

Homework 6 Solutions

EE450

Dr. Walker

R4.1)

A Network Layer packet is called a Datagram.

A router always send packets out based on their IP address but a switch is using the MAC layer and only forward packets to the receivers in its own sub-domain.

R4.8)

There are three different Switched mentioned in the text: 1. Switching via a bus 2.Switching via memory 3.Switching via an interconnection network.

An interconnection network is the only one which can forward packets in parallel if they are all destined for different outgoing ports.

P4.4)

a) It is easy, any packet for host three will go through port 3.

<i>Destination Address</i>	<i>Link Interface</i>
----------------------------	-----------------------

H3	3
----	---

b) No. In routers forwarding rules can only distinguish between different destinations and they cannot distinguish between packets coming from different sources.

c) One possible configuration is:

<i>Incoming interface</i>	<i>Incoming VC#</i>	<i>Outgoing Interface</i>	<i>Outgoing VC#</i>
1	12	3	22
2	63	4	18

Note, that the two flows could actually have the same VC numbers.

d) One possible configuration is:

Router B.

<i>Incoming interface</i>	<i>Incoming VC#</i>	<i>Outgoing Interface</i>	<i>Outgoing VC#</i>
1	22	2	24

Router C.

<i>Incoming interface</i>	<i>Incoming VC#</i>	<i>Outgoing Interface</i>	<i>Outgoing VC#</i>
1	18	2	50

Router D.

<i>Incoming interface</i>	<i>Incoming VC#</i>	<i>Outgoing Interface</i>	<i>Outgoing VC#</i>
1	24	3	70
2	50	3	76

P4.7)

- a) No. It is not possible. When a switch is sharing a bus, it is not possible to send two packets out at the same time.
- b) Yes. Crossbar is a structure which is designed for such a functionality. Each input port is connected to each output port.
- c) No, in this case the two packets would have to be sent over the same output bus at the same time, which is not possible.

P4.10)

- a)

<i>Prefix Match</i>	<i>Link Interface</i>
11100000 00	0
11100000 01000000	1
1110000	2
11100001 1	3
Otherwise	3

b)

Prefix match for first address is 5th entry: link interface 3

Prefix match for second address is 3rd entry: link interface 2

Prefix match for third address is 4th entry: link interface 3