# MOBILITY

### Pedro Cerecer
Customer Solutions Group

# Intel and Wireless

– Critical enabler for new usage models

  – Realization of true broadband services

  – Connectivity – digital home, digital office, digital health, on-the-go

  – Pull-through of enterprise server platforms

– Fundamental part of Intel platforms

  – WLAN (WiFi, Bluetooth, UWB)

  – WWAN (3G and WiMAX)

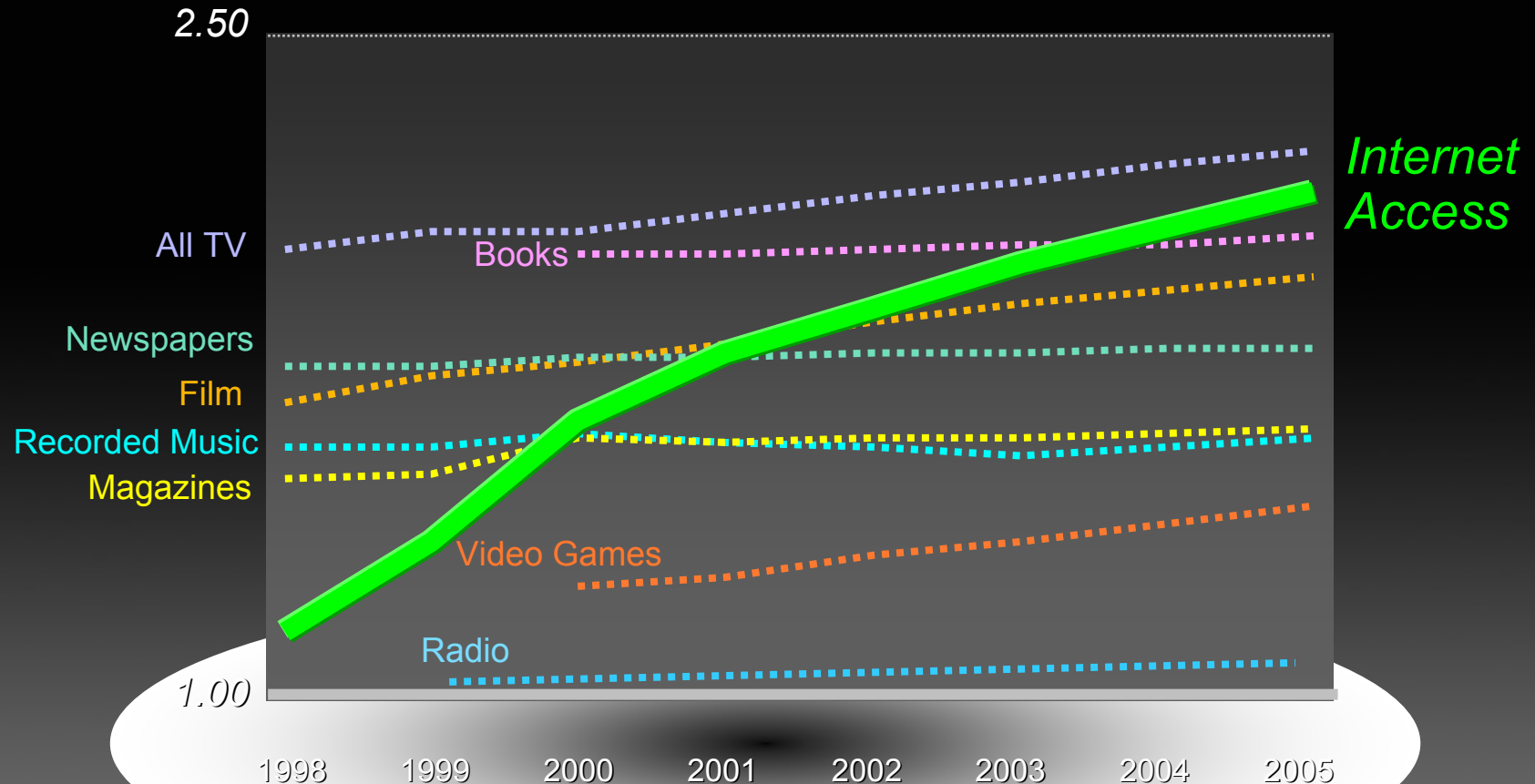**Digital Home**

**Digital Office**

**Digital Health**

**On-the-Go**

# Internet Soon To Pass All Other Media

## *Consumer Spend by Media*



Log Consumer Spend (Billions)

2.50

All TV

Books

Newspapers

Film

Recorded Music

Magazines

*Internet Access*

Video Games

Radio

1.00

1998  1999  2000  2001  2002  2003  2004  2005

Source: Pricewaterhouse Coopers

(intel)

# Intel Technology Initiatives For
# The Personal Internet

## Personal Everywhere:
## *Wi-Fi* → *WiMAX*

## Personal Small Screen:
## *Phones and UMPCs*

## Personal Big Screen:
## *Notebooks*

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# Intel Technology Initiatives For The Personal Internet

## Personal Everywhere:
## *Wi-Fi* ➡ *WiMAX*

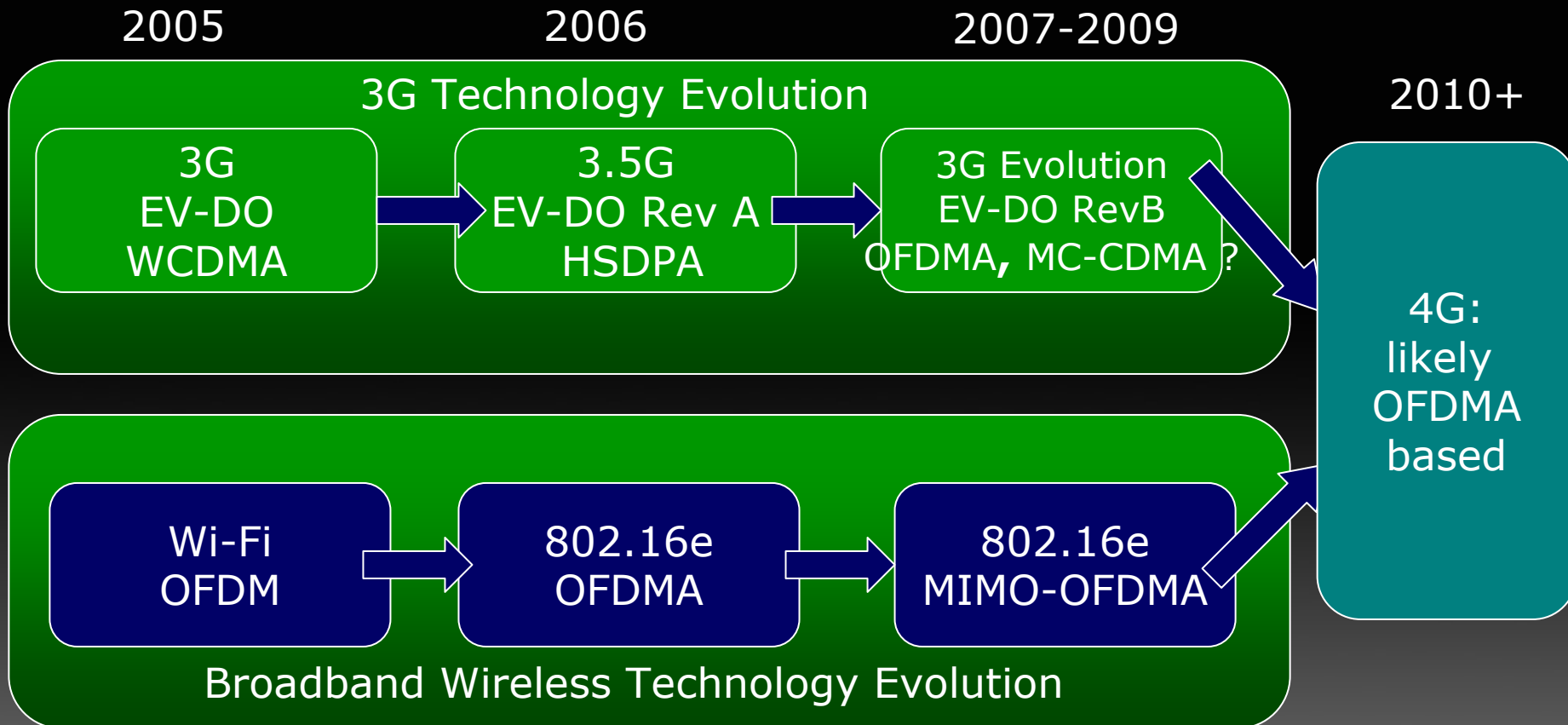## Personal Small Screen:
## *Phones and UMPCs*

## Personal Big Screen:
## Notebooks

(intel)

# Wireless Network Co-existence

**WAN**     *MAN*     *LAN*     *PAN*

**3G**
**WCDMA**
**UMTS**
**HSDPA**

**WiMAX***
**802.16**
**Broadband**

**Wi-Fi***
**802.11**

**UWB**
**and**
**Bluetooth**

**RFID/**
**TAG**
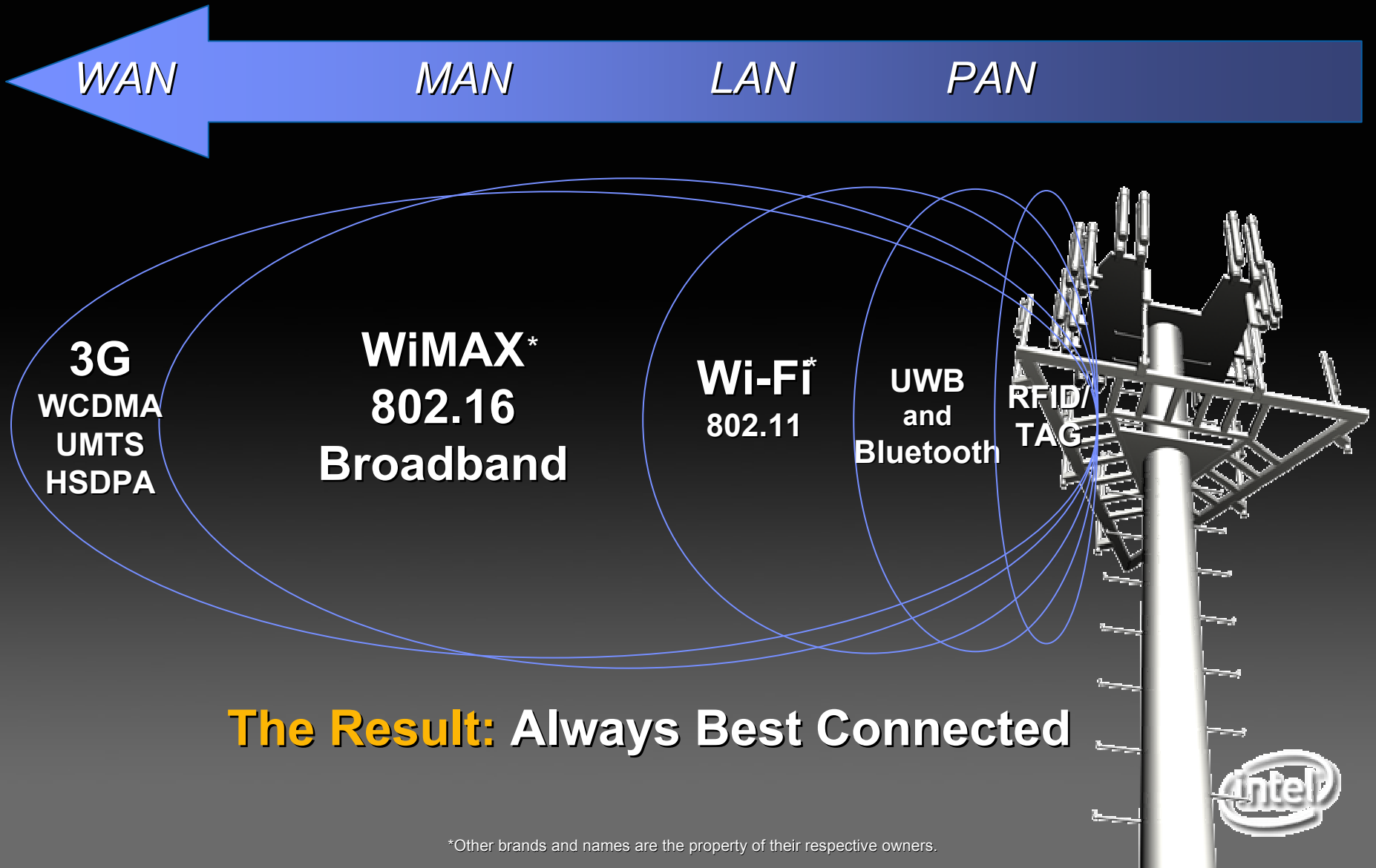
**The Result:** **Always Best Connected**

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*Other brands and names are the property of their respective owners.

# Mobile Wireless Technology Evolution



Source: Rysavvy Research

# Why WiMAX

**Established Customer Demand**

**Broadband, but Fixed**

**Mobile, but Narrowband**

*WiMAX Will Meet Emerging Customer Needs*

*Broadband Data, Voice, & Video for Multiple Devices and Usage Models*

(intel)

# WiMAX Usage & Planned Rollout



**'05** — Fixed Trials Begin

**'06-'07** — Notebook Integration & Early Mobile Trials

**'07-'08** — Phones & Early Mobile Network Rollout

**'08-'10** — Global Network Rollout

WiMAX FORUM

intel

Global
Ready

WiMAX
intel
Ofer R

Ofer Radio Chipset

Mobile WiMAX:
World's First Multi-Band
WiFi/WiMAX Radio

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# Intel Technology Initiatives For
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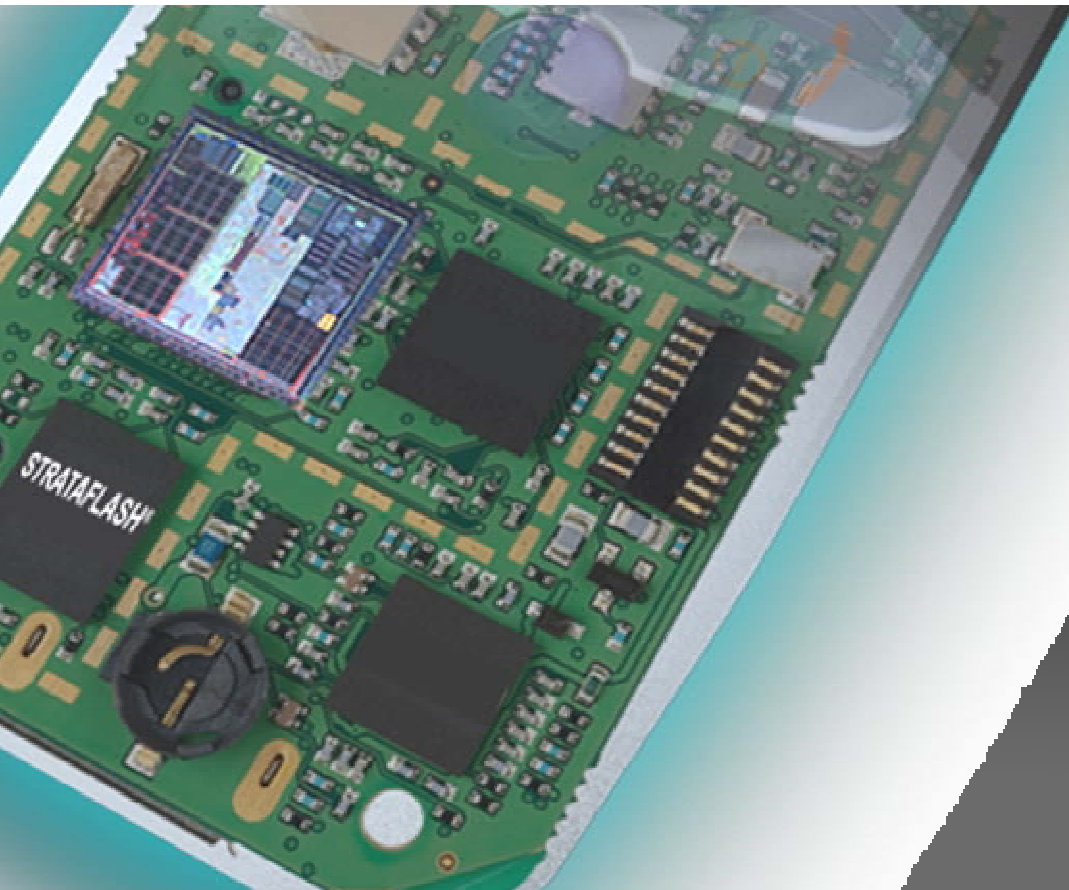(intel)

# Monahans
## Sampling Today

## Technology Enhancements

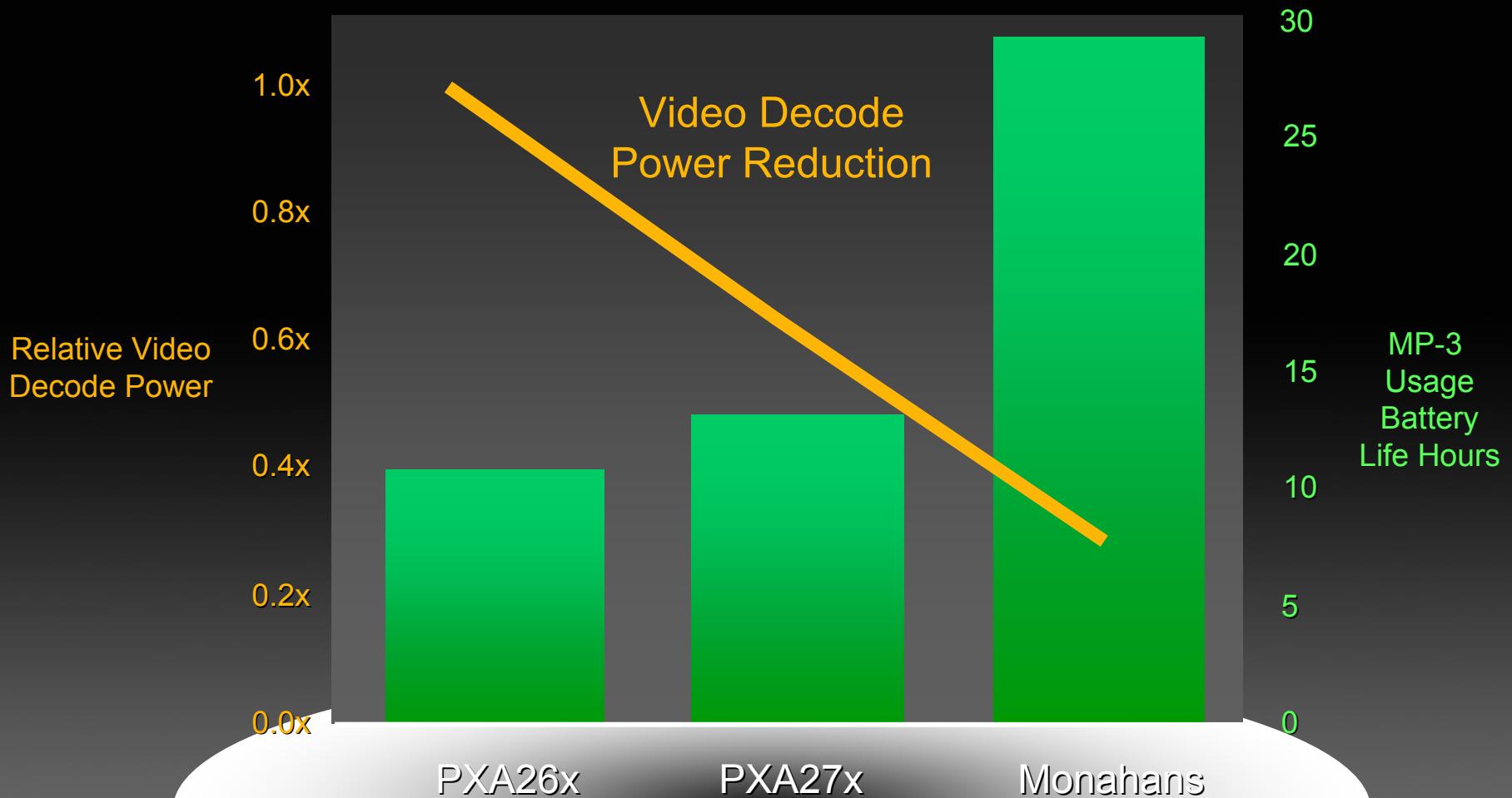*Wireless Intel SpeedStep™ II with Music Max*

*Intel VideoMax Technology*

*Intel Wireless MMX™ II*

*Intel Quick Capture Technology*

STRATAFLASH

(intel)

# A Leap in Performance & Energy Efficiency
## Audio and Video On the Phone

Video Decode
Power Reduction

Relative Video
Decode Power

MP-3
Usage
Battery
Life Hours

1.0x
0.8x
0.6x
0.4x
0.2x
0.0x

30
25
20
15
10
5
0

PXA26x        PXA27x        Monahans

Source: Intel simulations based on Manchac Coast benchmark using 1100 MaH battery life

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# The Next Step in PC Mobility

Thin and Light
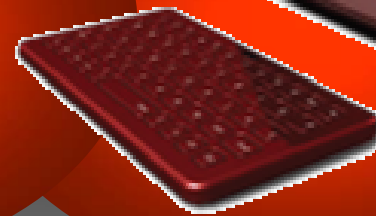Notebook

Launching

Entertainment/
Productivity
Notebook

Sub-Notebook

*Ultra Mobile PC*
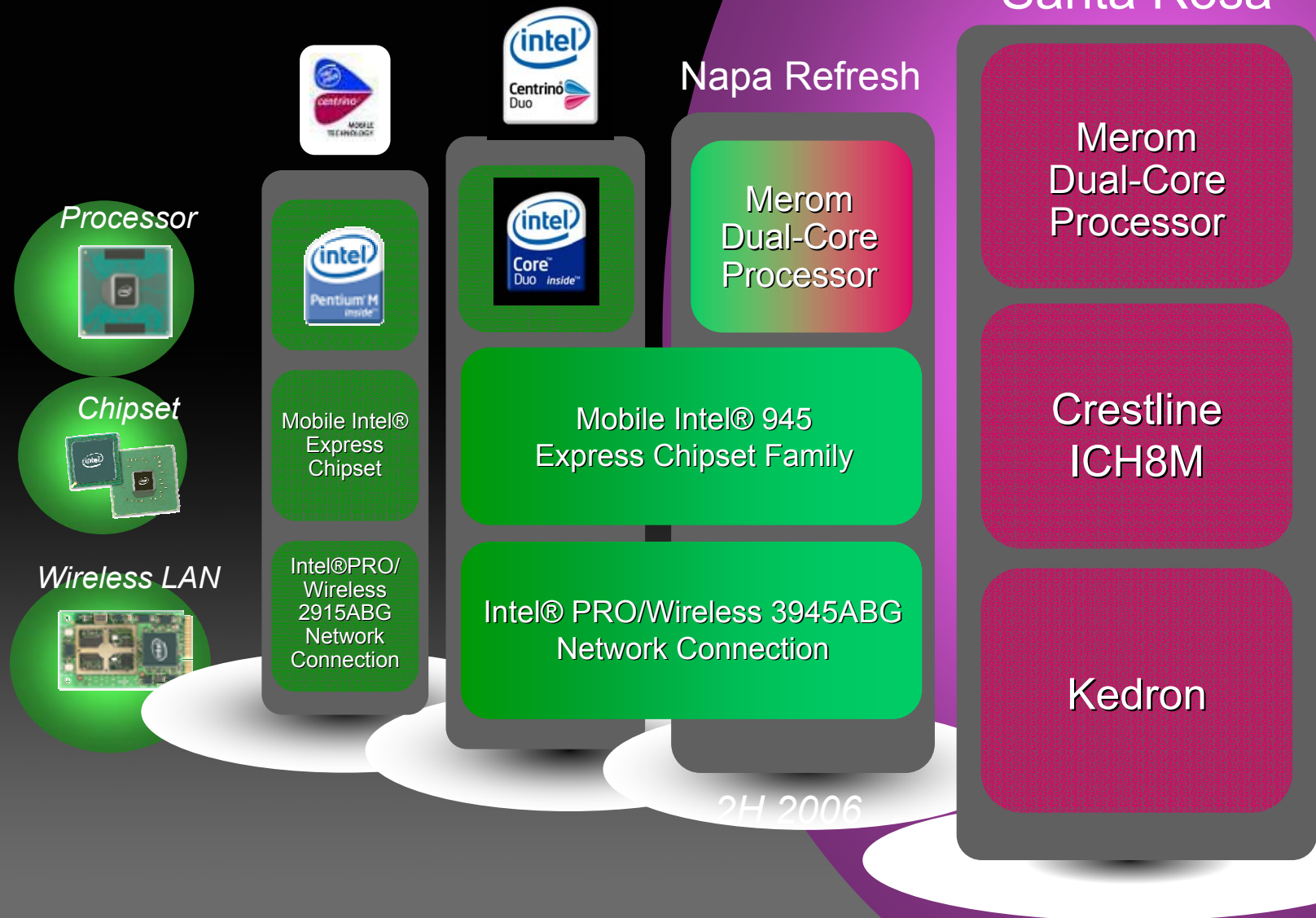
# Intel Technology Initiatives For
# The Personal Internet

## Personal Everywhere:
## Wi- ➤ WiMAX

## Personal Small Screen:
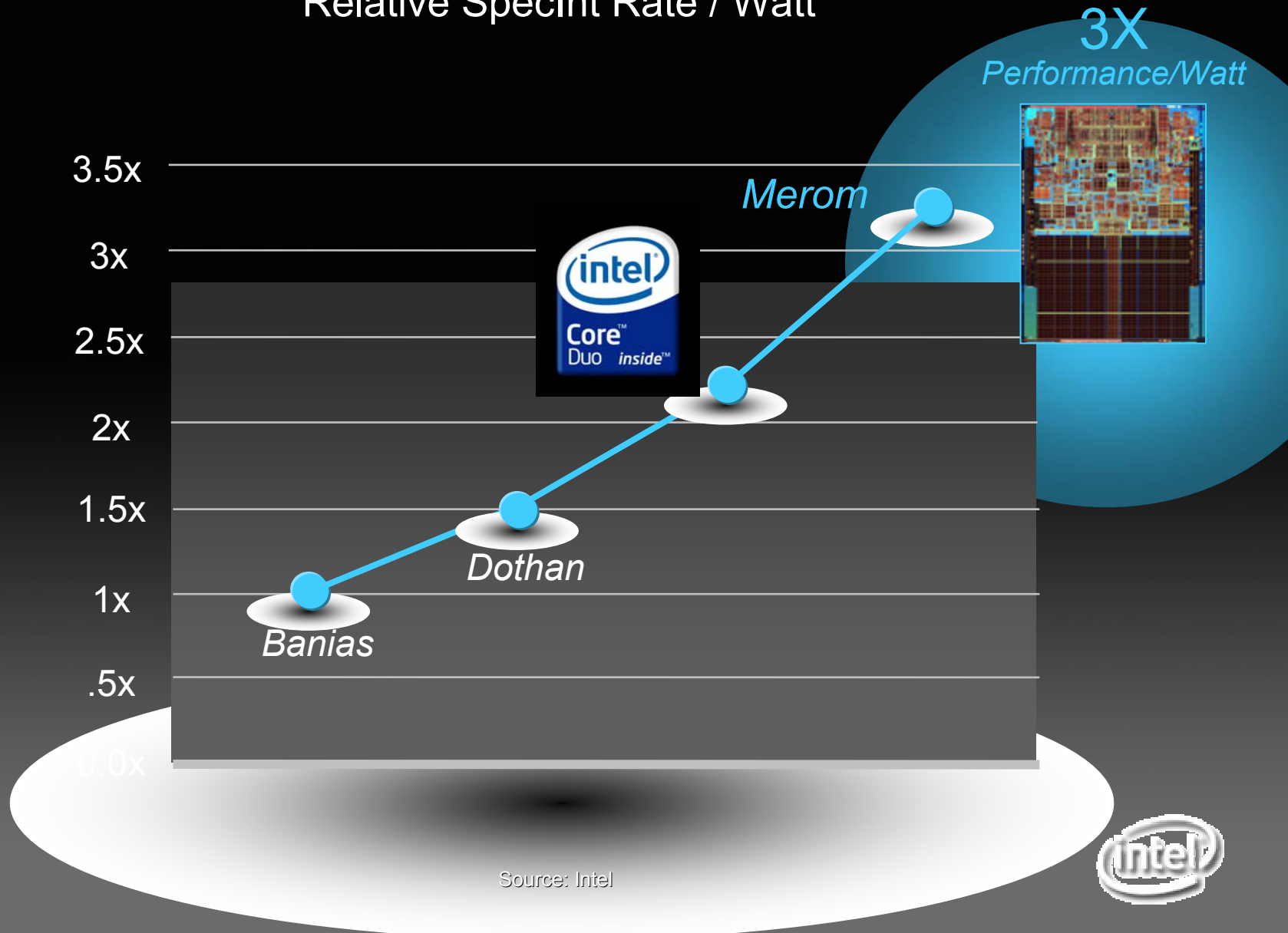## Phones and UMPCs

## Personal Big Screen:
## *Notebooks*

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# Mobile Platform Roadmap

**Processor**

**Chipset**

**Wireless LAN**

## Napa Refresh

**Merom Dual-Core Processor**

Mobile Intel® 945 Express Chipset Family

Intel® PRO/Wireless 3945ABG Network Connection

Mobile Intel® Express Chipset

Intel®PRO/ Wireless 2915ABG Network Connection

## Santa Rosa

**Merom Dual-Core Processor**

**Crestline ICH8M**

**Kedron**

*2H 2006*

# Summary: Key Market Trends

- **VoIP has taken off as broadband adoption accelerating**

- **User devices proliferating and consumer wallets become more  fragmented**

- **Services infrastructure converging to IP**

- **Large scale deployment of IMS is coming…**

- **"All IP Utopia" on the distant horizon…**

  **Media, Network and Service Convergence**

- **WiFi/WiMAX expands - consumer, enterprise, and public hotspots**

Intel® Leap ahead™

# 20+ Commercial WiMAX Deployments in 2005

# 802.16 standard basics

| | 802.16-2004 (rev d) | 802.16e |
|---|---|---|
| Completed | 802.16- 2004:  July 2004 | Estimate Q4'05 |
| Spectrum | < 11 GHz<br>Licensed  & Unlicensed | < 11 GHz  ( <6 GHz practical)<br>Licensed  (& Unlicensed) |
| User model | Fixed, portable | Pedestrian Mobility –> Full mobility<br>Receiver: in the notebook, HH |
| Channel Conditions | Non Line of Sight | |
| Modulation | OFDM 256 / OFDMA 2k | Scalable OFDMA (128 – 2k) |
| Peak Raw data rate | Up to 75 Mbps with 20MHz channels<br>4-18 Mbps in 5 MHz channels | Up to 75 Mbps with 20MHz channels<br>Full mobility:<br>80% performance of fixed usage model |
| Channel Bandwidth | Flexible channel bandwidths between 1.25 and 20 MHz | |
| Range at 2.5 GHz (average cell) | 2 to 10 km semi-rural<br>2 to 5 km urban/suburban<br>(frequency dependent – significantly better for 700MHz)<br>Max range 35 km at 700 MHz | Portable/mobile<br>Urban/Suburban/Semi-rural<br>1 – 5 km (indoor)<br>2 – 7 km (outdoor) |