with 10.0.0.1 port 5001
[ ID] Interval      Transfer    Bandwidth
[ 9] 0.0- 1.0 sec  2.46 MBytes 20.6 Mbits/sec
[ 9] 1.0- 2.0 sec  1.18 MBytes 9.90 Mbits/sec
[ 9] 2.0- 3.0 sec  384 KBytes 3.15 Mbits/sec
[ 9] 3.0- 4.0 sec  761 KBytes 6.24 Mbits/sec
[ 9] 4.0- 5.0 sec  127 KBytes 1.04 Mbits/sec
[ 9] 5.0- 6.0 sec  255 KBytes 2.09 Mbits/sec
[ 9] 6.0- 7.0 sec  317 KBytes 2.60 Mbits/sec
[ 9] 7.0- 8.0 sec  512 KBytes 4.19 Mbits/sec
[ 9] 8.0- 9.0 sec  315 KBytes 2.58 Mbits/sec
[ 9] 9.0-10.0 sec  191 KBytes 1.56 Mbits/sec
[ 9] 0.0-10.4 sec  6.43 MBytes 5.21 Mbits/sec
root@ubuntu:/home/student#

"Node: pc2"
[ 9] 1.0- 2.0 sec  4.93 MBytes 41.3 Mbits/sec
[ 9] 2.0- 3.0 sec  304 KBytes 2.49 Mbits/sec
[ 9] 0.0- 3.5 sec  7.25 MBytes 17.4 Mbits/sec
root@ubuntu:/home/student# ifconfig pc2-eth0 mtu 600
root@ubuntu:/home/student# iperf -c 10.0.0.1 -i 1 -t 10 -M 560
WARNING: attempt to set TCP maximum segment size to 560, but got 536

Client connecting to 10.0.0.1, TCP port 5001
TCP window size: 85.3 KByte (default)

[ 9] local 10.0.0.2 port 44438 connected with 10.0.0.1 port 5001
[ ID] Interval      Transfer    Bandwidth
[ 9] 0.0- 1.0 sec  3.88 MBytes 32.5 Mbits/sec
[ 9] 1.0- 2.0 sec  4.75 MBytes 39.8 Mbits/sec
[ 9] 2.0- 3.0 sec  4.25 MBytes 35.7 Mbits/sec
[ 9] 3.0- 4.0 sec  5.62 MBytes 47.2 Mbits/sec
[ 9] 4.0- 5.0 sec  6.88 MBytes 57.7 Mbits/sec
[ 9] 5.0- 6.0 sec  4.62 MBytes 38.8 Mbits/sec
[ 9] 6.0- 7.0 sec  4.00 MBytes 33.6 Mbits/sec
[ 9] 7.0- 8.0 sec  3.10 MBytes 26.0 Mbits/sec
[ 9] 8.0- 9.0 sec  1.37 MBytes 11.5 Mbits/sec
[ 9] 9.0-10.0 sec  3.86 MBytes 32.3 Mbits/sec
[ 9] 0.0-10.2 sec  42.3 MBytes 35.0 Mbits/sec
root@ubuntu:/home/student#
```

"Node: pc2"

```

root@ubuntu:/home/student# ifconfig pc2-eth0 mtu 300
root@ubuntu:/home/student# iperf -c 10.0.0.1 -i 1 -t 10 -M 260
WARNING: attempt to set TCP maximum segment size to 260, but got 536
-----
Client connecting to 10.0.0.1, TCP port 5001
TCP window size: 142 KByte (default)
-----
[ 9] local 10.0.0.2 port 44444 connected with 10.0.0.1 port 5001
[ ID] Interval      Transfer    Bandwidth
[ 9] 0.0- 1.0 sec  4.12 MBytes 34.6 Mbits/sec
[ 9] 1.0- 2.0 sec  4.75 MBytes 39.8 Mbits/sec
[ 9] 2.0- 3.0 sec  15.2 MBytes 128 Mbits/sec
[ 9] 3.0- 4.0 sec  10.1 MBytes 84.9 Mbits/sec
[ 9] 4.0- 5.0 sec  5.38 MBytes 45.1 Mbits/sec
[ 9] 5.0- 6.0 sec  7.50 MBytes 62.9 Mbits/sec
[ 9] 6.0- 7.0 sec  14.0 MBytes 117 Mbits/sec
[ 9] 7.0- 8.0 sec  4.38 MBytes 36.7 Mbits/sec
[ 9] 8.0- 9.0 sec  13.8 MBytes 115 Mbits/sec
[ 9] 9.0-10.0 sec  7.38 MBytes 61.9 Mbits/sec
[ 9] 0.0-10.3 sec 86.6 MBytes 70.4 Mbits/sec
root@ubuntu:/home/student#

```

"Node: pc2"

```

root@ubuntu:/home/student# ifconfig pc2-eth0 mtu 100
root@ubuntu:/home/student# iperf -c 10.0.0.1 -i 1 -t 10 -M 60
WARNING: attempt to set TCP maximum segment size to 60 failed.
Setting the MSS may not be implemented on this OS.
-----
Client connecting to 10.0.0.1, TCP port 5001
TCP window size: 85.3 KByte (default)
-----
[ 9] local 10.0.0.2 port 44454 connected with 10.0.0.1 port 5001
[ ID] Interval      Transfer    Bandwidth
[ 9] 0.0- 1.0 sec  20.9 MBytes 175 Mbits/sec
[ 9] 1.0- 2.0 sec  38.4 MBytes 322 Mbits/sec
[ 9] 2.0- 3.0 sec  24.5 MBytes 206 Mbits/sec
[ 9] 3.0- 4.0 sec  18.6 MBytes 156 Mbits/sec
[ 9] 4.0- 5.0 sec  20.8 MBytes 175 Mbits/sec
[ 9] 5.0- 6.0 sec  35.9 MBytes 301 Mbits/sec
[ 9] 6.0- 7.0 sec  47.4 MBytes 397 Mbits/sec
[ 9] 7.0- 8.0 sec  23.7 MBytes 199 Mbits/sec
[ 9] 8.0- 9.0 sec  24.9 MBytes 209 Mbits/sec
[ 9] 9.0-10.0 sec  31.6 MBytes 265 Mbits/sec
[ 9] 0.0-10.3 sec 287 MBytes 234 Mbits/sec
root@ubuntu:/home/student#

```

Opracowanie wyników:

MTU	BANDWIDTH
1500	5,21
1200	6,02
900	18,4
600	35
400	79,2
300	70,4
200	237
150	231
100	234

Zebrane wyniki podsumowano w postaci wykresu wraz z wykładniczą linią najlepszego dopasowania – wartość maksymalna osiągnięta jest dla **MTU = 200**.

