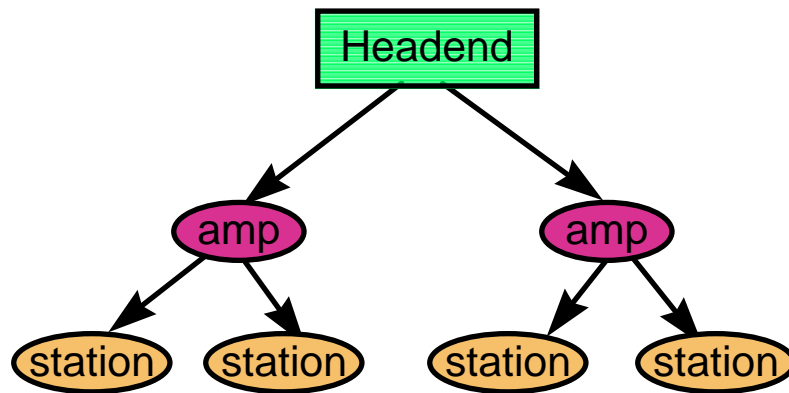
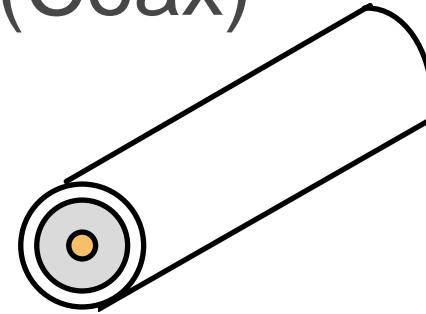


# Announcements

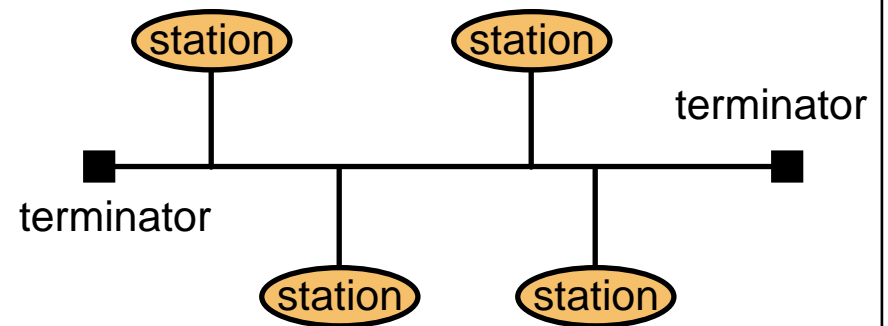
- Reading
  - Chapter 5: 5.1-5.4
  - Pthread Book Chapter 1 and Chapter 3 (to page 97)
- Homework #1 (due 9/30/97 in class)
  - chapter 1: 4, 5, 8, 22
  - chapter 2: 3,4,14, 47, 49, 50
- Programming Project #2 was handed out

# Transmission Media (Coax)

- copper with an insulator between it
  - 75 ohm - common for T.V.
  - 50 ohm - common for data transmission
- rates: 10's of Mbps baseband, 100's MPS broadband
  - supports multiple drops



Broadband Network



Baseband Network

# Transmission Media (cont.)

- Coax

- copper with an insulator between it
  - 75 ohm - common for T.V.
  - 50 ohm - common for data transmission
- rates: 10's of Mbps baseband, 100's Mbps broadband
- supports multiple drops

- Fiber

- uses principal of total internal reflection
  - get light to “bounce” along the fiber
- point to point communication
- 100's Mbps to several Gbps

# Transmission: No Cables

- Microwave

- above 100MHz
- uses directional (parabolic antenna)
- with 100m towers, can space them every 80km
- security:
  - directional signal
  - can add hop-by-encryption

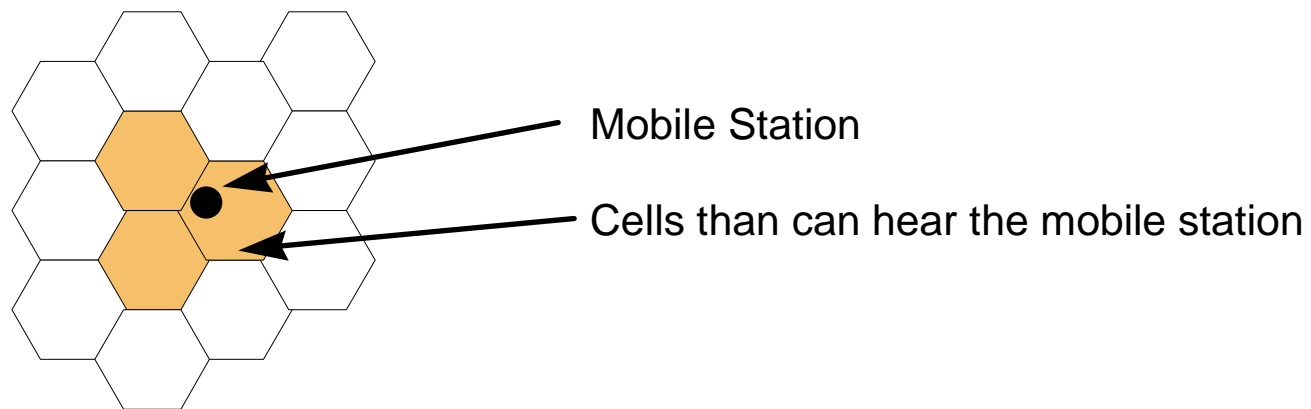
- Infrared

- uses: television remote, computer TANs (Table Area Nets)
- signal will not pass through walls
- security:
  - signal confined to a single room
  - anyone in the room can hear the signal though

# Transmission: No Cables (cont.)

- Cellular Radio (AMPS)

- divide service areas into cells
  - each unit talks to a base station in the cell
  - 832 duplex channels (allocated to two providers)
- security
  - virtually none
  - easy to eavesdrop
  - ease to “clone” cell phones



# Transmission: Satellites

- **Different Orbits Possible**
  - orbit affects many communication properties
- **Geosynchronous**
  - always over the same spot on the earth
  - 36,000 Km orbit is required
  - only 180 slots possible
  - uses one uplink and one down link frequency
  - large round-trip latencies
- **LEO (Low Earth Orbit)**
  - each satellite keeps moving into and out of range
    - solution: use a large number of satellites
    - sort of like cells, but the cells are the ones moving
  - lower round-trip latency