













Traceroute, PMTDU, Routing and Flooding

Complete Course on Computer Networks - Part III

30-03-2021 Classes by Ravindrababu Ravula

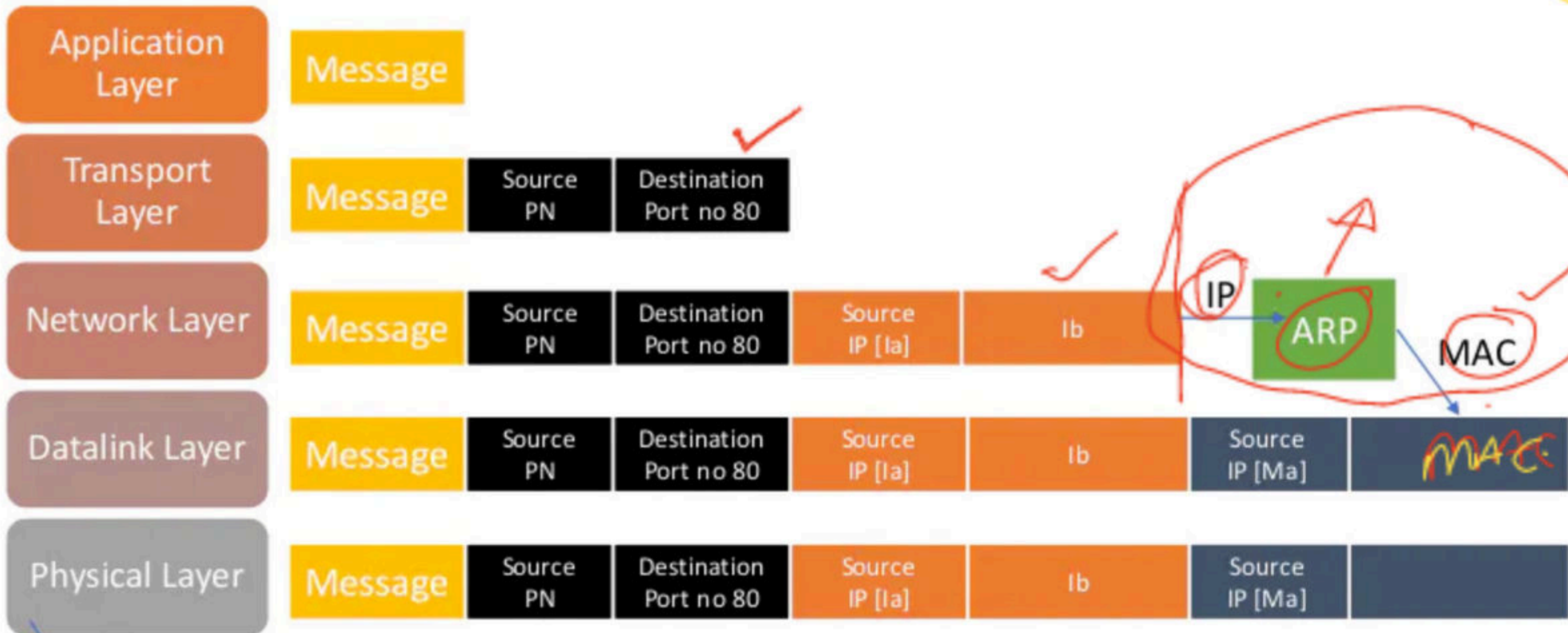
Lecture Name	Time
Closure Set of Attributes and Gate Questions DBMS	6.:00 AM 
Traceroute, PMTDU, Routing and Flooding CN	7:00 AM 
Normalization Practice Questions DBMS	8:05 PM  
Ages and Averages Practice Questions APTITUDE	5:00PM  
Process Management Set -1 O.S.	6:00PM  
Introduction to Linux Commands and Features Hands on Linux Commands L:2 Linux Course	7:00PM 
21st Century Web Applications L:2 Web Technologies Course	8:00PM 

ADDRESS RESOLUTION PROTOCOL [ARP]

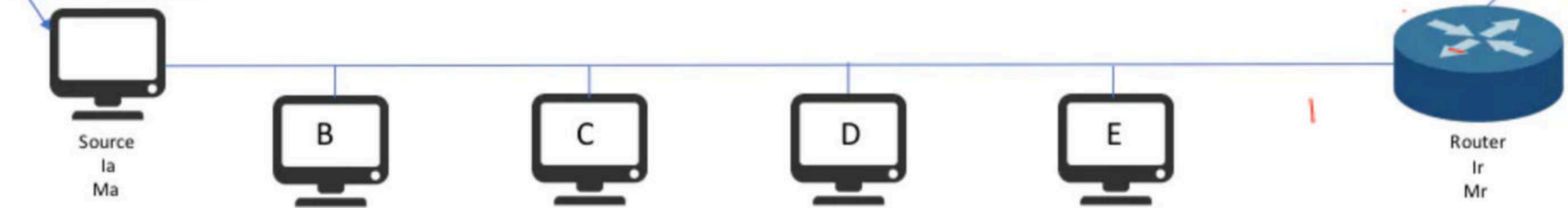


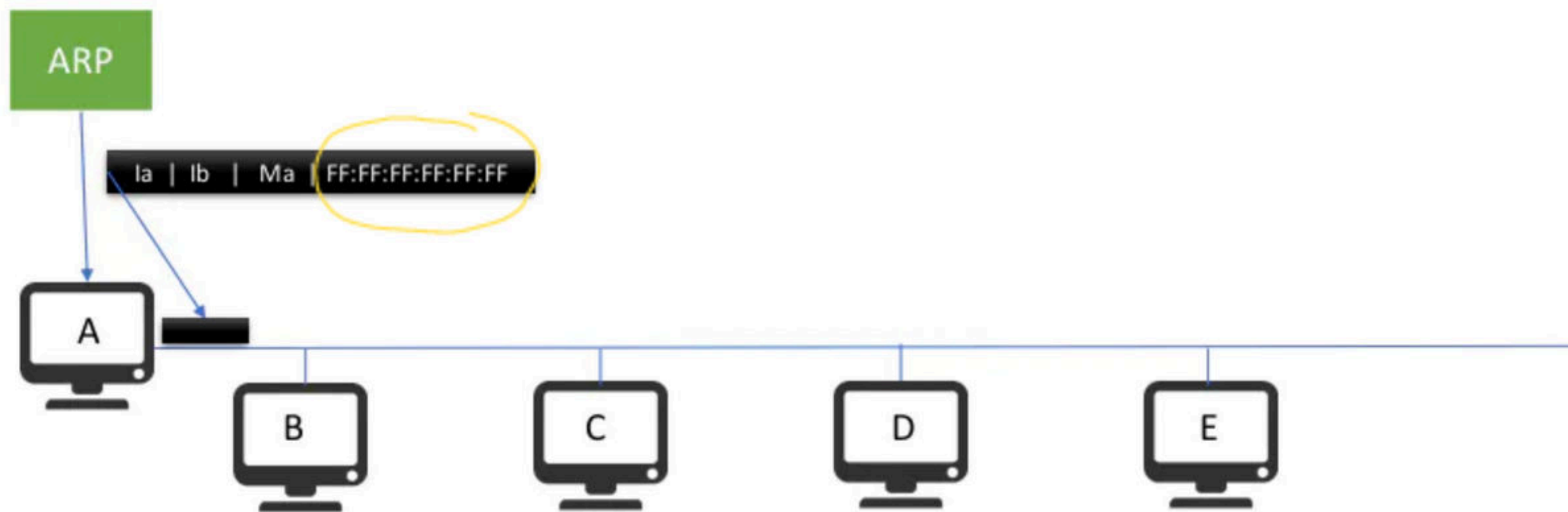
IP → MAC

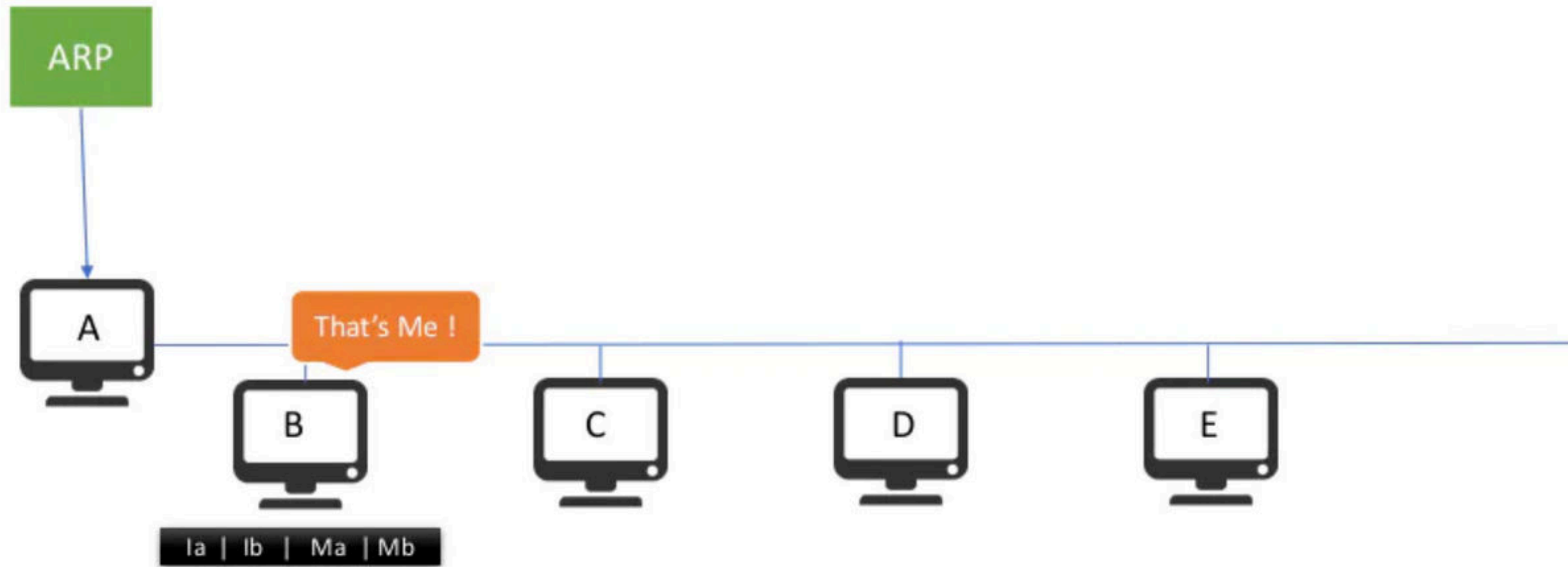
Linux

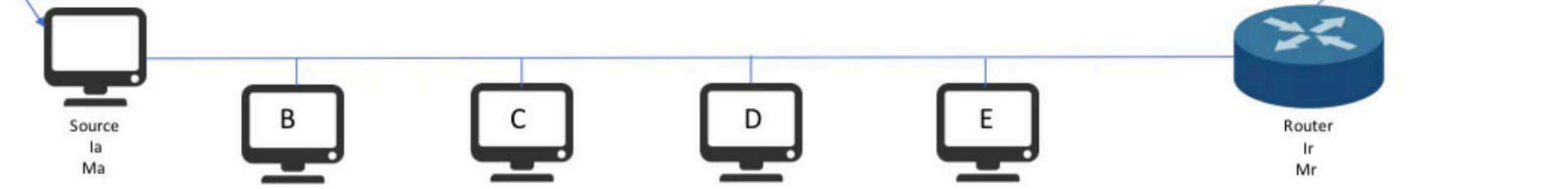
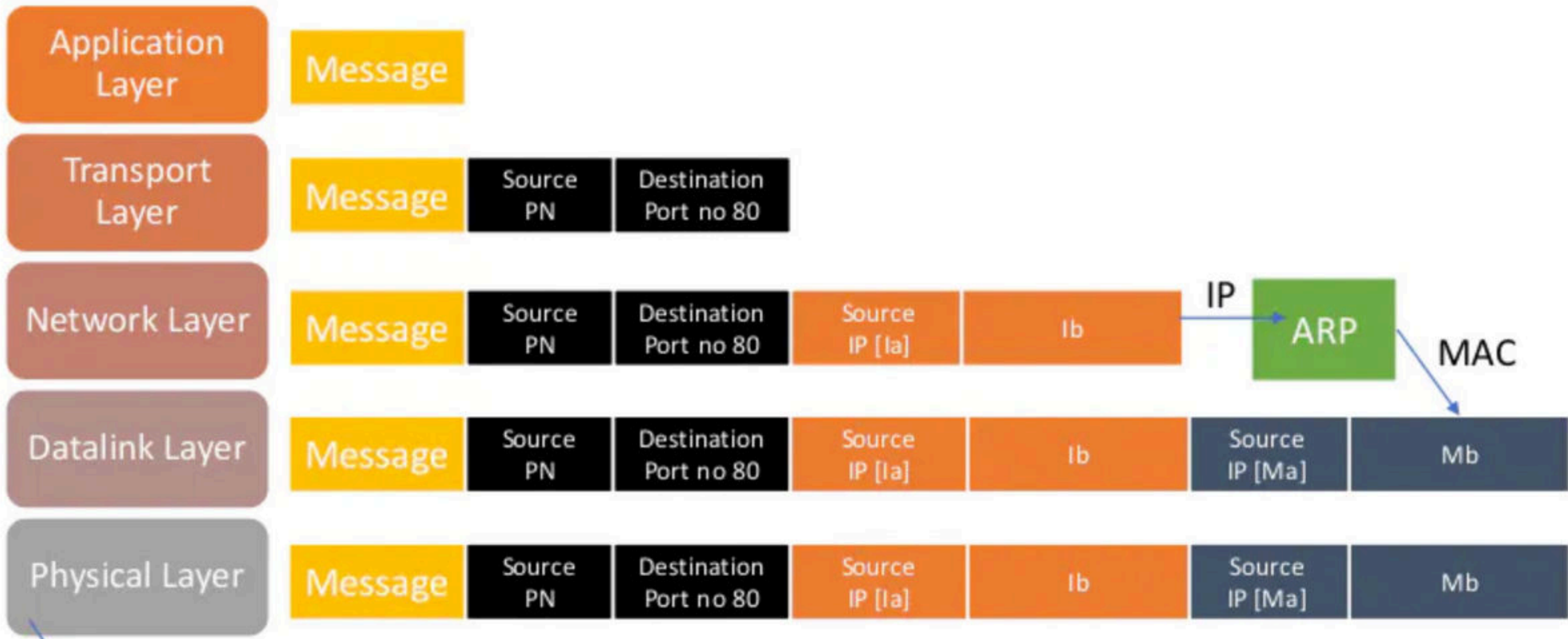


D MAC









KEY POINTS ABOUT ARP

ARP Request is Broadcast ✓

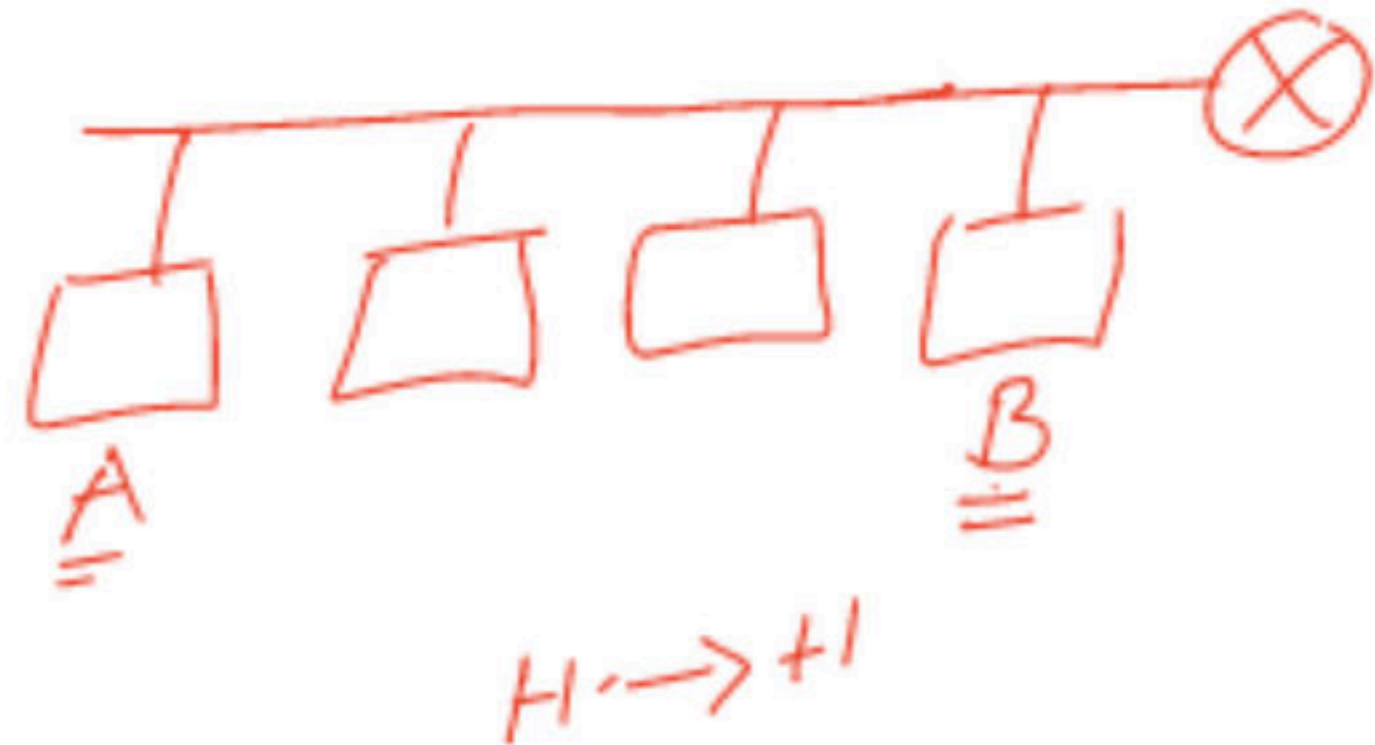
ARP reply is Unicast ✓

Finding the MAC Address of Another host

Finding the MAC Address of a Router

Router wants to find MAC address of Another Router

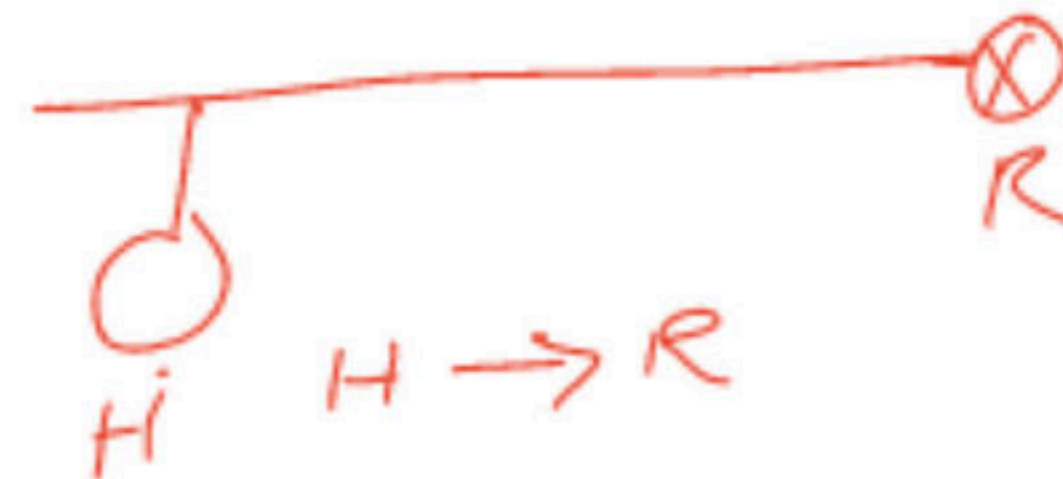
Router can find MAC address of a Host



in ARP table

IP	MAC	time
-	-	-
-	-	-
-	-	-

MAC → Perm X ✓
 IP → NO X ✓



Computer Networks

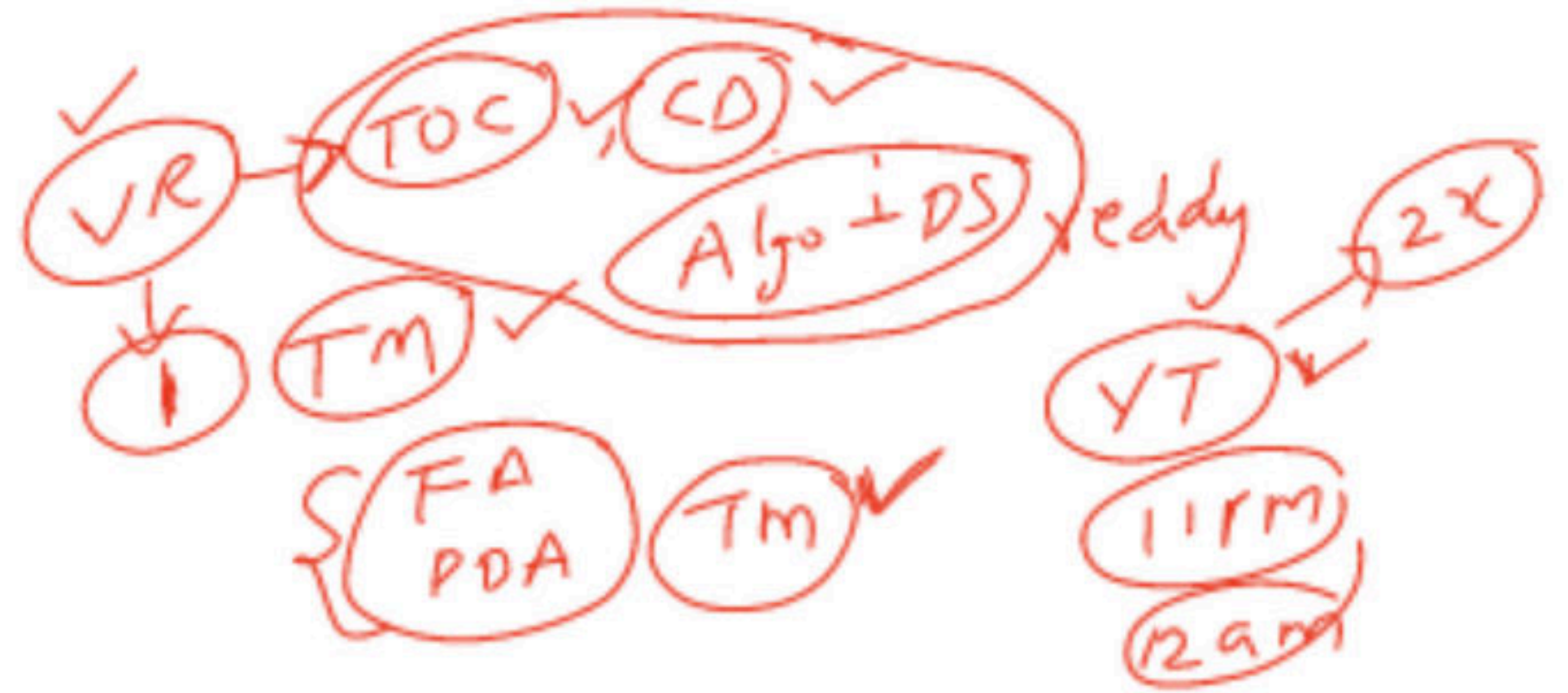
Special Address 127

(A) ✓

✓
TOL ✓
IP, frame, IP, Trac, Trac, ARP.

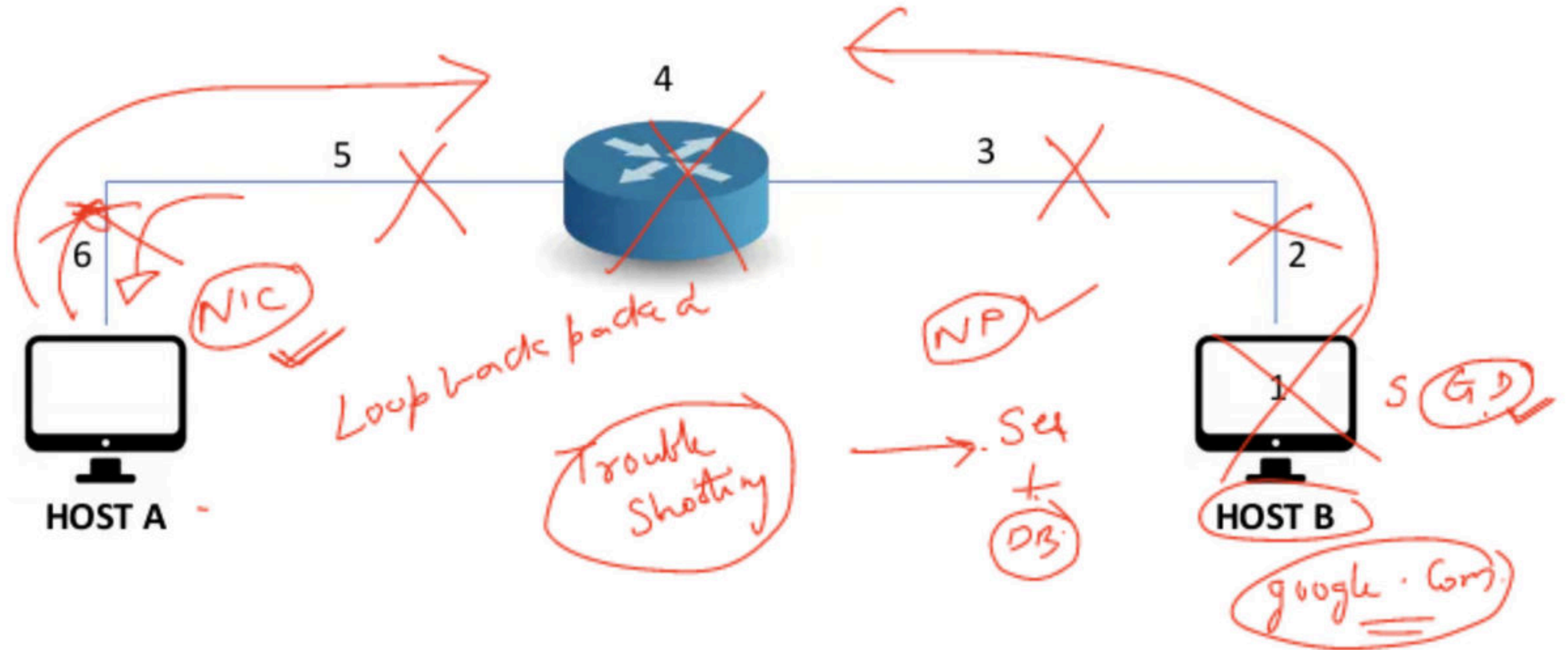
arpwatch ✓
linux ✓

TOL ✓



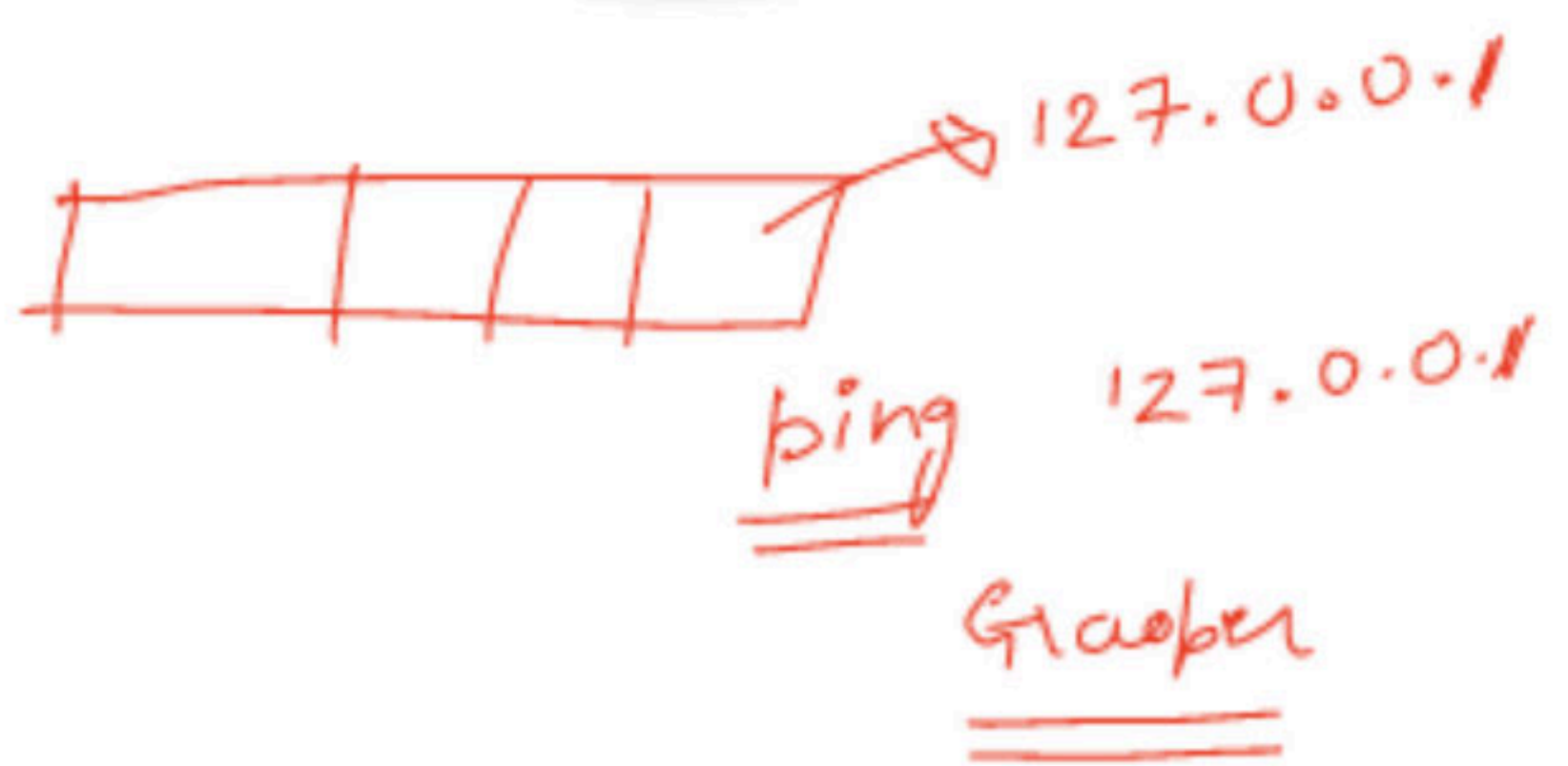
Suppose A has sent some data to B but B has not responded
What could be the possibilities?

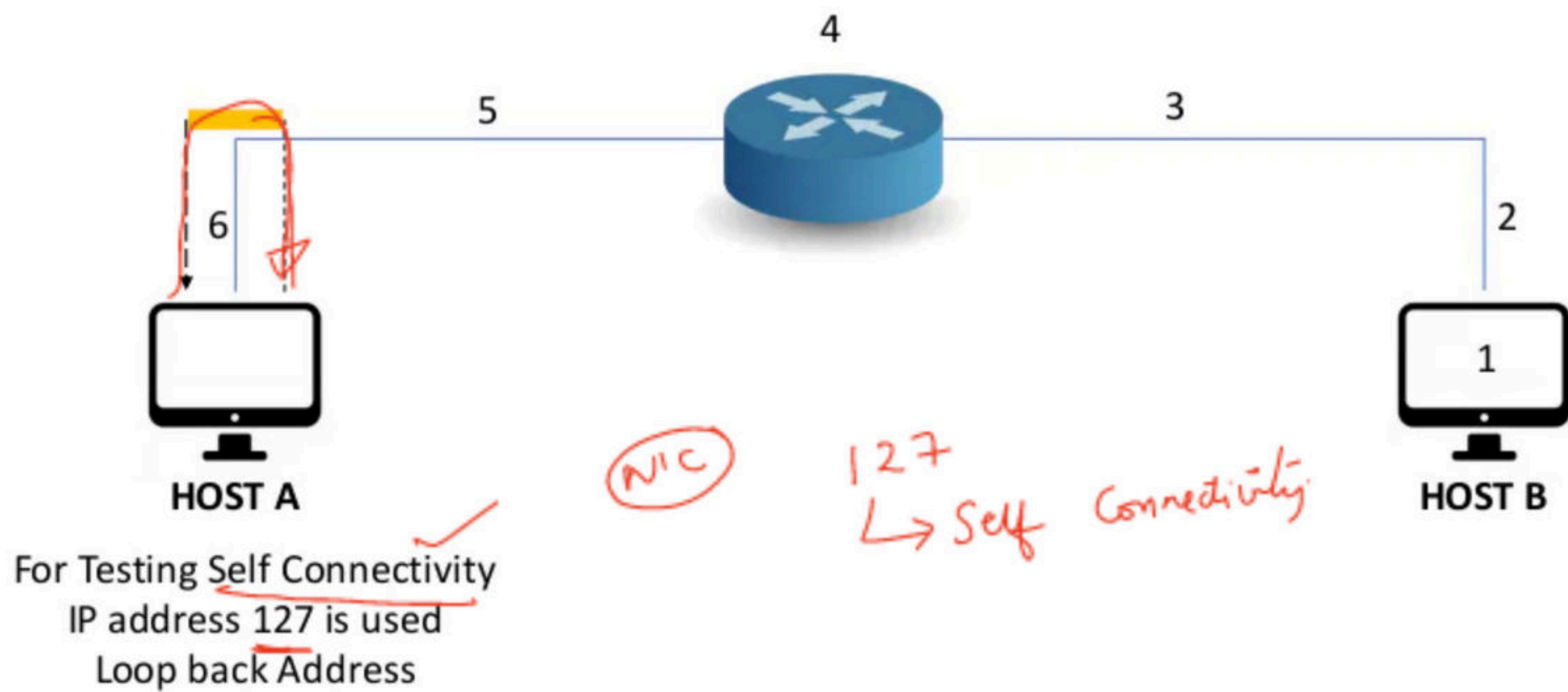
1,2,3,4,5,6 are the possibilities of failure.

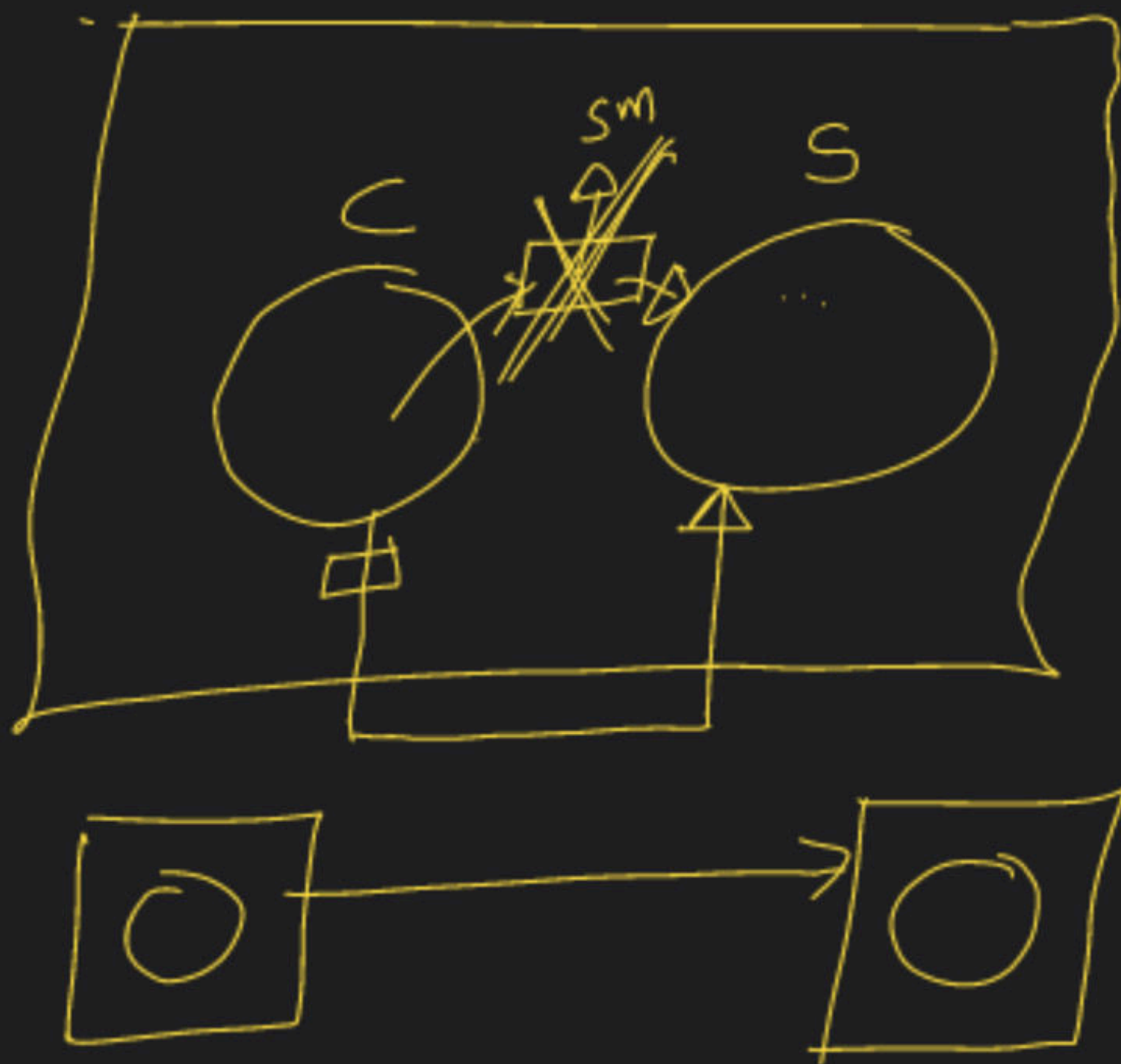


Handwritten notes in red ink:

- Cyber ✓
- 4 months ✓
- Augusi ✓
- 1 revision
- Alms, Tax, CN, DIS, OS, DI, CO
- 3
- Two checkboxes with checkmarks: ☒ ✓, ☒ ✓



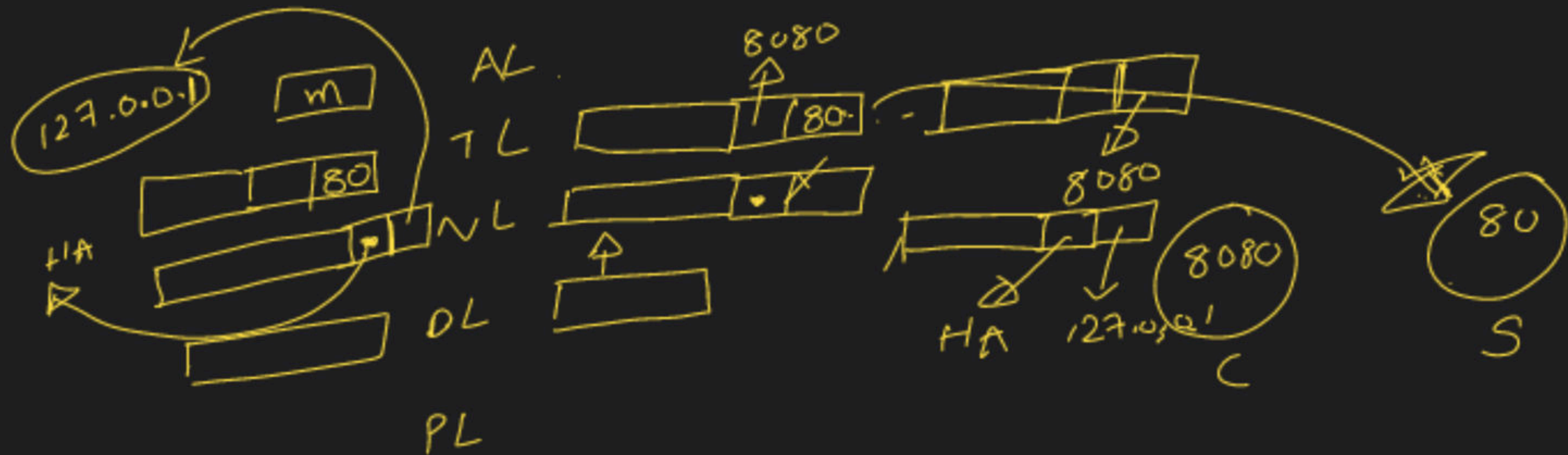




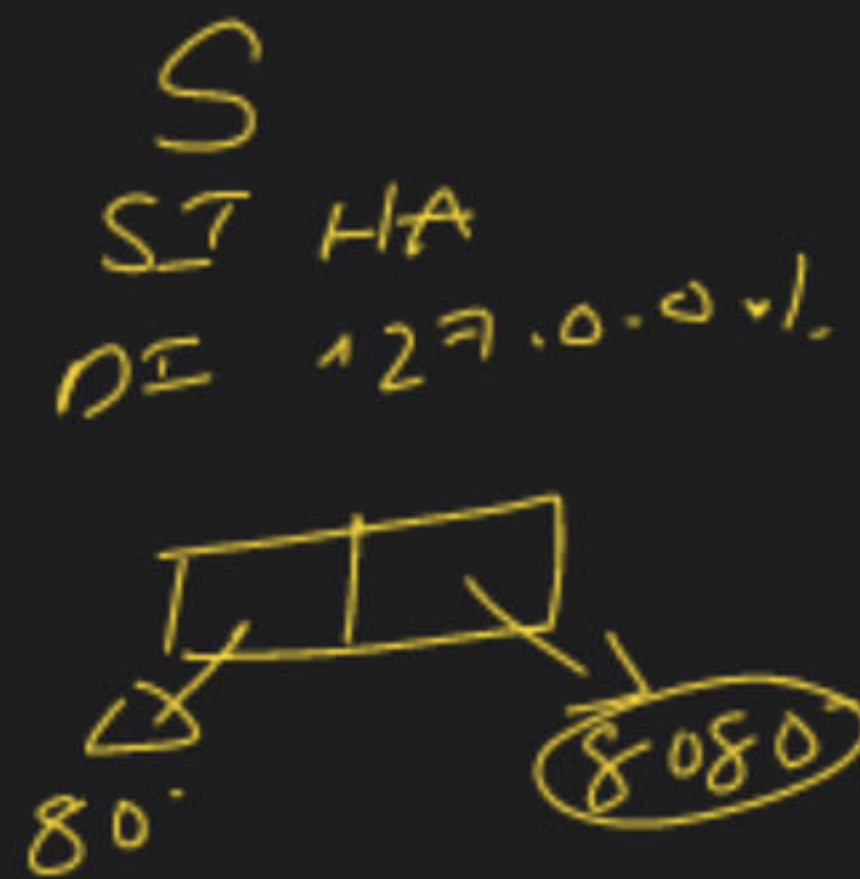
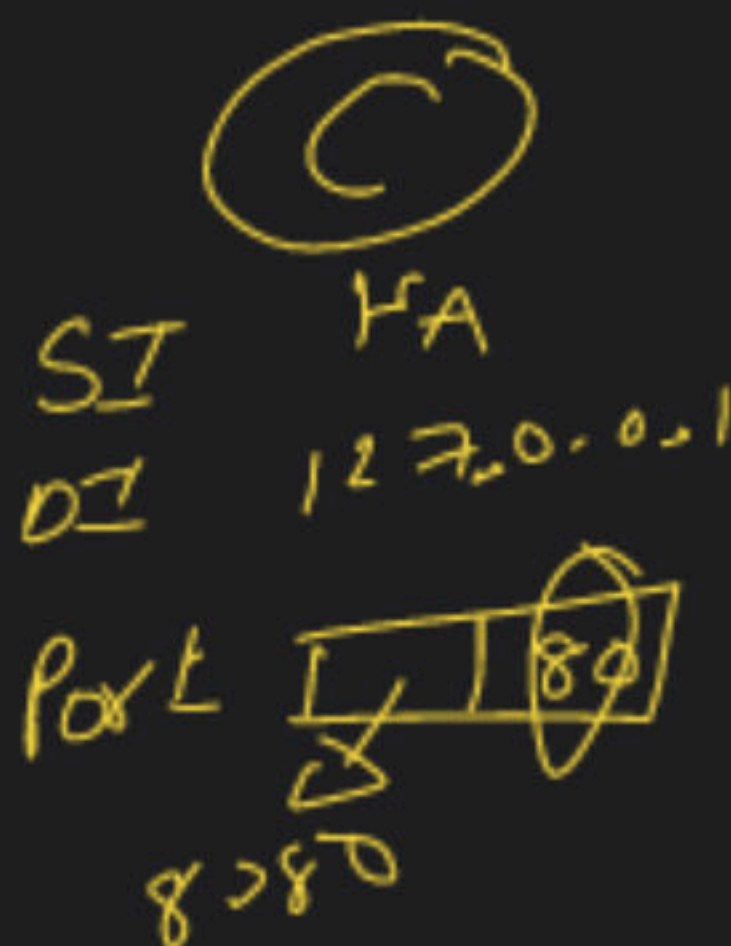
Ping 127.0.0.1

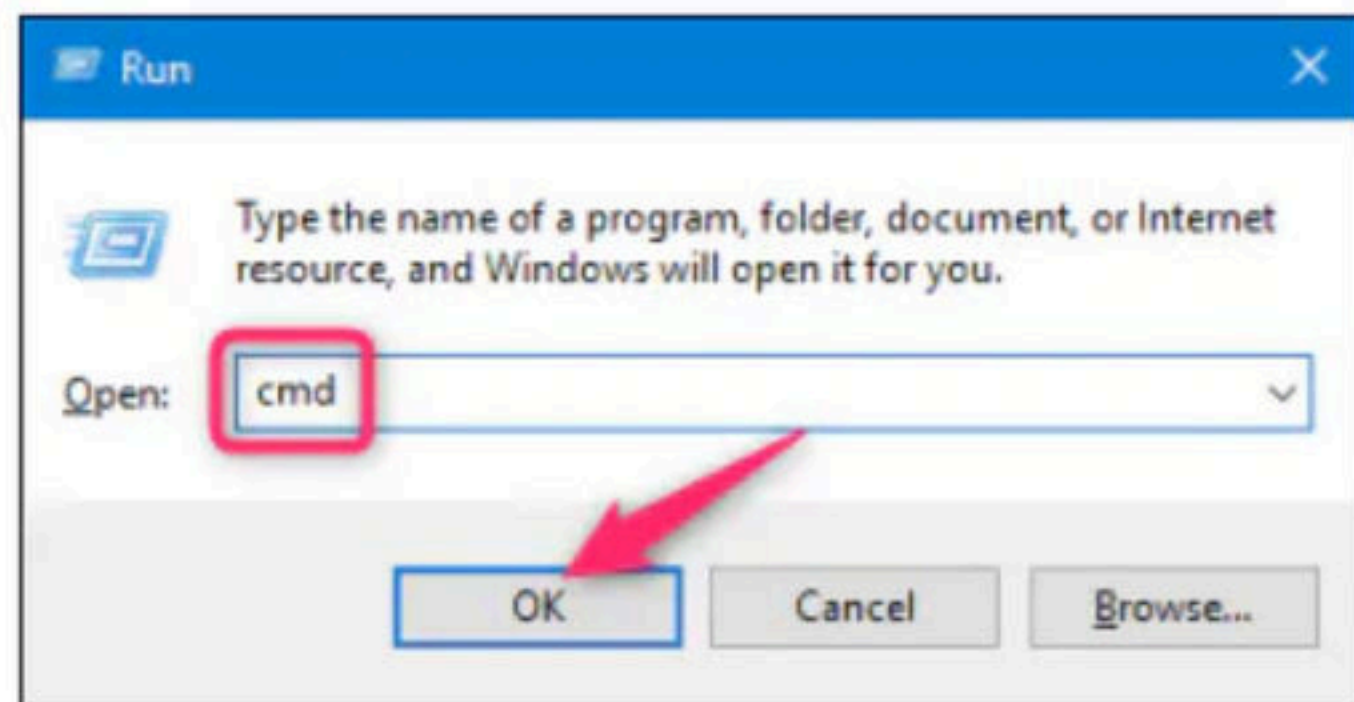
127.1.2.3

127.100.100.100



$C = HA$





```
Administrator: C:\Windows\System32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows\system32>ping 127.0.0.1

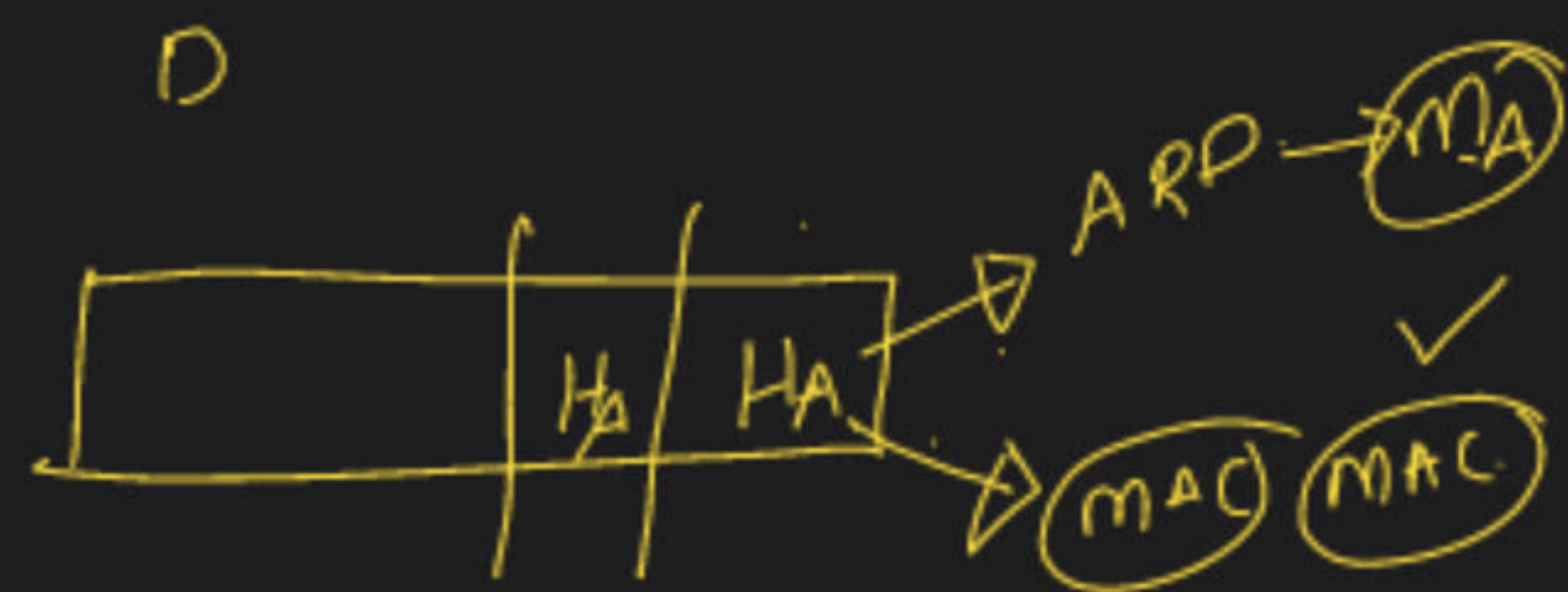
Pinging 127.0.0.1 with 32 bytes of data:
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128

Ping statistics for 127.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Windows\system32>
```

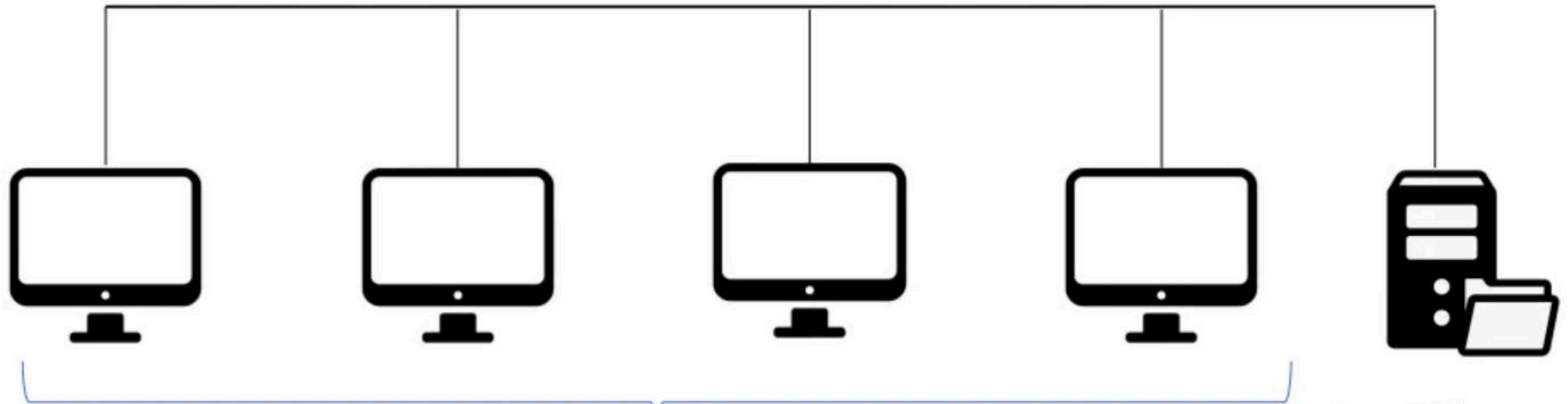

Computer Networks

RARP





ARP: IP → MAC ✓
RARP: (MAC → IP) ✓ +1



PCs without a Hard Disk

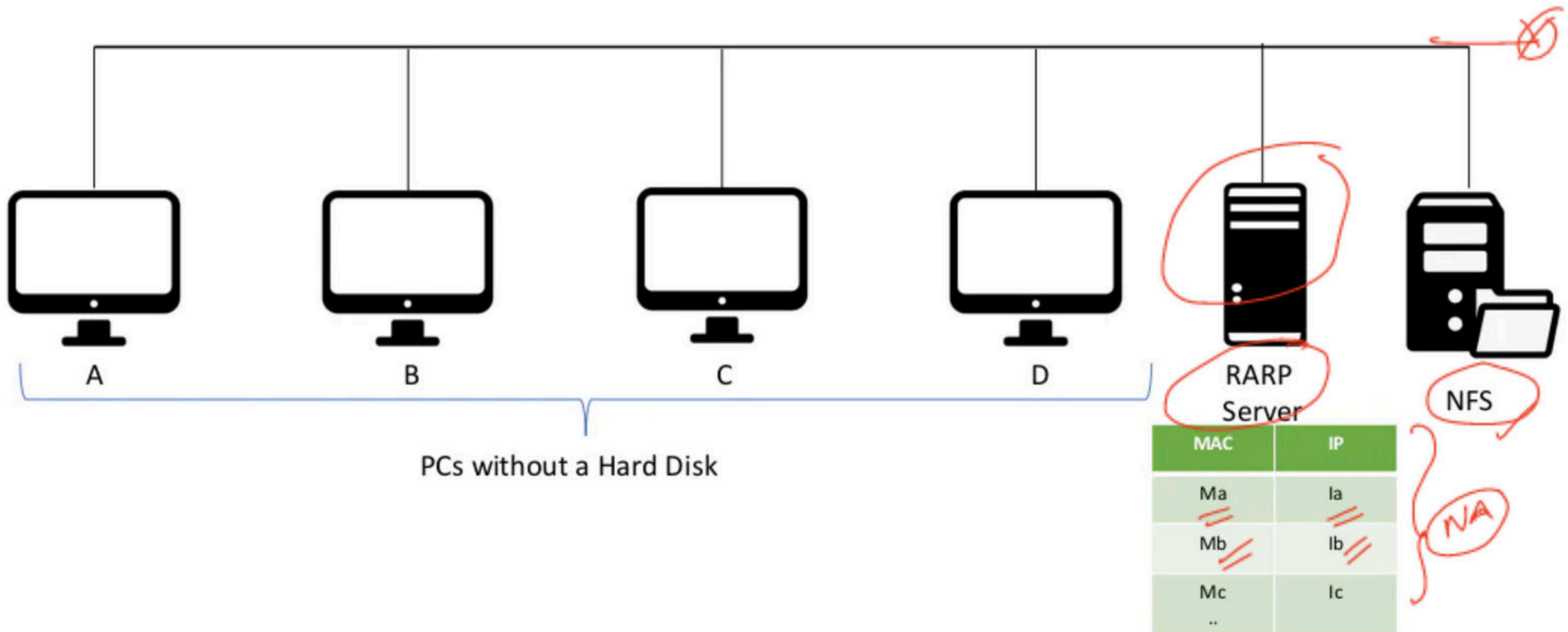
RAM IP SW.

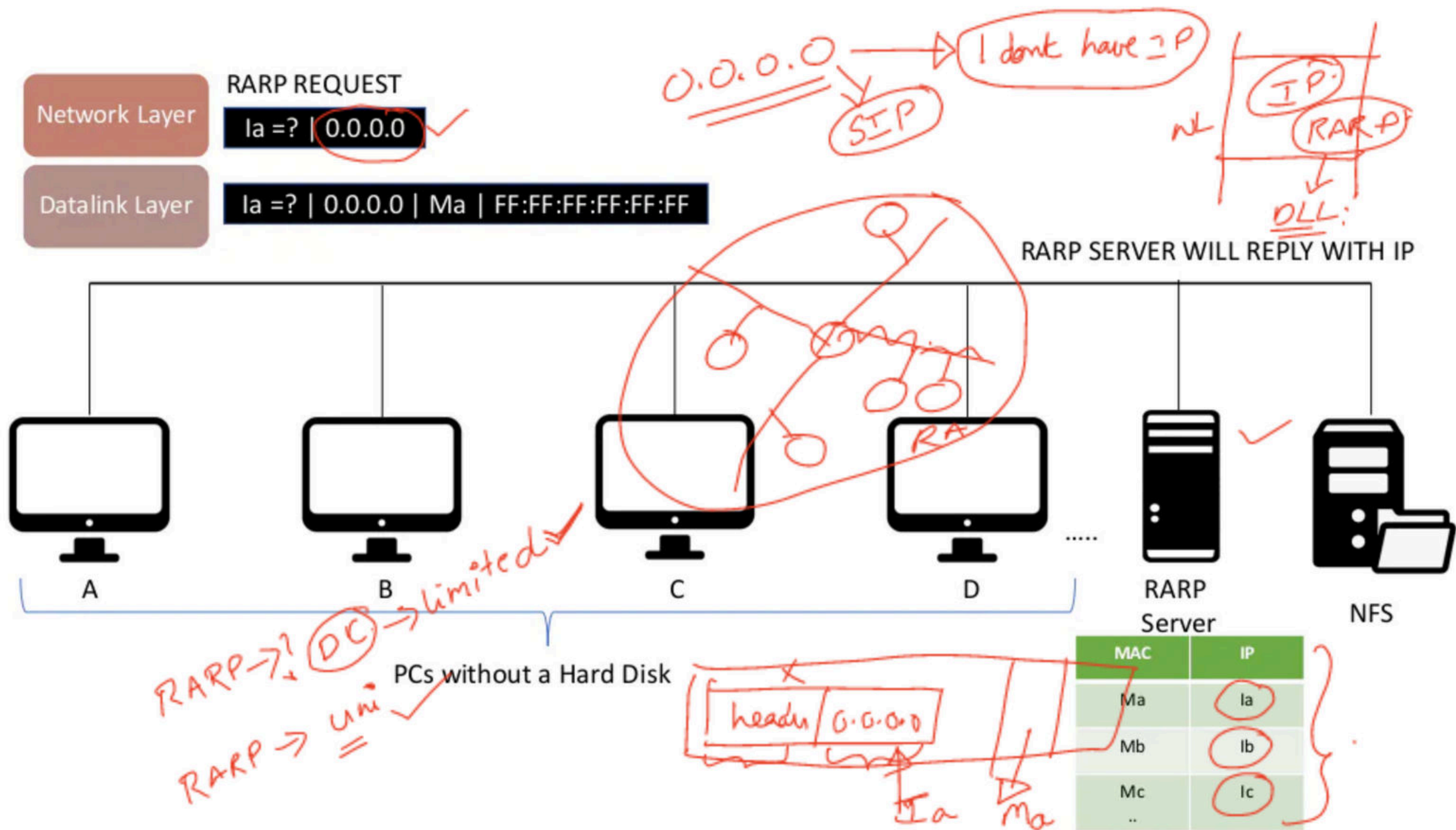
MAC → Hard wired on Rom
NIC

NFS

MAC- ROM
IP - RAM





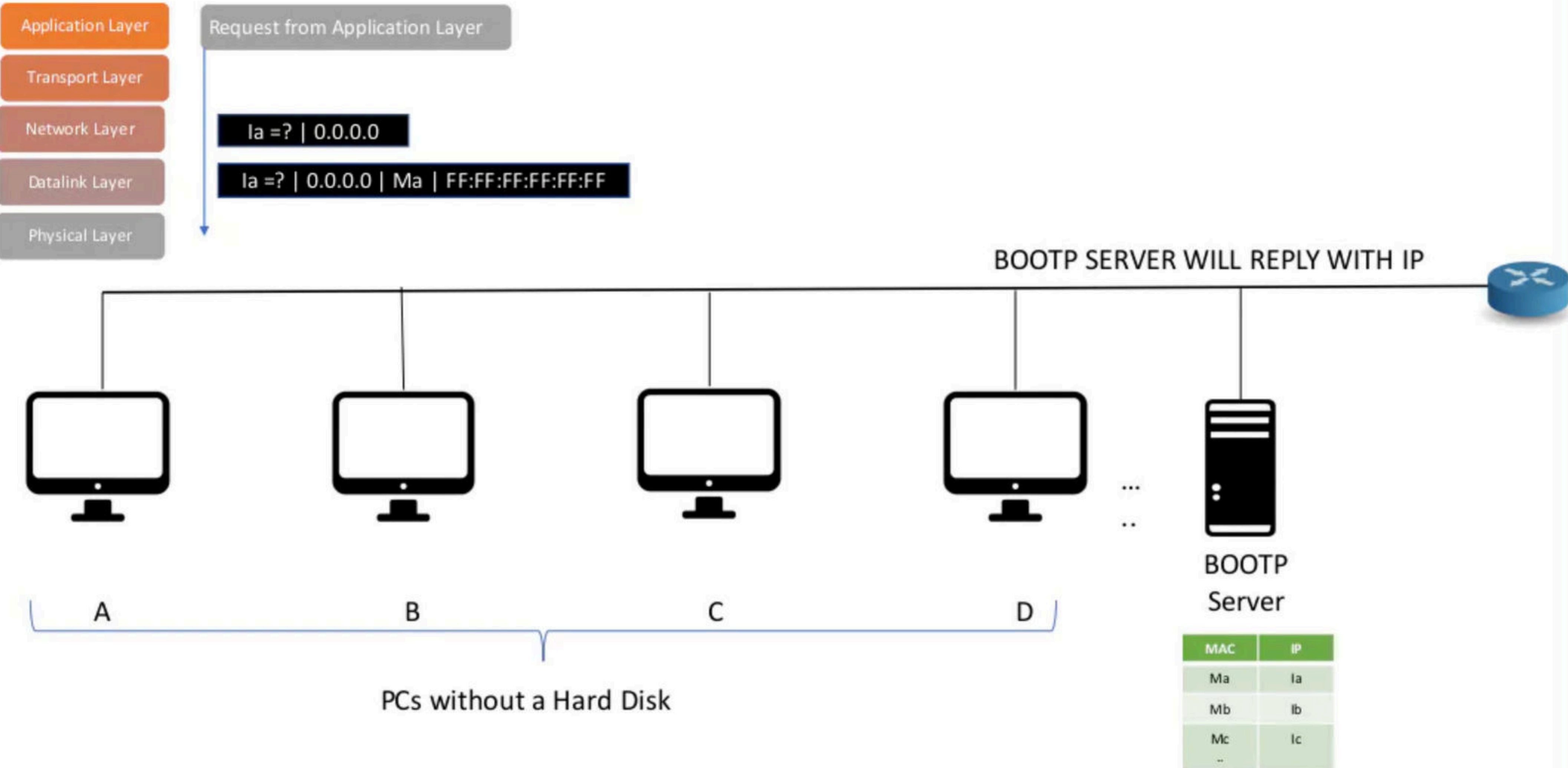


Computer Networks

BOOTP AND DHCP

BOOTP stands for Bootstrap Protocol.

BOOTP is similar to RARP except that BOOTP works at Application Layer





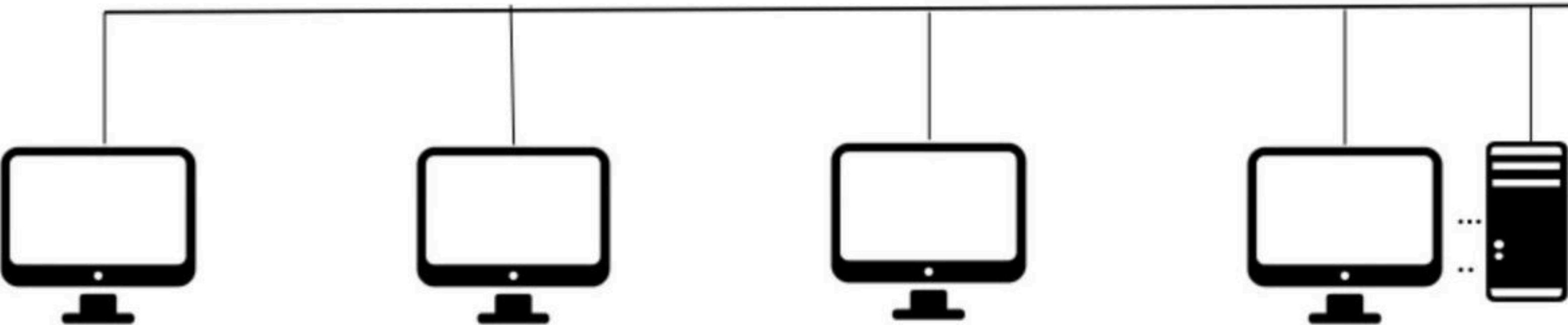
Request from Application Layer

la =? | 0.0.0.0

la =? | 0.0.0.0 | Ma | FF:FF:FF:FF:FF:FF

Network which does not have a BOOTP server has a Relay Agent

Advantage: Only one BOOTP sever is required
Disadvantage: Mapping Table is Static



A

B

C

D

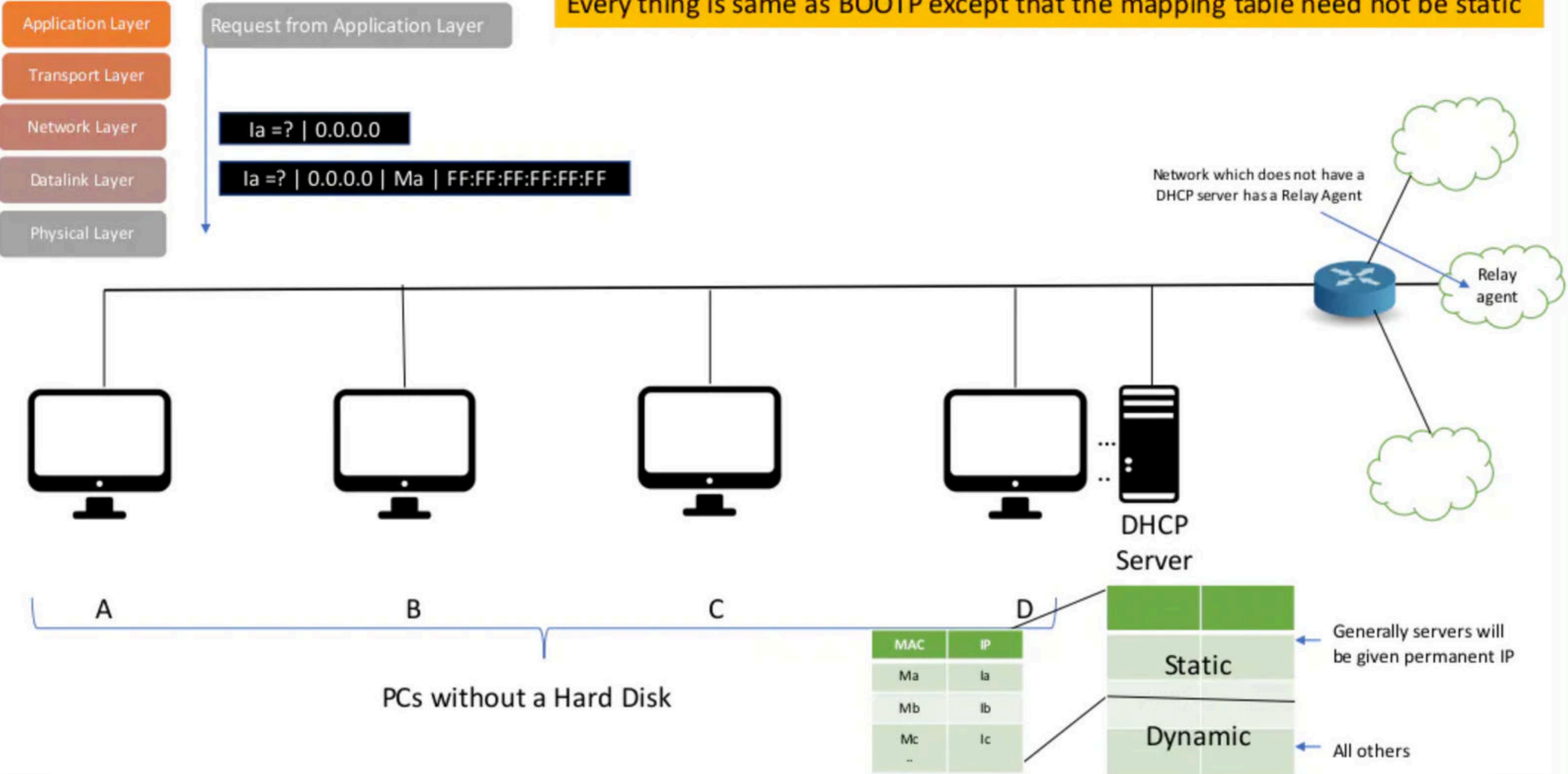
PCs without a Hard Disk

BOOTP Server

MAC	IP
Ma	Ia
Mb	Ib
Mc	Ic
..	

DHCP – Dynamic Host Configuration Protocol

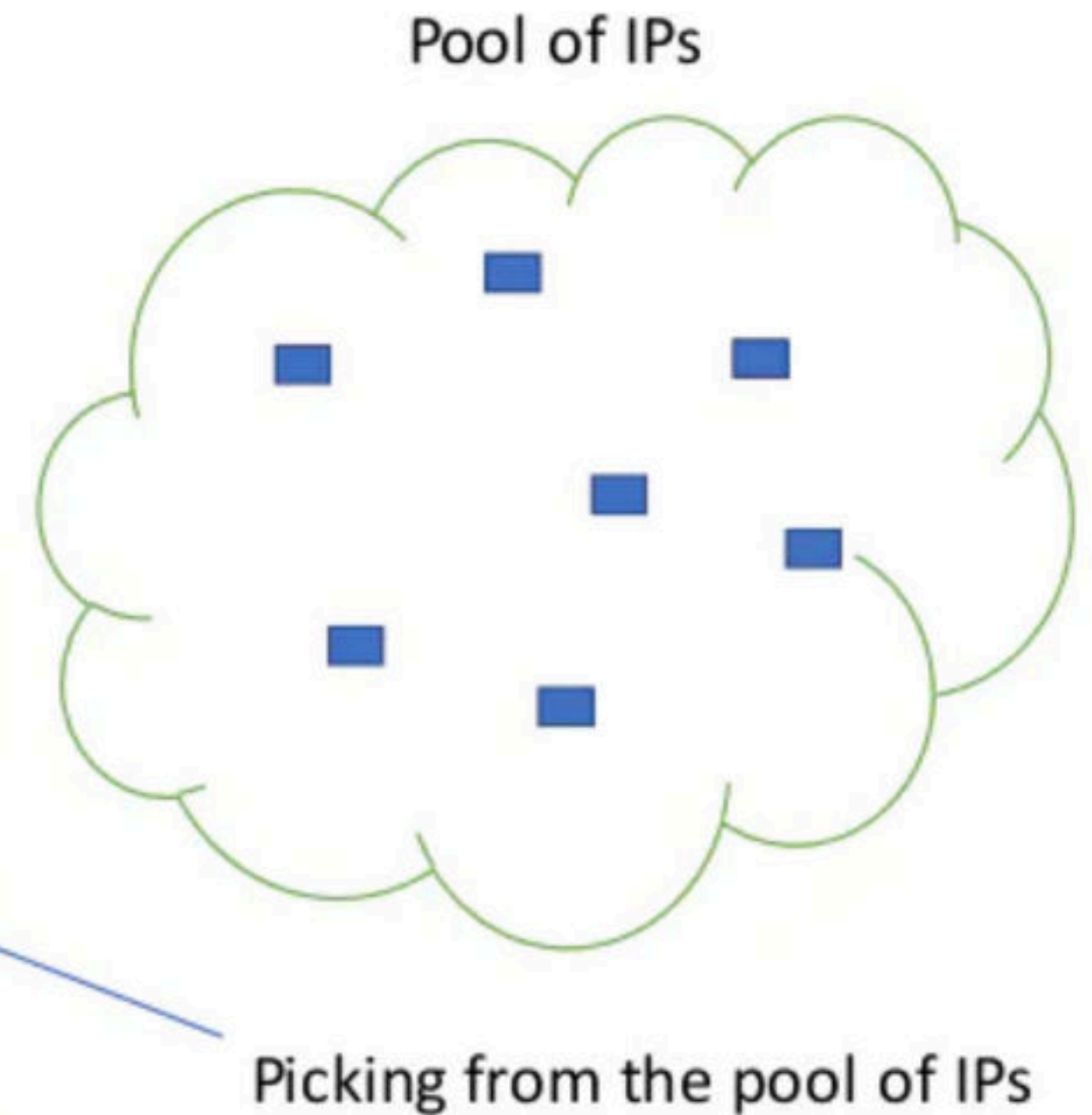
Every thing is same as BOOTP except that the mapping table need not be static



DHCP MAPPING TABLE

Static	MAC		IP	
	Ma		Ia	
	Mb		Ib	
	Mc		Ic	
	Md		Id	
	
Dynamic	MAC		IP	Least Time
	Ms		Is	10 mins

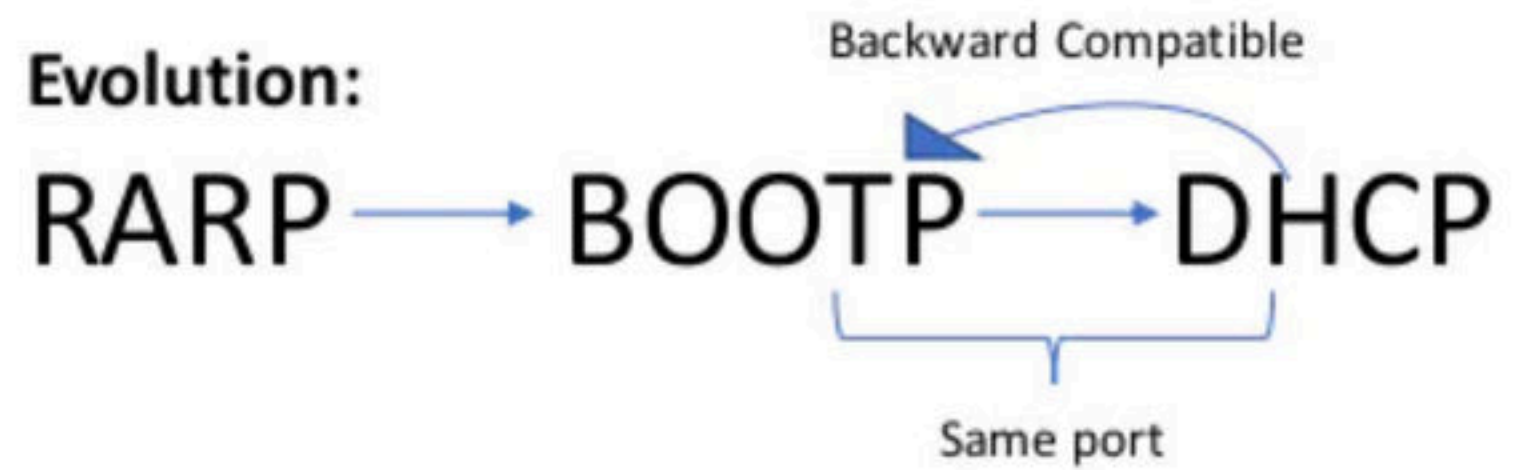
Note : If renew requests is not sent the IP is pulled and added back to the pool



Advantage and points to remember:

- Only One DHCP server is enough.
- Dynamic Table

Evolution:

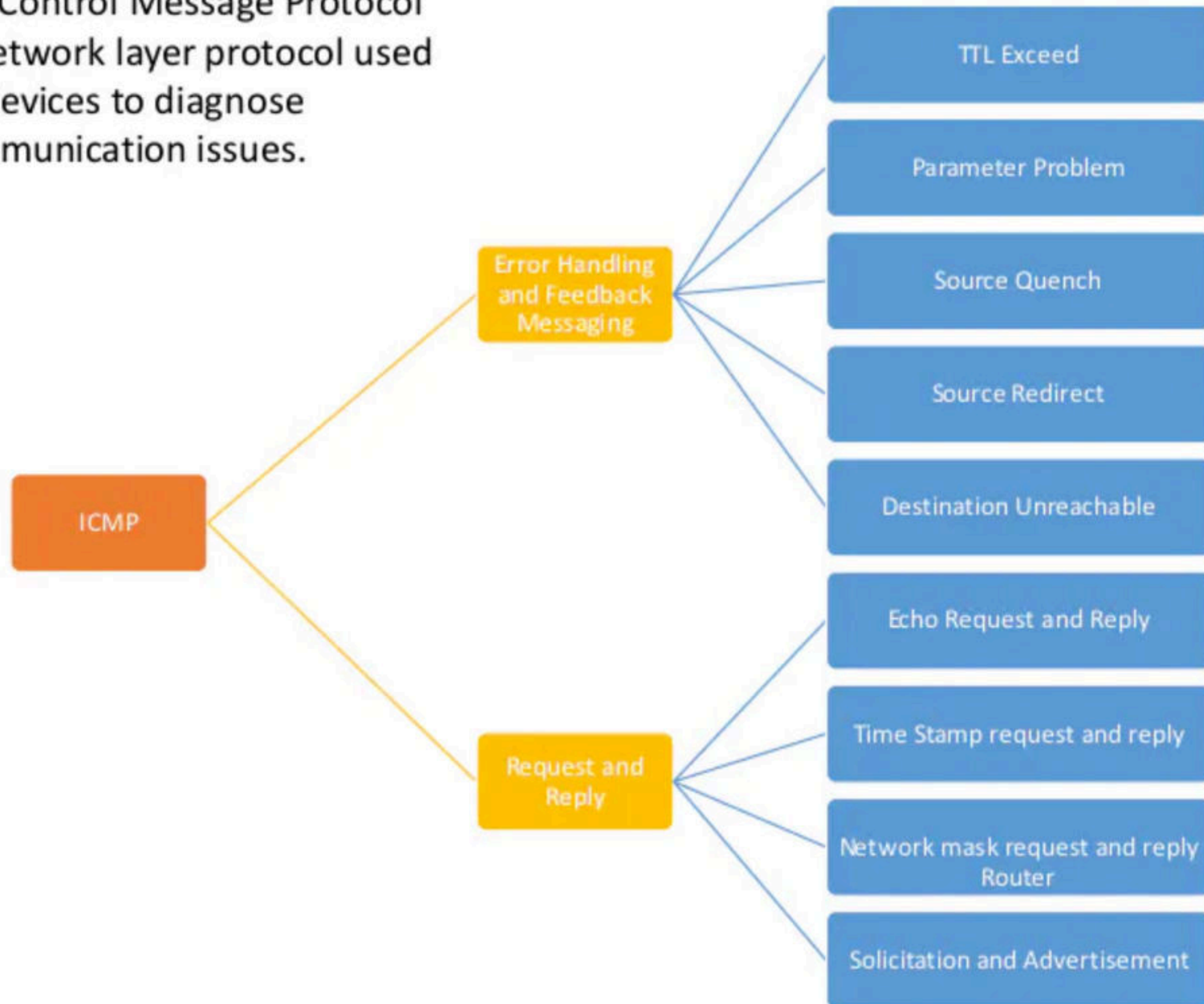


Computer Networks

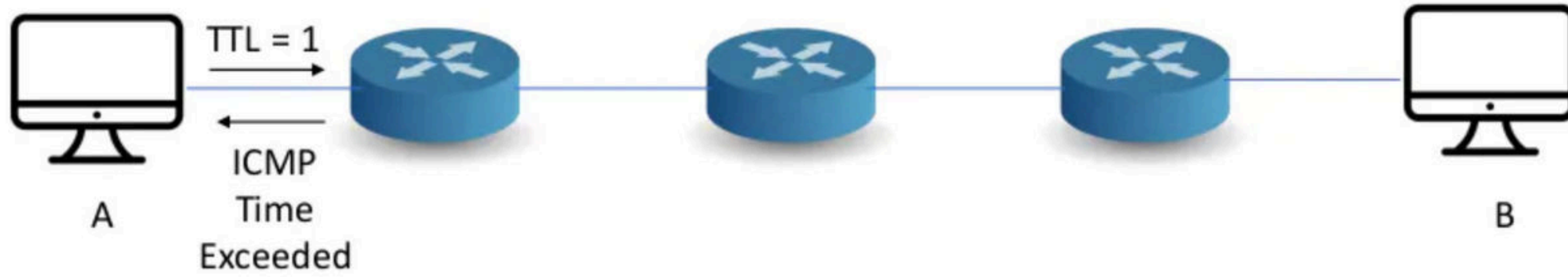
ICMP

Internet Control Message Protocol (ICMP)

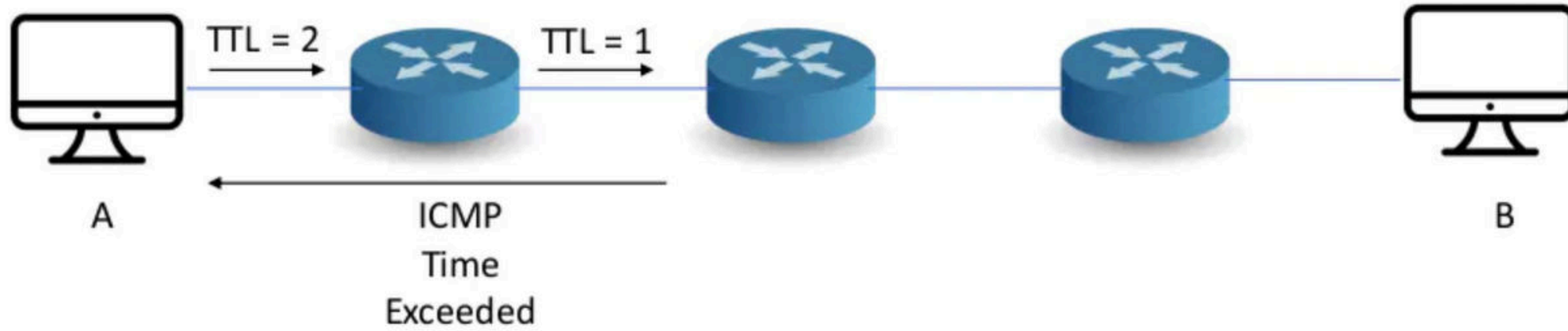
The Internet Control Message Protocol (ICMP) is a network layer protocol used by network devices to diagnose network communication issues.



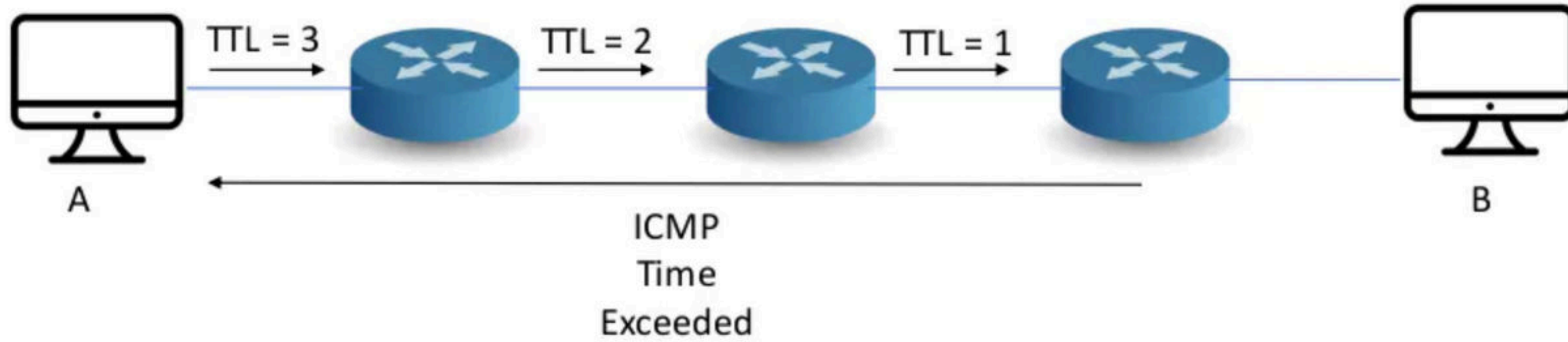
TTL Exceed



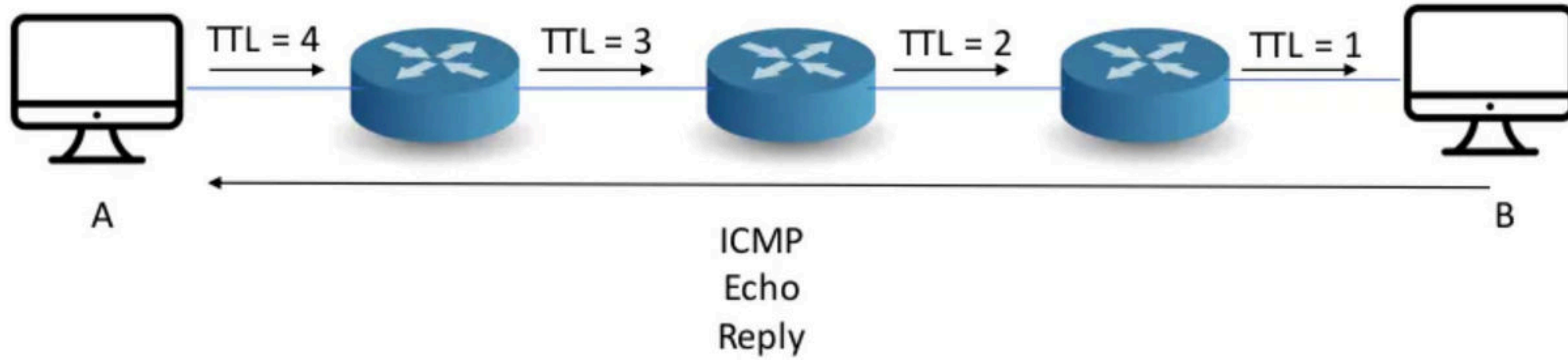
TTL Exceed



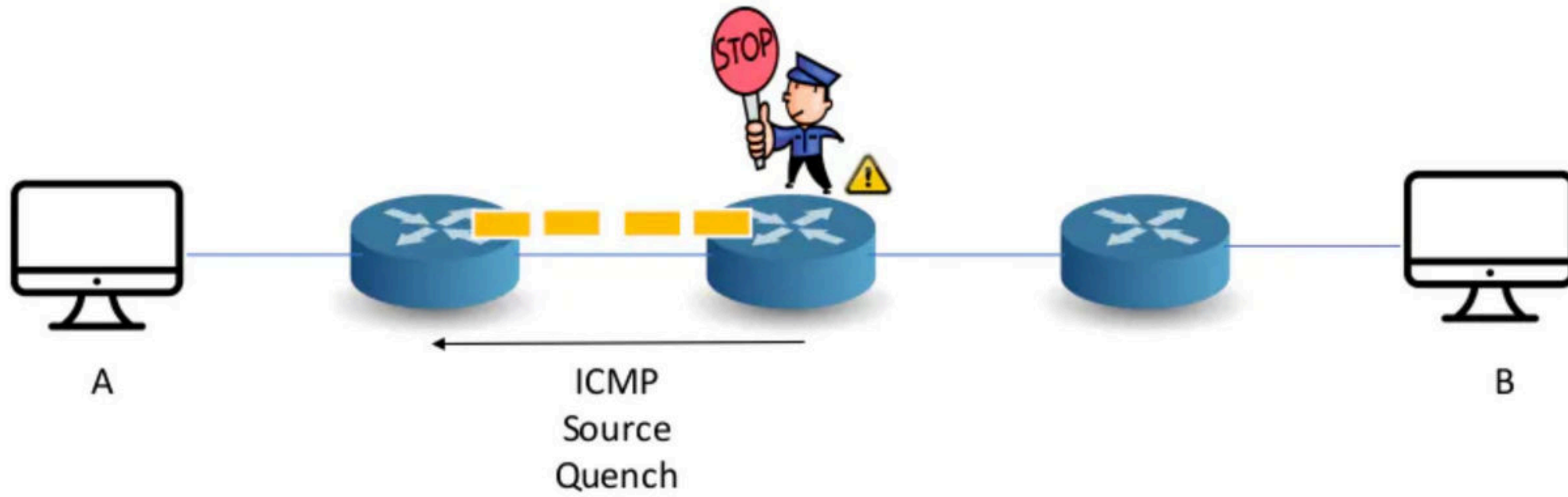
TTL Exceed



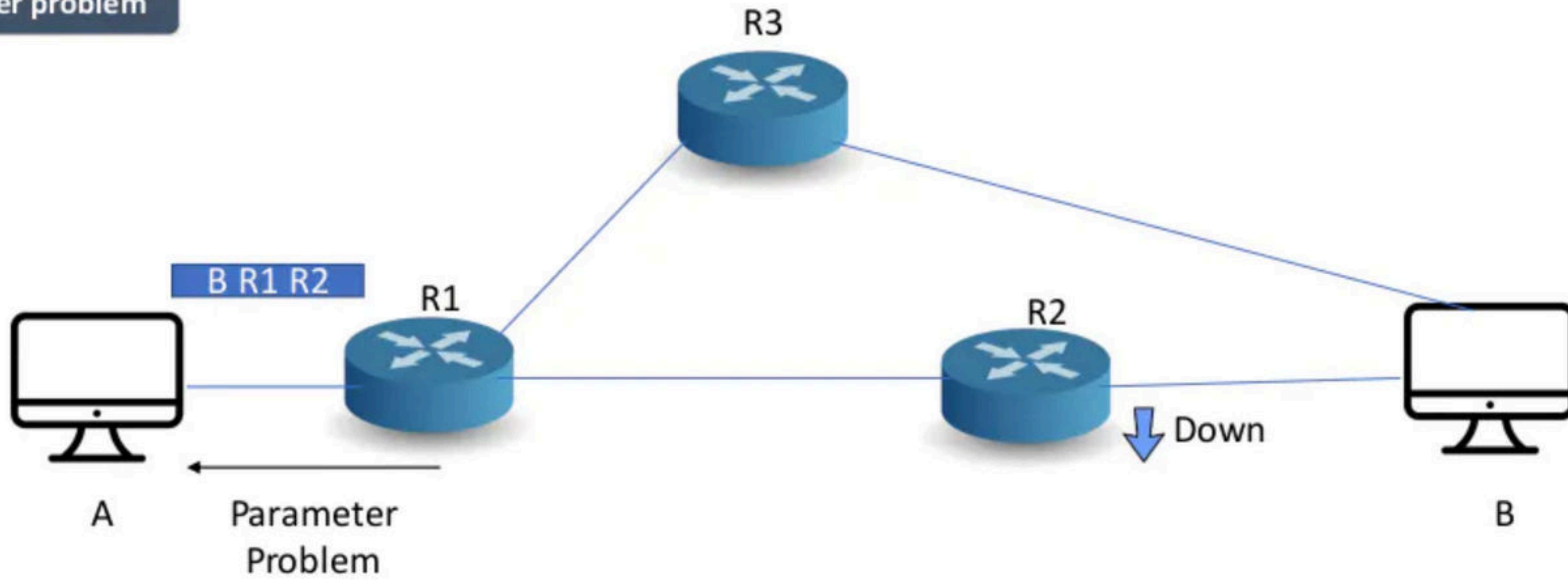
TTL Exceed



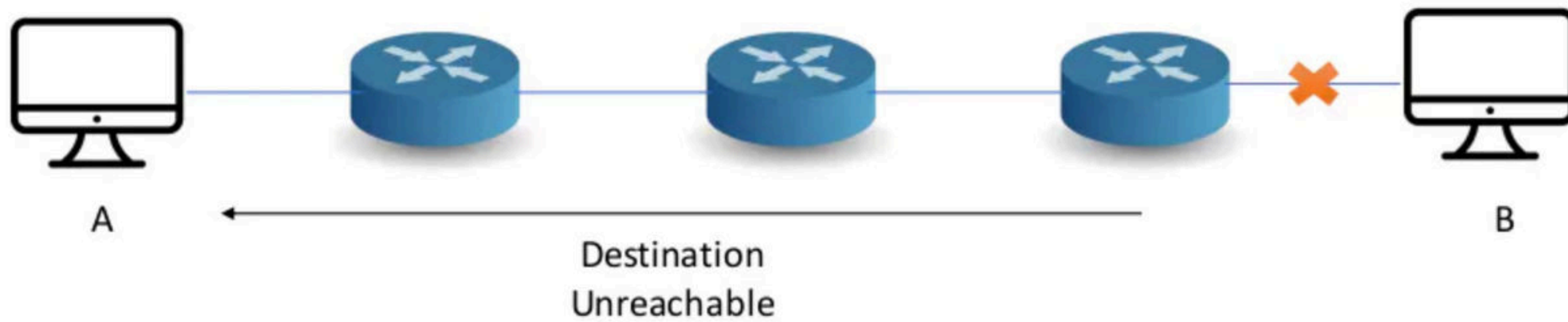
Source quench



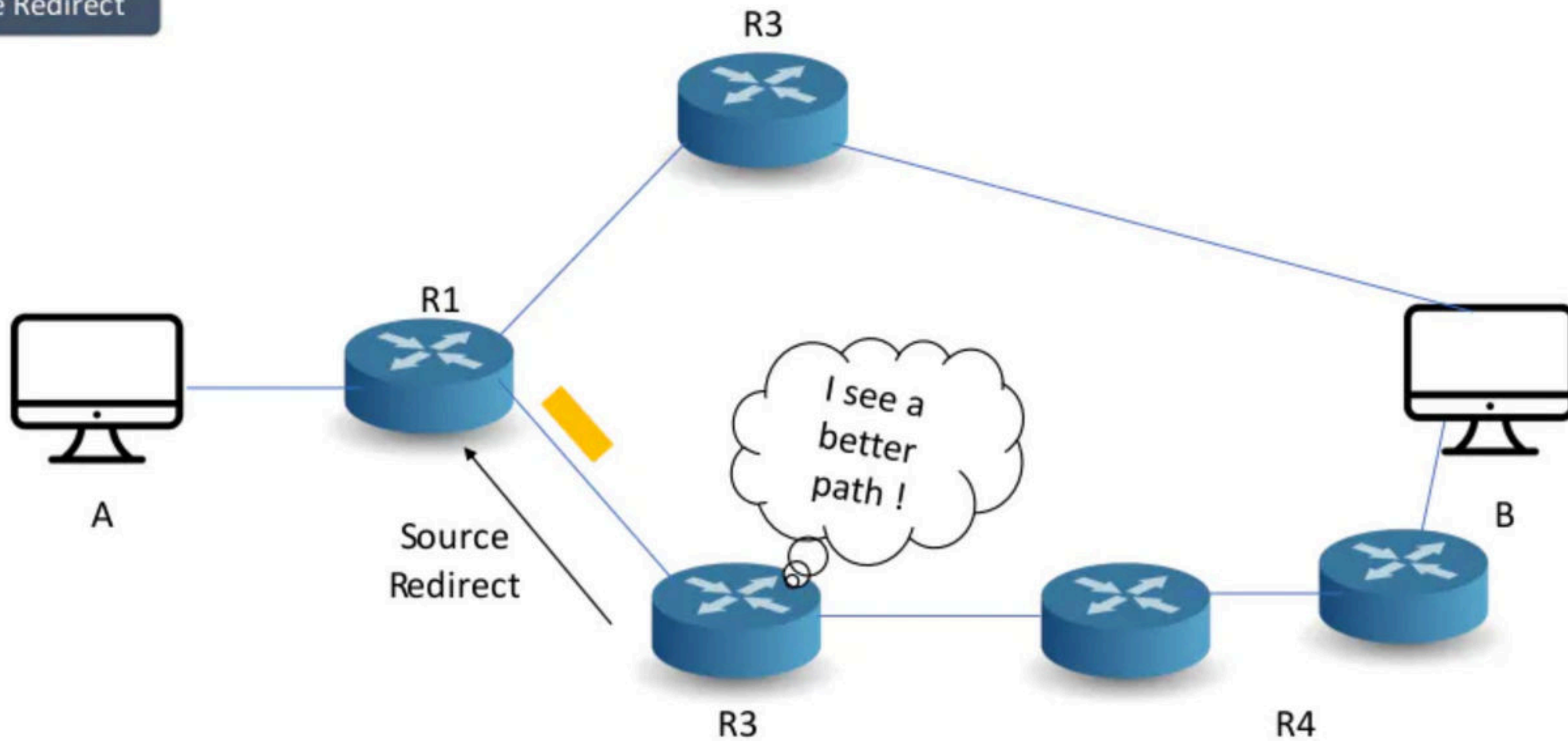
Parameter problem



Destination unreachable



Source Redirect



These are things that sender should know:

Who discarded ?

Why it got discarded ?

What packet did you discard?

