
**Computer Communication
EDA344, DIT 423**

Time and Place: Monday August 20, 2018, 14.00-18.00 SB-MU

Course Responsible: Marina Papatriantafilou (Tel: 772 5413), Ali Salehson (Tel 772 5746)

Allowed material:

- English-X (X can be French, German, Swedish, etc) dictionary
- *No other books, no notes, no calculators, no electronic devices.*

Grading:

CTH (EDA344): 3: 30-40 p, 4: 41-50 p, 5: 51-60 p

GU (DIT 423): Godkänd 30-45, Väl godkänd 46-60 p

Instructions

- **Write clearly your course-code**
- **Start answering each assignment on a new page; use only one side of each sheet of paper; please sort the sheets according to the question-ordering and number them.**
- Write in a **clear manner** and **motivate** (explain, justify) your answers. If it is not clear what is written for some answer, it will be considered wrong. If some answer is not explained/justified, it will get **significantly** lower marking.
- If you make any **assumptions** in answering any item, do not forget to clearly state what you assume.
- A good rule-of-thumb for the extend of detail to provide, is to include enough information/explanation so that a person, whose knowledge on computer communication is at the level of our introductory lecture, can understand.
- Please answer in English, if possible. If you have large difficulty with that (with all or some of the questions) and you think that your grade might be affected, feel-free to write in Swedish.
- Results, inspection of exam: Date will be announced on the web page after the exam.

Good Luck !!! Lycka till !!!!

5. General questions, applications, security (15p)

- (a) (4p) (i) Describe the structure of the DNS system and the role of the DNS servers at the different levels of hierarchy.
(ii) If a DNS client sends a request for the IP address of URL `www.chalmers.se` to a server at each level of the hierarchy, what is the reply?
- (b) (4p) (i) Suppose N packets arrive simultaneously to a link at which no packets are currently being transmitted or queued. Each packet is of length L and the link has transmission rate R . What is the average queuing delay for the N packets?
(ii) Now suppose that N such packets arrive to the link every LN/R seconds. What is the average queuing delay of a packet? Explain your answers. Using space-time diagrams to illustrate the packet transmissions will be helpful.
- (c) (4p) (i) Consider a server that receives a request with UDP and responds to it with UDP. If a client IP address spoofs its address with address Y , where will the server send the response?
(ii) Suppose a server receives a SYN with IP source address Y and after responding with a SYNACK, receives an ACK with IP source address Y with the correct acknowledgement number. Assuming the server chose a random sequence number and there is no man-in-the-middle, can the server be certain that the client is indeed Y (and not some other address X spoofing Y)?
- (d) (3p) (i) What purpose can a hash of a message serve regarding security issues?
(ii) Can you decrypt a hash of a message to get the original message? Explain your answer.