IEEE P802.11

Wireless LANs

Consideration on
Collision Detection Method
for WLAN

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Three CD methods discussed at 802.3 for COAX based Broadband Network

. beat-signal level detection

. Bit comparison & Col. Enhancement

. Random pulse

* Beat Signal level detection

level control & Freq. Modulation

Collision Zero or double level

"Listen while talk capability

* Bit comparison & Col Enhancement

Compare Sending & Receiveing Data bit by bit

"Listen while Talk"

* Random Pulse

send two pulses with random interval

"Deteroation of throughput"

Not necessarily requires "Listen while Talk"

Occupied Bandwidth
"Random Pulse

$\simeq$ 1/2 "Beat signal"

<1/2 "Bit Comparison"

Direct Transmission (no AP)

robustness

Design Example

Collision Window: n-pulse

Tx pulse number: k

➡ Collision Missing Probability

$1/{}_nC_k$

n=33 k=16 ${}_nC_k > 10^9$

Pulse width: 300 ns

Delay Spread margin: 200 ns

  Col. window = 16.5 μs

< 57.6 μs

(Minimum Packet Length)

Throughput Deterioration is little

Conclusion

Random Pulse method requires

* minimum Bandwidth

* no Access Point

Applying to Wireless LAN

Throughput Deterioration is little