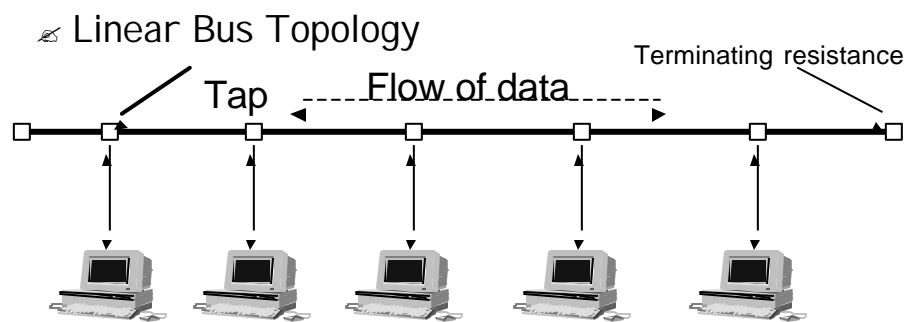


## LAN Topology (Cont.)

### Introduction

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## Bus Topology



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## Bus Topology

- Design Issues:
  - ✍ Channel multiplexing
  - ✍ Signal balancing: the signal strength must be adjusted to be within certain limits
  - ✍ Transmission medium
    - ✍ Coaxial Cable
      - Broadband
      - Baseband
  - ✍ Data rate
  - ✍ Cable length
  - ✍ Number of taps

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## Bus Topology (Cont.)

- Baseband Coaxial cable
  - ✍ Original usage was the Ethernet at 10Mbps
  - ✍ Digital Signaling
  - ✍ Bidirectional transmission
  - ✍ All frequency spectrum is consumed (I.e. no multiple channels)
  - ✍ Cannot easily propagate through branching points
  - ✍ Suffering attenuation
- Consequences:
  - ✍ Limited distance (~ 1km)
  - ✍ Suitable for bus but not for tree

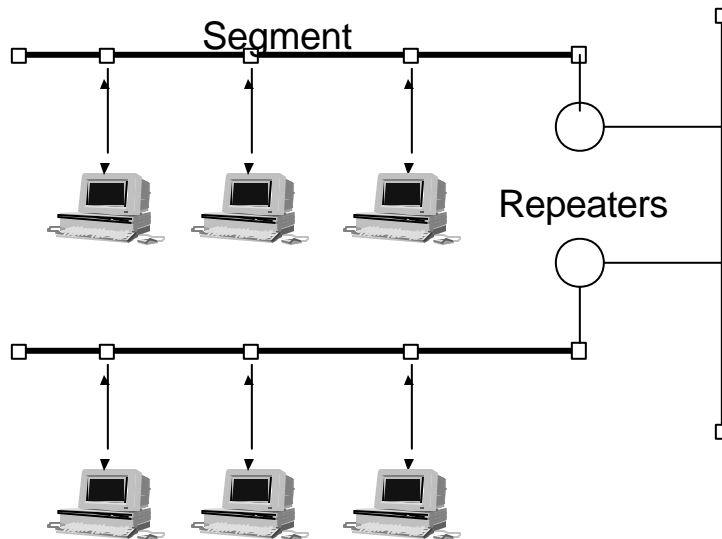
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## Bus Topology (Cont.)

	10BASE5	10BASE2
Data rate	10 Mbps	10 Mbps
Maximum segment length	500 m	185 m
Network span	2500 m	1000 m
Nodes per segment	100	30
Node spacing	2.5 m	0.5 m
Cable diameter	1 cm	0.5 cm

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## Baseband Configuration



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## Bus Topology (Cont.)

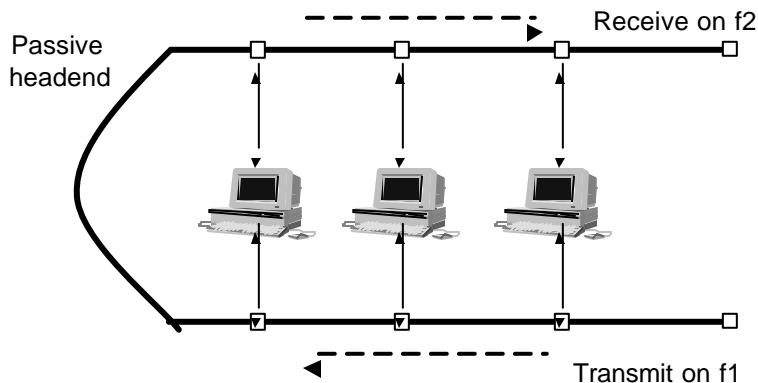
Baseband	Broadband
Digital signaling	Analog signaling (requires RF modem)
Entire bandwidth consumed by the signal	FDM possible
Bidirectional	Unidirectional
Bus topology	Bus or tree topology
Distance: up to a few kilometers	Distance: up to tens of kilometers

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## Broadband Coaxial Cable

- Dual

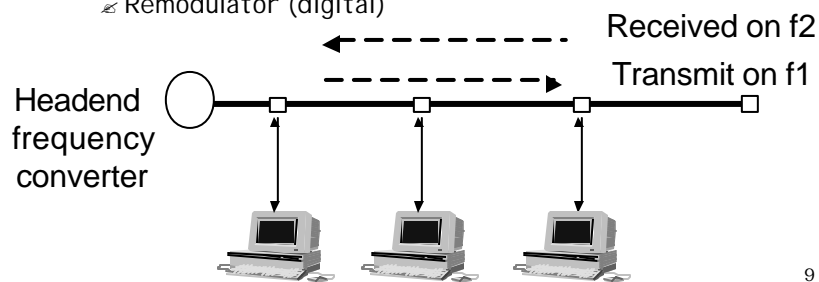
- ✍ Inbound and outbound are separated \_\_\_\_\_
- ✍ Stations send and receive on the same frequency



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## Broadband Coaxial Cable

- Split
  - ✍ Inbound and outbound paths are different frequency bands on the same cable
  - ✍ A frequency converter resides in the headend
    - ✍ Frequency translator (analog)
    - ✍ Remodulator (digital)

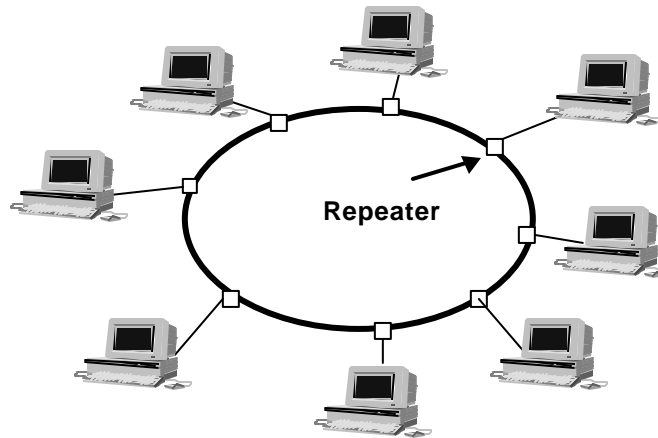


## Bus Topology (Cont.)

- Simple and inexpensive
- Limited to short distance (e.g. small office, home, ..)
- IEEE 802.4 Token bus LAN is a robust technology
- Market share is extremely limited

## LAN Topologies (Contd.)

### Ring.

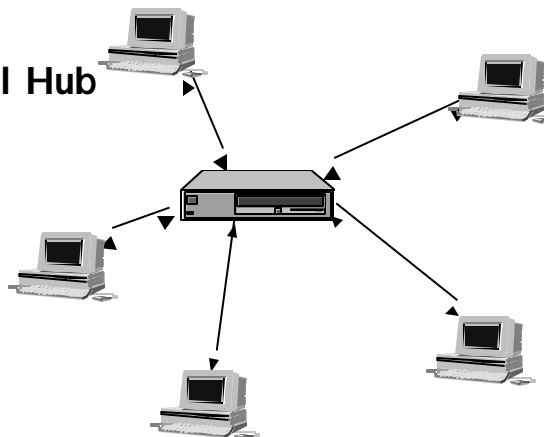


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## Star Topology

### • Functions of central Hub

- Store-and-Forward
- Broadcasting



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