

# Enhancing 802.11 With QoS

## Introductory Discussion

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# Why?

- Why do we want to enhance 802.11?
  - Technical reasons
    - Integrate with modern LAN infrastructures
      - 802.1p
      - IETF
    - Enhance performance of 802.11
  - Marketing
    - HomeRF/Bluetooth
    - Hype

# Why ? – NWN's view

- Enhancing performance.
- Integration.
  - IETF
- Marketing.

# What Services?

- Don't drop straight into the fundamental discussions.

# What Services?

- Ask the questions:
  - What makes wireless different?
  - What do we want to achieve?
  - What is possible?
    - What technology is available and feasible?
    - What is feasible for a wireless LAN?
  - Do we want to adapt the applications as well?
- Result:
  - Feasible services

# What Services ? - NWN's view

- What makes wireless different?
  - Shared medium,
  - Limited bandwidth,
  - No guarantees,
  - Mobility.
    - Across cells

# What Services ? - NWN's view

- What do we want to achieve?
  - We don't want to achieve hard – real-time guarantees.
    - Not feasible,
    - Most applications don't require them.
  - Want to maintain wireless' unique quality: mobility.
    - Traditional bandwidth reservation may not be desirable.

# What Services ? - NWN's view

- What is possible?
  - Soft real-time services
    - Applications with playback points
      - streaming video/audio
    - Adaptive applications
    - Bandwidth reservation
  - Link parameters
    - Packet delivery: bitrate, loss-rate (retry and fragmentation strategies).

# How ?

- DCF
  - Changing backoff mechanism.
    - Simple to implement.
  - Adding new contention mechanism.
    - Requires major modification of the standard.
  - Note that with both approaches it is difficult to integrate legacy devices.

# How ?

- PCF
  - Probably more complicated design, however:
    - centralized scheduling makes it easier to meet certain service requirements,
    - easy to integrate legacy devices, because they already adhere to PCF rules,
    - more powerful platform.

# How ? - NWN's view

- Use PCF.
  - Solve upstream scheduling problem.
    - TxQueue state of station.
  - Agree on a set of services and specify a mechanism for negotiating services.
  - Find a balance between flexibility and complexity.
    - Focus complexity in Access Point.