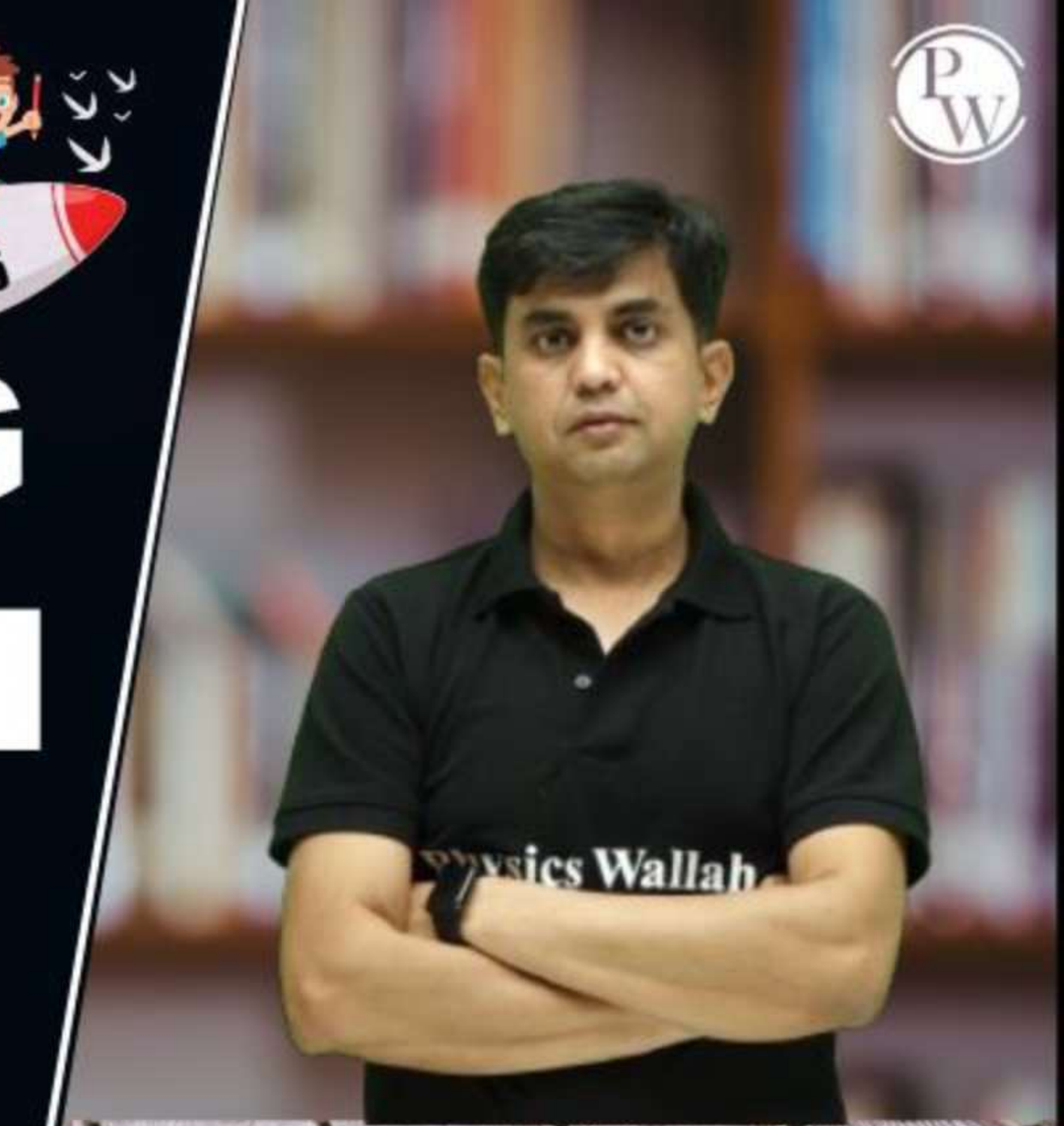
CS & IT ENGINEERING

Computer Network

Introduction

Lecture No. - 03



By - Abhishek Sir

Recap of Previous Lecture

Topic Application Layer

Topic Two Process Communication

Topics to be Covered

Topic Transport Layer

Topic Network Layer

Topic Data Link Layer

ABOUT ME

Hello, I'm Abhishek

- GATE CS AIR - 96
- M.Tech (CS) - IIT Kharagpur
- 12 years of GATE CS teaching experience

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Topic : Presentation Layer

Presentation layer functions :-

1. Code Conversion
2. Encryption and Decryption
3. Compression and Decompression

} optional

Topic : Code Conversion

-> Convert data into network standard code, before transmission
[Network presentable form]

ASCII : American Standard Code for Information Interchange

EBCDIC : Extended Binary Coded Decimal Interchange Code

UNICODE : Universal Coded Character Set

Topic : Code Conversion

Host A
ASCII

Host B
UNICODE

Network Standard Code
ASCII

Host C
EBCDIC

Host D
ASCII

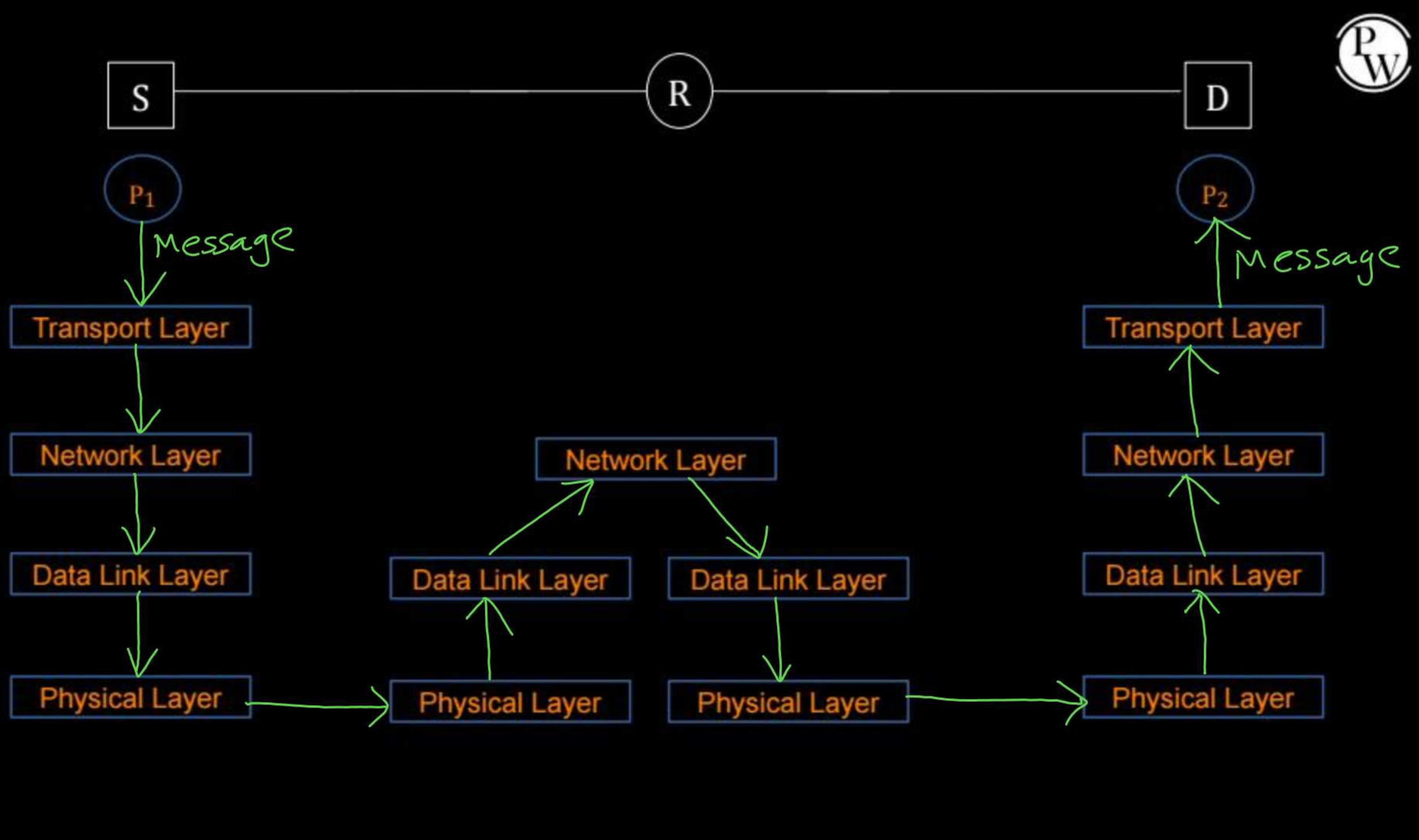
Topic : Session Layer

Session layer functions :-

1. Session Establishment
2. Dialog Management
3. Authentication
4. Authorization

#Q. Assume that source and destination hosts are connected through one intermediate router. Determine how many times each packet has to visit the data link layer during a transmission from source to destination hosts?

Ans : 4


S
R
D
P1
Message
Transport Layer
Network Layer
Data Link Layer
Physical Layer
Network Layer
Data Link Layer
Data Link Layer
Physical Layer
Physical Layer
P2
Message
Transport Layer
Network Layer
Data Link Layer
Physical Layer

#Q. Assume that source S and destination D are connected through two intermediate routers labeled R. Determine how many times each packet has to visit the network layer and the data link layer during a transmission from S to D ?

[GATE-2013, 1-Mark]

IIIT-B

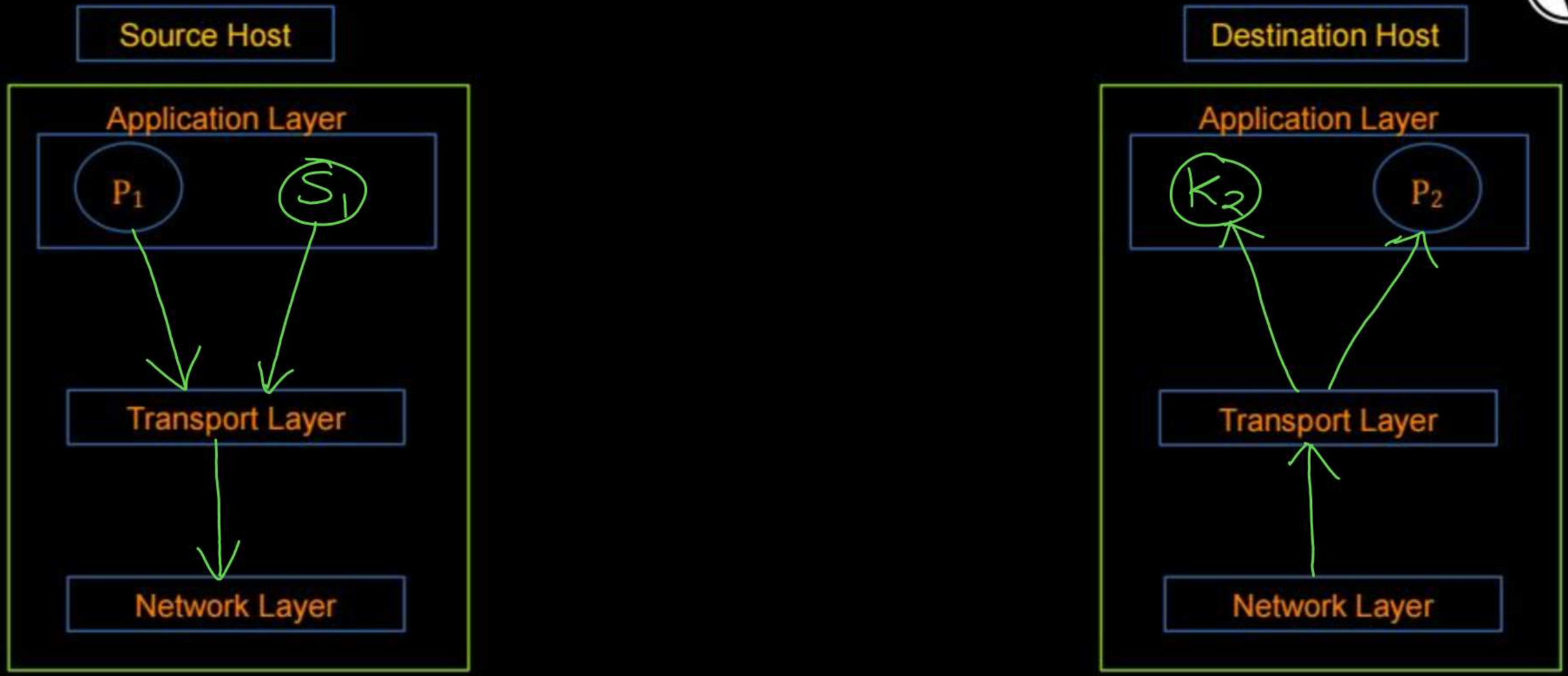
H.W.

(A) Network layer – 4 times and Data link layer – 4 times

(B) Network layer – 4 times and Data link layer – 3 times

(C) Network layer – 4 times and Data link layer – 6 times

(D) Network layer – 2 times and Data link layer – 6 times


Source Host
Application Layer
P1
S1
Transport Layer
Network Layer
Destination Host
Application Layer
K2
P2
Transport Layer
Network Layer

Topic : Transport Layer

-> Provide logical communication between application processes

(Processes running on different machine)

-> Responsible for process-to-process (end-to-end) communication

#Q. Which of the following functionality must be implemented by a transport protocol over and above the network protocol ?

[GATE-2003]

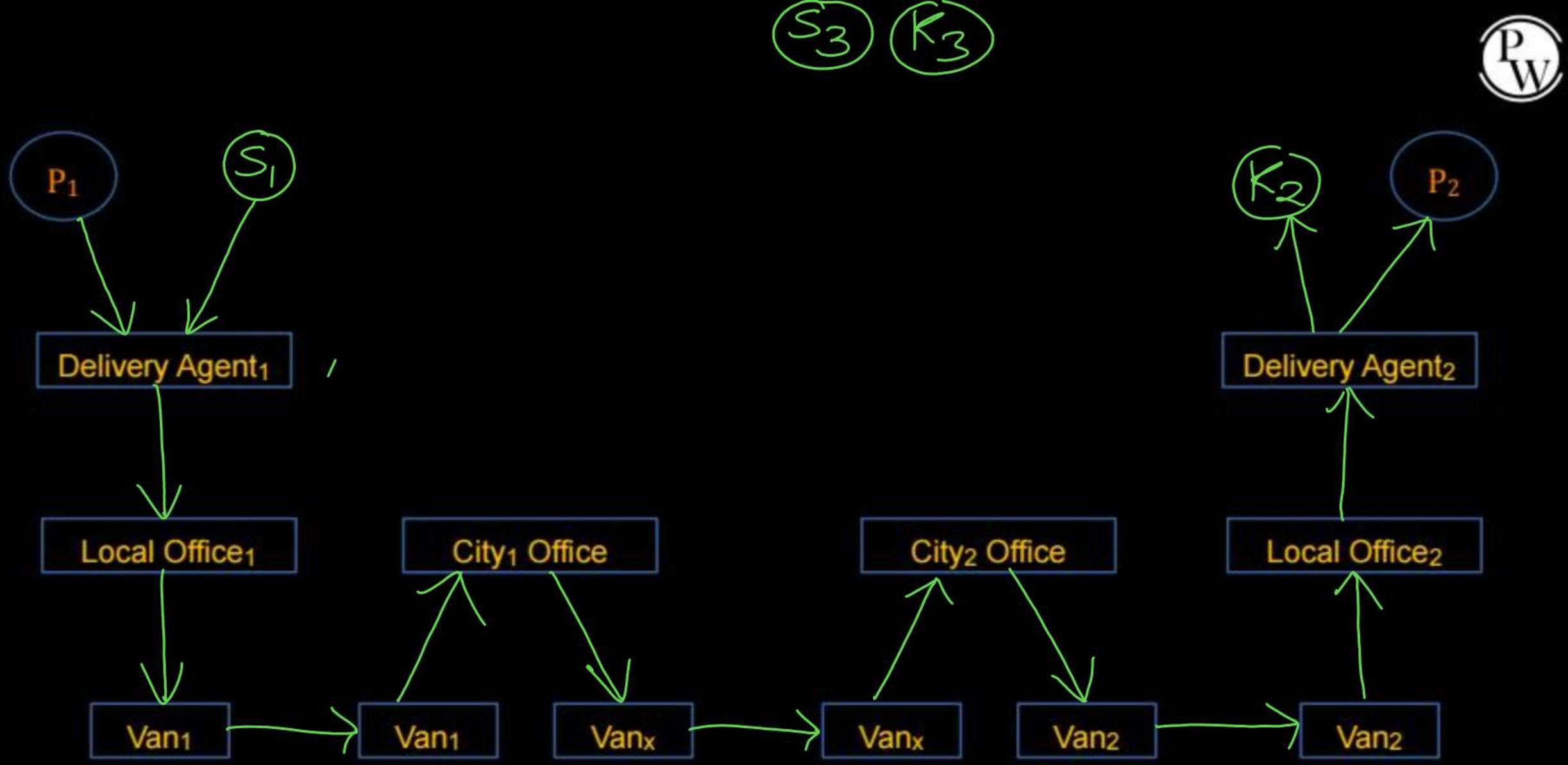
(A) Recovery from packet losses

(B) Detection of duplicate packets

(C) Packet delivery in the correct order

(D) End-to-end connectivity

Optional services of transport layer.


S3
K3
P1
S1
K2
P2
Delivery Agent1
Delivery Agent2
Local Office1
City1 Office
City2 Office
Local Office2
Van1
Van1
Vanx
Vanx
Van2
Van2

Topic : Transport Layer

-> Multiplexing & Demultiplexing

[Demultiplexing on the basis of Destination Port Number]

Topic : Transport Layer

Two Transport Layer Protocols :

1. UDP : User Datagram Protocol (Basic Protocol)
2. TCP : Transmission Control Protocol (UDP + Extra Services)

UDP is faster than TCP

Topic : Transport Layer

Application Layer Protocol	Transport Layer Protocol
DNS	UDP (Default) TCP (Conditional)
HTTP/1 HTTP/2	TCP
HTTP/3	UDP
FTP	TCP
SMTP	TCP

#Q. Which one of the following uses UDP as the transport protocol?

[GATE-2007]

(A) HTTP

(B) Telnet → TCP

(C) DNS

(D) SMTP → TCP

Ans: C

#Q. Which of the following transport layer protocols is used to support electronic mail?

[GATE-2012]

(A) SMTP ⟹ Application layer

(B) IP ⟹ Network layer

(C) TCP

(D) UDP

#Q. Which of the following transport layer protocols is used to support electronic mail?

[GATE-2012]

(A) SMTP

(B) IP

(C) TCP

(D) UDP

Ans : (C) TCP

E-mail uses SMTP as application layer protocol.

SMTP uses TCP as transport layer protocol.

2 mins Summary

Topic Transport Layer

Topic ~~Network Layer~~

Topic ~~Data Link Layer~~

THANK - YOU