Collaborative Mesh Networking

Instructor: Rob Faludi
Week 2

Warmup

Find & Fix

- 5 minute presentations of student work

Readings

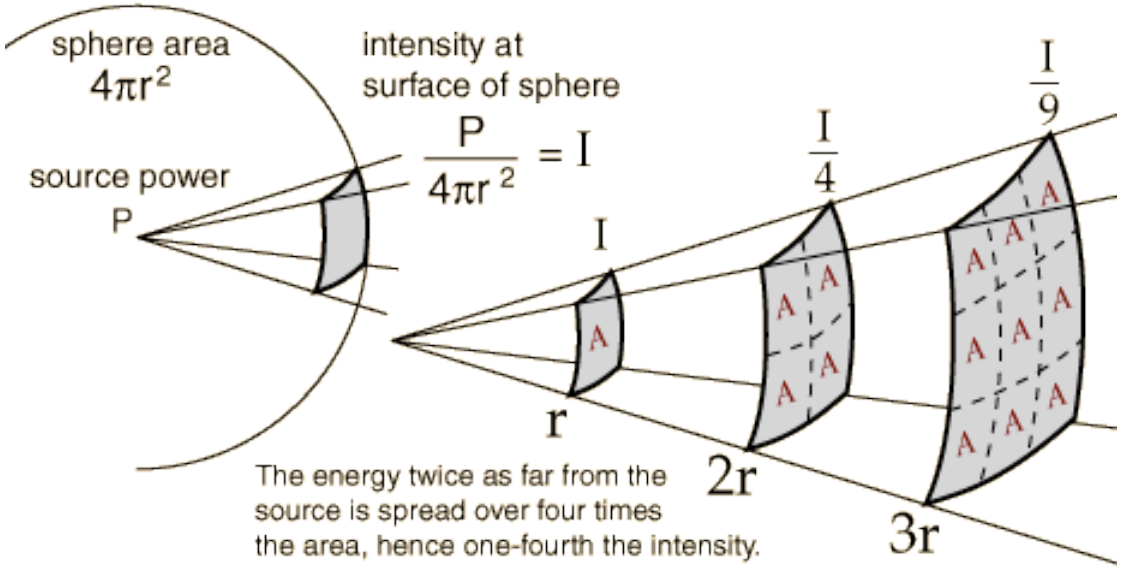
- Economist demonstrates cutting edge
- Weiser: history
- Bradbury: importance of humans
- more at the end if time

Radio Communications

- What is radio?
    - electromagnetic waves
    - no medium required
- Modulation
- Well-described mystery: “air waves” “wireless” “ethereal communication”
- posters

Why Wireless?

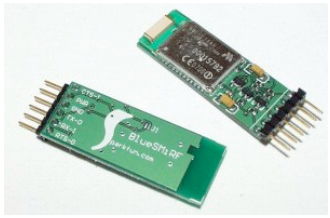
- why wireless (mesh ≠ wireless)
- inverse square law

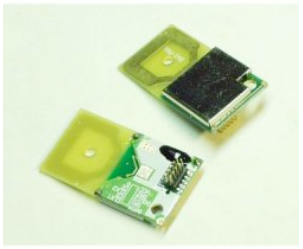


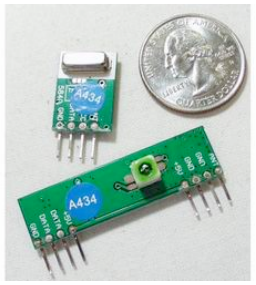
- what technologies can be used for device communication?

Existing Methods for Device Communication

- Bluetooth
- "RF"
- XPort TCP/IP
- WiPort TCP/IP
- MatchPort
- Cell Phone Data GPRS







ZigBee & 802.15.4

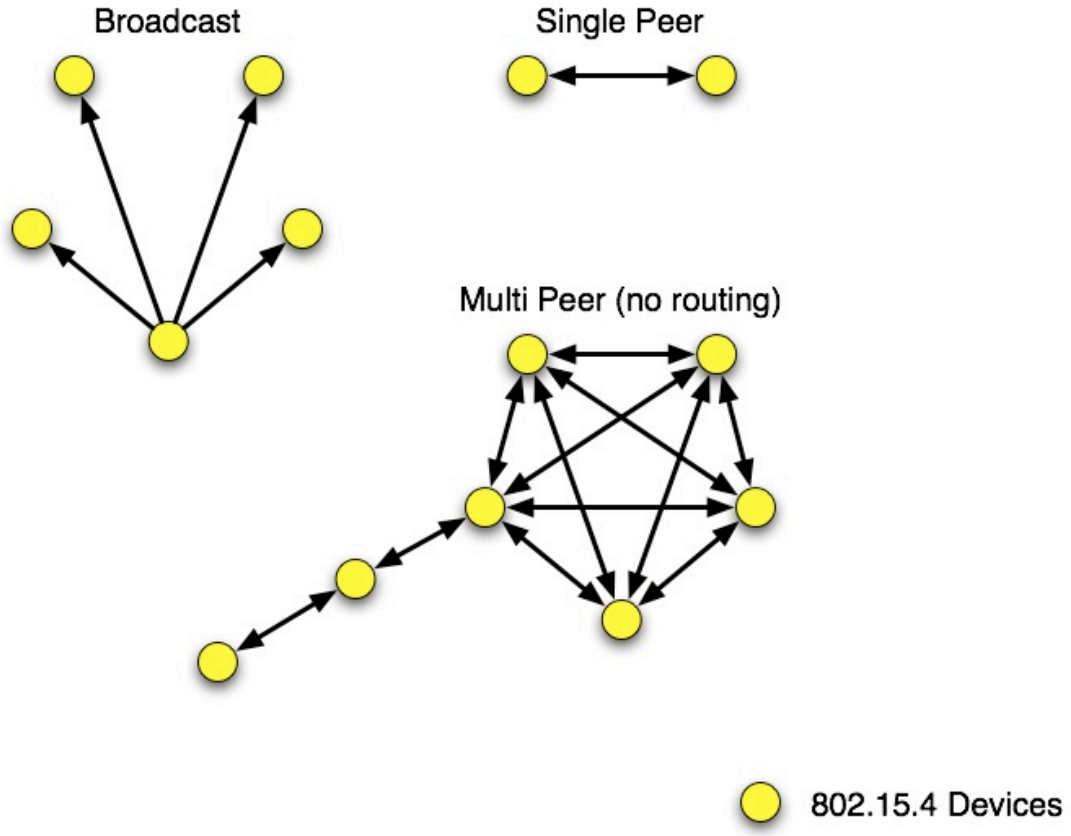
- ZigBee is built on top of the IEEE 802.15.4 protocol
- XBee radios can be configured with or without ZigBee
- Both ways are useful

802.15.4

- low power
- addressing
- cheap
- wireless
- small
- standardized

802.15.4 Topologies

- single peer
- multi-peer
- broadcast



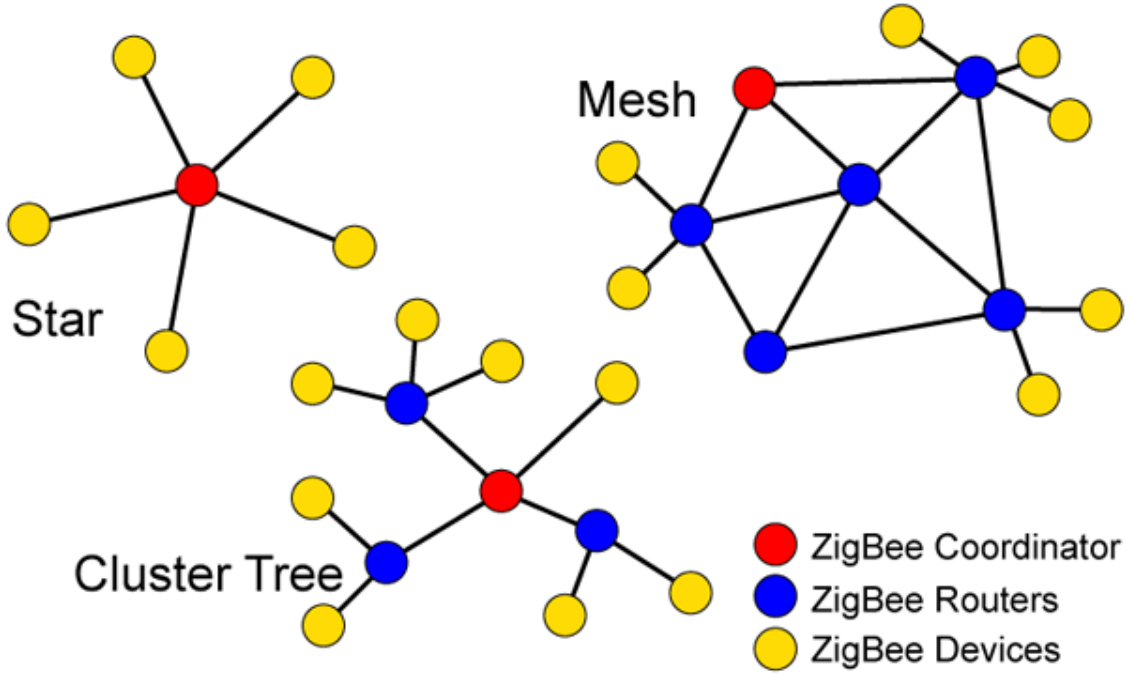
ZigBee

- routing
- self-healing mesh
- ad-hoc network creation

ZigBee™ Alliance

ZigBee Topologies

- peer
- star
- mesh
- routing



Readings and Assignments

- Readings
  - XBee User Manual
  - Making Things Talk, pages 192 - 206.
- Assignment
  - Glow the Light
  - extra reading: http://en.wikipedia.org/wiki/Rock_paper_scissors

The Common Side-blotched Lizard (*Uta stansburiana*) exhibits a RPS pattern in its different mating strategies.

Schedule Workshop

- Friday afternoon in lab?
- Saturday noon in 406?