CS 2204-01 Communications and Networking

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Written Assignment Unit 5

**Q1:**

To find out the router's destination, it is necessary to check the address range from the one with the largest number of bits indicating the network address.

| Address/Mask | Next Hop | Address Range |
| --- | --- | --- |
| 135.46.56.0/22 | Interface 0 | 135.46.56.1～135.46.59.254 |
| 135.46.60.0/22 | Interface 1 | 135.46.60.1～135.46.63.254 |
| 192.53.40.0/23 | Router 1 | 192.53.40.1～192.53.41.254 |
| Default | Router 2 | - |

Use this result to see where each address can be reached:

1. 135.46.63.10

It is included in the address range of 135.46.60.0/22, so it reaches Interface 1. 2.

2. 135.46.57.14

It is included in the address range of 135.46.56.0/22, so Interface 0 is reached. 3.

3. 135.46.52.2

It is not included in any address range, so it reaches Router 2, which is Default. 4.

4. 192.53.40.7

It is included in the address range of 192.53.40.0/23, so it reaches Router 1. 5.

5. 192.53.56.7

It is not included in any address range, so it reaches Router 2, which is Default.

**Q2:**

IP addresses are assigned in blocks of powers of two. Therefore, the four organizations are assigned IP addresses A: 4,096, B: 2,048, C: 4,096, and D: 8,192. Using this condition, the corresponding answers for each organization are as follows:

Organization A

* First IP address: 198.16.0.0
* Last IP address: 198.16.15.255
* Mask address: 198.16.0.0/20

Organization B

* First IP address: 198.16.16.0
* Last IP address: 198.16.23.255
* Mask address: 198.16.16.0/21

Organization C

* First IP address: 198.16.24.0
* Last IP address: 198.16.31.255
* Mask address: 198.16.24.0/20

Organization D

* First IP address: 198.16.32.0
* Last IP address: 198.16.63.255
* Mask address: 198.16.32.0/19

**Q3:**

The router creates a new distance vector table from the report received from R1. To calculate the new cost to each destination, add the link cost from R to R1 to the cost to each destination provided in the report from R1. Since the cost of the R-R1 link is 1, the new cost to each destination based on the report from R1 is as follows

* New cost to A: 1 + 1 = 2
* New cost to B: 1 + 1 = 2
* New cost to C: 4 + 1 = 5
* New cost to D: 4 + 1 = 5

Next, these new costs are compared to the costs in the existing distance vector table.

* The cost to A remains the same: 2. The next hop remains R1.
* The cost to B has been updated from 3 to 2, a lower cost. The next hop is updated to R1.
* The cost to C remains unchanged at 4 after the update, and the next hop remains R1.
* The cost to D is updated from 5 to 5 and remains the same, but the next hop may be changed to R1 because there is a route through R1 according to the report, in this case, there are no specific instructions, so the default routing policy is followed.

In conclusion, the distance vector table for R is updated as follows (only changes are noted)

* The cost of B is updated from 3 to 2 and the next hop is changed to R1.

Word-Count: 492

References

Dordal, P. (2019). *An introduction to computer networks.*

(n.d.). *Computer networks.*