IPV4

works on network layer. the transport layer send the segments when it uses the TCP/IP and send the datagram when uses UDP the IP breaks these segments and datagrams into the packets when these segments had breaked the header is attached with the IP. These header provide the information to the reciever side about the packets. in IP header the information are represented by different headers.

version no - The version no IP is define by version no field. Here it is version 4

Header length - IPV4 Header length is 32 bit words.

Type of service - This field decide the right way to the router for that router can decide the order of sending the packets. if the packets priority is high the the vale value of field is high

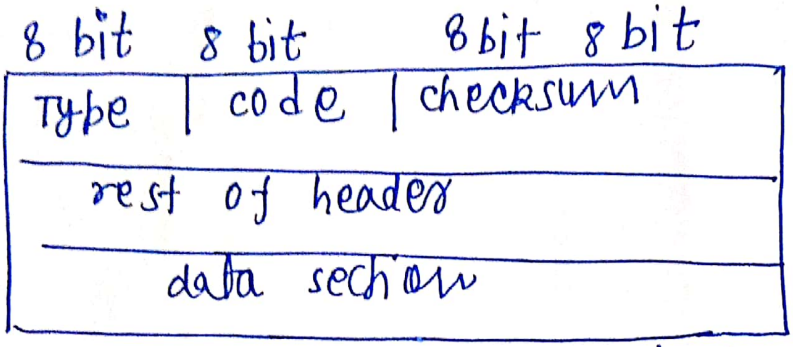
total lenght - it is 16 bit field. and describe the total lenght of IP datagram

identification - it is 16 bit no and its uniquely identify the source address of any segments.

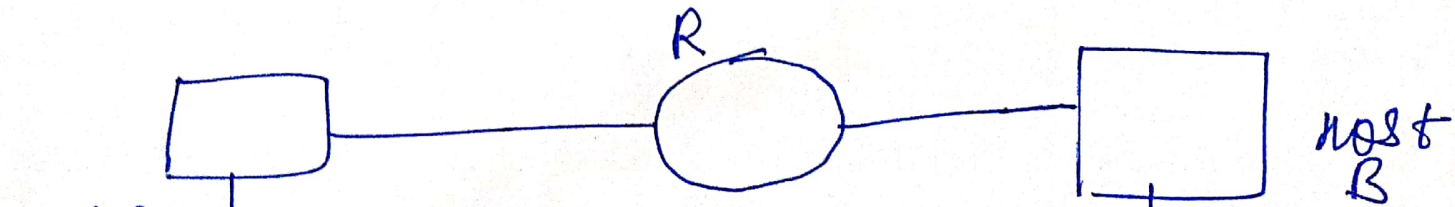
Icmp ⇒ overcome the problem of IP

Icmp is designed to overcome the following two problems
(1)- no error reporting
(2)- lacks a mechanism for queries } these two problems are with IP protocol
or no communication

icmp message are not directly passed to the data link layer. The messages are first encapsulated inside IP datagram before going to the lower layer.



* If a router discard the packet due to the any reason like cable problem then IP protocol has no mechanism that the server no about the problem.
* Icmp supports the IP protocol.
* icmp ~~sup~~ send the messages and report the errors and tell about the device status

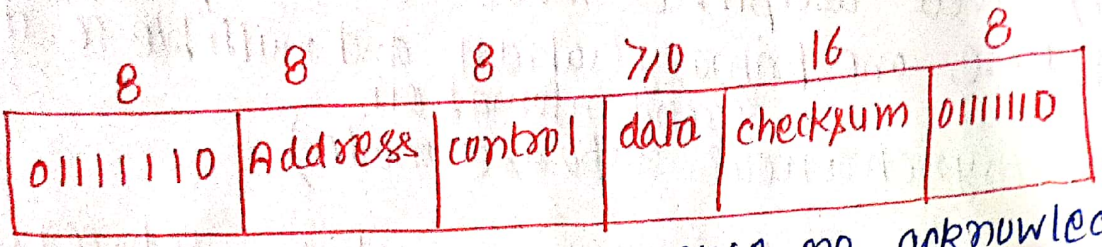


If the router will not found the route packet then router discard the ~~mes~~ packet

HDLC

HDLC (High level data link control) is a bit oriented protocol for communication over point to point and multipoint links.

frame format for bit oriented protocol



control field - used for sequence no, acknowledgement

data field - data field contain information

It is developed by ISO. HDLC is a group of protocol to transmit frame between end points HdLC protocol mange the flow of data. Hdlc works in data link layer. It provide high flexibility, Adaptibility, reliability and efficiency of operation.

HDLC protocol embedded the information in a frame that allow devices to control data flow and control errors

HDLC station - there are 3 type of station

① Primary station - it look after conecting and disconnecting the link

② secondry station - it operates under primary station the frame send by secondry station is called responce

③ combined station - it act as a primary and secondry station.

operation mode for data transfer

NRM (normal response mode) - use for point to point and point to multipoint data transfer
It is a synchronous mode of communication
It is well decipline mode as compare to ARM. Here one primary sation and multiple se station
↙ send information

ARM (Asynchronous response mode)

It is only used for communication between primary and secondary station

ABM (Asynchronous balanced mode)

use for point to point communication between two station. the information frames can send into the full duplex manner

HDLC Frame format

(a)- I Frame - information frame ↙ carray the data or information from network layer
(b)- S Frame - supervisory frame ⇒ used for flow control error control
(c)- U frame - unnumbered frame
↓
used of exchanging the session management and control information between communication device

↙ reserve for system management

I Frame — [user information]

Flag	Address	control	user information	FCS	Flag

I-frame

* Flag repeted two times

Flag	Address	control	FCS	Flag

s-frame

Flag	Address	control	management information	FCS	Flag

u-frame

Flag field - it is a 8 bit sequence with the bit pattern 01111110 that identifies both the beginning and end of the frame it serve a shyncronization pattern for reciver

Address - contain address of station. and generally contain secondry station address

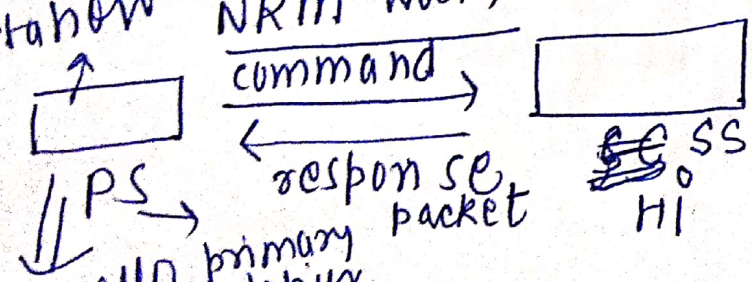
control field - used for error and flow control

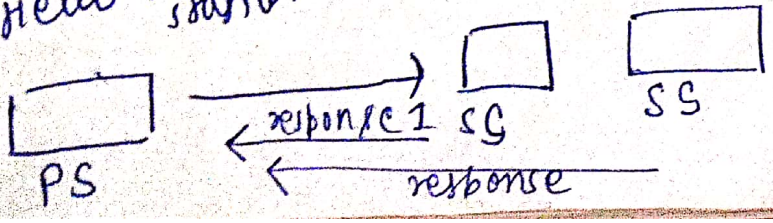
information - user data and management information

FCS - frame check sequence
↳ it is the error detection field of HDLC

point to point

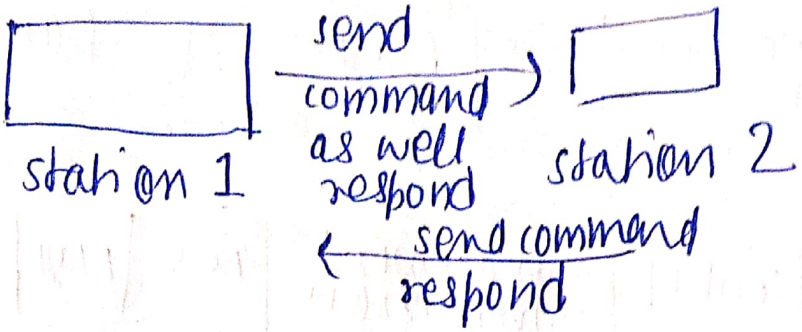
station NRM works





ABM~~ARM~~ works - only point to point

each station can function as primary or secondry as well means every station send the command as also respond



MAC

mac address is assigned by the manufecturer to the NIC card

ARP protocol can retrive MAC address of a device

It is a 48 bits (6 bytes) hexadecimal address

IP

IP address is assigned by the network administrator or ISP

RARP protocol can retrive IP address of a device

Ipv4 is a 32 bit (4 bytes) address and IPV6 is a 128 bits (16 bytes) address