

The Dawn of Wireless Twilight

Longsong Lin

Intel Innovation Center



Evolution or Revolution?

Computing Technology

- IBM 360 (1970) -- Centralized
- Sun and Cray (1980) – Client/Server
- Personal Computing (1990) --Personalized
- Mobile Computing – Agnostic

Communication Technology

- Ethernet (1980+) to WWW (1990+)
- Wireless (2000+) to Media (2010)

Market Size Moves

- Million\$ market -- IBM 360, 20 year,
- Billion\$ -- Intel Pentium, 15 years
- Trillion\$ -- Mobile, next 10 years.

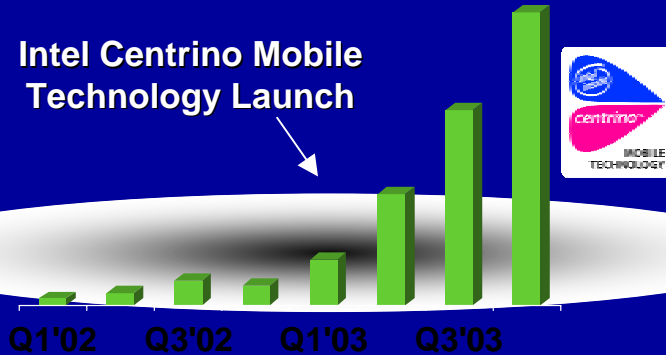
Convergence Movement

- Voice – Electrical Era → Bell
- Computing Data -- Transistor Era → IBM
- Communicating Data -- Silicon Era → Intel
- Computing and Communications → **Converged Era !!**

Wireless Everywhere: Centrino

Intel's Ramp of 802.11 Products

Intel Centrino Mobile Technology Launch



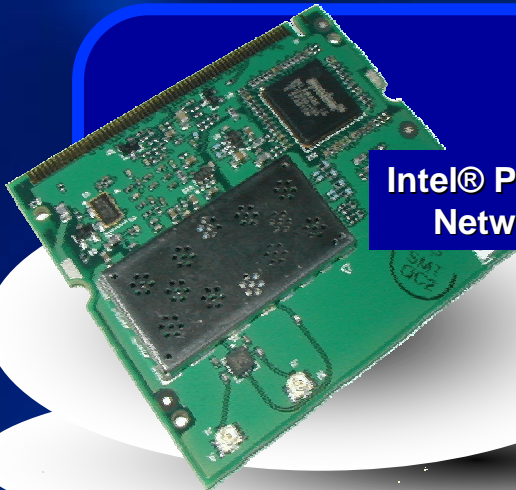
Source: Intel Internal



Accelerate the adoption of broadband wireless networks and be the leader in wireless silicon for PC, Handheld and Infrastructure applications

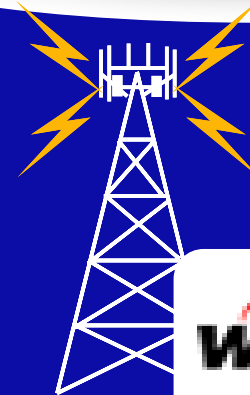


802.11a/b/g MiniPCI
Access Point
Ref Designs
Low Power 802.11b/g



Intel® PRO/Wireless 2100
Network Connection

Last Mile
Broadband
Technology

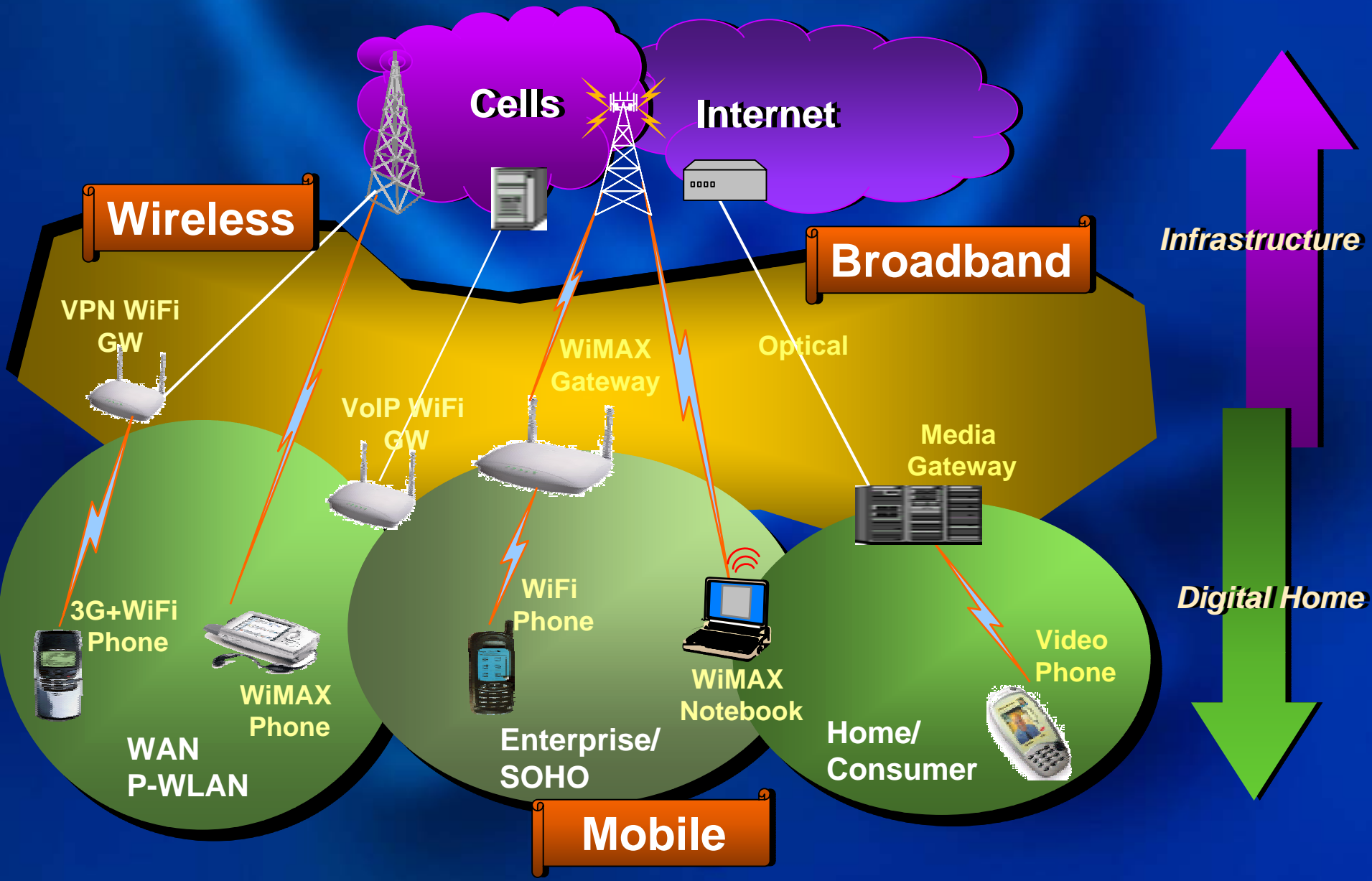


WiMAX



* Other names and brands may be claimed as the property of others

Intel Innovation Center: *Broadband Mobile Wireless*



The Evolution: Mobile to Converged Phone

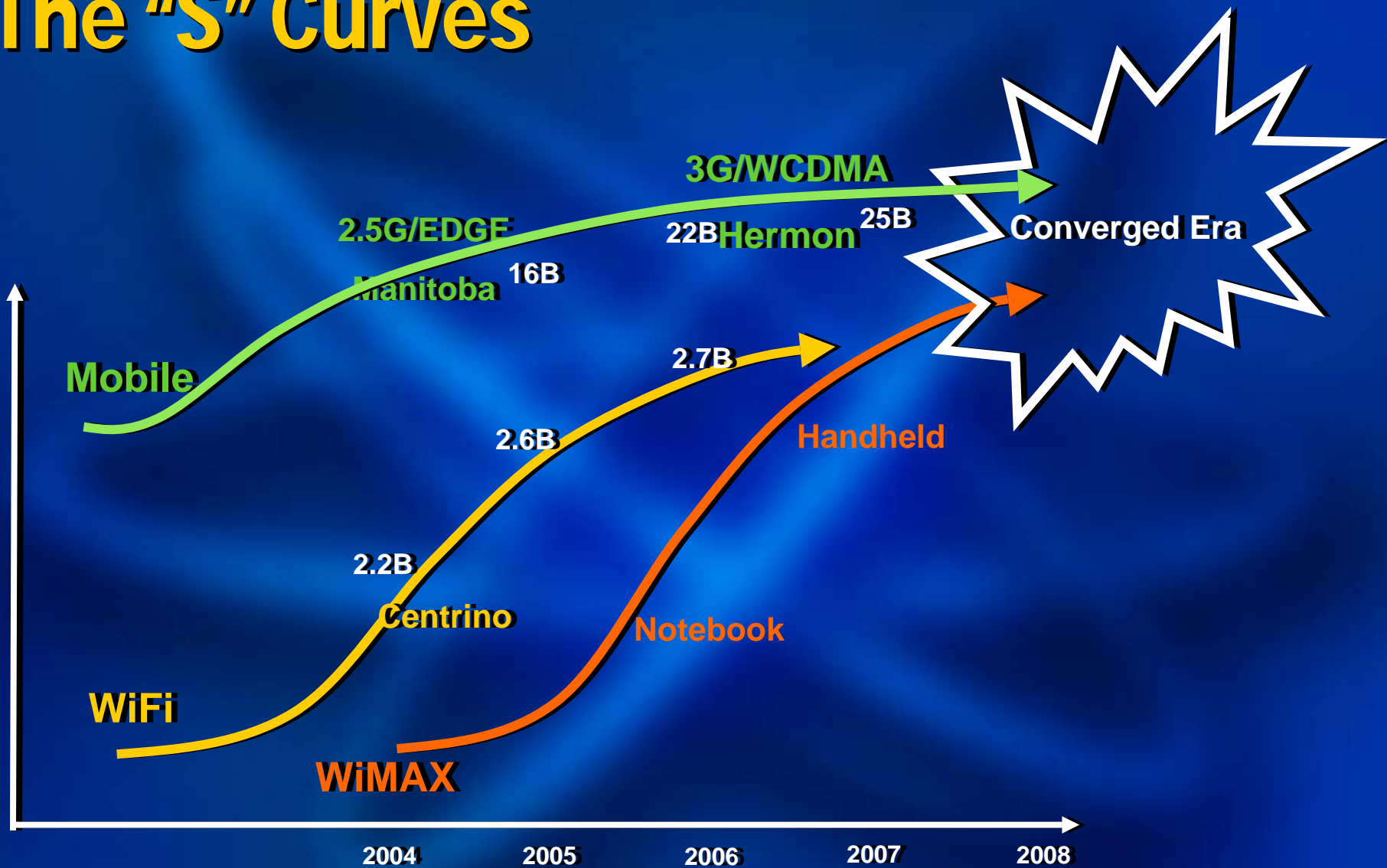
- The Market
 - Nokia, the biggest handset maker: More than 50 operators are expected to offer high-speed services by the end of 2004,
 - Siemens AG's wireless: about 5 million users will probably be using high-speed services by 2004, user numbers reach 40M in 2005 and 100M in 2006.
- 2.5G Phones
 - PXA800F processor, Manitoba
 - Featured an XScale applications processor, a GSM/GPRS modem, and flash memory integrated onto a single chip.
- Three-radio Cell Phones -- Wi-Fi, Bluetooth or 2.5G
 - Wi-Fi, Bluetooth, and GSM/GPRS capability built-in, running Intel's latest applications processor Bulverdi and Intel StrataFlash® memory.
 - Supports multiple full-featured OS, plays MP3 files with PC-quality sound, and includes a 1.3 mega pixel digital camera for pictures and video.
 - Capable of accessing high-speed wireless networks --- Wi-Fi, Bluetooth or 2.5G
- 3G Handheld to Converged Phone
 - Hermon processors will support faster UMTS/WCDMA 3G networks, also features full videoconferencing capability
 - Smart phones design basis to drive 3G phones for the mainstream market.



The Revolution: WiFi to WiMAX

- The difference is that while Wi-Fi's range is 200 feet, WiMax's range extends to some 30 miles. And the speed over 200Mbps.
- WiMAX “inflection point” in the 2006-2008 timeframe similar to what happened with Wi-Fi over the past few years,
- WiMAX capability would be available in notebook computers by 2006
- WiMAX would be available in handsets by 2007.
- Metro Dense Model
 - Put a WiMax node on an existing cellular tower and make service available throughout metro for as little as \$100,000.
- Rural Sparse Model
 - Providing broadband over copper phone lines is expensive in much of the carrier's sparsely populated territory.

The "S" Curves



Intel's Vision: A Time for Harmonic Co-existence

The wireless industry is evolving from a web of independent networks into a single, integrated wireless network.

There will be multiple standards, and no single standard is sufficient anymore.

There won't be a battle of competing technologies

It will be a requirement that Wi-Fi, WiMAX, and 3G coexist, and that coexistence is going to enable a host of exciting new applications and business models.

