

I will solve some PYQ's in class.

If time is not sufficient then I will solve
in youtube remaining.

All PYQ's we cannot solve in class as there are
100's of PYQs

Even with extra classes, it's not possible.

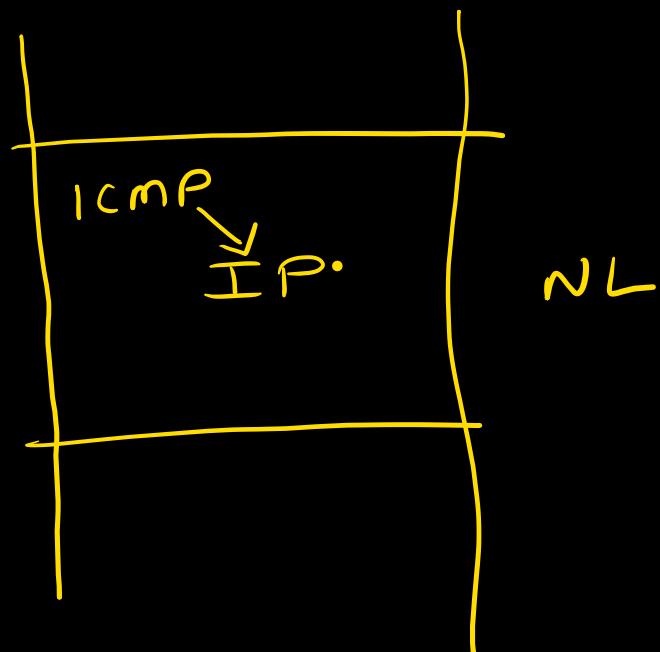
Videos will be uploaded in the app.

Can't give exact deadline for CN, as it depends on
doubts you ask.

There is no point in teaching fast if you
don't understand.

I have to go slow. So that everyone understands it.
All PYQ's will be solved.

Internet ICMP
control message Protocol.



ICMP packet travel
inside IP datagram

Types of ICMP

Error handling
or

Feedback messaging

- 1) TTL exceed ✓
- 2) Parameter problem ✓
- 3) Source quench ✓
- 4) Source redirect ✓
- 5) Destination unreachable ✓

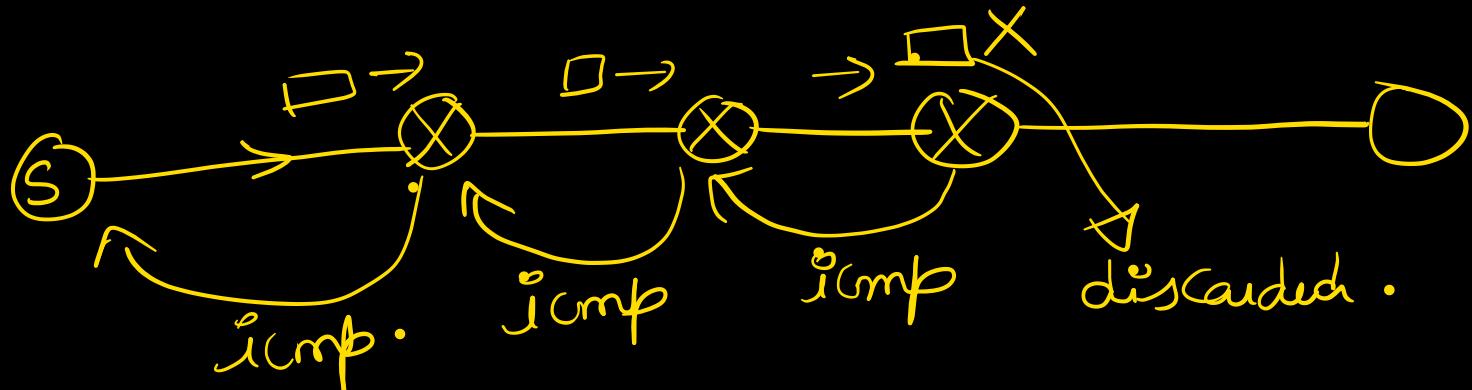
Destination host
unreachable

Destination
Port
unreachable

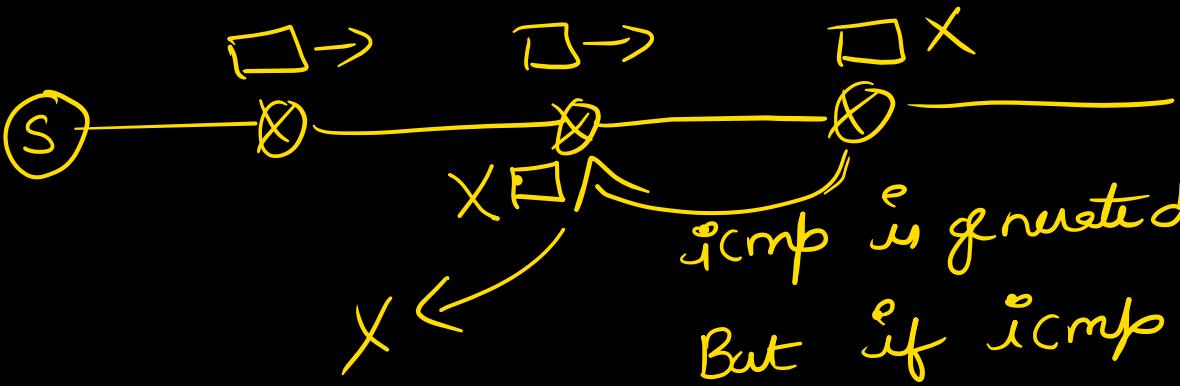
Request and
Reply

- 1) Echo request and reply ✓
- 2) Time stamp req and rep ✓
- 3) N/W mask req and rep ✓
- 4) Router solicitation and
advertisement. ✓

ICMP → give feedback if any IP is lost.



So it looks like ICMP is adding reliability to IP.
But it's not true.

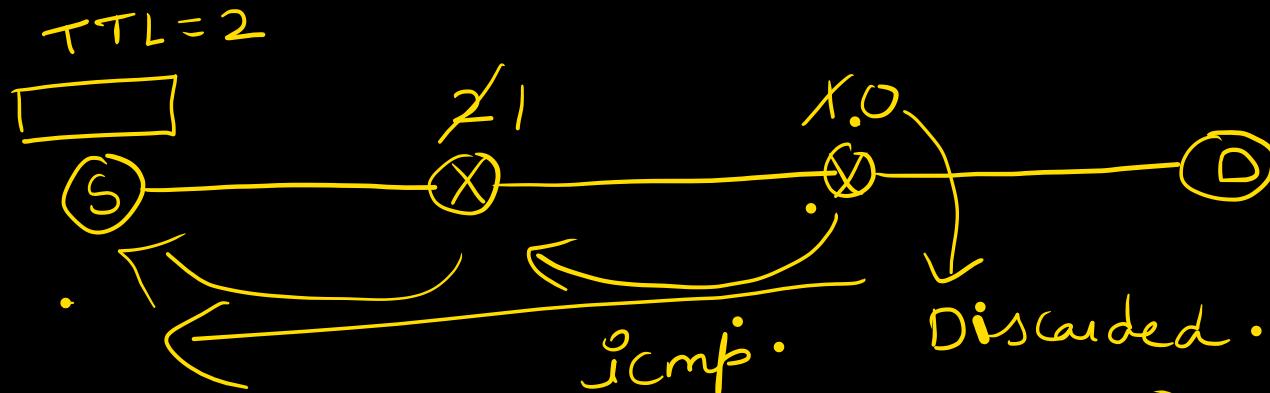


icmp is generated.

But if icmp is discarded,
then no icmp is generated.

(ip + icmp) → still unreliable

TTL exceed:

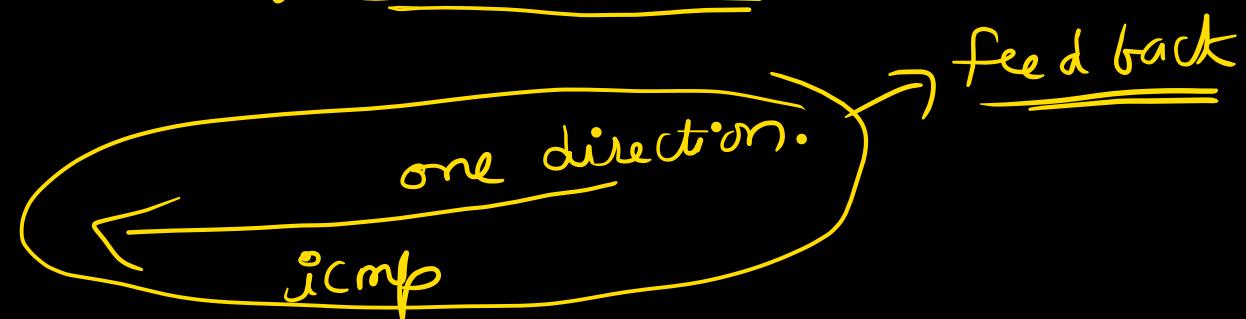


(Type = TTL exceeded).

(what if icmp is lost?)

→ ip & icmp are unreliable.

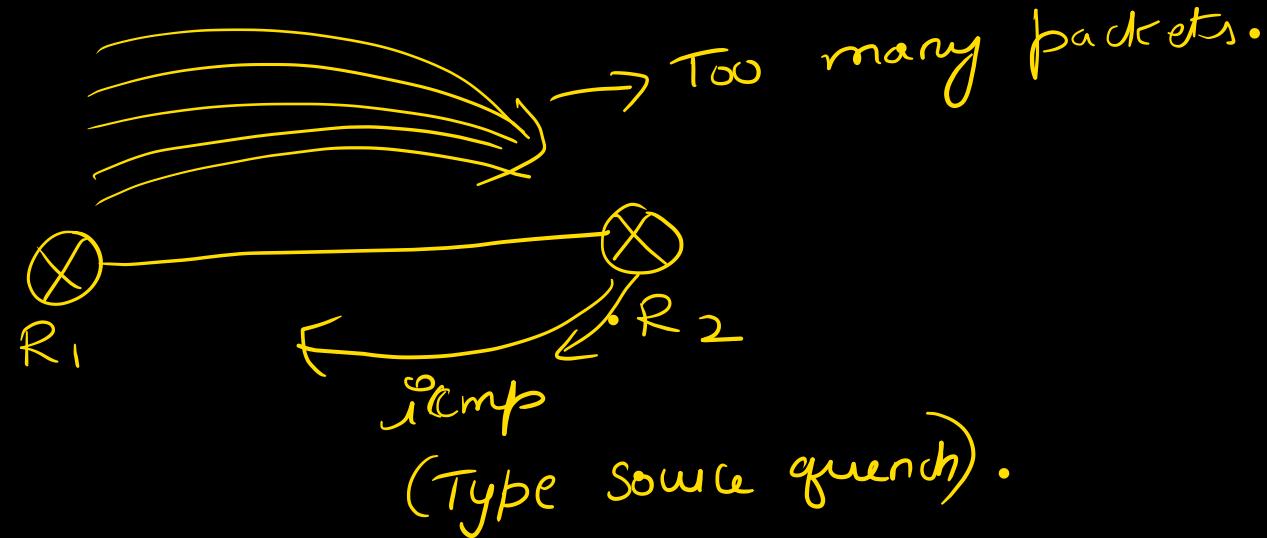
∴ TL protocols will handle packet loss.



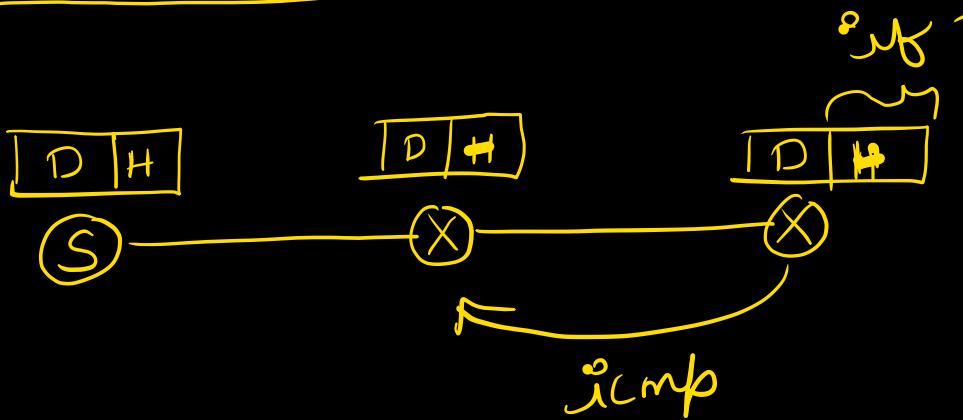
not



Source quench:

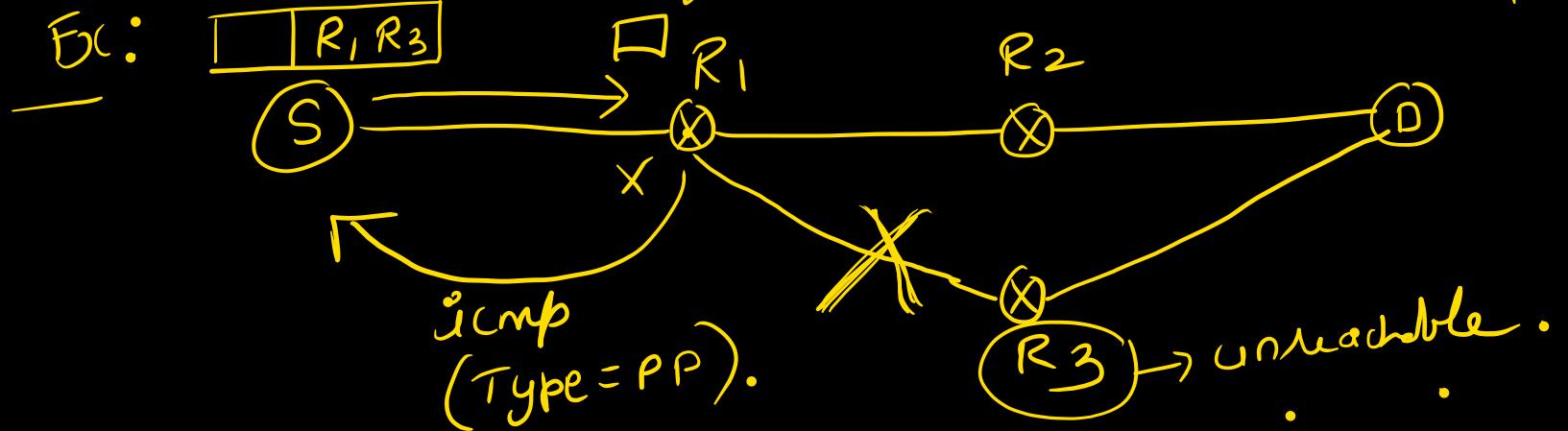


Parameter problem :



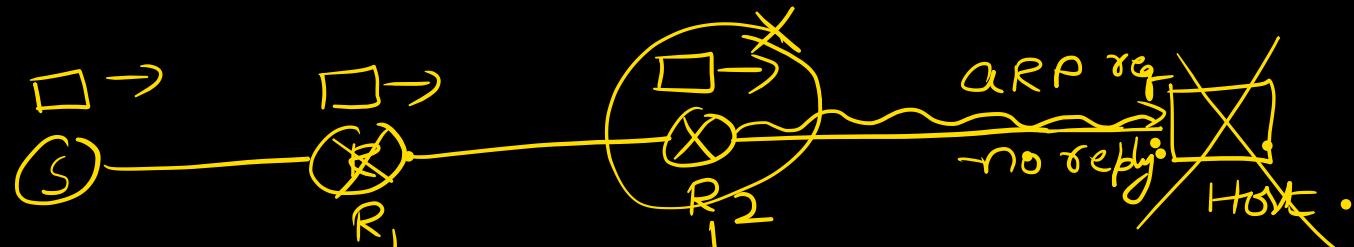
if there is a problem with setting of fields in header then packet will be discarded and icmp will be sent.

strict source Routing. (Type: Parameter problem)

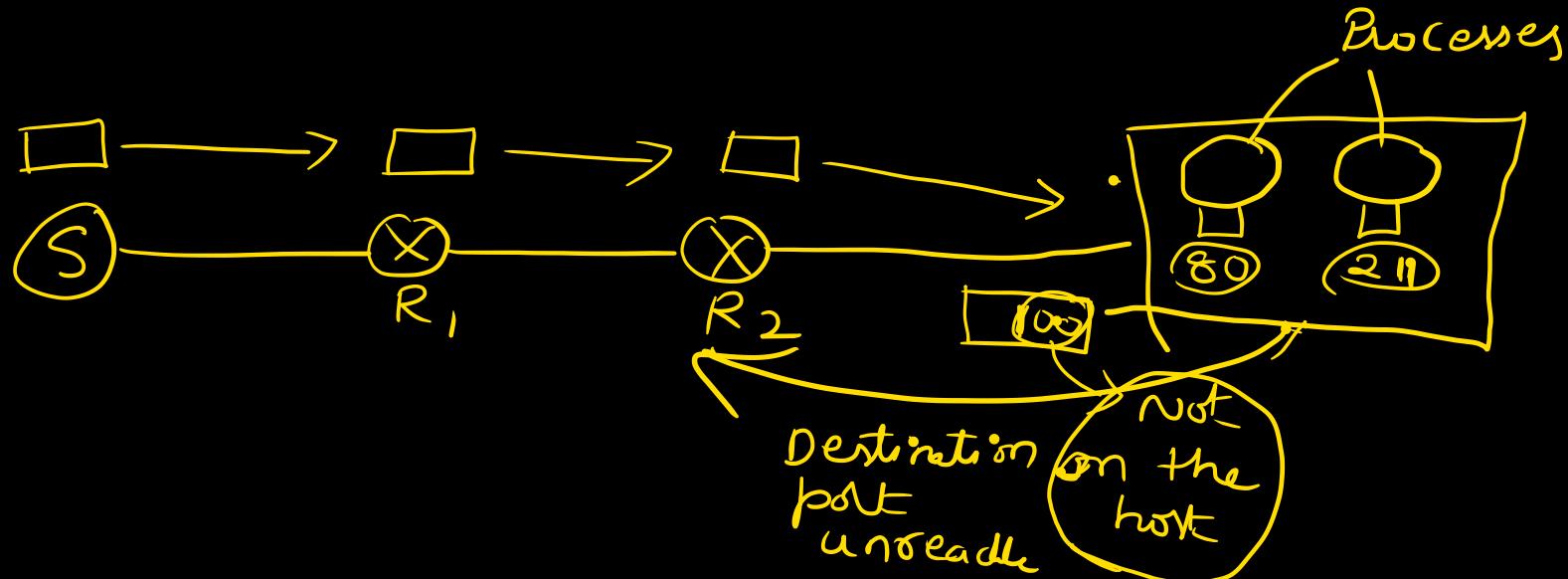


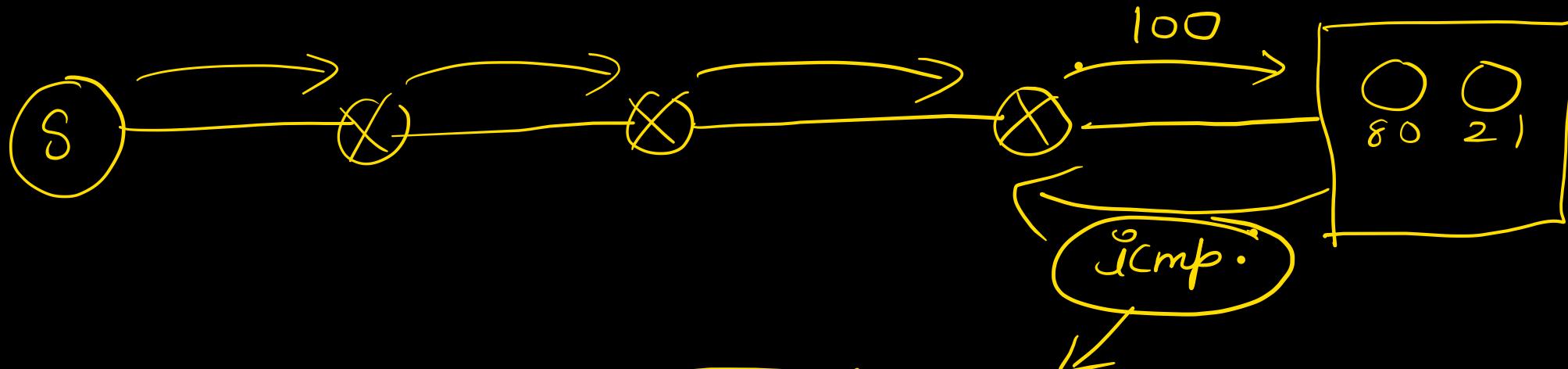
Destination host unreachable:

Packet discarded.



icmp (destination host unreachable)

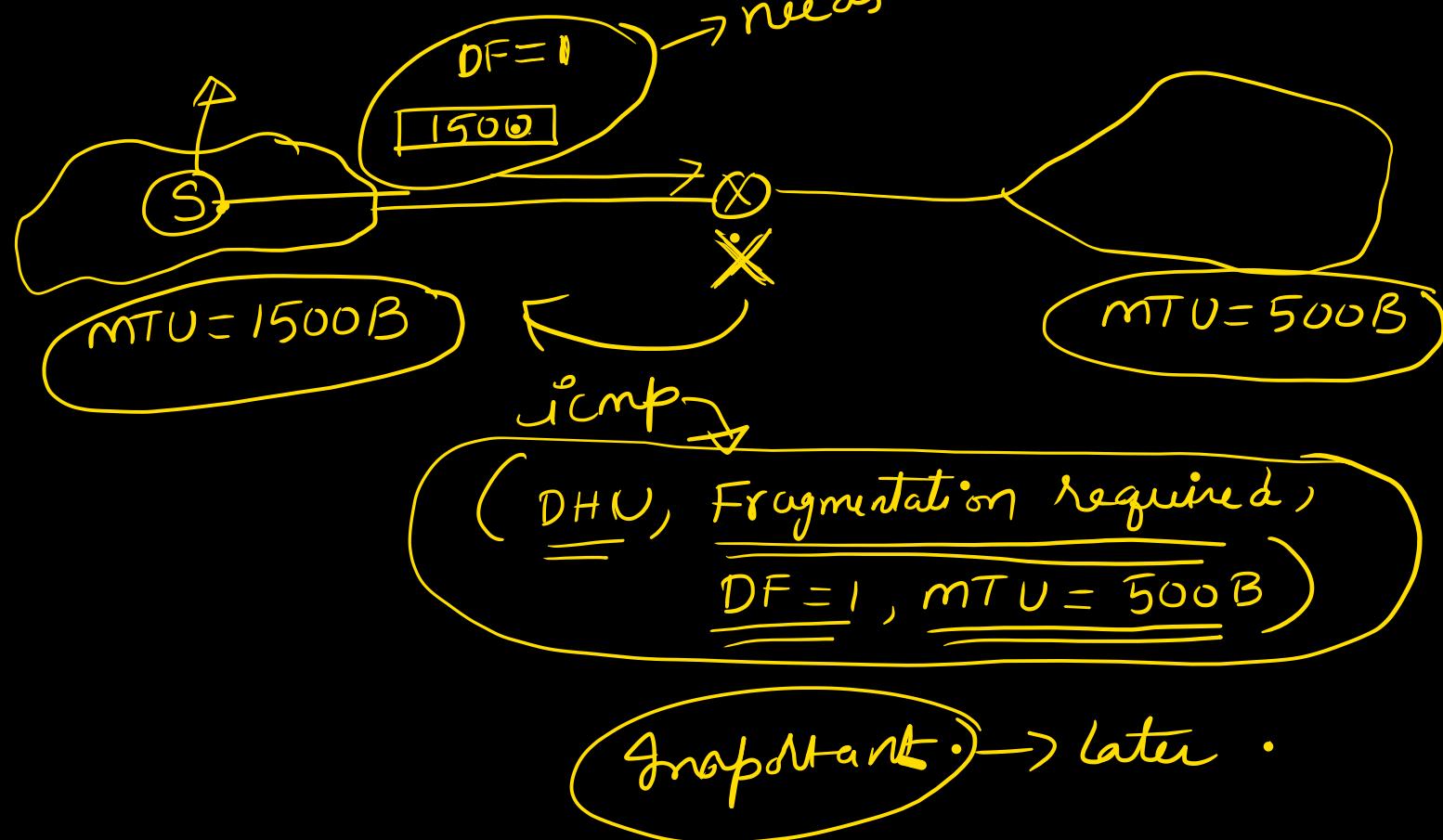




[only case] when a rec will
send back an ICMP packet.

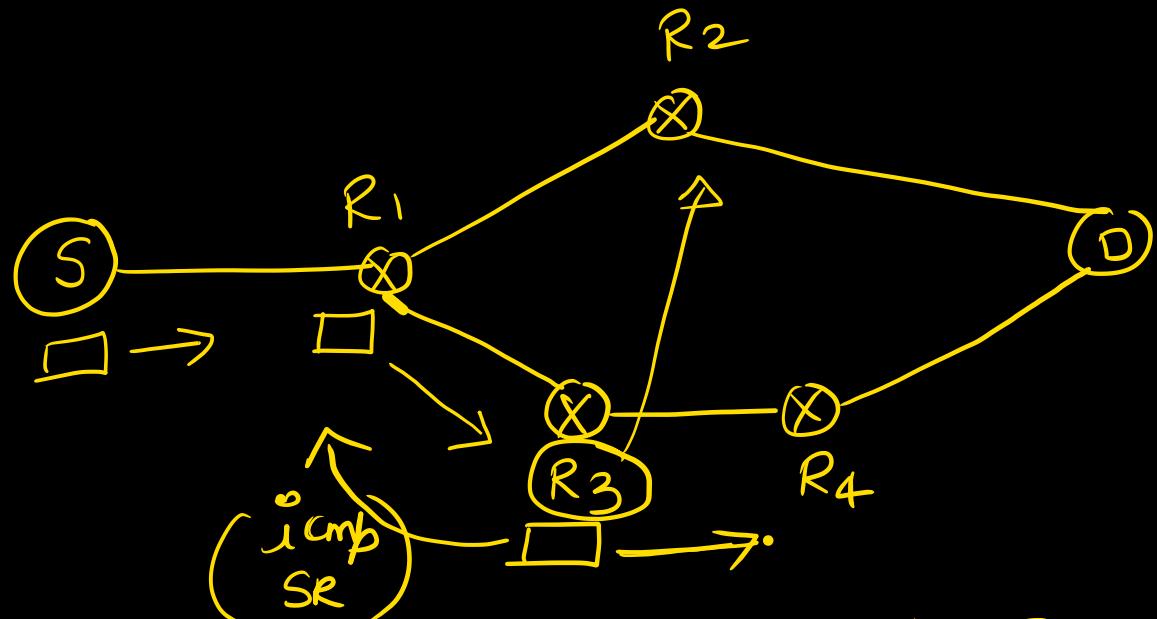
This is important.
we will see later.

E: Destination host unreachable •

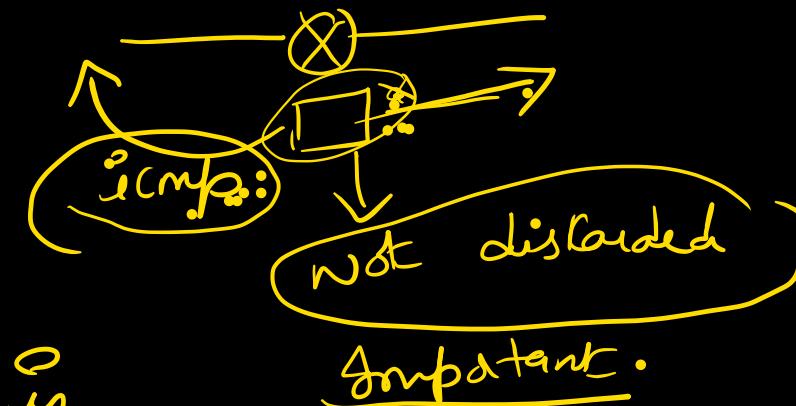


source redirect:

A Router will suggest better route if possible.



$R_3 \rightarrow$ Send a message to R_1 , that R_2 is shorter. $\text{only if } R_3$ knows that R_2 is shorter. It doesn't happen in all the cases.

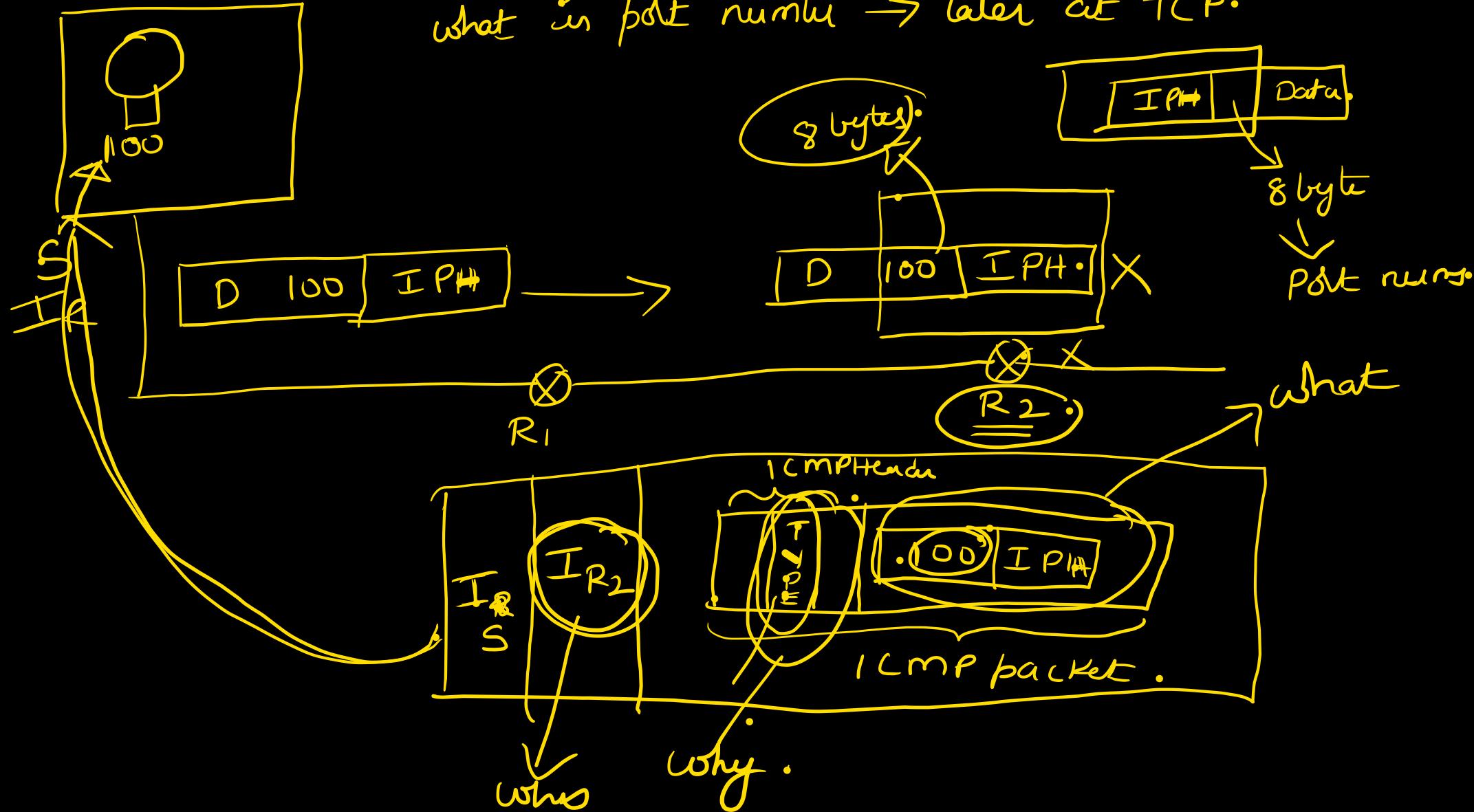


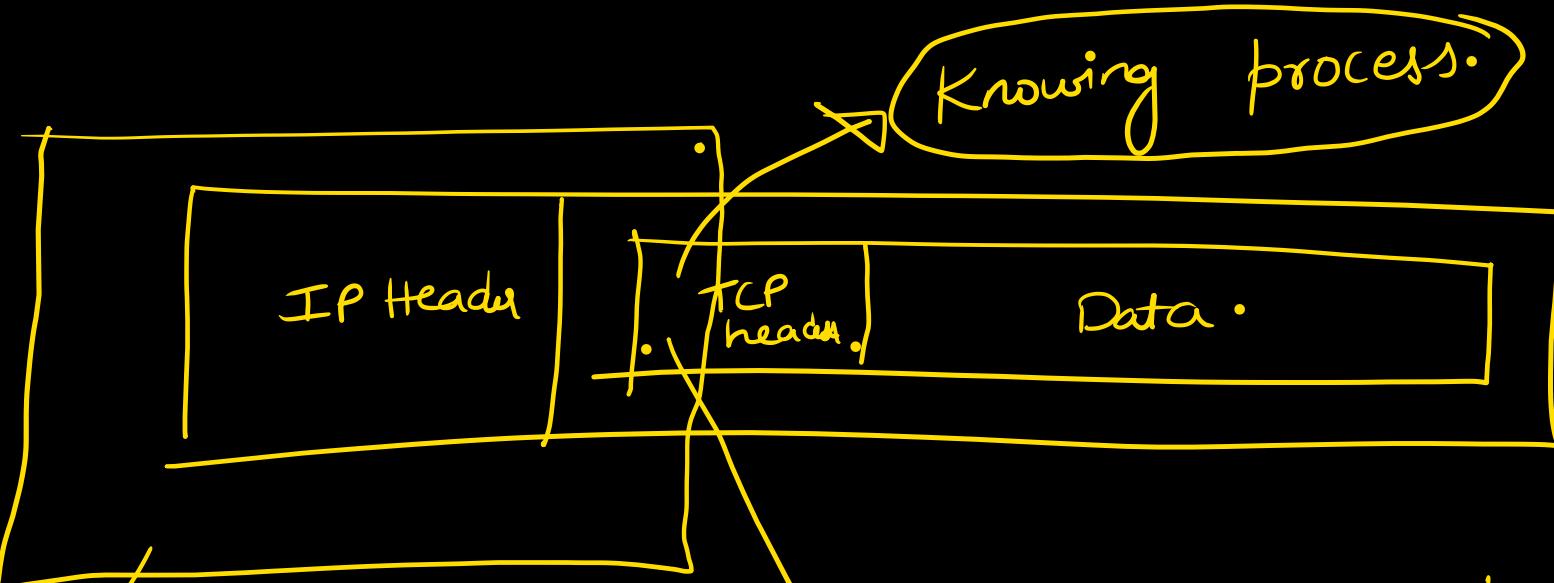
When a packet is discarded, ~~sent~~ sender needs to know

- (1) what packet is discarded?
- (2) why is it discarded?
- (3) who discarded?

what, why, who.

what in port number → later at TCP.



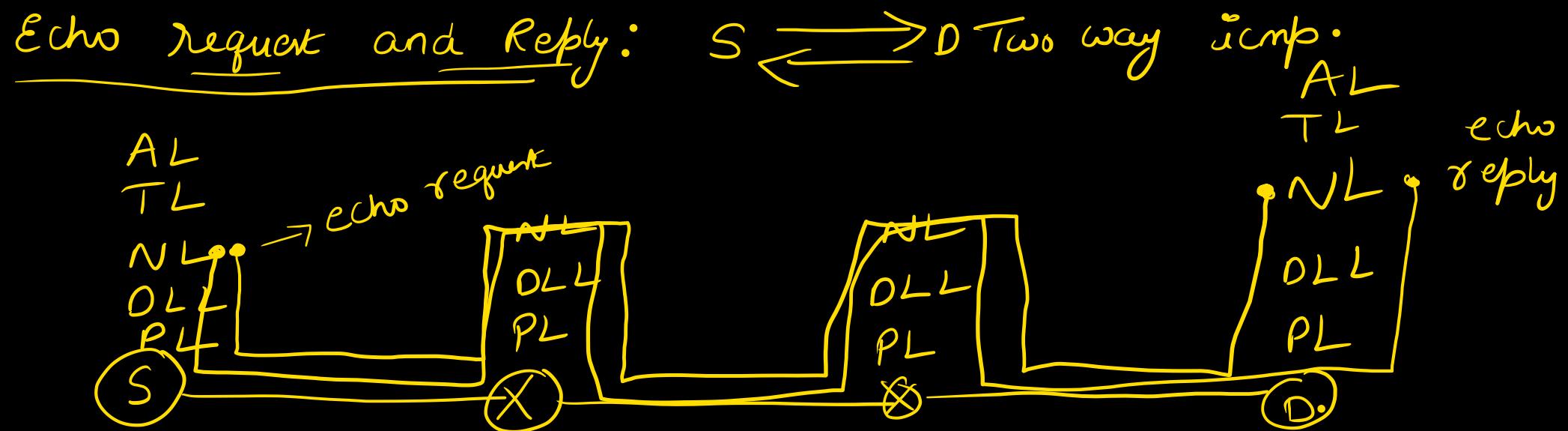


IP header + 8 bytes of TCP & UDP header.

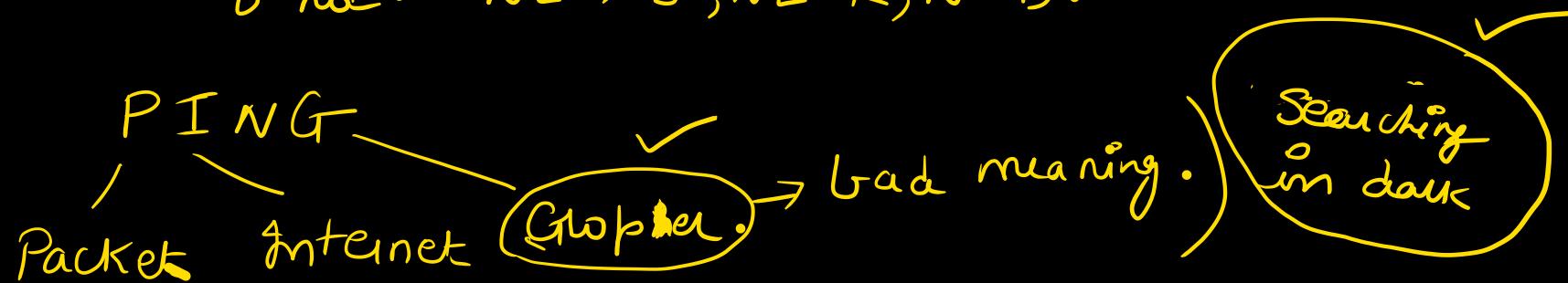
Which
what packet?

SPT + DPT + Seq number

Later \Rightarrow in TCP



\therefore It is used to test whether all NL's are working or not. $NL \rightarrow S, NL \rightarrow R, N \rightarrow D$.



many servers disable echo reply → why?

It is misused.

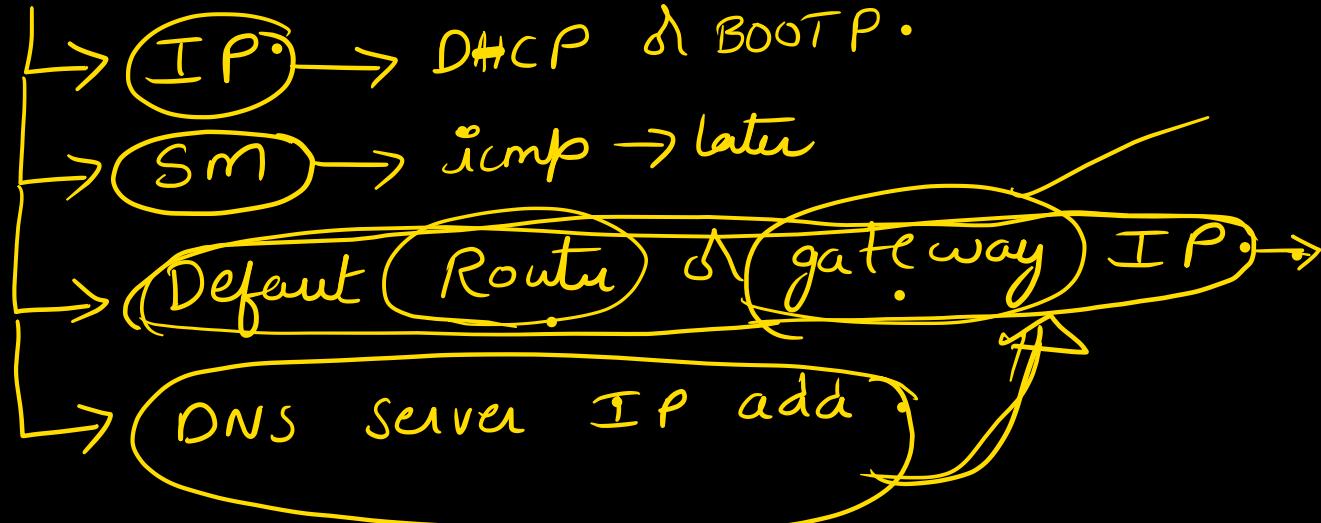
PING Attack:

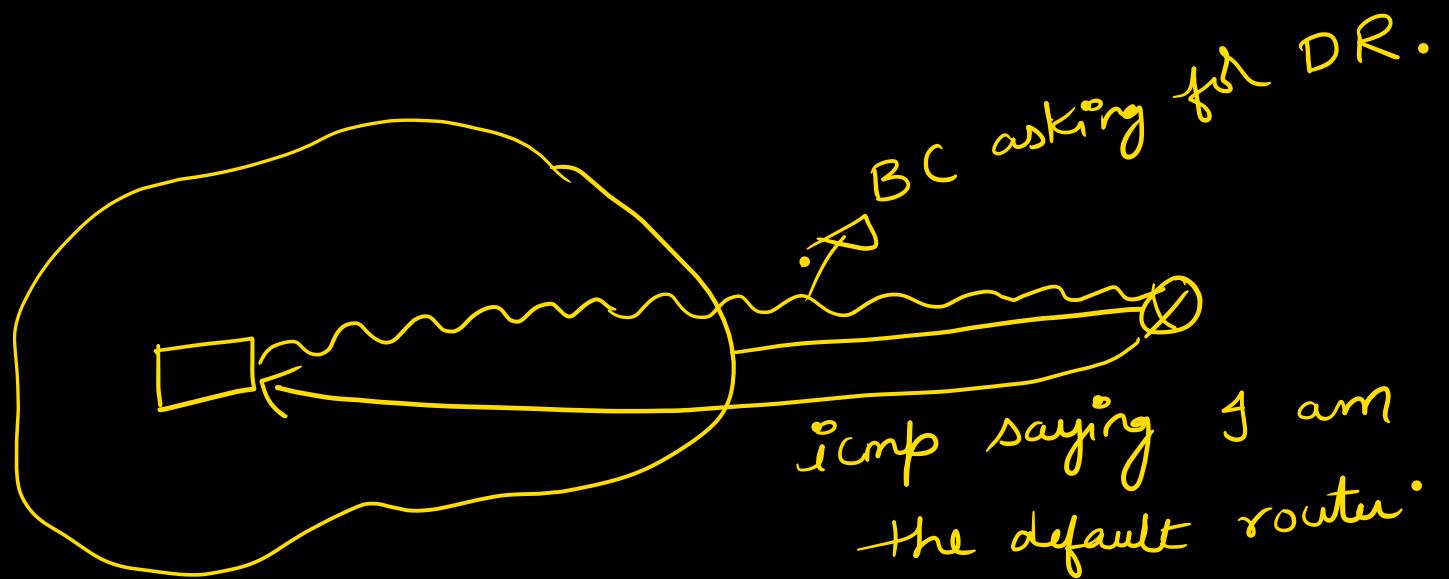


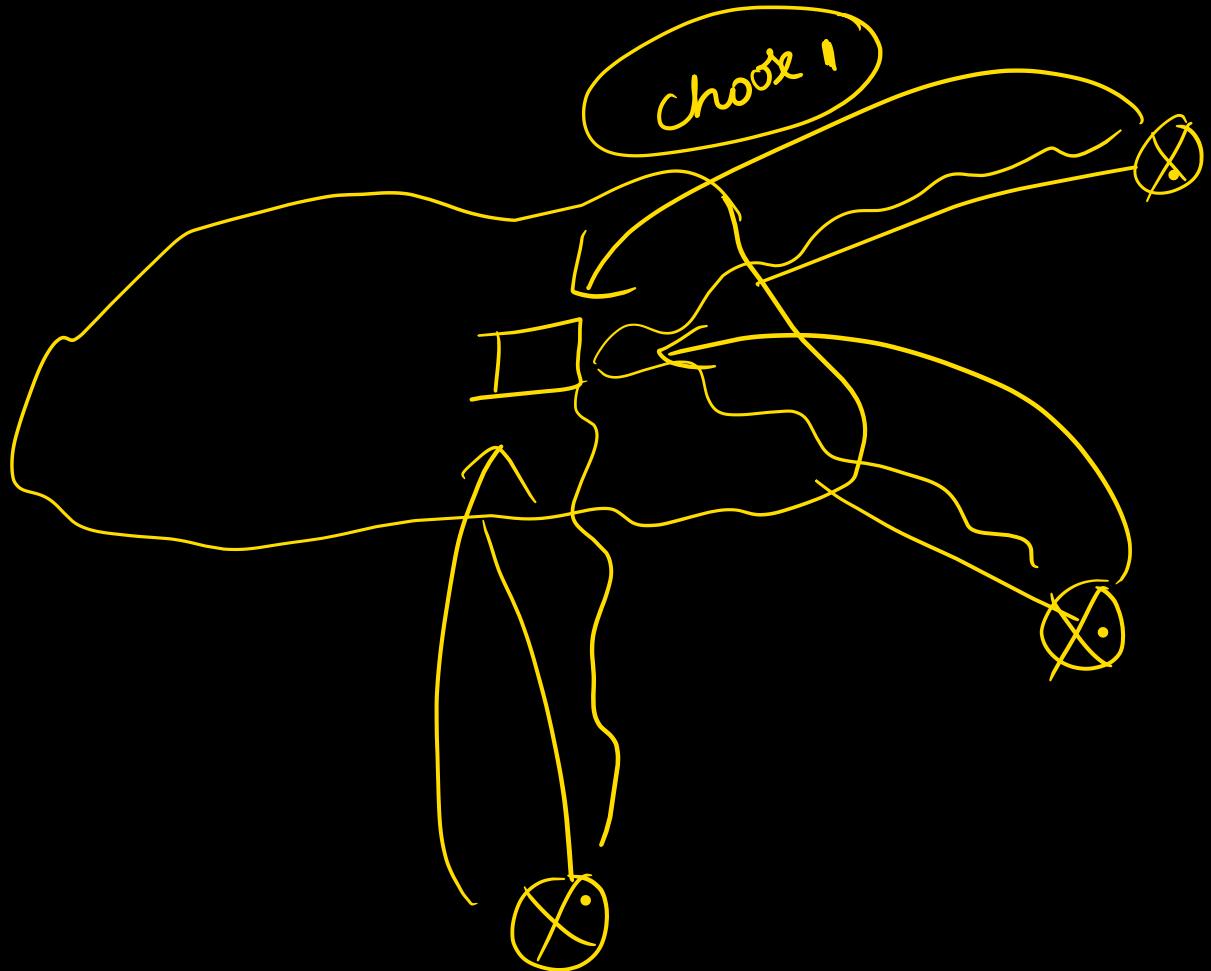
Protection needs to be implemented.

Router solicitation :

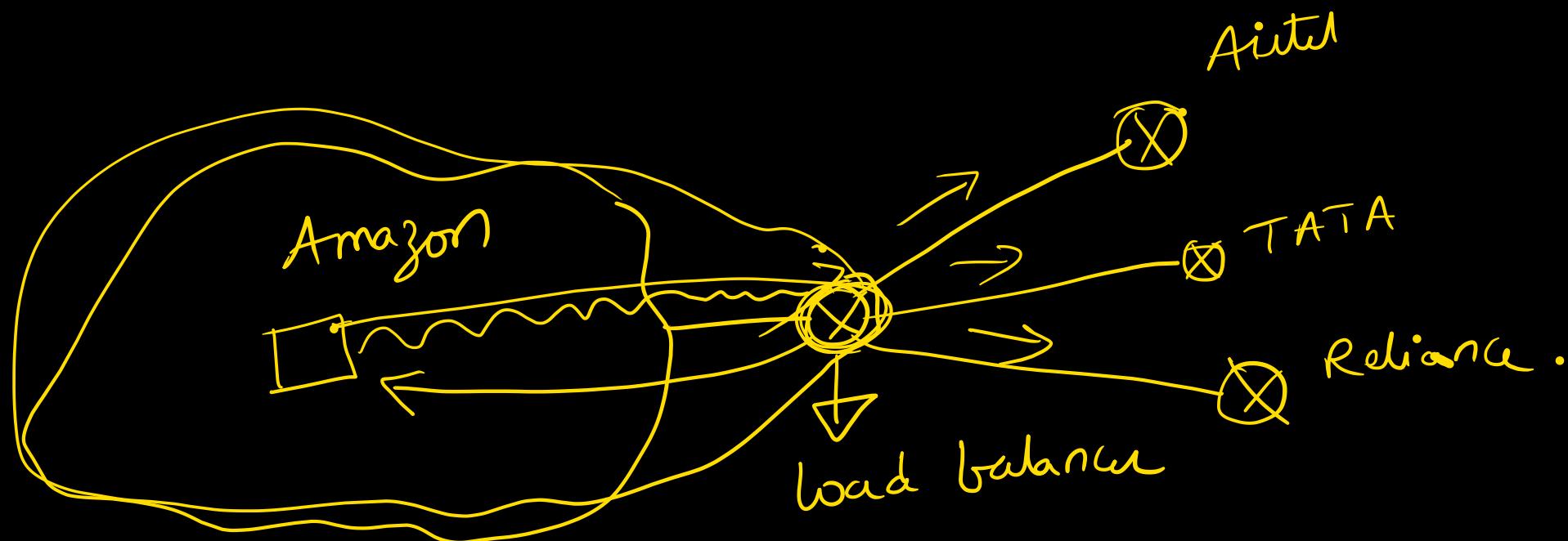
(H) → wants internet connection.







Generally IT
companies take
3 connections
for better availability



Router advertisement:

new route is added.

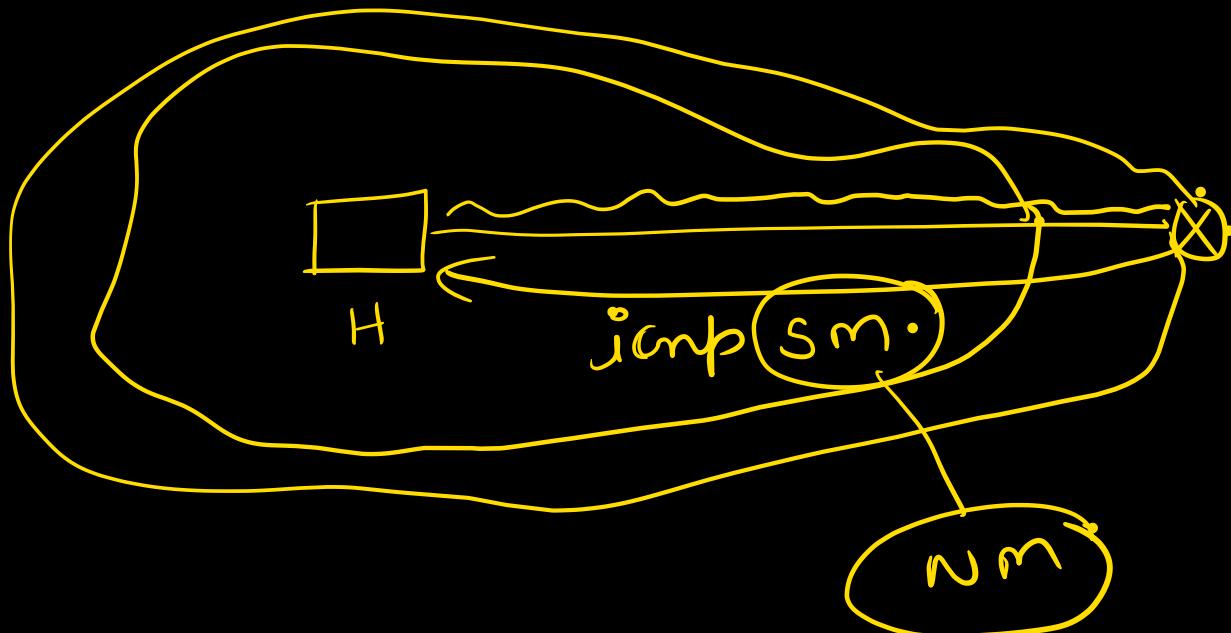


N/w to mark req and Reply:

sm



- 1) Get IP
- 2) GET def Router IP
- 3) ASK DR f₁ sm.



Time stamp Req and Reply:

S

India

9:00 am

D

US

10:00 pm

Synchronized.

TS ~~is~~ stamp → used for that

But it's not used now.

old.

There are many applications of ICMP. Two popular are

(i) **traceroute**

(ii)

PMTU

PMTU

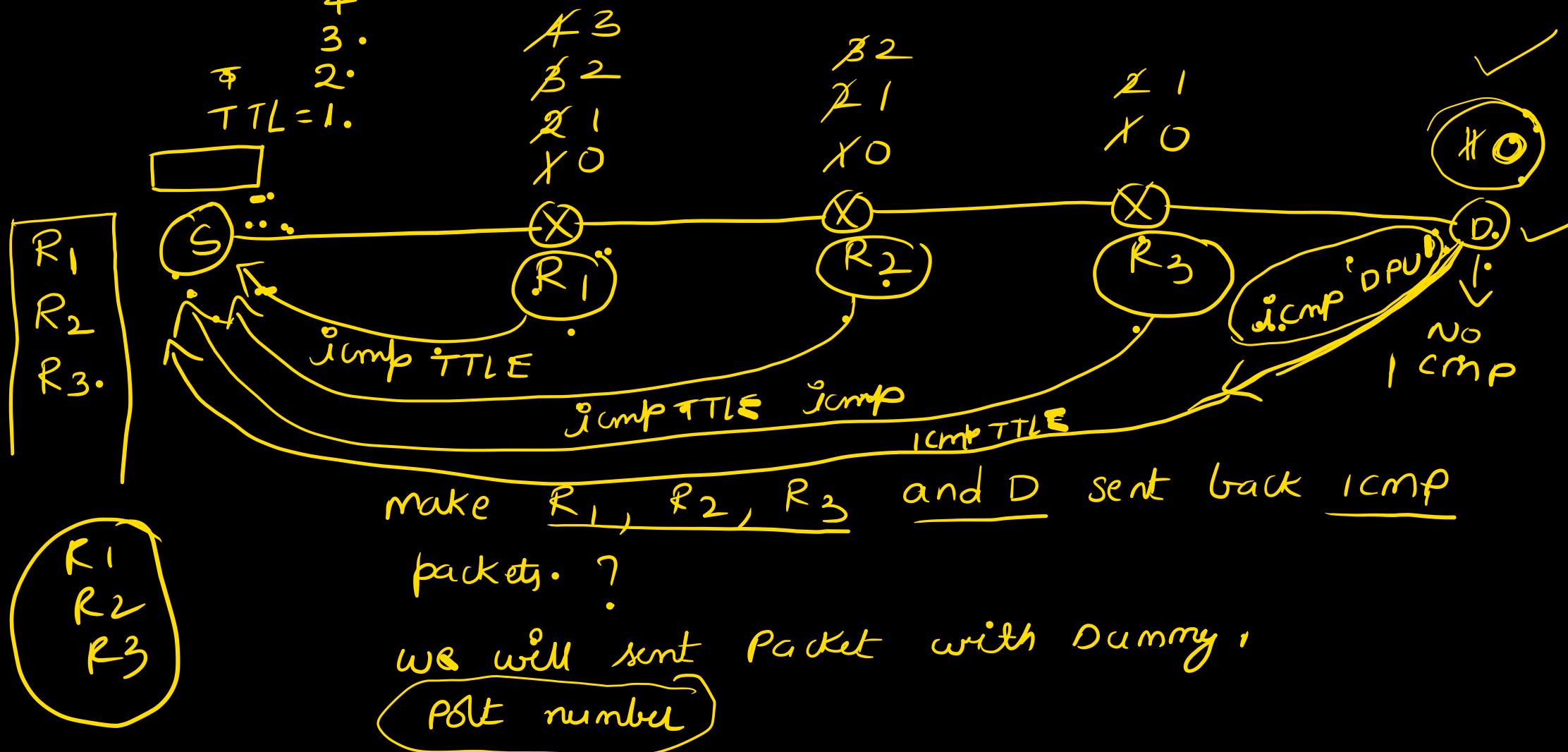
D

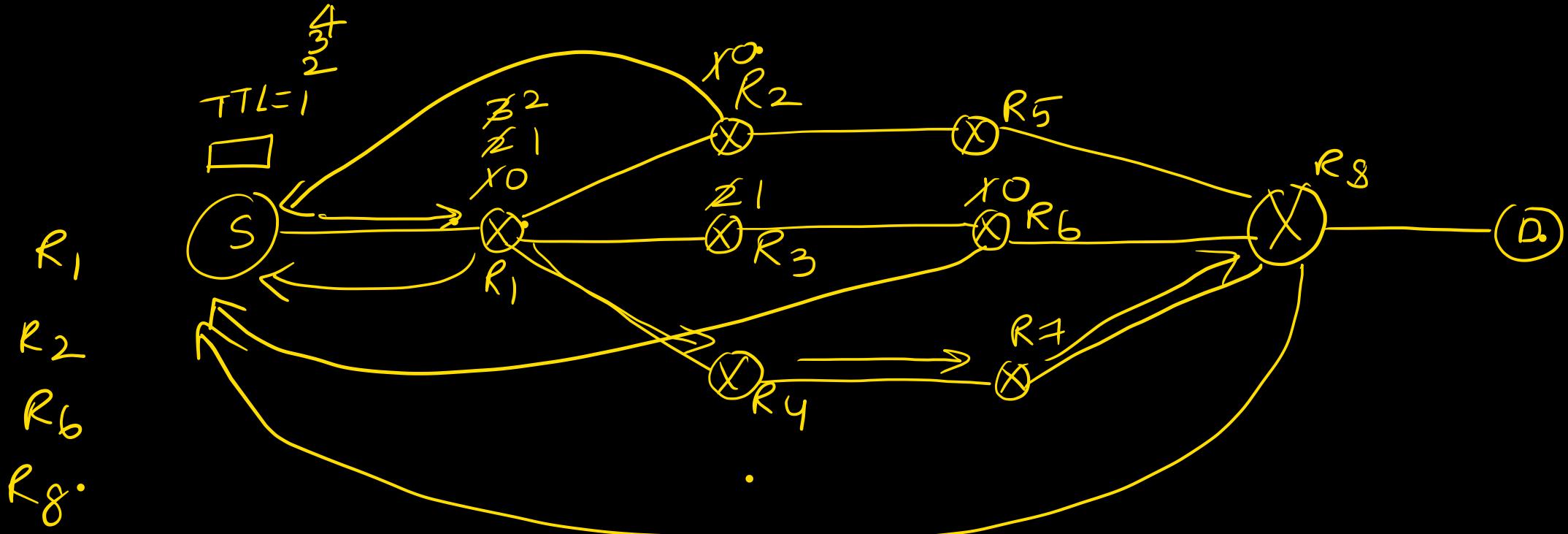
Path

MTU

Discovery.

Trace route : \rightarrow Traceroute Tracert • google.

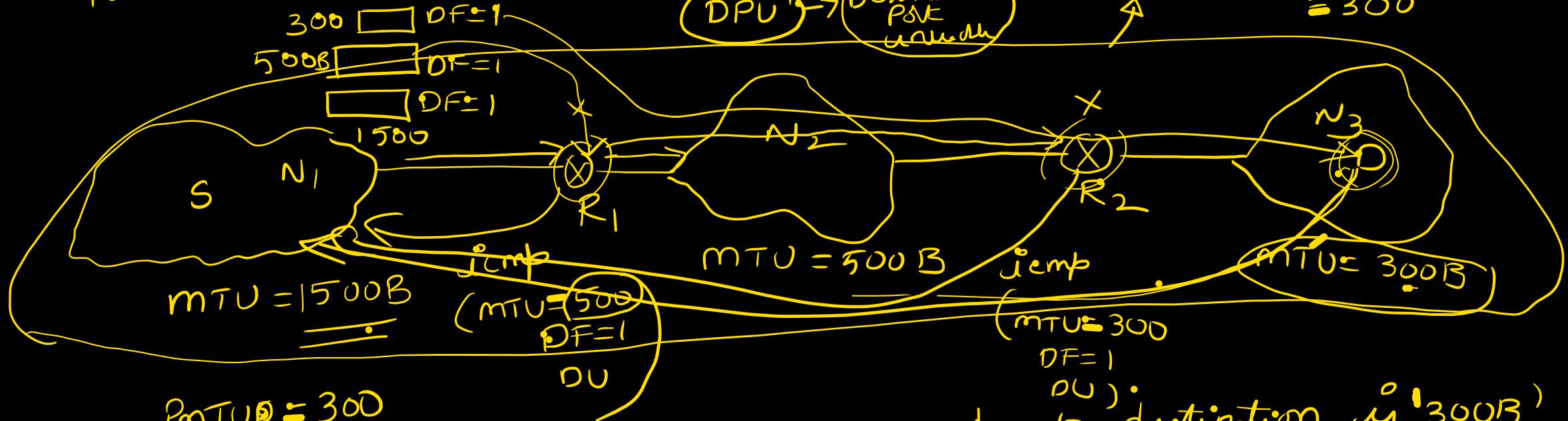




\therefore packet may take diff routes. So
 exact path is not guaranteed by
 Traceroute.

PMTUD:

Path MTU Discovery.



To avoid fragmentation. But how will source know it?

Routing:

Tomorrow

