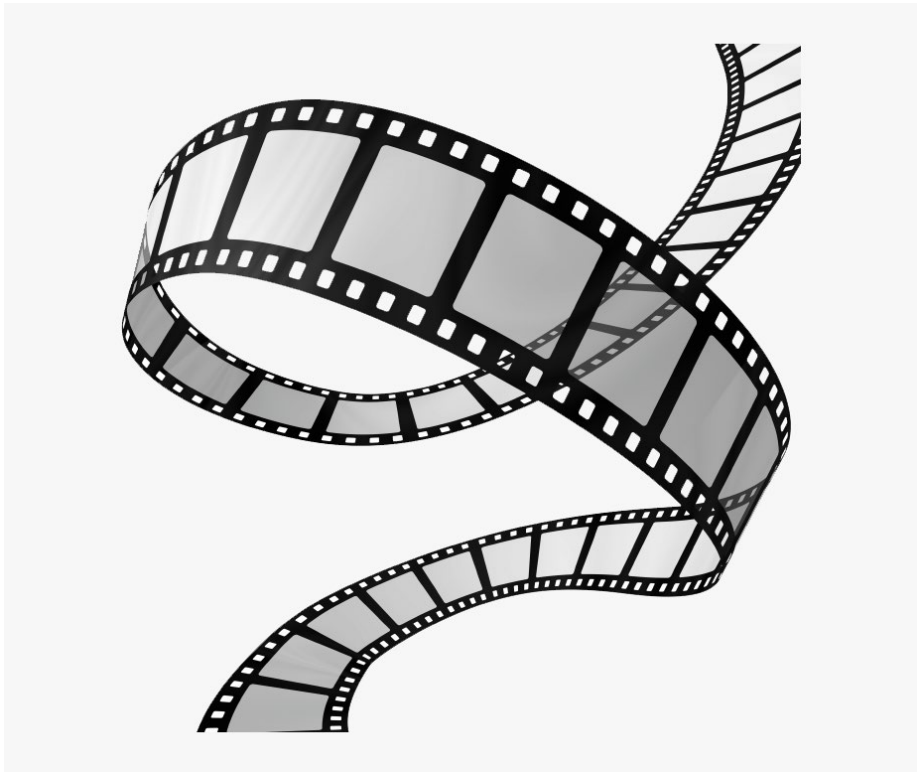
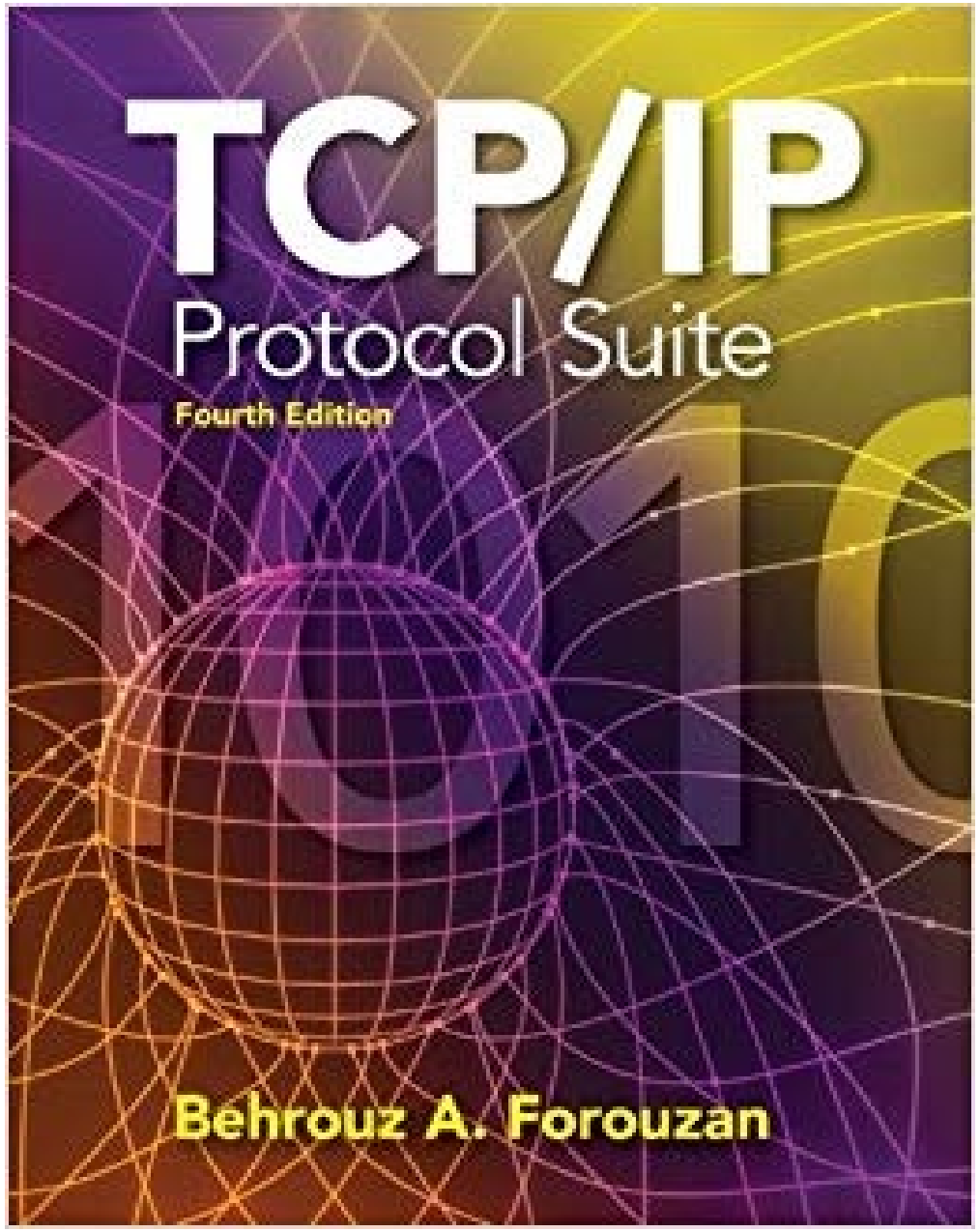
Video and audio recording of the 3214 lectures is strictly prohibited.



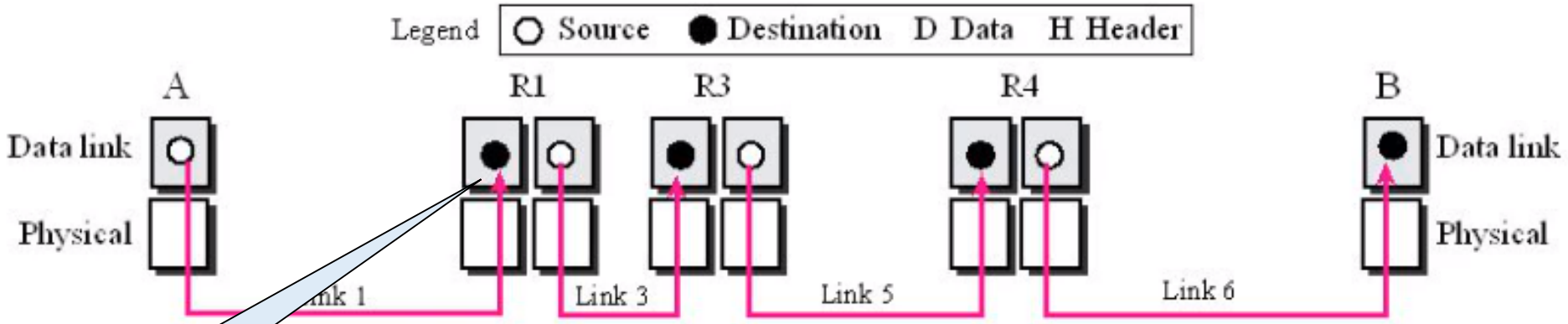
1 [sec] of video = 20+ images

1 [min] of video = 1,200+ images

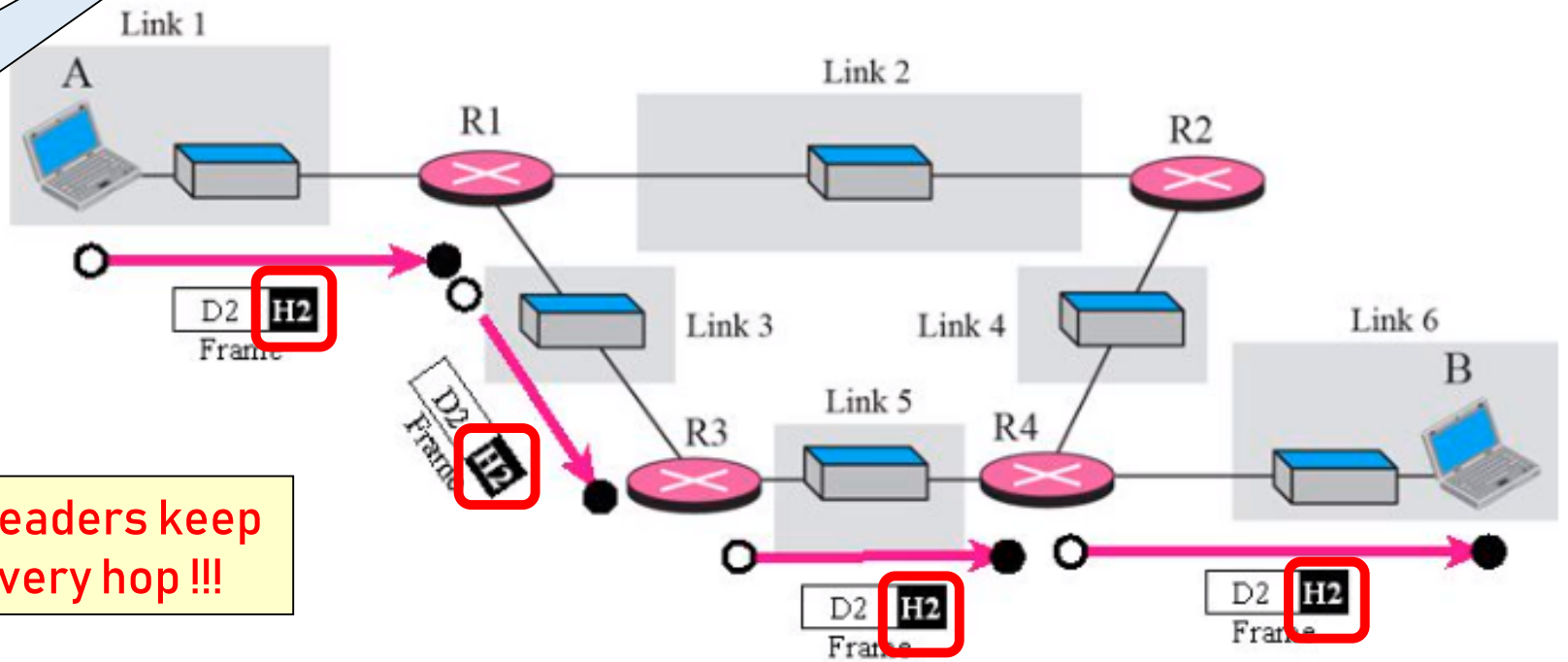
1 [h] of video = 72,000+ images


TCP/IP
Protocol Suite
Fourth Edition
Behrouz A. Forouzan

The data link layer transforms the physical layer, a raw stream of bits, to a reliable link between two OR MORE devices on the same network. It makes the physical layer appear error-free to the upper layer.

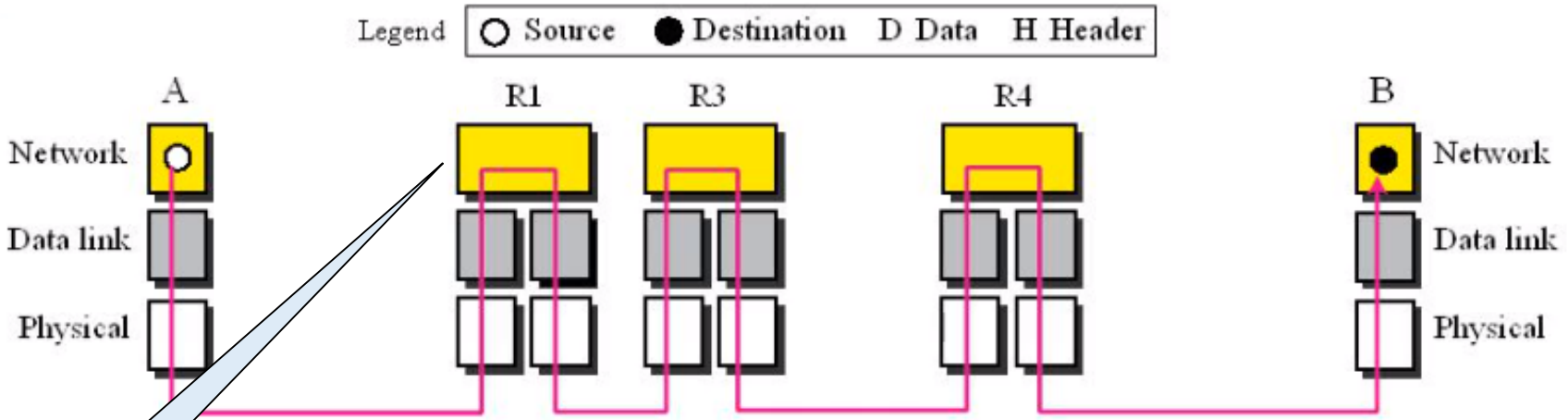


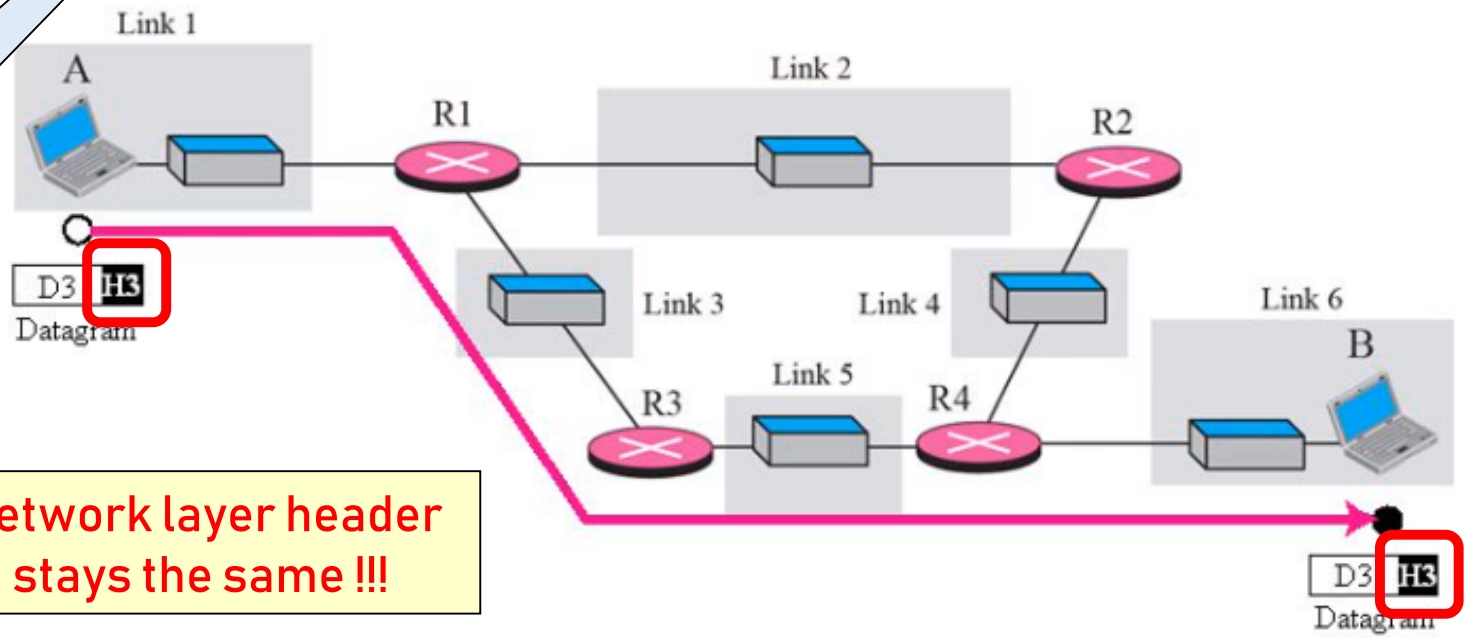
Why do source / destination have to be changed on every hop??



Data link layer headers keep changing on every hop !!!

While the data link layer oversees the delivery of packets between two devices on the same network, the network layer is responsible for the source-to-destination delivery of packet across multiple networks / links.

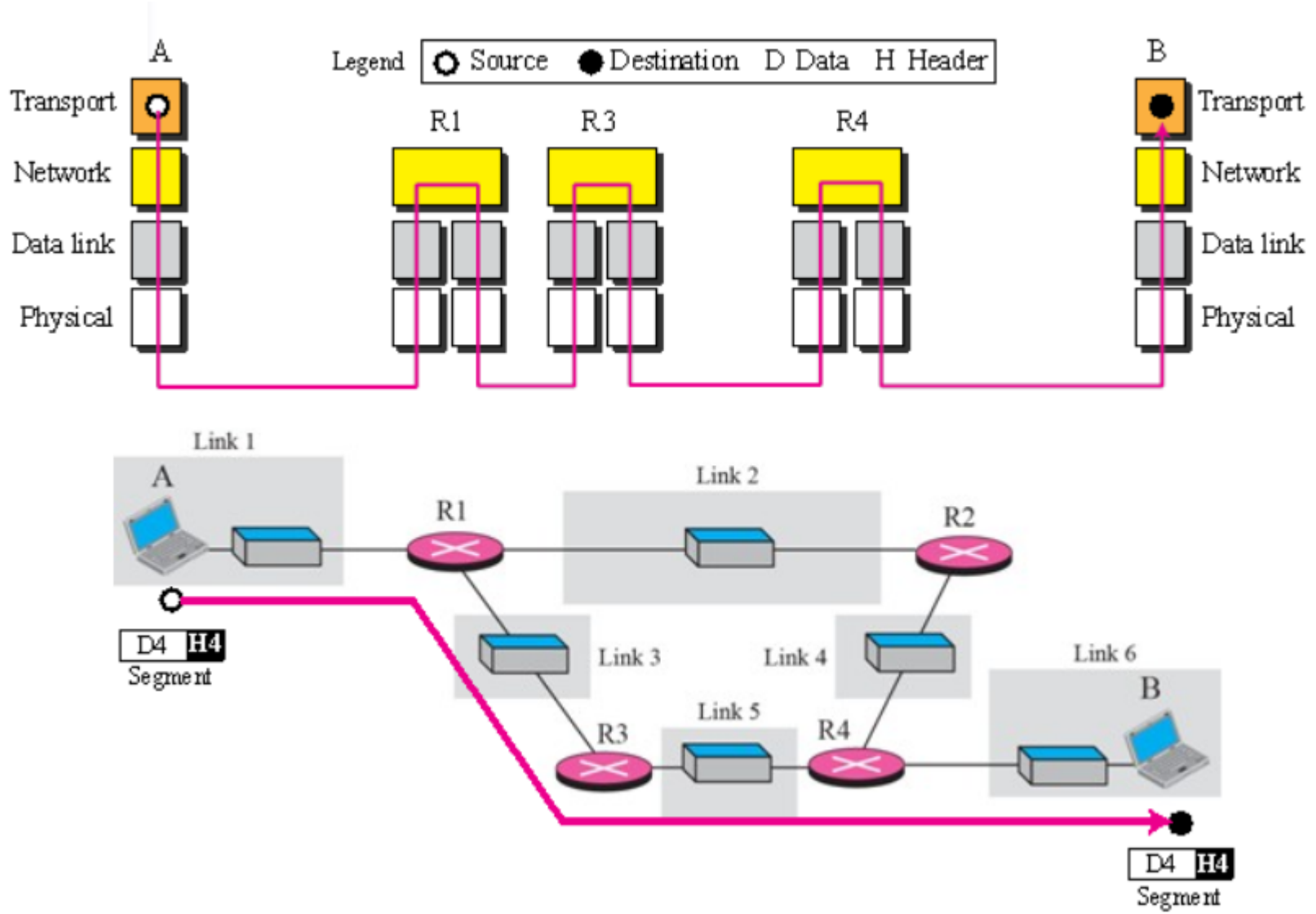


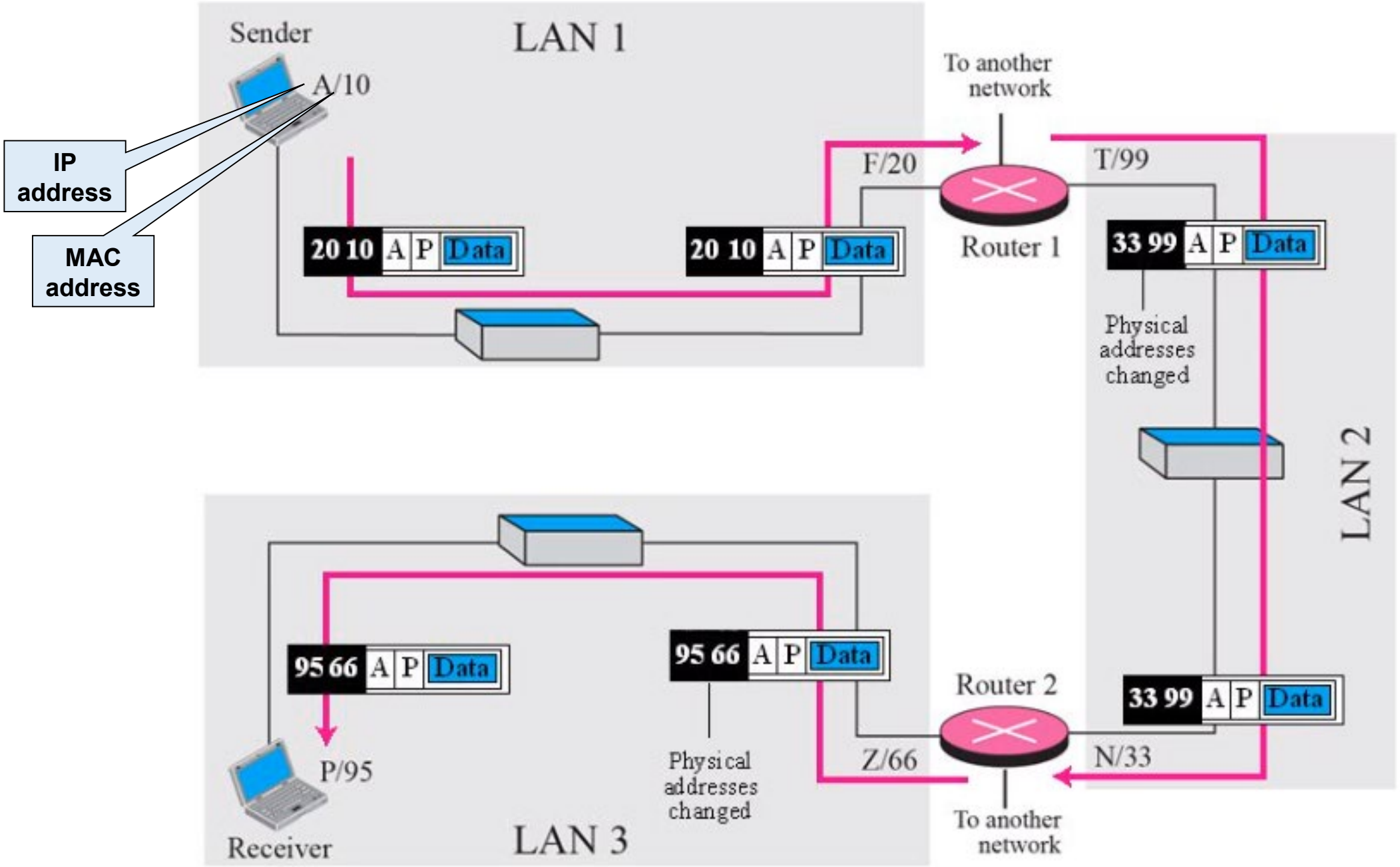


Why do intermediate routers need to 'pull' packets all the way to the network layer??

Network layer header stays the same !!!

The transport layer is responsible for process-to-process delivery of an entire message. While the network layer gets each packet to the correct computer, the transport layer gets the entire message to the correct process on that computer.




Sender
LAN 1
A/10
IP address
MAC address
20 10 A P Data
20 10 A P Data
F/20
To another network
Router 1
T/99
33 99 A P Data
Physical addresses changed
LAN 2
95 66 A P Data
95 66 A P Data
P/95
Receiver
Physical addresses changed
LAN 3
Router 2
Z/66
N/33
33 99 A P Data
To another network

MAC vs IP addressing

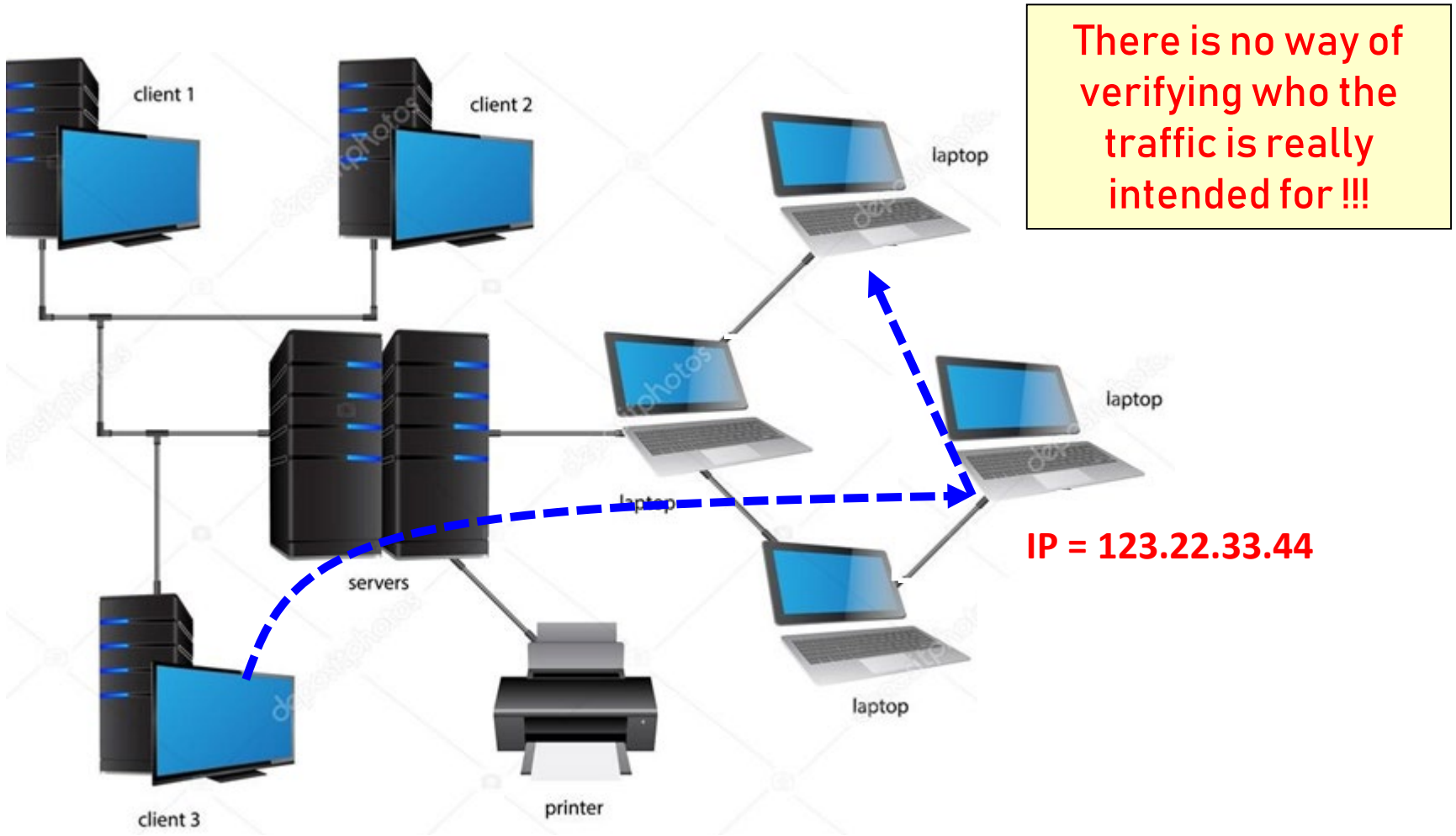
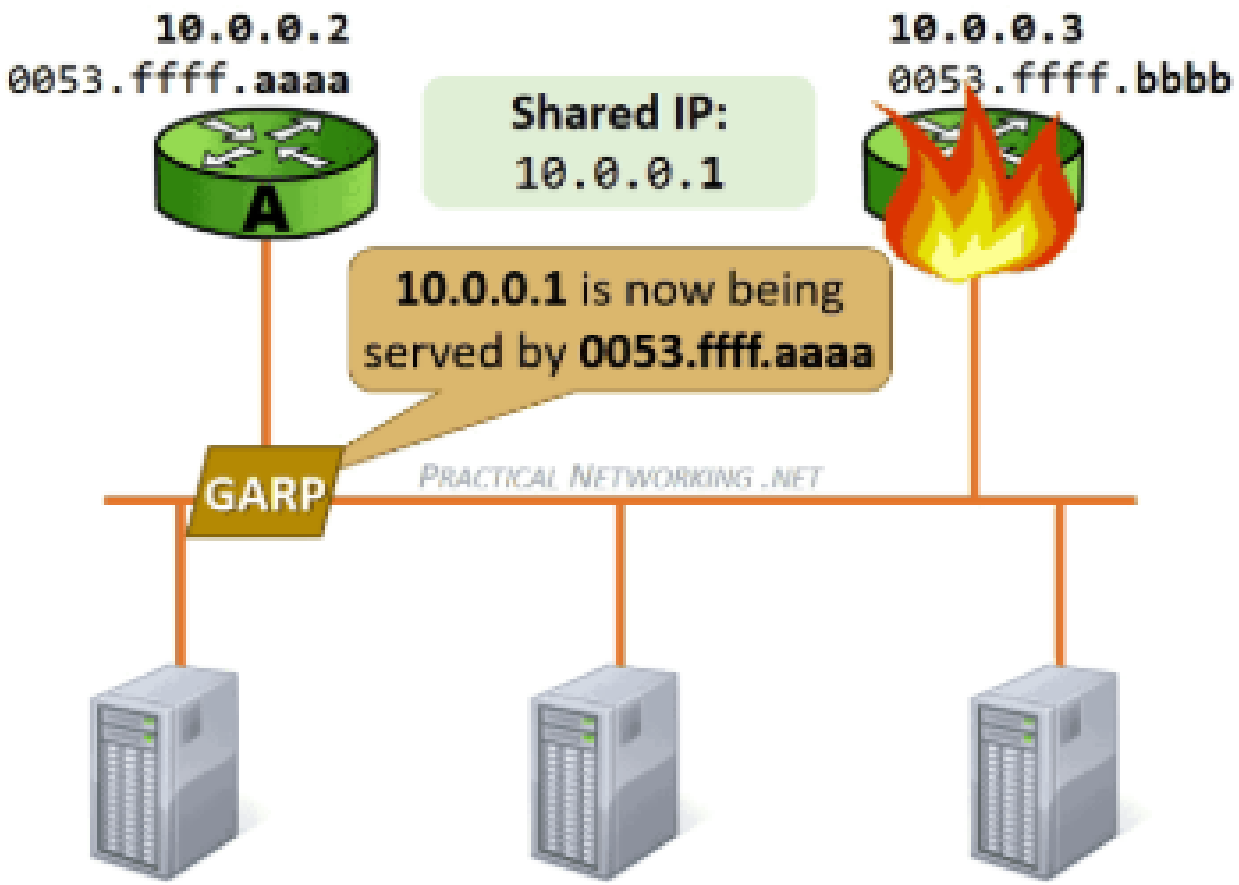
IP addresses are needed
because MAC addresses are not good
for WAN/Internet routing.

Now that we have IP addresses,
why do we still have to bother with
MAC addresses??

MAC address
IP address
Alice J. Smith
1234 Yonge St., Apt. 77
Toronto, ON
Canada

Imagine a LAN with a limited number of IP addresses.

# of IPs < # of devices



Imagine a network that advertises one important IP / service to the rest of the world, but wants to have multiple physical devices/machines provide service on this IP …