

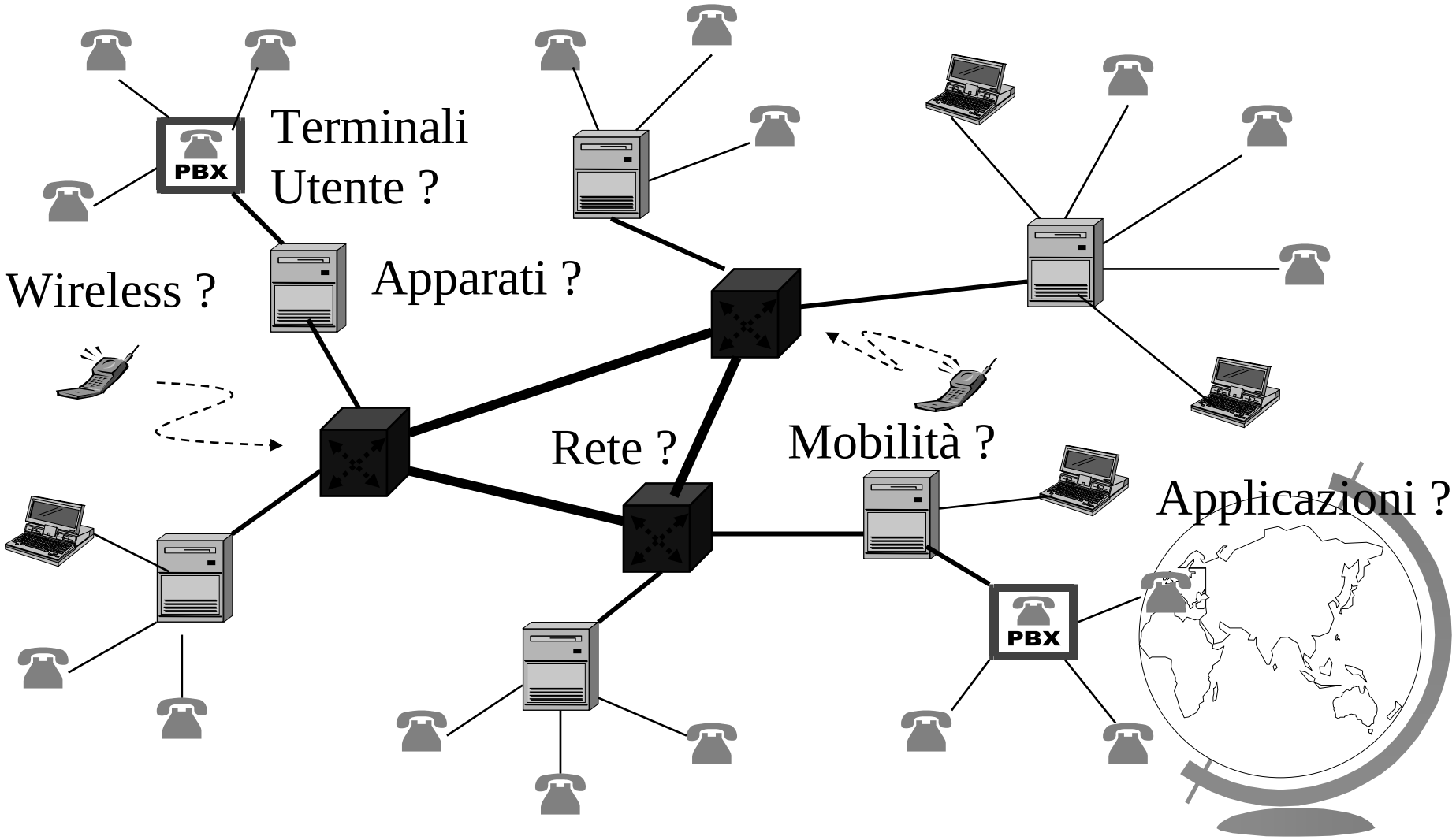
INTRODUZIONE

Prof. Ing. Maurizio Casoni

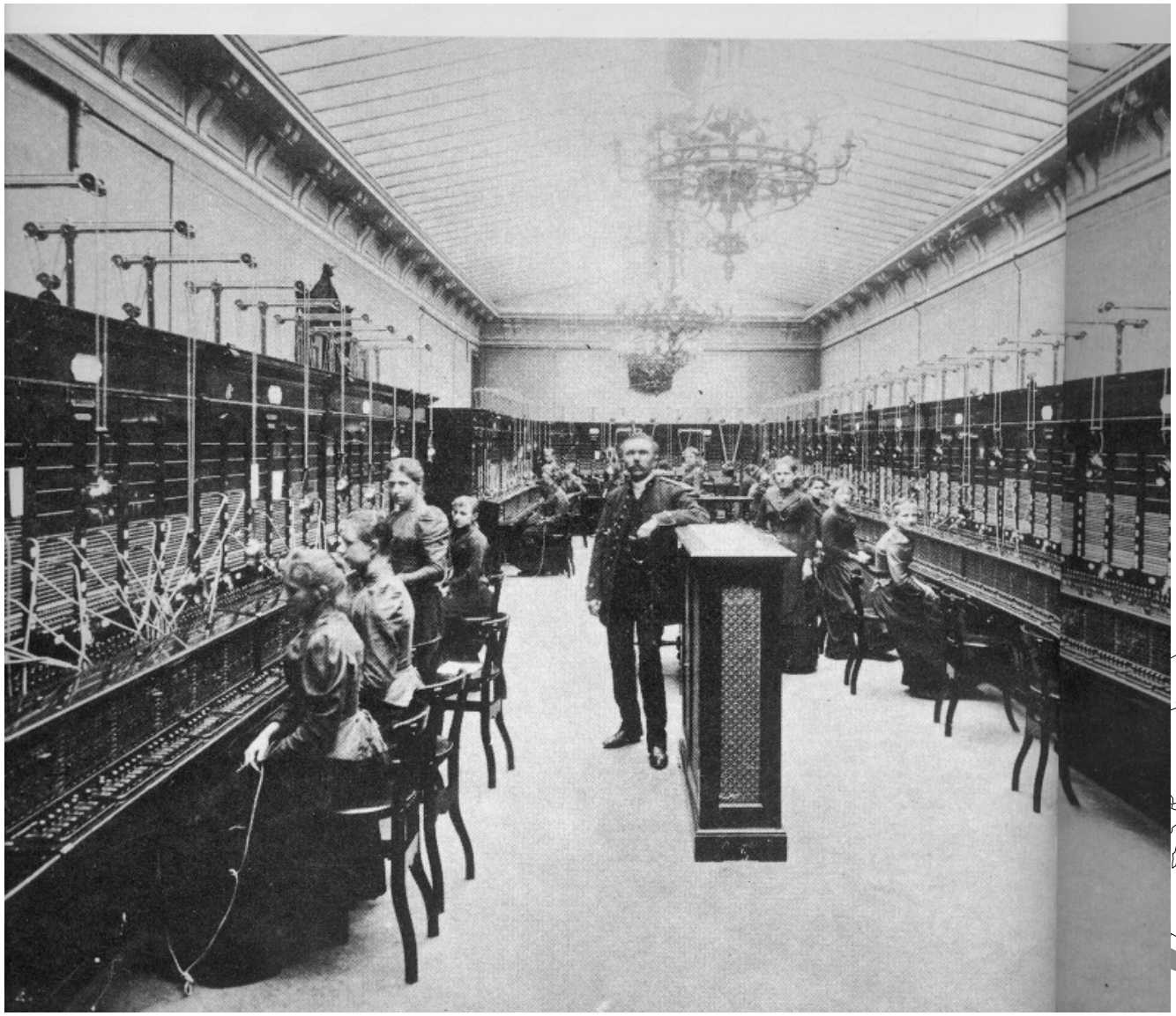
Dipartimento di Ingegneria “Enzo Ferrari”

Università degli Studi di Modena e Reggio Emilia

CONFIGURAZIONE DI RETE: MOLTEPLICI SOLUZIONI

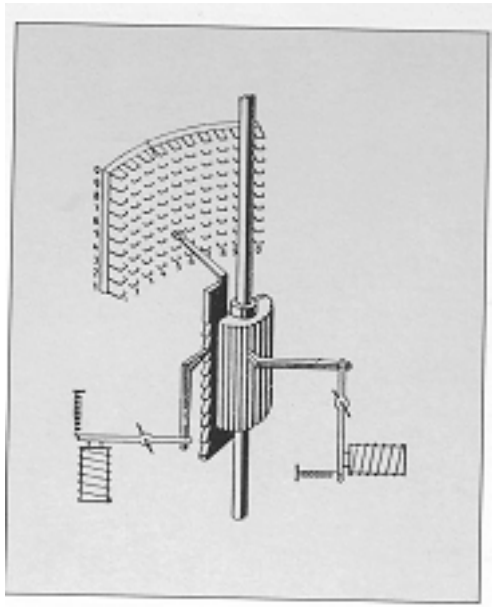


Centrale di commutazione: 1880-90

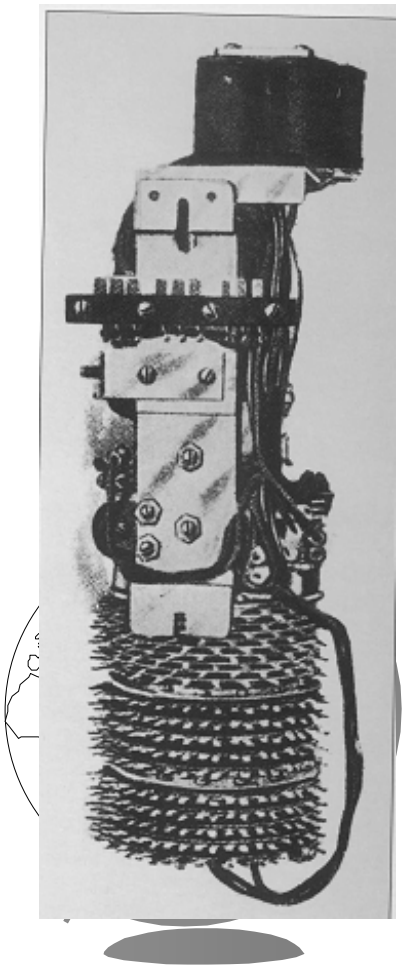


Evoluzione

Selettore a sollevamento e rotazione:
gli impulsi provenienti dall'utente chiamante pilotano gli elettromagneti che sollevano e ruotano il braccetto di contatto sul banco di contatto

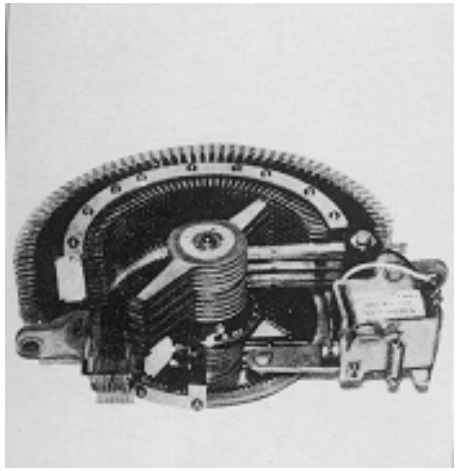


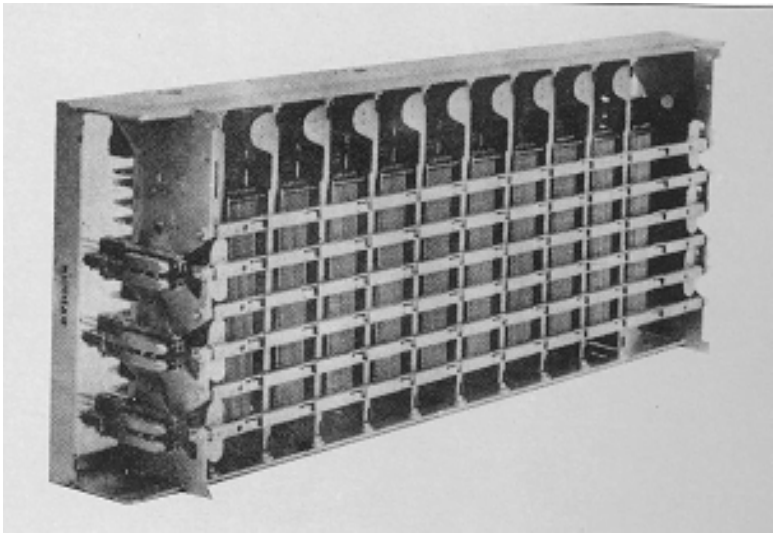
Selettore a sollevamento e rotazione Strowger: 1889



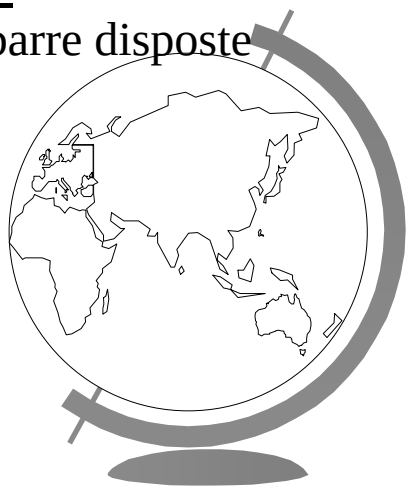
Evoluzione

Selettore a motore o rotativo: dotato del solo movimento rotatorio dei contatti mobili su contatti fissi disposti su arco di 180 gradi

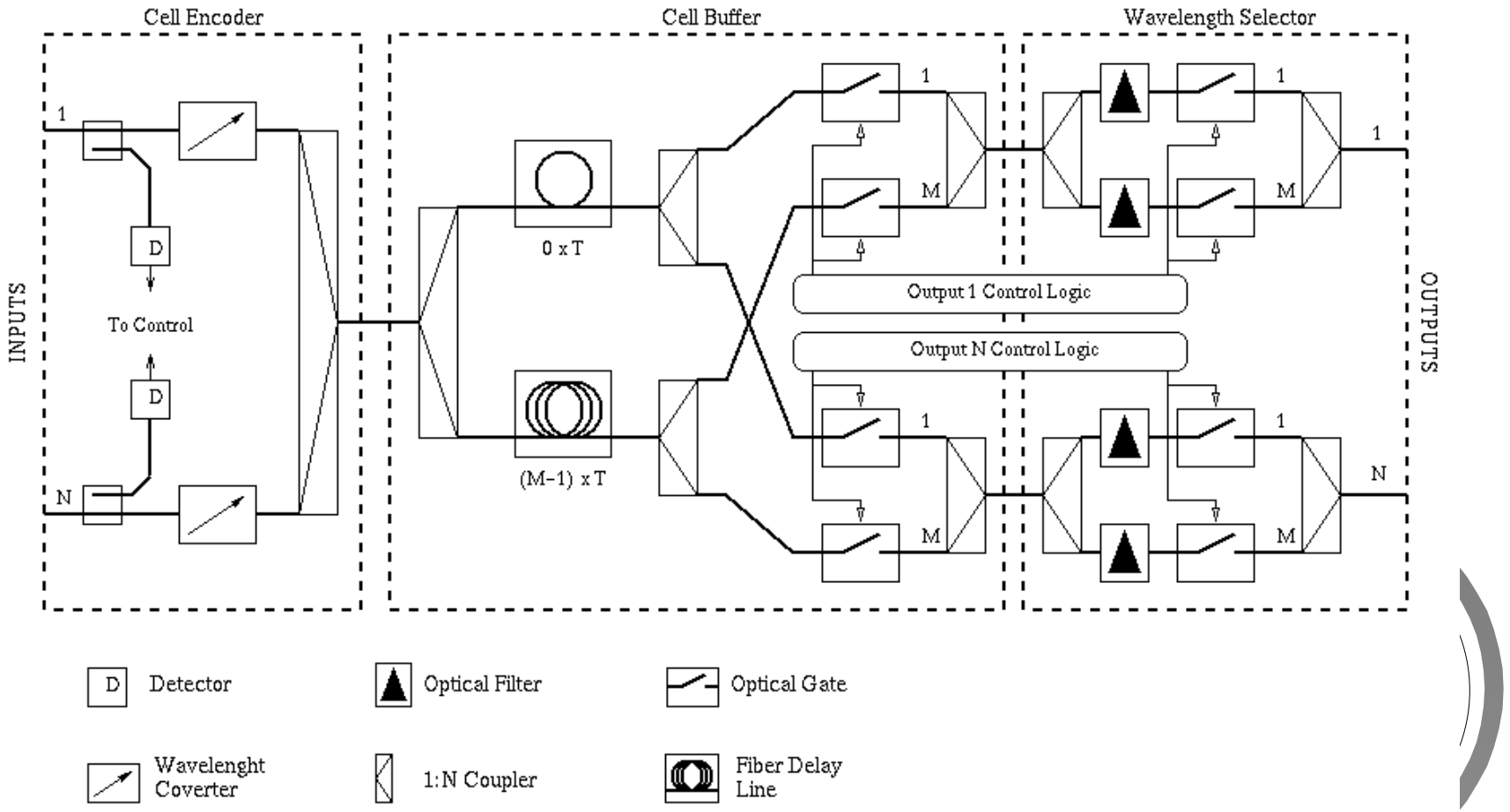




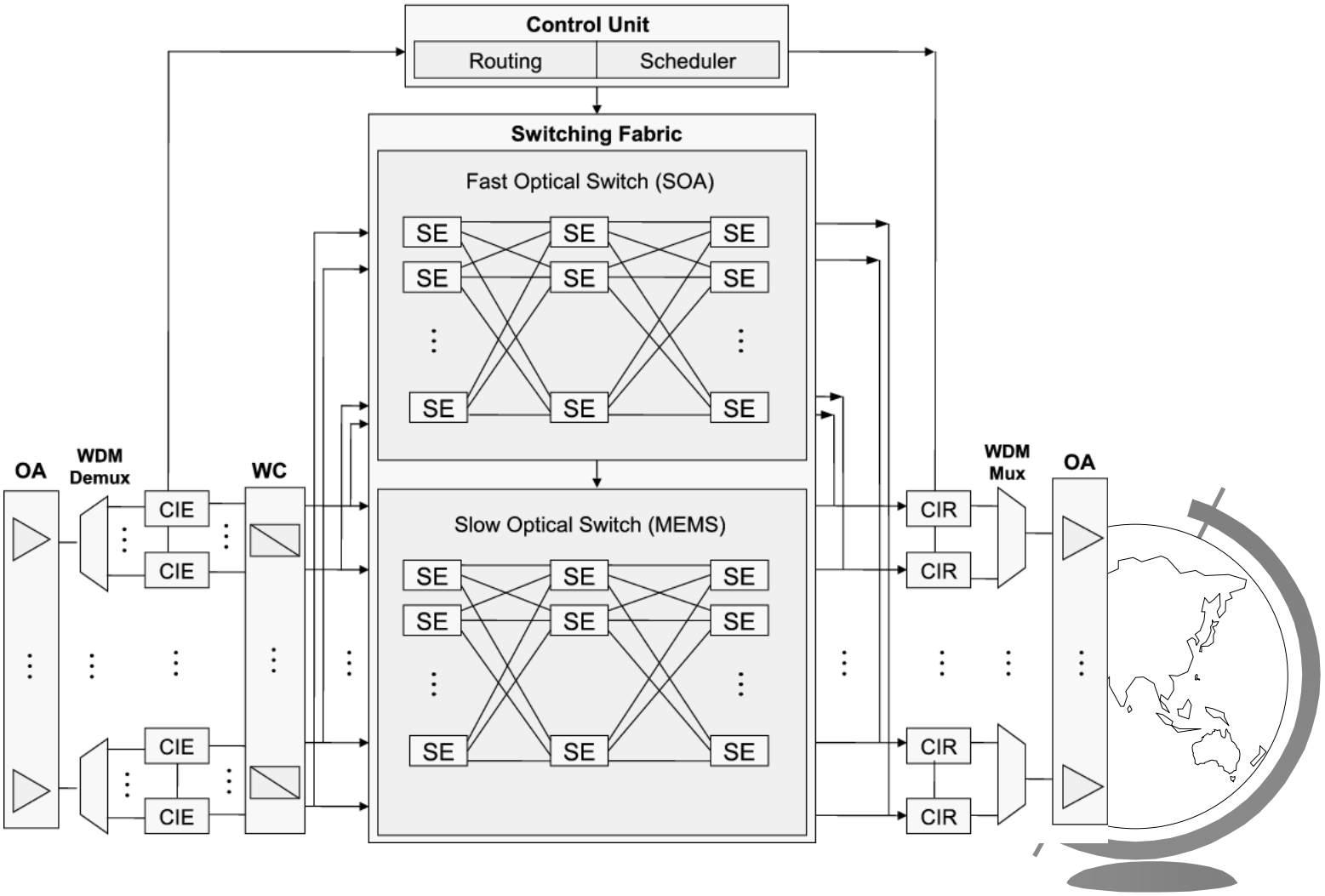
Selettore a barre incrociate: realizza la connessione all'incrocio di barre disposte a matrice e mosse da relè



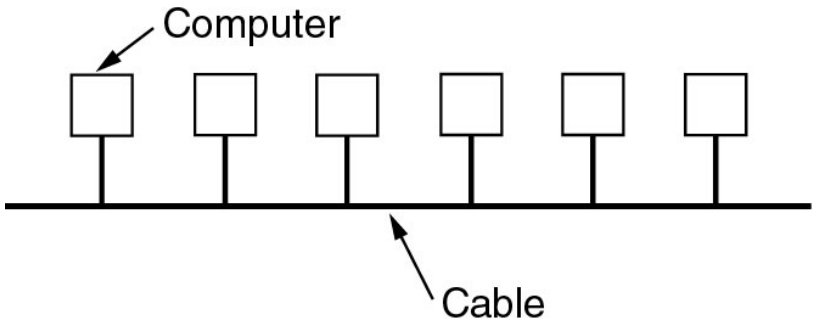
…… nodo di commutazione ottico B&S



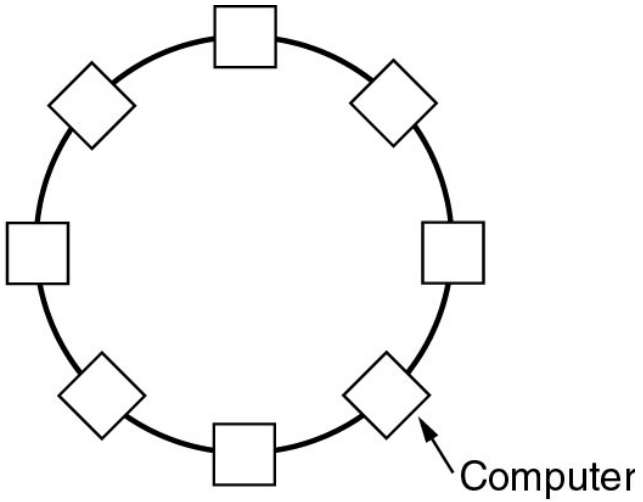
ARCHITETTURA ROUTER OTTICO



RETI LOCALI



(a)



(b)

Due principali topologie

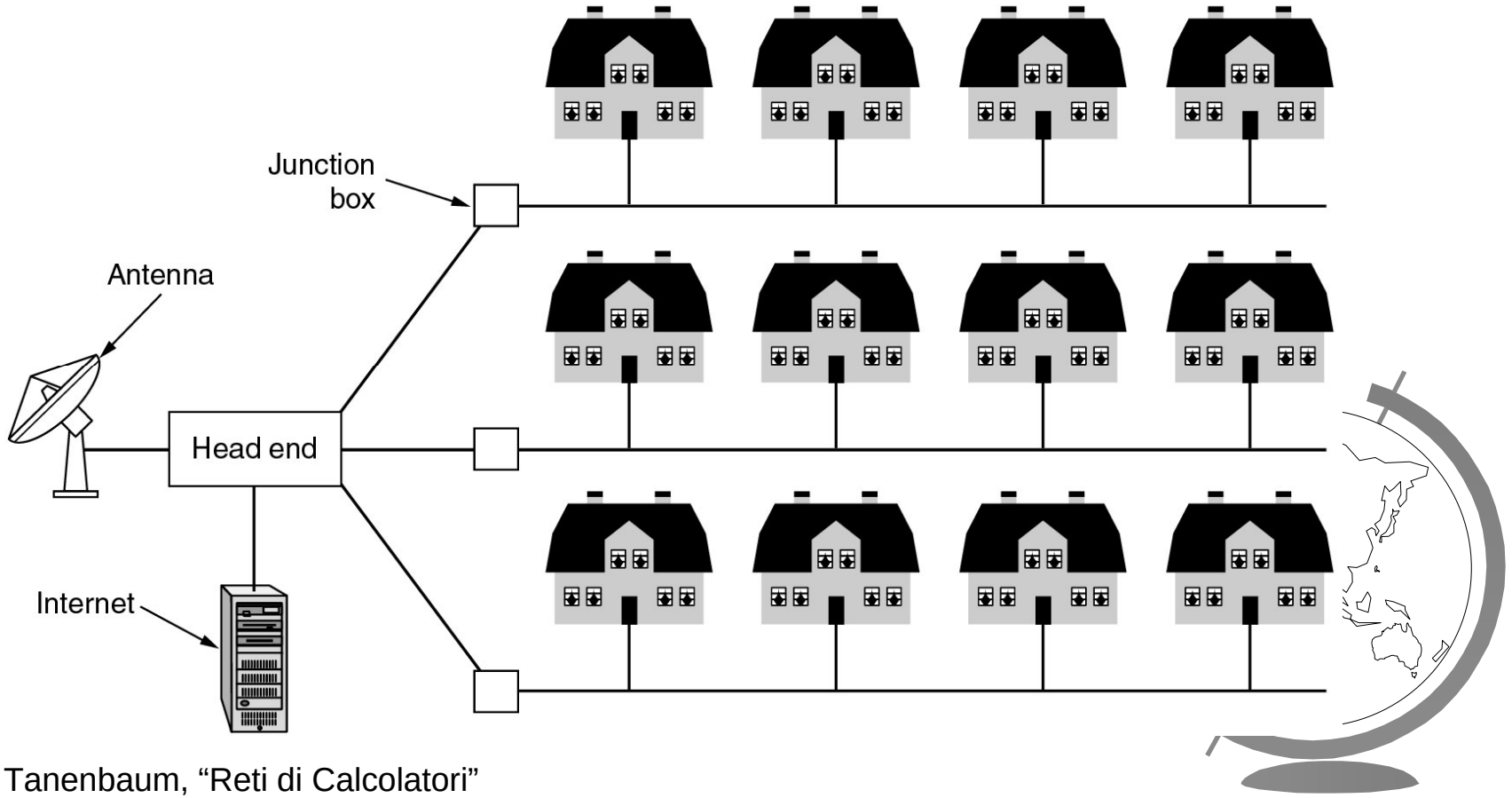
- (a) Bus
- (b) Ring



Da A.S. Tanenbaum, “Reti di Calcolatori”

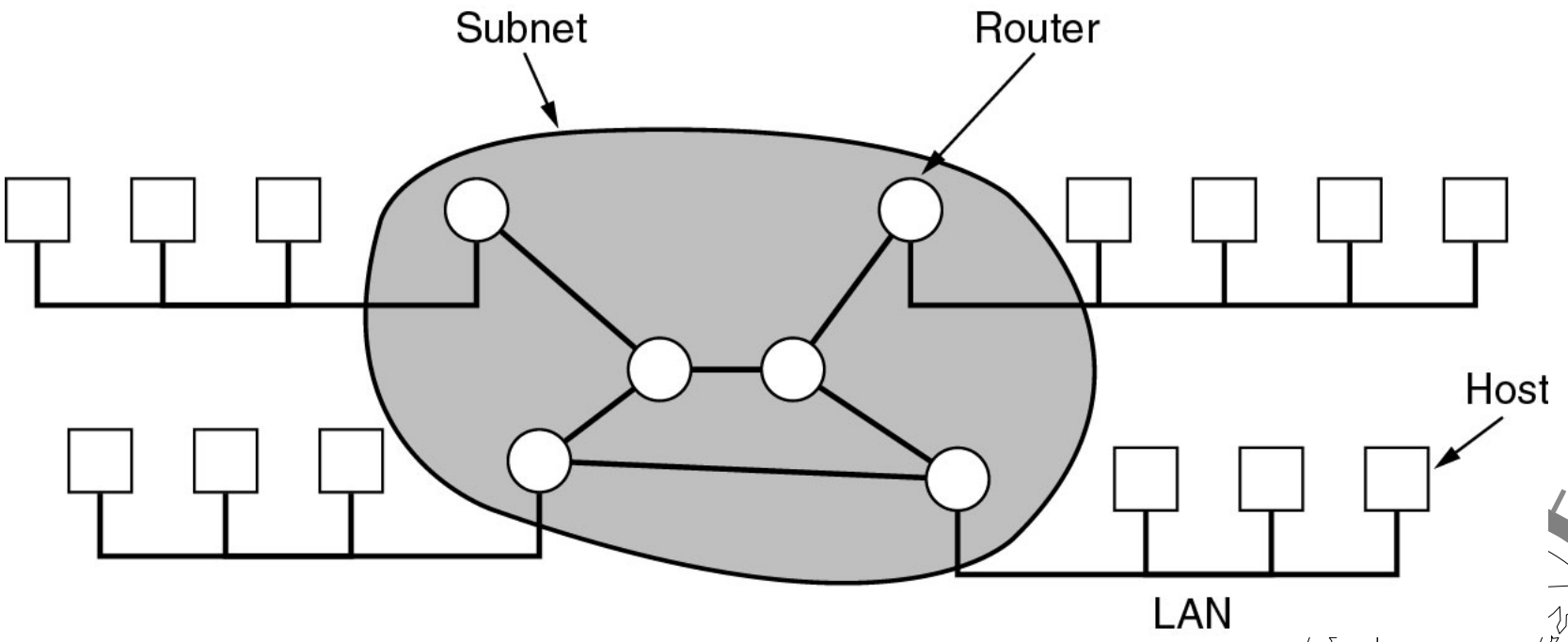
Metropolitan Area Networks

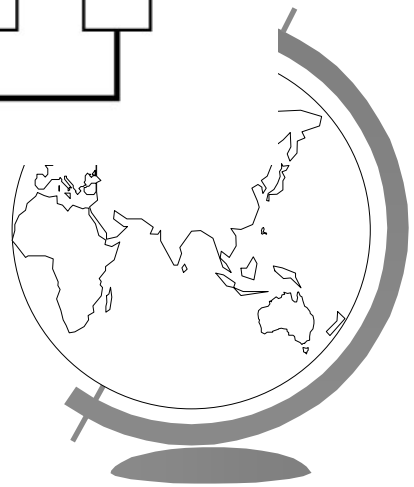
- Esempio di TV via cavo



Da A.S. Tanenbaum, “Reti di Calcolatori”

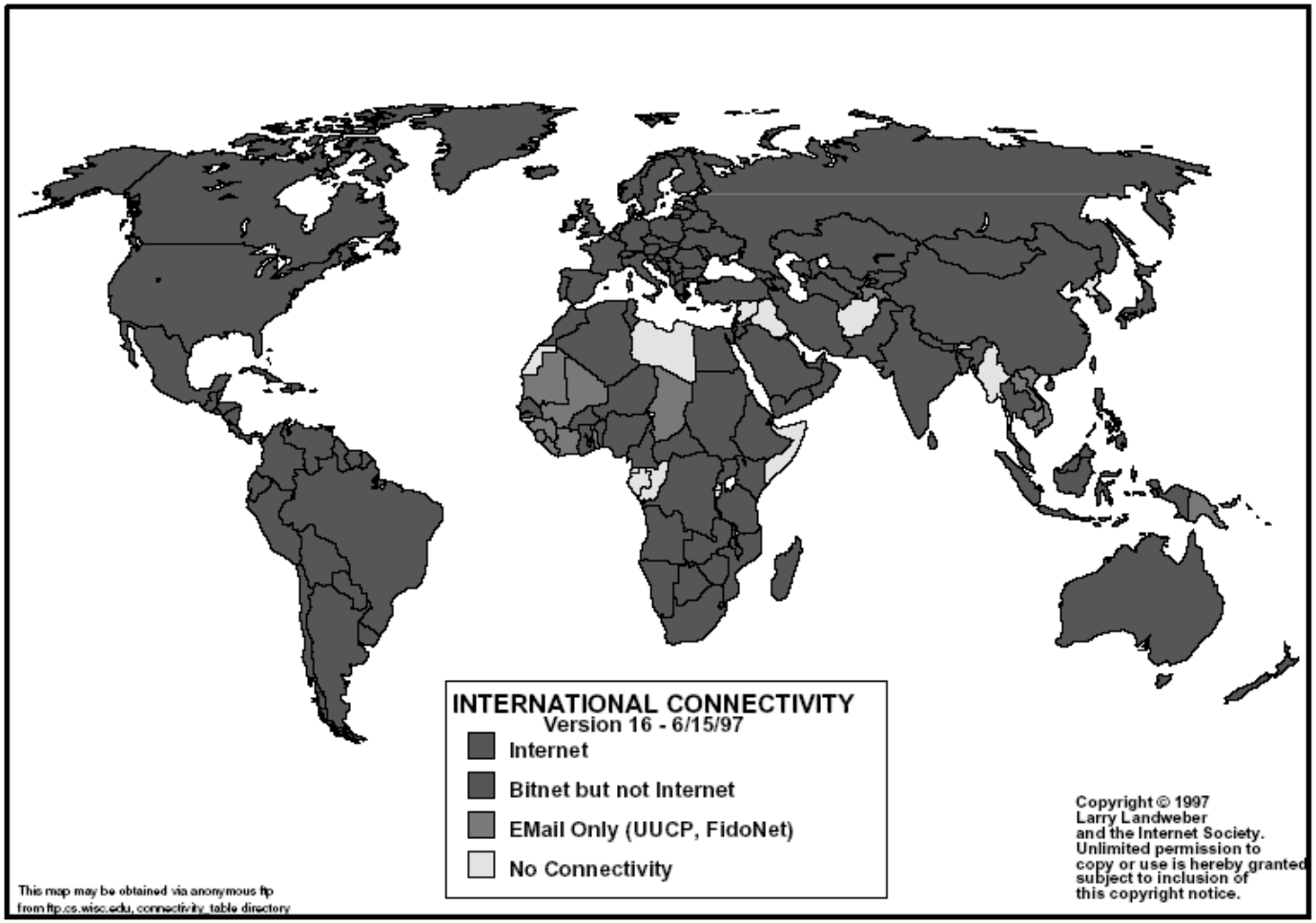
Wide Area Network

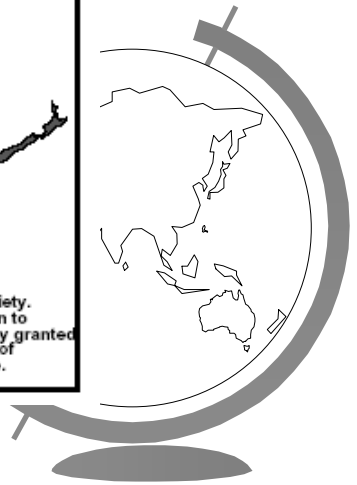




Da A.S. Tanenbaum, “Reti di Calcolatori”

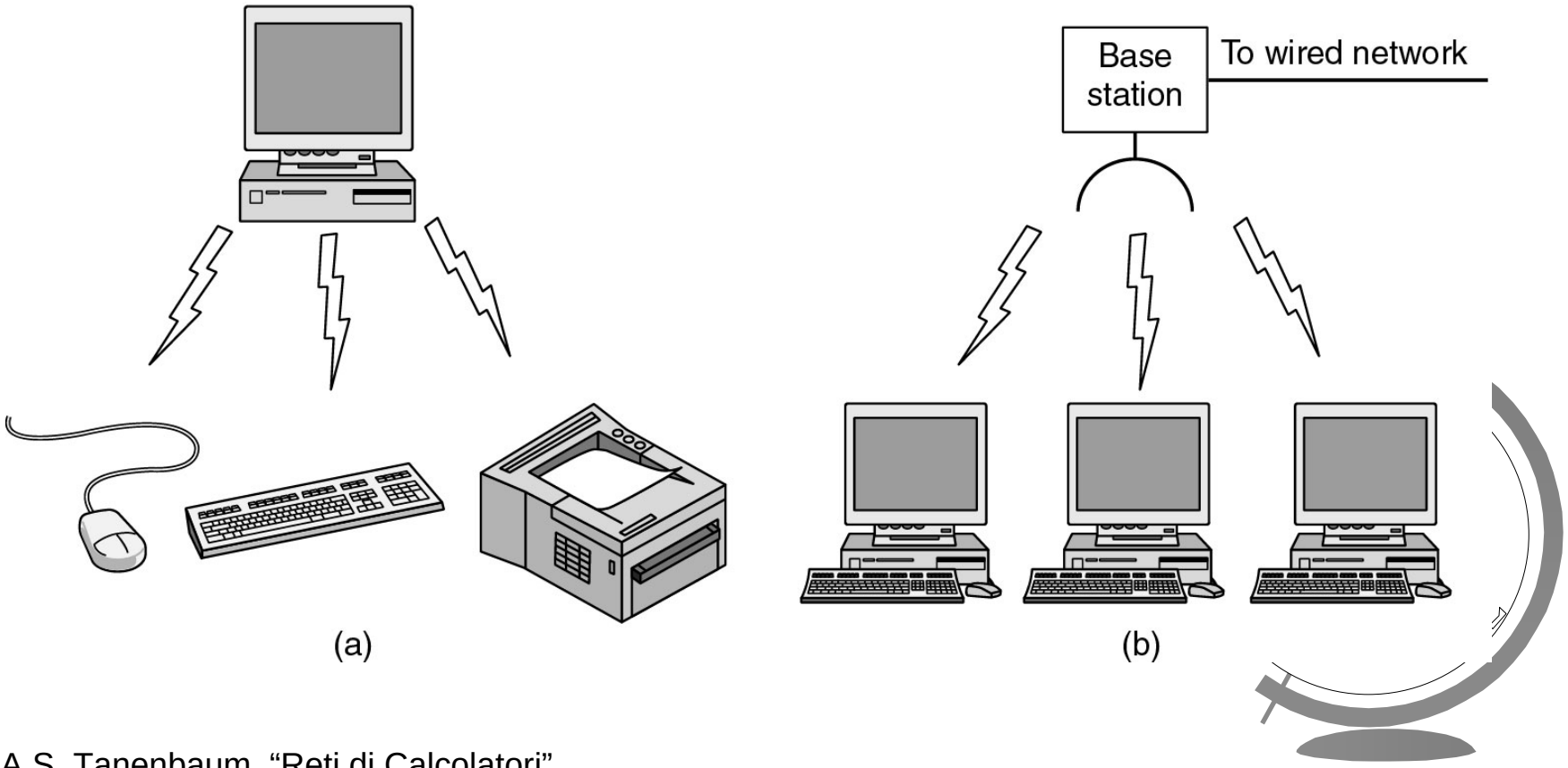
Internet


INTERNATIONAL CONNECTIVITY
Version 16 - 6/15/97
Internet
Bitnet but not Internet
EMail Only (UUCP, FidoNet)
No Connectivity
This map may be obtained via anonymous ftp
from ftp.cs.wisc.edu, connectivity_table directory
Copyright © 1997
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Wireless Networks

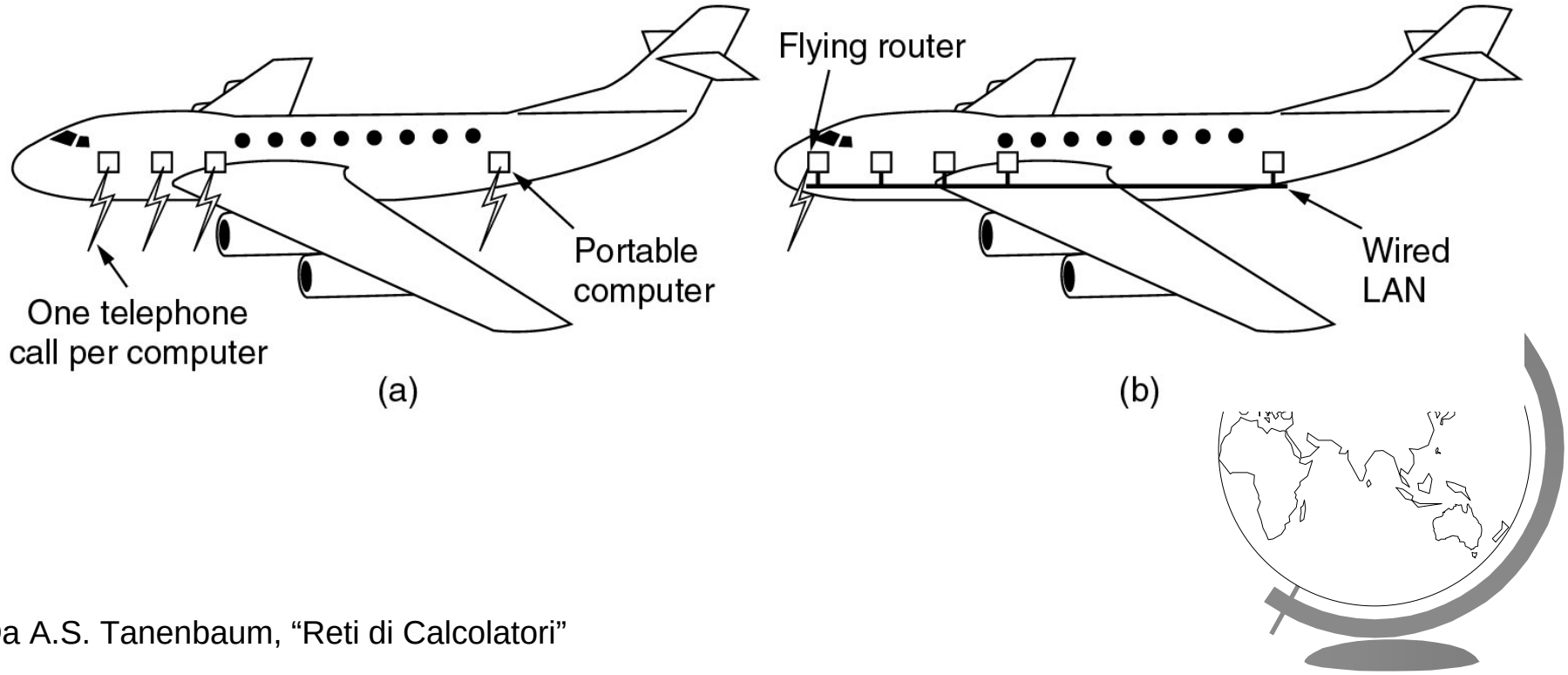
- (a) Bluetooth
- (b) Wireless LAN (IEEE 802.11)



Da A.S. Tanenbaum, “Reti di Calcolatori”

Wireless Networks

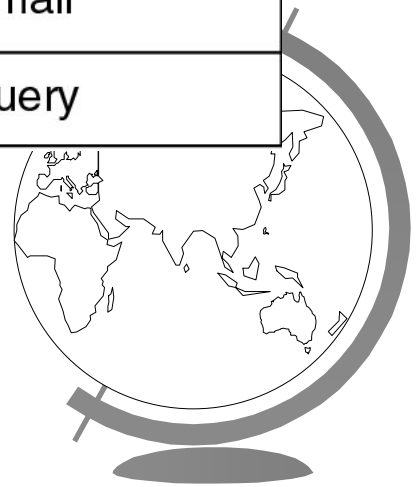
- (a) Individual mobile computers
- (b) A flying LAN



Da A.S. Tanenbaum, “Reti di Calcolatori”

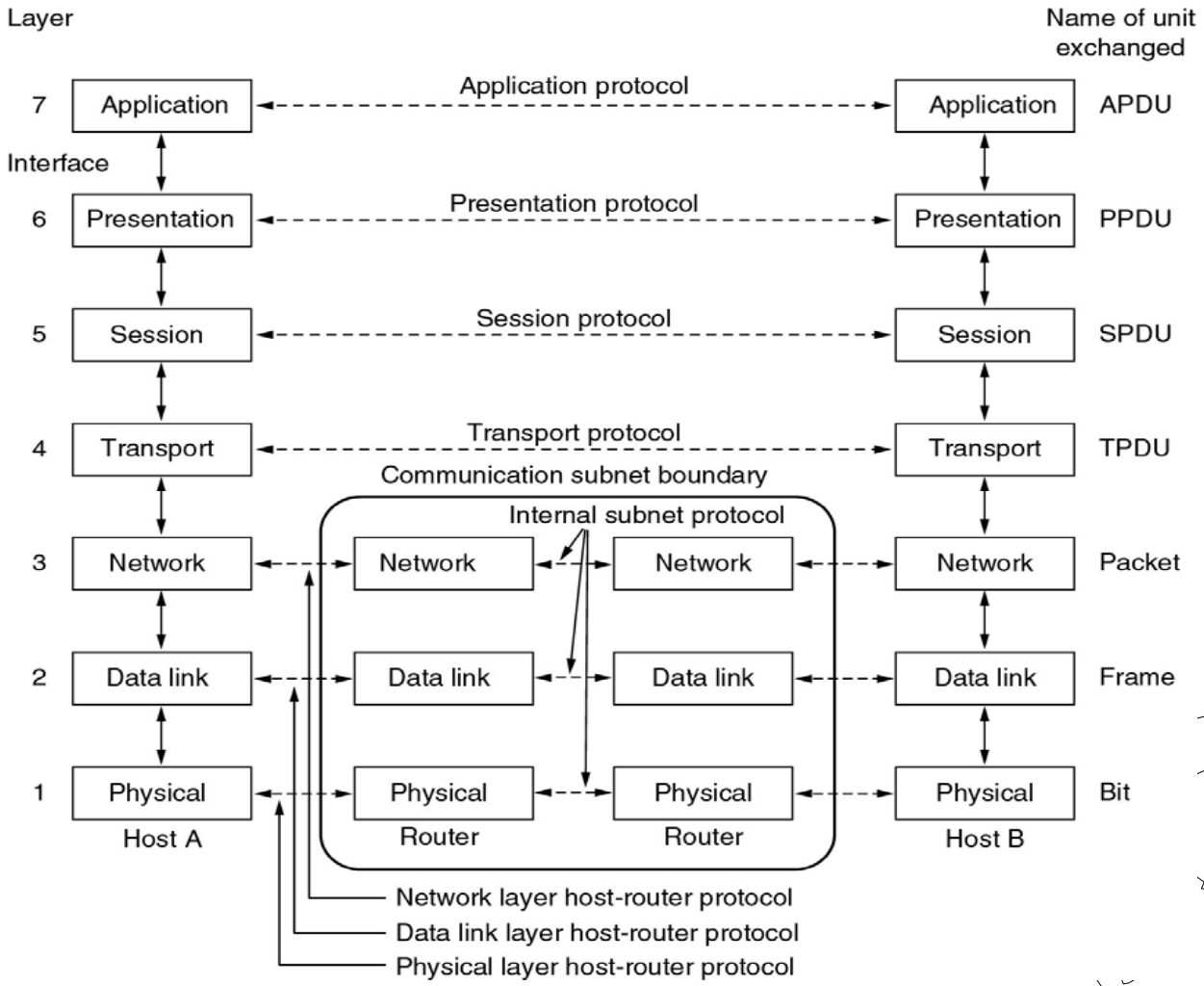
Connection-Oriented and Connectionless Services

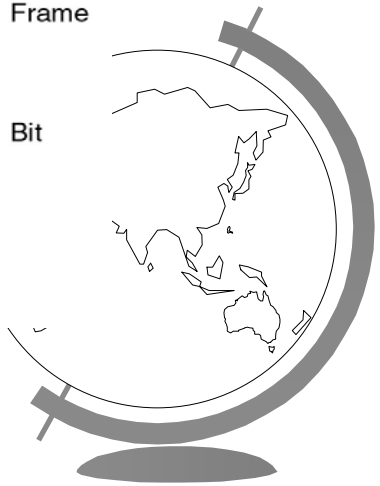
	Service	Example
Connection-oriented	Reliable message stream	Sequence of pages
	Reliable byte stream	Remote login
	Unreliable connection	Digitized voice
Connection-less	Unreliable datagram	Electronic junk mail
	Acknowledged datagram	Registered mail
	Request-reply	Database query



Da A.S. Tanenbaum, “Reti di Calcolatori”

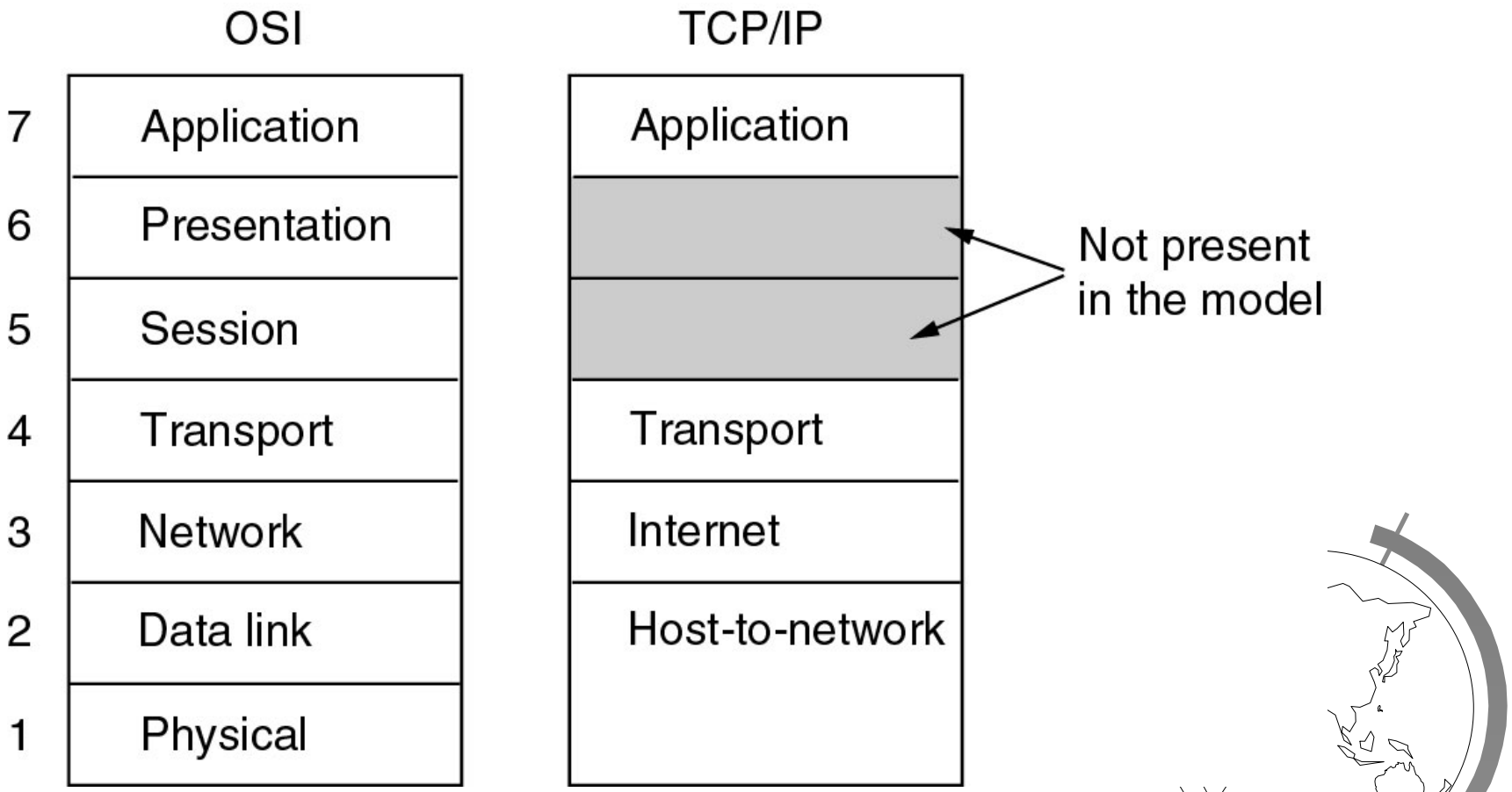
Modello di Riferimento OSI





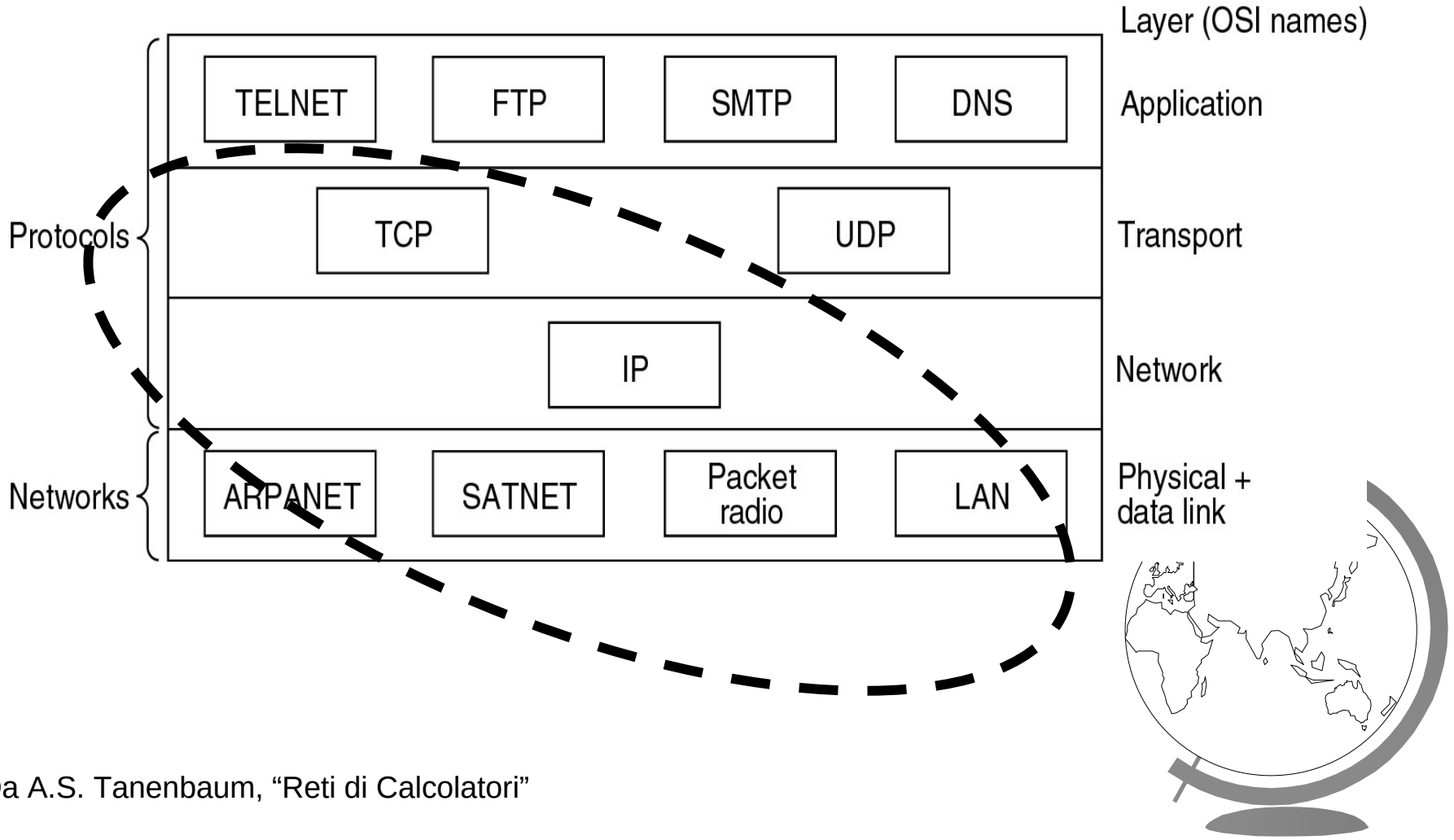
Da A.S. Tanenbaum, “Reti di Calcolatori”

MODELLI DI RIFERIMENTO



Da A.S. Tanenbaum, “Reti di Calcolatori”

MODELLI DI RIFERIMENTO



Da A.S. Tanenbaum, “Reti di Calcolatori”

COMMUTAZIONE DI PACCHETTO A CIRCUITO VIRTUALE e DATAGRAM: Confronto

Issue	Datagram subnet	Virtual-circuit subnet
Circuit setup	Not needed	Required
Addressing	Each packet contains the full source and destination address	Each packet contains a short VC number
State information	Routers do not hold state information about connections	Each VC requires router table space per connection
Routing	Each packet is routed independently	Route chosen when VC is set up; all packets follow it
Effect of router failures	None, except for packets lost during the crash	All VCs that passed through the failed router are terminated
Quality of service	Difficult	Easy if enough resources can be allocated in advance for each VC
Congestion control	Difficult	Easy if enough resources can be allocated in advance for each VC

Da A.S. Tanenbaum, “Reti di Calcolatori”

ENTI DEL MONDO DEGLI STANDARD

- **PTT** (Post, Telegraph & Telephone): ammimistrazione che ha una qualche autorità in una nazione per i servizi trasmissivi (Italia: Ministero PT);

- **CCITT** (Comitè Consultatif International de Telegraphie et Telephonie): organismo internazionale che emette le specifiche tecniche per le PTT. Di recente è entrato a far parte del ***ITU*** (International Telecommunication Union), organo specializzato dell' O.N.U.;
  - ***ITU-T*** : Comitato consultivo internazionale di Telegrafia e Telefonia
  - ITU-R : Comitato consultivo internazionale di Radiocomunicazione
  - ***Raccomandazioni*** serie X (reti digitali) e serie V (reti analogiche)

- ISO (International Standard Organization): è il principale ente di standardizzazione internazionale che si occupa anche di reti di calcolatori;



- IEEE (Institute of Electrical and Electronics Engineers): è l'organizzazione professionale mondiale degli ingegneri elettrici ed elettronici con gruppi di standardizzazione sulle reti di calcolatori;

- EIA/TIA (Electronic/Telecommunications Industry Association).

TESTI CONSIGLIATI

- M.Casoni, *Lezioni di Tecniche di Interconnessione*, Pitagora Editrice.
- M.L. Merani, M. Casoni, W. Cerroni, *Hands-On Networking From Theory to Practice*, Cambridge University Press.
- R.Ramaswami, K.N.Sivarajan, *Optical Networks, a Practical Perspective*, Morgan Kaufmann, ISBN 1 55860 445 6.
- Z. Wang, *Internet QoS: Architectures and Mechanisms for Quality of Service*, Morgan Kaufmann, ISBN: 1558606084
- Dispense come integrazione

