HIGH SPEED 2.4-GHz PHY PERFORMANCE ISSUES

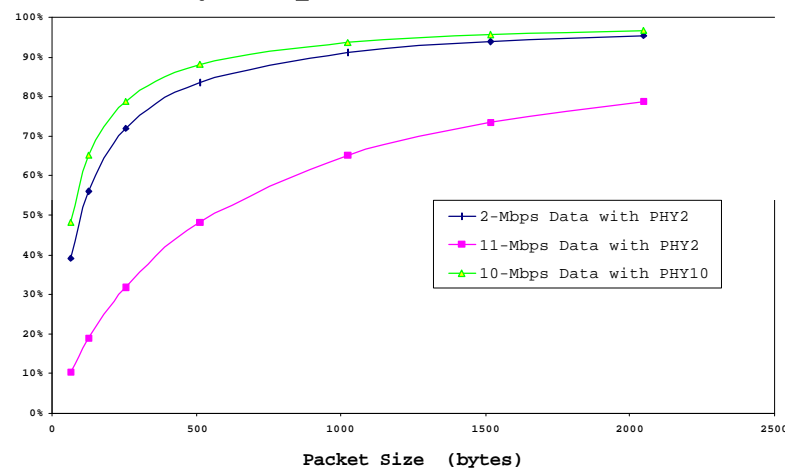John H. Cafarella

MICRILOR, Inc.

Introduced in Maui
D11_9750 - D11_9753

- 10-Mbps Modulation
  - Five-Fold Increase in Data Rate
  - Low E_B/N_0 & Very Robust
- MSK Spreading Modulation
  - Greatly Reduced Power Drain
  - Multiple Frequency Channels
- Changing PN Codes
  - Security & BSA Isolation

Treat as Entirely New PHY
(not compatible with 1- & 2-Mbps PHY)

- Current PHY Header will Burden Throughput for 10-Mbps Operation
- Higher Bandwidth Resolves Multipath
- Coexistence with Slower DSSS via Frequency Separation
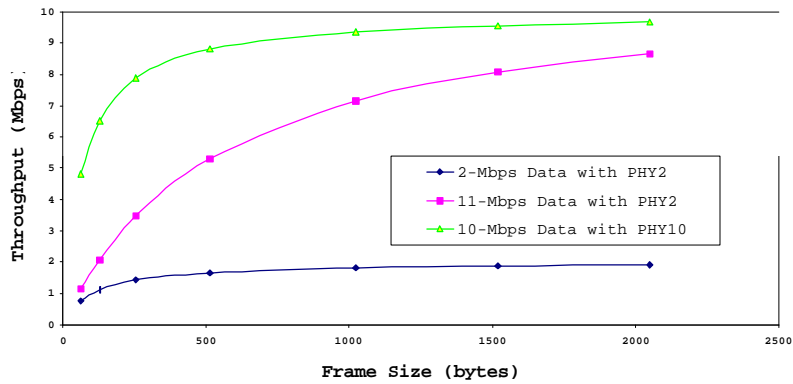- Low Current for PCMCIA Needs MSK
- Changing Codes for Spatial Re-Use

Efficiency Impact of PHY Header

2-Mbps Data with PHY2	
11-Mbps Data with PHY2	
10-Mbps Data with PHY10	

No Contention (One-Way Transmission)   *No RTS/CTS Overhead*
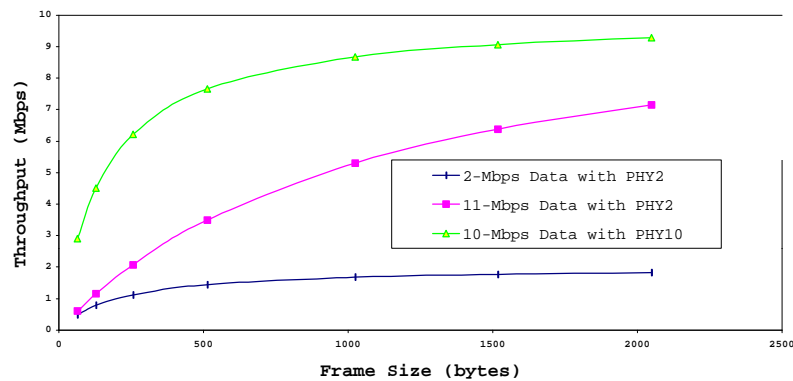
Throughput Impact of PHY Header

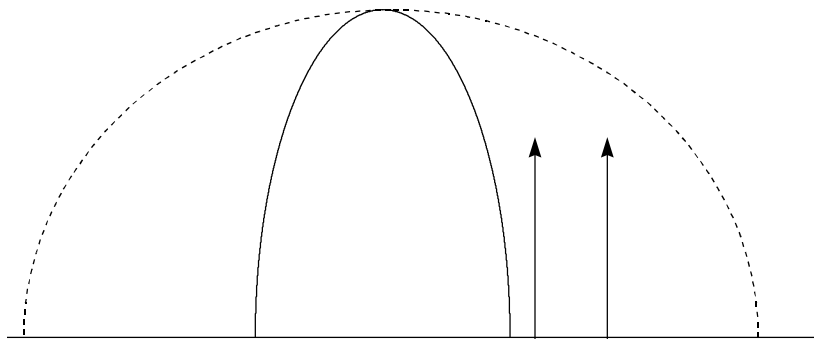*No Contention (One-Way Transmission)*   **No RTS/CTS Overhead**

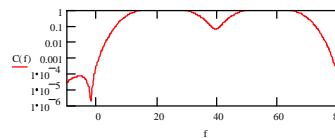# Throughput Impact of PHY Header
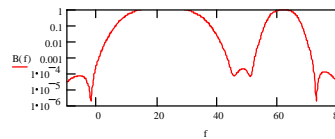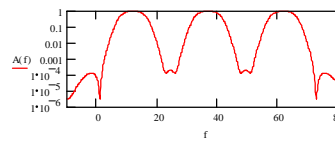# with RTS/CTS Protocol

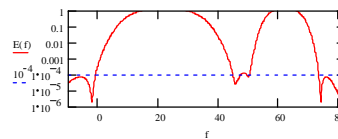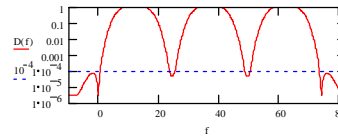*No Contention (One-Way Transmission)*

3:1 Resolution Bandwidth

Channelization Options

- **Three 2-Mbps**
  - Present 802.11

- **10- and 2-Mbps**
  - Compatibility Mode
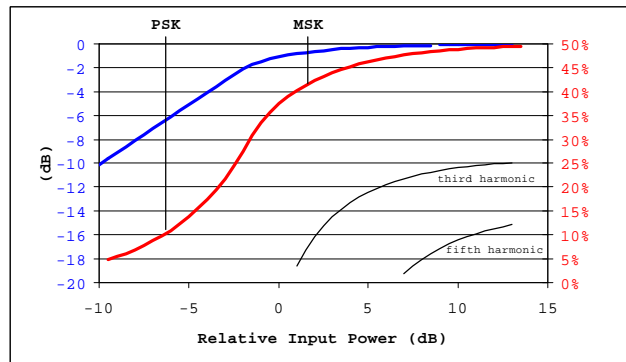
- **Two 10-Mbps**
  - 48-dB Isolation (incl. PG)

Channelization Options (cont.)

- Three 5-Mbps
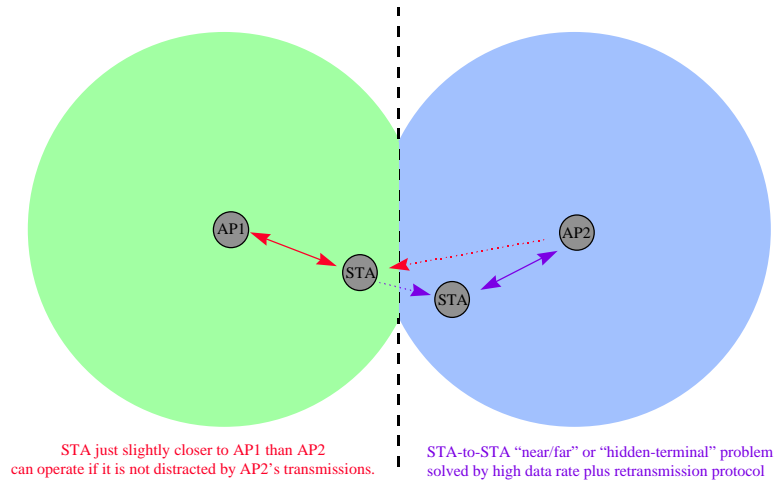 - 16-Mchip/sec

- 10- and 5-Mbps

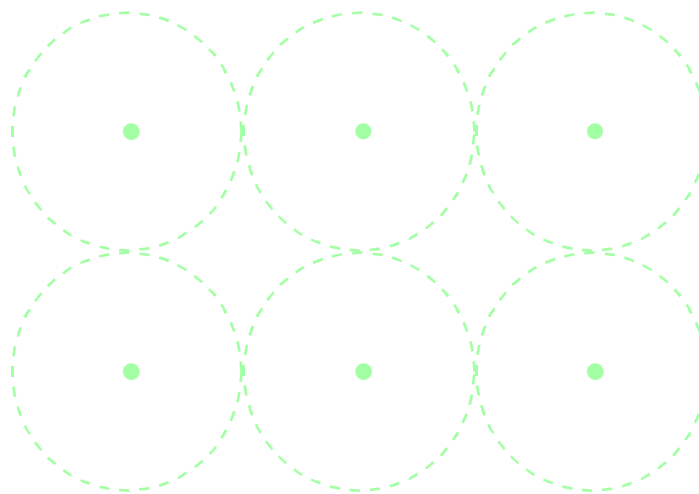# Power Amplifier
Nonlinearities & Efficiency

PSK must avoid PA nonlinearities to avoid
regeneration of spectral sidebands; MSK can
operate right into saturation.

Idealized Power Amplifier

Changing Codes for Spatial Re-Use

STA just slightly closer to AP1 than AP2
can operate if it is not distracted by AP2's transmissions.

STA-to-STA "near/far" or "hidden-terminal" problem
solved by high data rate plus retransmission protocol

Deployment with
Different PN Codes

Combining Two 10-Mbps Bands
with Different PN Codes