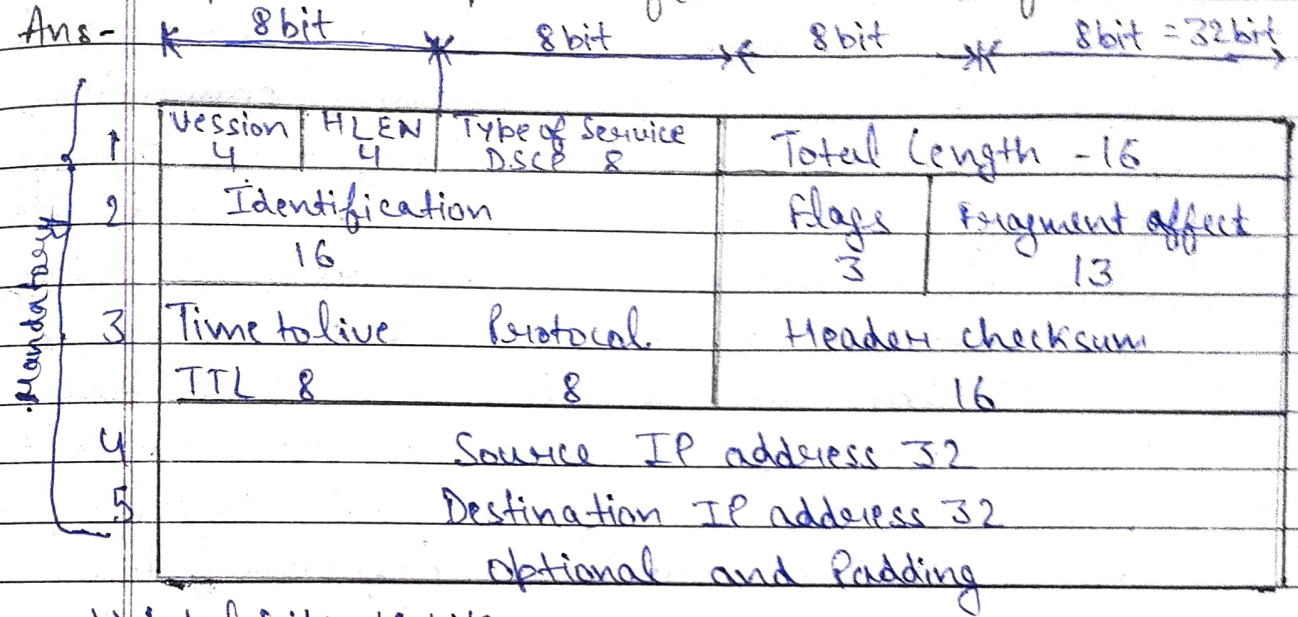
Page No. 1
Date 13/11/21

Assignment No. 3

Qu. Explain IP packet format in brief.

Ans-



If we add total bits = 160 bits

$\therefore \frac{160}{8}$ - 20 byte.

Header size

It contains - 12 fields of different length in its fixed 20 bytes part and one optional part that may contain 0 or more words along with padding

- IPv4 works at network layer.
- IPv4 header is connectionless protocol.
- It is a datagram service. It means it is equiped with all information which is required to reach its destination point.

- Datagram
  - Header size - 20 - 60 Bytes (min, max)
  - Payload - 0 - 65515 Bytes (Actual data to be sent)

Total size of datagram = 20 + 65515 = 65535

∴ Max size of Datagram = 2^{16}

Q. - what is dotted decimal notation?

Ans-

Dotted decimal notation is a system of presenting numbers that is a little different from the common conventions in arithmetic as it is taught in schools. Specially, dotted decimal notation is used in various IT contexts, including in internet Protocol addresses.

The dotted decimal notation-system used so commonly in IP addressing is just one of several choices for representing numbers differently. Another common one is the hexadecimal system, in which traditional numbers are augmented by letters of the alphabet in a base-16 system.

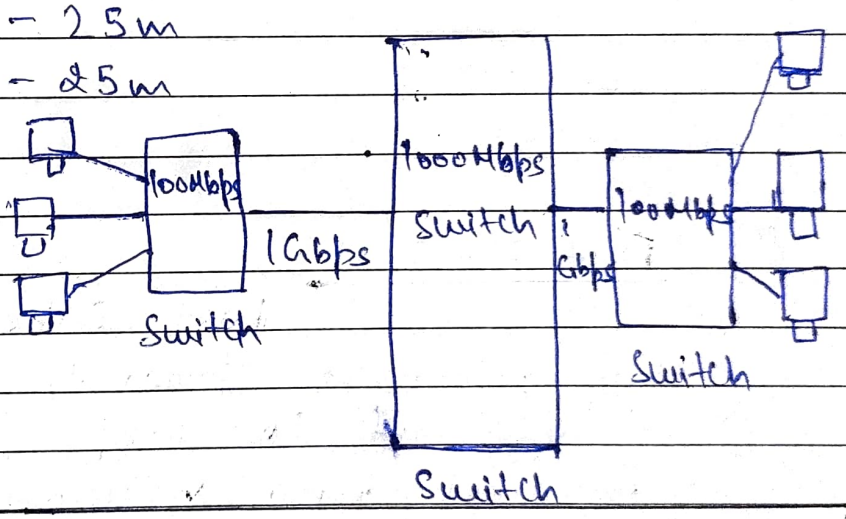
Assignment No. 4

Qu. write notes on -

Ans-

a) Gigabit ethernet :-

- Data rate 1000 Mbps or 1 Gbps.
- Collision domain is reduced.
- Uses optical fibres.
- 4 categories are -
  - 1000 base LX } uses optical fibres. - 550 m multimode
  - 1000 base SX } - 550m - 5000m in Monomode.
  - 1000 base CX - 25m
  - 1000 base T - 25m

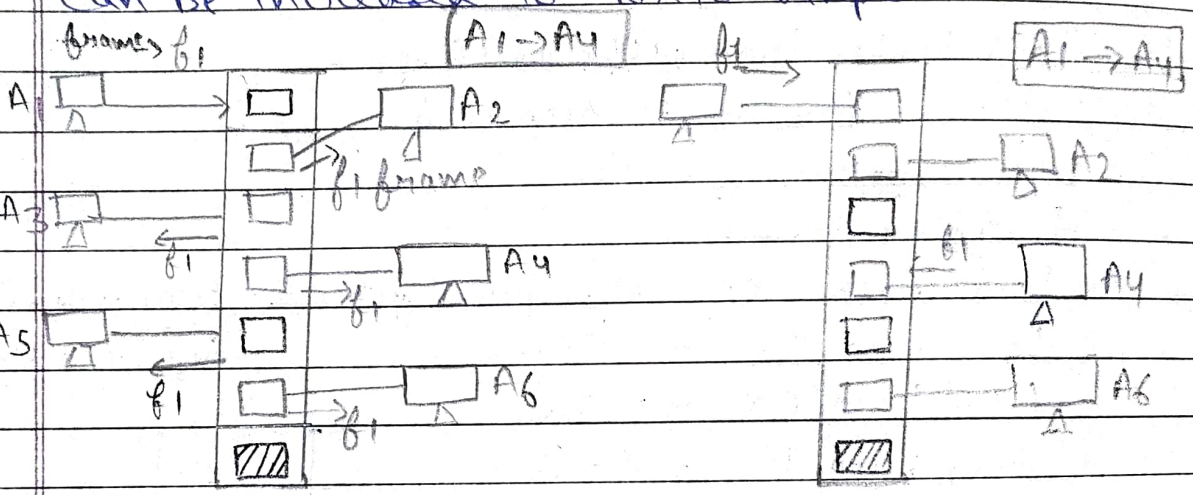


b) Switched ethernet :-

- It replaces HUB of previous methods with switches.
- If devices A1 sends one data frame f_1, then hub will recieve it and sends f_1 to all others devices at a time, hence all cables will remain busy, and hence others will not be able to send any other frame at that time.

  To remove this issue, Switched ethernet came into picture.

- If A1 sends frame to A4, then in switched ethernet, only one one channel i.e from A1 to switch and switch to A4 will be busy and others will be free for any communication.
- So in switch N/w with N-devices, the capacity can be increased to N x 10 Mbps.



(c) Fast Ethernet:

Fast Ethernet is a variation of Ethernet standards that carry data traffic at 100 Mbps (Mega bits per second) in local area networks (LAN). It was launched as the IEEE 802.3u standard in 1995, and stayed the fastest network till the introduction of Gigabit Ethernet.

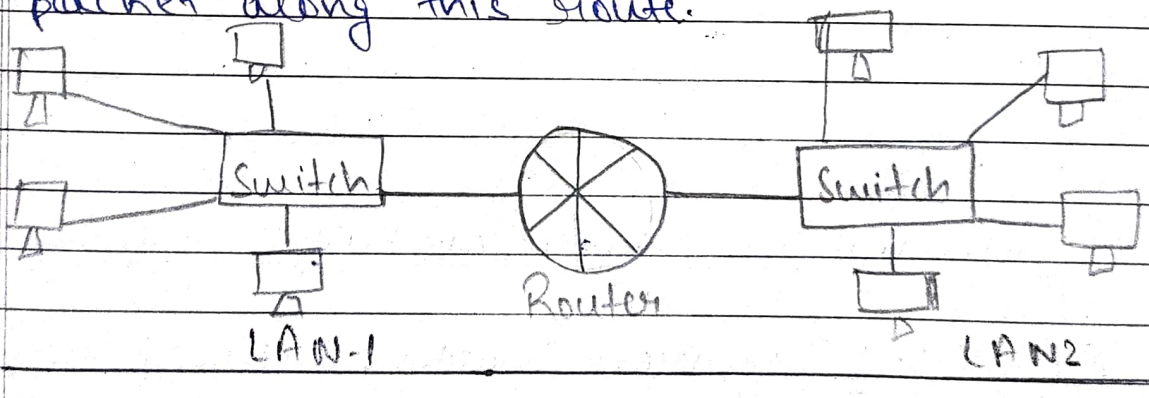
Fast Ethernet is popularly named as 100-BASE-X. Here, 100 is the maximum throughput, i.e. 100 Mbps, BASE denoted use of baseband transmission, and X is the type of medium used, which is TX or FX.

Assignment no-5

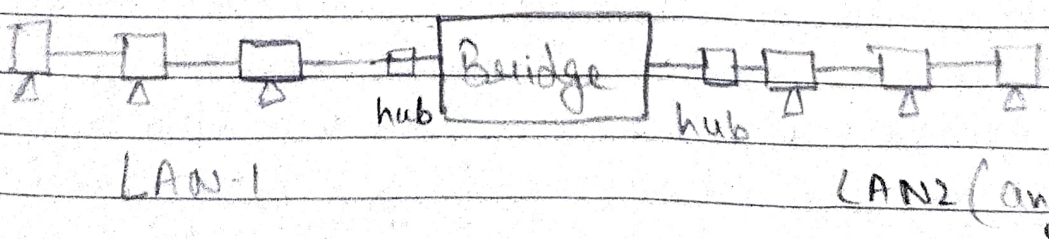
Q.- write short notes on -
a) Routers
b) Bridges
c) Gateways
d) Switches.

a) Routers - Routers are networking devices operating at layer 3 or a network layer of the OSI model. They are responsible for receiving, analysis and forwarding data packets among the connecting computer networks.

when a data packet arrives the router inspects the destination address, consults its routing tables & decides the optimal route and then transfers the packet along this route.

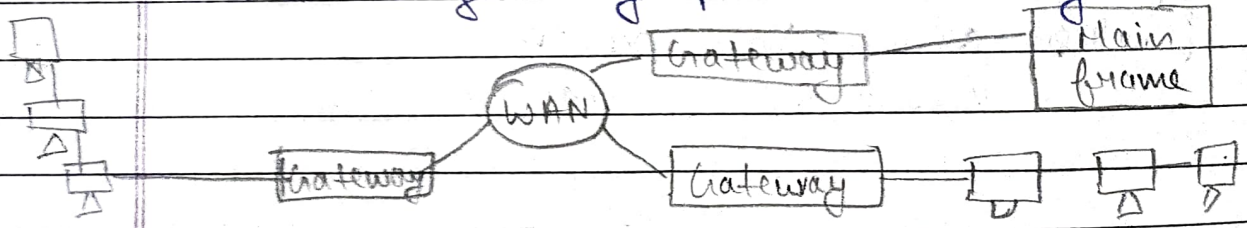


b) Bridges:- (layer 2 switch)



It connects multiple LANs together to form a larger LAN. The process of aggregating networks is called network bridging. It makes the combined network to appear as a single network. It operates at Data link layer. They are also known as Layer-2 switch. Subnetworks should have similar protocols.

c) Gateway:
This device is used to connect two network with different transmission protocols together. Gateways serve as an entry and exit point for a network as all data must pass through or communicate with the gateway prior to being routed.



- Gateways are slower than Bridges and routers.

d) Switches: They are networking devices operating at layer 2 as a data link layer of OSI-model.
- They connect devices in a network and use packet switching to send, receive or forward data packets or data frames over the network.
- It has many ports for connections.
- They receive data from multiple input ports and send to its intended destination in the network.

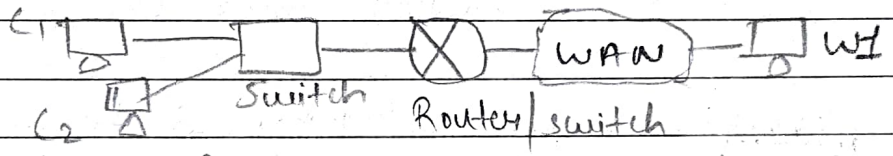
Assignment No. 6

Q- What is DHCP server how we use this server and its benefits?

Ans-

DHCP Server: (Dynamic Host Configuration Protocol) It is a network server that automatically provides and assigns IP addresses default gateways and other network parameters to client devices. It relies on the standard protocol known as DHCP. to respond to broadcast queries by clients.

- **How to use a Router/switch as DHCP server:**



DHCP has a ~~key~~ role in communication between private LAN to Public WAN. whenever System wants to communicate any system WI in WAN, it's request will be routed through DHCP server.

It is very easy to configure system Manually if LAN is small also DHCP is used.

- **Benefits :-**

- Reliable IP address configuration. DHCP minimizes configuration errors caused by manual IP address configuration, such as

typographical errors, or address conflicts caused by the assignment of an IP address to more than one computer at the same time.

- Reduced Network administration.

Q- Define a) PING b) IPCONFIG
c) NETSTAT d) TRACEROUTE.

a) PING: Most commonly used tool. This tools is used to test connectivity between requesting host and destination host.
e.g: ping 192168.1.38 -t. , if it msg -
1. Reply from 192.168.1.38. byte = 32 time = 7ms
TTL = 255 then it means connection is proper.

2. If messages shown is "Request time out", then it means there is some break / issue in cable.

b) IPCONFIG:
This is used to determine IPCONFIG of host. It gives TCP/IP configuration details like IP Address, Subnet masks and default gateway of the computer.

IP Config command is used for windows
IP CONFIG Command is used in Linux.

e.g: IPCONFIG: Detail.

c) NETSTAT :-

This used to determine current state of active network connections on a host. When verifying the status of a listening port on a host or to check and see what remote hosts are connected to a local host on a specific port.

e.g- Netstat :-

d) Traceroute :

It can be used to determine more specific information about the path to the destination host including the route the packet takes and the response time of these intermediate hosts.

It is useful for trouble-shooting large networks.

e.g : tracert www.google.com ↵

1. 4ms 12ms 5ms 10.131.81.1
2. * 120ms 194ms 192.24.164.190
3. - - -

Here traceroute command is used in LINUX.

Page No. 10
Date 10/01/22

Assignment No-7

Q. Compare WIMAX and LI-FI

Ans-

Feature	WIMAX	LIFI
Full Form	Worldwide Interoperability for Microwave Access.	Light-fidelity.
Operation	BroadBand wireless access	It transmits data using light with the help of LED bulbs.
Technology	Wireless metropolitan Area N/w.	Present IrDA compliant Device.
Merits	Can be used for long ranges upto 30Kms.	Interference is less, can pass through salty sea water.
Data Transfer Speed	Works at 50Mbps/Hz and can peak up to 100 Mbps in a 20MHz.	About 1Gbps.
Data Density	Works in high dense environment.	Works in high dense environment.
Coverage distance	Upto 40 miles	About 10 m
Power Consumption	High	Medium

Cost/price	medium	low
working concept	Request/grant	Direct binary data Sensing.

Q. what is bluetooth profile?

Ans-

A bluetooth profile is a wireless interface specification for Bluetooth-based communication between devices, such as the hands-Free profile. For a Mobile device to connect to a wireless headset, both devices must support the Hands-Free Profile.

- Specific parts of the Bluetooth protocol stack used by the protocol. To perform its task, each profile uses particular options and parameters at each layer of the stack.