**Chapter**-**8(IP Subnetting)**

1. What is subnetting?

Ans: The practice of dividing a network into two or more networks is called subnetting.

2. What are the benefits of subnetting?

Ans:

* Reduced network traffic
* Optimized network performance
* Simplified management
* Facilitated spanning of large geographical distances

3. What is subnet mask?

Ans: A Subnet mask is a 32-bit number that masks an IP address, and divides the IP address into network address and host address. Subnet Mask is made by setting network bits to all "1"s and setting host bits to all "0"s.

Default subnet mask:

**Class Format Default subnet mask**

A network.host.host.host 255.0.0.0

B network.network.host.host 255.255.0.0

C network.network.network.host 255.255.255.0

4. What is Classless Inter-Domain Routing (CIDR)?

Ans: CIDR (Classless Inter-Domain Routing) is a way to allow more flexible allocation of Internet Protocol (IP) addresses than was possible with the original system of IP address classes.

Ans.

5. Write the steps for troubleshooting or (how to find and fix an IP addressing problem)?

Or Write the four diagnostics steps for troubleshooting.

Ans: The four simple steps for troubleshooting are:

* Ping the loopback address,
* Ping the NIC,
* Ping the default gateway and
* Ping the remote device.

6. What is Network Address Translation (NAT)?

Ans: A NAT (Network Address Translation or Network Address Translator) is the virtualization of Internet Protocol (IP) addresses. NAT helps to improve security and to decrease the number of IP addresses an organization needs.

Or NAT is an Internet standard that enables a local-area network (LAN) to use one set of IP addresses for internal traffic and a second set of addresses for external traffic.

7. Write about the Advantages and disadvantages of implementing NAT?

Ans:

|  |  |
| --- | --- |
| **Advantages** | **Disadvantages** |
| Conserves legally registered addresses.  Reduces address overlap occurrences.  Increases flexibility when connecting to the Internet.  Eliminates address renumbering as the network changes. | Translation introduces switching path delays.  Loss of end-to-end IP traceability.  Certain applications will not function with  NAT enabled. |

8. Write the Types of Network Address Translation (NAT)?

Ans: There are three types of NAT:

**Static NAT (SNAT):** This type of NAT is designed to allow one-to-one mapping between local and global addresses.

**Dynamic NAT:** This version gives you the ability to map an unregistered IP address to a registered IP address from a pool of registered IP addresses.

**Overloading:** This is the most popular type of NAT configuration. Overloading really is a form of dynamic NAT that maps multiple unregistered IP addresses to a single registered IP address—many-to-one—by using different ports.

9. Write about NAT Names?

Ans:

|  |  |
| --- | --- |
| **Name** | **Meaning** |
| Inside local  Outside local  Inside global  Outside global | Name of the inside source address before translation  Name of the destination host before translation  Name of the inside host after translation  Name of the outside destination host after translation |

**Packet InterNet Groper (ping)** Uses an Internet Control Message Protocol (ICMP)  
echo request and replies to test if a host IP stack is initialized and alive on the network.  
**traceroute** Displays the list of routers on a path to a network destination by using Time  
to Live (TTL) time-outs and ICMP error messages. This command will work on a router,  
MAC, or Linux box but not from a Windows command prompt.  
**tracert** Same command as traceroute, but it’s a Microsoft Windows command and will  
not work on other devices, like a Cisco router or Unix box.  
**arp –a** Displays IP-to-MAC-address mappings on a Windows PC.  
**ipconfig /all** Used only from a DOS prompt. Shows you the PC network configuration.