

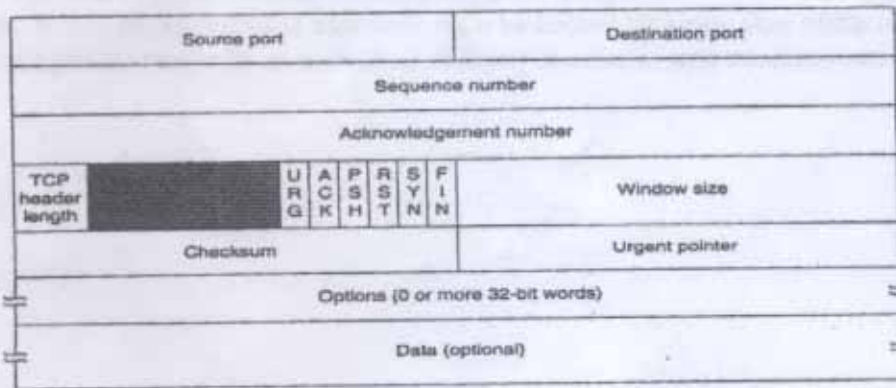
S-72.1120 Data Communications and Protocols
Exam, Sept. 3rd, 2007

Student nr _____ Name _____

1. A salesman is often on the move, but he keeps his calendar at the server computer at the company headquarters. A server program on that computer and a client program on the salesman's portable computer are used to read and update the calendar. The programs communicate with each other through a reliable TCP connection. Sketch some typical application level messages that might be sent between the client and server programs.

2. E-mail messages come from the external world to the server computer of a company (or ISP). Explain briefly, how the messages are handled by each of the following programs (protocols) and in which order the programs are used.

- a) POP3
- b) TCP
- c) IP
- d) Eudora(etc.)+SMTP



3. Concerning to the TCP protocol, explain briefly

- how transmission errors (simple bit level errors) can be noticed?
- what is done in case of such an error?
- which of the three functions (methods) below is related to the TCP protocol? How can you see that?
- what information is usually transmitted in the data field of the first function?

- `sendip(addr,data,len)`
- `connect(addr,port,reply)`
- `sendmail(addr,subject,text)`

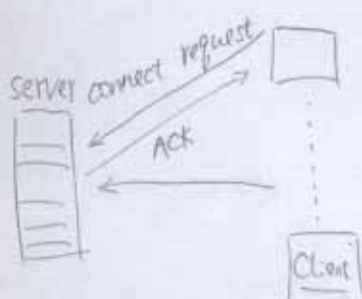
4. a) Within the Internet, data is sent over many kinds of transmission media and through various networks. Nevertheless, some things have to be standardized within the entire network in order to be able to communicate. Mention two such things.
- b) Which Internet-related addresses must be known by a new user of the net (a company, an ISP or a private user with an individual address) in order to start communicating?

S-72.1120 Tiedonsiirto ja yhteyskäytännöt

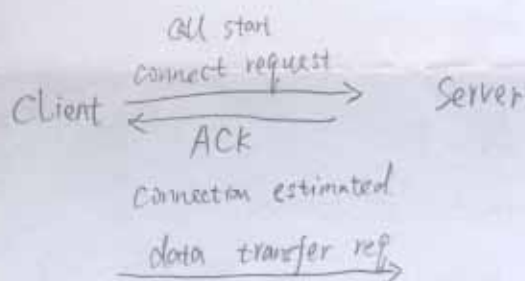
Tentti 3.9.2008

Op.no _____ Nimi _____

1. Urheiluseuran tietokoneella (palvelin) on mm. lähiajan tapahtumakalenteri. Lajeja ja tapahtumia on paljon ja jäsenet voivat hakea tapahtumatietoja omalle koneelleen eri hakukriteerien perusteella sopivaa asiakasohjelmaa käyttäen. Asiakas- ja palvelinohjelma kommunikoivat keskenään luotettavan kuljetustason yhteyden (TCP) välityksellä. Luonnostelee joitakin ohjelmien välillä kulkevia sovellustason viestejä. Kyse on tietokoneiden välisestä tiedonsiirrosta.



On the computer



2. Lähiverkkoon liitettyyn tietokoneeseen saapuu ulkomaailmasta käyttäjän joltakin palvelimelta hakema sähköpostiviesti, jota käyttäjän koneessa käsittelevät mm. TCP-protokolla, IP-protokolla, WWW-selain ja Ethernet-liitäntäohjelma. Missä järjestyksessä em. ohjelmat saapuvaa viestiä käsittelevät ja mitä kukin ohjelma viestille tekee?

1. On the computer (server) of a sports club is a calendar of coming events. There are many events and members use a suitable client program on their own computers to fetch event data based on various search criteria. The client and server programs communicate by way of a reliable transport level connection (TCP). Sketch some application level messages that might be sent between the programs.

Notice that we speak of data exchange between two computers.

2. An e-mail message fetched by a user from some server arrives to the user's client computer that is connected to a local area network (LAN). At the client computer the message is handled by the TCP protocol, the IP protocol, the WWW browser and the Ethernet interface ~~program~~ program. In which order is the message handled by each of the programs? Also explain the main purpose of each program.

3. a) selitä lyhyesti, mitä tarkoitetaan virtuaalisella lähiverkolla (VPN).

b) lähtevä IP-viesti tulee lähiverkossa käyttäjän koneelta ko. paikallisen verkon Internet-palvelimelle. Mitä toimenpiteitä viestille suoritetaan tällä palvelimella virtuaalisen lähiverkon tapauksessa.

3. a) explain briefly what is meant by a virtual private network (VPN)

b) in a local area network (LAN), an outgoing IP-message arrives from a user's computer to the local Internet server computer.

In case of a VPN, what needs to be done to the message by that computer.

4 Pertaining to transport level communication (TCP) explain briefly

a) What is meant by the checksum and how it is used?

b) how and for what purpose do you use the transmission window