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Communication Systems Group (CSG)

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Exercises in PMMC

Exercise 5

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1) B-ISDN & ATM

1.1) Why is the B-ISDN reference model divided into layers and planes?

1.2) Explain why congestion in ATM networks may occur, although ATM is connection oriented. Be reminded that before a connection is established the reservation of bandwidth is done at different hierarchy levels of the various ATM connections. Thus, state exactly, at which hierarchy level congestion may occur.

1.3) How many virtual paths and virtual channels are theoretically possible when deploying the UNI or the NNI cell format.

1.4) What is the difference between ATM cross-connects and ATM switches?

1.5) The combination of VPI- and VCI information is often represented by decimal numbers separated by a period. For example, 11.255 represents a VPI of 00001011 and a VCI of 00000000 11111111.
Consider the subsequent connection table and sketch a corresponding network element with all relayed virtual paths and channels. Assume that virtual path 2 and 3 arrive on the same link (virtual path 5 arrives on another link) and that virtual path 3 and 5 leave on the same link (virtual path 2 leaves on another link). Note that virtual paths bind traffic logically to links, wherefore each VPI has a unique incoming link and a unique outgoing link.

VPI/VCI In	VPI/VCI Out
2.3	3.3
2.5	2.1
3.1	2.2
5.1	5.3
3.3	5.1
5.2	3.2

1.6) What is abbreviated by SAR and what is it used for in ATM?

1.7) Connections at the...

a) ... ATM layer are service dependent.

☐ true ☐ false

b) ... ATM layer are service independent.

☐ true ☐ false

c) ... AAL layer are service dependent.

☐ true ☐ false

d) ... AAL layer are service independent.

☐ true ☐ false

2) Internet

2.1) How long (measured in bit) is an IPv4 address and an IPv6 address? How much bigger is the address space (that is theoretically possible) of IPv6 than the address space of IPv4?

2.2) Comparison of peering Structures.

a) What advantages and drawbacks have fully meshed peering structures compared to exchange routers?

b) What advantages offers an exchange switch compared to an exchange router?

c) How can an exchange switch be made more attractive for ISPs?

3) IntServ/DiffServ

3.1) In what aspects differ IntServ and DiffServ?

3.2) Explain how IntServ and DiffServ can be integrated and what are possible benefits of such integration.