CHAPTER 19: Network Layer : Logical Addressing

Solutions to Selected Review Questions

Review Questions

1. An ***IPv4*** address is **32** bits long. An ***IPv6*** address is **128** bits long.

2. A ***block in class A*** address is ***too large*** for almost any organization. This means most of the addresses in class A are wasted and not used. ***A block in class C*** is probably ***too small*** for many organizations.

3. The ***network address*** in a block of addresses is the first address. The ***mask*** can be **ANDed** with any address in the block to find the network address.

4. ***IPv4 addresses*** are usually written in decimal form with a decimal point (dot) separating the bytes. This is called ***dotted-decimal notation***. Each address is **4** bytes. ***IPv6*** addresses are usually written in hexadecimal form with a colon separating the bytes. This is called ***hexadecimal notation***. Each address is **16** bytes or **32** hexadecimal digits.

5. Home users and small businesses may have created small networks with several hosts and need an IP address for each host. With the shortage of addresses, this is a serious problem. A quick solution to this problem is called ***network address translation (NAT***). NAT enables a user to have a large set of addresses internally and one address, or a small set of addresses, externally. The traffic inside can use the large set; the traffic outside, the small set.

6. ***Classes A***, ***B***, and ***C*** are used for **unicast** communication. ***Class D*** is for **multicast** communication and ***Class E*** addresses are **reserved** for special purposes.

7. ***Classful addressing*** assigns an organization a Class A, Class B, or Class C block of addresses. ***Classless addressing*** assigns an organization a block of contiguous addresses based on its needs.

8. Multicast addresses in ***IPv4*** are those that start with the **1110** pattern. Multicast addresses in ***IPv6*** are those that start with the **11111111** pattern.

9. A ***mask*** in classful addressing is used to find the first address in the block when one of the addresses is given. The ***default mask*** refers to the mask when there is no subnetting or supernetting.

10. In ***subnetting***, a large address block could be divide into several contiguous groups and each group be assigned to smaller networks called subnets. In ***supernetting***, several small address blocks can be combined to create a larger range of addresses. The new set of addresses can be assigned to a large network called a supernet. ***A subnet mask*** has ***more*** consecutive 1s than the corresponding default mask. ***A supernet mask*** has ***less*** consecutive 1s than the corresponding default mask.