**Chapter 5**

**5. Consider the subnet of Fig. 5-12(a). Distance vector routing is used, and the following vectors have just come in to router C: from B: (5, 0, 8, 12, 6, 2); from D: (16, 12, 6, 0, 9, 10); and from E: (7, 6, 3, 9, 0, 4). The measured delays to B, D, and E, are 6, 3, and 5, respectively. What is C's new routing table? Give both the outgoing line to use and the expected delay.**

Via B (11,6,14,18,12,8)

Via D (19,15,9,3,12,13)

Via E (12,11,8,14,5,9)

C’s new routing table (11,6,0,3,5,8), outging line (B,B,-,D,E,B).

**20. Suppose that host A is connected to a router R 1, R 1 is connected to another router, R 2, and R 2 is connected to host B. Suppose that a TCP message that contains 900 bytes of data and 20 bytes of TCP header is passed to the IP code at host A for delivery to B. Show the Total length, Identification, DF, MF, and Fragment offset fields of the IP header in each packet transmitted over the three links. Assume that link A-R1 can support a maximum frame size of 1024 bytes including a 14-byte frame header, link R1-R2 can support a maximum frame size of 512 bytes, including an 8-byte frame header, and link R2-B can support a maximum frame size of 512 bytes including a 12-byte frame header.**

A-R1:

Lenth = 940, Identification = x, DF = 0, MF = 0, Fragment offset = 0

R1-R2:

1. Lenth = 500, Identification = x, DF = 0, MF = 1, Fragment offset = 0
2. Lenth = 460, Identification = x, DF = 0, MF = 0, Fragment offset = 60

R2-b:

1. Lenth = 500, Identification = x, DF = 0, MF = 1, Fragment offset = 0
2. Lenth = 460, Identification = x, DF = 0, MF = 0, Fragment offset = 60

**27. A large number of consecutive IP address are available starting at 198.16.0.0. Suppose that four organizations, A, B, C, and D, request 4000, 2000, 4000, and 8000 addresses, respectively, and in that order. For each of these, give the first IP address assigned, the last IP address assigned, and the mask in the w.x.y.z/s notation.**

The size must be a power of two.

A: 198.16.0.0 – 198.16.15.255 198.16.0.0/20

B: 198.16.16.0 – 198.16.23.255 198.16.16.0/21

C: 198.16.32.0 – 198.16.47.255 198.16.32.0/20

D: 198.16.64.0 – 198.16.95.255 198.16.64.0/19

**28. A router has just received the following new IP addresses: 57.6.96.0/21, 57.6.104.0/21, 57.6.112.0/21, and 57.6.120.0/21. If all of them use the same outgoing line, can they be aggregated? If so, to what? If not, why not?**

They can be aggregated to 57.6.96.0/19

**29. The set of IP addresses from 29.18.0.0 to 19.18.127.255 has been aggregated to 29.18.0.0/17. However, there is a gap of 1024 unassigned addresses from 29.18.60.0 to 29.18.63.255 that are now suddenly assigned to a host using a different outgoing line. Is it now necessary to split up the aggregate address into its constituent blocks, add the new block to the table, and then see if any reaggregation is possible? If not, what can be done instead?**

Add new table entry: 29.18.0.0/22.

当一个packet即匹配29.18.0.0/22，又匹配29.18.0.0/17，将发送到掩码较大的目标地址即29.18.0.0/22，被指定目标地址。

**30. A router has the following (CIDR) entries in its routing table:**

**Address/mask Next hop**

**135.46.56.0/22 Interface 0**

**135.46.60.0/22 Interface 1**

**192.53.40.0/23 Router 1**

**default Router 2**

**For each of the following IP addresses, what does the router do if a packet with that address arrives?**

**(a) 135.46.63.10**

**(b) 135.46.57.14**

**(c) 135.46.52.2**

**(d) 192.53.40.7**

**(e) 192.53.56.7**

(a) Interface 1

(b) Interface 0

(c) Router 2

(d) Router 1

(e) Router 2