TSIN02 Internetworking

Exercise class 2 solutions

Exercise 1: **Direct**; Both hosts are on the same network (same netid: 137.23).

Exercise 2: A routing table for a LAN not connected to the Internet and with no subnets can have a routing table with host-specific addresses. There is no next-hop address since all packets remain within the network.

Exercise 3: If the packet with destination address 140.24.7.194 arrives at R3, it gets sent to interface m0. If it arrives at R2, it gets sent to interface m1 and then to router R3. The only way R1 can receive the packet is if the packet comes from organization 1, 2, or 3; it goes to R1 and is sent out from interface m3.

Exercise 4: See the table below:

Mask	Network address	Next-hop address	Interface
/20	120.14.64.0	—	m0
/20	120.14.96.0	—	m2
/20	120.14.112.0	—	m3
/0	0.0.0.0	default router	m4

Exercise 5: See the table below:

Mask	Network address	Next-hop address	Interface
/22	120.14.96.0	—	m0
/22	120.14.100.0	—	m1
/22	120.14.104.0	—	m2
/22	120.14.108.0	—	m3
/0	0.0.0.0	default router	m4

Exercise 6: See the table below:

Exercise 7: Reliability is not of primary importance in applications such as echo, daytime, BOOTP, TFTP and SNMP. In custom software, reliability can be built into the client/ server

Mask	Network address	Next-hop address	Interface
/30	120.14.64.0	—	m0
/30	120.14.64.4	—	m1
/30	120.14.64.8	—	m2
/30	120.14.64.12	—	m3
…	…	…	…
/30	120.14.65.252	—	m127
/0	0.0.0.0	default router	m128

applications to provide a more reliable, low overhead service.

Exercise 8: The data section is only 16 bytes. The TCP header is 20 bytes. IP header is 20 bytes. The header and trailer is 19 bytes (without preamble). Thus, the efficiency at each layer:
a. At TCP level:
(16) / (16 + 20) = 0.444 ⟶ 44.4%.

b. At IP level:
(16) / (16 + 20 + 20) = 28.57 ⟶ 28.57%.

c. At data link level:
(16) / (16 + 20 + 20 + 19) = 0.2133 ⟶ 21.33%.