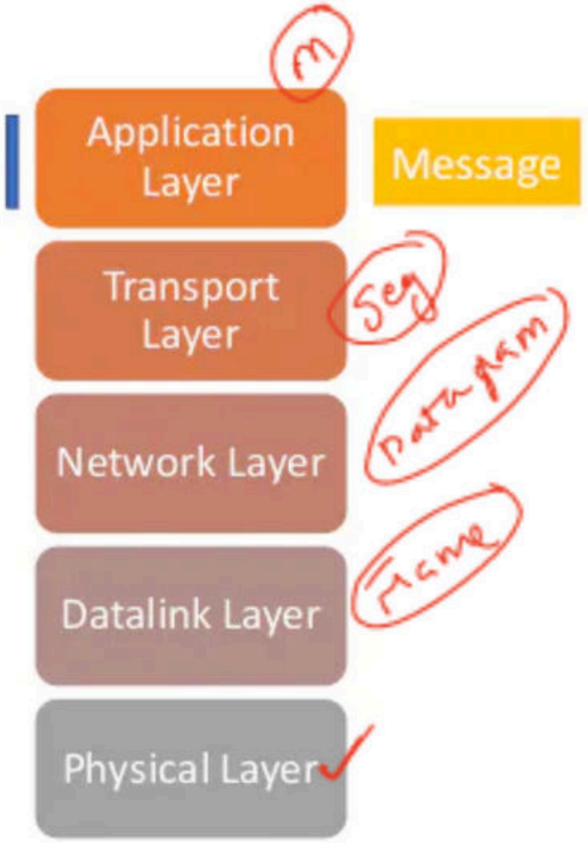
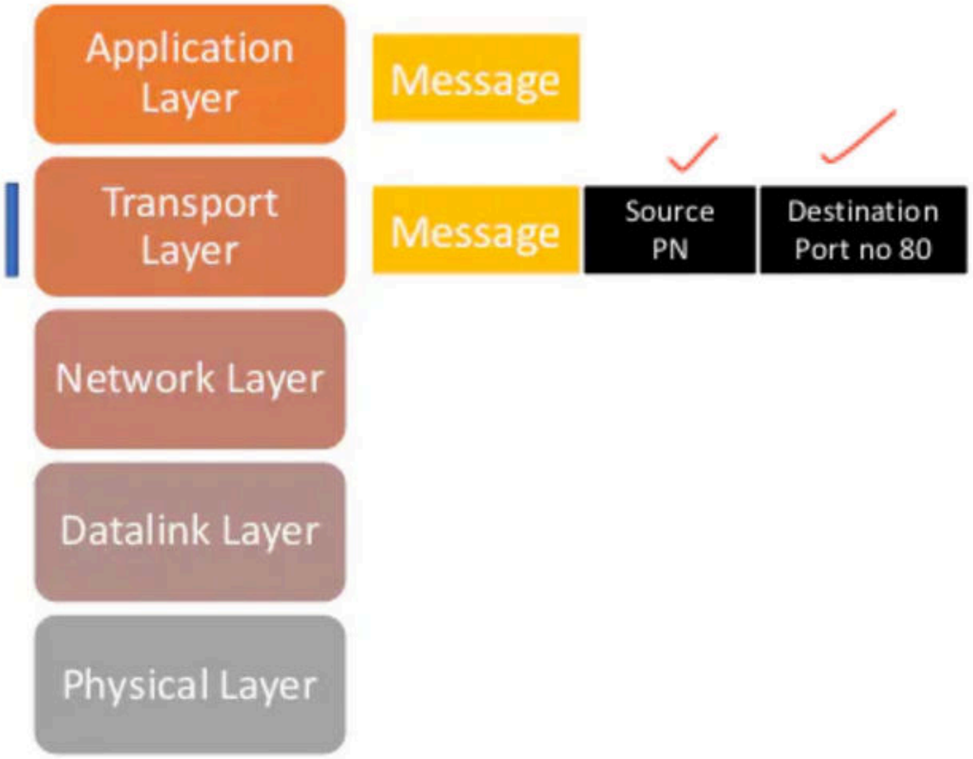
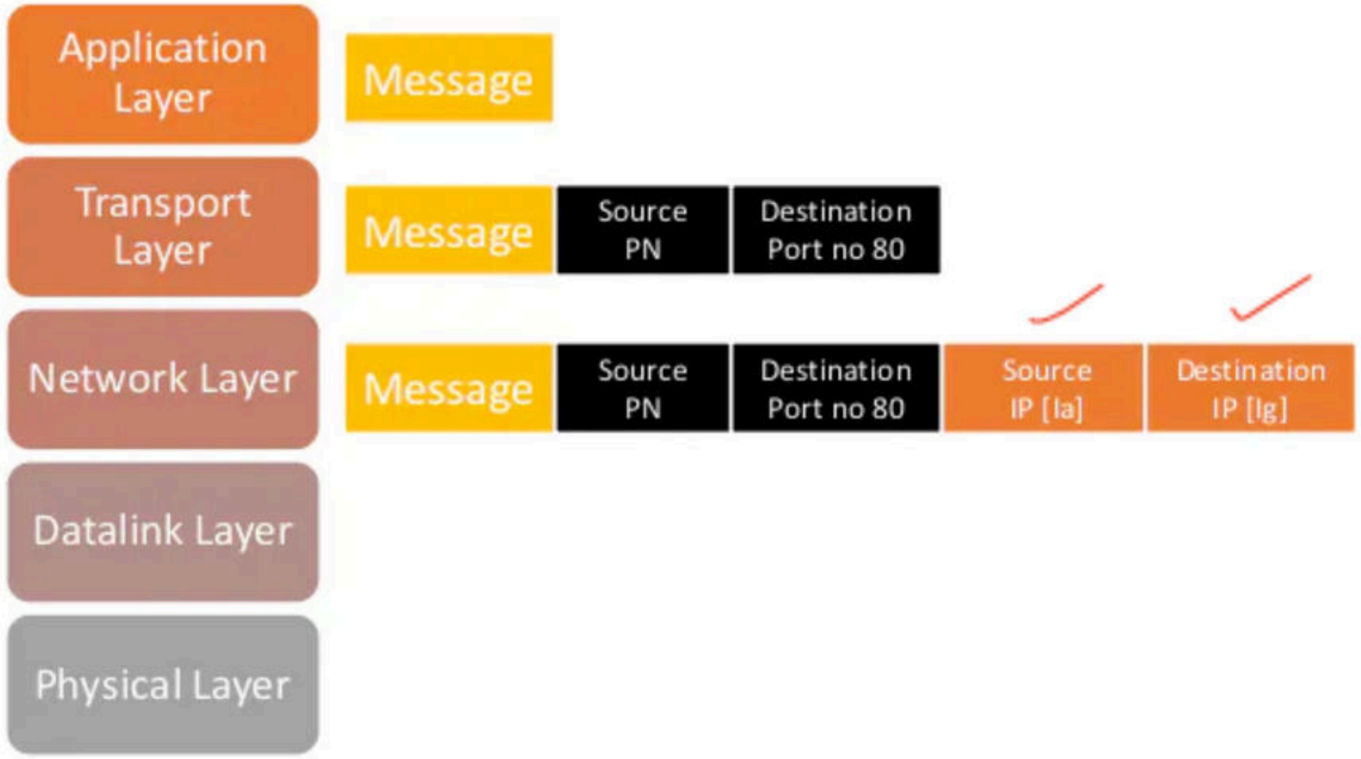
BOOTP, DHCP and ICMP

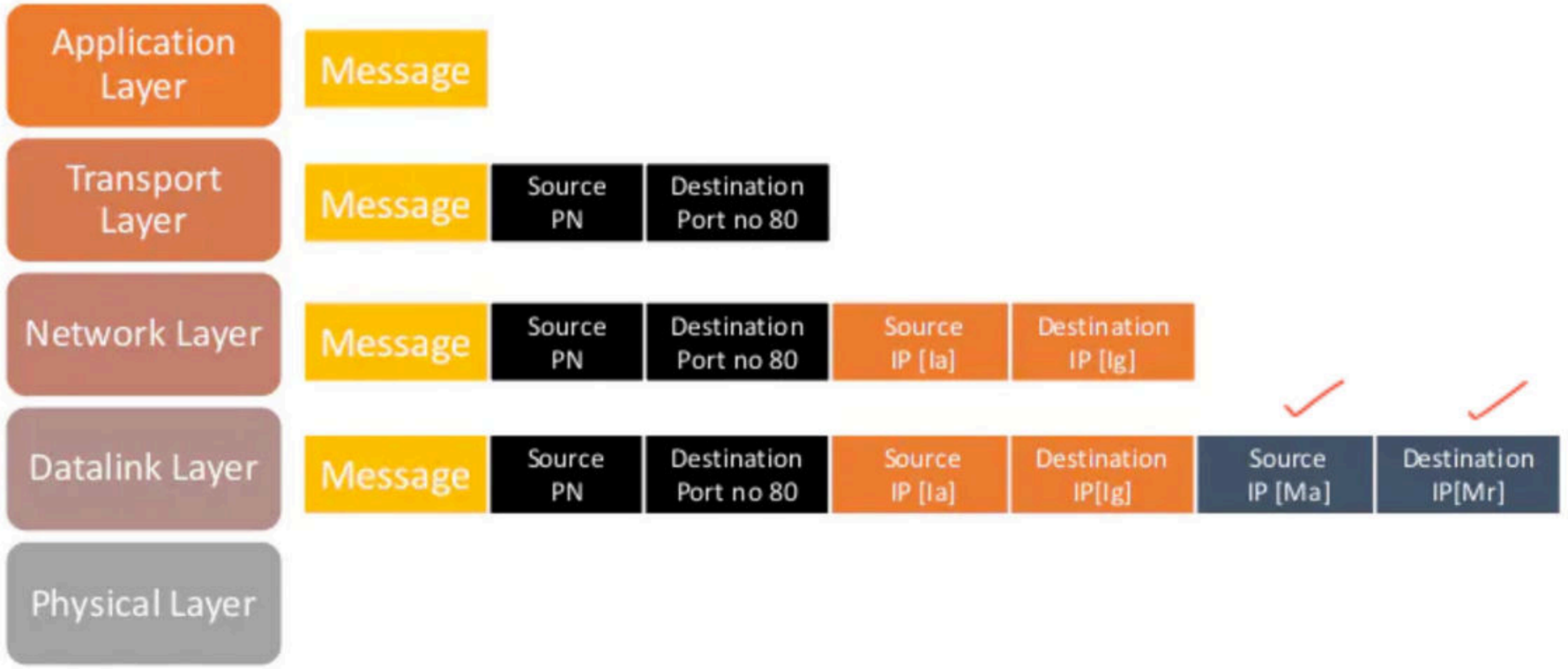
Complete Course on Computer Networks - Part II

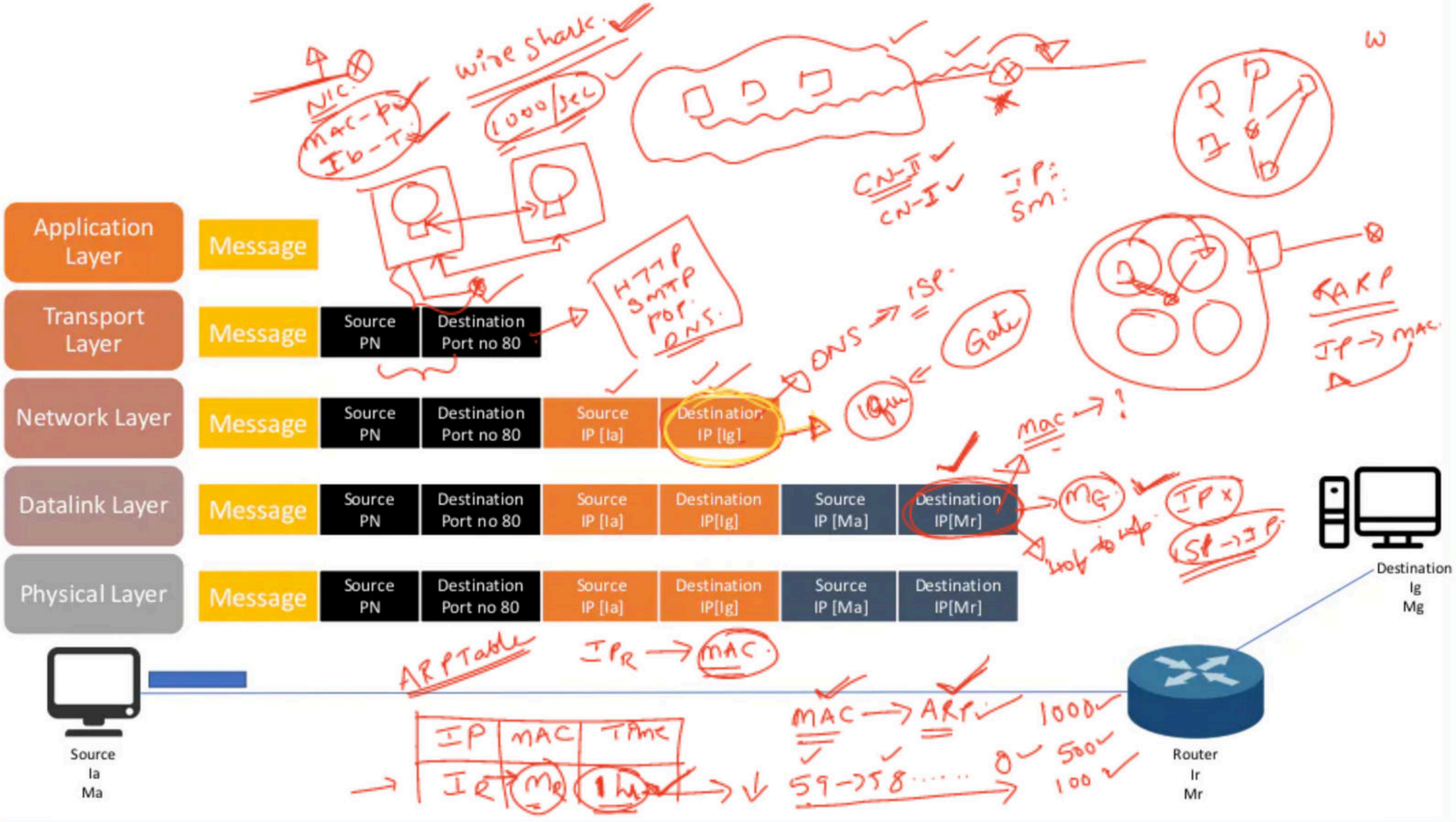
Ravindrababu Ravula • Lesson 14 • Mar 8, 2021

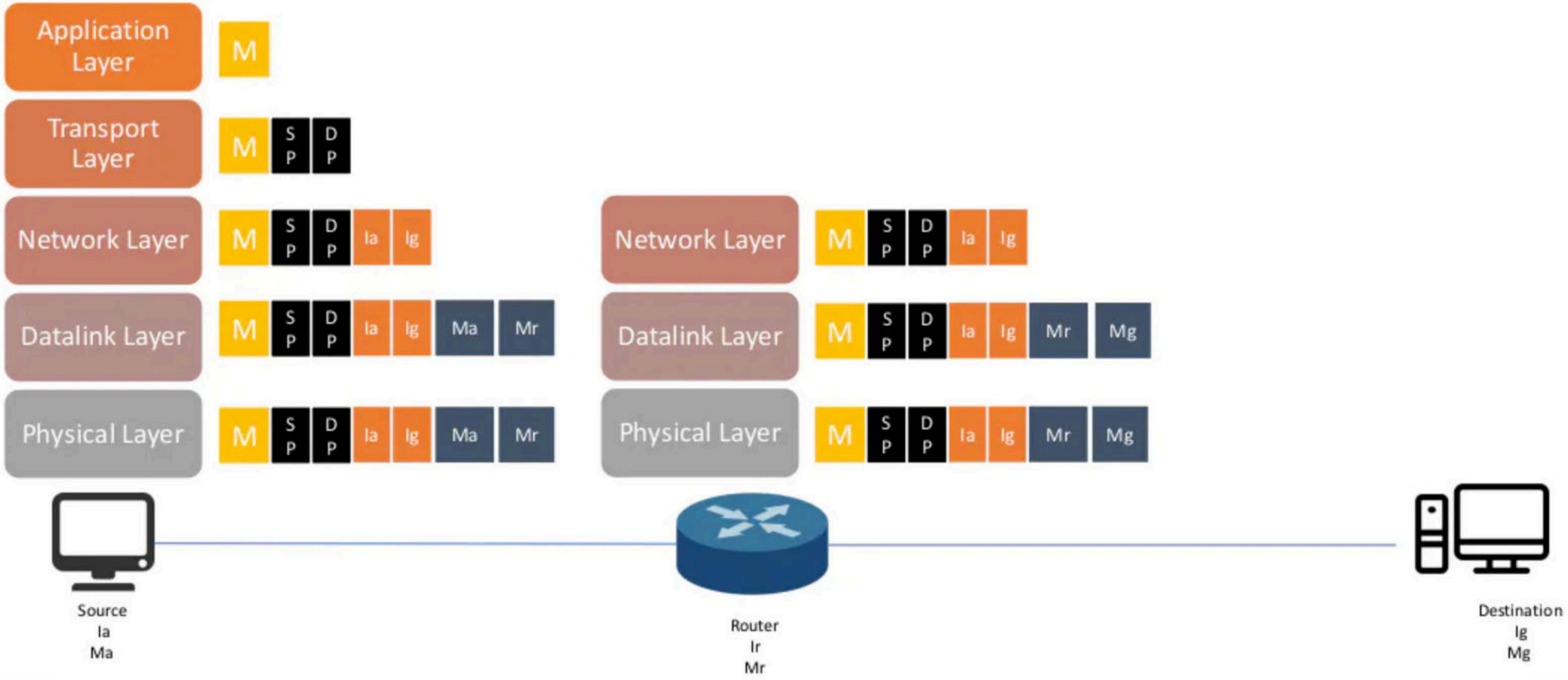

Application Layer
Message
Transport Layer
Network Layer
Datalink Layer
Physical Layer

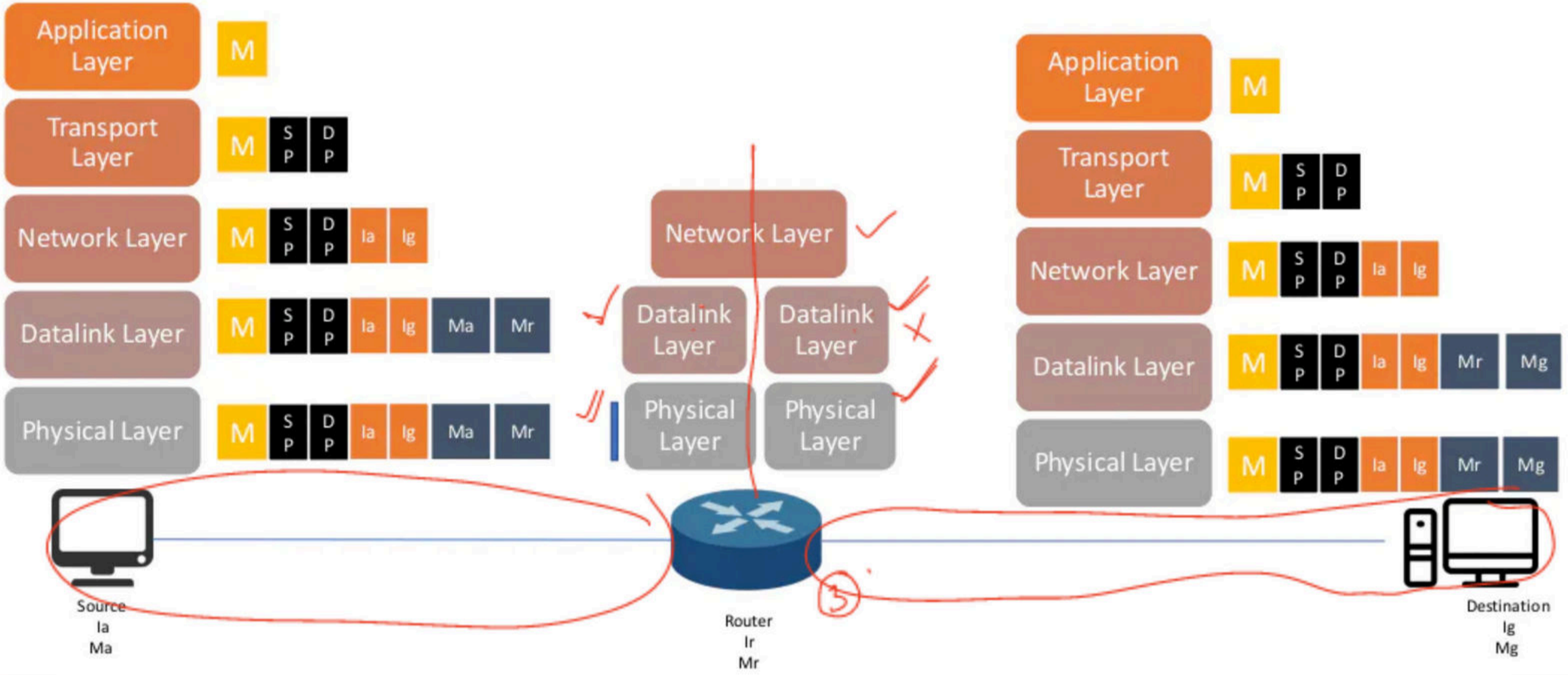

Application Layer
Transport Layer
Network Layer
Datalink Layer
Physical Layer
Message
Message
Source PN
Destination Port no 80

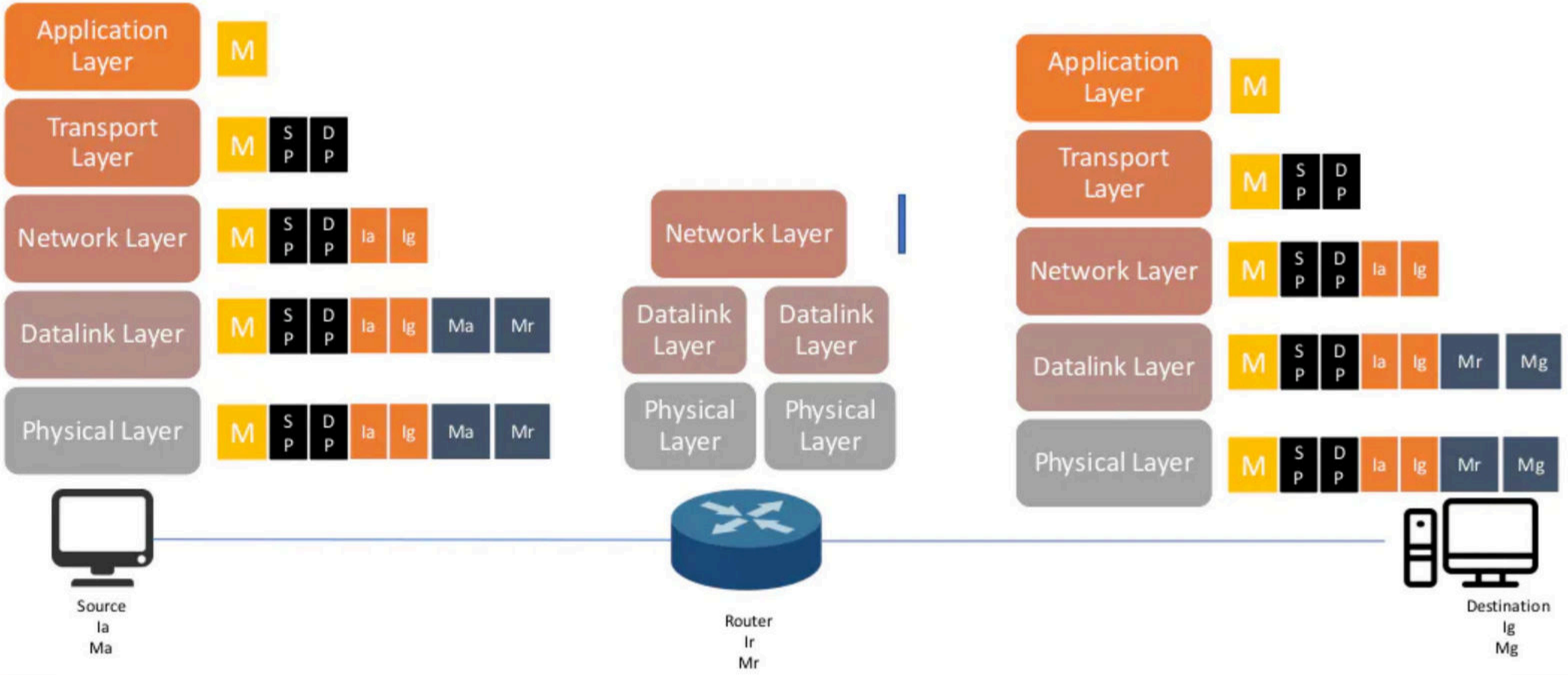

Application Layer
Message
Transport Layer
Message
Source PN
Destination Port no 80
Network Layer
Message
Source PN
Destination Port no 80
Source IP [Ia]
Destination IP [Ig]
Datalink Layer
Physical Layer

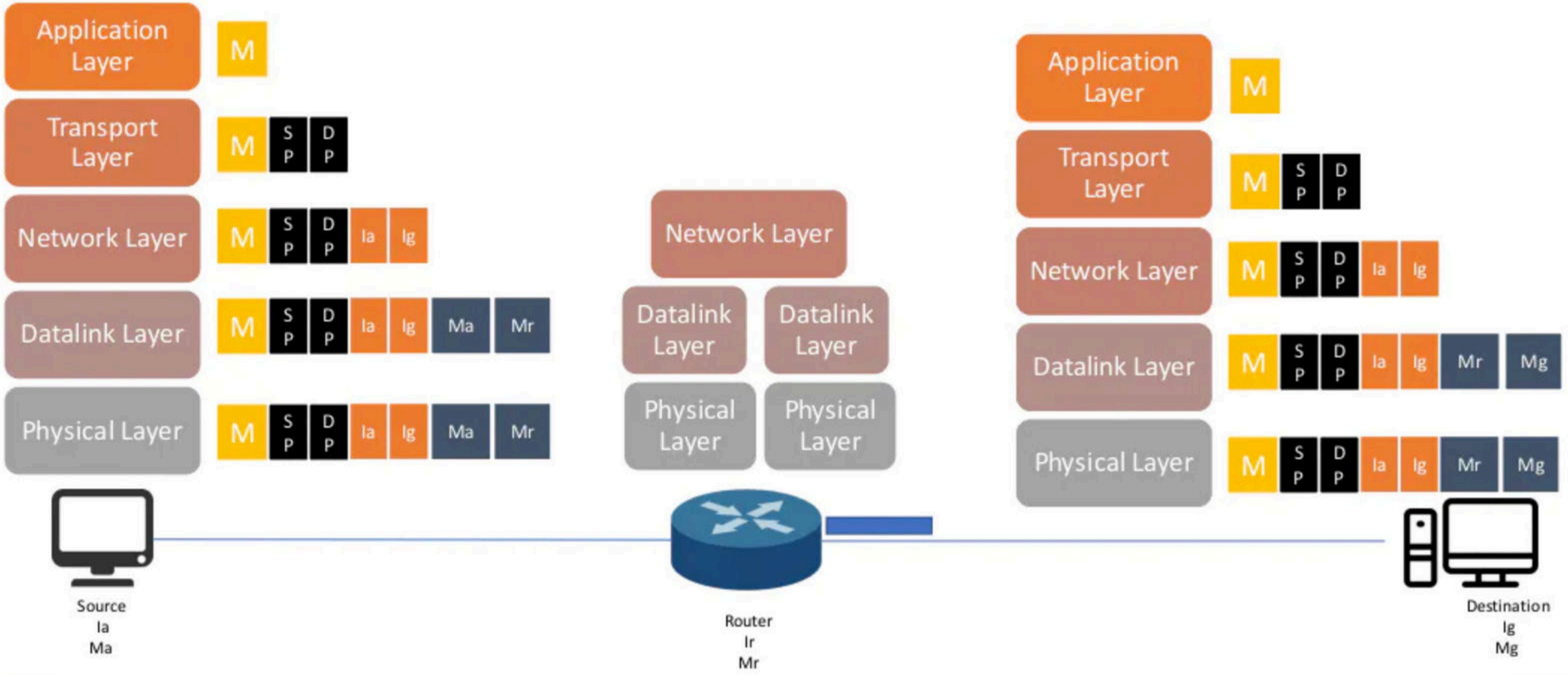

Application Layer
Message
Transport Layer
Message
Source PN
Destination Port no 80
Network Layer
Message
Source PN
Destination Port no 80
Source IP [Ia]
Destination IP [Ig]
Datalink Layer
Message
Source PN
Destination Port no 80
Source IP [Ia]
Destination IP[Ig]
Source IP [Ma]
Destination IP[Mr]
Physical Layer

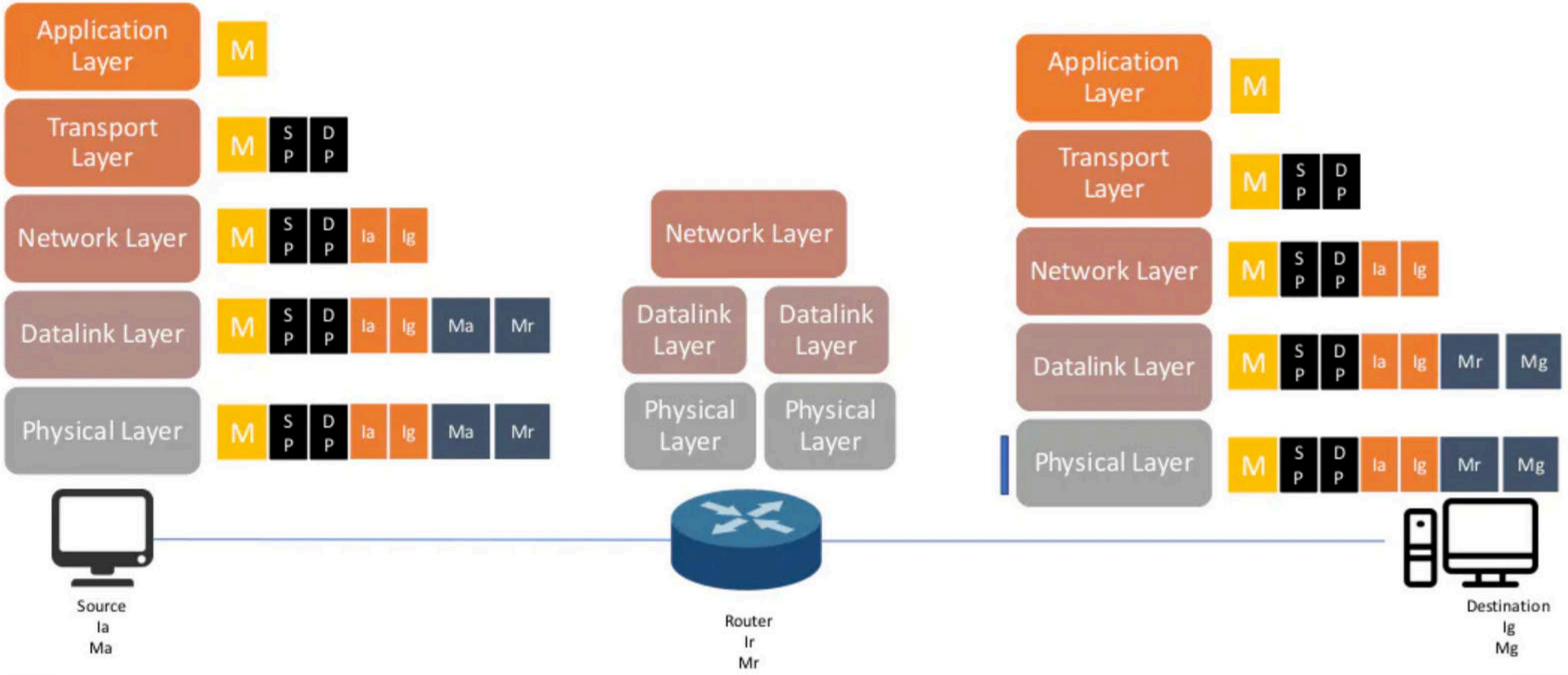

Application Layer
Message
Transport Layer
Message
Source PN
Destination Port no 80
Network Layer
Message
Source PN
Destination Port no 80
Source IP [Ia]
Destination IP [Ig]
Datalink Layer
Message
Source PN
Destination Port no 80
Source IP [Ia]
Destination IP[Ig]
Source IP [Ma]
Destination IP[Mr]
Physical Layer
Message
Source PN
Destination Port no 80
Source IP [Ia]
Destination IP[Ig]
Source IP [Ma]
Destination IP[Mr]
Source
Ia
Ma
Router
Ir
Mr
Destination
Ig
Mg
wire shark
1000/sec
NIC
MAC-P
Ib-T
CN-II
CN-I
IP:
SM:
HTTP
SMTP
POP
DNS
DNS → ISP
Gate
IQu
RARP
IP → MAC
MAC → ?
MG
IP x
ISP → IP
ARP Table
IP_R → MAC
MAC → ARP
1000
500
100
IP
MAC
Time
IR
MR
1 hr
59 → 58

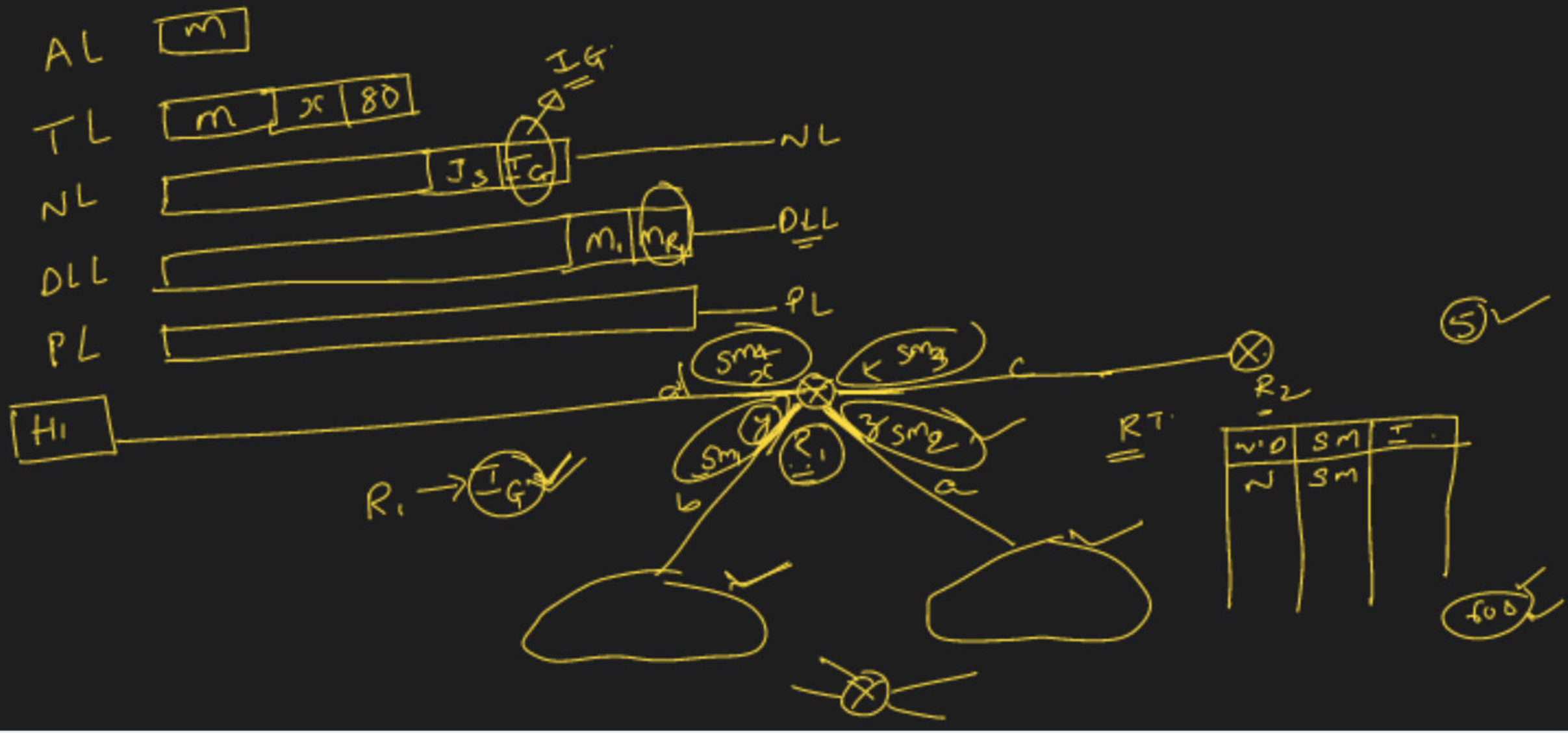

Application Layer
M
Transport Layer
M
S P
D P
Network Layer
M
S P
D P
Ia
Ig
Datalink Layer
M
S P
D P
Ia
Ig
Ma
Mr
Physical Layer
M
S P
D P
Ia
Ig
Ma
Mr
Network Layer
M
S P
D P
Ia
Ig
Datalink Layer
M
S P
D P
Ia
Ig
Mr
Mg
Physical Layer
M
S P
D P
Ia
Ig
Mr
Mg
Source
Ia
Ma
Router
Ir
Mr
Destination
Ig
Mg


Application Layer
M
Transport Layer
M
S P
D P
Network Layer
M
S P
D P
Ia
Ig
Datalink Layer
M
S P
D P
Ia
Ig
Ma
Mr
Physical Layer
M
S P
D P
Ia
Ig
Ma
Mr
Network Layer
Datalink Layer
Datalink Layer
Physical Layer
Physical Layer
Application Layer
M
Transport Layer
M
S P
D P
Network Layer
M
S P
D P
Ia
Ig
Datalink Layer
M
S P
D P
Ia
Ig
Mr
Mg
Physical Layer
M
S P
D P
Ia
Ig
Mr
Mg
Source
Ia
Ma
Router
Ir
Mr
Destination
Ig
Mg


Application Layer
M
Transport Layer
M
S P
D P
Network Layer
M
S P
D P
Ia
Ig
Datalink Layer
M
S P
D P
Ia
Ig
Ma
Mr
Physical Layer
M
S P
D P
Ia
Ig
Ma
Mr
Source
Ia
Ma
Network Layer
Datalink Layer
Datalink Layer
Physical Layer
Physical Layer
Router
Ir
Mr
Application Layer
M
Transport Layer
M
S P
D P
Network Layer
M
S P
D P
Ia
Ig
Datalink Layer
M
S P
D P
Ia
Ig
Mr
Mg
Physical Layer
M
S P
D P
Ia
Ig
Mr
Mg
Destination
Ig
Mg


Application Layer
M
Transport Layer
M
S P
D P
Network Layer
M
S P
D P
Ia
Ig
Datalink Layer
M
S P
D P
Ia
Ig
Ma
Mr
Physical Layer
M
S P
D P
Ia
Ig
Ma
Mr
Source
Ia
Ma
Network Layer
Datalink Layer
Datalink Layer
Physical Layer
Physical Layer
Router
Ir
Mr
Application Layer
M
Transport Layer
M
S P
D P
Network Layer
M
S P
D P
Ia
Ig
Datalink Layer
M
S P
D P
Ia
Ig
Mr
Mg
Physical Layer
M
S P
D P
Ia
Ig
Mr
Mg
Destination
Ig
Mg


Application Layer
M
Transport Layer
M
S P
D P
Network Layer
M
S P
D P
Ia
Ig
Datalink Layer
M
S P
D P
Ia
Ig
Ma
Mr
Physical Layer
M
S P
D P
Ia
Ig
Ma
Mr
Source
Ia
Ma
Network Layer
Datalink Layer
Datalink Layer
Physical Layer
Physical Layer
Router
Ir
Mr
Application Layer
M
Transport Layer
M
S P
D P
Network Layer
M
S P
D P
Ia
Ig
Datalink Layer
M
S P
D P
Ia
Ig
Mr
Mg
Physical Layer
M
S P
D P
Ia
Ig
Mr
Mg
Destination
Ig
Mg


AL
m
TL
m
x
80
NL
Js
IG
NL
DLL
m1
mR1
DLL
PL
PL
H1
sm4
x
sm3
c
d
y
sm1
R1
z
sm2
b
a
R1 → IG
RT
R2
W.D
SM
I
N
SM
5
600

Computer Networks

Session Layer

Functions of Session Layer

- Authentication and Authorisation
- Checkpointing
- Synchronisation
- Dialog control

Functions of Session Layer

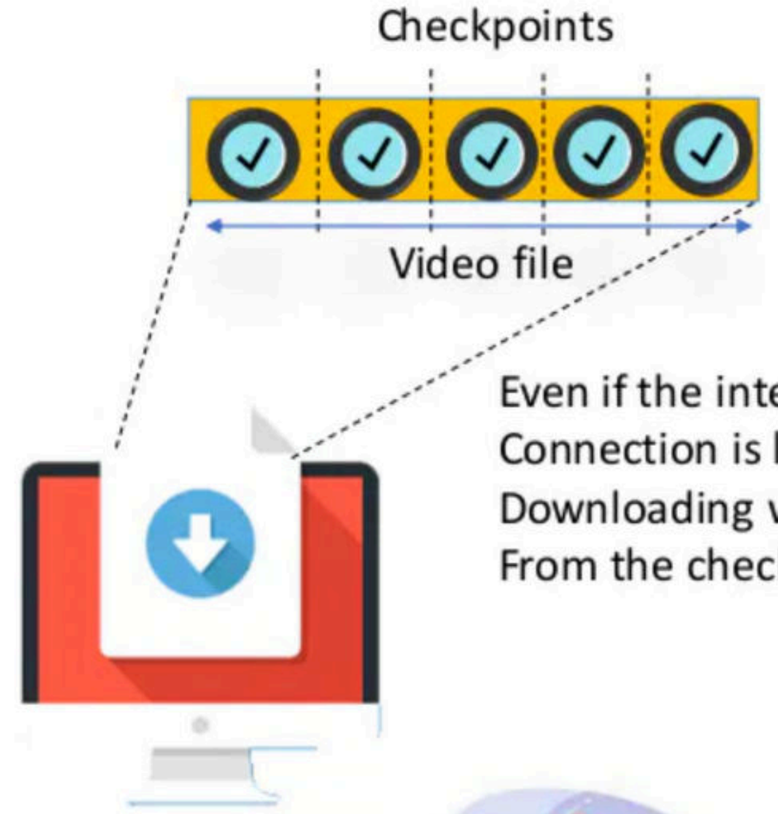
- Authentication and Authorization
- Checkpointing
- Synchronisation
- Dialog control

Authentication is the process of recognizing a user's identity. It is the mechanism of associating an incoming request with a set of identifying credentials. The credentials provided are compared to those on a file in a database of the authorized user's information on a local operating system or within an authentication server.

Authorization is is the process of granting or denying access to a network resource which allows the user access to various resources based on the user's identity.

Functions of Session Layer

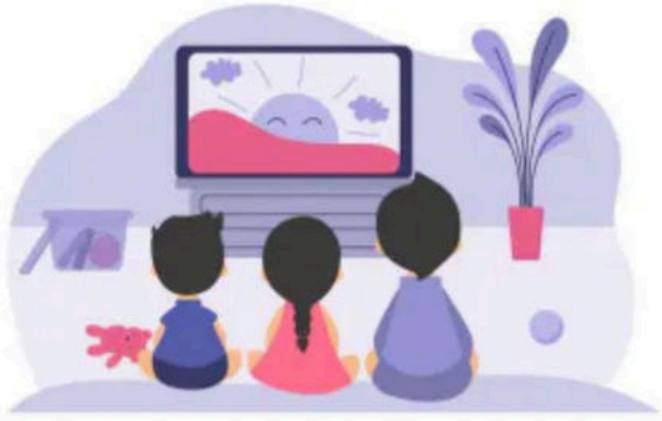
- Authentication and Authorisation
- Checkpointing
- Synchronisation
- Dialog control



Even if the internet Connection is lost, Downloading will resume From the checkpoint.

Functions of Session Layer

- Authentication and Authorisation
- Checkpointing
- Synchronisation
- Dialog control



Functions of Session Layer

- Authentication and Authorisation
- Checkpointing
- Synchronisation
- Dialog control

Video conferencing – Only one person must speak at once

Computer Networks

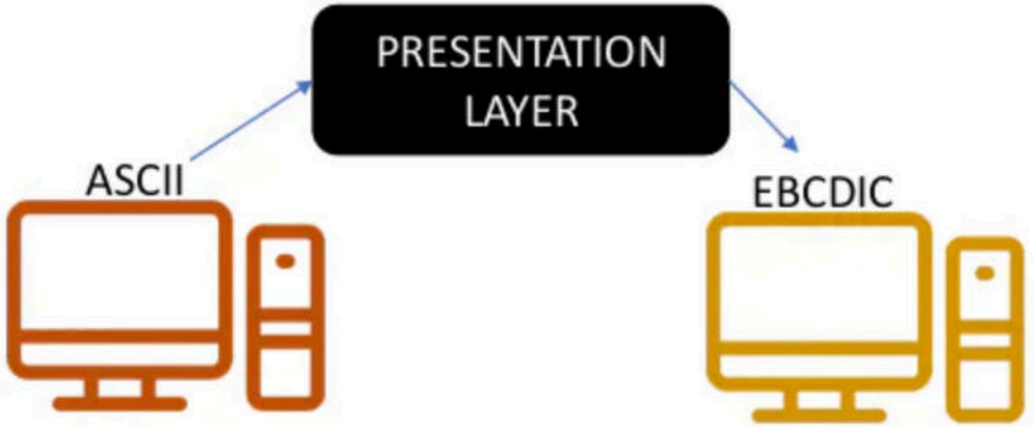
Presentation Layer and GATE 2014 question

Functions of Presentation Layer

- Data Translation
- Encryption and Decryption
- Data compression

Functions of Presentation Layer

- Data Translation
- Encryption and Decryption
- Data compression



Functions of Presentation Layer

- Data Translation
- Encryption and Decryption
- Data compression

Functions of Presentation Layer

- Data Translation
- Encryption and Decryption
- Data compression

GATE 2014

An IP machine Q has a path to another IP machine H via three IP routers R1, R2, and R3.

Q—R1—R2—R3—H

H acts as an HTTP server, and Q connects to H via HTTP and downloads a file. Session layer encryption is used, with DES as the shared key encryption protocol. Consider the following four pieces of information:

[I1] The URL of the file downloaded by Q

[I2] The TCP port numbers at Q and H

[I3] The IP addresses of Q and H

[I4] The link layer addresses of Q and H

Which of I1, I2, I3, and I4 can an intruder learn through sniffing at R2 alone?

A) Only I1 and I2

B) Only I1

C) Only I2 and I3

D) Only I3 and I4

GATE 2014

An IP machine Q has a path to another IP machine H via three IP routers R1, R2, and R3.

Q—R1—R2—R3—H

H acts as an HTTP server, and Q connects to H via HTTP and downloads a file. Session layer encryption is used, with DES as the shared key encryption protocol. Consider the following four pieces of information:

[I1] The URL of the file downloaded by Q

[I2] The TCP port numbers at Q and H

[I3] The IP addresses of Q and H

[I4] The link layer addresses of Q and H

Which of I1, I2, I3, and I4 can an intruder learn through sniffing at R2 alone?

A) Only I1 and I2

B) Only I1

C) Only I2 and I3

D) Only I3 and I4

Answer:

An Intruder can't learn [I1] through sniffing at R2 because URLs and Download are functioned at Application layer of OSI Model.

An Intruder can learn [I2] through sniffing at R2 because Port Numbers are encapsulated in the payload field of IP Datagram.

An Intruder can learn [I3] through sniffing at R2 because IP Addresses and Routers are functioned at network layer of OSI Model.

An Intruder can't learn [I4] through sniffing at R2 because it is related to Data Link Layer of OSI Model.