Network Technology And Administration

CH-4
IP Addressing & Window 2008 Server

Index

- IP Addressing
- IP Address Classes
- Subneting , Superneting
- Introduction to IPV6

1. IP Address :

- An IP address is uniq identified for a node or Host connection in Network.

- An IP address is 32 bit binary number usually represent at 4 decimal value each represent 8 bits in the range from 0 to 255 separated by dot (.) operator.

1. IP Address :

- But computer understand only Binary number hence this decimal address are converted in to binary number.

- For ex : 127.12.10.3

- Every IP address consists of two part one identify Net ID and another identify Host ID .

IP Address Class :

- IP Address Class :

 - in class full addressing the address space is divided in to five class A , B , C , D ,E.

 - A : class A address are for large network with many devices.

 - B : class B address are medium sign network.

- C : class C address are small size network.

- D : class D address are reserved for multicasting.

- E : class E address are reserved for future they could be use for host address.

2. Subnetwork :

- An IP address has 2 parts:
  - The Network identification.
  - The Host identification.
- Frequently, the Network & Host portions of the address need to be separately extracted.
- In most cases, if you know the address class, it's easy to separate the 2 portions.

2. Subnetwork :

- Under this addressing scheme, called Subnetting, separating the Network & Host requires a special process called Subnet Masking.

2. Subnetwork :

- The subnet masking process was developed to identify & extract the Network part of the address.

- A subnet mask, which contains a binary bit pattern of ones & zeros, is applied to an address to determine whether the address is on the local Network.

2. Subnetwork :

- The process used to apply the subnet mask involves Boolean Algebra to filter out non-matching bits to identify the network address.

2. Subnetwork :

- Boolean Algebra is a process that applies binary logic to yield binary results.

- Working with subnet masks, you need only 4 basic principles of Boolean Algebra:

  - 1 and 1 = 1
  - 1 and 0 = 0
  - 0 and 1 = 0
  - 0 and 0 = 0

2. Subnetwork :

- There are default standard subnet masks for Class A, B and C addresses:

Default Subnet Masks	
Address Class	**Subnet Mask**
Class A	255.0.0.0
Class B	255.255.0.0
Class C	255.255.255.0

2. Subnetwork :

- The subnet mask goes like this:

1. If a destination IP address is 206.175.162.21, we know that it is a Class C address & that its binary equivalent is:
11001110.10101111.10100010.0001 0101

2 We also know that the default standard Class C subnet mask is: 255.255.255.0 and that its binary equivalent is:

11111111.11111111.11111111.00000000

3. Supernet :

- A supernet is an internet protocol (IP) network that is formed from the combination of two or more networks.

- The process of forming a supernet is often is called supernetting.

- The benefits of supernet are management of address space.

3. Supernet :

- In internet networking terminology a supernet is a block of contiguous sub networks addressed as a single subnet.

- Supernetting requires the use of routing protocol which support for CIDR classless inter domain routing & VLSM variable length subnet masking.

3. Supernet :

- CIDR means classless inter domain routing and VLSM means variable length subnet masking which are methods used for formation of supernetting.

4. IPV6 :

- Ipv6 is a version of the internet protocol (IP) that it next version on the ipv4.

- Ipv6 has a large address space than Ipv4.

- Ipv6 uses the 128 bit address where ipv4 uses only 32 bits .

1 Larger address space :

- The most important feature of IPV6 is a much larger address space than that of IPV4, address in IPV6 are 128 bits long, compared to 32 bit addresses in IPV4.

- In another perspective [view point] this is the same number of IP addresses per person as the number of atoms in a metric ton of carbon.

2 Stateless address auto configuration :

- IPV6 hosts can configure themselves automatically when connected to a routed. IPV6 network using ICMPV6 [internet control message protocol v 6].

3 Multicast :

- The transmission of a packet to multiple destinations in a signal send operation is part of the base specification in IPV 6

➢ Installation & Configuration :

-> A tree consists of signal domain or multiple domains in a configuration namespace.

-> A forest is a collection of trees and represent the outermost boundary within which users , computers , groups and objects exits.

➢ **Account :**

User account :

A record that consists of all the information that define a user of Microsoft windows server 2003.

■ This include the user name and password required to log on the groups in which the user account has membership and the user's rights and permission for using the computer and network and accessing their resources.

b) Domain :

A group of computer and other devices on a network that are administered as a single unit.

- On the internet domain names are hierarchical construction that from the basic for the domain name system.

c) Computer account :

An account that is created by a domain administrator and that uniquely identifies the computer on the domain.

d) Group account :

A collection of user accounts by making a user accounts a member of a group , you give the related user all the rights and permission granted to the group.

Logging Events :

- Some operating system such as windows NT have the capability to keep a running log of the system events.

- That log services as a records of the previous errors warning and other messages from the system.

- Windows NT's event viewer application provides you with access to the event log.

➤ **Monitoring Performance :**

- One of the most important tasks that should be performance on the network is some form of statistical collecting.

- These statistics can range from the performance of the servers workstation and other devices on the network to the performance of individual components within a program or services itself.

Monitoring Performance :

- Three types of performance monitoring tools :

1 simple Network Management Protocol (SNMP)

2 Windows NT Performance Monitor

3 Windows 95's System Monitor

➢ **Monitoring Performance :**

1 SNMP :

SNMP is a protocol that is supported by most pieces of hardware & software that support the TCP / IP protocol stack.

- The SNMP services collects predefined information .

- This information stored in a MIB.

➤ **Monitoring Performance :**

2   Windows NT Performance Monitor :

- Windows 's performance monitor tool lets you monitor important system parameters for the computer on your network in real time .

- Performance monitor can keep an eye on a large number of system parameter providing a graphical or tabular profile of system and network trends.

➤ **Monitoring Performance :**

3 Windows 95's System Monitor :

- Windows 95 includes a program called system monitor that also enables use to collect information on the windows 95 machine in real time

- System manager collect information on the different categories of item on the system.

Monitoring Network Traffic :

- As an administrator you need to monitor and detect problem with traffic on your network .

- With network monitor you can gather information about the network traffic that flow to and from the network adapter of the computer on which it is installed.

➢ **Monitoring Network Traffic :**

- You can use event viewer to monitor the following types of events :
  - System events
  - Security events
  - Application events

➢ MMC :

- Microsoft management console hosts administrative tools that you can use to administer networks , computer , services , and other system components .

- The first things to understand is that a MMC is a host for an administrative tool called snap in.

➢ MMC :

- A snap in is actually an Active –x module that is used to perform a specific function , but without a snap in a console is useless.