

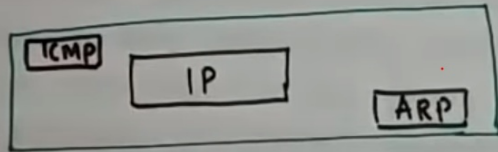
ICMP – Internet Control Message Protocol – Messages, Format | DCN Networking Lectures in Hindi

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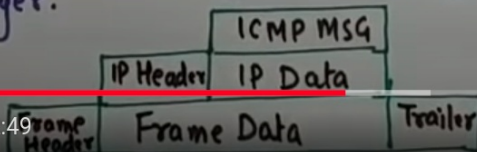
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Internet Control Message Protocol (ICMP) :- ICMP is designed to overcome the following two problems with IP Protocol:

- (i) No Error Reporting/Correcting mechanism.
- (ii) Lacks a mechanism for Queries.



→ ICMP messages are not directly passed to the data link layer. Instead, the messages are first encapsulated inside IP datagrams before going to the lower layer.

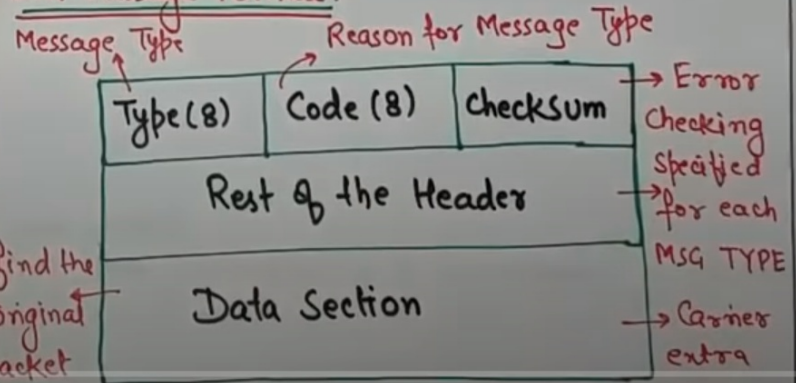


ICMP Messages:-

Error Reporting
Reports Problem that Router or a Host may encounter while Processing of IP Packet.

Query
Fetch Important/Specific Info from a Router or Host.

ICMP Message Format:-



8:40 / 22:49



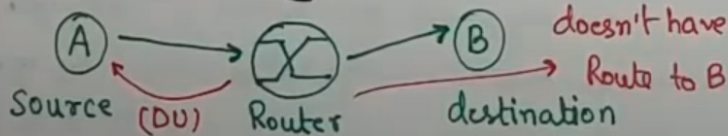
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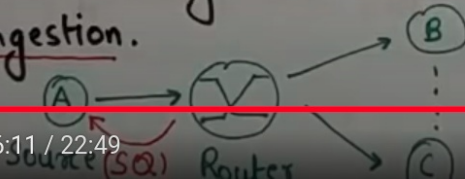
Error Reporting Messages:- ICMP always reports error message to the original source.

[ICMP does not correct errors]

(i) Destination Unreachable:- Whenever a Route to the destination is not found, datagram is discarded and Router/Host sends Destination Unreachable Message back to the source.



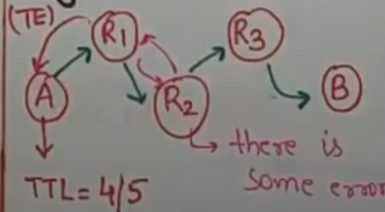
(ii) Source Quench:- This message informs the source that a datagram has been discarded due to congestion.



(iii) Time Exceeded:- It is generated in following two cases.

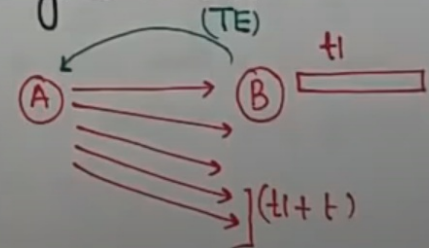
Code-0

Whenever a Router's a datagram with TTL Value to Zero (0), it discards the datagram and sends a time-exceeded Msg to the original source.



Code-1

When the final destination doesn't receive all fragments in a set time, it discards the received fragments and sends a time-exceeded Msg. to the original source.



Page 3 Assignment of ICMP protocol

(Data Communication and Networking) (ICMP-3)

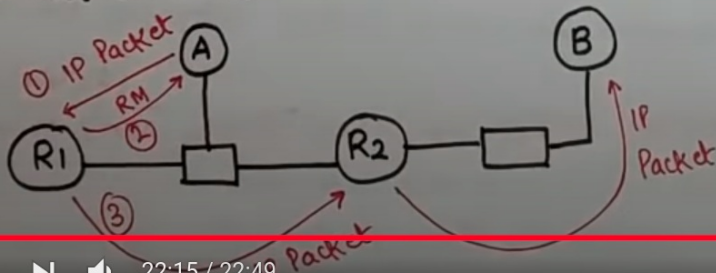
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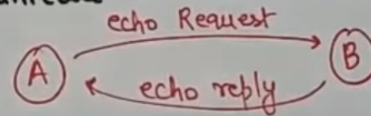
(iv) **Parameter Problem**:- If router/host discovers an ambiguous or missing value in any field of the datagram, it discards datagram and sends a **Parameter Problem** message back to the source. → **Code '0'** → Error/Ambiguity in one of the Header field.
→ **Code '1'** → Required Part of the option is missing.

(v) **Redirection**:- It is sent from a router to a host on same local NLW.



ICMP Query Messages:- It is used to diagnose some NLW problems.

(i) **Echo Request and Reply**:- Designed for the diagnostic purpose. These messages are used to determine whether two systems can talk/communicate with each other.



(ii) **Timestamp Request and Reply**:- Two machines use these messages to determine the Round-Trip time needed for an IP datagram to travel b/w them.

→ Sending Time = Receive - Original
→ Receiving Time = Returned - Transmit
→ Round-Trip = Sending + Receiving

