

CS 31006: Computer Networks

Department of Computer Science
and Engineering



INDIAN INSTITUTE OF TECHNOLOGY
KHARAGPUR

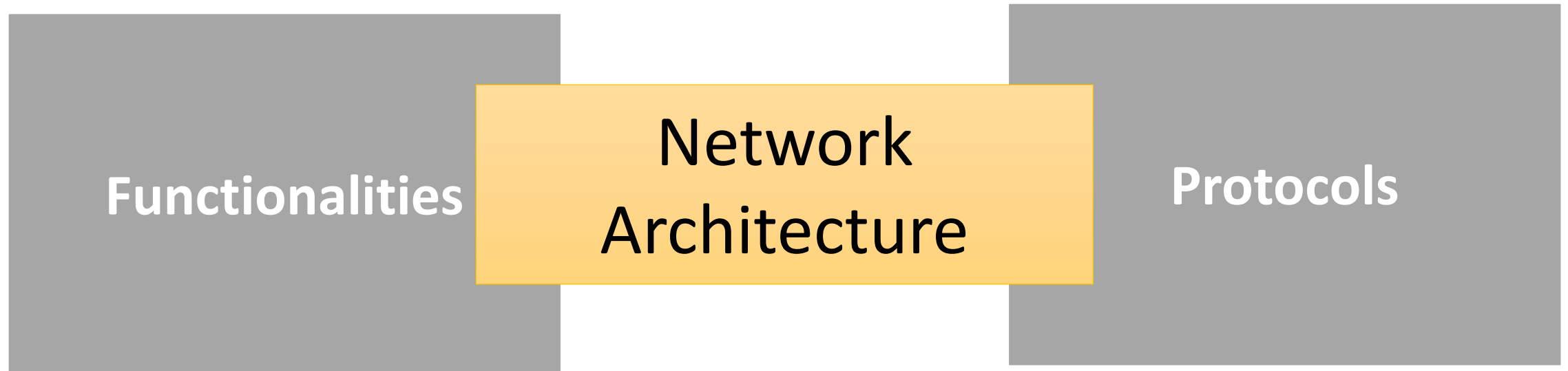


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Objectives of the Course

- Understand how two computers in the Internet talk to each other
- Go through the basic functionalities of the computer networks
- Learn how to program the network
- Learn the future of the computer network – Do we need any further changes in the design?



So, What is Network Architecture?

- A way to visualize how two remote computers talk to each other



Network Protocol Stack



So, What is Network Architecture?



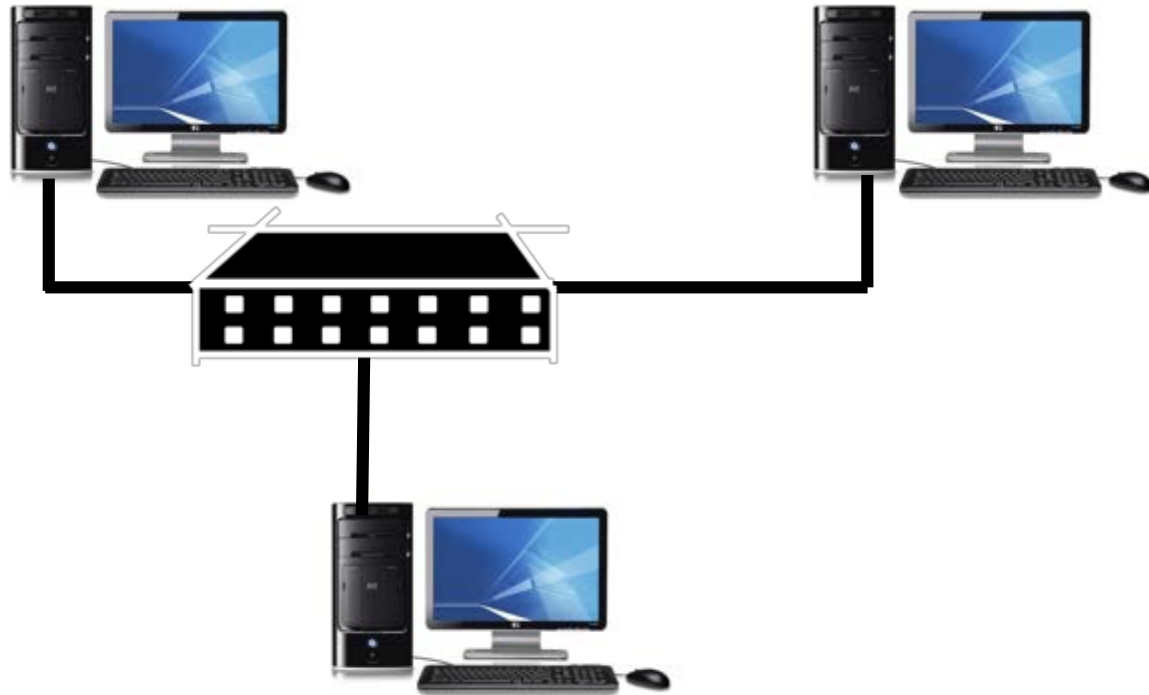
So, What is Network Architecture?



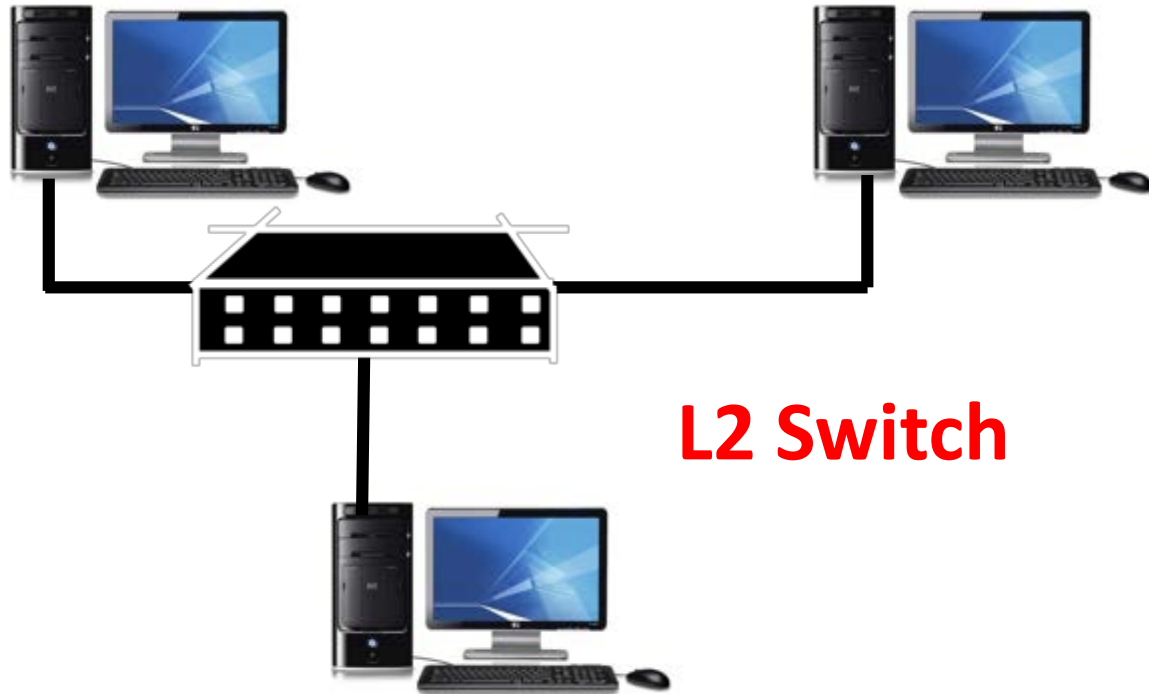
Requirement: Convert digital data to analog signal and vice versa

Physical

So, What is Network Architecture?



So, What is Network Architecture?

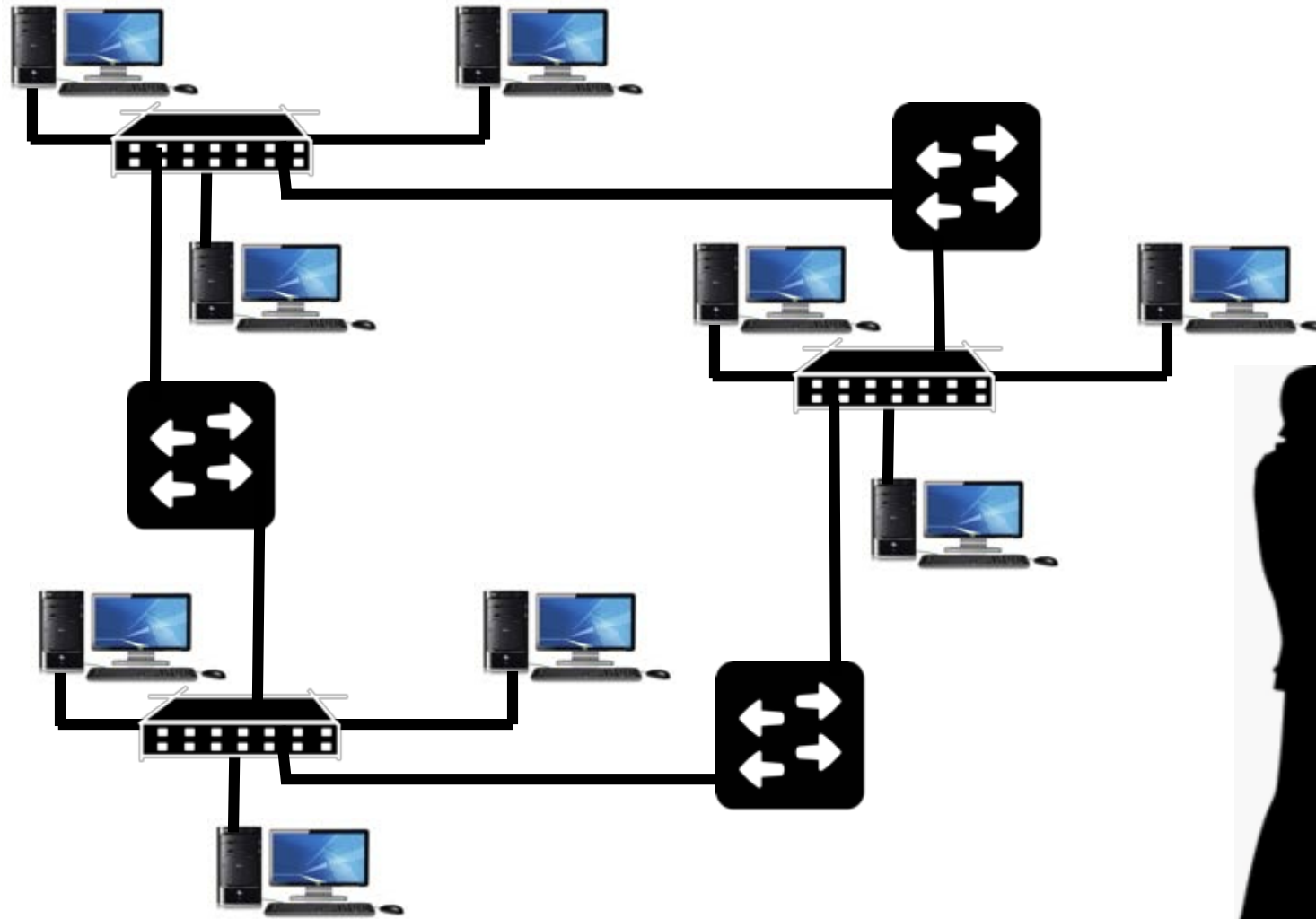


Requirement: Ensure proper scheduling in media access

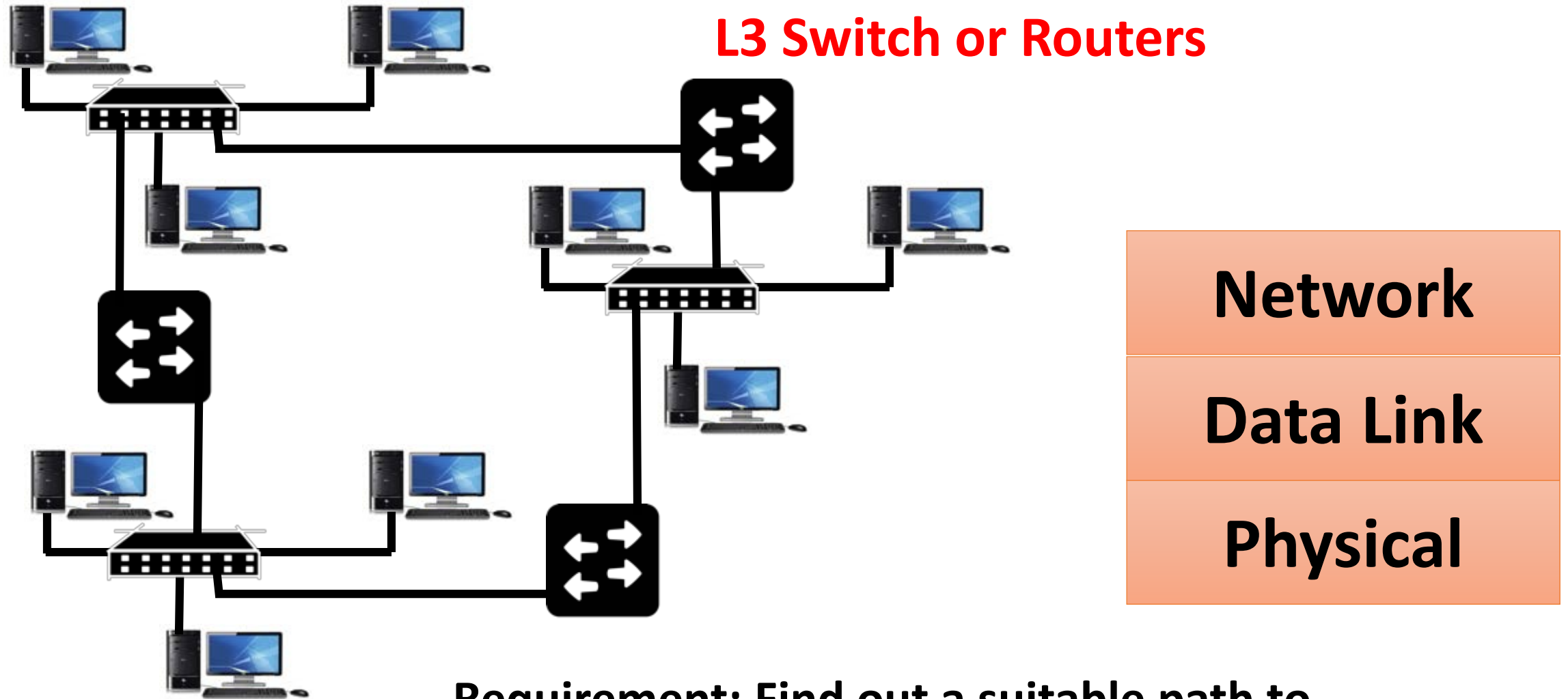
Data Link

Physical

So, What is Network Architecture?

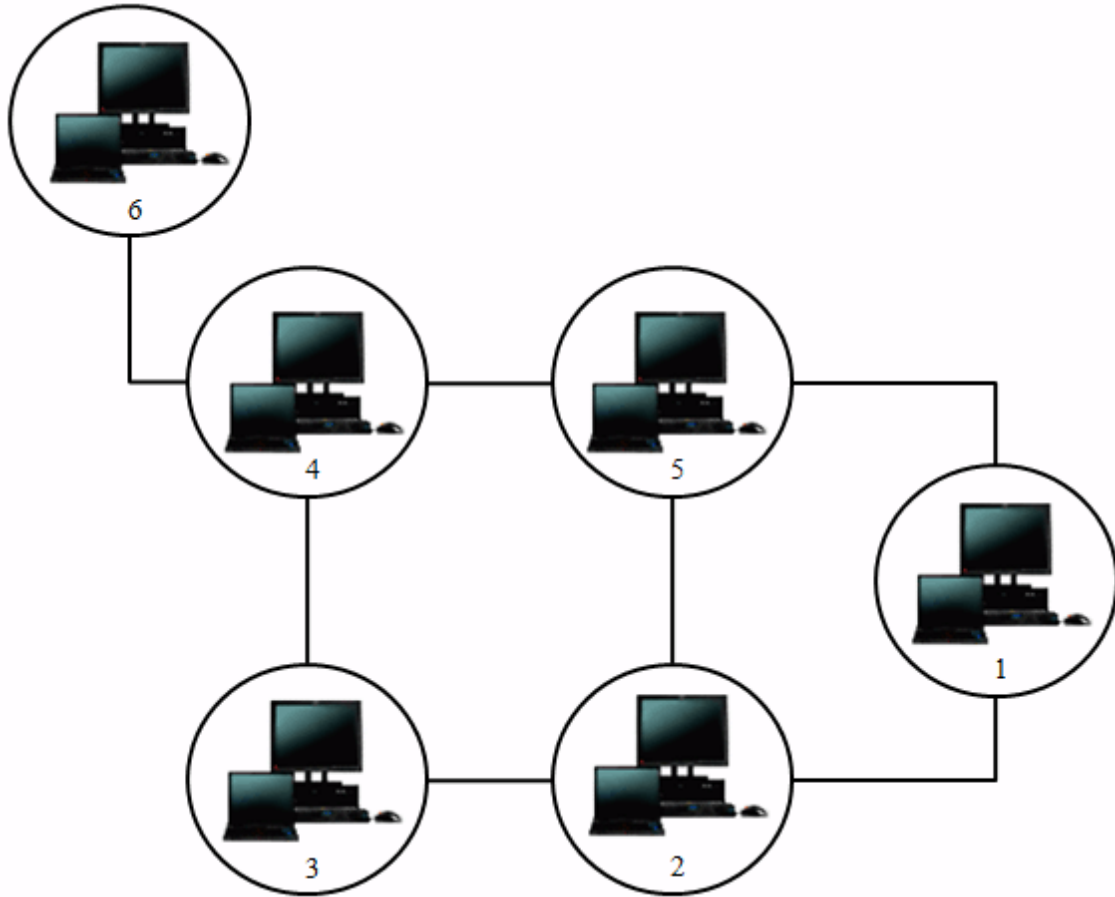


So, What is Network Architecture?

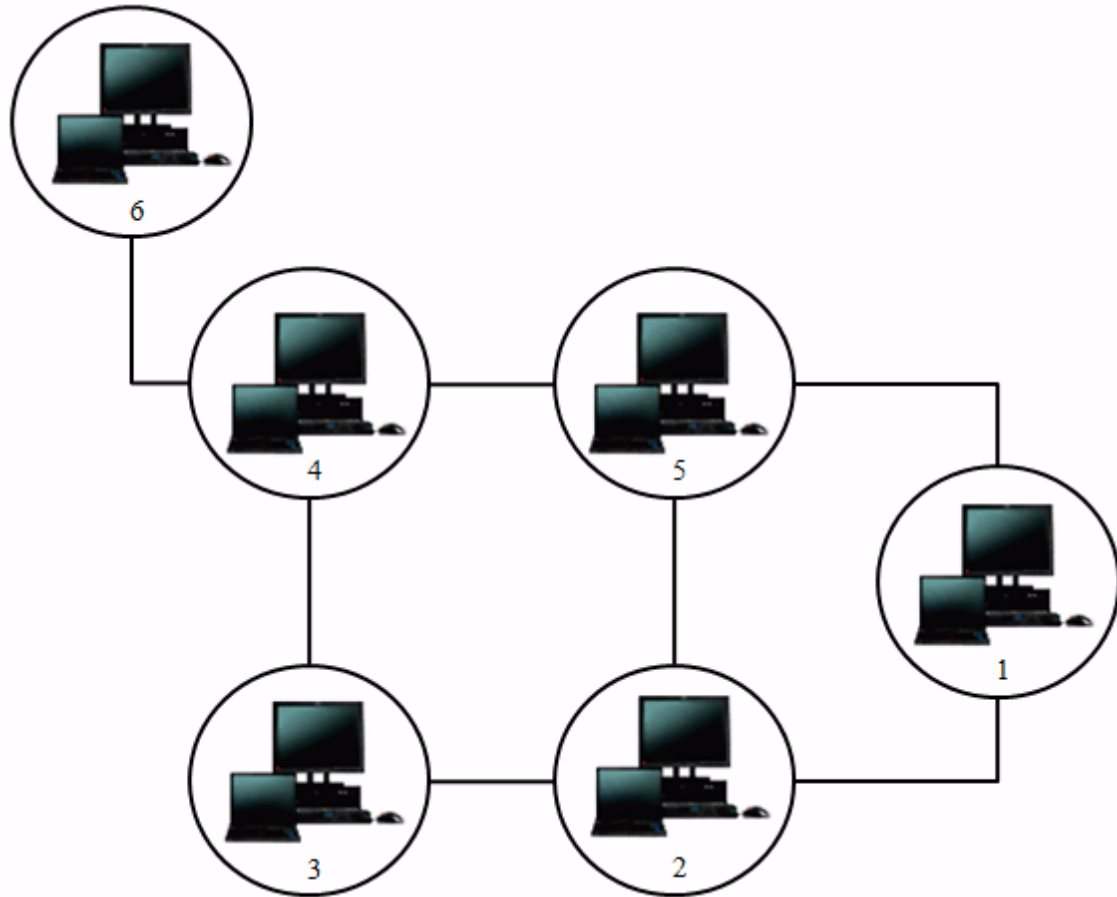


Requirement: Find out a suitable path to forward data

So, What is Network Architecture?



So, What is Network Architecture?



Transport

Network

Data Link

Physical

Requirement: End to end traffic control in the network

So, What is Network Architecture?



Network Protocol Stack



Application

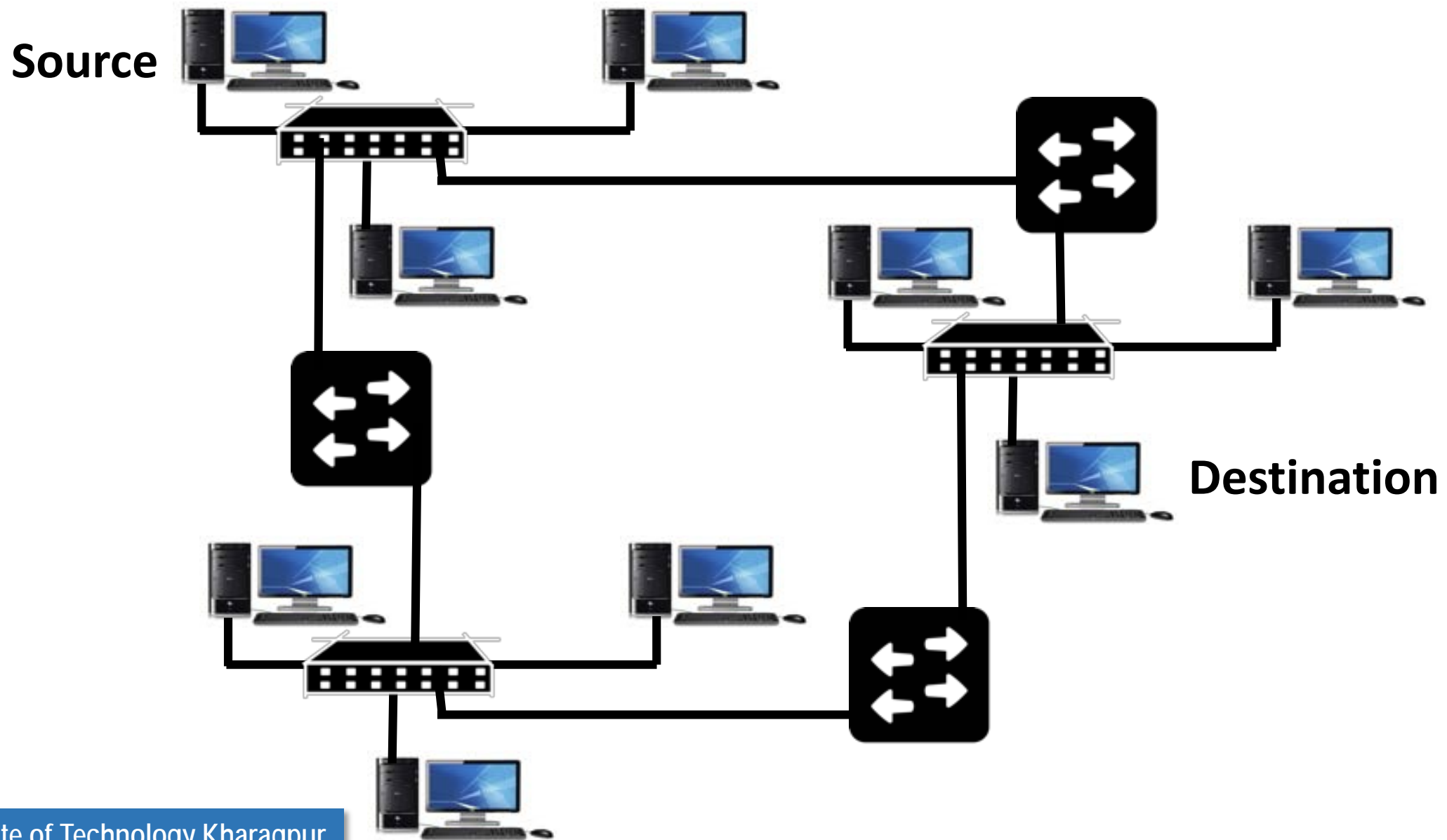
Transport

Network

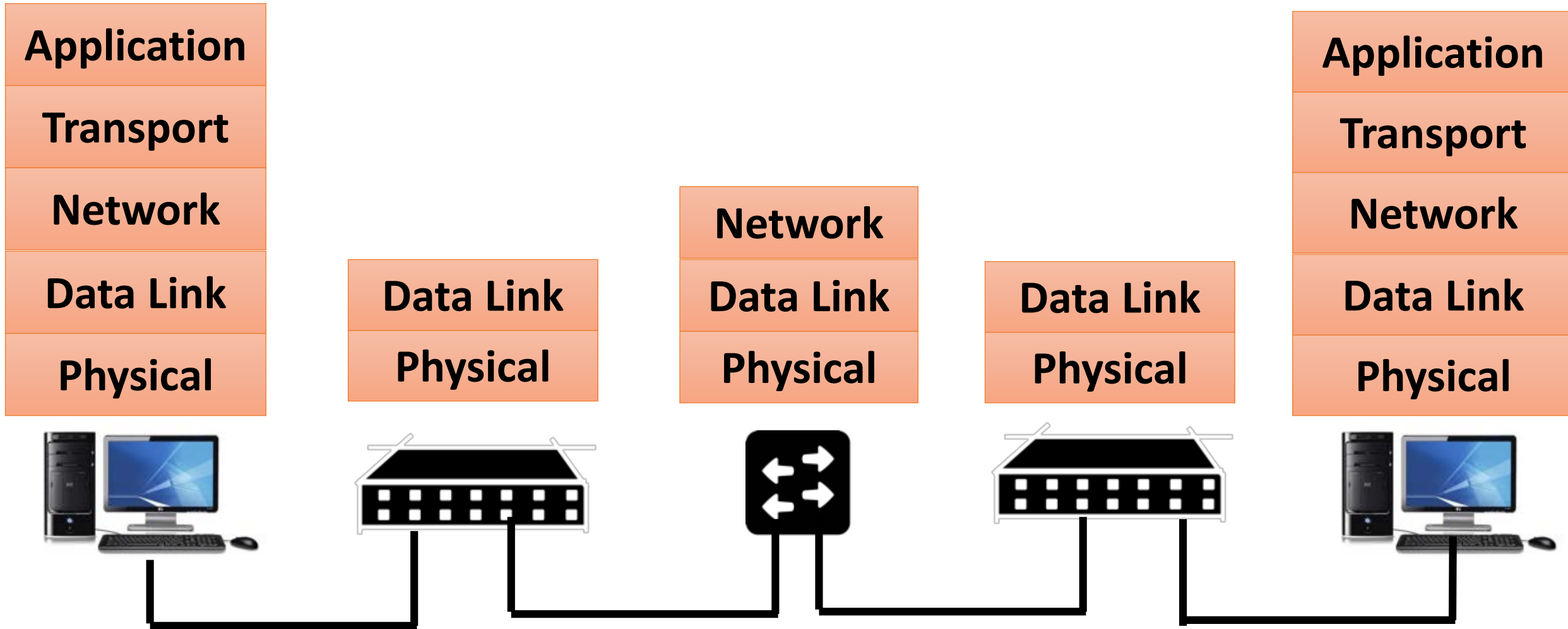
Data Link

Physical

Data Transfer between Two Remote Machines



Data Transfer between Two Remote Machines



Protocols at Different Layers

Application

HTTP, FTP, SMTP

Transport

TCP, UDP, RTP

Network

IPv4, IPv6, MPLS

Data Link

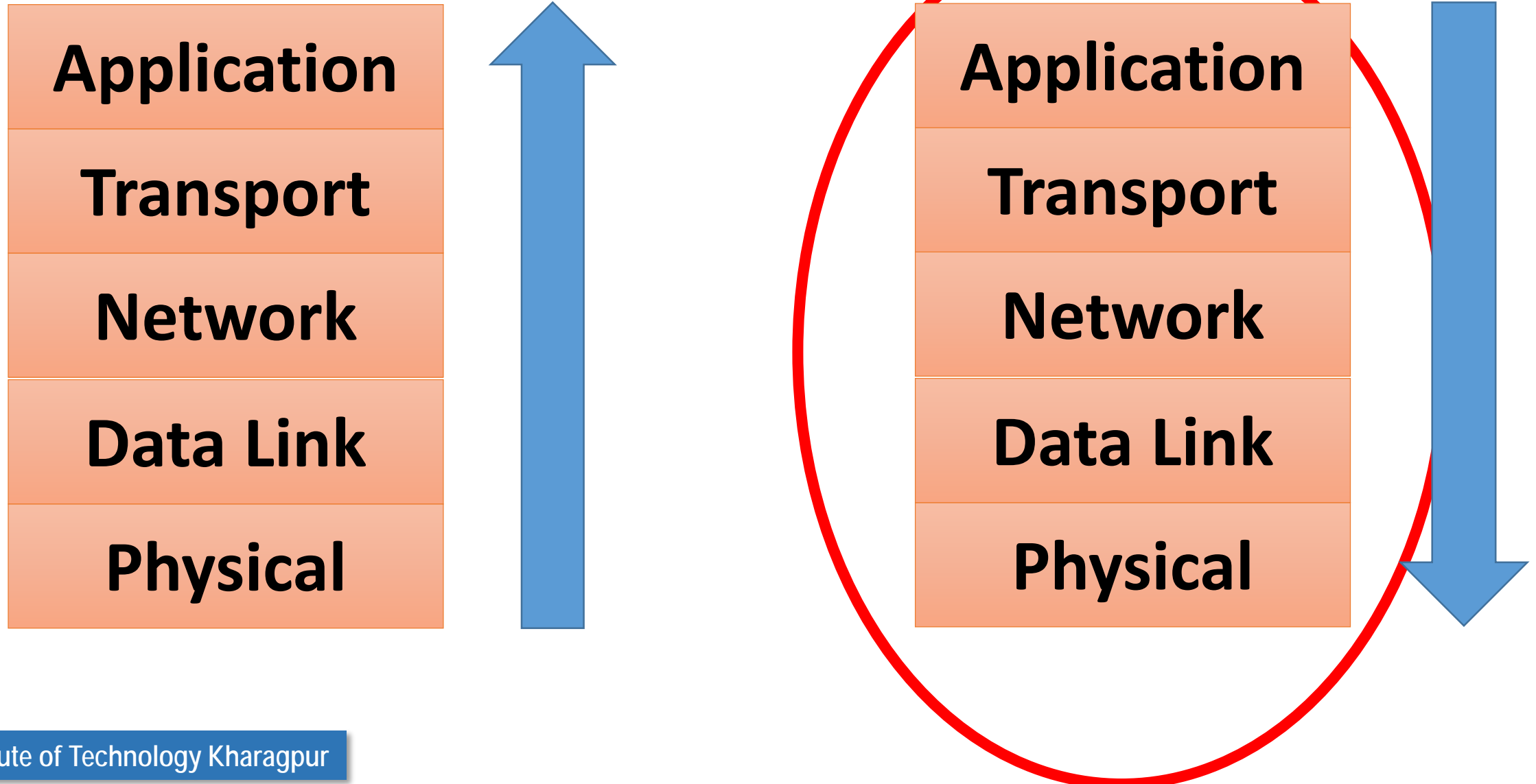
Ethernet, WiFi, Bluetooth, UMTS, LTE

Physical

Network Management and Control – Cross Layer Protocols

Application	HTTP, FTP, SMTP	DNS
Transport	TCP, UDP, RTP	SNMP
Network	IPv4, IPv6, MPLS	ARP, DHCP
Data Link	Ethernet, WiFi, Bluetooth, UMTS, LTE	
Physical		

Two Ways to Learn Computer Networks



Books to Follow ...

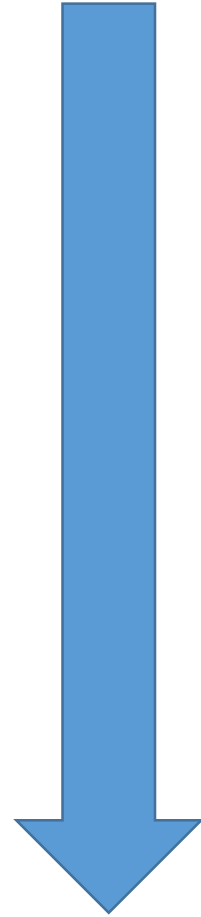
Application

Transport

Network

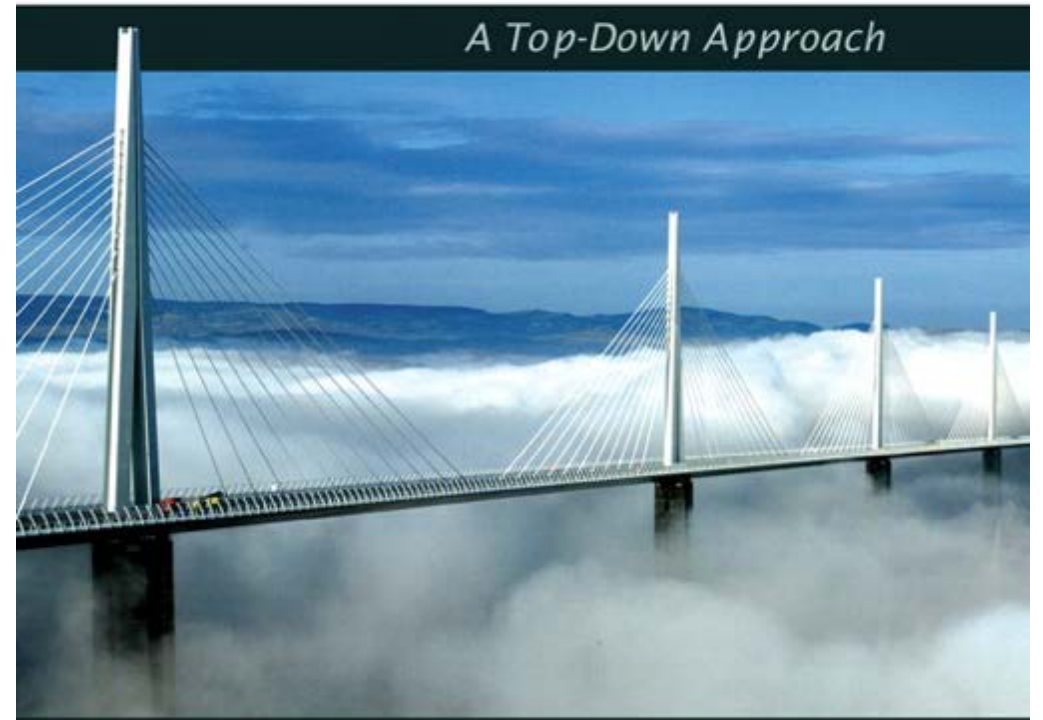
Data Link

Physical



COMPUTER NETWORKING FIFTH EDITION

A Top-Down Approach



KUROSE • ROSS

Books to Follow ...

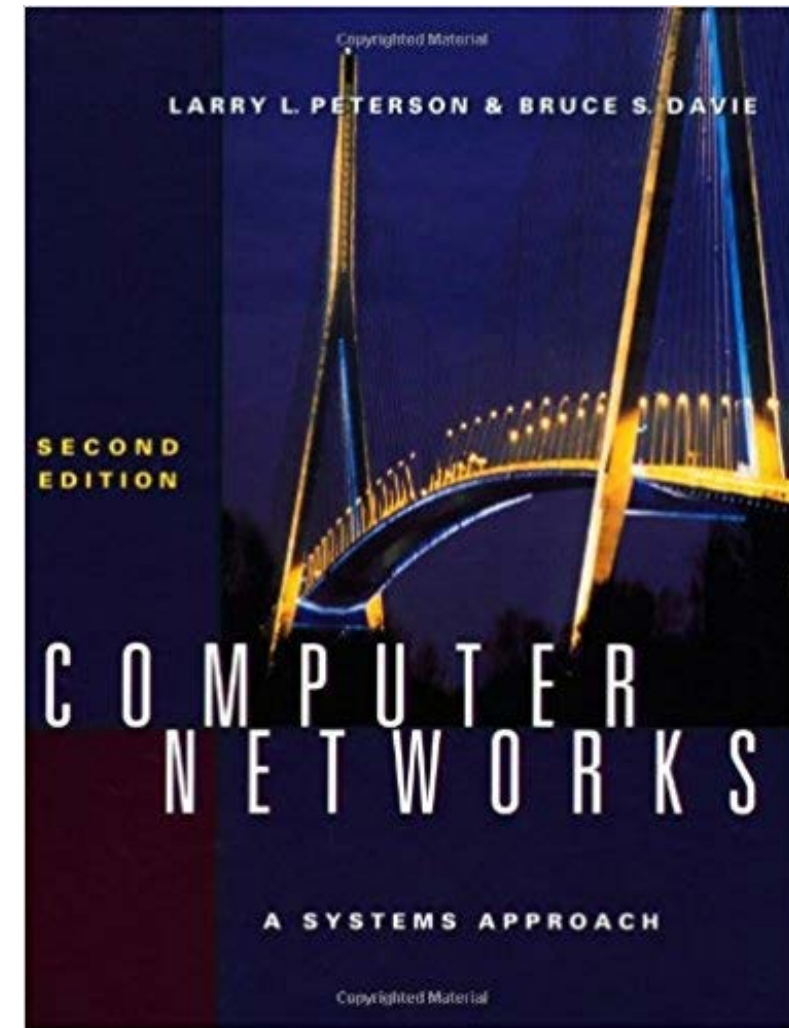
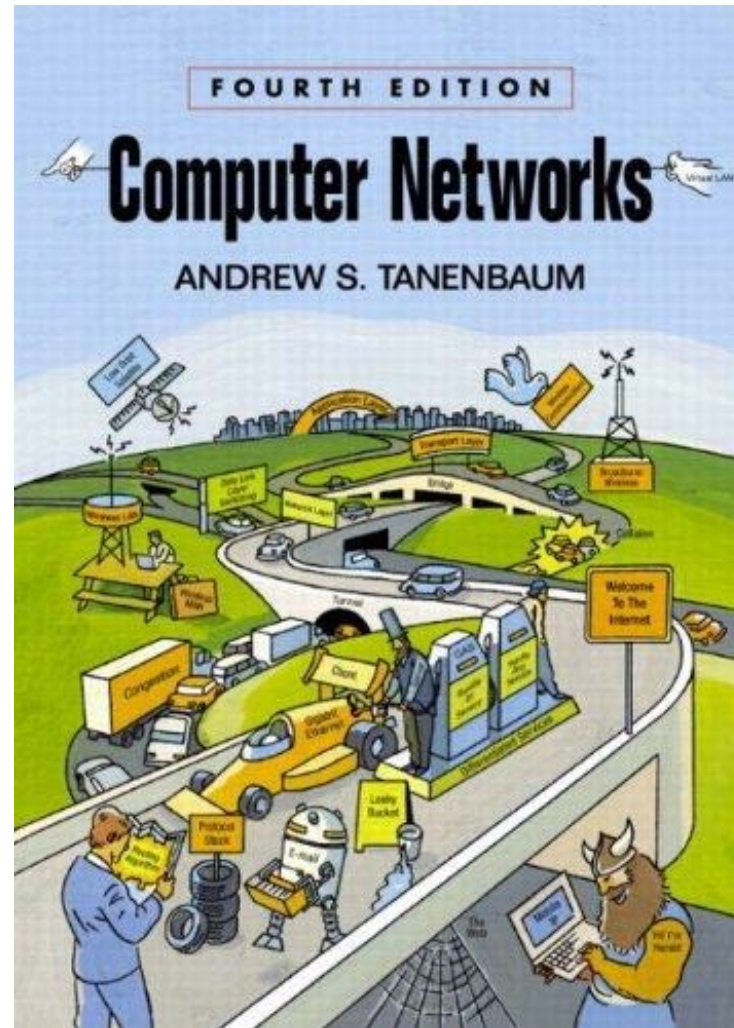
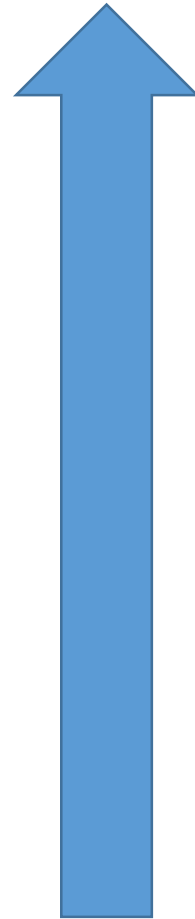
Application

Transport

Network

Data Link

Physical



Books to Follow (Online Books)...

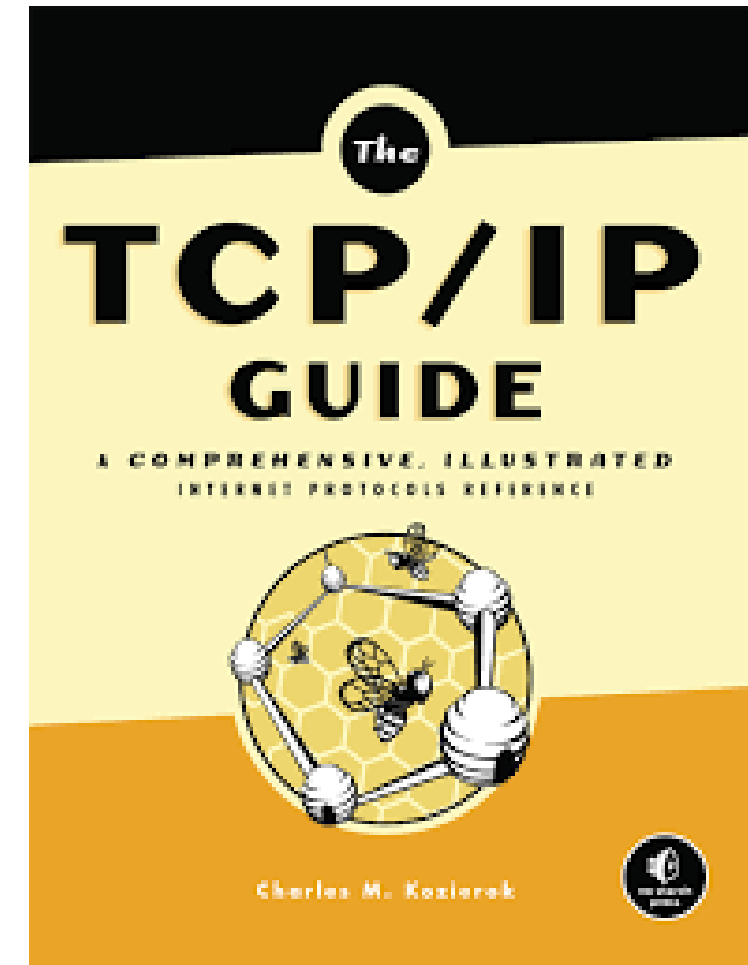
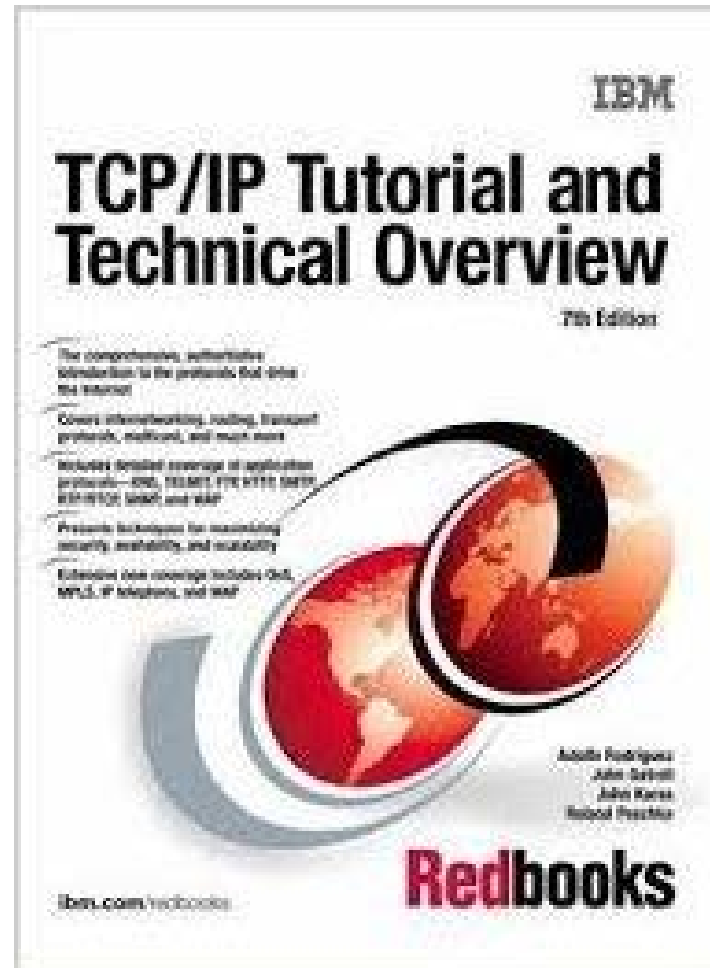
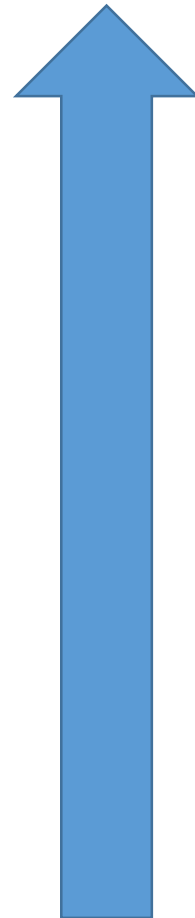
Application

Transport

Network

Data Link

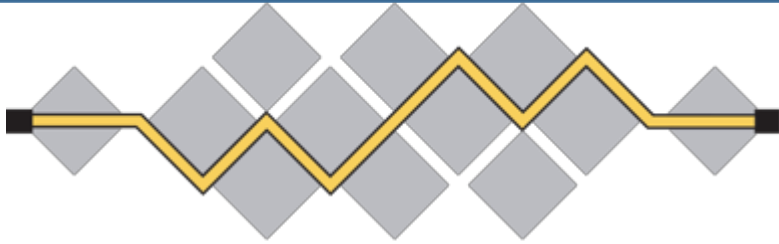
Physical



<http://www.redbooks.ibm.com/abstracts/gg243376.html>

<http://www.tcpipguide.com/>

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Memos in the **Requests for Comments (RFC)** document series contain technical and organizational notes about the Internet. They cover many aspects of computer networking, including protocols, procedures, programs, and concepts, as well as meeting notes, opinions, and sometimes humor. Below are links to RFCs, as available from [ietf.org](#) and from [rfc-editor.org](#). Note that there is a brief time period when the two sites will be out of sync. When in doubt, the RFC Editor site is the authoritative source page.

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e tool realizing the requirements
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Course Evaluations

- Four-five class tests
 - Students attempt the exams individually
 - Solves and submits the answers on Moodle
 - Usually equal weightage assigned for each test towards final grade
- Time-bound online examination/take-home examination
- No Mid-semester or End-semester Examination, as per institute policy for Spring 2021

Other Course Related Information

- Course Website:
<http://cse.iitkgp.ac.in/~sandipc/courses/cs31006/cs31006.html>
- All course materials will be posted on the website, as well as on Moodle
 - Slides posted after the relevant portion has been covered in class
- Moodle Courses:
CS31006_S2021 Computer Networks
Passphrase: STUS2021
- Please use MS Teams class for any discussions
- Attendance: Institute policy will be followed – deregistration for low attendance
- Make the class lively – no question is a stupid question !!!