CS & IT ENGINEERING

Computer Networks

[redacted] IP Support Protocol

Lecture No.- 2

By- Ankit Doyla Sir

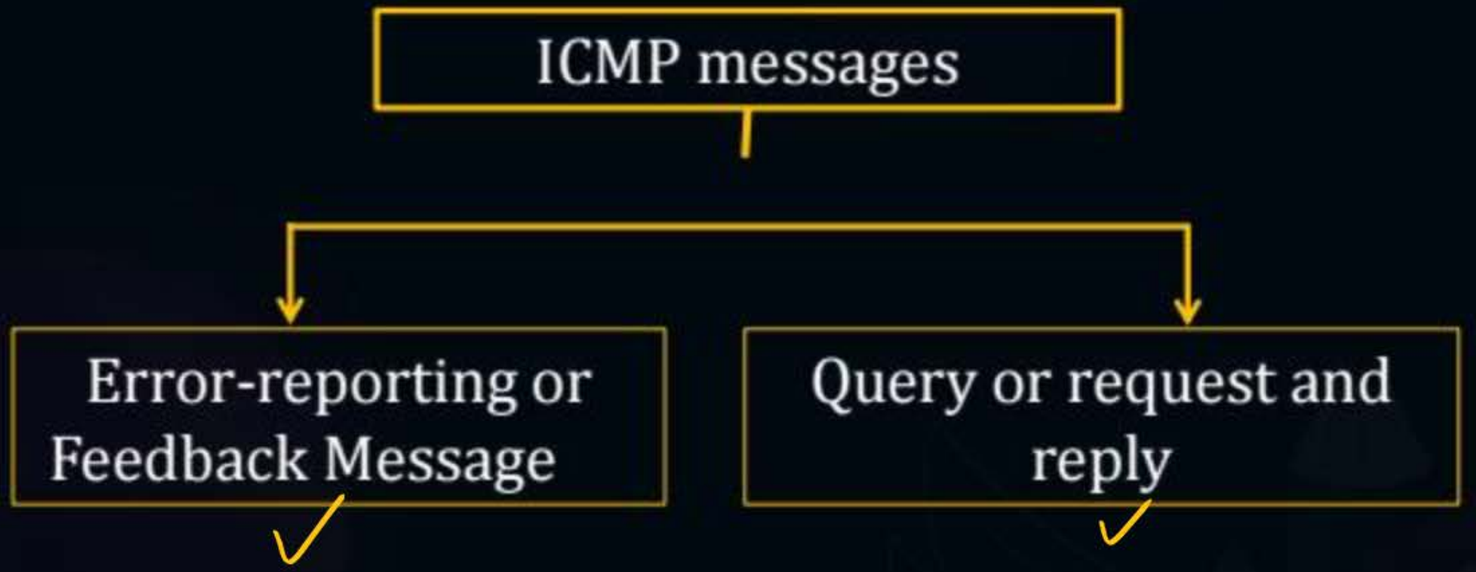
Topics to be Covered

Topic Introduction To ICMP

Topic ICMP Feedback Messages

Introduction To ICMP

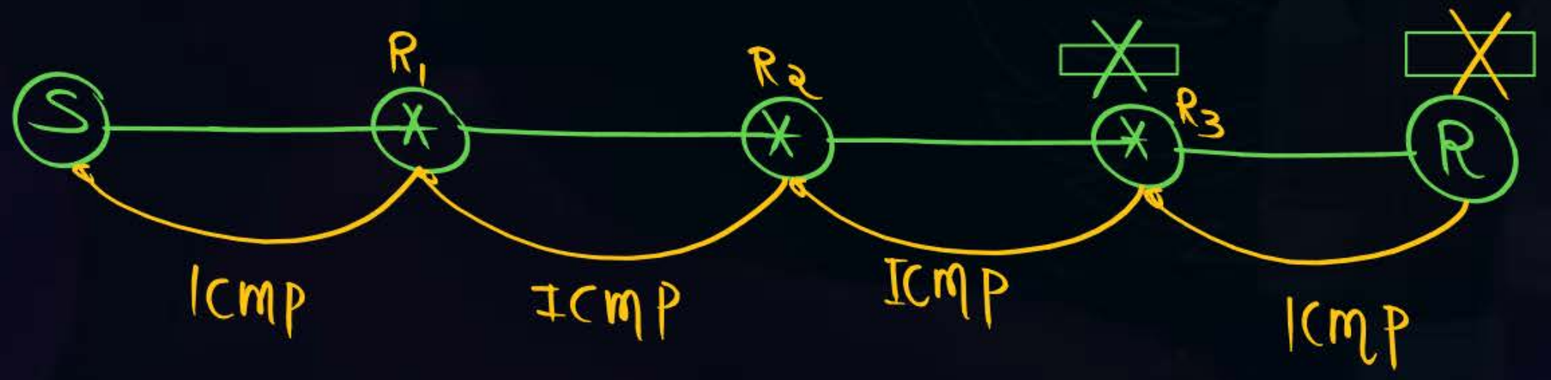
Topic : Internet Control Message Protocol



Topic : Internet Control Message Protocol

Error reporting messages:

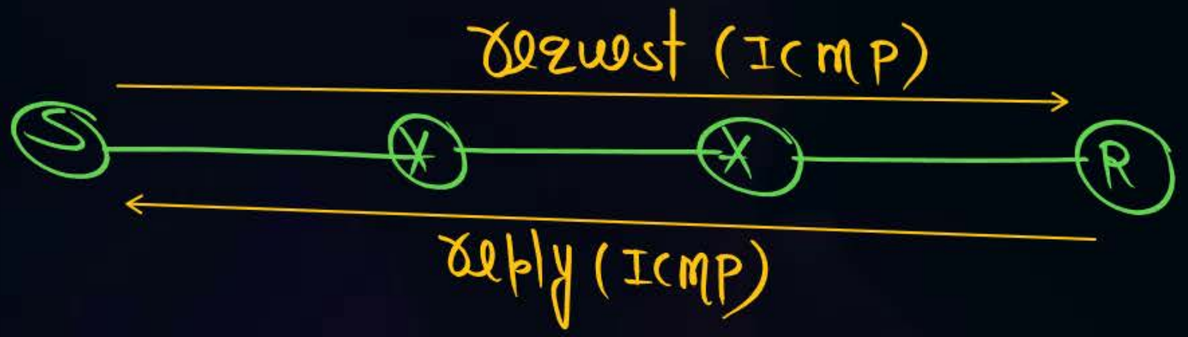
1. Whenever datagram is discarded by intermediate router or end receiver then we informed to sender that your packet has been discarded.
2. This information is sent using ICMP.
3. Direction of packet movement for ICMP is from router to sender or receiver to sender.



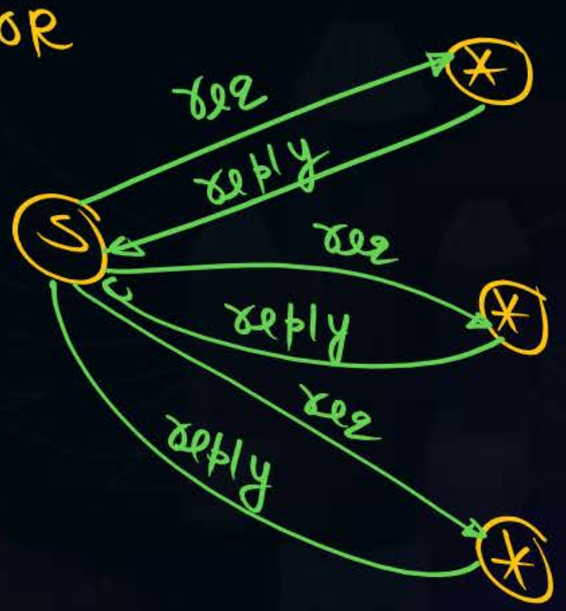
Topic : Internet Control Message Protocol

Query messages:

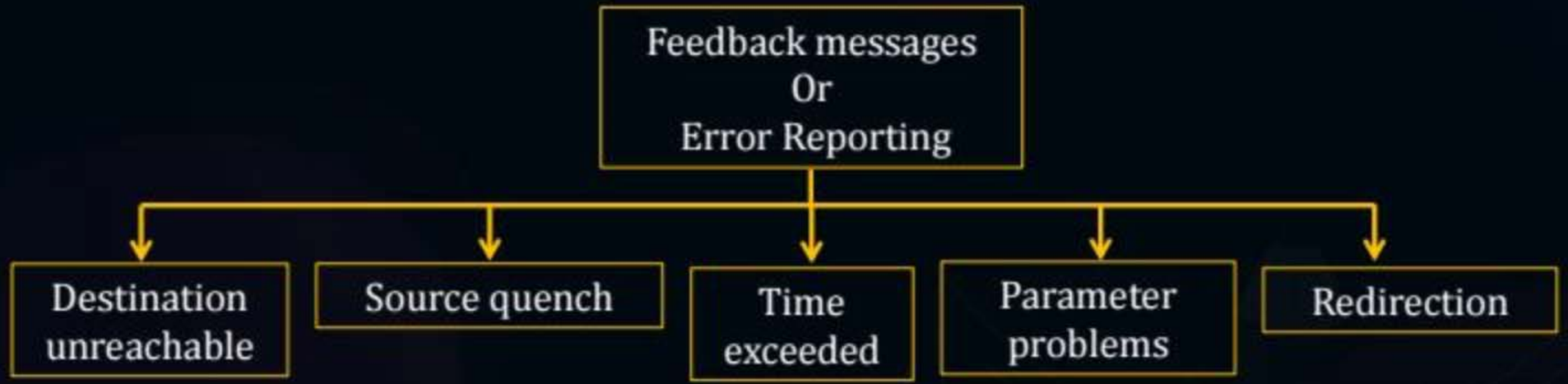
The query messages are those messages that help the host to get the specific information of another host. For example, suppose there are a client and a server, and the client wants to know whether the server is live or not, then it sends the ICMP message to the server.



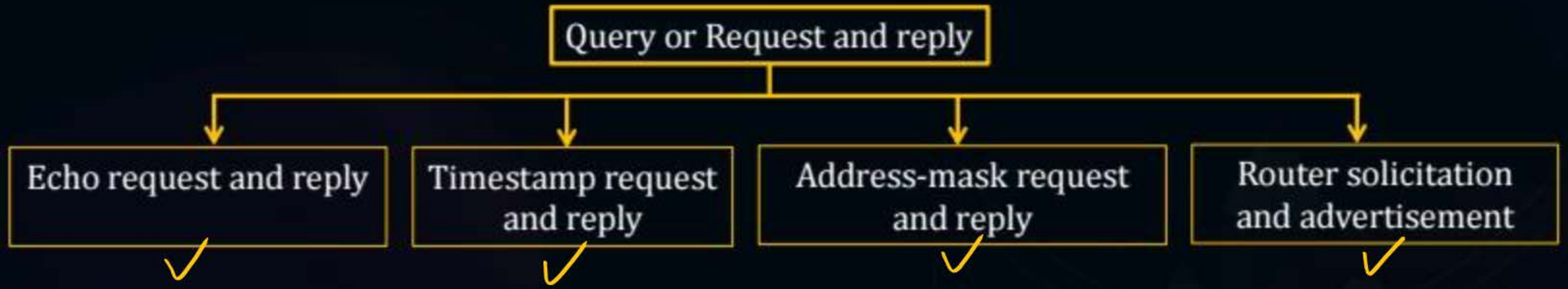
OR



Topic : Internet Control Message Protocol



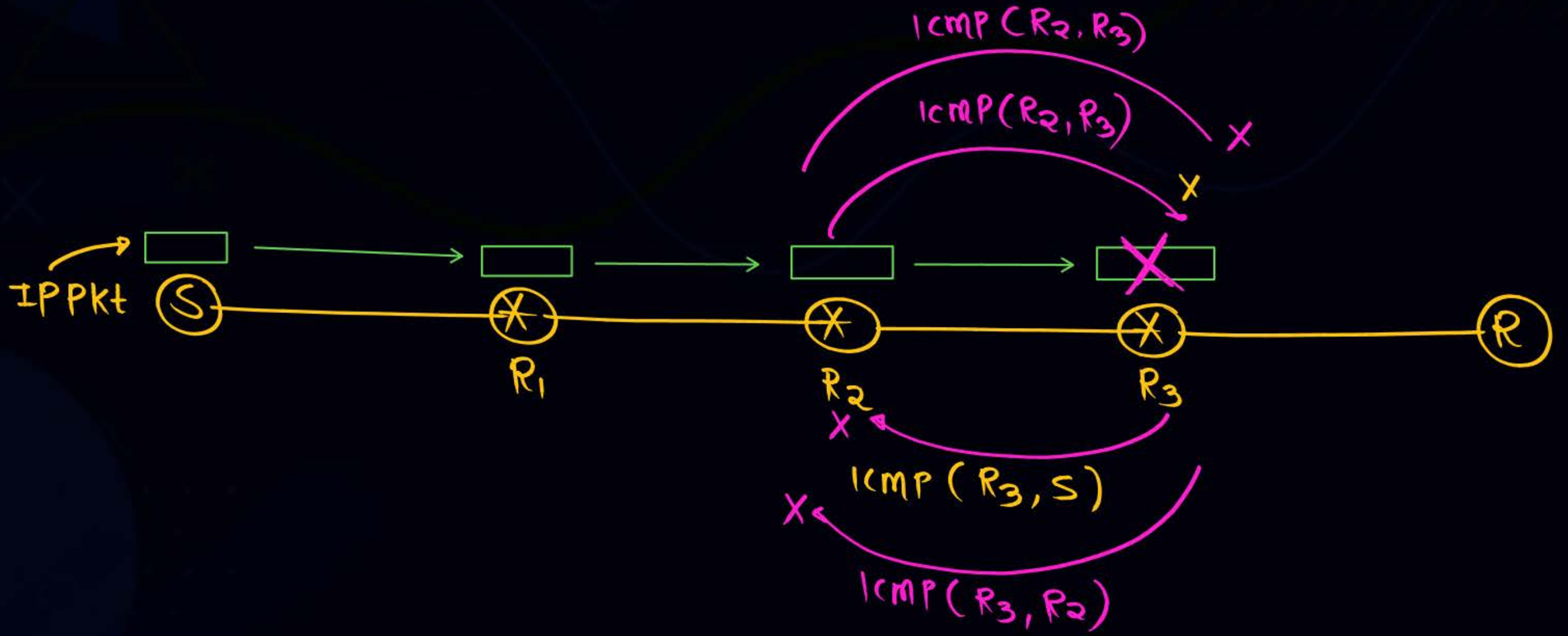
Topic : Internet Control Message Protocol



Topic : Internet Control Message Protocol

Since IP does not have a inbuilt mechanism for sending error and control messages. It depends on Internet Control Message Protocol (ICMP) to provide an error control. It is used for reporting errors and management queries. It is a supporting protocol and used by networks devices like routers for sending the error messages and operations information.

e.g. the requested service is not available or that a host or router could not be reached.



Infinite Looping

Topic : Internet Control Message Protocol

NOTE:

Whenever any IP packet is discarded initially ,ICMP packet will be generated and whenever ICMP packet will be discarded then no ICMP message will be generated

IP+ICMP → unreliable because there is no ICMP message OF Icmp Packet

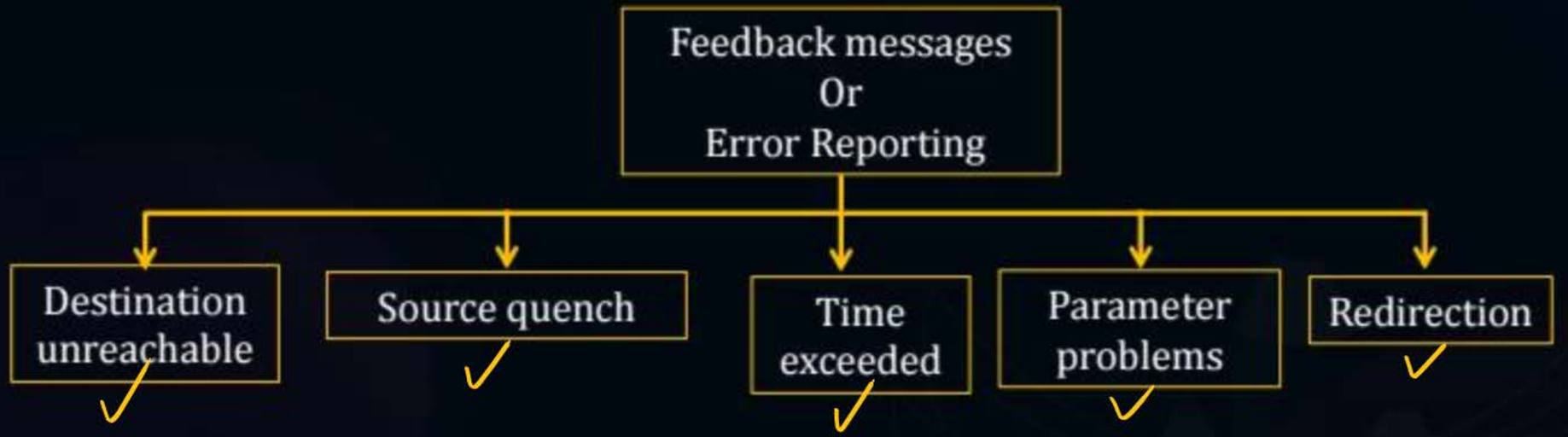
Topic : Internet Control Message Protocol

The following are important point about ICMP error messages:

- No ICMP error message will be generated in response to a datagram carrying an ICMP
- NO ICMP error message will be generated for a fragmented datagram that is not the first fragment.
- No ICMP error message will be generated for a datagram having a multicast address
- NO ICMP error message will be generated for a datagram having a special address such as 127.0.0.0 or 0.0.01.

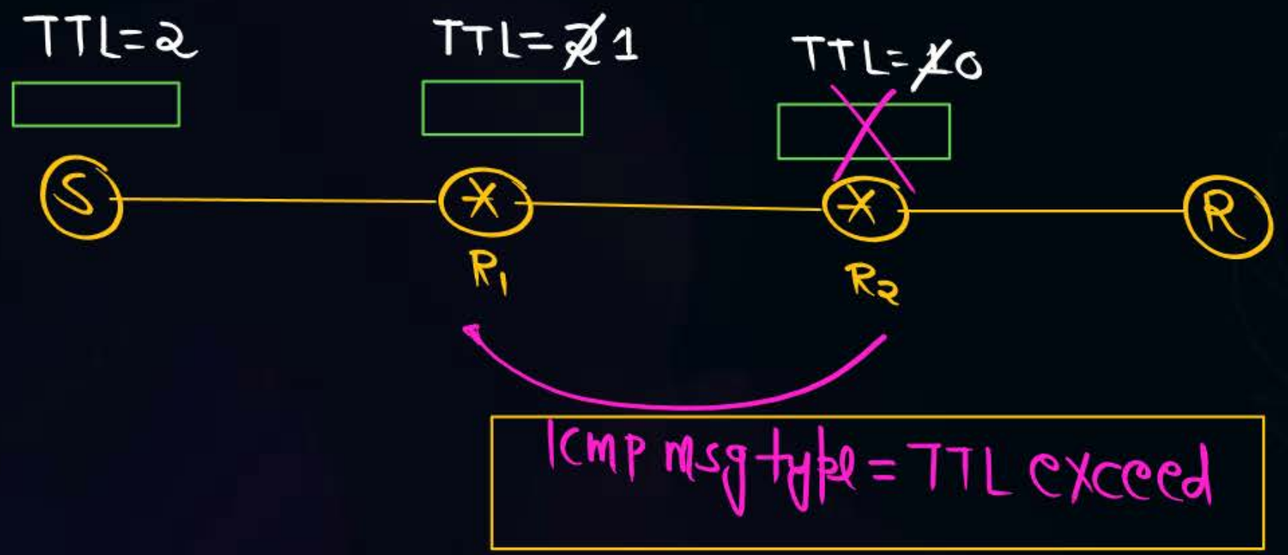
ICMP Feedback Messages

Topic : Internet Control Message Protocol



Topic : Internet Control Message Protocol

1. **TTL exceed:** Whenever TTL becomes 0, Router will discard the packet and send an ICMP message to source.



Topic : Source quench message:

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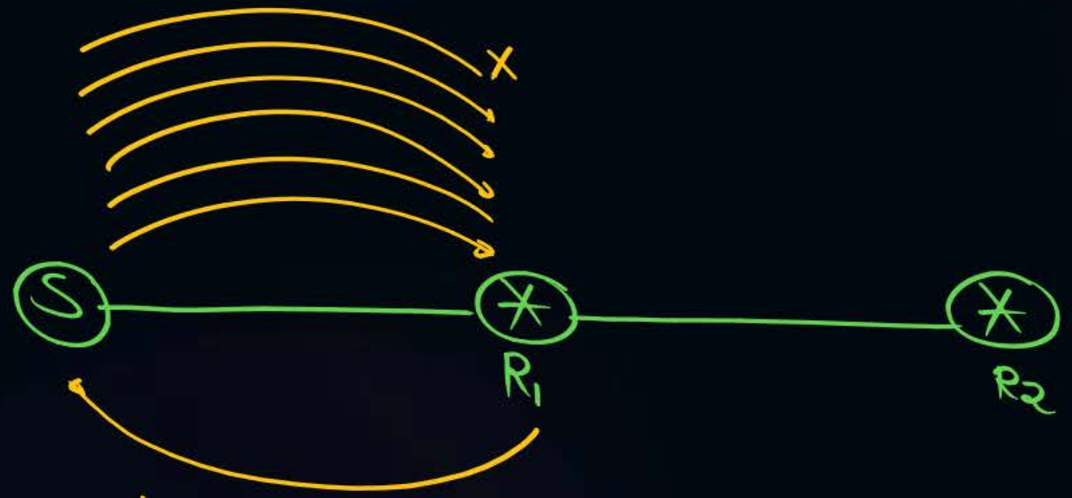
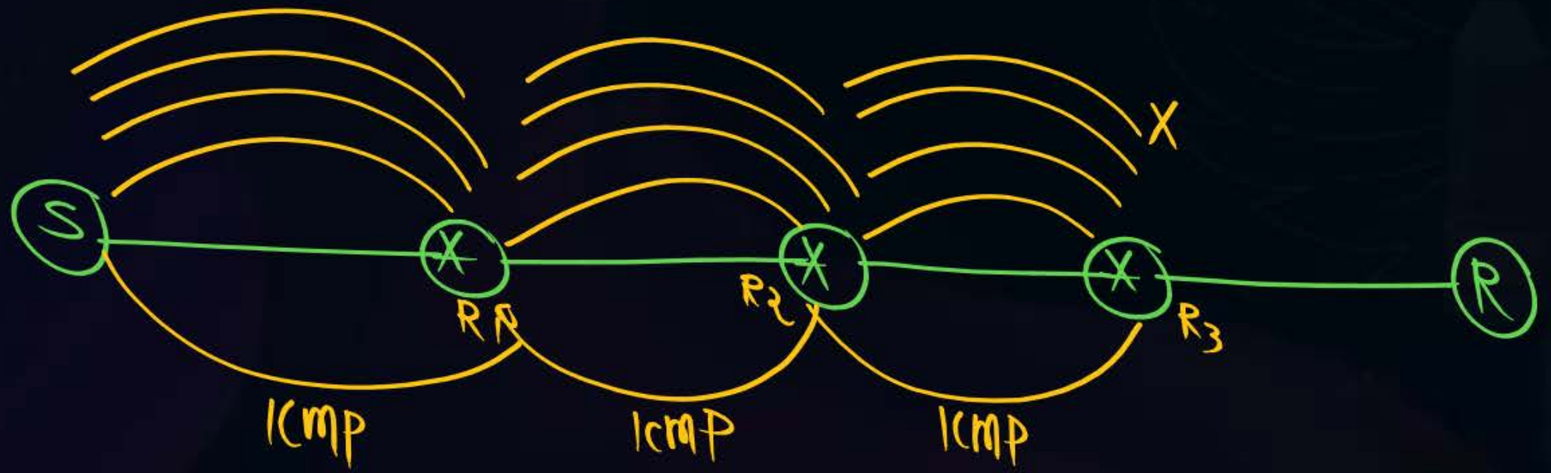


icmp msg type = source quench

(2)



Topic : Source quench message:

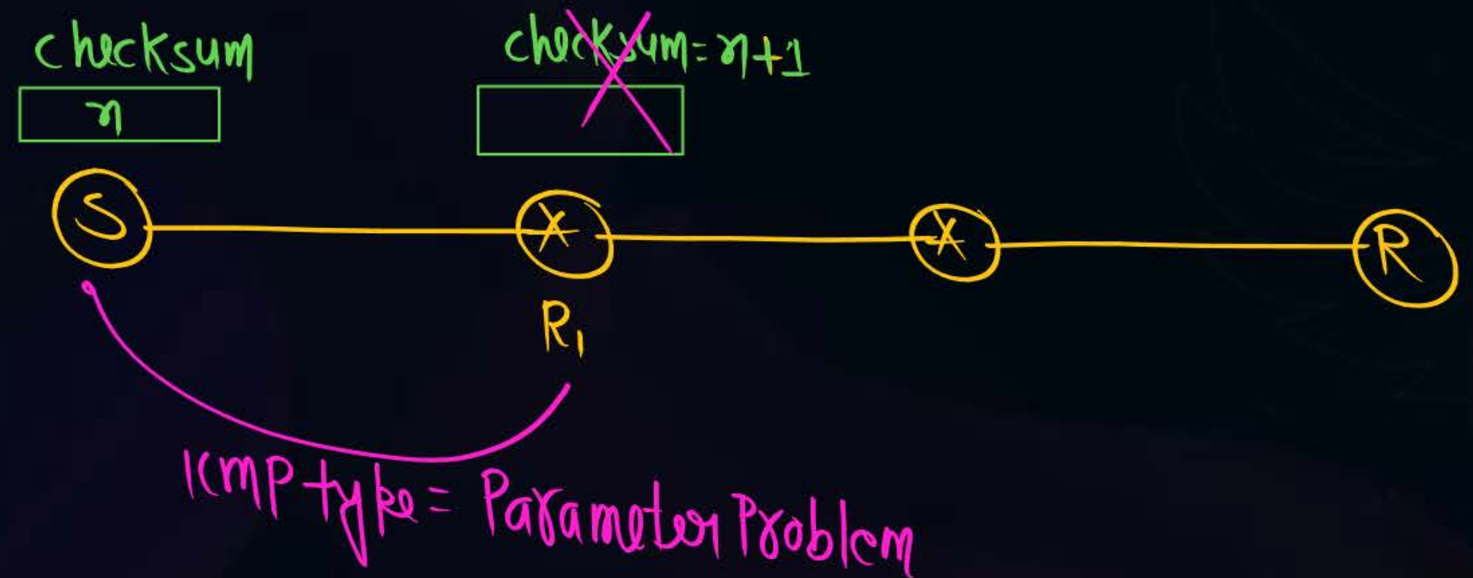
1. Source quench message is request to decrease traffic rate for messages sending to the host(destination). Or we can say, when receiving host detects that rate of sending packets (traffic rate) it is too fast it sends the source quench message to the source to slow the pace so that no packet can be lost.
2. ICMP will take source IP from the discarded packet and informs to source by sending source quench message.

   Then source will reduce the speed of transmission so that router will free from congestion.
3. When the congestion router is far away from the source the ICMP will send hop by hop source quench message so that every router will reduce the speed of transmission.

Topic : Parameter problem

Case II

1. Whenever packets come to the router then calculated header checksum should be equal to received header checksum then only packet is accepted by router.
2. If there is a mismatch packet will be dropped by router.
3. ICMP will take the source IP from discarded packet and informs to source by sending parameter problem message.



Case I

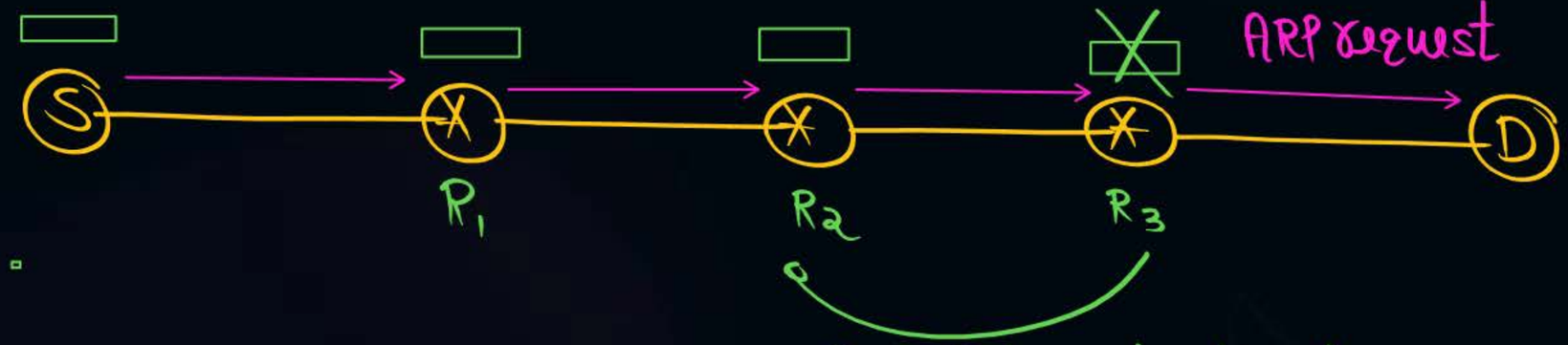
Strict source Routing

$DR_3 R_2 R_1$

Topic : Destination un-reachable

Topic : Destination host un-reachable

(1)



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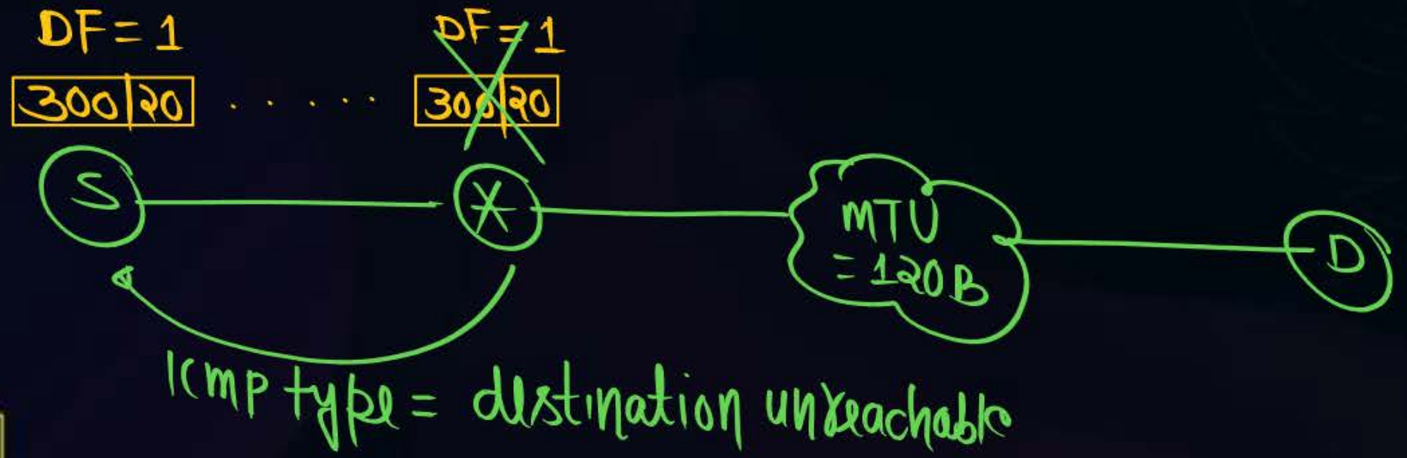
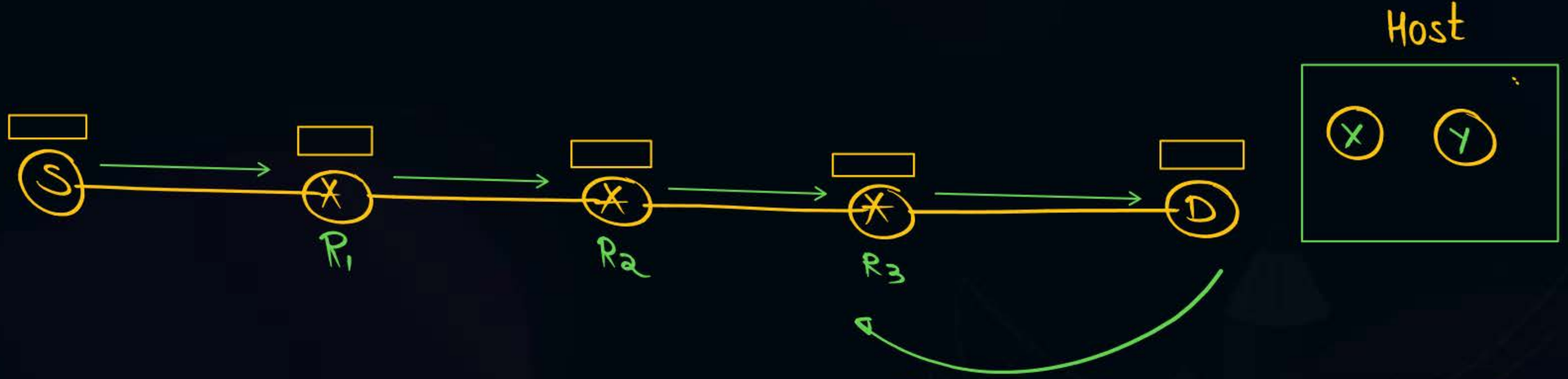


Topic : Destination port un-reachable

Port No = 80



ICMP msg type = destination Port Unreachable

Topic : Redirection message

The redirection message is used when the source uses a wrong router to send out its message. The router redirects the message to appropriate router, but informs the source that it needs to change its default route in the future. The IP address of the default route is sent in the message

THANK - YOU