SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

19CSB302- COMPUTER NETWORKS

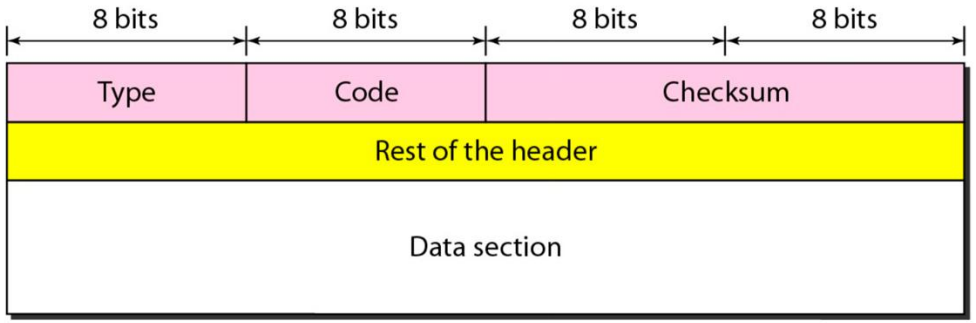
UNIT-3 INTERNETWORKING AND ROUTING

Internet Control Message Protocol (ICMP)

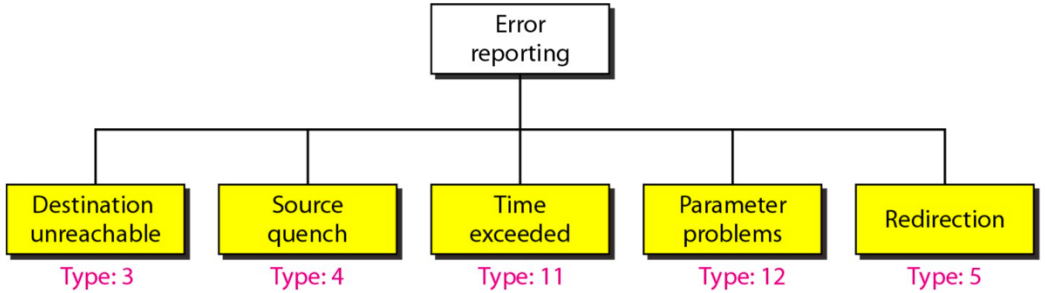
- Internet Control Message Protocol (ICMP) is a network layer protocol used to diagnose **communication errors** by performing an error control mechanism
- IP does not have an inbuilt mechanism for sending error and control messages. It depends on Internet Control Message Protocol(ICMP) to provide error control.
- ICMP packets are transmitted in the form of datagrams that contain an IP header with ICMP data. ICMP datagram is similar to a packet, which is an independent data entity.

ICMP Header

General format of ICMP messages



Type (8-bit): The initial 8-bit of the packet is for message type



- **Code (8-bit):** Code is the next 8 bits of the ICMP packet format, this field carries some additional information about the error message and type.

- **Checksum (16-bit):** Last 16 bits are for the checksum field in the ICMP packet header. The checksum is used to check the number of bits of the complete message and enable the ICMP tool to ensure that complete data is delivered.
- The next 32 bits of the ICMP Header are **Extended Header** which has the work of pointing out the problem in IP Message.
- The last part of the ICMP packet is Data or Payload of variable length.

Types of ICMP messages

- **Information Messages** – In this message, the sender sends a query to the host or router and expects an answer. For example, A host wants to know if a router is alive or not.
- **Error-reporting message** – This message report problems that a router or a host (destination) may encounter when it processes an IP packet.
- **Query Message** – It helps a router or a network manager to get specific information from a router or another host. This message is commonly used to ping a message.

Category	Type	Message
Error-Reporting Messages	3	Destination unreachable
	4	Source quench
	11	Time Exceeded
	12	Parameter Problem
	5	Redirection
Query Message	8 or 0	Echo request or reply
	13 or 14	Timestamp request or reply
	17 or 18	Address mask request or reply
	10 or 9	Router Solicitation or advertisement

Echo-request and echo-reply message

- A router or a host can send an echo-request message. It is used to ping a message to another host that "Are you alive". If the other host is alive, then it sends the echo-reply message.

Timestamp-request and timestamp-reply message

- The timestamp-request and timestamp-reply messages are also a type of query messages. Suppose the computer A wants to know the time on computer B, so it sends the timestamp-request message to computer B. The computer B responds with a timestamp-reply message.

Address Mask Request

- The ICMP Address Mask Request and Address Mask Reply query messages provide a host with the ability to determine the subnet mask in use on the local network.

Router Solicitation

- The ICMP Router Solicitation message is sent from a computer host to any routers on the local area network to request that they advertise their presence on the network.