CS 31006: Computer Networks

Department of Computer Science and Engineering

INDIAN INSTITUTE OF TECHNOLOGY
KHARAGPUR

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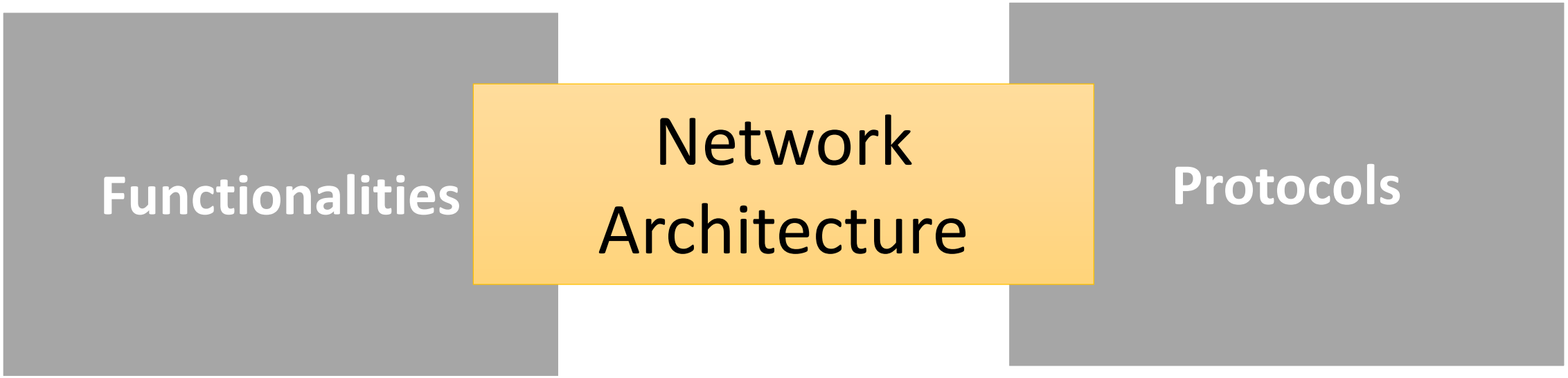
Objectives of the Course

- 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

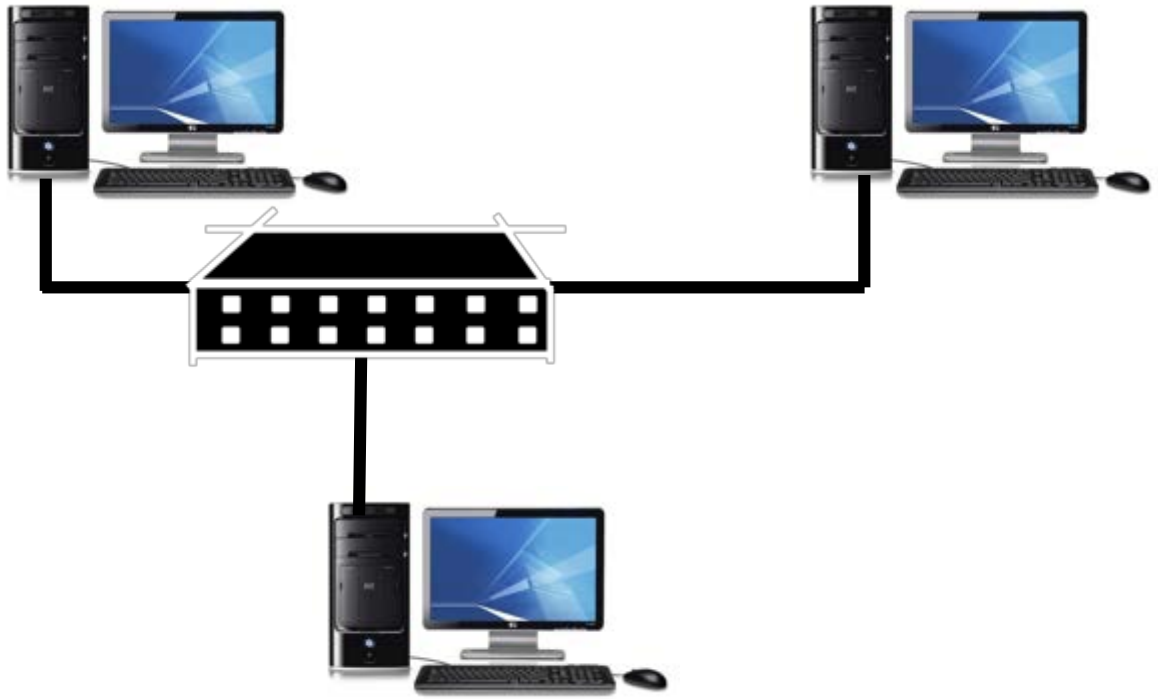
So, What is Network Architecture?

So, What is Network Architecture?

Requirement: Convert digital data to analog signal and vice versa

Physical

So, What is Network Architecture?



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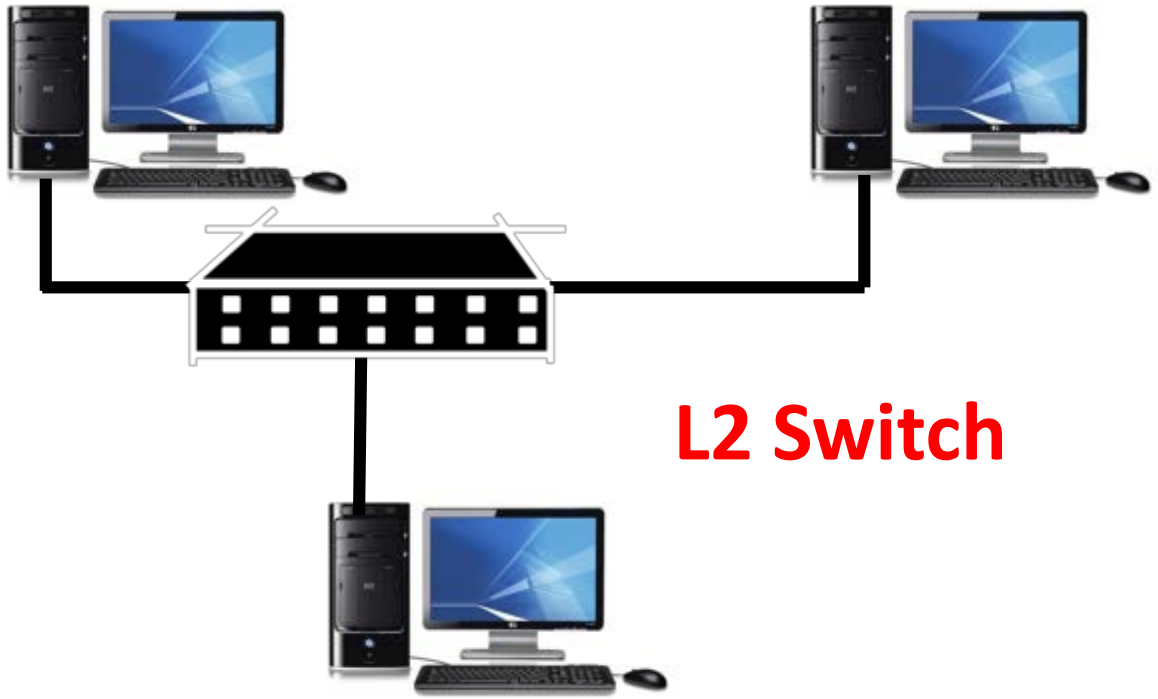


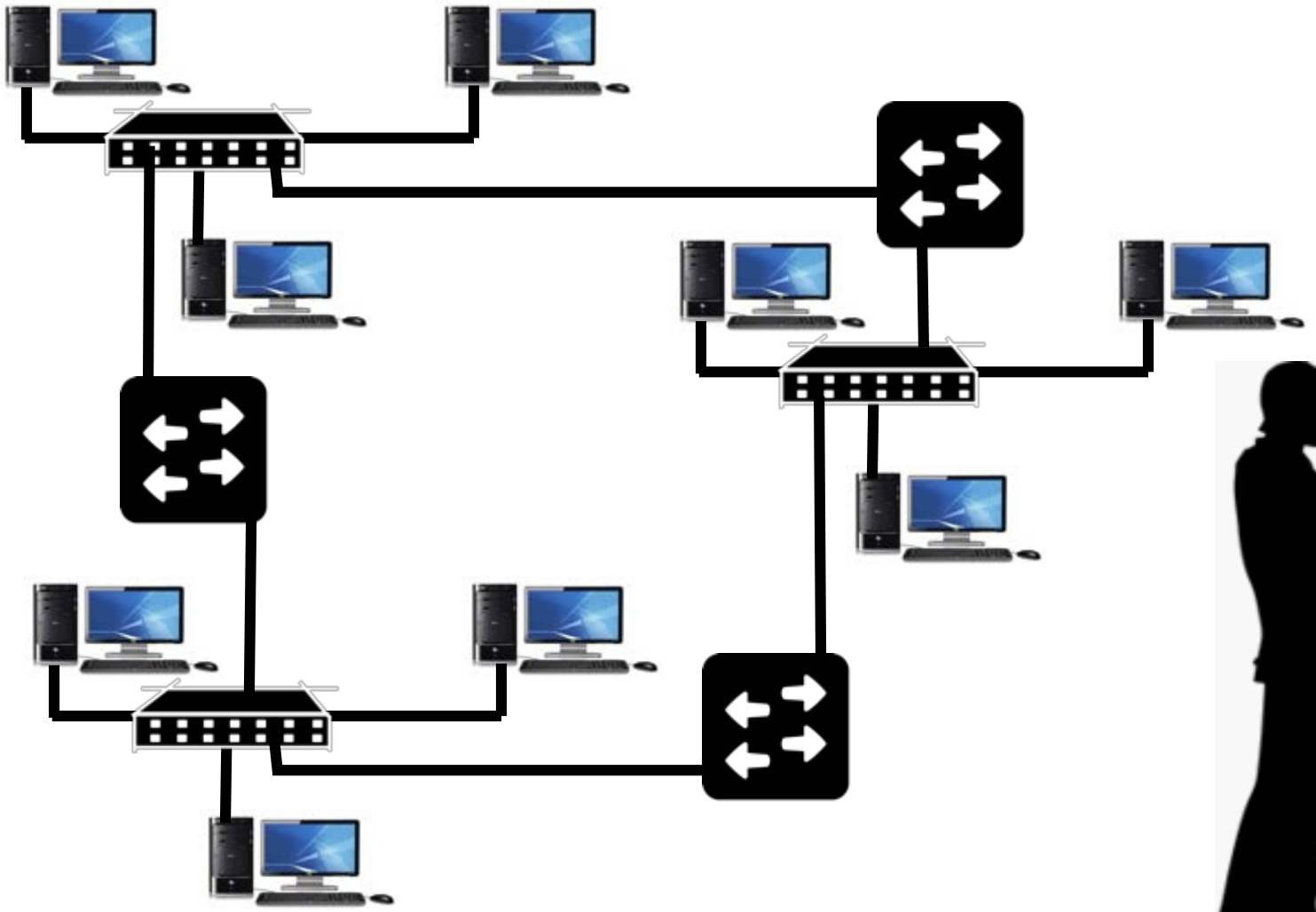
L2 Switch

Requirement: Ensure proper scheduling in media access

Data Link

Physical

So, What is Network Architecture?



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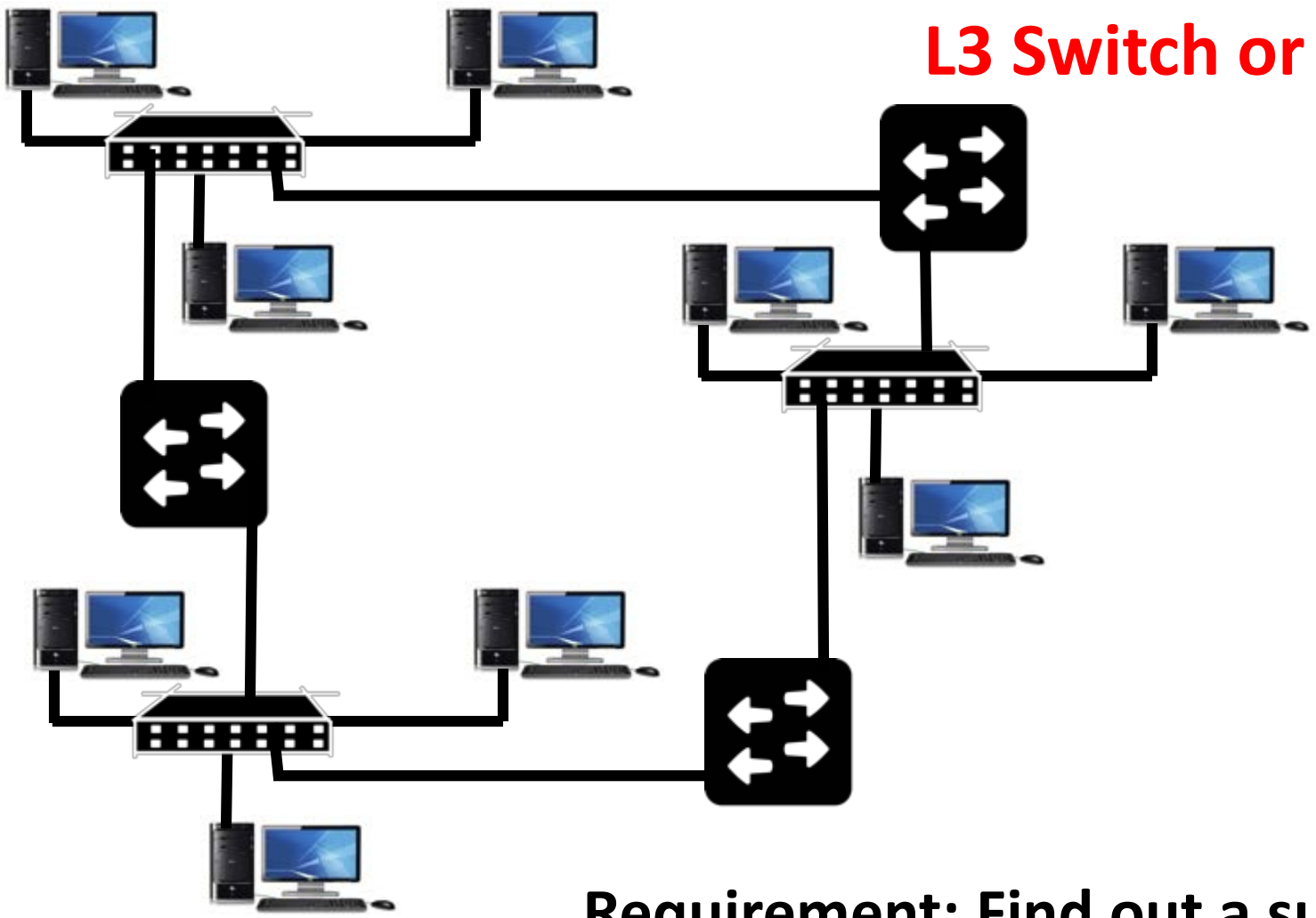
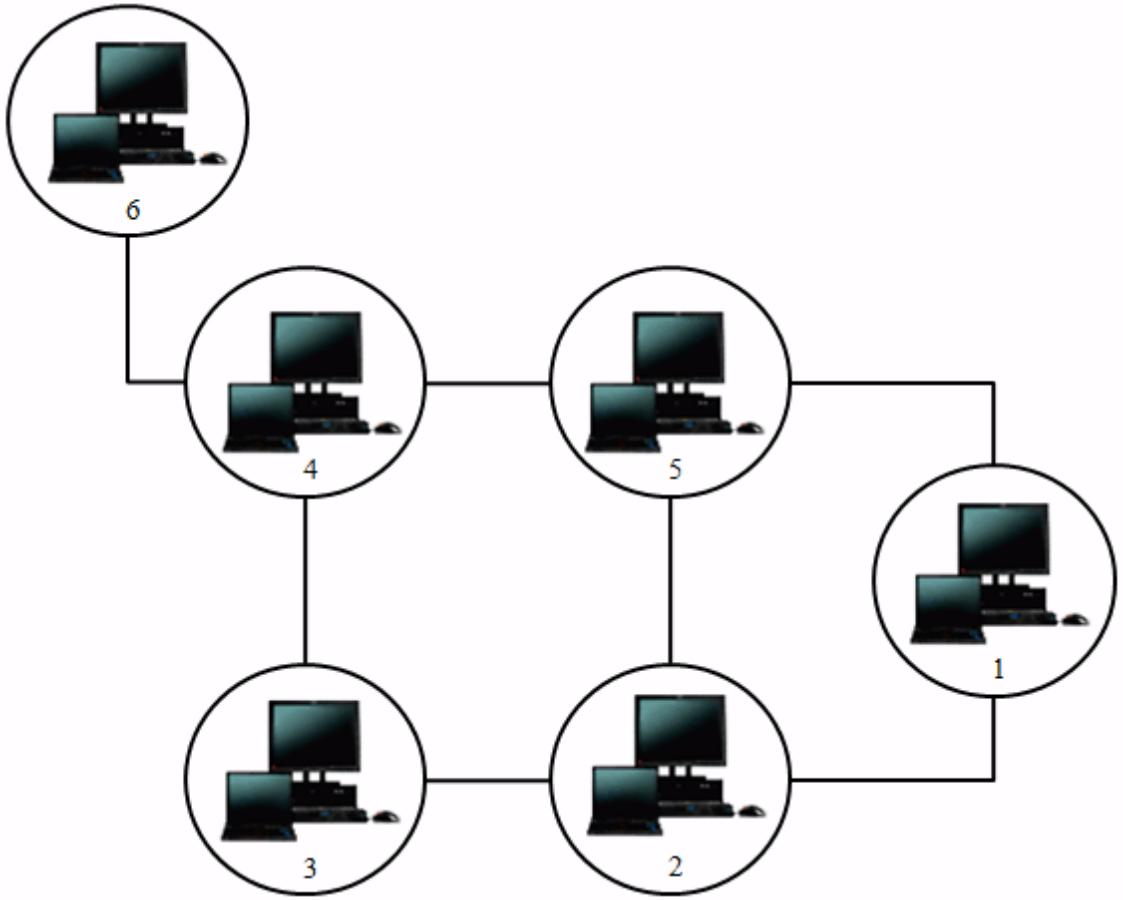


L3 Switch or Routers

Network
Data Link
Physical

Requirement: Find out a suitable path to forward data

So, What is Network Architecture?



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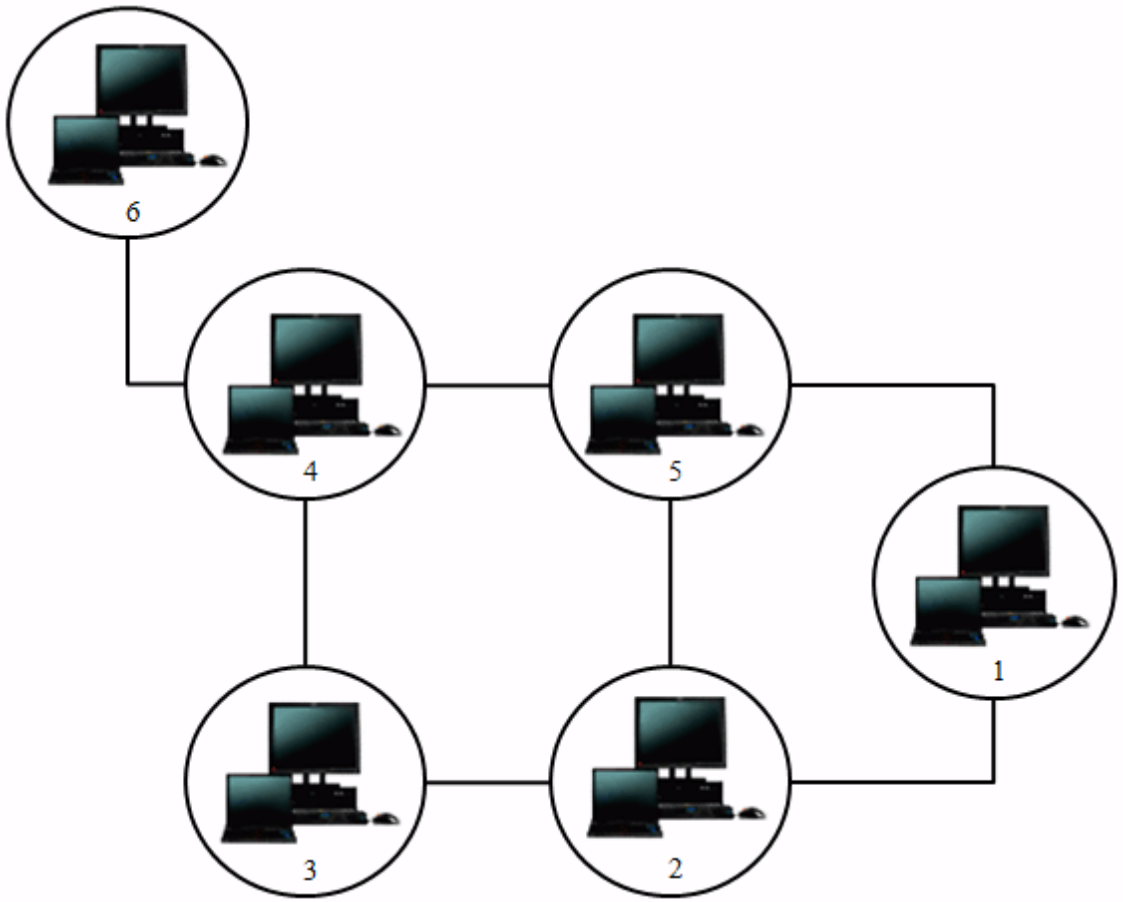


Transport

Network

Data Link

Physical

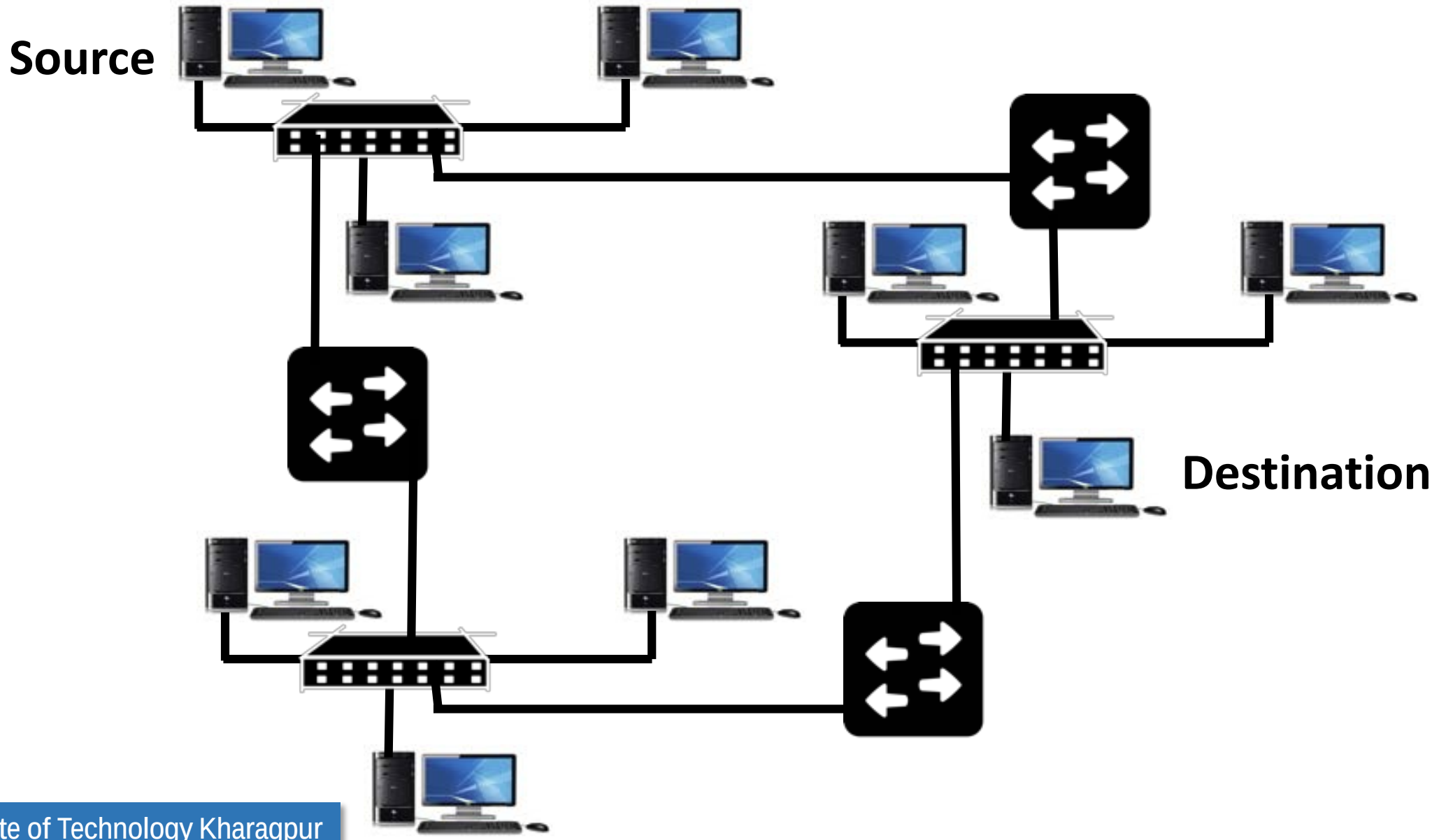
Requirement: End to end traffic control in the network

So, What is Network Architecture?

Network Protocol Stack

- Application
- Transport
- Network
- Data Link
- Physical

Data Transfer between Two Remote Machines



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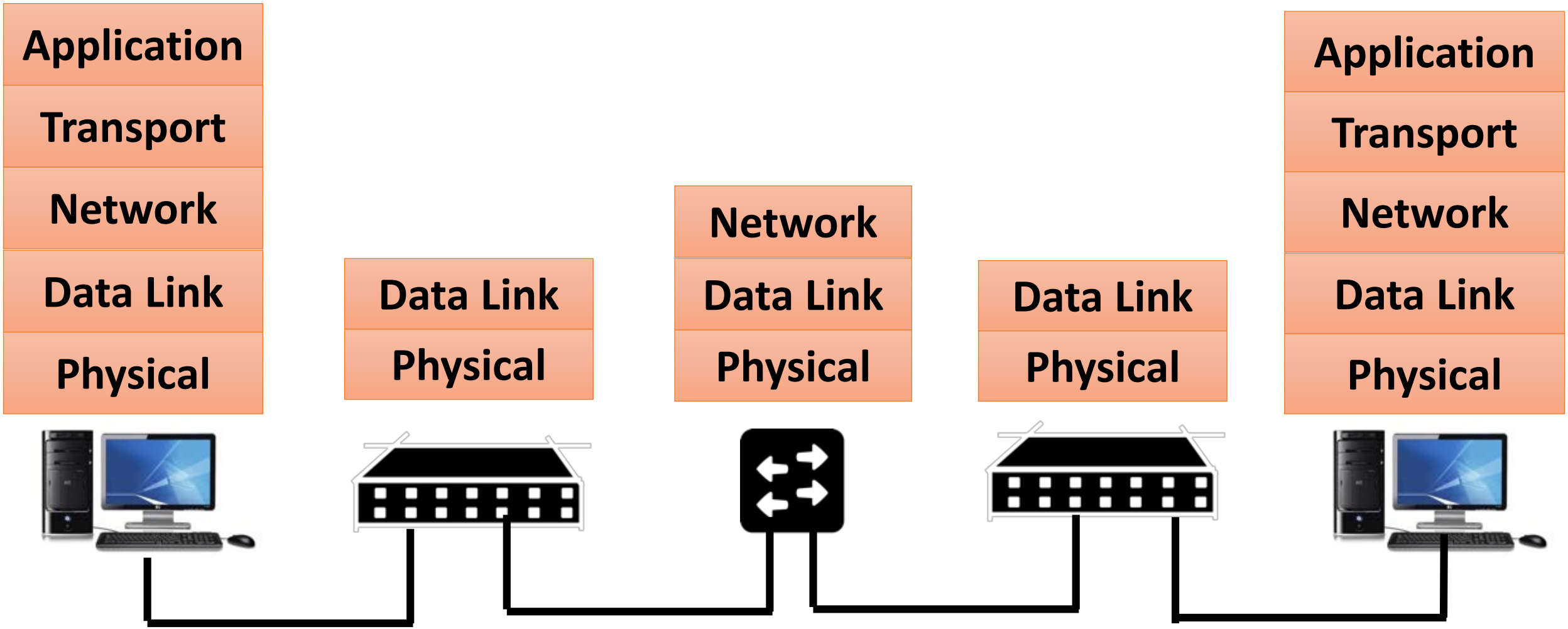
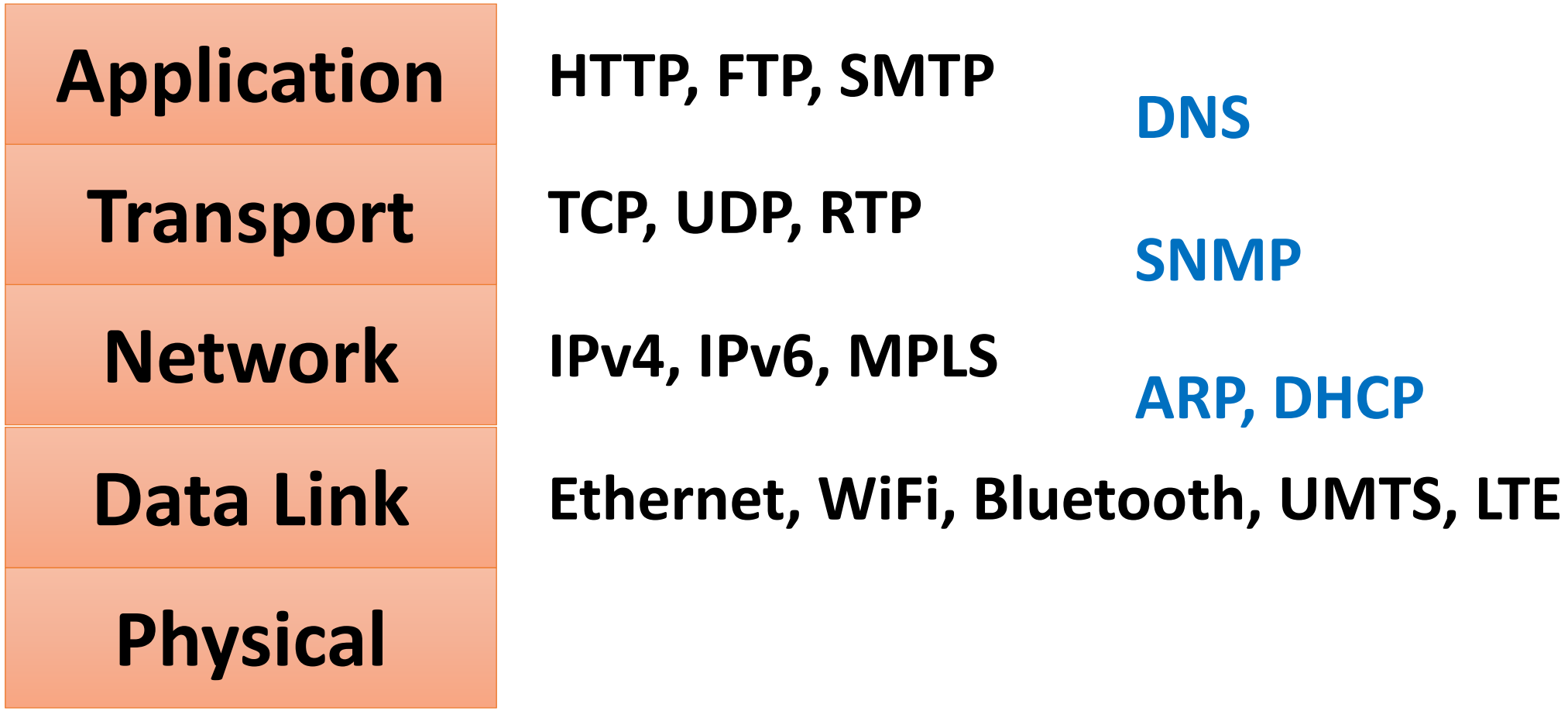


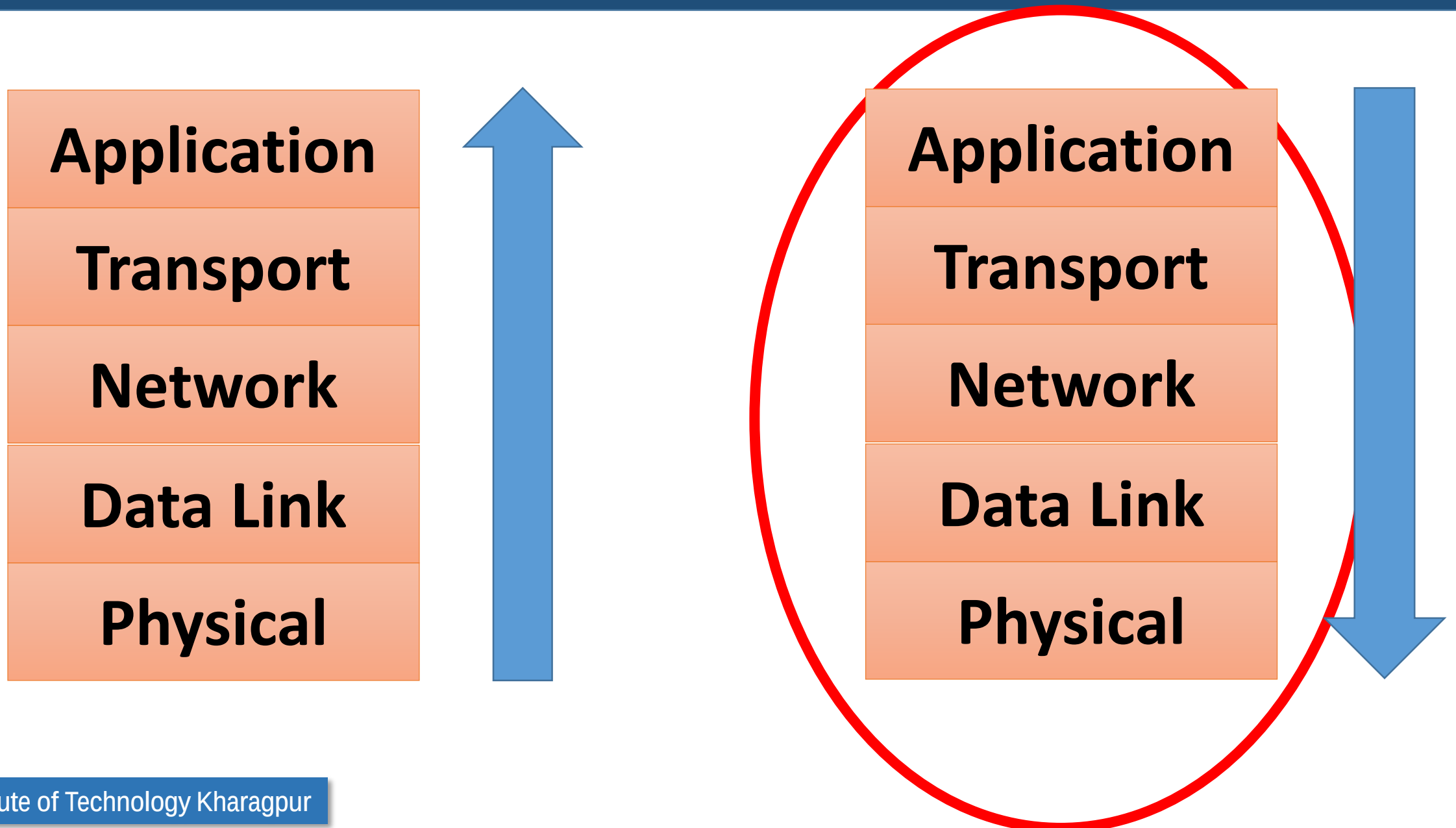
Protocols at Different Layers

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

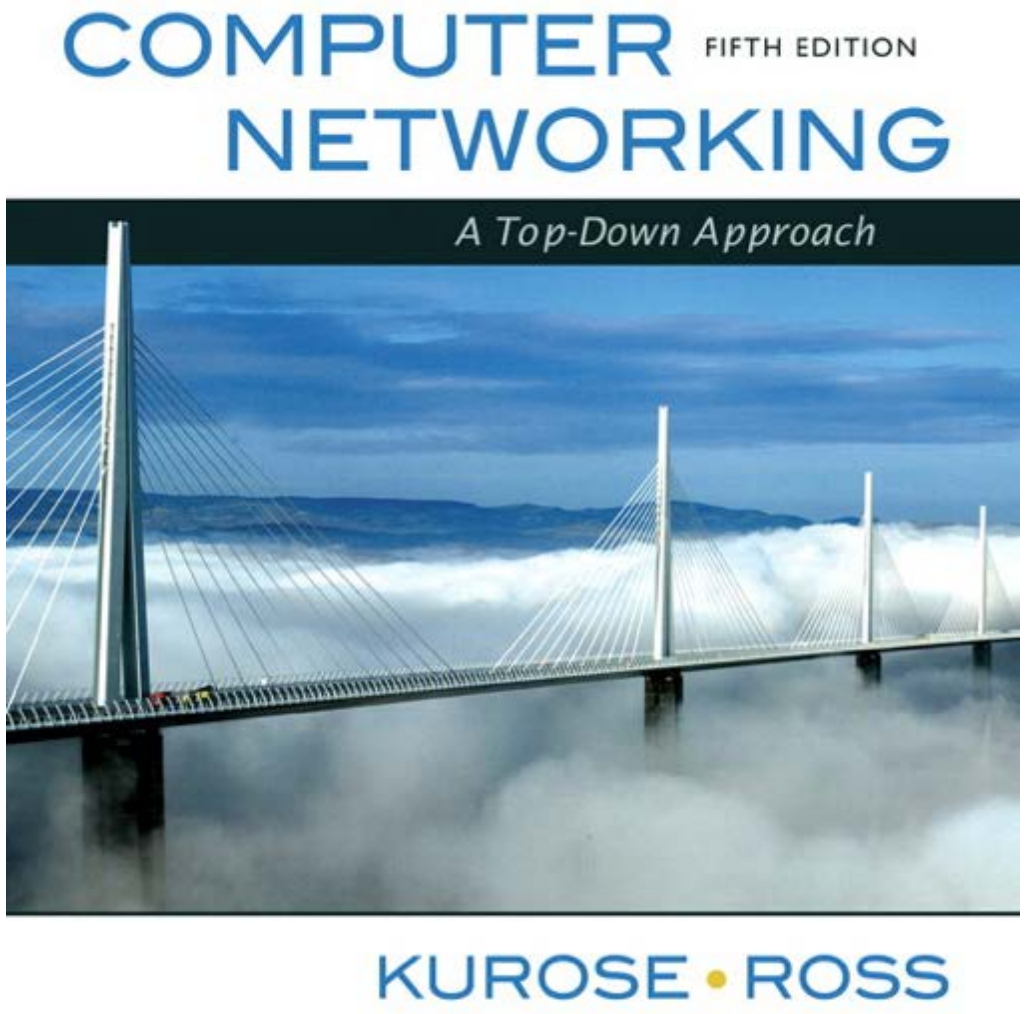


Two Ways to Learn Computer Networks



Books to Follow …

- Application
- Transport
- Network
- Data Link
- Physical



Books to Follow …

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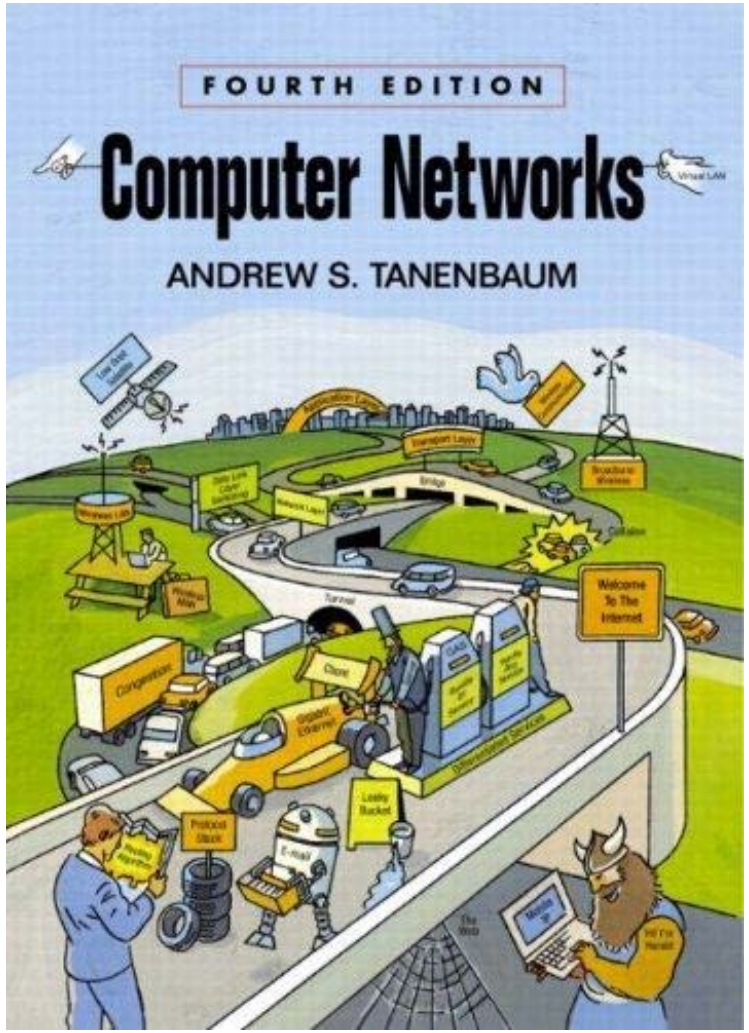
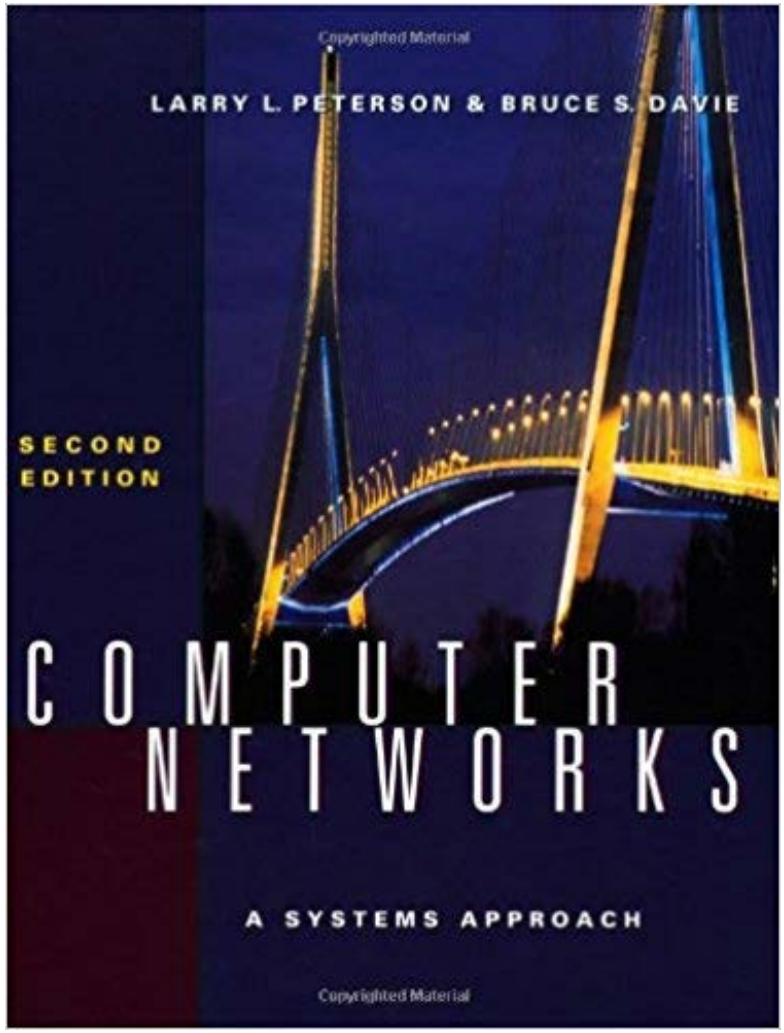




Books to Follow (Online Books)…

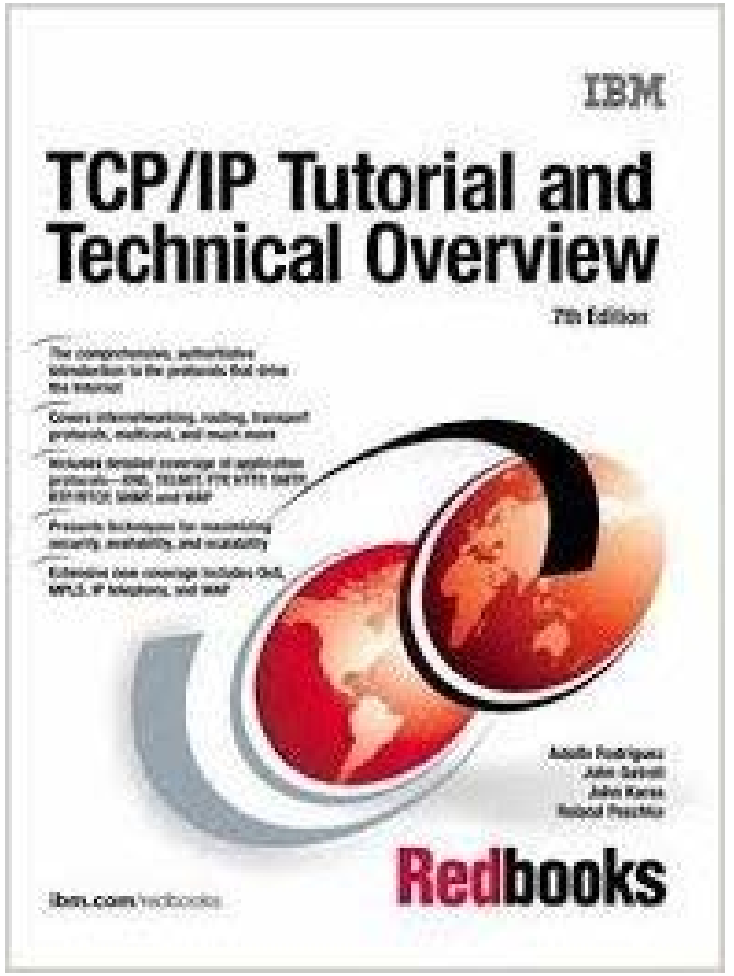
Application

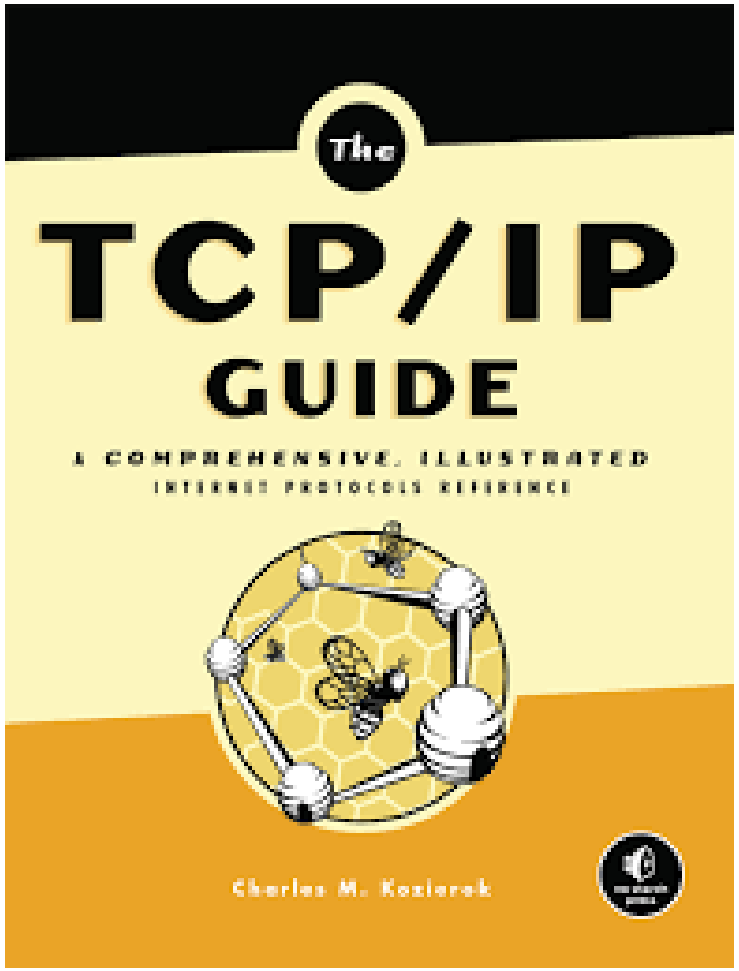
Transport

Network

Data Link

Physical





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

http://www.tcpipguide.com/

Internet Resources

The Internet Engineering Task Force (IETF®)

The goal of the IETF is to make the Internet work better.

The mission of the IETF is to make the Internet work better by producing high quality, relevant technical documents that influence the way people design, use, and manage the Internet. Newcomers to the IETF should start here.

News

- IETF 104 in Prague!
- IETF Blog
- IETF Daily Dose

Next Meeting: IETF 101 London

IETF 101 - March 17-23, 2018

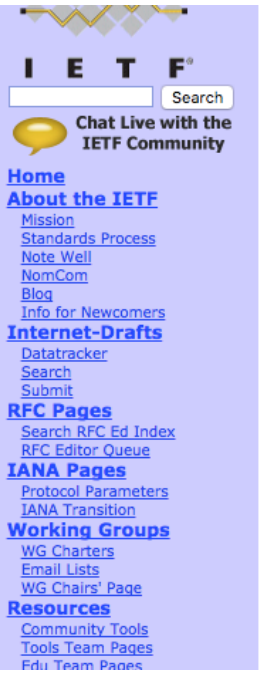
- Register
- Important Dates
- Wiki
- Agenda
- Meeting Materials
- Remote Participation
- Hackathon (open to public)

Recent Meeting: IETF 100 - Singapore

- IETF 100 Information
- IETF 100 Proceedings

Internet-Drafts and RFCs Quick Search

Search



Request for Comments (RFC)

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.

RFCs associated with an active IETF Working Group can also be accessed from the Working Group's web page via IETF Working Groups.

IETF Repository Retrieval

- Advanced search options are available at IETF Datatracker and the RFC Search Page.
- A text index of RFCs is available on the IETF web site here: RFC Index (Text).
- To go directly to a text version of an RFC, type *https://www.ietf.org/rfc/rfcNNNN.txt* into the location field of your browser, where NNNN is the RFC number.

RFC Editor Repository Retrieval

- RFC Search Page
- RFC Index (HTML | TXT | XML)
- Additional listings of RFCs
- RFC Editor Queue

RFC Errata

Published RFCs never change. Although every published RFC has been submitted to careful proofreading by the RFC Editor

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
- We'll set up a Piazza group – please use the group for any discussions
- Attendance: Institute policy will be followed – deregistration for low attendance
- Make the class lively – no question is a stupid question !!!