11/22/16

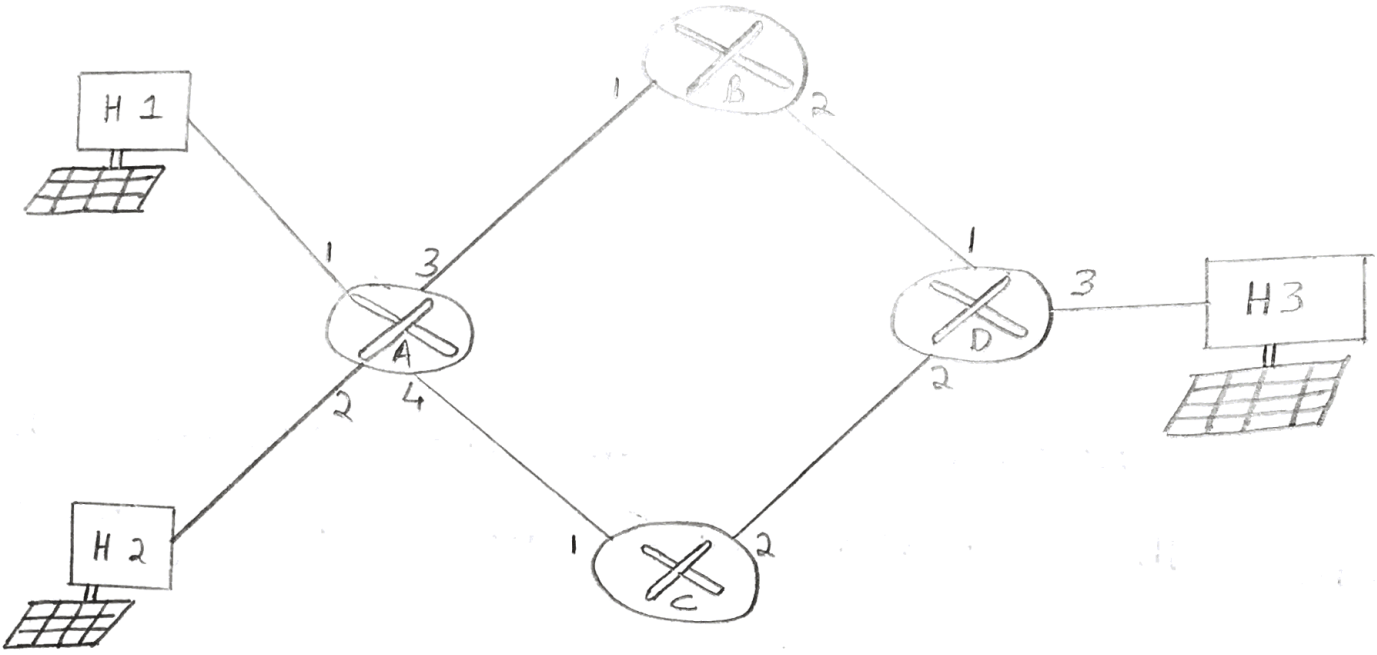
DATA COMMUNICATION - I

HW - 4

Kiran Shettar

UML ID - 01605800

Problem 1 : CH4



(a) For router 'A', data destined to Host H3 is forwarded through interface 3.

Forwarding table:

Destination Address	Link interface
H3	#3

(b) It is NOT possible because, in case of datagram network, the rule of forwarding table is based on only the destination address. Not based on the source address.

(c) One possible configuration for router 'A' is as follows:

Incoming interface	Incoming VC number	Outgoing interface	Outgoing VC number
1	12	3	22
2	63	4	18

However we can also observe that both the traffic flows may have the same VC numbers.

(d) Consider the following possible configurations:

ROUTER B:

Incoming interface	Incoming VC number	Outgoing interface	Outgoing VC number
1	22	2	24

ROUTER C:

Incoming interface	Incoming VC number	Outgoing interface	Outgoing VC number
1	18	2	50

ROUTER-D :

Incoming interface	Incoming vc number	Outgoing interface	Outgoing vc number
1	24	3	70
2	50	3	76

Problem 2 : (CH4)

(a) In the given scenario we can only transmit one packet at a time over a shared bus. Therefore it's not possible to forward two packets through the switch fabric.

(b) Since the given scenario says that packets to be forwarded to two different output ports, we can transmit/forward because as long as two packets use different input buses and different output buses, packets can be forwarded in parellel.

(c) In the given scenario it is not possible to forward the two packets through the switch fabric at the same time by using a crossbar because by doing that, the packets would ⇒

have to be sent over the same output bus at the same time, which is not possible.

Problem 5: (CH 4)

(a) Destination address range:

Forwarding table:

Prefix match	Link interface
11100000 00	0
111 00000 01000000	1
1110000	2
11100001 1	3
otherwise	3

(b) For the first destination address, we connect to the link interface 3.

Link 1: i.e 11001000 10010001 01010001 01010101

Link 2: 11100001 01000000 11000011 00111100

Link 3: 11100001 10000000 00010001 01110111

Problem 7 : (CH4)

Prefix match	Interface
1	0
10	1
111	2
otherwise	3

Destination address range	Link interface
11000000 through (32 addresses) 11011111	0
10000000 through (64 addresses) 10111111	1
11100000 through (32 addresses) 11111111	2
00000000 through (128 addresses) 01111111	3

Problem 9 : (CH4)

Prefix match	Link interface
11100000 00 (224.0/10)	0
11100000 01000000 (224.64/16)	1
1110000 (224/8)	2
11100011 (225.128/9)	3
otherwise	3

Problem 14 : (CH-4)

Length	flag	offset
700	1	0
700	1	85
700	1	170
700	0	255

* The maximum size of data field is ~~680~~, 680, since IP header consists 20 bytes for each fragment.

* The number of generated fragments are:

$$(2400 - 20)/680 = 3.5$$

→ from this we can say 4 fragments are generated.

* The offsets for the 4 fragments are:

<i> $0/8 = 0$

<ii> $680/8 = 85$

<iii> $680 * 2/8 = 170$

<iv> $680 * 3/8 = 255$

* The first three segments/fragments will have the value flag = 1 and last fragment will have flag = 0.

Problem 16 (CH-4)

(a) Solution:

Home address:

<i> 192.168.1.1

<ii> 192.168.1.2

<iii> 192.168.1.3 & with the router interface being 192.168.1.4

(b) The following is the NAT translation table:

WAN side	LAN side.
24.34.112.235, 4000	192.168.1.1, 3345
24.34.112.235, 4001	192.168.1.1, 3346
24.34.112.235, 4002	192.168.1.2, 3445
24.34.112.235, 4003	192.168.1.2, 3446
24.34.112.235, 4004	192.168.1.3, 3545
24.34.112.235, 4005	192.168.1.3, 3546