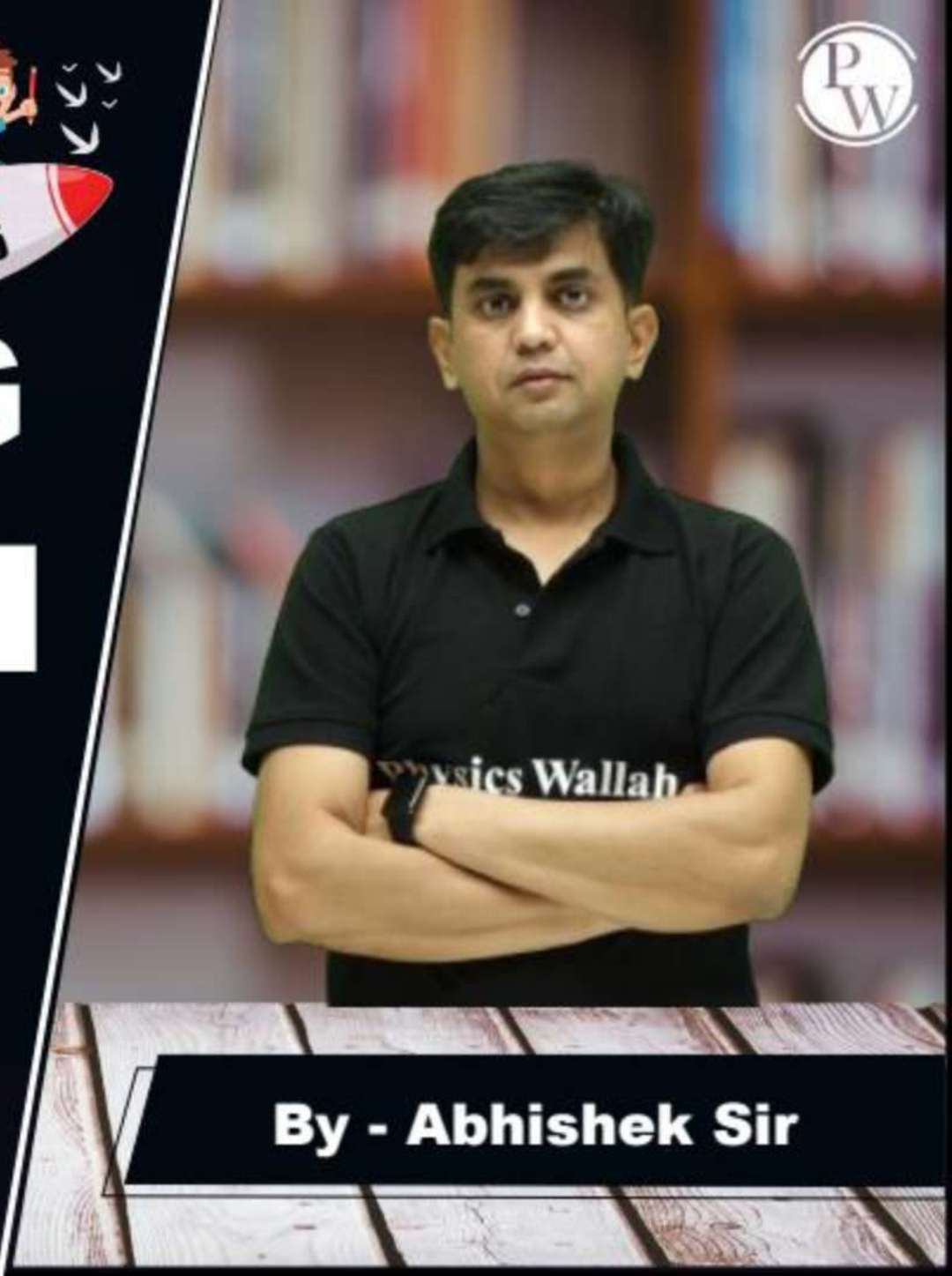
CS & IT ENGINEERING

Computer Network

Introduction

Lecture No. - 02



By - Abhishek Sir

Recap of Previous Lecture

Topic Concepts of Layering

Topic OSI & TCP/IP Model

Topic Application Layer

Topics to be Covered

Topic Application Layer

Topic Two Process Communication

Topic Transport 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 : Application Layer

→ Network application program (network process)
[e.g. Browser]

→ **Process :** Program in execution
[Process id (pid) managed by OS]

[Pid: Identifier]

Topic : Port Number

16 bit unsigned int
Range → 0 to $(2^{16}-1)$

-> Port Number (16-bit) : Identifier

-> Used to identify a network process in a machine
[Process involved in Network Communication]

"netstat"

-> Port Number managed by OS
[different with process id (pid)]

Topic : Port Number

–> Port numbers are divided into three ranges :

1. System (Well-known) Ports : 0 to 1023
   [assigned and controlled]

2. Registered Ports : 1024 to 49151
   [not assigned or controlled, but can be registered to prevent duplication]

3. Dynamic (Private) Ports : 49152 to 65535
   [not assigned, controlled or registered]

server

client

Topic : Two Process Communication

Two network processes belongs to :

1. **Same Host**
   → Communicate using IPC (Inter-process communication) of OS

2. **Different Hosts**
   → Communicate over network

Topic : Protocol

-> Set of Rules

-> Define, how data is exchanged between network processes

Topic : Application Layer

Application Layer Protocols :

-> DNS : Domain Name System

-> HTTP : Hyper Text Transfer Protocol

-> FTP : File Transfer Protocol

-> SMTP : Simple Mail Transfer Protocol

} Client-Server Model

Topic : PDU

=> Protocol Data Unit (PDU)

→ Basic unit of exchange

→ Between same protocols of different machine

→ Between 'Layer-n protocol' of one machine and 'Layer-n same protocol' of other machine

Topic : Application Layer

Application Layer PDU : "Message"

#Q. The protocol data unit (PDU) for the application layer in the Internet stack is:

[GATE-2012]

(A) Segment

(B) Datagram

(C) Message

(D) Frame

Topic : Two Process Communication

→ Two network processes, belongs to **different hosts**

→ Communicate over network, by exchanging "messages"

Topic : Two Process Communication

Two paradigm :

1. **Client - Server**
   [e.g. Web browsing, Email]

2. **Peer to peer**
   [e.g. BitTorrent, VoIP]

#Q. Which one of the following is not a client server application?

[GATE-2010]

(A) Internet chat

(B) Web browsing ⇒ [Web browser → Web server]

(C) E-mail ⇒ [Mail Client → Mail server]

(D) Ping

#Q. Which one of the following is not a client server application?

[GATE-2010]

(A) Internet chat

(B) Web browsing

(C) E-mail

(D) Ping

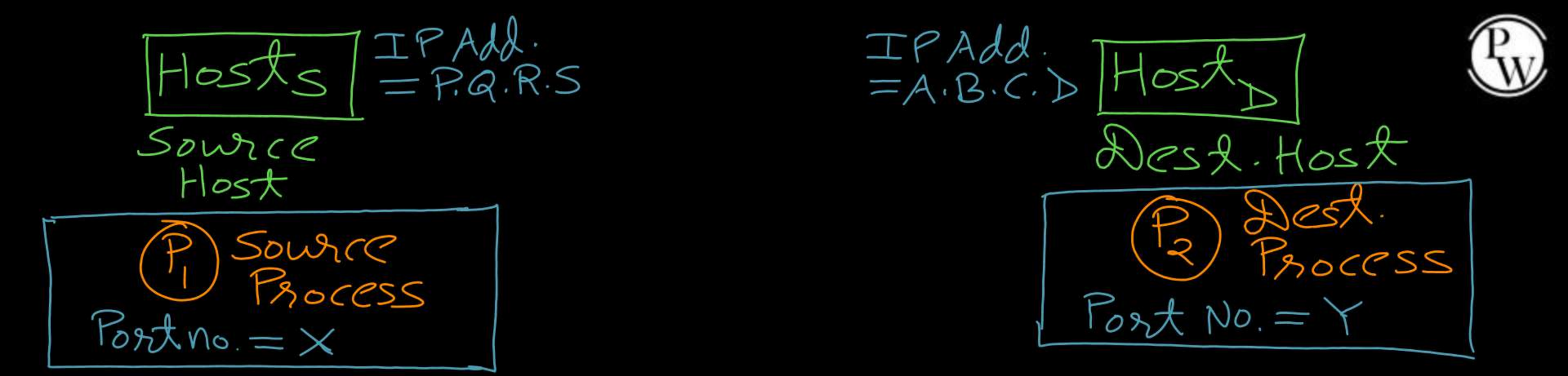
Ans : (D) Ping

Ping is utility, to check connectivity between either client - client or client - server.

Topic : Two Process Communication

Communication Credentials

- Source Port No. (16-Bit) : Port no. = X
- Source IP Address (32-Bit) : P.Q.R.S
- Destination IP Address (32-Bit) : A.B.C.D
- Destination Port No. (16-Bit) : Port no. = Y


Host$_S$
IP Add. = P.Q.R.S
Source Host
P_1 Source Process
Port no. = X
IP Add. = A.B.C.D
Host$_D$
Dest. Host
P_2 Dest. Process
Port No. = Y

2 mins Summary

Topic Application Layer

Topic Two Process Communication

Topic Transport Layer

THANK - YOU