

The IP Switching Model

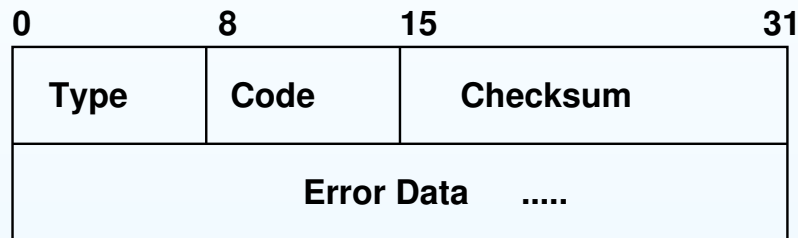
IP Datagram Switching Model

1. If you are a host, check to see if the destination address is local. If so, send to the MAC address of the recipient otherwise, send to the MAC address of the local router, *else*
2. Extract the destination address from the packet.*
3. If the address is local, send to the destinations MAC address, *else*
4. Pass the destination address to the routing algorithm to get the port number of the next hop router.
5. If the packet cannot be delivered, drop it and follow the error algorithm.

If Type-of-Service routing is enabled, the router would also need the TOS flags.

Error Control

IP has no internal error control, but it can generate errors to be delivered by ICMP (Internet Control Message Protocol).



The error data is either nothing or the IP Header plus the first 64 bytes of the packet that is in error.

The big problem for ICMP is that it can only reply to the original source of the packet.

Error Control

There are 23 error types, but the most interesting are:

Echo Reply

Destination Unreacheable

Redirect

Parameter Problem

Time Stamp Reply

Address Mask Reply

Echo Request

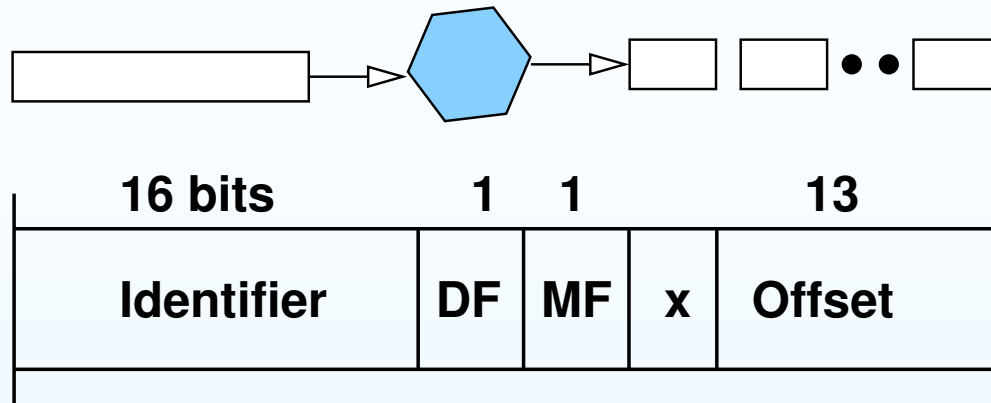
Source Quench

Time Exceeded

Time Stamp Request

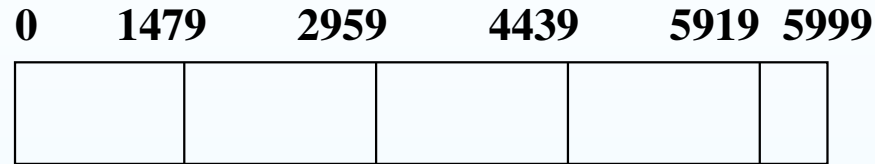
Address Mask Request

Fragmentation



- If DF is set, a packet that needs fragmentation will be dropped.
- The identifier is a randomly generated value.
- MF = 1 indicates that more fragments follow.
- Offset is the offset of this fragment in the message.

Fragmentation Example



Offset	MF	Data
0	1	0-1479
1480	1	1480-2959
2960	1	2960-4439
4440	1	4440-5919
5920	0	5920-5999