# Lecture 7
# Datalink – Ethernet, Home

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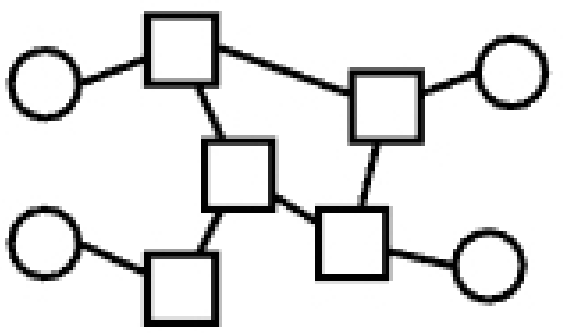
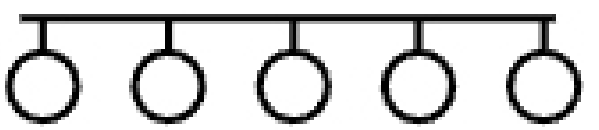
## Datalink Layer Architectures





- Packet forwarding.
- Error and flow control.
- Media access control.
- Scalability.

## Multiple Access Protocols

- Prevent two or more nodes from transmitting at the same time over a broadcast channel.
  - » If they do, we have a collision, and receivers will not be able to interpret the signal
- Several classes of multiple access protocols.
  - » Partitioning the channel, e.g. frequency-division or time division multiplexing
    - – With fixed partitioning of bandwidth – not flexible
  - » Taking turns, e.g. token-based, reservation-based protocols, polling based
  - » Contention based protocols, e.g. Aloha, Ethernet

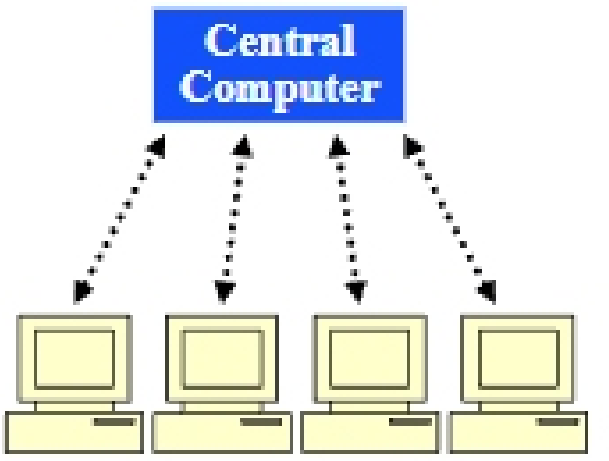


## Today's Lecture

- LAN technologies: Ethernet.
- Bridges and LAN switches.
- Connectivity to the home.

# Aloha

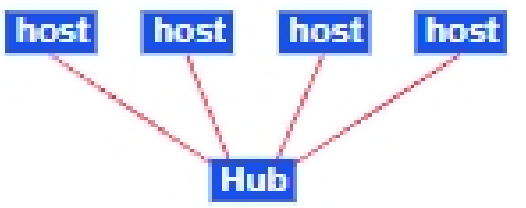
- Nodes sends the message when it has data to send.
- If it receives an ack, it considers the transmission completed, otherwise it retransmits after a random delay.
- Simple, distributed protocol, but not very efficient
  - 18% maximum utilization
- Slotted Aloha: more efficient.
  - Reduces chances of collision
  - 37% maximum utilization






# 802.3 Ethernet

Broadcast technology


- Carrier-sense multiple access with collision detection (CSMA/CD).
  - MA = multiple access
  - CS = carrier sense
  - CD = collision detection
- Base Ethernet standard is 10 Mbs.
  - Original design was ~2 Mbs
  - Faster versions discussed later