

CS 640: Introduction to Computer Networks

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Lecture 23 -
CSMA/CA, Ad Hoc and Sensor Networks

Scenarios and Roadmap

- Point to point wireless networks
 - Example: Your laptop to CMU wireless
 - Challenges:
 - Poor and variable link quality (makes TCP unhappy)
 - Many people can hear when you talk
 - Pretty well defined.
- Ad hoc networks (wireless++)
 - Rooftop networks (multi-hop, fixed position)
 - Mobile ad hoc networks
 - Adds challenges: routing, mobility
 - Some deployment + some research
- Sensor networks (ad hoc++)
 - Scatter 100s of nodes in a field / bridge / etc.
 - Adds challenge: Serious resource constraints
 - Current, popular, research.

IEEE 802.11 Wireless LAN

- **802.11b**
 - 2.4-2.5 GHz unlicensed radio spectrum
 - up to 11 Mbps
 - direct sequence spread spectrum (DSSS) in physical layer
 - all hosts use same chipping code
 - widely deployed, using base stations
- **802.11a**
 - 5-6 GHz range
 - up to 54 Mbps
- **802.11g**
 - 2.4-2.5 GHz range
 - up to 54 Mbps
- All use CSMA/CA for multiple access
- All have base-station and ad-hoc network versions