EDA385/INN661 Internet technology Exam

EDA385 0298

March 14, 2007 14:00—18:00

Examiner: Albert Nummelin (phone: 0739—728 765, 772 5720)

The examiner will answer questions at approximately 15:00 and 16:30.

Allowed student material: Language dictionary only

Credits	CTH grade	Credits	GU grade
0—15	U	0—15	U
16—23	3	16—28	G
24—31	4	29—40	VG
32—40	5		

Solutions will be posted on the course home page on or before Friday, March 16.

Results will be posted on or before Friday, March 30.

The graded exams can be reviewed at the examiner's office (room 3466 in the EDIT building) on Tuesday, April 3 between 09:00—10:00.

Instructions

1. You may answer in English or Swedish. Use proper grammar and punctuation

2. All answers need to be motivated, unless otherwise stated.

3. Answer concisely, but explain all reasoning. Correct answers without motivation or with wrong motivation will not be given full credit

4. Write clearly. Unreadable or hard-to-read handwriting will not be given any credit.

5. Do not use red ink

6. Solve only one problem per page

7. Sort pages by ascending problem order

8. Anything written on the back of the pages will be ignored

9. Do not hand in empty pages or multiple solutions to the same problem. Clearly cross out anything written that is not part of the solution.

Exam

1. Internet design principles

    a) What is meant by the end-to-end principle and why is it important in the architecture of the Internet? Give example. (2 credits)

    b) Which organisation is responsible for developing standards for the Internet and how are such standards documented and published? (2 credits)

2. Transport layer

    a) What is the difference between standard UDP and UDP Lite? Why was UDP Lite introduced? (2 credits)

    b) How is the pseudo-header used in UDP and TCP? (2 credits)

    c) What is meant by the term TCP-friendly? (2 credits)

    d) Explain how congestion control is handled in DCCP. You do not need to describe any specific algorithm details, only the general approach used in this protocol. (2 credits)

3. IPv6

    a) Explain how the following concepts are handled differently in the IPv6 and IPv4 datagram headers: (4 credits)
        i. address
        ii. options
        iii. checksum
        iv. fragmentation

    b) How is the Routing header typically used? (2 credits)

    c) The IPv6-address `FF01::80:700:1234:ABC0:43` has been written using compressed notation. Write the full, uncompressed address, with each hexadecimal number written out. (2 credits)

    d) What are the two types of IPv6 unicast addresses with respect to scope? (1 credit)

    e) Describe the steps in the stateless address autoconfiguration process. (3 credits)

4. Mobile IP

    a) Describe how mobile IPv4 works in the two cases with and without a Foreign Agent. (3 credits)

    b) What is the two-crossing problem (also known as "triangle routing") and how is it avoided in mobile IPv6? (3 credits)

5. The Domain Name System

    a) What information does the root zone file in the DNS system contain? (2 credits)
    b) What is a pointer (PTR) query and how can it be used? (2 credits)

6. MPLS

Give two main reasons why many large ISPs use MPLS in their core networks. (2 credits)

7. Network management

    a) What is the design idea behind SNMP? Give an example briefly explaining how, e.g., a reboot of a managed router could be implemented using SNMP (2 credits)
    b) Explain what a MIB is and its function. (2 credits)