NS Lab 4 Answer Sheet
NS3 simulator - TCP Performance Monitoring

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Lab date: Sep 19 & 23 2013

Hand-in time (submit to blackboard) by Sep 30, 2013 13:00CEST

Total points: 20 pts

Please provide your answer in the appropriate space for each question

Task 1 – Throughput of TCP client-server connection

1. Here, an Mbit is (apparently) a million bits, as opposed to a 1024^2 bits.

Latency	Measured Throughput	Calculated Throughput	Calculation
64ms	1.03Mbps	1.02 Mbps	(16384 * 8 / 10^6) / (0,064 * 2)
96ms	0.68 Mbps	0.68 Mbps	(16384 * 8 / 10^6) / (0,096 * 2)
128ms	0.51 Mbps	0.51 Mbps	(16384 * 8 / 10^6) / (0,128 * 2)

2. Yes, it inversely affects throughput. The TCP client waits to submit more than RWIN bytes until it receives an ACK; the client has to wait longer if the latency is bigger.

3. Optimal RWIN value: 51200 bytes
   Calculation: ((3.2 * 10^ 6) * (0.064 * 2)) / 8

4. 3.10 Mbps

Task 2 – Monitoring TCP congestion window

1.

Figure 1: Tahoe – droptail queue = 100

2.a.

Figure 2: Tahoe, droptail queue = 40

2.b

Figure 3: Tahoe, droptail queue = 40 (from 1 until 1.85 secs)

State changes, Tahoe – from 1 until 1.85 secs		
Time (sec, 3 decimal) accuracy	cwnd (bytes)	New state
1.000	1	*(initial state)*

2.c

Figure 4: Tahoe, droptail queue = 40 (from 4 until 6 secs)

State changes, Tahoe – from 4 until 6 secs		
Time (sec, accuracy 3 decimal)	cwnd (bytes)	New state
4.000		*(initial state)*

3.a

Figure 5: Reno, droptail queue = 40

3.b

Figure 6: Reno, droptail queue = 40 (from 4 until 6 secs)

State changes, Reno – from 4 until 6 secs				
Time (sec, accuracy 3 decimal)	Current cwnd (bytes)	New cwnd (bytes)	New state	Event
4.000		---	*(initial state)*	---

Submission

You have to submit:

- Your answers to all the questions. Use this provided **answer sheet** for you answers and graphs. Provide your answers in the appropriate answer field for each question
- The source codes of the two tasks.
- The graphs and the produced data.

Attention: You have to submit one PDF file that contains all the answers and graphs; the name of the file should be lab4-<lastname_firstletter>.pdf (example: lab1-vanderveldt_k.pdf, or lab1-pittaras_c.pdf). Additionally you have to submit one zip (or rar) file containing the source codes, the graphs and the data. The name of the file should be: lab4-source-<lastname_firstletter>.zip

Any other kind of submission will not be taken into account. You must also put your full name and your student number at the top of the answer sheet.