

## The Need for Fragmentation

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In order for 802.11 to be a widely accepted standard for wireless LANs, it must be an inexpensive, "plug & play" solution that is compatible with existing wired networks.

### The Problem

- **The MAC frame has two constraints.**
  - **The first is the size of frame that the PHY (radio) can transmit with reasonable success.**
  - **The second is the size of the data frame that is presented to the MAC from higher layer protocols.**
- **It is unlikely that the PHY frame size will be large enough to support all the protocols that may be presented from higher layers (Ethernet max = 1518 bytes, Token Ring Max = 16k bytes).**

### Radio Frame Size

- **Many sources have suggested that the maximum radio frame size for a 2.4 GHz Frequency Hopping radio is on the order of 400 bytes or less.**
- **This is based on bit error rate and microwave oven interference.**
- **It is unknown what frame sizes future PHYs may be capable of handling.**

### Protocol Frame Size

- It has been suggested that if the MAC can support a frame size of 600 bytes, most of the popular network protocols could, in principle, be configured to operate.
- There may be protocols that are difficult or impossible to configure.

### Routing verses Bridging

- It has also been suggested\* that routing be used to solve the the frame size problem.
- This would require an Access Point to be a multi-protocol router.
- This is in direct conflict with an inexpensive, plug & play solution.
- If a protocol is not routable or configurable and the frame size is larger than can be handled by 802.11, it can not operate on an 802.11 WLAN.
- A flexible Access Point that can accept frame sizes that are typical on todays wired networks reduces the impact and cost to users.

## Layer 2.5 Fragmentation

- **An alternative to eliminate the need for a router is to do fragmentation above the MAC at both the Access Point and Station - Layer 2.5 Fragmentation.**
  - This leads to non-interoperability.
  - If one is using an 802.11 compliant Access Point from one vendor and wants to use 802.11 compliant network adapters from another vendor, they may not work together due to the fact the fragmentation used is not interoperable.
- **Would not be able to take advantage of efficiencies of media access that would be possible if fragmentation was done in the MAC.**
  - Channel access
  - Channel utilization

## Conclusion

- **The frame sizes supported by all the PHYs with which the MAC must operate is an unknown.**
- **It is a difficult (or impossible) job to define the frame sizes required by all the protocols that will operate over an 802.11 WLAN.**
- **If 802.11 can support the frame sizes that operate on existing wired networks, the job of installing and using an 802.11 WLAN is greatly simplified.**
- **Fragmentation must be part of the MAC to provide for an inexpensive, "plug & play" solution that is compatible with existing wired network.**