ii) Query message

It occurs in pairs, helps a host or nlw manager get specific information from a router or another level. The types of query message are :-

a) Fetch request and reply.

This message is generated in response to an echo request. It is mandatory for all hosts and must include the exact payload received in the request.

b) Timestamp request and reply.

Two machines can use the timestamp request a timestamp reply messages to determine the round trip time needed for an IP datagram to travel between them.
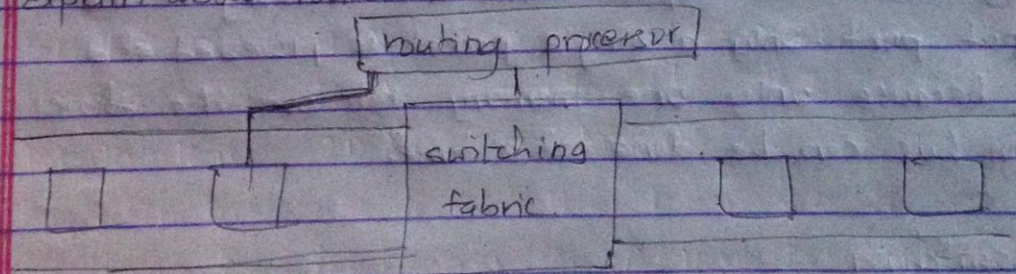
c) Address mask request and reply

A host may know its IP address but it may not know the corresponding host thus ICMP returns this message.

d) Router solicitation & advertisement

A host broadcasts a router solicitation message then the router that receive the solicitation message broadcast their routing information using the router advertisement message.

17 Explain about router architecture in detail

=>

Input port   Output port

fig. router architecture

Router architecture is designed so that routers are equipped to perform two main functions: process routing table protocols and use routing protocols to determine best path. The input put manages all the incoming data packets with the help of routing process in which includes various routing protocols. The routing processor is also responsible for the network management & managing the routing tables. The switching fabric builds connections with other networks via switches & routers and finally the data packets are sent to the output port via transport bus.

10. What are the various types of switching fabrics in router? explain each of them.

=) Switching fabric is a network topology in which the nodes interconnet via one or more n/w switches. There are three types of switching fabrics they are: memory, bus & cross bar.

i) Memory switching

A packet will be copied from input port to the memory and then copied from the memory to the output port. Only a single packet is processed at a time because only one memory rate over the shared system bus can be done at a time.

ii) Bus switching

Datagram from input port memory will be transferred to the output memory via a shared bus. Since the bus is shared, there will be bus connection.

iii) Crossbar switching

Switching via interconnection network overcomes bus bandwidth limitations because there's no bus connection contention. There are many advanced design for this switching via interconnections network.

19 Describe how packet loss can occur at input ports. Describe how packet loss at input ports can be eliminated.

⇒ Packet loss occurs if queue size at the input port grows large because of slow switching fabric speed & thus exhausting the router's buffer space. It can be eliminated if the switching speed is at least 'n' times faster where 'n' is the number of input ports present in the router.

20. Discuss why each input port in a high speed router stores shadow copy of the forwarding table.

⇒ The forwarding decision of the packets are determine decentralized in high speed router which means that the router processor is not only the one responsible for the forwarding of the packets. The switching fabric is also forwarding of responsible in packet forwarding. Thus to decrease the traffic in the bottleneck processing in the router, a shadow copy of forwarding table is stored in the input port of the router.