

Počítačové siete

Prerekvizity: 1-INF-165 alebo 1-AIN-170

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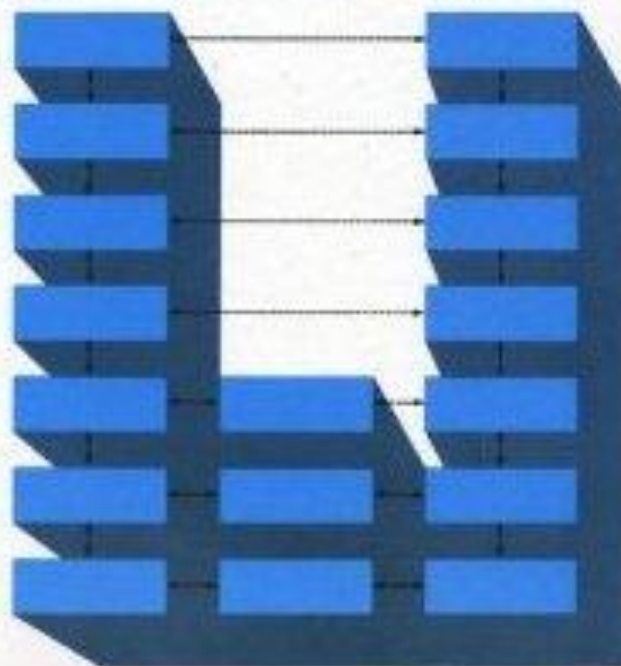
STREDA: 15. mája 2013
poslucháreň B

Termín je povinný. Výnimky len vo vážnych prípadoch a s **dôveryhodným ospravedlnením !**

LITERATÚRA

- Andrew S. Tanenbaum:
Computer Networks, 4th Ed, Prentice-Hall, 2002
[A.Tanenbaum home page](#)
- William Stallings:
Data and Computer Communications, 6th Ed,
Prentice-Hall, 2000

COMPUTER NETWORKS



ANDREW S. TANENBAUM

FOURTH EDITION

Computer Networks

ANDREW S. TANENBAUM



New in the fourth edition of *Computer Networks* is coverage of the following topics:

- Ad hoc networks
- ADSL
- Bluetooth
- Broadband wireless
- CGI scripts
- Content delivery networks
- Cookies
- Data link layer switching
- DHCP
- Differentiated services
- Dynamic Web content
- Gigabit Ethernet
- I-mode devices
- Integrated services
- Internet over cable
- Internet radio
- JavaScript
- MP3
- MPLS
- NAT
- Peer-to-peer networks
- PHP
- POP3
- Quality of service
- Remote procedure call
- Socket programming
- streaming audio
- Transaction/TCP
- VLANs
- VPN
- WAP
- Web caching
- wireless LANs
- wireless MANs
- XHTML
- XML and XSL

Dostupné na stránke autora

Preface, Index, and Chapter Samples

The preface and index and the following chapter samples are available for previewing in both PDF and PostScript formats.

- PREFACE
- CHAPTER 1 INTRODUCTION
- SECTION 2.6 THE MOBILE TELEPHONE SYSTEM
- SECTION 3.4 SLIDING WINDOW PROTOCOLS
- SECTION 4.4 WIRELESS LANS
- SECTION 5.6 THE NETWORK LAYER IN THE INTERNET
- SECTION 6.6 PERFORMANCE ISSUES
- SECTION 7.4 MULTIMEDIA
- SECTION 8.9 WEB SECURITY
- INDEX

Figures: Below you will find links for downloading the figures from the book in .zip archives.

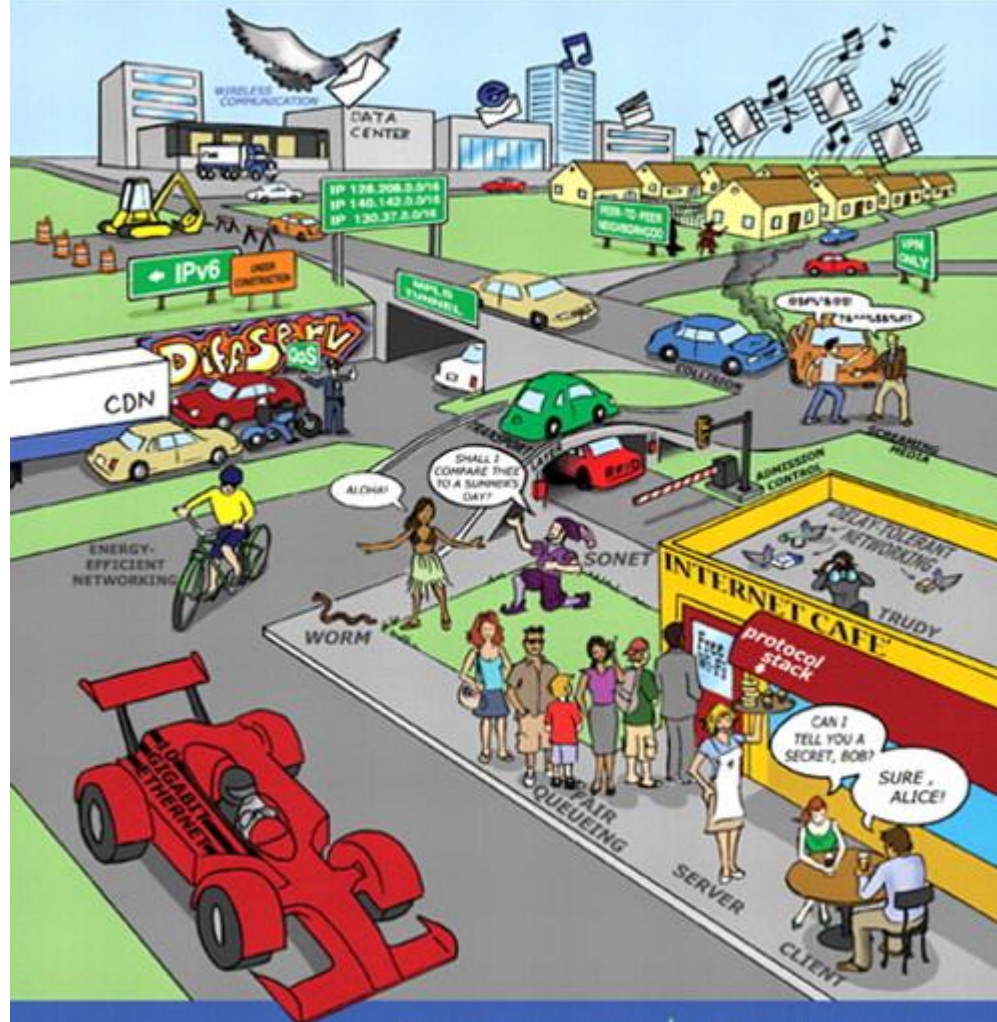
Format	Size (MB)	Description
PostScript	6	This zip file contains eight PostScript files, one per chapter. Each file contains all the figures for that chapter, one figure per page, with its caption. This format is good for printing overhead sheets.
PDF	1	This zip file contains eight PDF files, one per chapter. Each file contains all the figures for that chapter, one figure per page, with its caption. This format is good for printing overhead sheets.
EPS	17	This zip file contains all the figures in .eps format, one figure per file without caption. Since .eps files are vector graphics, they can be edited as need be.
JPEG	34	This zip file contains all the figures in .jpg format, one figure per file without caption. JPEG files cannot be edited, but they can be included in PowerPoint presentations.

COMPUTER NETWORKS



FIFTH EDITION

COMPUTER NETWORKS



TANENBAUM | WETHERALL

COMPUTER NETWORKS

FIFTH EDITION

ANDREW S. TANENBAUM

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Amsterdam, The Netherlands

DAVID J. WETHERALL

University of Washington

Seattle, WA

PRENTICE HALL

Boston Columbus Indianapolis New York San

Francisco Upper Saddle River

Amsterdam Cape Town Dubai London Madrid

Milan Paris Montreal Toronto

Delhi Mexico City Sao Paulo Sydney Hong Kong

Seoul Singapore Taipei Tokyo

New in the Fifth Edition

Among the many changes in this book, the most important one is the addition of Prof. David J. Wetherall as a co-author. David brings a rich background in networking, having cut his teeth designing metropolitan-area networks more than 20 years ago. He has worked with the Internet and wireless networks ever since and is a professor at the University of Washington, where he has been teaching and doing research on computer networks and related topics for the past decade.

Of course, the book also has many changes to keep up with the ever-changing world of computer networks. Among these are revised and new material on:

- Wireless networks (802.12 and 802.16)

- The 3G networks used by smart phones

- RFID and sensor networks

- Content Distribution using CDNs

- Peer-to-peer networks

- Real-time media (from stored, streaming, and live sources)

- Internet telephony (voice over IP)

- Delay-tolerant networks

DATA AND COMPUTER COMMUNICATIONS

Seventh Edition



WILLIAM STALLINGS

DATA AND COMPUTER
COMMUNICATIONS

NINTH EDITION



WILLIAM STALLINGS

Data and Computer Communications, 9/E William Stallings

ISBN-10: 0131392050

ISBN-13: 9780131392052

Publisher: Prentice Hall

Copyright: 2011

Format: Cloth; 888 pp

Published: 08/03/2010

Computer Science Student Resource Site

Maintained by William
Stallings

- <http://www.computersciencestudent.com/>
- <http://williamstallings.com/Biography.html>

Prečítať kapitoly:

PREFACE

CHAPTER 1

INTRODUCTION

1.1 USES OF COMPUTER NETWORKS

1.2 NETWORK HARDWARE

1.3 NETWORK SOFTWARE

1.4 REFERENCE MODELS

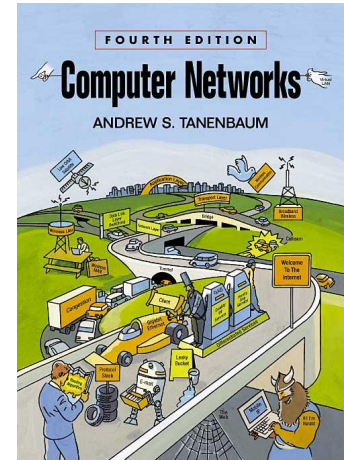
1.5 EXAMPLE NETWORKS

1.5.1 The Internet

1.5.3 Ethernet

1.5.4 Wireless LANs: 802.11

1.6 NETWORK STANDARDIZATION



CHAPTER 2

THE PHYSICAL LAYER

2.1 THE THEORETICAL BASIS FOR DATA COMMUNICATION

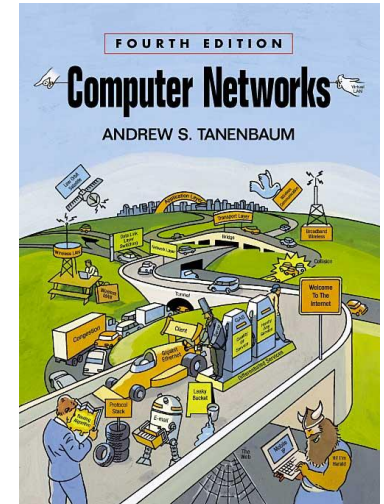
2.2 GUIDED TRANSMISSION MEDIA

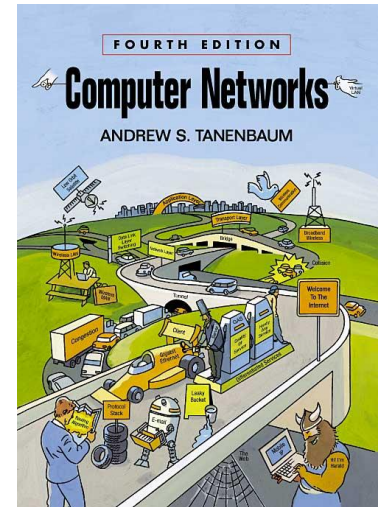
2.3 WIRELESS TRANSMISSION

2.5 THE PUBLIC SWITCHED TELEPHONE NETWORK

2.6 THE MOBILE TELEPHONE SYSTEM

2.7 CABLE TELEVISION





CHAPTER 3

THE DATA LINK LAYER

3.1 DATA LINK LAYER DESIGN ISSUES

3.2 ERROR DETECTION AND CORRECTION

3.4 SLIDING WINDOW PROTOCOLS

CHAPTER 4

THE MEDIUM ACCESS CONTROL SUBLAYER

CHAPTER 5

THE NETWORK LAYER

5.6 THE NETWORK LAYER IN THE INTERNET

5.6.1 The IP Protocol

5.6.2 IP Addresses

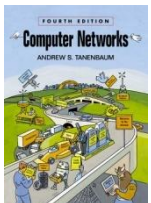
5.6.3 Internet Control Protocols

5.6.4 The Interior Gateway Routing Protocol: OSPF

5.6.5 The Exterior Gateway Routing Protocol: BGP

5.6.6 Internet Multicasting

5.6.8 IPv6

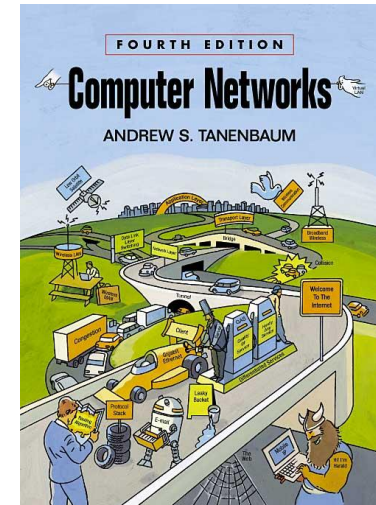


CHAPTER 7

THE APPLICATION LAYER

7.1 DNS--DOMAIN NAME SYSTEM

■ ■ ■



Co je čím ... v počítačových sítích

http://earchiv.cz/i_coje.php3

Layer 2/3/4-7 switching:

<http://www.earchiv.cz/b02/b0200001.php3>

Směrovače nebo přepínače? A na které vrstvě?

<http://www.earchiv.cz/b00/b0007001.php3>

Computer Networks, Fourth Edition

PowerPoint Slides

Figures

<http://authors.phptr.com/tanenbaumcn4/>

Address Resolution Protocol

http://www2.rad.com/networks/network/arp/main.htm#_How

<http://www.osischool.com/protocol/arp/basic>

IP Routing Simulation

<http://www2.rad.com/networks/2005/ipkit/main.htm#Questions>

LITERATÚRA - pokračovanie

- Fred Halsall: Introduction to data communications and computer networks. Addison Wesley, 1985.
- Fred Halsall: Data Communications, Computer Networks and Open Systems. Fourth Edition, Addison Wesley, 1996
- Jean Walrand: Communication Networks
- Bill Hancock: Network concepts and architectures
- Uyles D. Black: Emerging communication technologies.
- Odborné časopisy, zborníky z konferencií, príručky, tutoriály, štandardy, normy, RFC, ...

KLÚČOVÉ SLOVÁ

Computer Networks

Data Communications and
Computer Networks

Communication Networks

Telecommunications

– Fixed and Mobile

Networks, Systems, Services

Komu je určená prednáška?

Kto má záujem o:

- všeobecné otázky o telekomunikáciach
- prehľad histórie, súčasnosti a budúcnosti telekomunikácii
- princípy sietí, systémov a ich štandardy (nie fyzikálne princípy prenosu informácie)

CIEĽ PREDNÁŠKY

- všeobecná orientácia študentov, ktorí sa nechcú ďalej špecializovať v telekomunikáciach
- základ pre tých, ktorí chcú pokračovať ďalej
- byť familiárny, čo sa týka terminológie
- byť schopný komunikovať so špecialistami
- byť schopný čítať odbornú a technickú literatúru

TELEKOMUNIKÁCIE

Technológie a procedúry používané na realizáciu optimálneho prenosu informácie cez:

- verejné (public) možnosti

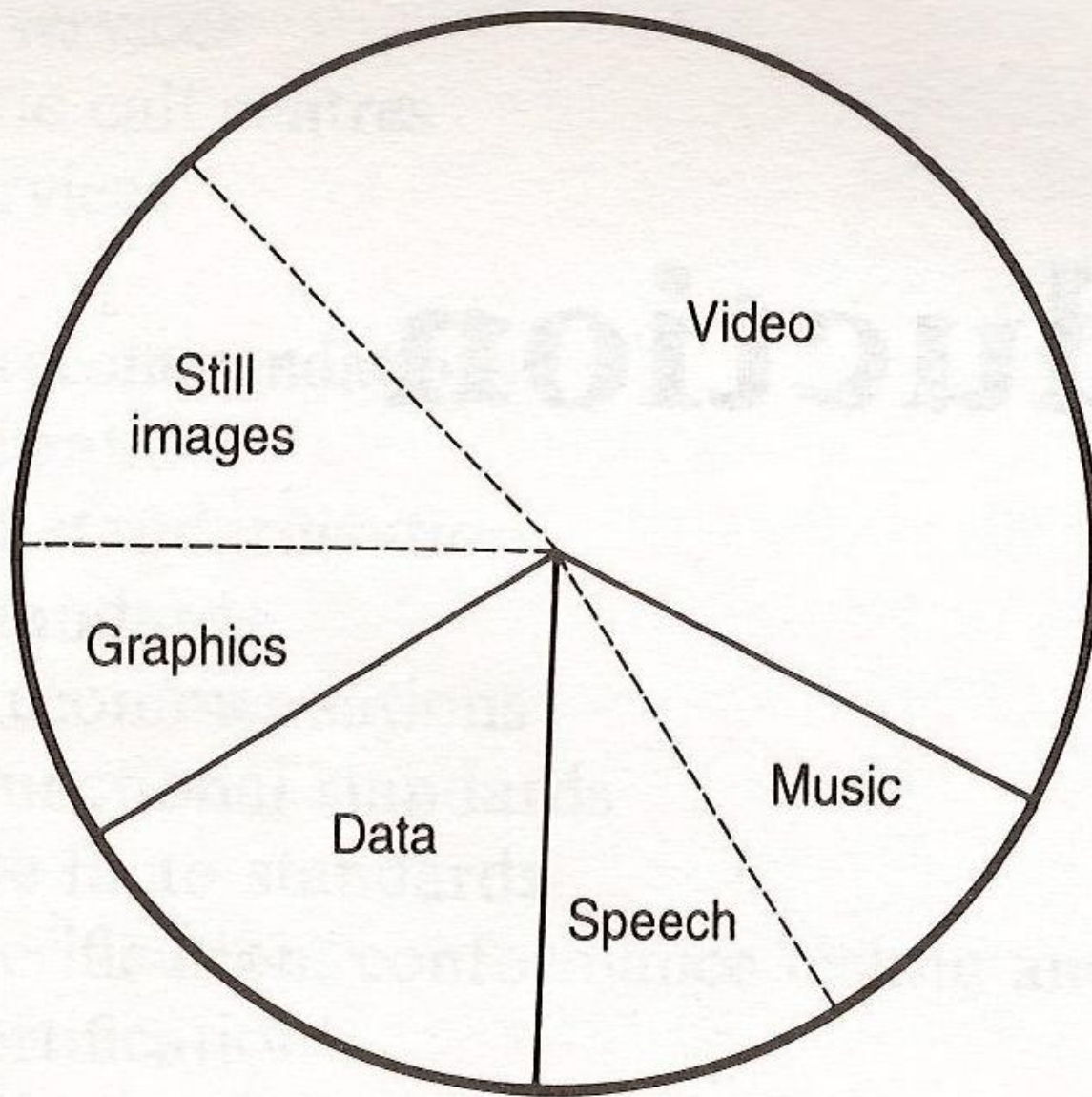
PSTN

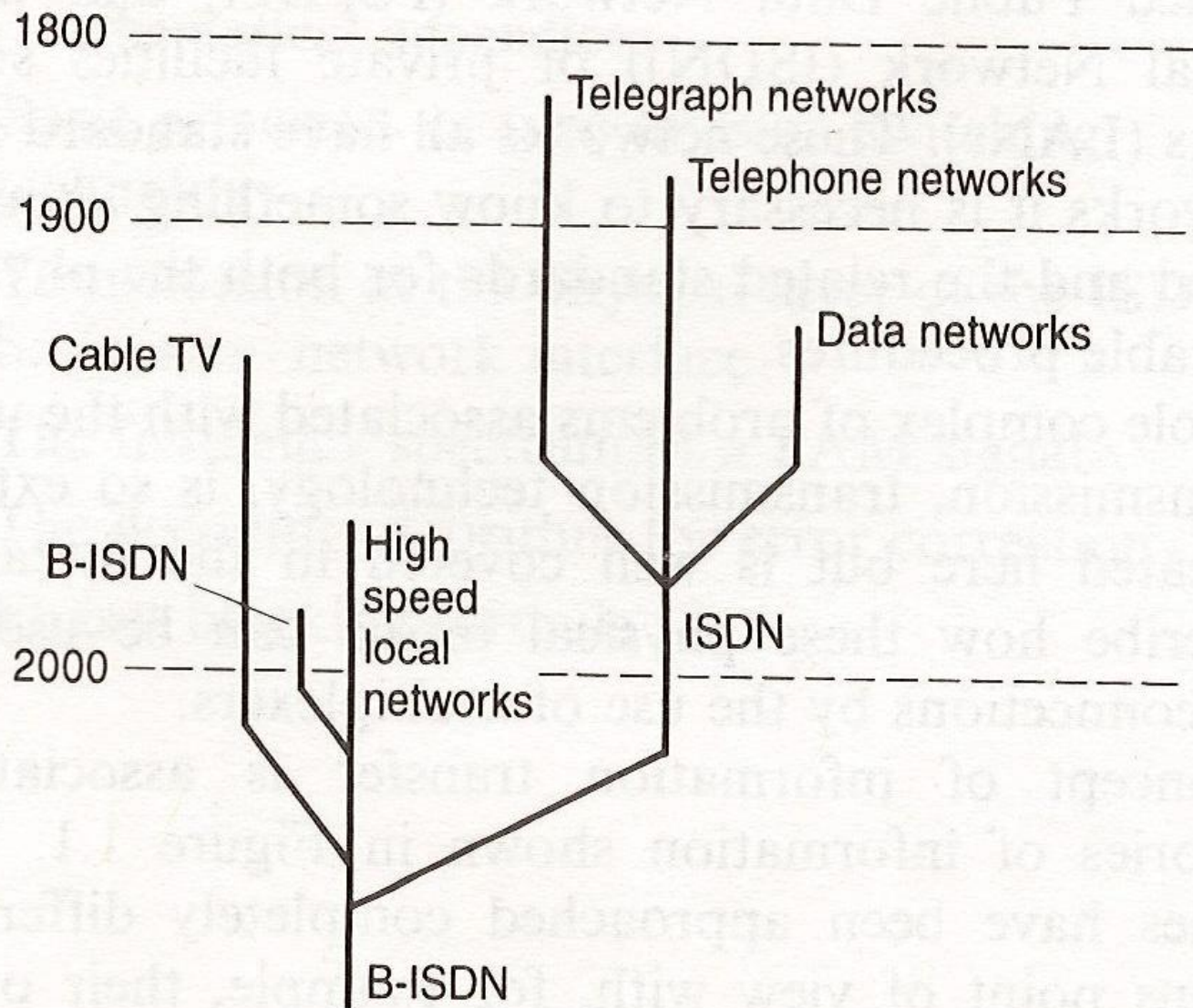
PSPDN

ISDN

- súkromné (privátne) možnosti

LAN (Local Area Network)





Telecommunication networks and services

Networks Chapter 2

Switching principles
Chapter 3

Communication protocols
Chapter 4

General aspects of
user equipment
Chapter 5

ISDN
Chapter 6

Mobile
communication
Chapter 7

Digital multiplexing
Chapter 8

Sources and
coding
Chapter 9

Performance
analysis
Chapter 10

Telecommunications
services
Chapter 11

Standards and
recommendations
Chapter 12

Network configurations topology

N = number of nodes, L = number of links

Number of links L :



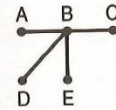
Point-to-point link

$$N - 1$$



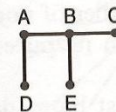
Linear tree

$$N - 1$$



Star

$$N - 1$$



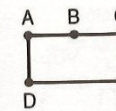
Tree

$$N - 1$$



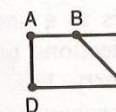
Hierarchical

$$N - 1$$



Ring

$$N$$



Mesh network

$$>N, <\frac{N(N-1)}{2}$$



Fully connected network

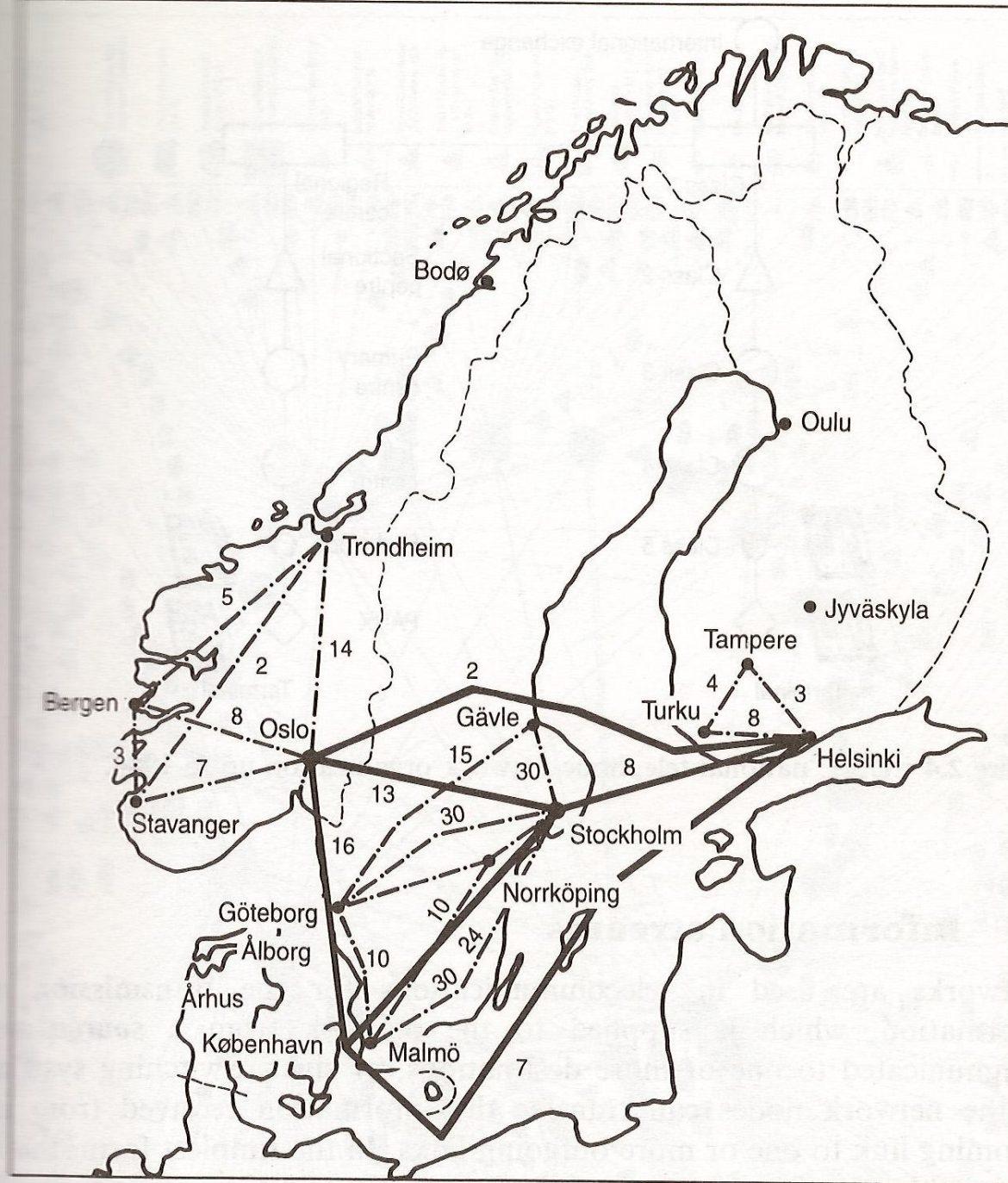
$$\frac{N(N-1)}{2}$$

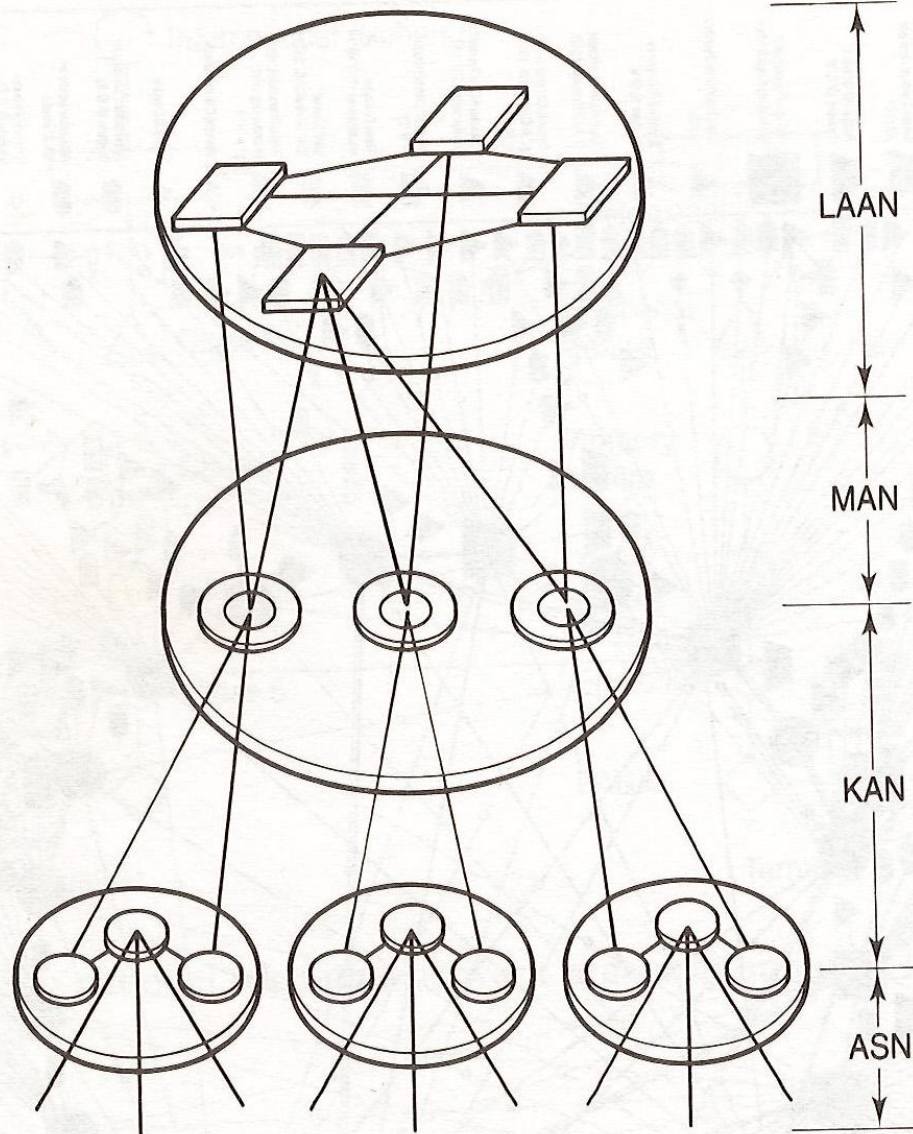


Triangulated

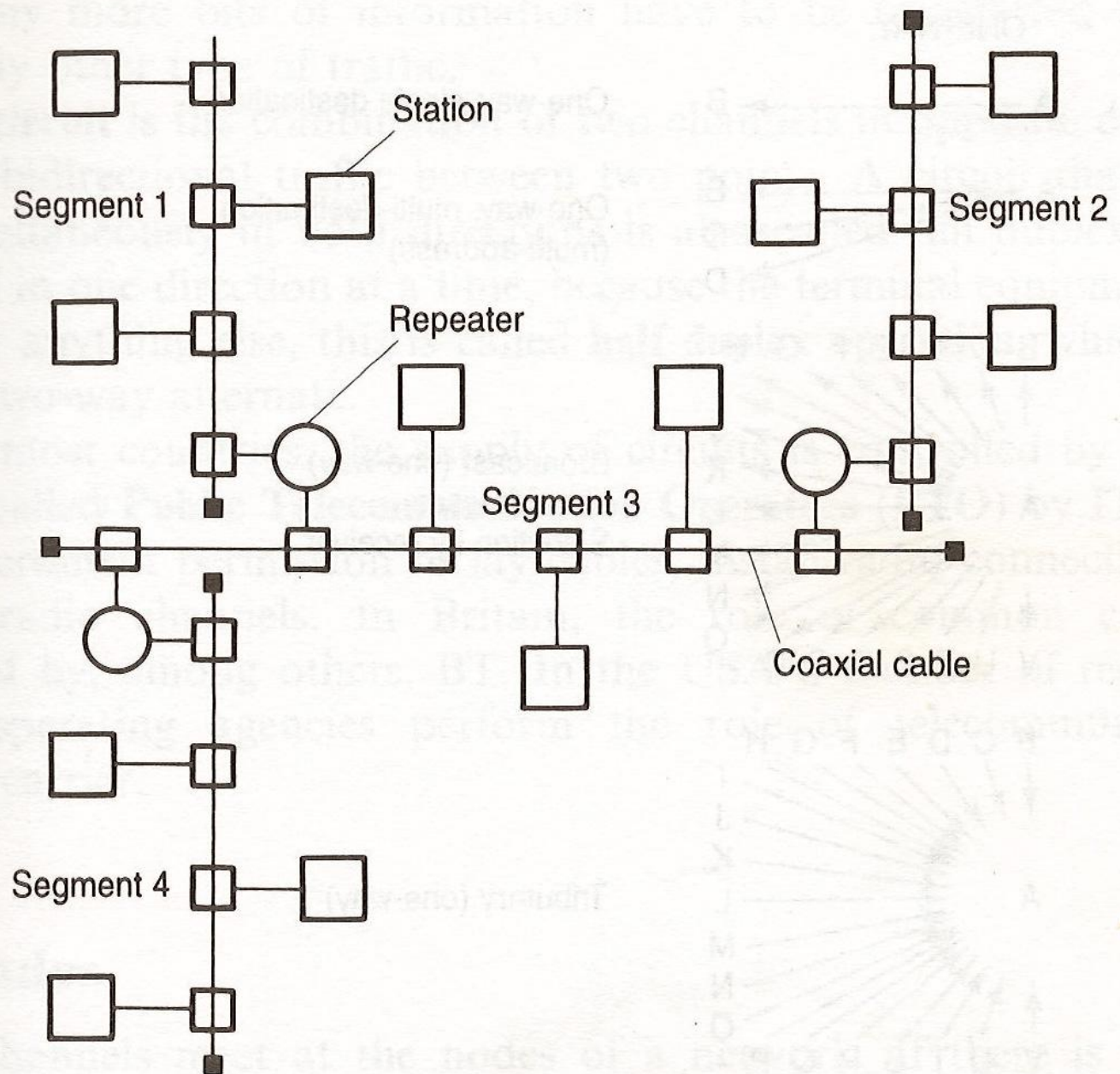
$$2N - 3$$

Figure 2.1 Network configurations.





LAAN = Long distance network: fully connected network
 MAN = Medium distance network: triangulated network
 KAN = Short distance network: ring network
 ASN = Subscriber star network: star network



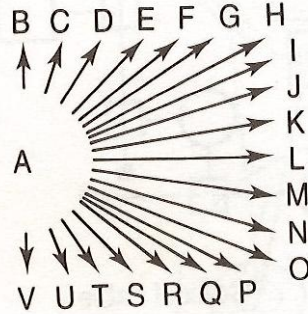
ONE-WAY:



One-way, single destination



One-way, multi-destination
(multi-address)

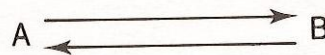


Broadcast (one-way)
no addresses
Selection by receiver

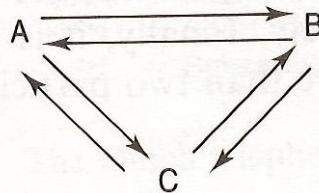


Tributary (one-way)

TWO-WAY:



Two-way alternate (half duplex)
Two-way simultaneous (full duplex)



Conference

