Net Centric Systems

Summer Term 2011

http://www.p2p.tu-darmstadt.de/teaching/summer-term-2011/ncs-net-centric-systems/

TECHNISCHE UNIVERSITÄT DARMSTADT

Prof. Dr. Thorsten Strufe
Dipl.-Inform. Andreas Höfer
Peer-to-Peer Networks Group (P2P)

Prof. Dr. Max Mühlhäuser
Dipl.-Inform. Sebastian Döweling
Telecooperation Group (TK)

Exercise 2 – Networks & IP

Submit from 9/5/2011 to 13/5/2011 in your exercise group
or until 13/5/2011, 18:00 in moodle (as pdf file).

Please note, that by submitting your solution to this exercise, you confirm that you are the exclusive author(s) of the respective material. For additional information, we would like to refer you to: http://www.informatik.tu-darmstadt.de/de/studierende/studium-alt/plagiarismus/

Task 2.1: Layers / Reference Models

a) What are the advantages and disadvantages of using layers for network architecture?

b) What is the difference between the OSI Model and the Internet Layer Model?

c) What does DHCP mean and to which layer would you assign it in the Internet Layer Model?

Task 2.2: Network Types

a) Briefly discuss the pros and cons of connection-oriented and connectionless networks.

b) Which type of network would use TCP to transmit data and which type of network would use UDP?

c) What is a handshake and why is it needed? Which type of network uses handshakes?

Task 2.3: IP Addressing

a) How many Class A networks can be addressed in “class-full” IP addressing?

b) What are the network part, the subnet part, and the host part of the (Class B) IP address 172.16.10.50 with subnet mask /27? Write down the address parts and the subnet mask in decimal form.

c) What are the network part and the host part of the (CIDR) IP address 172.16.10.50/27? Write down the address parts in decimal form.

Task 2.4: IP Addressing – Subnet Masks

An organization receives the network address 199.199.10.0.

a) Which class does this IP address belong to?

b) What is the default subnet mask of this address?

c) The organization's network administrator now uses the subnet mask 255.255.255.240. What are his intentions by doing so? How many hosts can he then address in one subnet?

Task 2.5: IP Addressing – Var. Leng. Subnet Masks

An organization receives the network address block 195.53.192.0/19. The administrator wants to set up eight subnets of equal size (No. 0 to 7).

a) Specify the subnet mask for this organization.

b) What is the total number of usable host addresses in each subnet?

c) State all subnets and the corresponding IP address ranges for this organization using a table.

d) To which subnet (number) is a packet with the destination address 195.53.208.12 transported?