

EXPERIMENT - 1

Aim - To establish LAN configuration

Requirements: Pentium IV Computer Windows XP Professional Edition LAN cable

Procedure:

- 1) Switch on the Two systems
- 2) Connect the two system using network cable.
- 2) After connect the systems. Click the my network place icon on the desktop for the first system
- 3) Then click view network connection.
- 4) Now right click local area connection and click properties.
- 5) Click the internet protocol (TCP/IP) and set the IP address for the First system

Example IP address: 192.168.0.1

Subnet mask: 255.255.255.0

- 6) Then click ok
- 7) Repeat the steps 2-6 for the another system

Result

By following the above procedures, we can connect the peer to peer connection using LAN successfull

EXPERIMENT - 2

Aim - Study of WAN

Procedure - Wide Area Network (WAN) is a telecommunication network that is used to simply extend a LAN over a large geographical distance.

Technically, two or more local area networks can be connected via WAN with different layer 3 devices like routers or firewalls.

Most WAN IP address uses the static public IP address, dynamic public IP address, and PPPoE (Point-to-Point Protocol) as the connection to the ISP depending on the subscription. Static public IP addresses are much expensive as compare to dynamic and PPPoE because we only have limited unique public IP address that cannot be reused by other customers. Private IP addresses are only routable on the local network and not routable over WAN or the internet. The below diagram shows the LAN and WAN infrastructure.

There are many WAN connections that we use to provide our connectivity to the internet. Below are the common options for WAN connectivity from the internet provider.

Leased Line

This WAN connection type is a dedicated point-to-point link and fixed-bandwidth data connection. By using leased lines, your network will have a completely secured and reliable connection, high bandwidth, and superior quality of service. On the other side, leased lines can be expensive and not

scalable as it is a permanent physical connection.

Digital Subscriber Line

DSL is a medium used to transfer digital signals over the standard telephone lines. It uses a different frequency than the telephone is using so that you can use the internet while making a call. DSL is an older concept that provides a typical speed of around 6mbps. The good thing in DSL is the bandwidth is not shared and provides a constant speed.

Cable Internet

One way to provide broadband internet connection is by using cable internet from a local cable TV provider. It has quite a similarity with DSL as it also uses an existing cable modem from cable TV to send data. On this connection, the speed varies with the number of users on the service at a specific time.

Fiber Internet Access

It is the newest broadband connection that provides the highest internet speed service to the customers. It is also commonly used in

telecommunication backhaul connections because of the higher speed it can handle as compared to other cables. DWDM, SONET, and SDH are the ISP backhaul transport equipment that uses fiber optic cable. Fiber optic is also used in telecom packet switching networks or circuit switching networks.

Multi-Protocol Label Switching (MPLS)

MPLS is a type of VPN that uses labels on forwarding packets instead of IP addresses or layer 3 headers. It offers optimum security and routing for customer's sites. On MPLS, the service provider is participating in the customer's routing.

Wireless WAN

Most of us are using mobile phones that use mobile data to connect to the internet. The commonly known connection types for wireless WAN are 3G, 4G, LTE, and 5G. It is the services offered by local ISP to provide wireless internet access to mobile devices via cellular sites. It uses specific frequencies to provide wider coverage and stronger signal to customers.

EXPERIMENT - 3

Aim - Study of various Network Topology

Procedure - A network is the interconnection of two or more devices. The study of arrangement or mapping of elements (links, nodes) of a network is known as network topology. For communication distribution of computers has become very important issue which deliver end to end performance at a low cost, hence distribution system performance is influenced by the technology adopted by network interconnection so distribution of computers is done according to communication network arranged in a geometrical manner known as network topology.

BUS Topology. Bus topology is a network type in which every computer and network device is connected to single cable.

RING Topology. It is called ring topology because it forms a ring as each computer is connected to another computer, with the last one connected to the first.

STAR Topology. In this type of topology all the computers are connected to a single hub through a cable. ...

MESH Topology. It is a point-to-point connection to other nodes or devices. All the network nodes are connected to each other.

TREE Topology. It has a root node and all other nodes are connected to it forming a hierarchy. It is also called hierarchical topology.

HYBRID Topology. It is two different types of topologies which is a mixture

of two or more topologies.

EXPERIMENT - 5

Aim - Study of sliding window protocol

Procedure - In these protocols, the sender has a buffer called the sending window and the receiver has buffer called the receiving window.

The size of the sending window determines the sequence number of the outbound frames. If the sequence number of the frames is an n -bit field, then the range of sequence numbers that can be assigned is 0 to $2n - 1$.

Consequently, the size of the sending window is $2n - 1$. Thus in order to accommodate a sending window size of $2n - 1$, a n -bit sequence number is chosen.

The sequence numbers are numbered as modulo- n . For example, if the sending window size is 4, then the sequence numbers will be 0, 1, 2, 3, 0, 1, 2, 3, 0, 1, and so on. The number of bits in the sequence number is 2 to generate the binary sequence 00, 01, 10, 11.

The size of the receiving window is the maximum number of frames that the receiver can accept at a time. It determines the maximum number of frames that the sender can send before receiving acknowledgment.

Go - Back - N ARQ

Go - Back - N ARQ provides for sending multiple frames before receiving the acknowledgment for the first frame. It uses the concept of sliding

window, and so is also called sliding window protocol. The frames are sequentially numbered and a finite number of frames are sent. If the acknowledgment of a frame is not received within the time period, all frames starting from that frame are retransmitted.

Selective Repeat ARQ

This protocol also provides for sending multiple frames before receiving the acknowledgment for the first frame. However, here only the erroneous or lost frames are retransmitted, while the good frames are received and buffered.

EXPERIMENT - 6

Aim - Study of networking command

Procedure -

target

This is the destination IP address or a hostname user want to ping.

-a

This option resolves the hostname of an IP address target.

-t

This ping command option will ping the target until you stop it by pressing Ctrl-C.

-n count

This option is used to set the number of ICMP Echo Requests to send, from 1 to 4294967295. If -n is not specified, the ping command will return 4 by default.

-l size

This option is used to set the size, in bytes, of the echo-request packet from 32 to 65,527. If the -l option is not specified, the ping command will send a 32-byte echo request.

-s count

This option is used to report the time in the Internet Timestamp format that each echo request is received and an echo reply is sent. The maximum count value is 4, i.e. only the first four hops can be time stamped.

-r count

This command uses the ping command option to specify the number of hops between the source computer and the target computer. The maximum count value is 9; the Tracert command can also be used if the user wants to view all the hops between two devices.

-i TTL

This ping command option sets the Time to Live (TTL) value; the maximum value is 255.

-f

Use this ping command option to prevent ICMP Echo Requests from being fragmented by routers between the source and the target. The -f option is often used to troubleshoot Path Maximum Transmission Unit (PMTU) issues.

-w timeout

A timeout value must be specified while executing this ping command. It adjusts the amount of time in milliseconds. If the -w option is not specified, then the default timeout value of 4000 is set, which is 4 seconds.

-p

To ping a Hyper-V Network Virtualization provider address.

-S srcaddr

This option is used to specify the source address.