



Internet Control Message Protocol (ICMP)



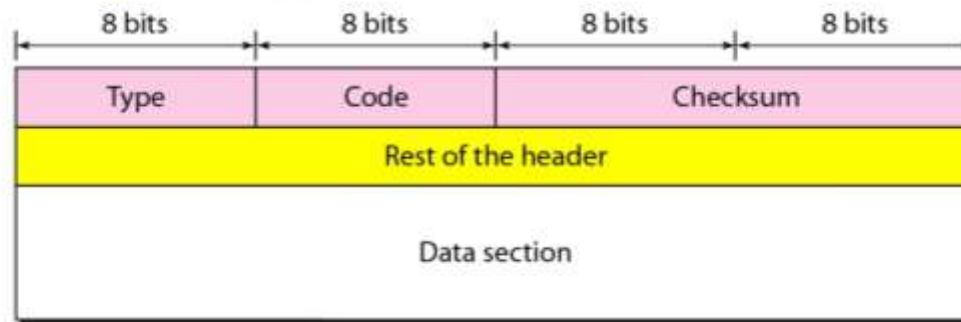
- Internet Control Message Protocol (ICMP) is a network layer protocol used to diagnose **communication errors** by performing an error control mechanism
- IP does not have an inbuilt mechanism for sending error and control messages. It depends on Internet Control Message Protocol(ICMP) to provide [error 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

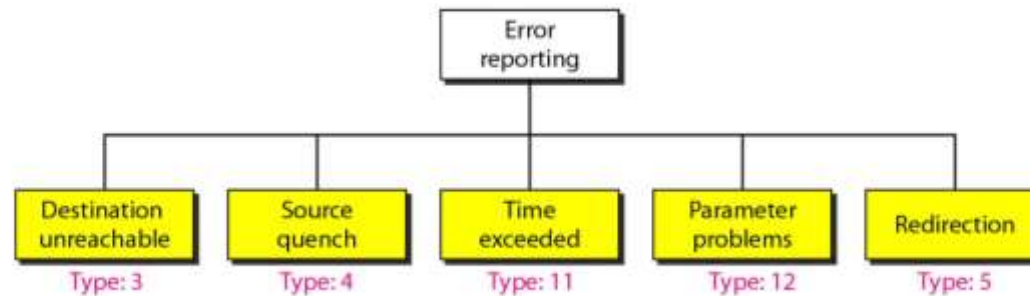


General format of ICMP messages





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.



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.
- These messages can help determine the amount of time it takes for ICMP query messages to travel across a network



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.