

# **The OSI Model and TCP/IP Protocol Suite**

7

Application

6

Presentation

5

Session

4

Transport

3

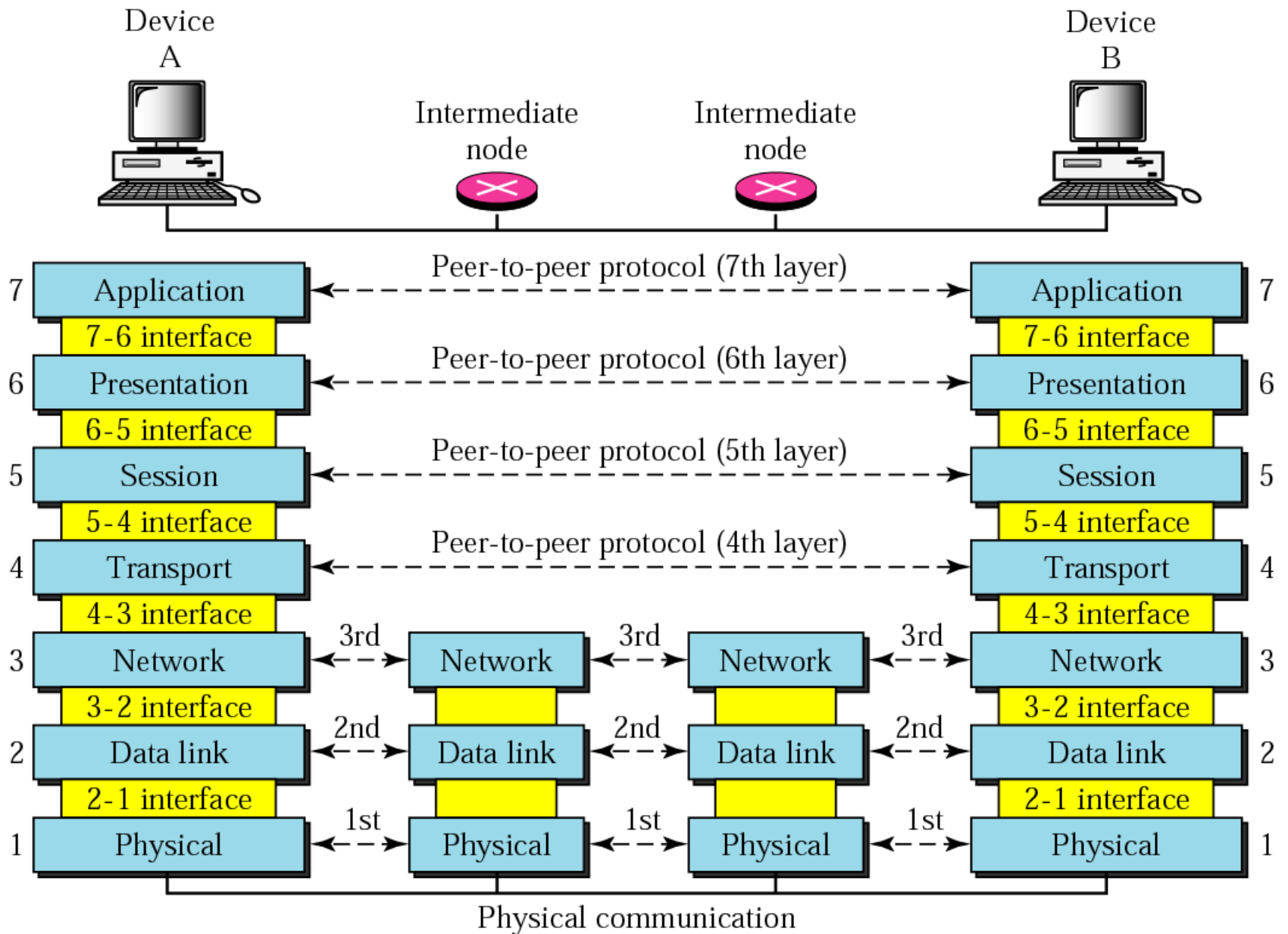
Network

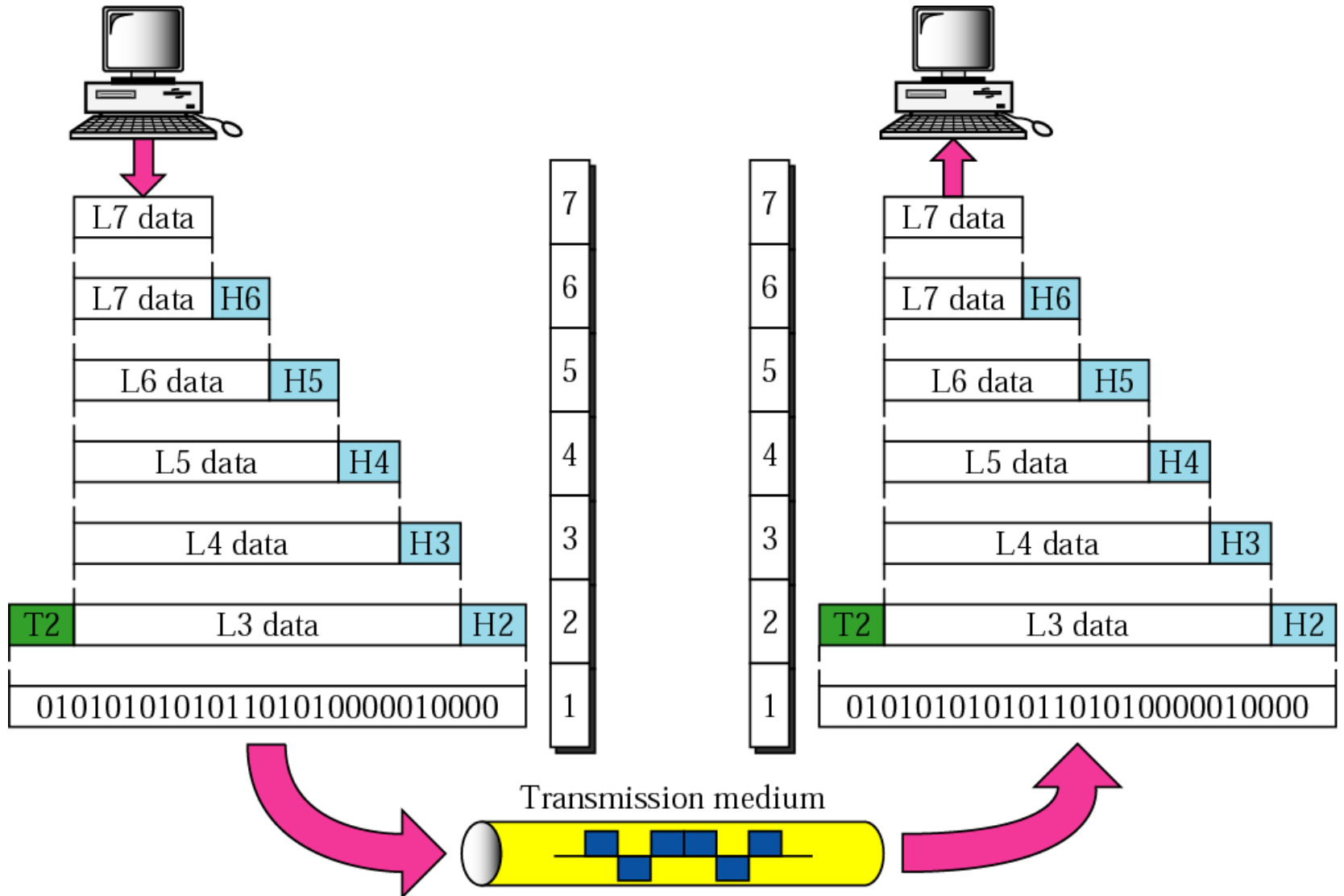
2

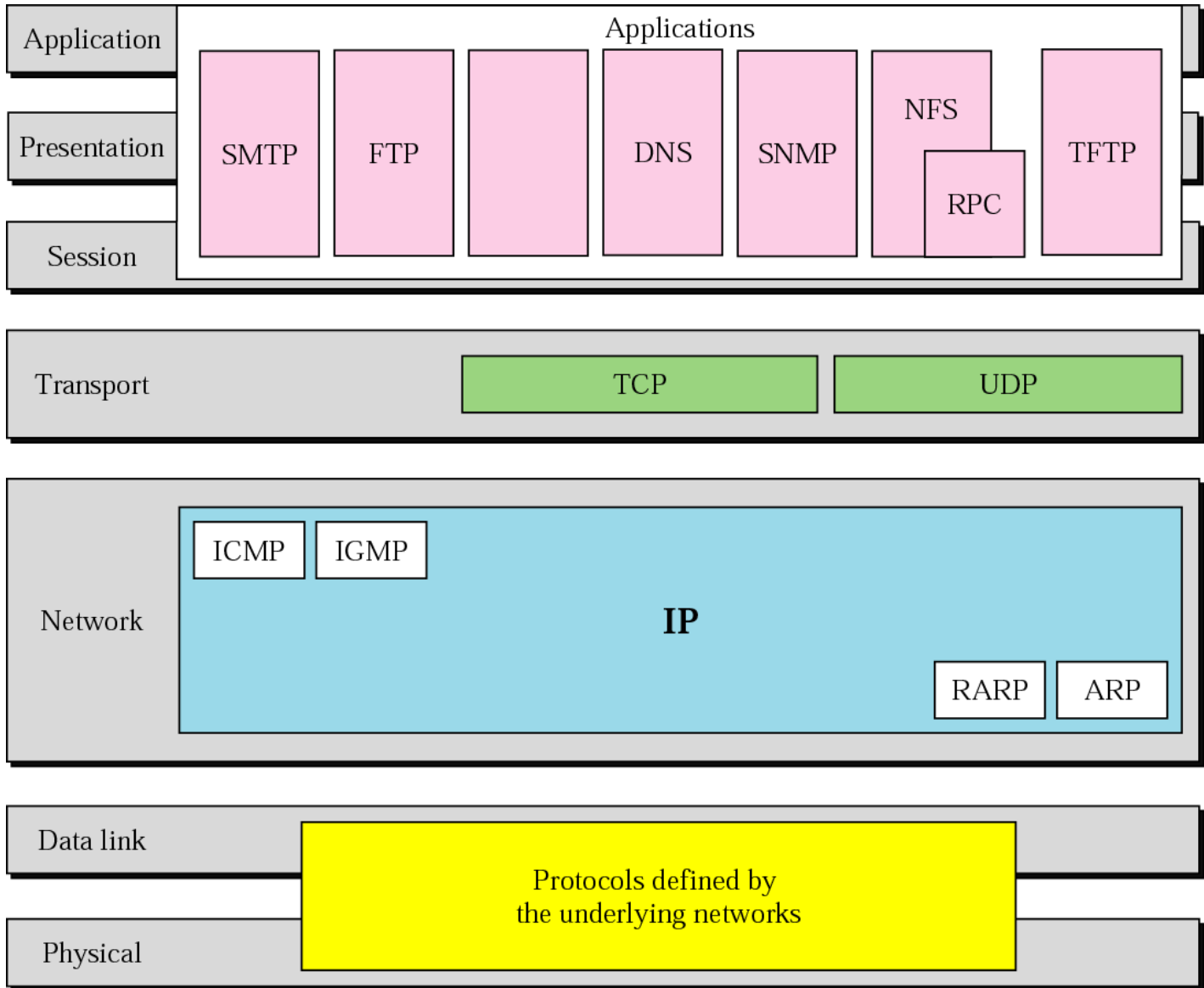
Data link

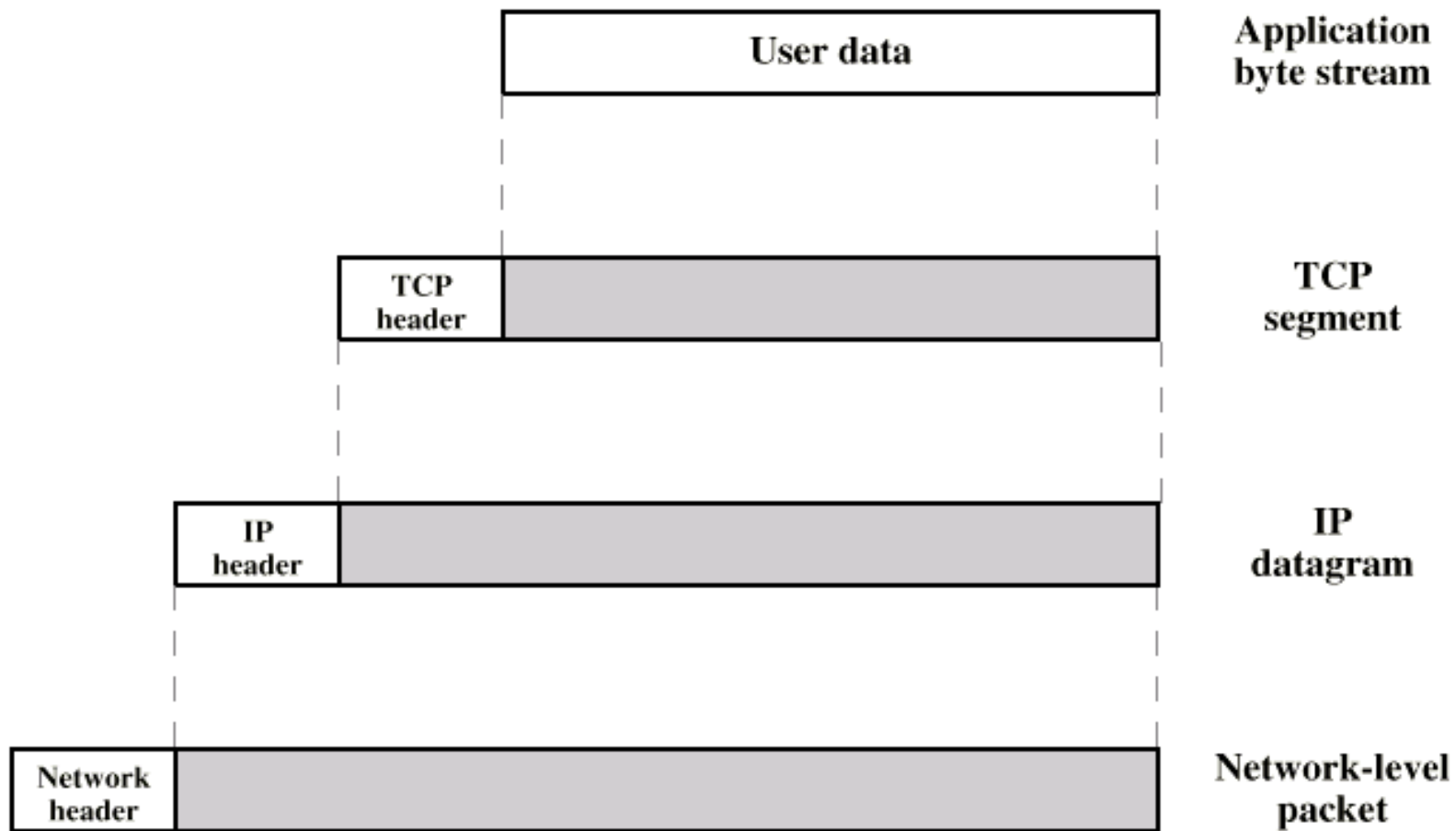
1

Physical









# Physical Layer

- Mengatur masalah kelistrikan dan bentuk fisik media penghantar



# Protocol in Physical Layer (TCP/IP or Other)

- RS-232
- T1
- E1
- 10BASE5
- 10BASE2
- 10BASE-FL
- 10BASE-T
- 100BASE-TX
- 100BASE-FX
- 100BASE-T4
- 100BASE-SX/LX
- POTS
- SONET
- DSL
- 802.11a/b/g/n  
PHY

# **Protocol in Physical Layer (SS7 – Signaling System 7)**

- **MTP-1**

# Protocol in Physical Layer (AppleTalk)

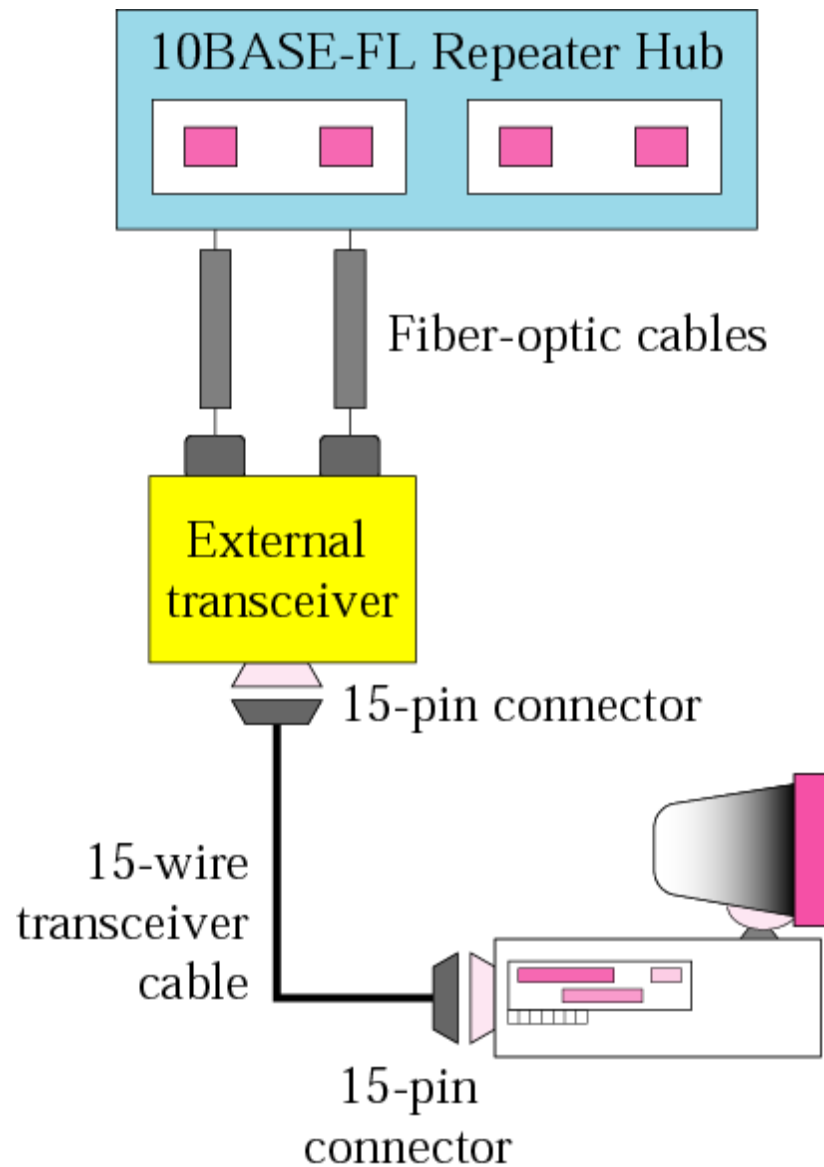
- RS-232
- RS-422
- STP
- PhoneNet

# Protocol in Physical Layer (OSI)

- X.25
- X.21bis
- EIA/TIA-232
- EIA/TIA-449
- EIA-530
- G.703

Figure 3-5:d

# Ethernet implementation



d. 10BASE-FL

# 10BASE2

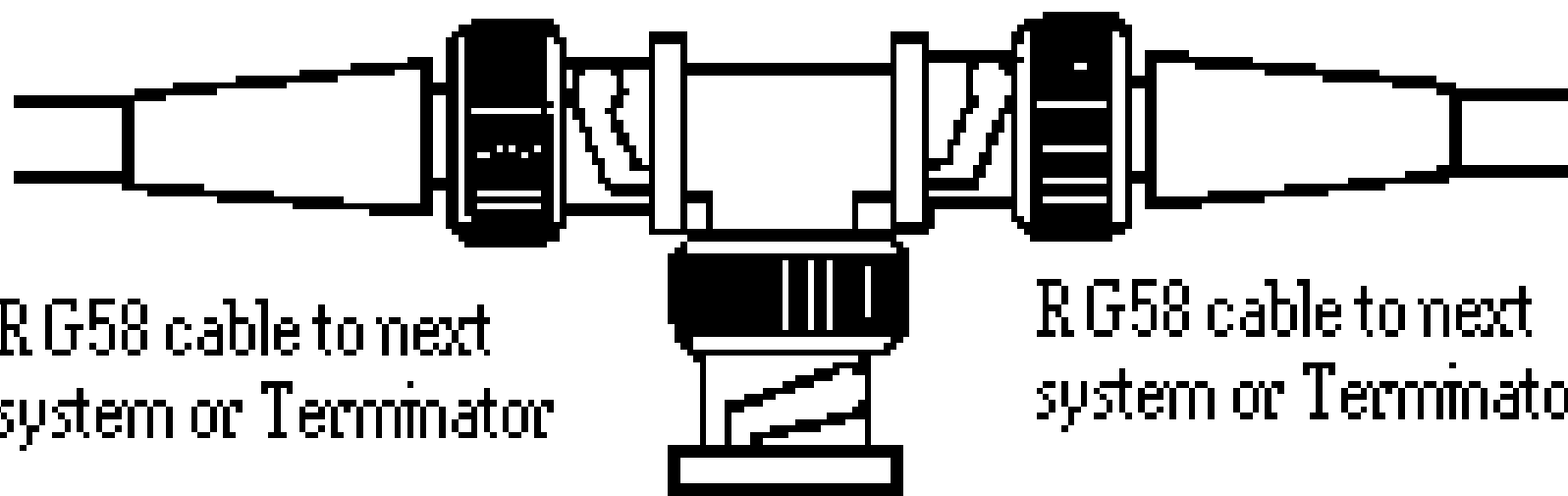
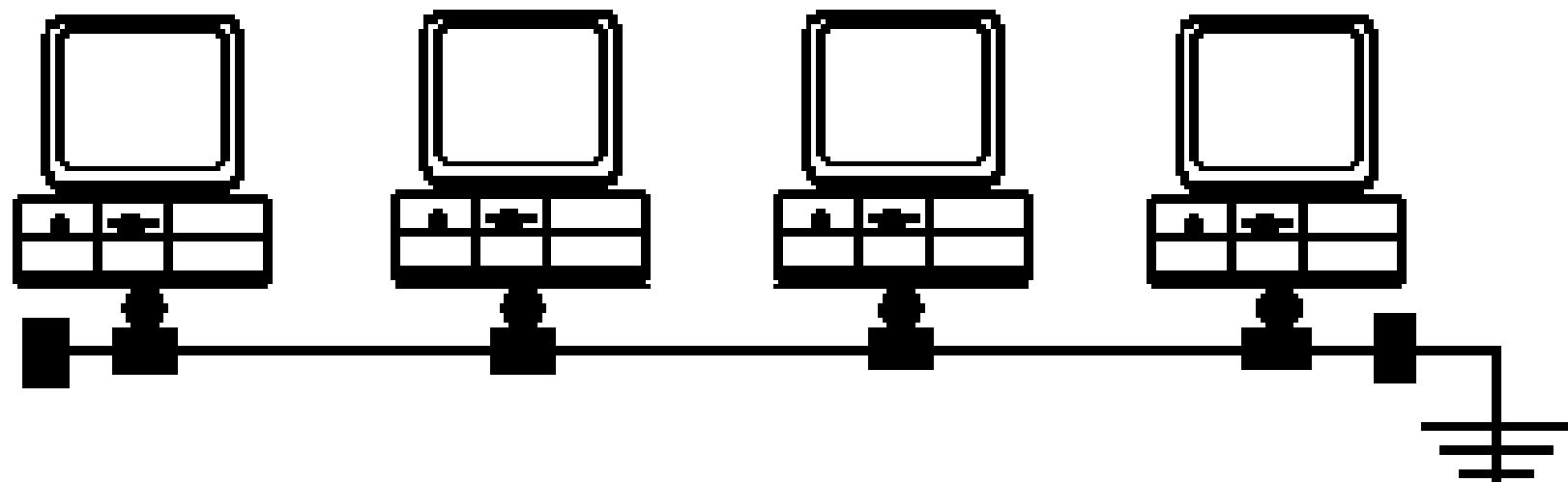
- **10BASE2** (*cheapernet, thin ethernet, thinnet or thinwire*)
- Varian dari Ethernet
- thin coaxial cable **RG-58**
- terminator : **BNC connectors**
- Bandwidth = 10 Mbps
- Practical = 6 Mbps



# 50 Ohm Terminator







RG58 cable to next  
system or Terminator

RG58 cable to next  
system or Terminator

connect to BNC on the netcard

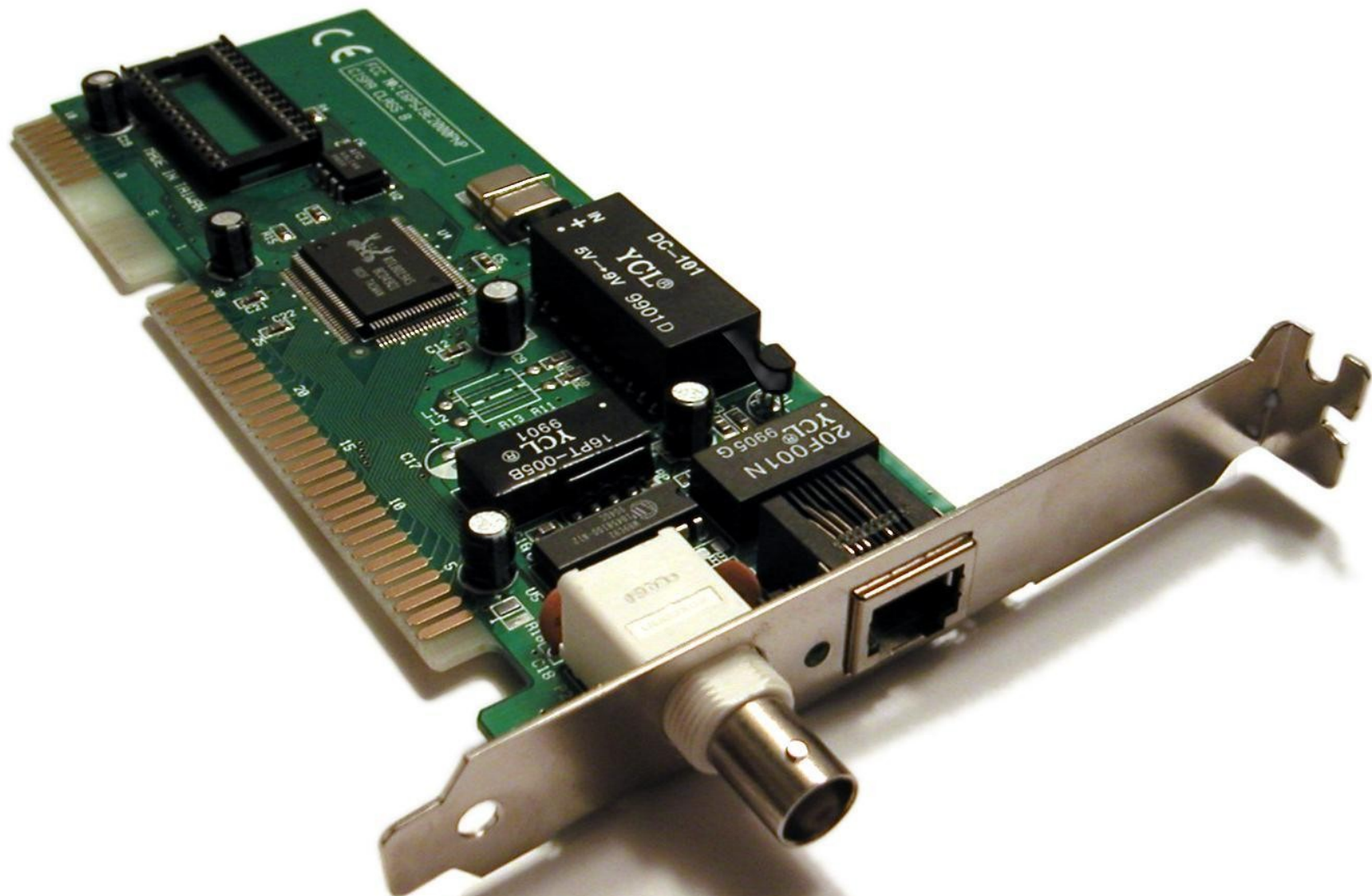
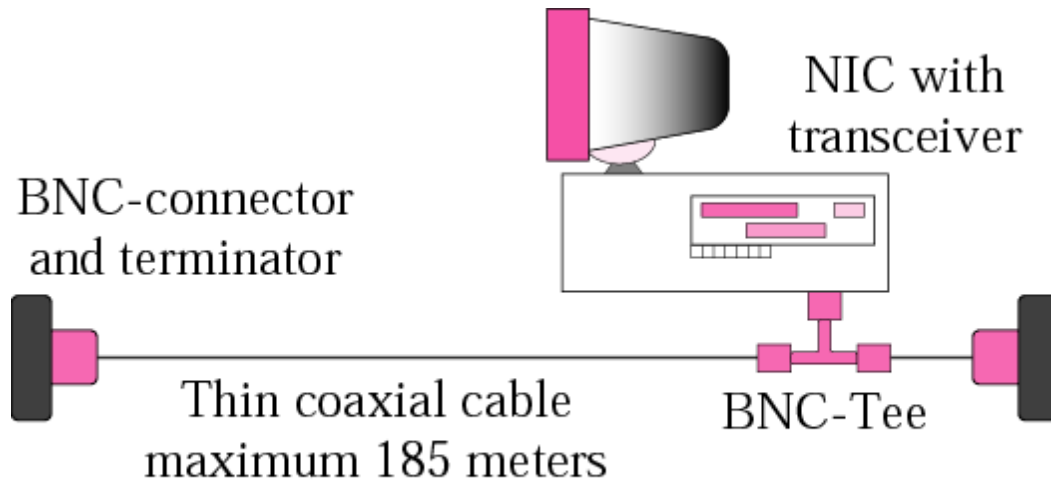


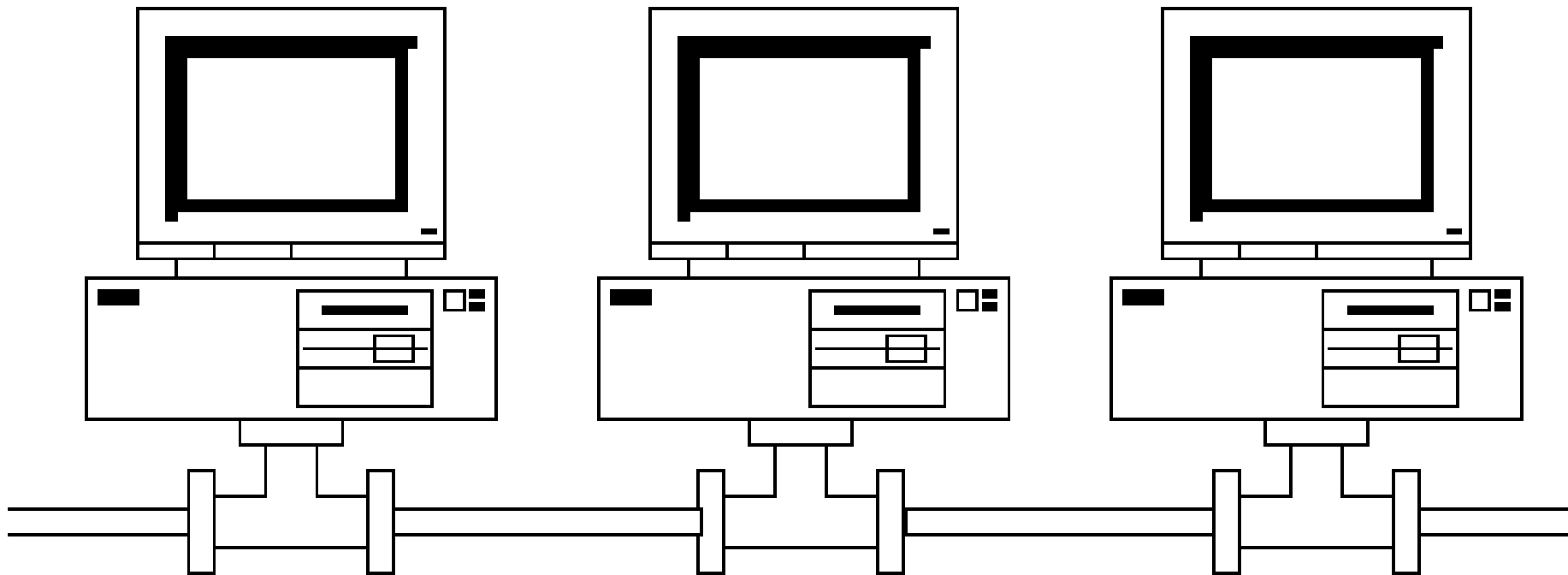


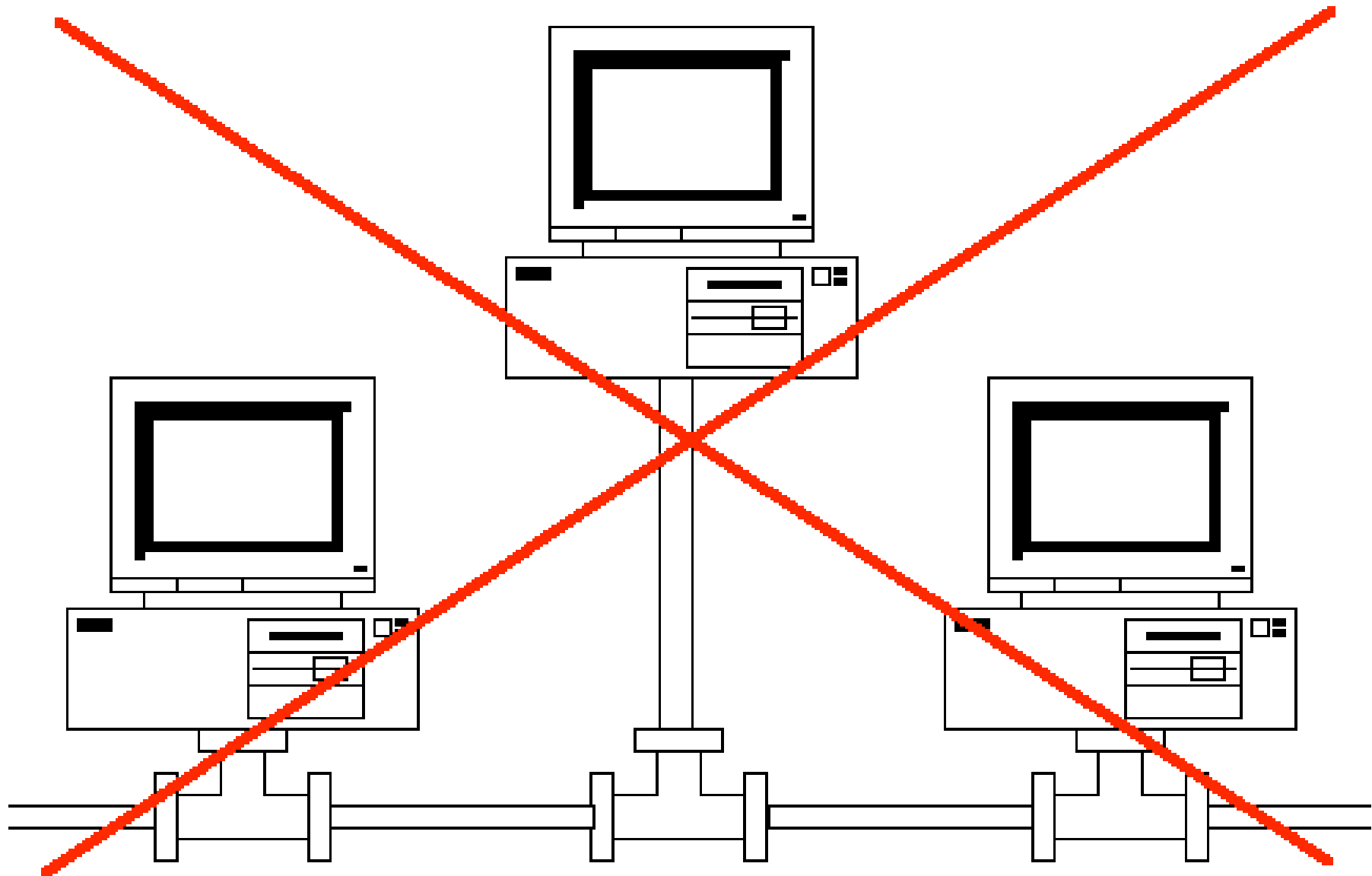
Figure 3-5:b

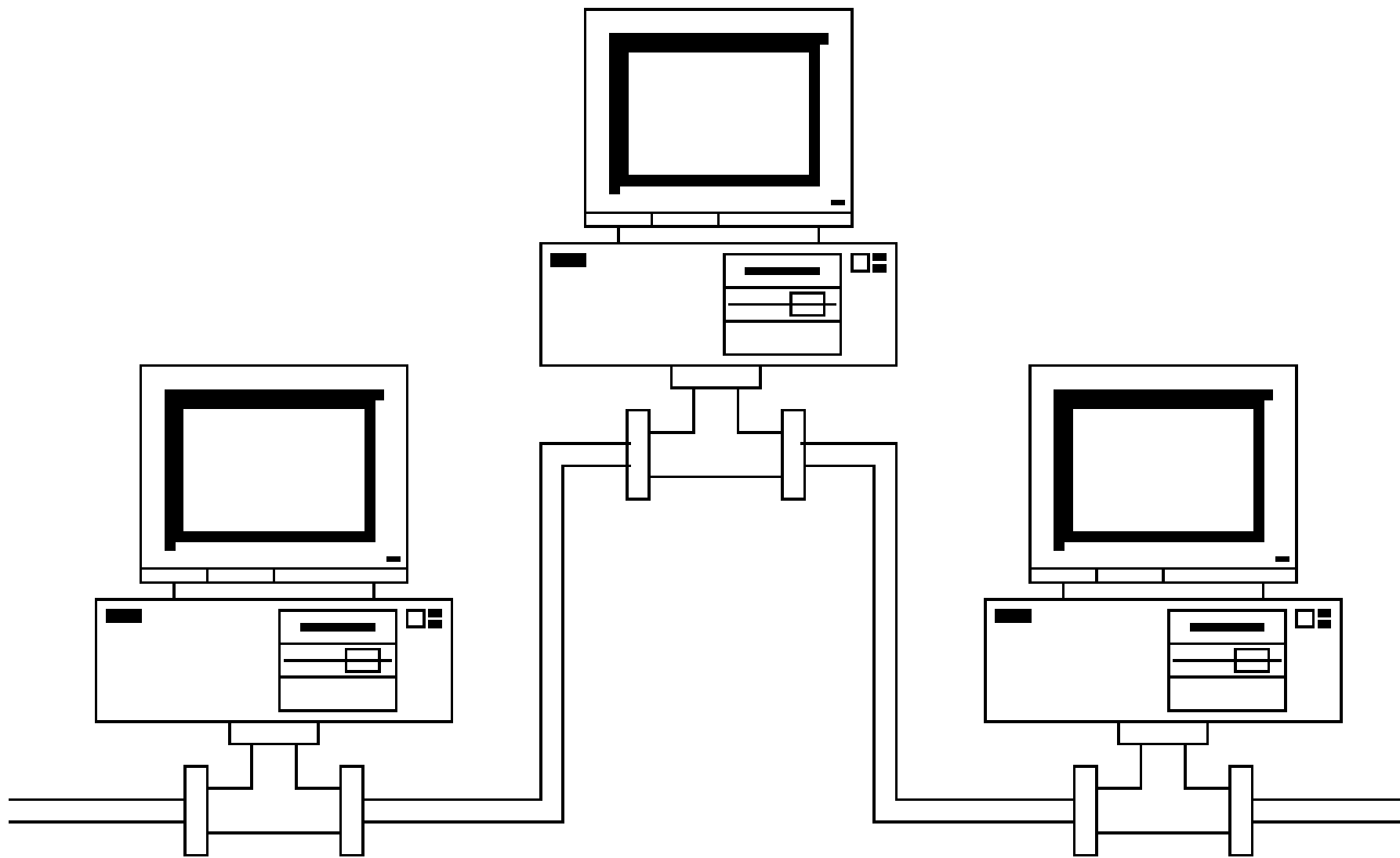
# Ethernet implementation

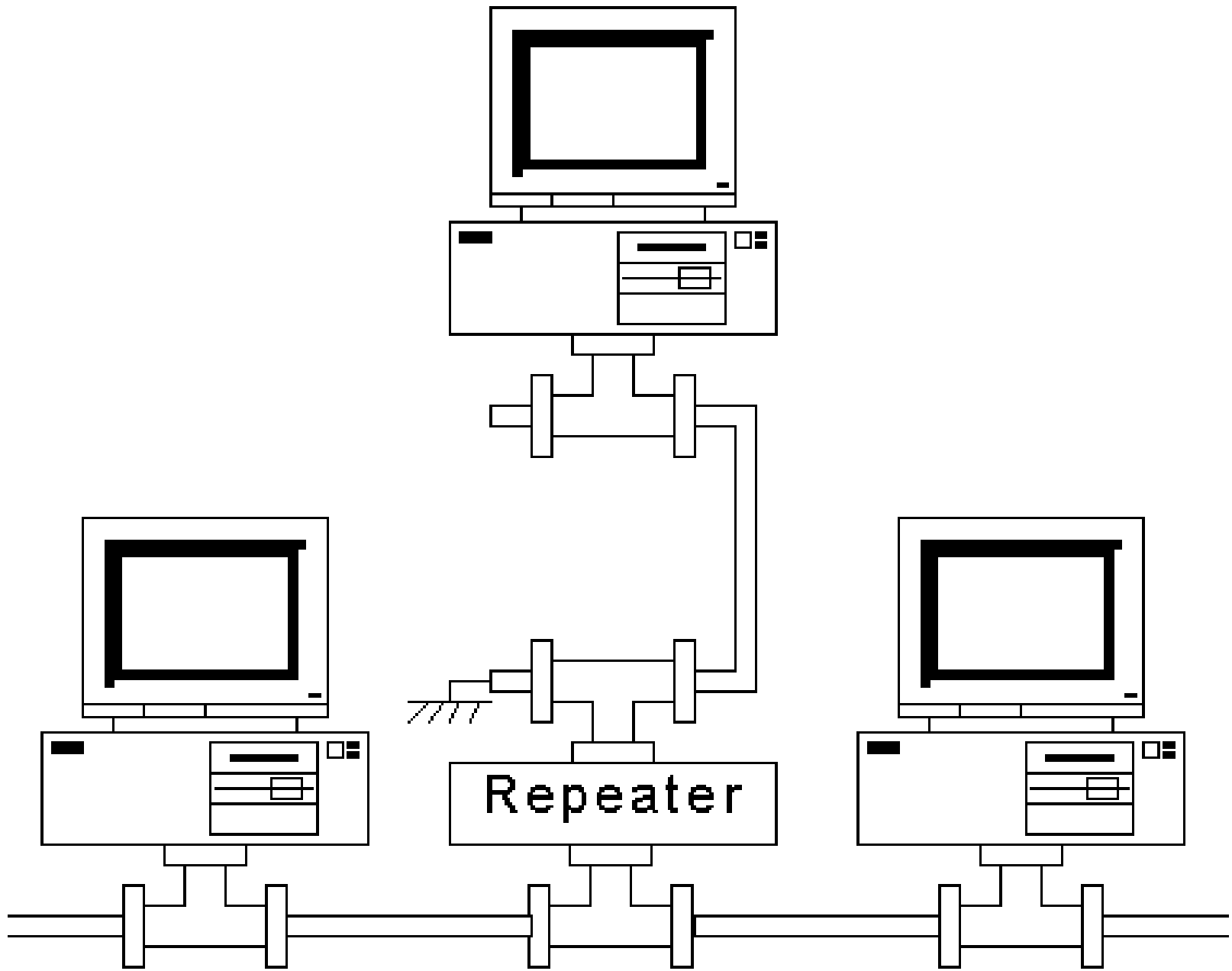


b. 10BASE2

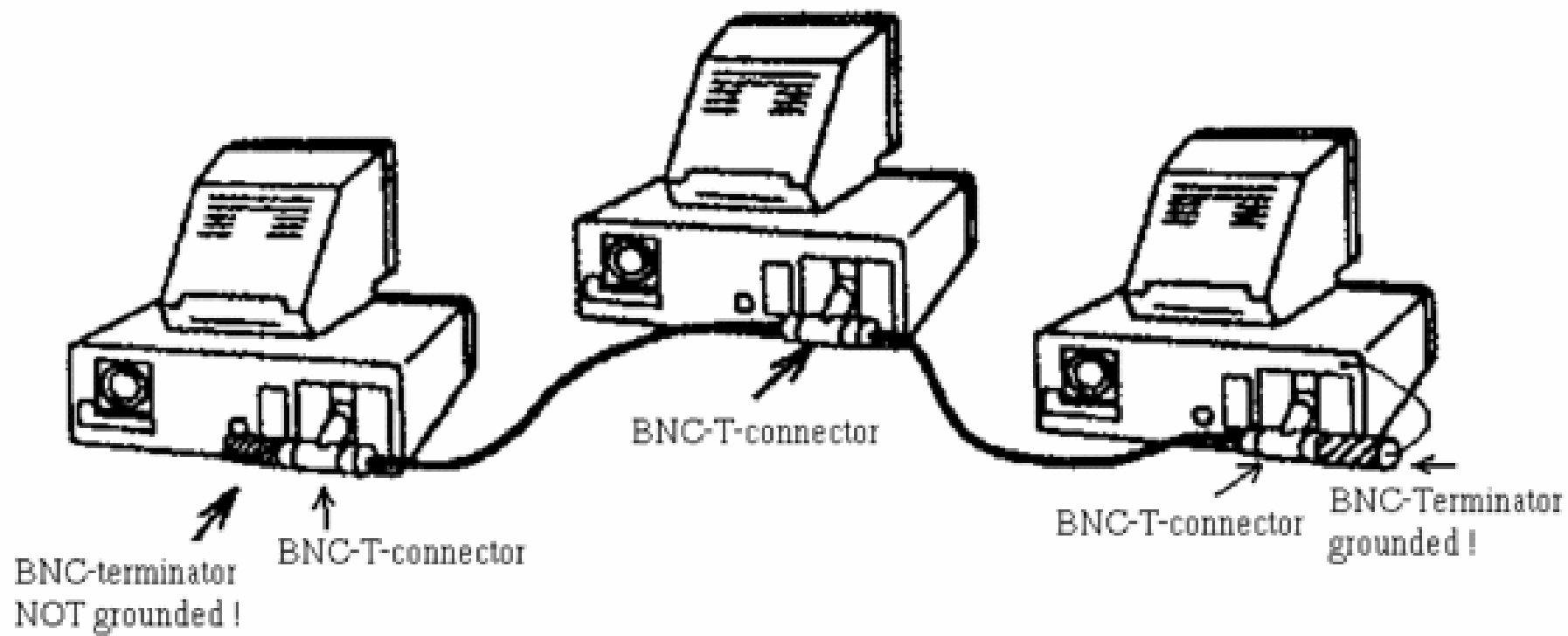












**"Open"  
Terminator**

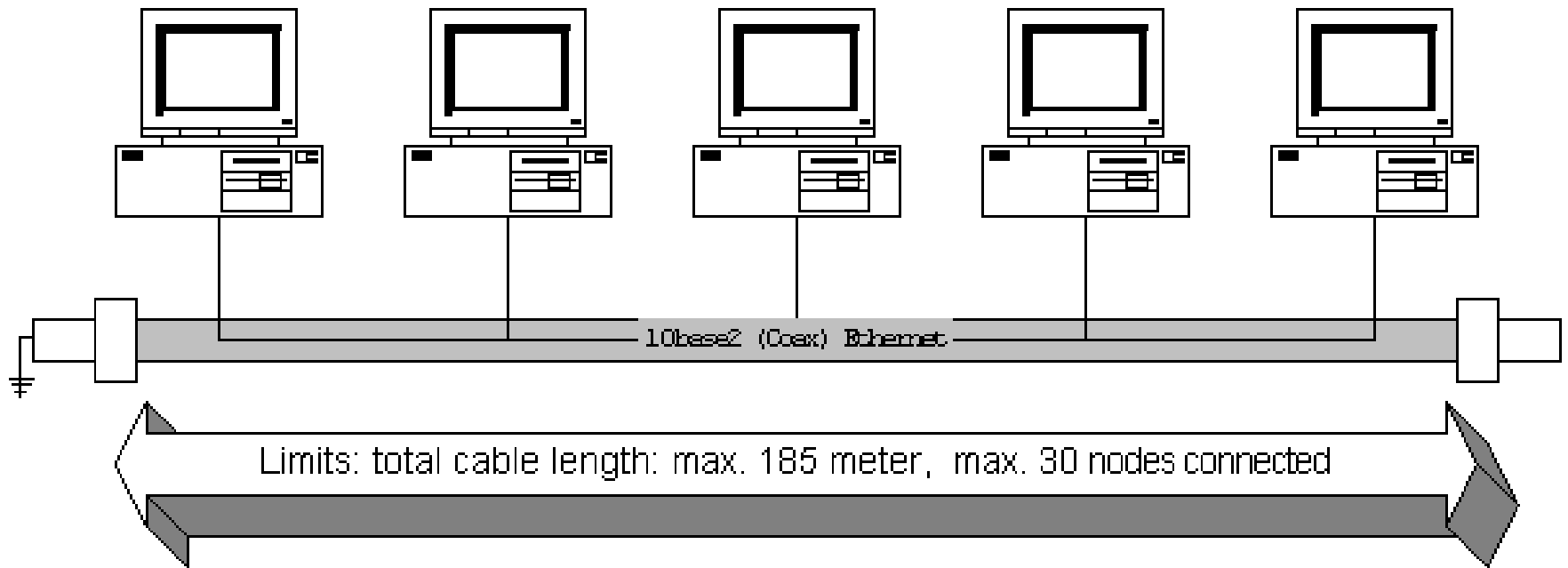


**BNC terminators**

**"Grounded"  
Terminator**



*with ground wire*



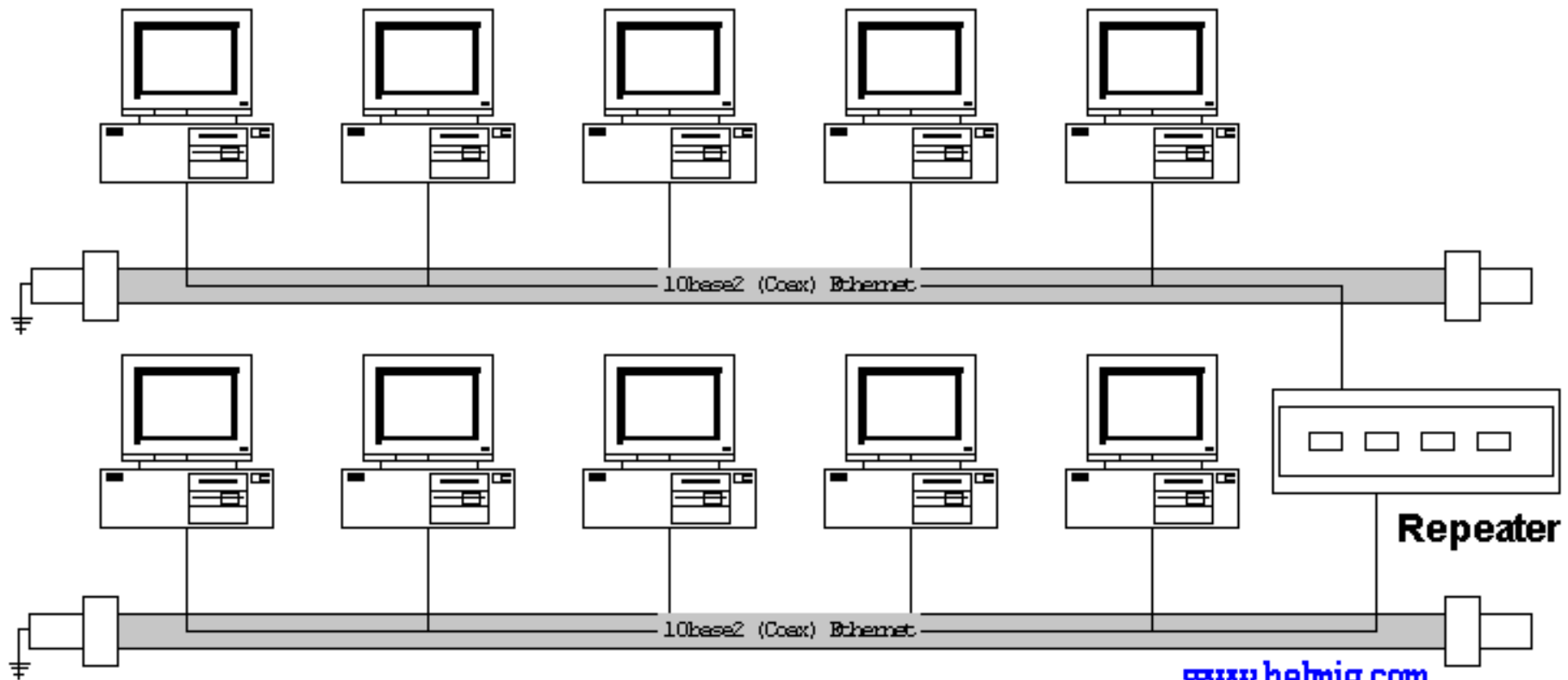
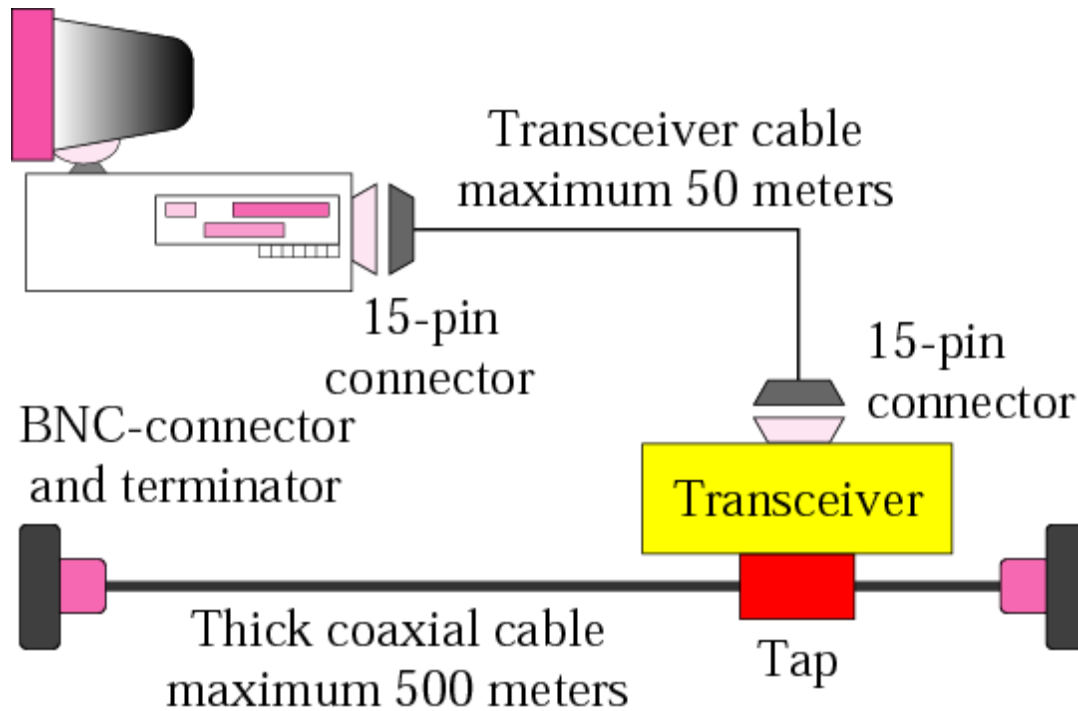


Figure 3-5:a

# Ethernet implementation



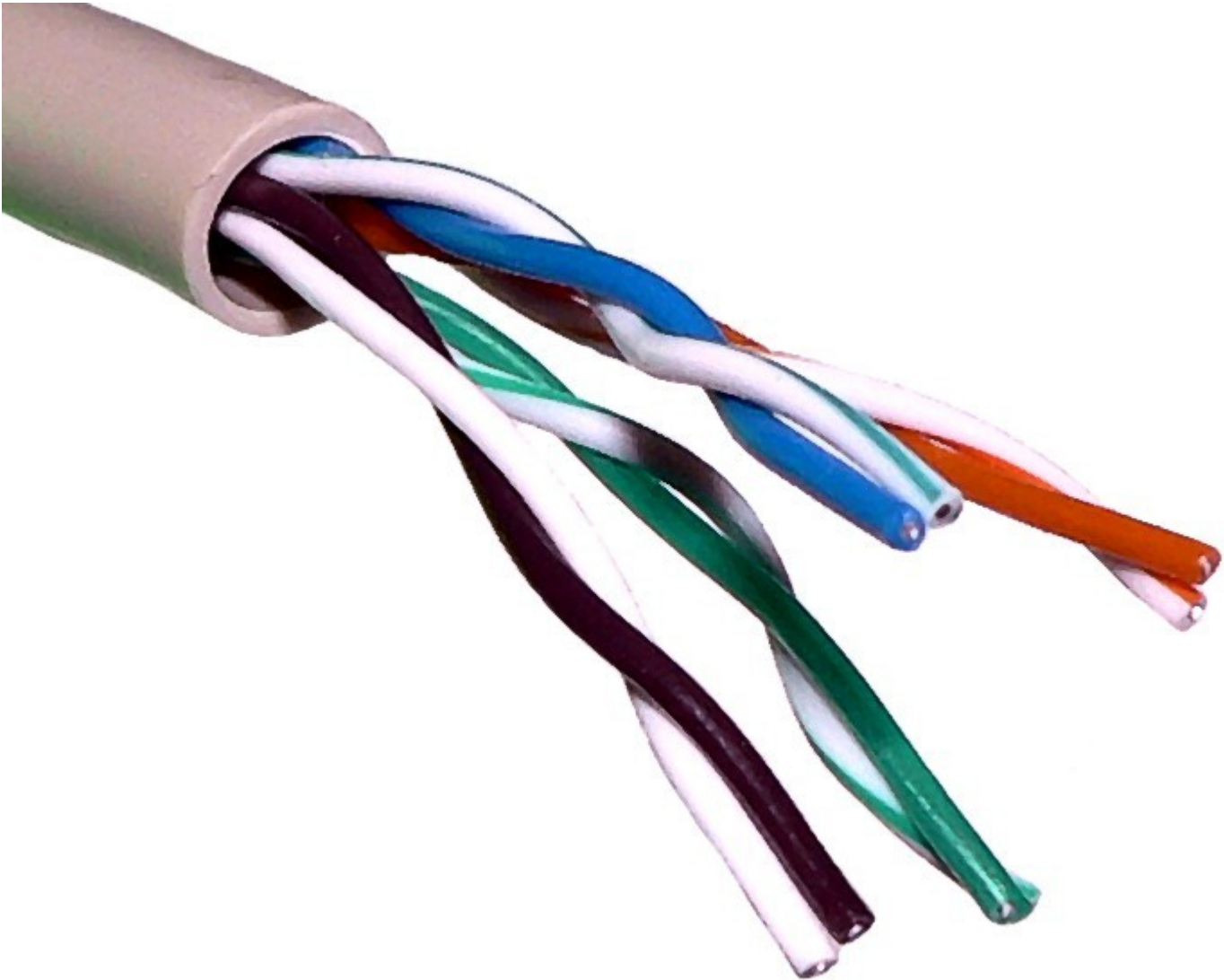
a. 10BASE5

# 10BASE-T (Ethernet)

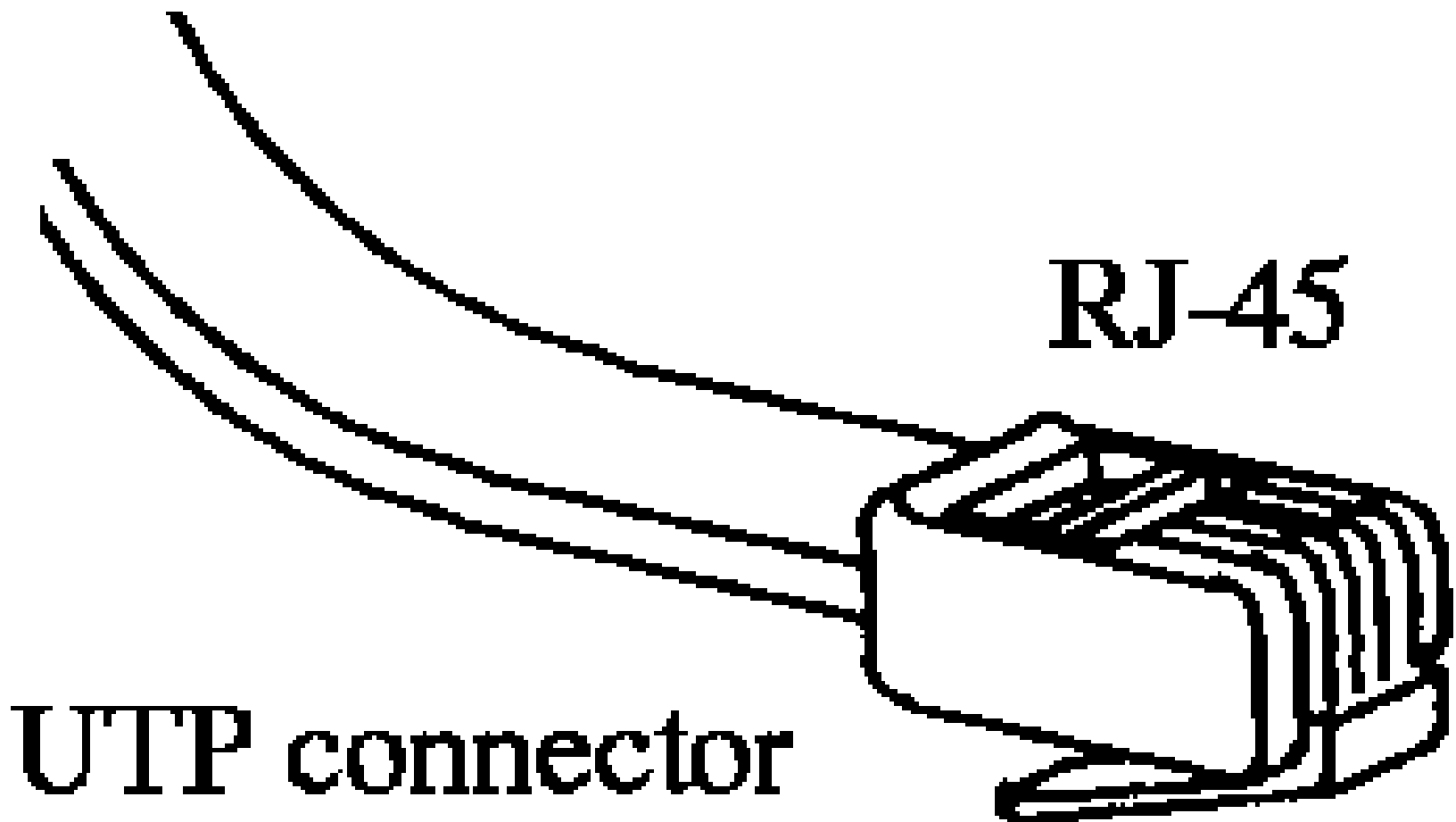
- Twisted Pair Ethernet (10baseT),  
atau "UTP" =  
Unshielded Twisted Pair",
- Konektor = RJ45

# 10BASE-T (Ethernet)

- Speed = 10 Mbps
- Max 100 meter







RJ-45

UTP connector

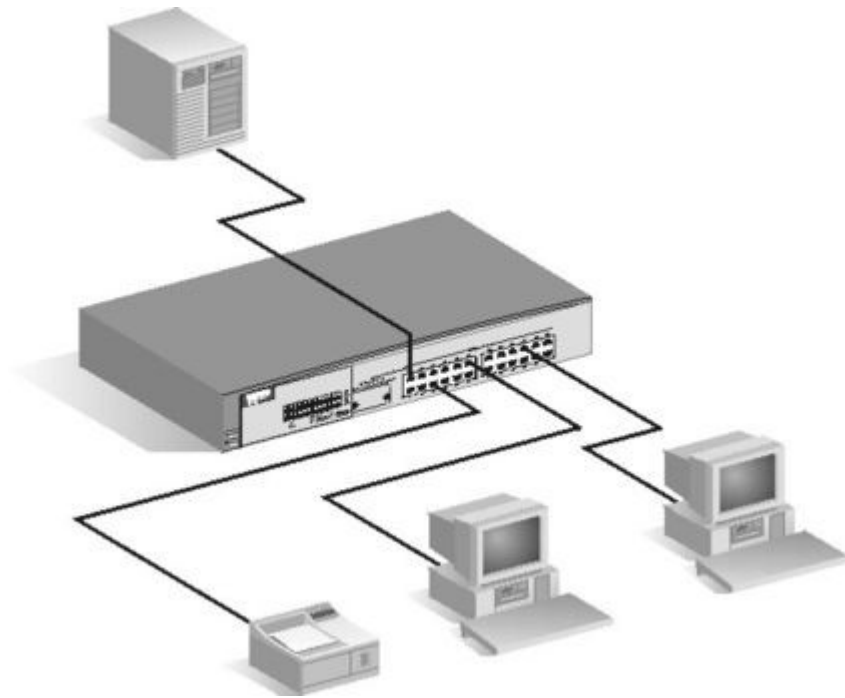




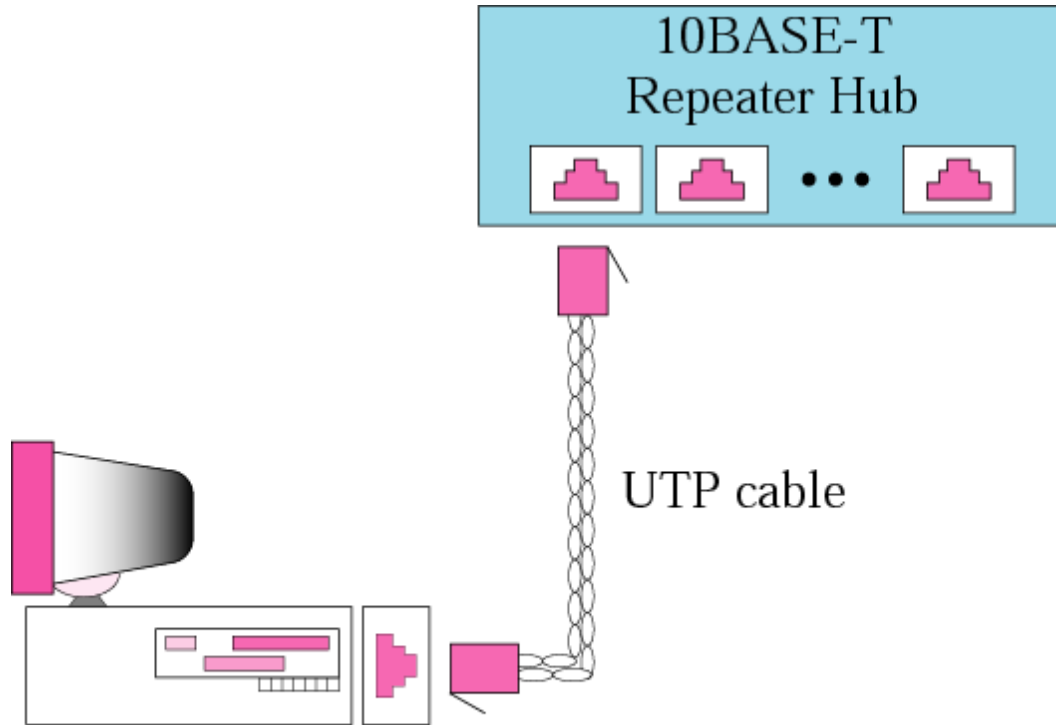
- These Twisted Pair cables connect now each PC to the "hub":







# Ethernet implementation

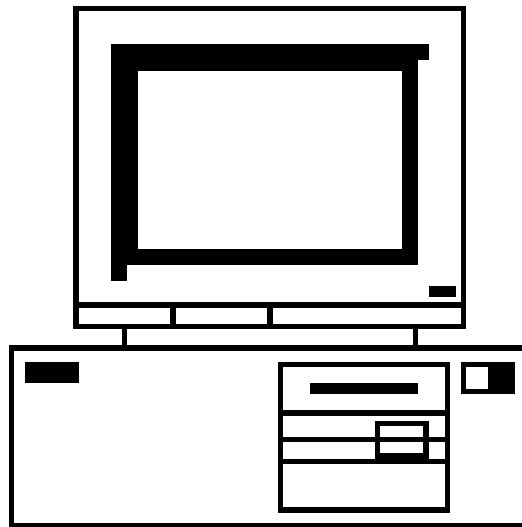


c. 10BASE-T

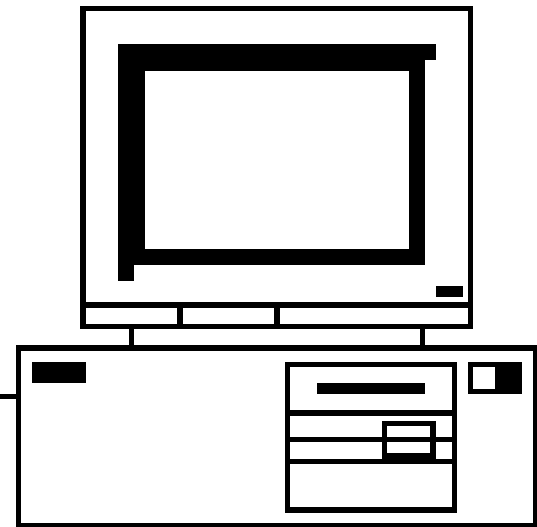
Hub



Twisted Pair  
(10baseT/UTP  
cable

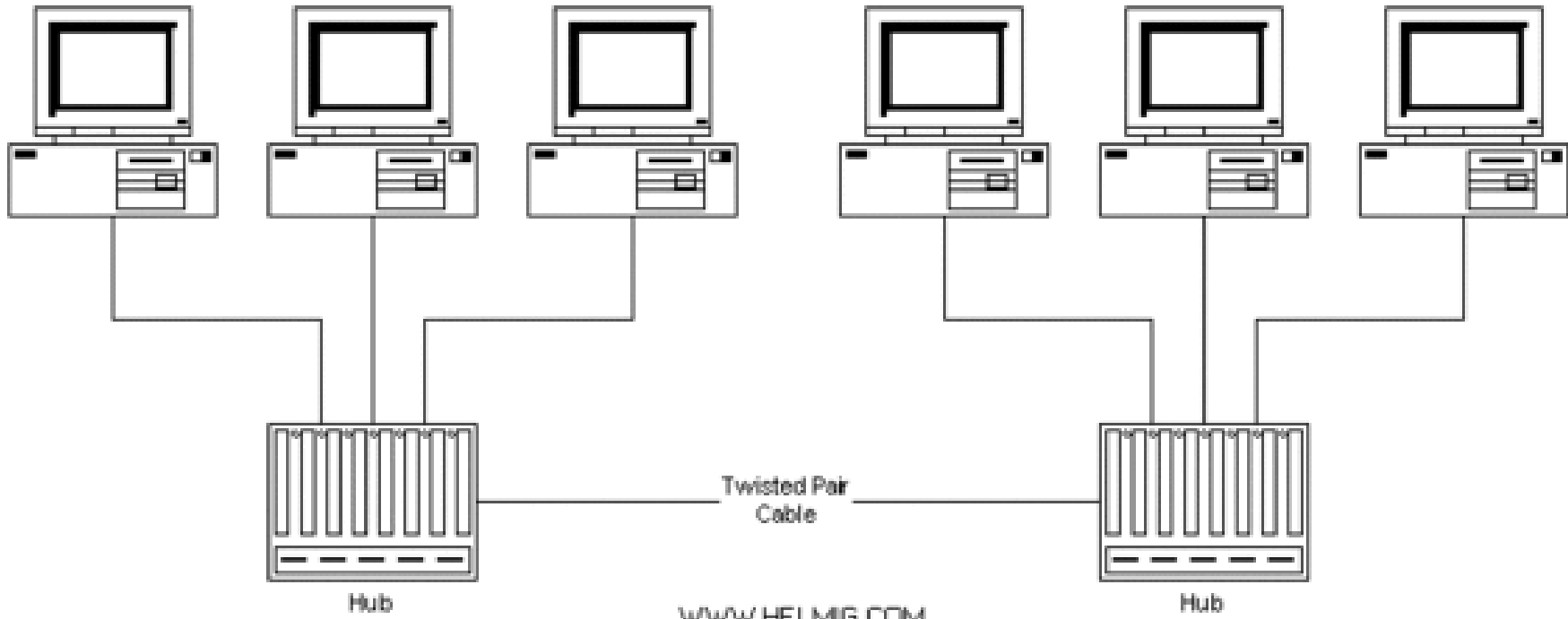


PC#1



PC#2

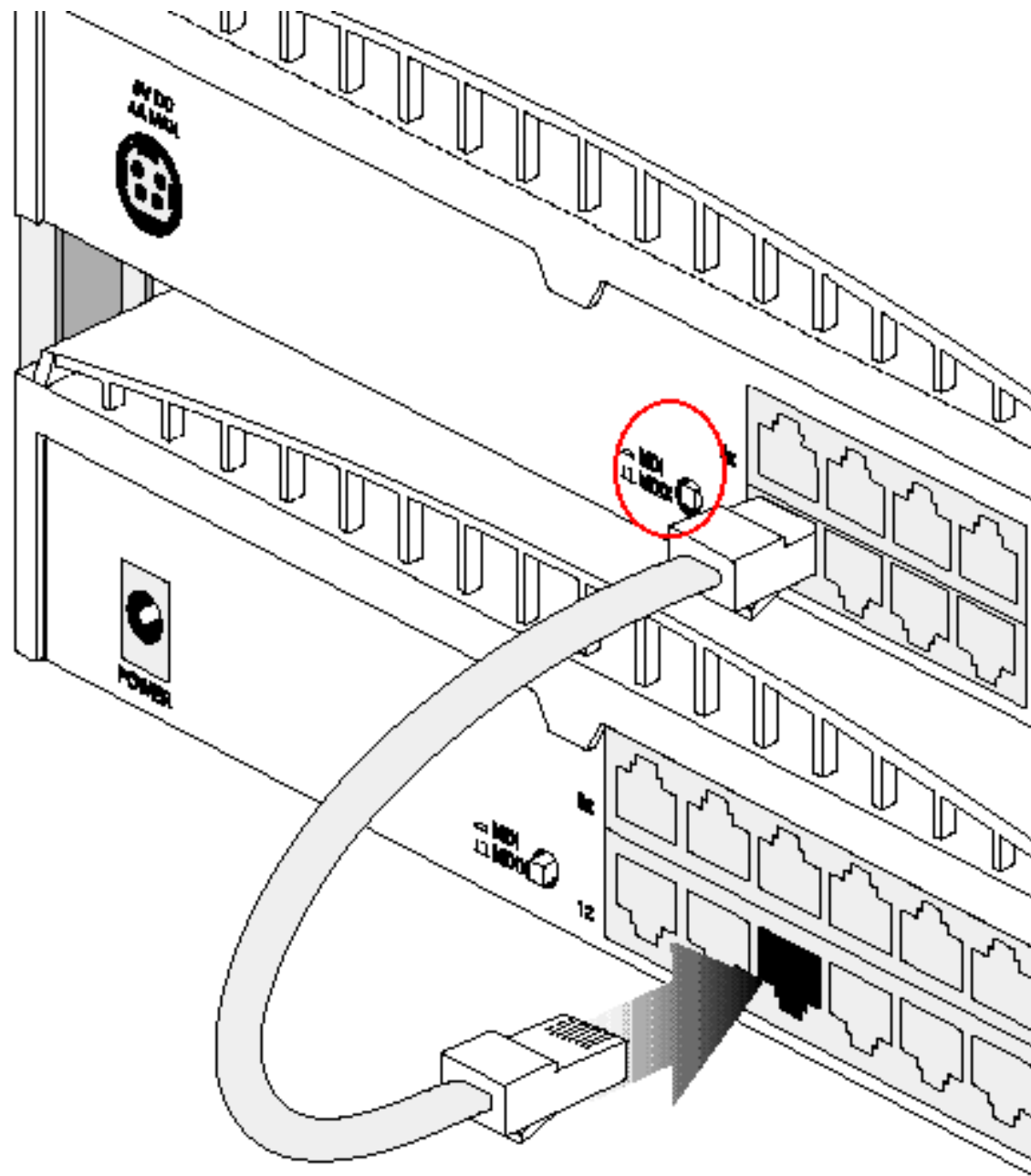




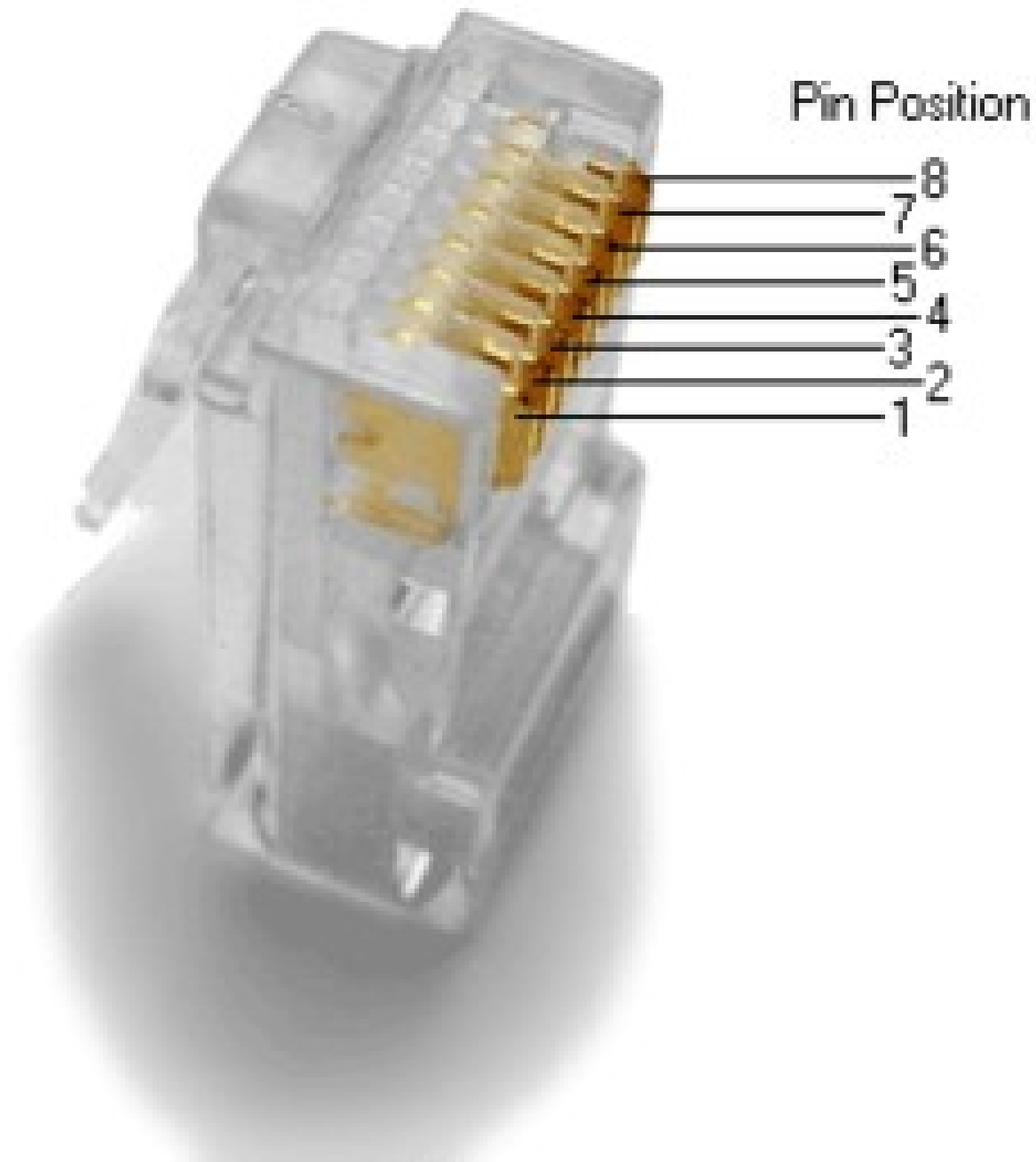
[www.HELMI.G.COM](http://www.HELMI.G.COM)

# Hub-HUB Cable

- Jika hub menggunakan konektor biasa => kabel cross
- Jika tidak, menggunakan kabel lurus



- 10BASE-T = pins 1 and 2 (transmit or TX), and pins 3 and 6 (receive or RX)



# TIA/EIA-568-A T568A Wiring

Pin	Pair	Wire	Color
1	3	tip	 white/green
2	3	ring	 green
3	2	tip	 white/orange
4	1	ring	 blue
5	1	tip	 white/blue
6	2	ring	 orange
7	4	tip	 white/brown
8	4	ring	 brown

# TIA/EIA-568-B T568B Wiring

Pin	Pair	Wire	Color
1	2	tip	 white/orange
2	2	ring	 orange
3	3	tip	 white/green
4	1	ring	 blue
5	1	tip	 white/blue
6	3	ring	 green
7	4	tip	 white/brown
8	4	ring	 brown

# Manchester code



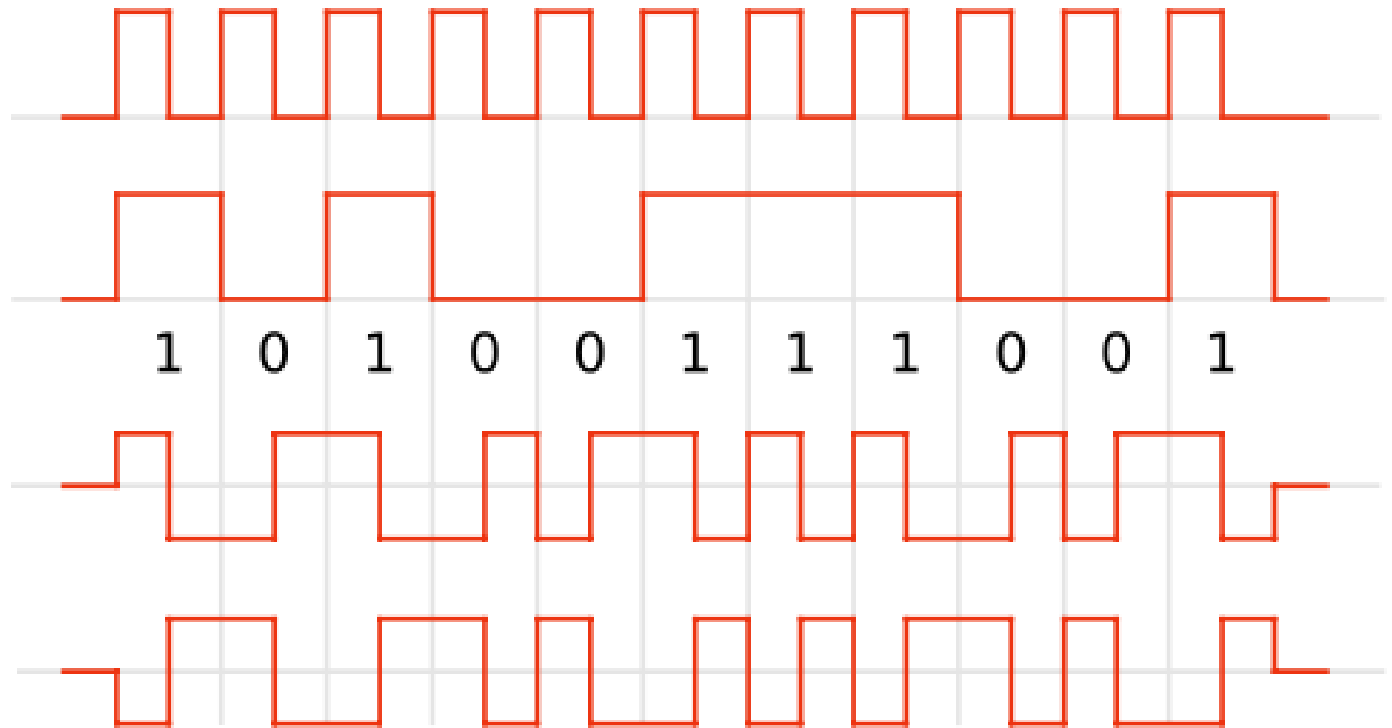
Clock

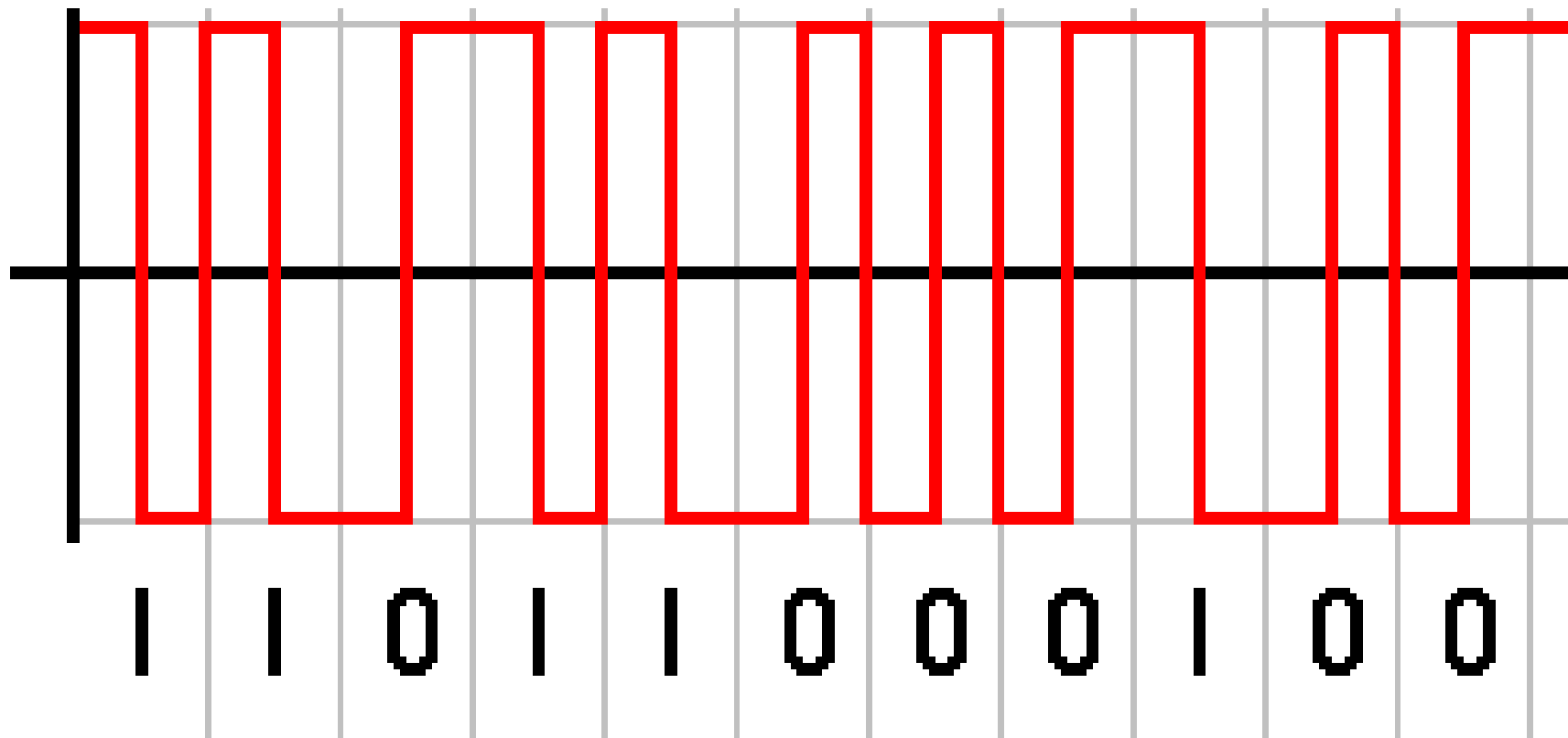
Data

1 0 1 0 0 1 1 1 0 0 1

Manchester  
(as per G.E. Thomas)

Manchester  
(as per IEEE 802.3)

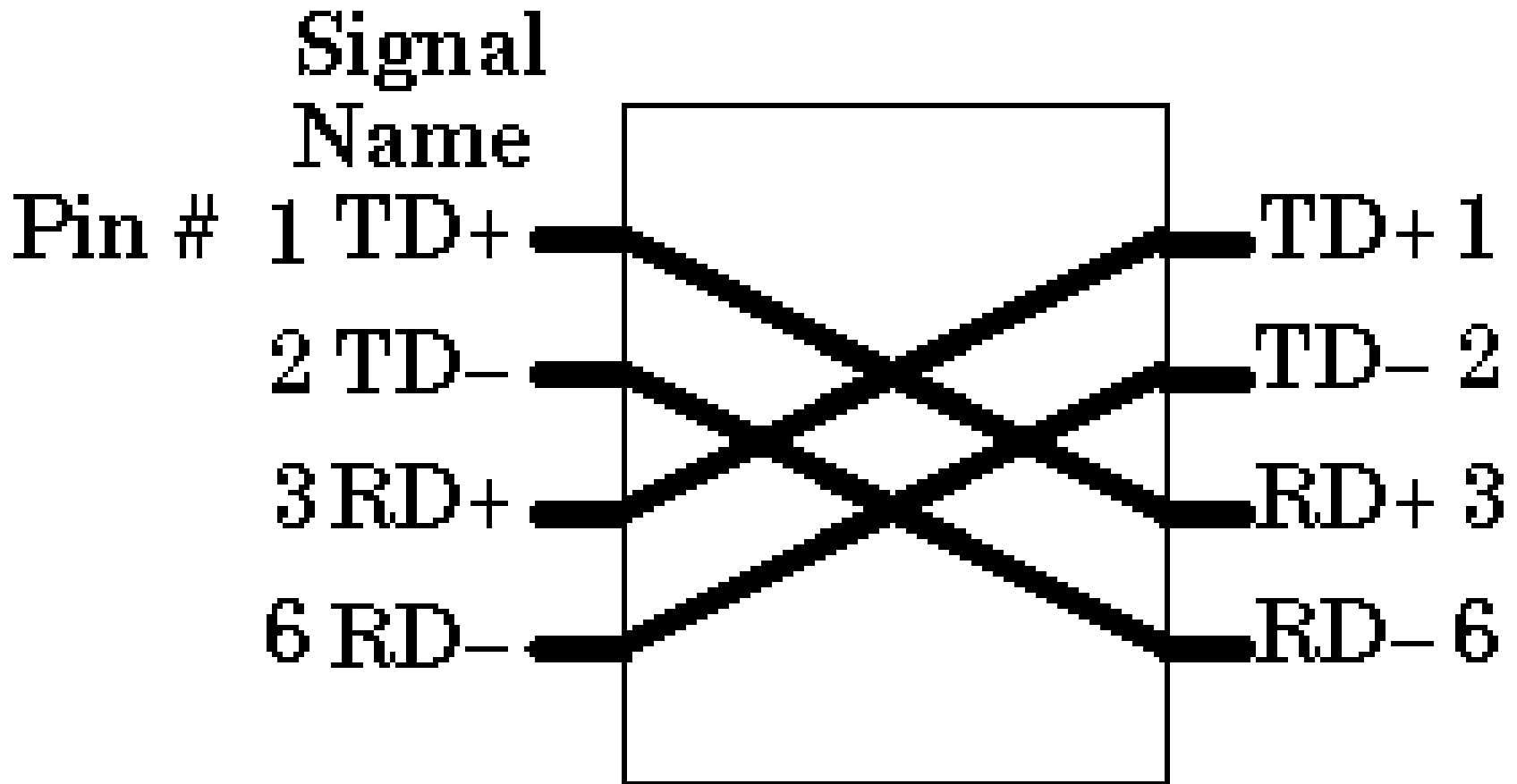




# 100BASE-TX (Fast Ethernet)

- 100BASE-TX prinsip = 10BASE-T
- (100 Mbps)
- Different LAN card
- Different HUB
- Different Swicth

# 100BASE-TX



# 100BASE-T4

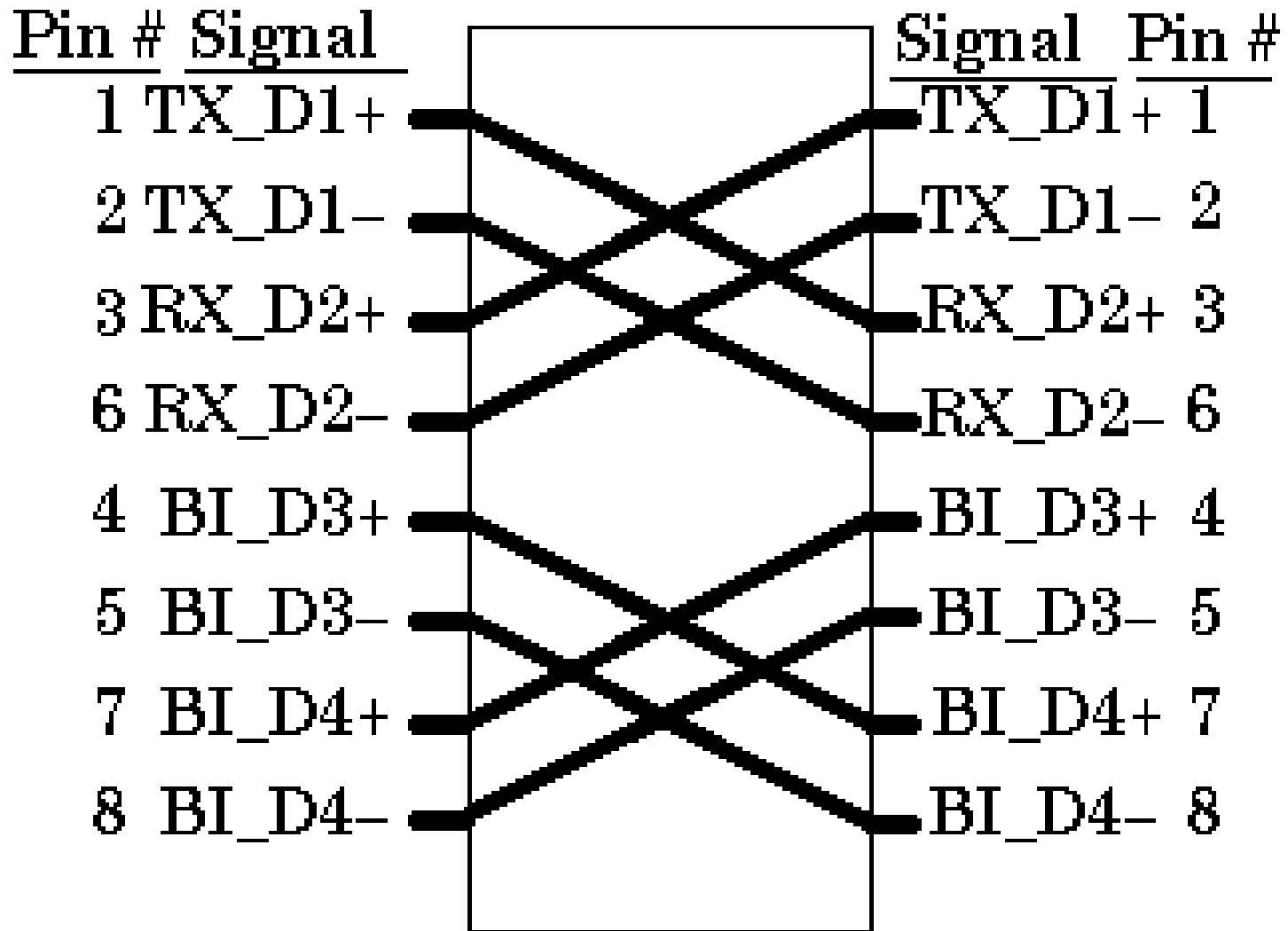
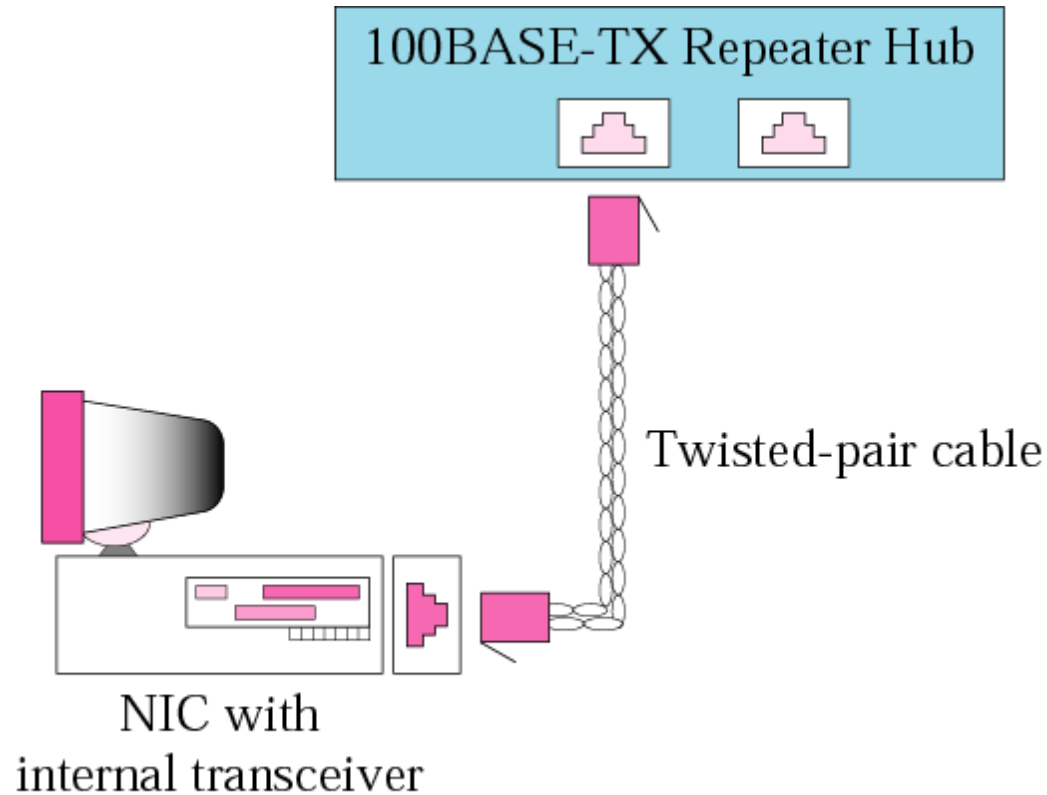


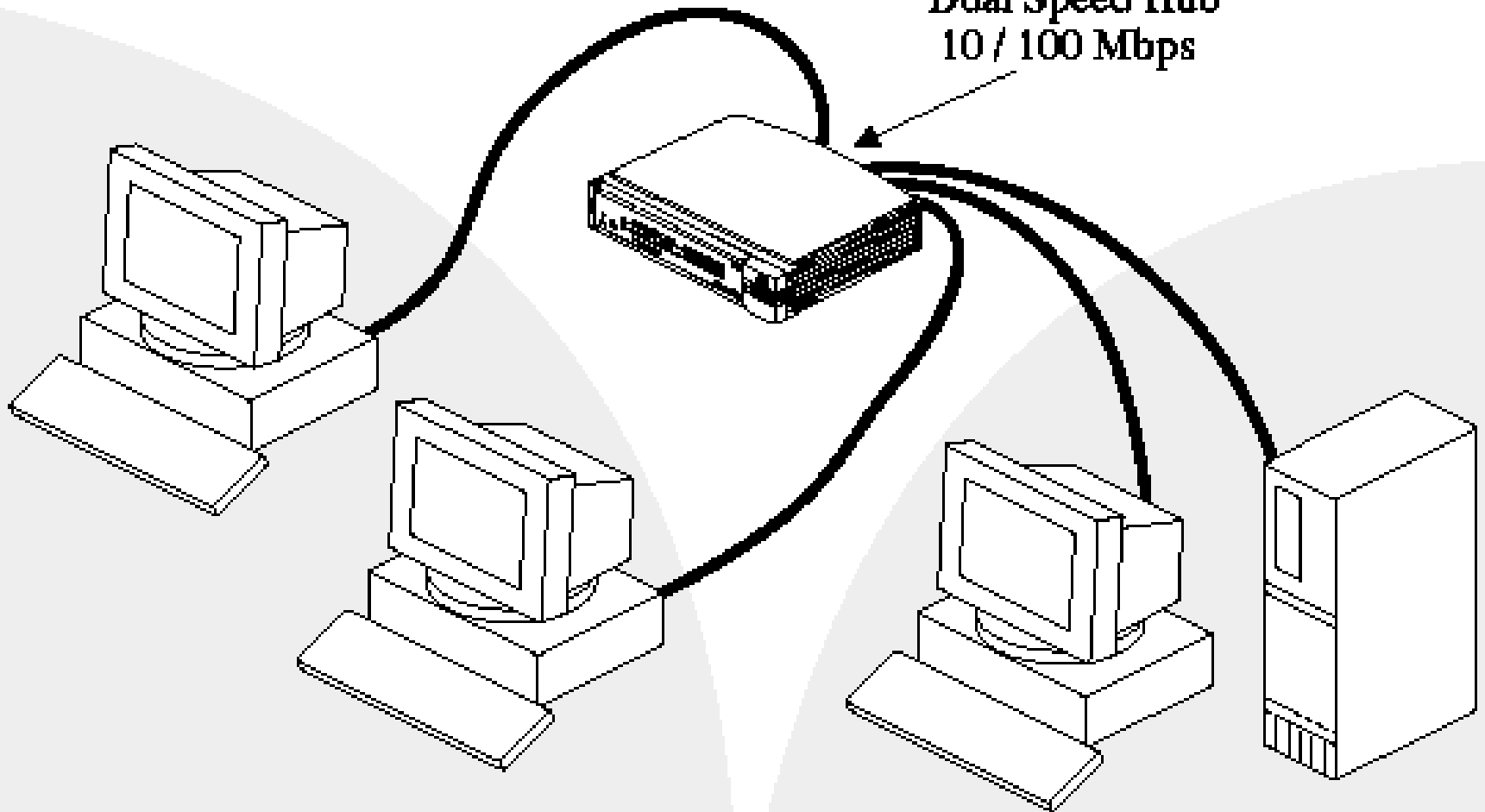
Figure 3-6:a

# Fast Ethernet implementation



a. 100BASE-TX

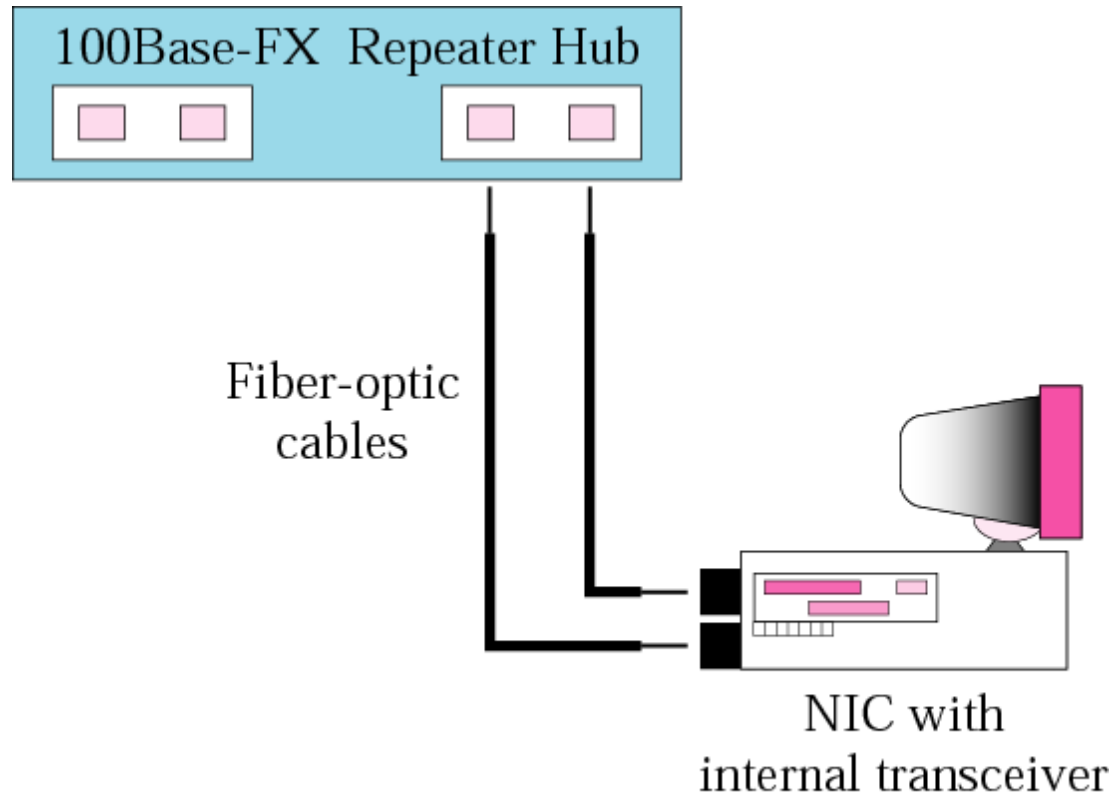
Dual Speed Hub  
10 / 100 Mbps



10 Mbps

100 Mbps

# Fast Ethernet implementation

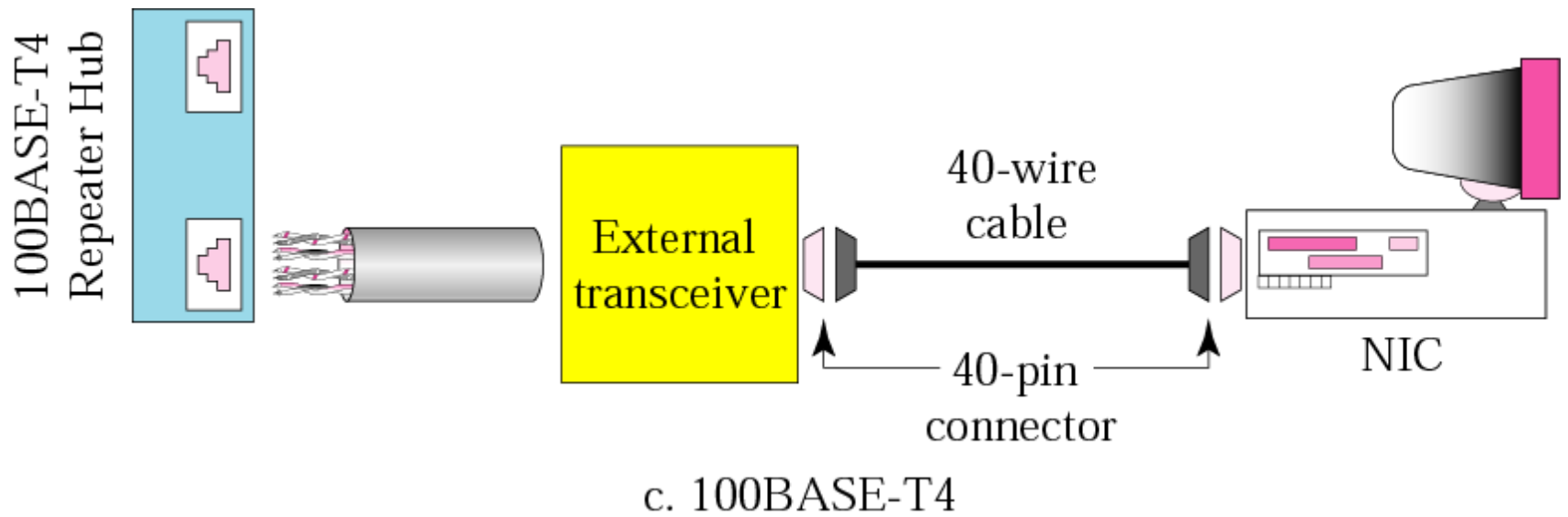


b. 100BASE-FX

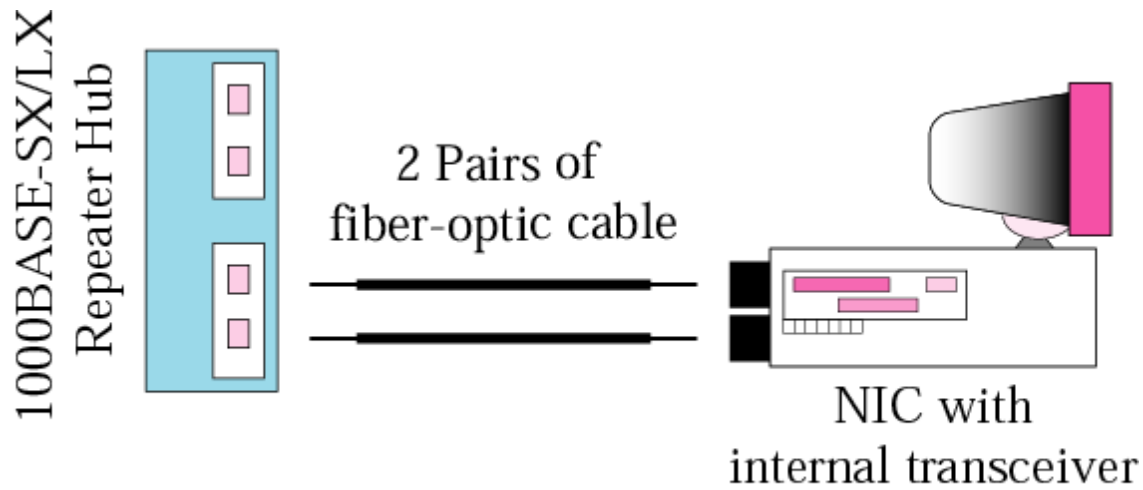


Figure 3-6:c

# Fast Ethernet implementation

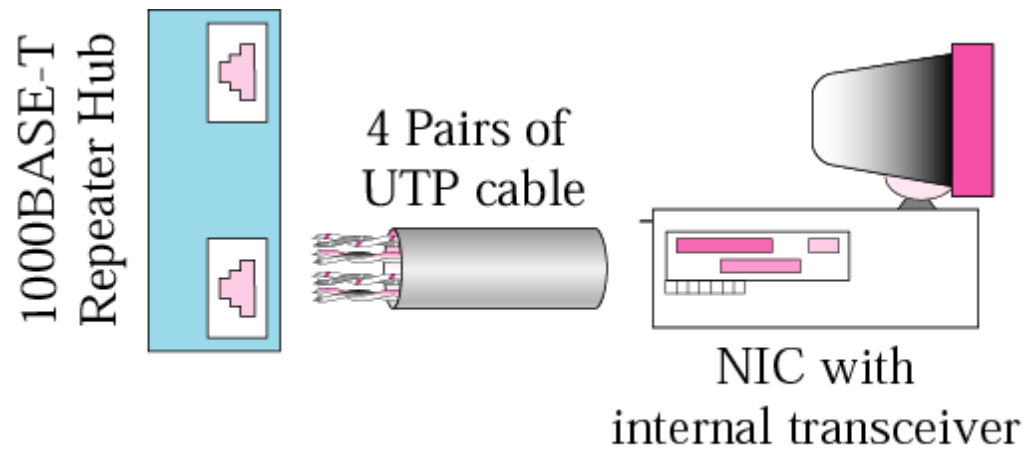


# Gigabit Ethernet implementation



a. 1000BASE-SX/LX

# Gigabit Ethernet implementation



b. 1000BASE-T









