



PRESENTS

**NETWORLD INTEROP**

an INTEROP event

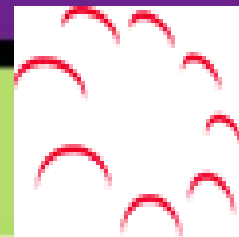
# Wireless Broadband Access - One Size Doesn't Fit All!

---

Steve Goldberg

CEO, CoWave Networks

September 12, 2001



# Broadband....What's that?

---

- Let's first define broadband (for consumers)
  - Faster than dial-up speeds or something greater than 50kbps
  - It seems to imply multimedia...or does it?
  - It certainly could be fixed, portable, or mobile
  - What about QoS or SLA's
- In Fy2001
  - Broadband mobility seems to be between 9.6kbps and several hundred kilobits/sec
  - Broadband portable between 19.2kbps and several hundred kilobits/sec
  - Broadband fixed between 64kbps and 2Mbps

# You can't fool Mother Nature!

---

- What's happening in the world of mobility
  - 2.5 G ....GPRS/EDGE..struggling to get to >10kbps/user
  - 3G....CDMA2000...looking for >50kbps/user..yet to be seen
  - 3G....W-CDMA...only promises..T1/E1 still the Holy Grail
  - Proprietary...>10Mbps has been quoted
- Fixed/Portable access
  - LMDS...many megabits and many bucks
  - MMDS...Cable/DSL speeds but will the cost to deliver be competitive
  - “Unlicensed Bands”...no spectrum costs but what about interference
  - 802.11x....could be the answer in selected “public” locations

# All roads lead to Rome....but some get you there a lot faster

---

- Topologies

- Point-to-point....long range/high capacity but doesn't scale
- Point-to-multipoint...made huge strides but hasn't yet scaled to residential market
- Peer-to-peer/Mesh...Small cell performance with large cell costs

- Protocols

- TDM....Inefficient for Internet traffic...
- Pure IP....Can it do multimedia
- Hybrid schemes...the best of both

# Which way to go....

---

- Fixed wireless for Home/Office
- WLAN solutions for Hot Spots (Airports, Convention Centers, Hotels, etc.)
- Mobile solutions in between

The market may well be defined by how you are billed...by the minute or “all you can eat”

# Are Mobile/Cellular and Fixed Wireless solutions on a collision course?

- It certainly doesn't look that way
  - It could be years and many \$billions before mobile solutions offer even 100kbps "on the go"
  - Not clear what defines a mobile broadband application
- Fixed solutions
  - Multi-megabits/sec are possible but it will take time to reach the economies of scale seen in cellular
  - Applications are plentiful....it may be just a "chicken or the egg" problem

# In 5 years....

---

- Fixed wireless broadband access will take a big piece of the worldwide market share from cable/DSL
- 3G cellular will be big but perhaps not as big as some might think
- WLAN access points will “pop up” everywhere and provide near ubiquitous broadband in-building and campus coverage