MACAW Bharghavan, Demers, Shenker, Zhang [Bhargahavan94a]

(got to slide 15 on March 2)

CSci551: Computer Networks
SP2006 Thursday Section

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Key ideas

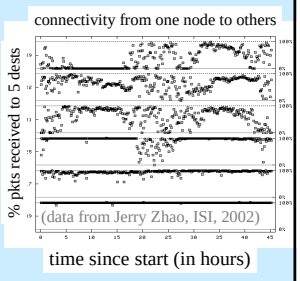
- macaw: Multiple Access Collision Avoidance Wireless
- MAC protocol
  - how to send on the shared channel
- hidden terminal/exposed terminal
  - need to be careful collisions at receiver (senders can't hear each other)
- contention based vs. schedules
  - implications: need to deal with collisions
  - need to be careful about fairness

Wireless MAC Options

- Contention-based vs. token-based/scheduled
  - why contention? statistically better utilization
  - why token? better fairness and gurantees
  - MACAW: contention; 802.11 contention based (ad hoc mode), also scheduled in managed mode
- Base-station vs. ad hoc
  - why base-station? clear who to talk to, how to get to the Internet; use hierarchy; pre-arranged coverage
  - why ad hoc? work without infrastructure; take advantage of relaying
  - MACAW base stations; 802.11 both, but mostly in base-station
    - except that recent Macs seem to support ad hoc mode

Radio Propagation

- Simple model: fixed tx range
  - propagation can be r^{-3} or r^{-1} (near or far)
  - issues: collisions, capture, interference
  - good simple model, but only an approximation
- Reality is *much* worse
  - multipath fading
  - time-varying effects



Carrier Sense in Wireless

- Carrier Sense: before transmitting, check if carrier present
  - works in Ethernet
  - why not for wireless? because receiver and sender have different "carrier senses"
- Issues: hidden and exposed terminals