

Course S-38.3165 (Switching Technology) exam questions, March 12, 20109

1. Explain what is meant by the following switch fabric related concepts.

- a.) Blocking?
- b.) Full accessibility?
- c.) Throughput

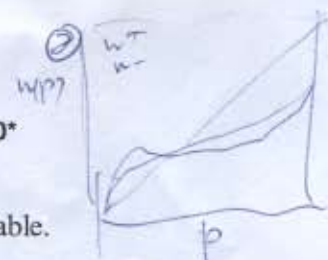
2. You have an 8x8 non-blocking switch.

- a.) If the switch supports only point-to-point connections then how many different connection states the switch can support? Notice that each legitimate connection state occupies all inputs and all outputs. *Intentional and unintentional acquisition of automaticity according to Barsh and Choptrend*
- b.) If the switch supports point-to-multipoint connections then how many different connection states it can support? Notice that each legitimate connection state occupies all outputs.
- c.) The switch is modified to be an 8x4 concentrator and it is used for point-to-point connections. How many different connection states it can support? Notice that a legitimate connection state occupies all outputs.

3. Routing table of a router includes the following prefix entries.

A = 0* B = 1* C = 11* D = 000* E = 0011* F = 0110*
 G = 1000* H = 1001* I = 1011* J = 1110* K = 111*

- a.) Draw a binary trie (1-bit trie) that depicts the data structure of the routing table.
- b.) Convert the obtained binary trie into a path compressed binary trie.
- c.) Convert the compressed binary trie into a multibit trie by using stride size of K=2.



Give the maximum number of lookups in each of the three cases.

③ Define Nash Equilibrium b) what are the nash equilibrium of the game

4. The switch fabric of a telephone exchange, which implements 120 incoming and outgoing E1 line interfaces, is implemented by using memory chips and is based on the time-slot interchange principle. The switch fabric is composed of a switch memory (SM), control memory (CM) and control logic. Incoming time-slots of the E1 lines are written cyclically into SM and reading of the time-slots from SM is controlled by CM. CM, which is also read cyclically, contains a pointer for each output time-slot and this pointer points to a memory location (i.e. time-slot), content of which is carried in the outgoing time-slot in question. Incoming and outgoing links as well as the read and write operations of SM and CM are synchronised to each other.

- a.) Sketch a block diagram of the switch fabric?
- b.) What are the required minimum sizes of the SM and CM memory blocks?
- c.) What is the required memory speed (i.e. memory access cycle) of SM and CM?

	PZ	A	B	B
player 1	10/10	5/8		
player 2	8/5	8/8		

4) How do the prediction of the Metcalfe's Law and "n log(n) rule for network valuation" differ from each other when communication networks are interconnected