Spring Analyst Meeting
Paul S. Otellini :: President and Chief Operating Officer
2003 Intel Spring Analyst Meeting
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**Convergence** of Computing & Communications

*"Always" and "All-Ways" Digital*

**Wireless**

*the 1st Killer Environment*

Winning with **Connected Computing**

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## 7 Years Ago…

1 **Billion** Connected **Computers**

*Andy Grove*

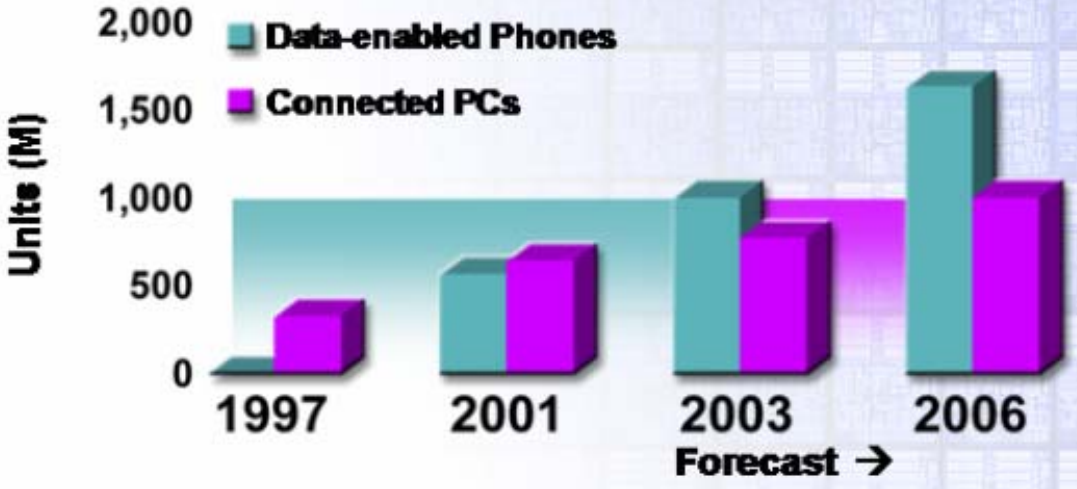
## 4 Years Ago…

1 **Billion** Connected **Computers**

1 **Billion** Connected **Handsets**

*Craig Barrett*

## What happened?




Source: Intel

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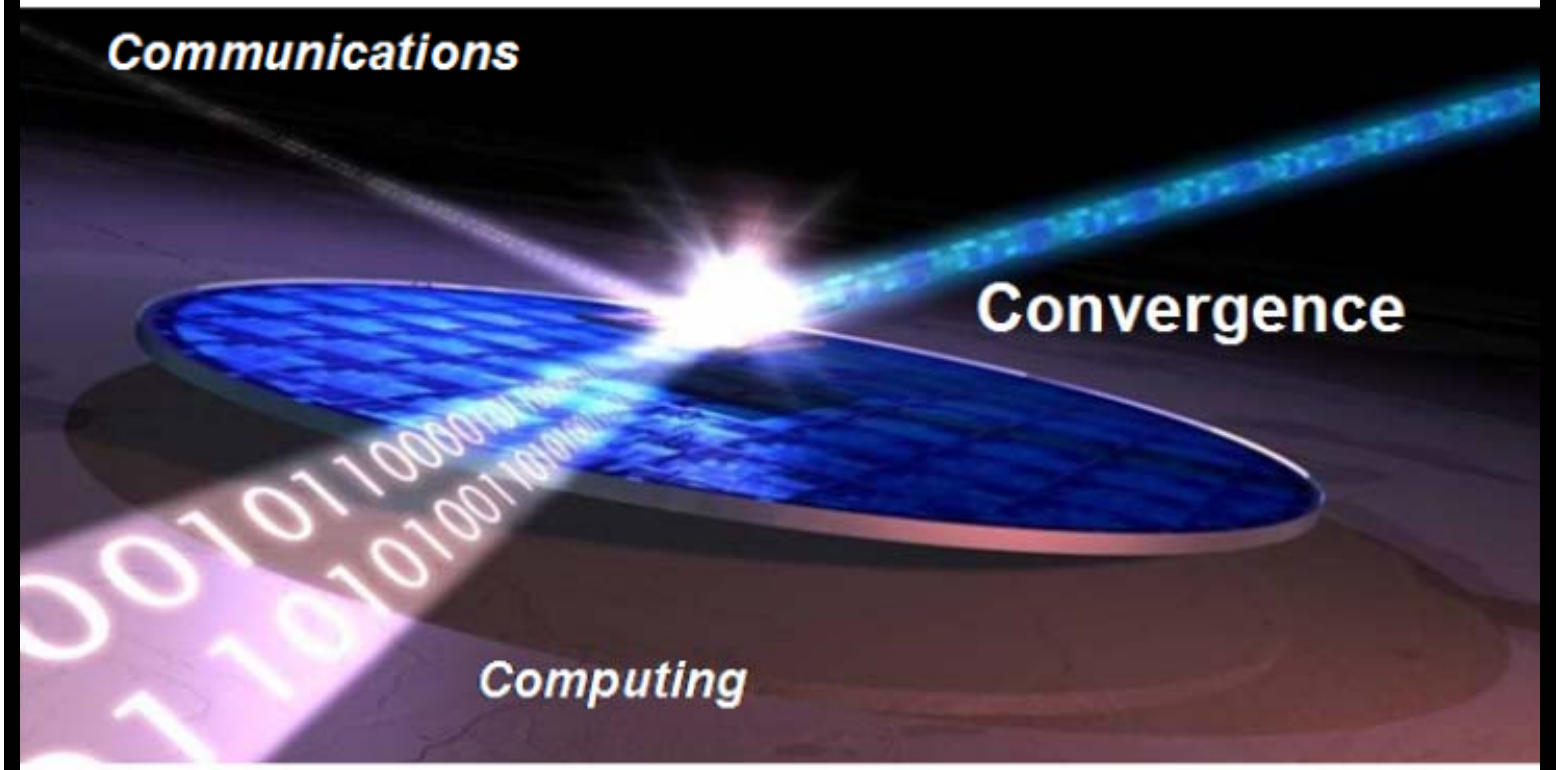
**One year ago...**

**All computers will *communicate*...**




**All communications devices will *compute*...**

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# Convergence
# is here...

***Intel® Centrino™***
***Mobile Technology***

***Manitoba***
***"Wireless Internet on a Chip"***

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# Making Convergence Mainstream

## With the device…

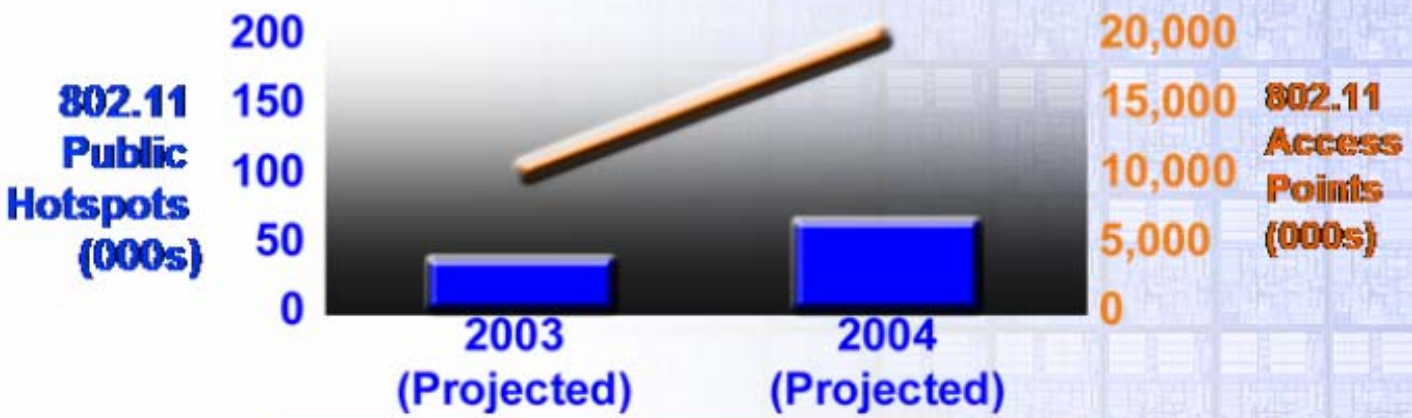
*Intel® Centrino™ Mobile Technology*

***2003 → 2004 units: >2x***

*Intel XScale™ Technology-based handsets*

***2003 → 2004 units: >10x***

## and the connections…




Adding 27,000 access points per day…

Source: Intel; InStat 5/03 (APs), Gardner (Hotspots)

# the 2010 Opportunity…

**1.5 Billion** Broadband **PCs**

***Wired*** *(Copper, DSL/VDSL/Cable and Fiber)*
*and* ***Wireless*** *(802.11, 802.16 and 3G/4G)*

**2.5 Billion** Connected **Handsets with "GHz"**

*performance equivalence of a* ***"4GHz Pentium® 4"***

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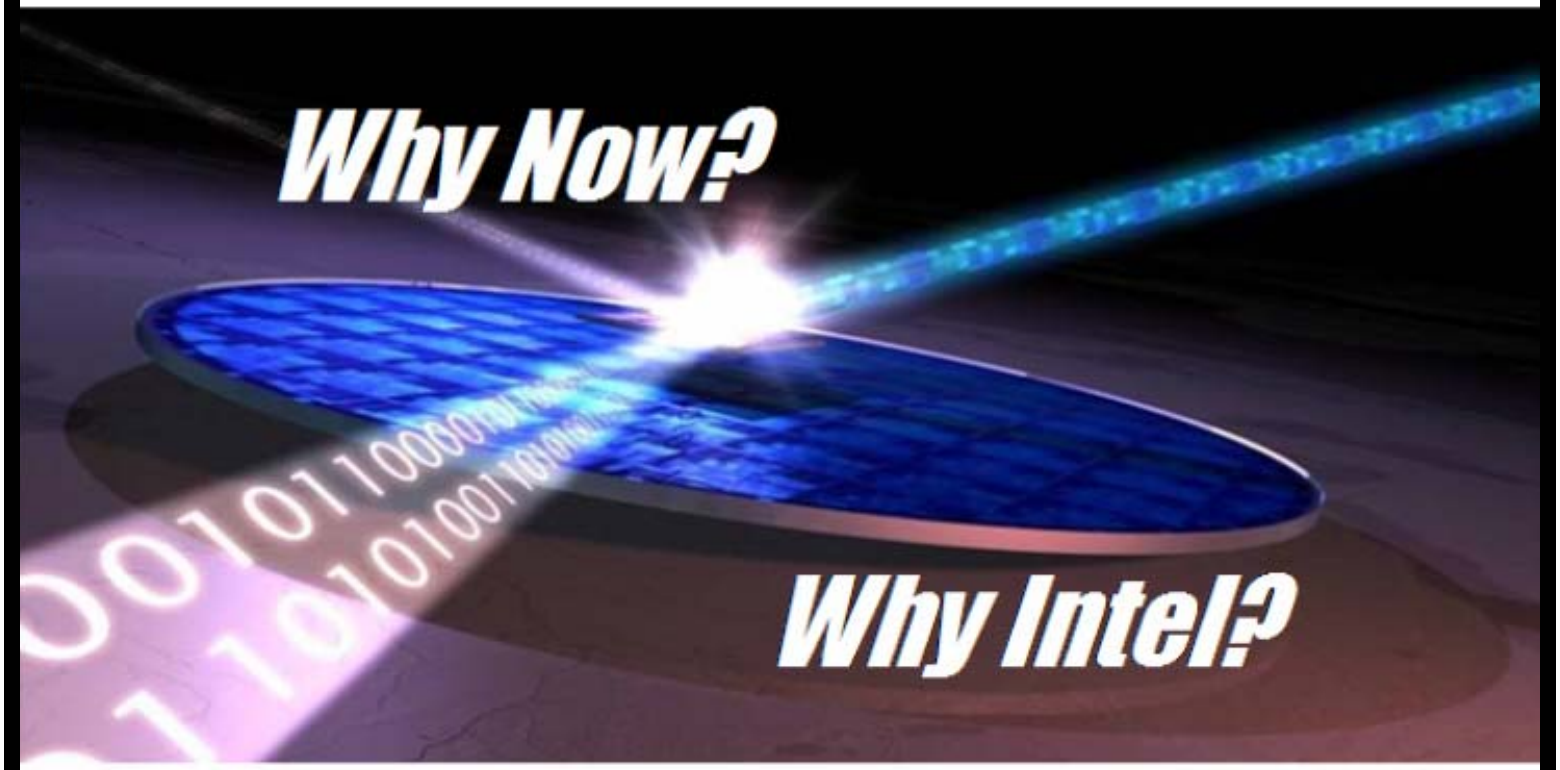
# CONVERGENCE

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Convergence

*Why Now?*

# "ALWAYS" & "ALL-WAYS"

Digital

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# Wireless:
# The 1st Killer Environment

**Wi-Fi means Business**

*Business Week, April, 2003*

**Wi-Fi Inside**
**Positions Intel at Top**

*Telephony Magazine, March, 2003*

**Wi-Fi: Anytime, Anywhere**

*Wall Street Journal, March, 2003*

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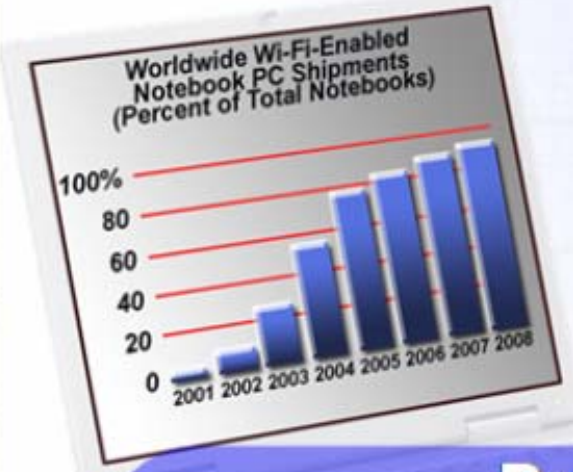
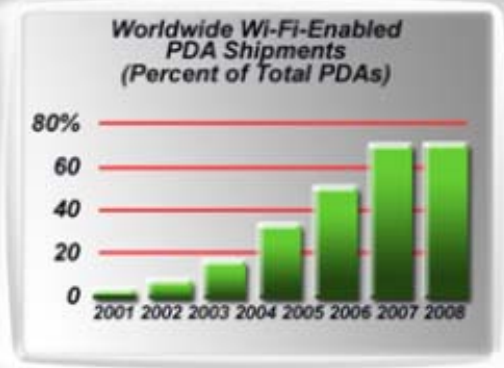



## Driving Wireless Notebook Adoption

## But, this is "BC"

*(Before Centrino™ Mobile Technology)*




## and Wi-Fi Enabled Handhelds...

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Source: Allied Business Intelligence

# Wireless: not just 802.11...

Devices will require multiple standards...
*in all geographies... in one device*

**WLAN** 802.11.b → b/g → a/b/g/i → n

**WMAN** 802.16

**WWAN** GSM → GPRS → UMTS → 4G?

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"Radio Free Intel" = Leadership

and more than **Notebooks & Handsets...**

*Wireless*: the next **server** opportunity

**Internet** : edge

**Wireless** : databases & OCC* apps

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* Occasionally Connected Computing

# Convergence

## *Why Intel will **Win**?*

Lowest **Cost**

Highest **Capabilities**

Worlds best **"Diffusion Engine"**

Common **Software**

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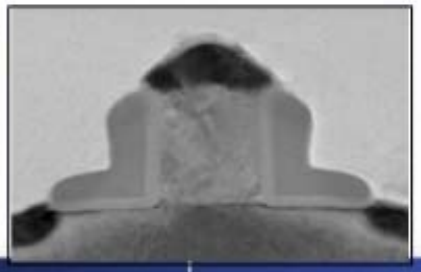
# Moore's Law
## Alive and Well

**130nm node**
70nm gate

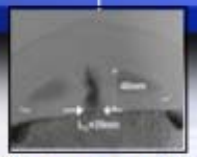


**65nm node**
30nm gate (prototype)

**32nm node**
15nm gate (prototype)

2001 2003 2005 2007 2009

**90nm node**
50nm gate



**45nm node**
20nm gate (prototype)

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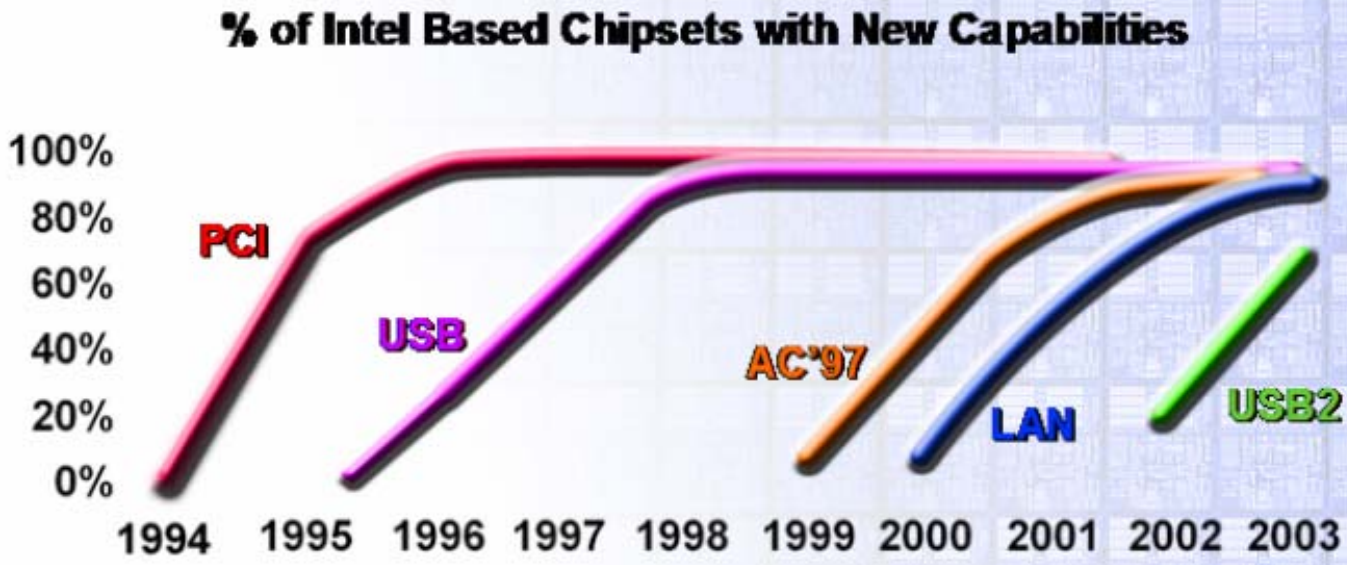
Delivering Highest Capabilities at Lowest Cost

# Intel: The Worlds Best "Diffusion Engine"




No one else can "diffuse" capabilities on our scale
Next… **Wireless, PCI-E, Serial ATA…**

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# Software Goal:
# Write once, run **best on Intel** processors…

**Occasionally Connected Computing**

***"Always" and "All-ways" Connectivity***

***Common denominator is Intel silicon and tools***

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JAMDAT™ mobile

# demo

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# Winning Converged Computing...

**Mobile Internet Clients**

**Digital Home**

**Digital Office**

**Communications Infrastructure**

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# Intel® Centrino™ Mobile Technology:
# Raising the Bar…

**Worldwide launch in Q1**

125 designs, 50 at launch

**CMT ramp meeting our expectations**

Wireless attach rate > 50%

**New Market: "White-book"**

Launch: 3 ODMs, 35 SIs

2003: 8 ODMs, 120 SIs

Enabling the channel to sell into the growth segment

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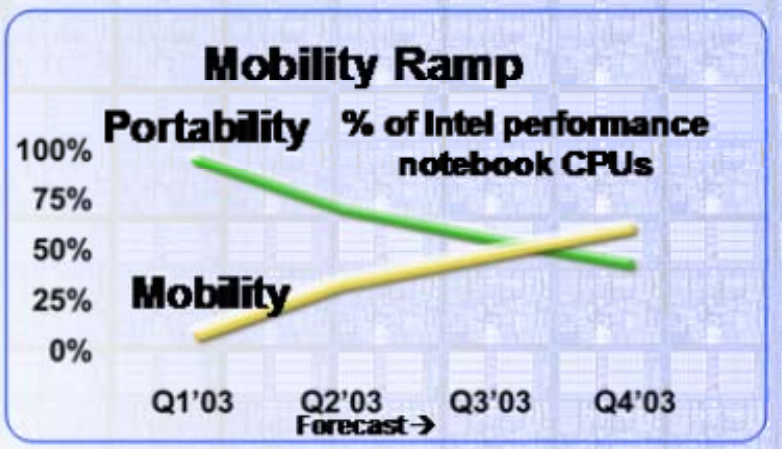
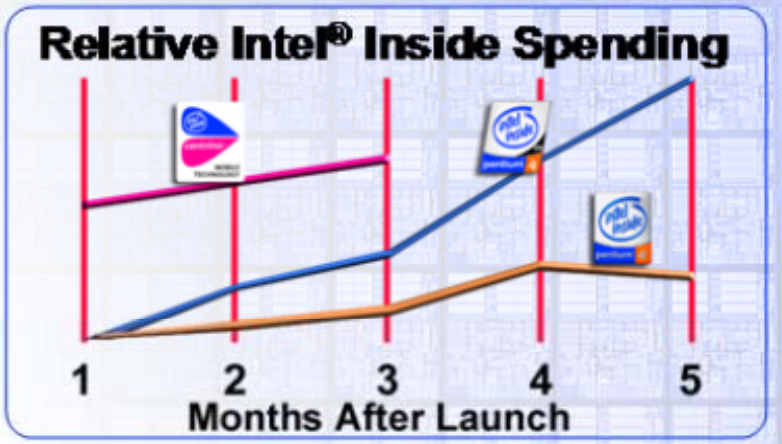



Source: Intel

# And it gets **Better**…

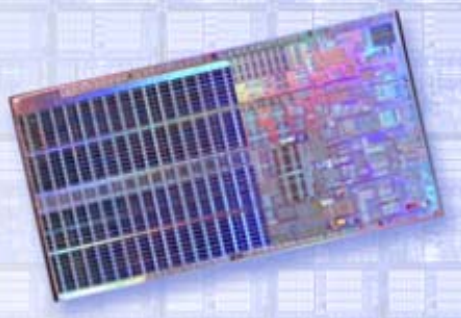
**2H'03**

Dothan: 1st 90nm mobile CPU

Better performance (2x cache, higher GHz)

Wireless: 802.11a/b & 802.11b/g

New chipset: Backlight Image Adaptation



**2004:**

Next Gen. Wireless: 802.11a/b/g

Next Gen. Mobility: Newport Concept

"Quick Peek" lid display, Always-on Wireless

5 radios, all day battery life, fan-less…

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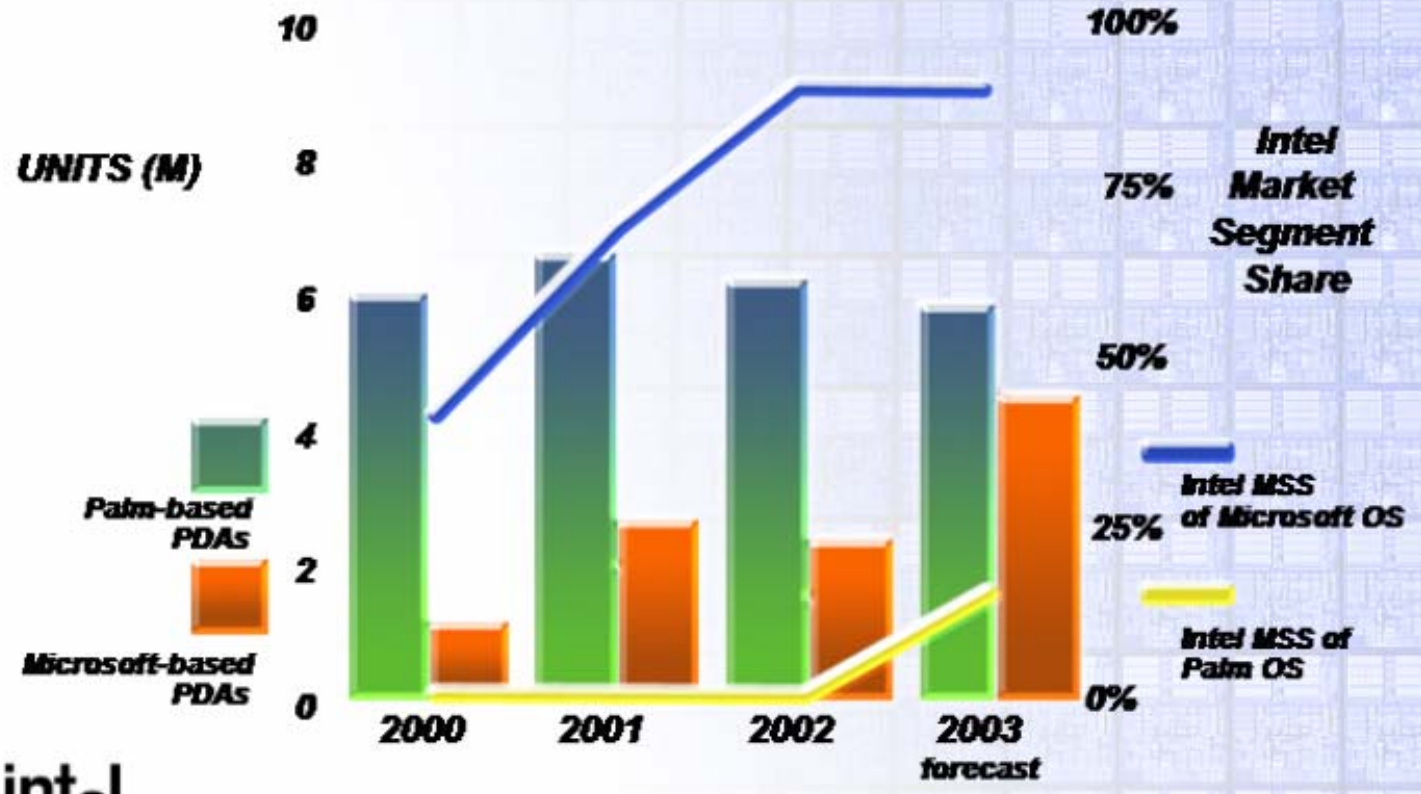
# Extending Mobility:
# 2003 is the **crossover** point for PDAs…




Source: Gartner, Intel

# Prescott: enabling the Digital Home & Digital Office

**Technology Leadership**:

- Hyper-Threading, La Grande Technology

**Platform Leadership**: New capabilities

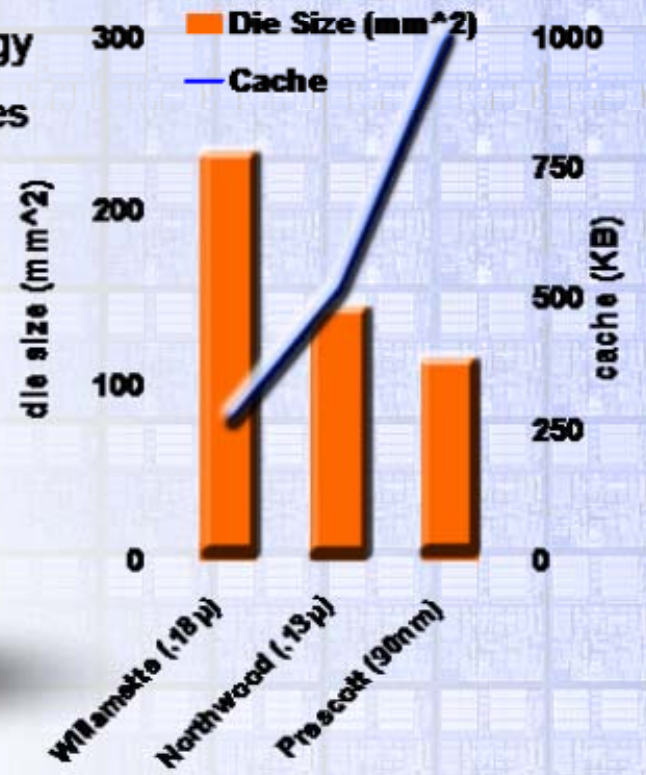
- 800MHz FSB, 400MHz DDR, SATA
- Statesboro, Marble Falls, Powersville

**Mfg. Leadership**: 90nm, 300mm

**Software**: Office 11, Sinbad...

Powersville

Marble Falls

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*More than "just the next CPU"*

# Winning the **Digital Home**

*"TiVo is God's machine."*

*Michael Powell, FCC Chairman*
*February, 2003*

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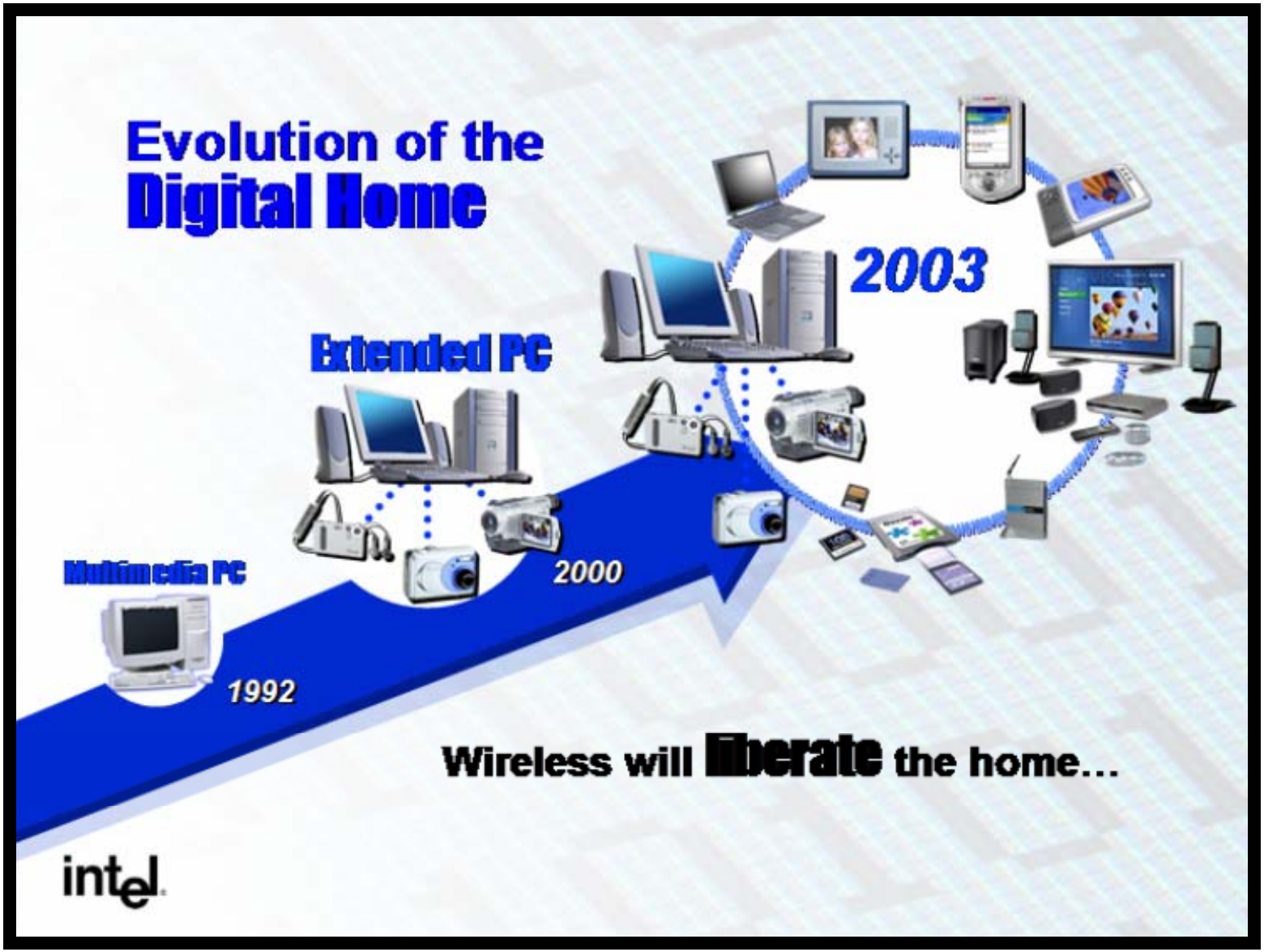
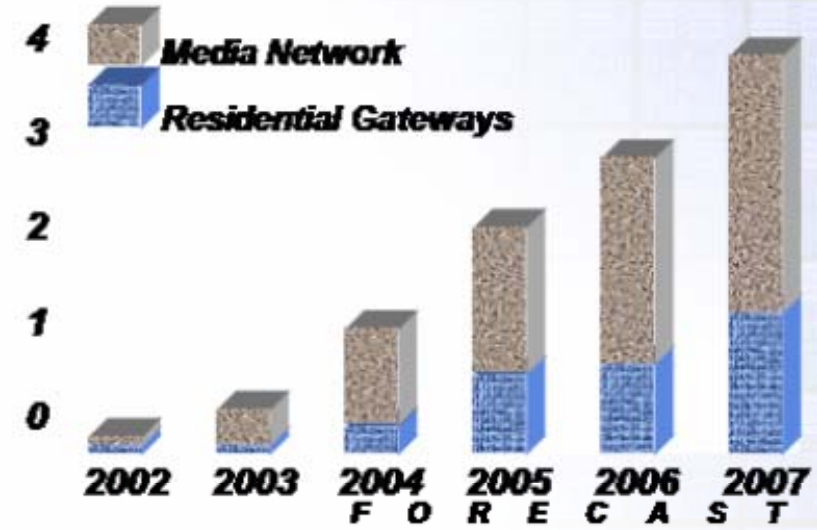

Evolution of the
Digital Home
2003
Extended PC
2000
Multimedia PC
1992
Wireless will liberate the home…
intel

# Whole House **Media Connectivity:**



Philips iPronto

Linksys Digital Media Adapter

Toshiba Transcube 20

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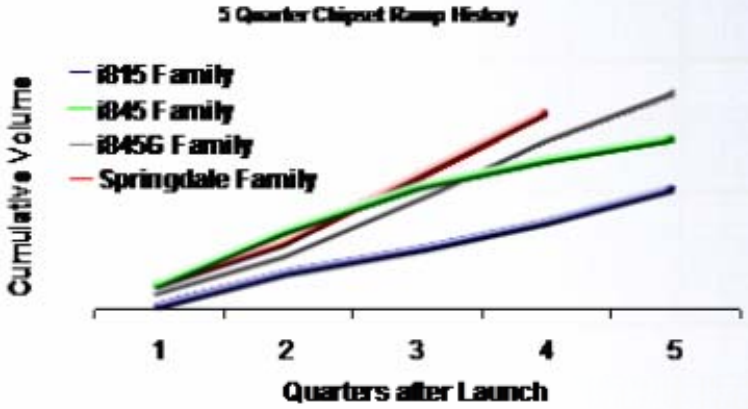
Source: In-Stat/MDR, March, 2003

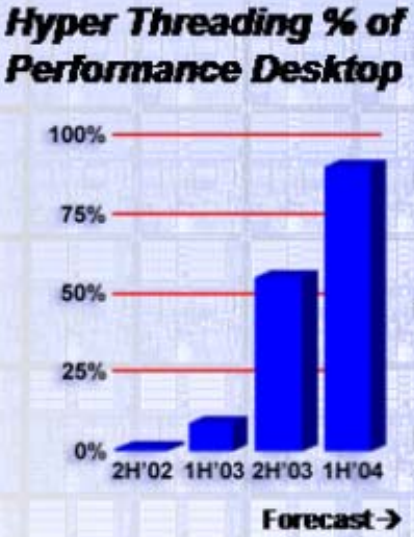
*Other names and brands may be claimed as the property of others.

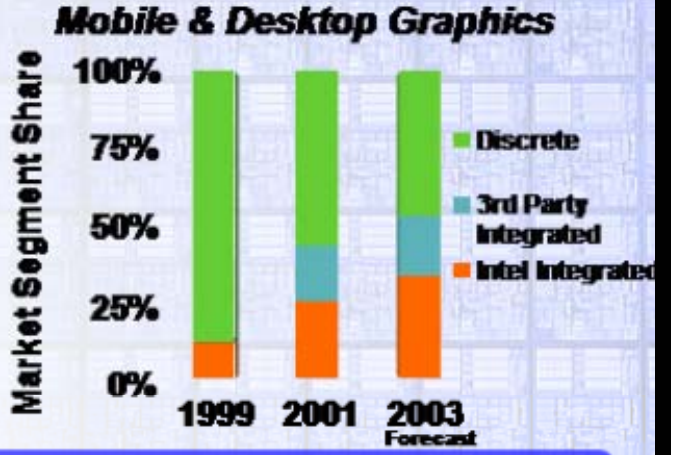
# Winning the Digital Home

## With Standards & Partners
CE and PC Industries

## Technology & Capabilities
**1H: Springdale** (865), HT
**2H: Prescott**: 90nm, 300mm
**graphics**: goal is #1 in '03

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Your Content, Your Apps: *"Always"* & *"All-Ways"* Available

* Intel Springdale Forecast
Source: Mercury Research Q4 '02

# Winning the **Digital Office**

With a compelling **upgrade** proposition

With **notebooks and wireless**

With the best **server building blocks**…

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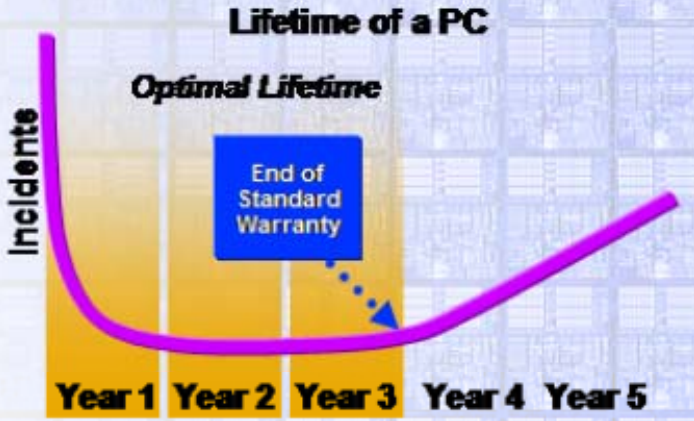
# Digital Office: Why Upgrade Now?

**500M PCs below 700MHz***

Three refresh drivers

1) TCO
2) Security
3) Productivity




*A Big Four accounting firm partner indicated that his firm's auditors… will look at clients running mission-critical business processes on **unsupported and vulnerable computers**.*

Aberdeen Group

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Source: Siemens Business Services

* Source: Business Week, Jan 2003

# IT benefits from **Mobile and Wireless**

ThinkEquity partners

The key driver why laptops will be such a lynchpin for corporate upgrade cycle is **productivity**.

Gartner

WLAN ROI: **Additional 8hrs per week** in productivity over wired networking

Deloitte & Touche

~ 85% of our employees have notebooks. We gain huge **productivity advances** by providing notebooks to anyone who wants one.

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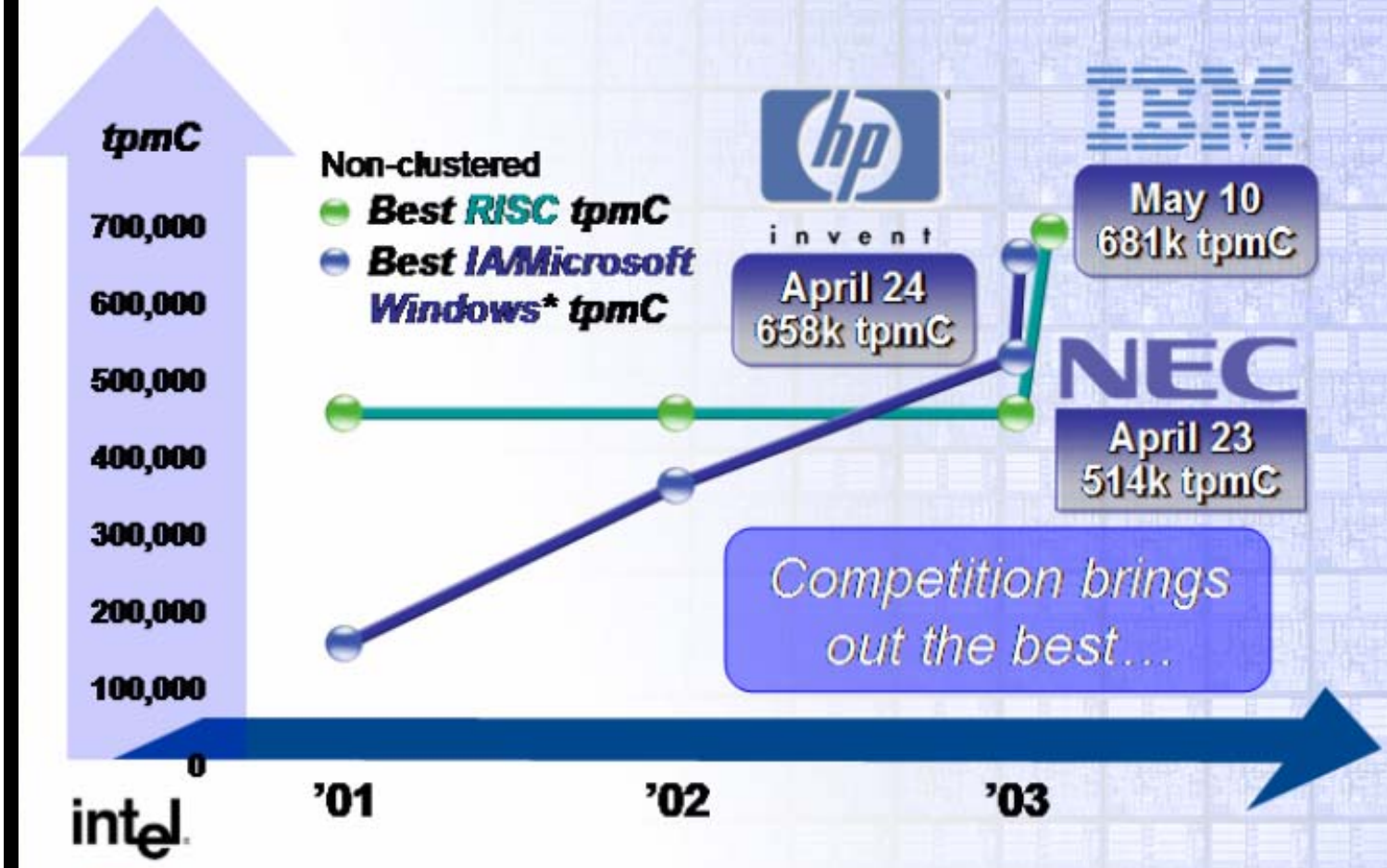
# Proof-points: IGNITING the Refresh…

*419 "wins"… in all geos*

*1.5M incremental clients, and growing…*

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

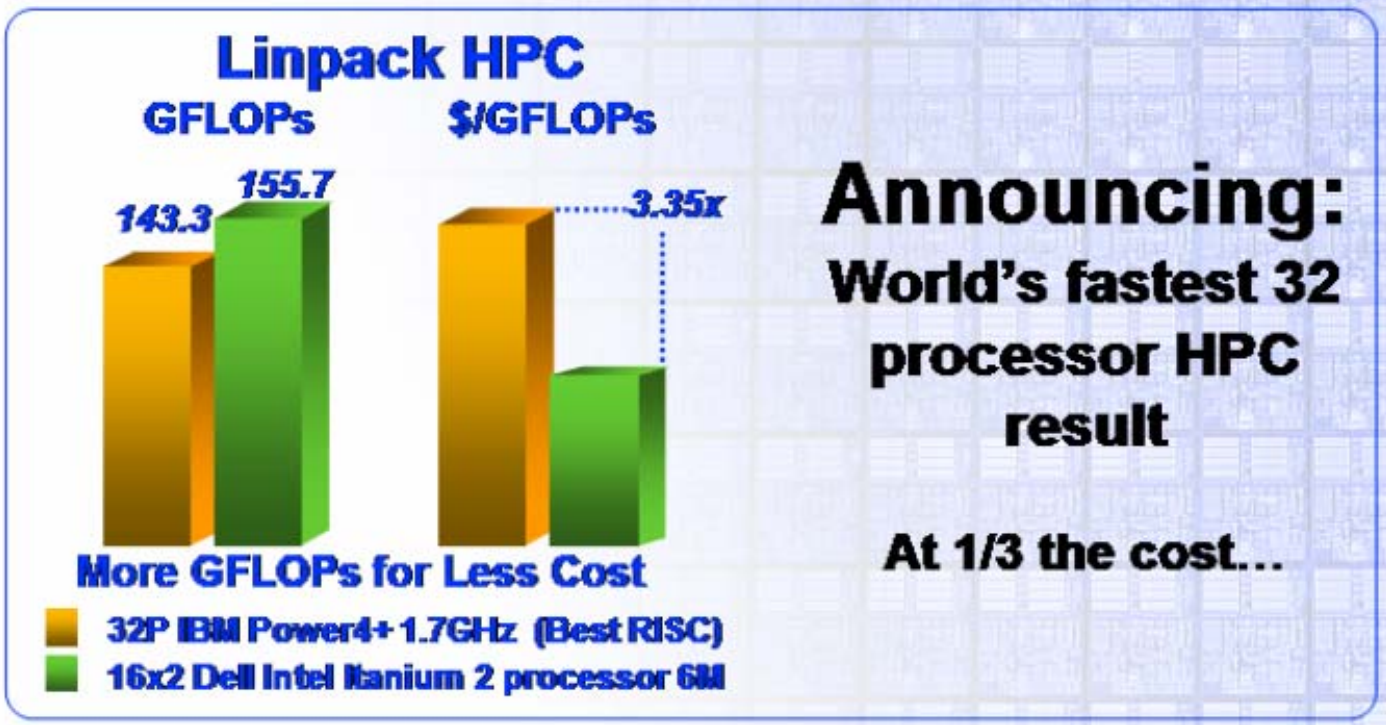
# The Enterprise: **Winning the last Hill…**




Source: www.tpc.org. Results as of 4/24/03. See backup slide for details on tpmC, $/tpmC and Availability dates. TPC-C version 5. Other brands and names may be claimed as the property of others.

# Leading the (Lin) Pack:

## Intel® Itanium® 2 Processor 6M




Source: Dell Computer for Itanium® 2 processor 6M results on a cluster of 16 Dell PowerEdge Servers, each with 2 Itanium® 2 processors 6M at 1.5GHz, 4GB RAM, RedHat Linux AS 2.1. Source: http://www-1.ibm.com/servers/eserver/pseries/hardware/system_perf.pdf for Best RISC result on IBM eServer p690 with 32 Power 4+ processors at 1.7GHz. $/GFLOP based on estimated street prices of these systems.

Results as of 5/12/03

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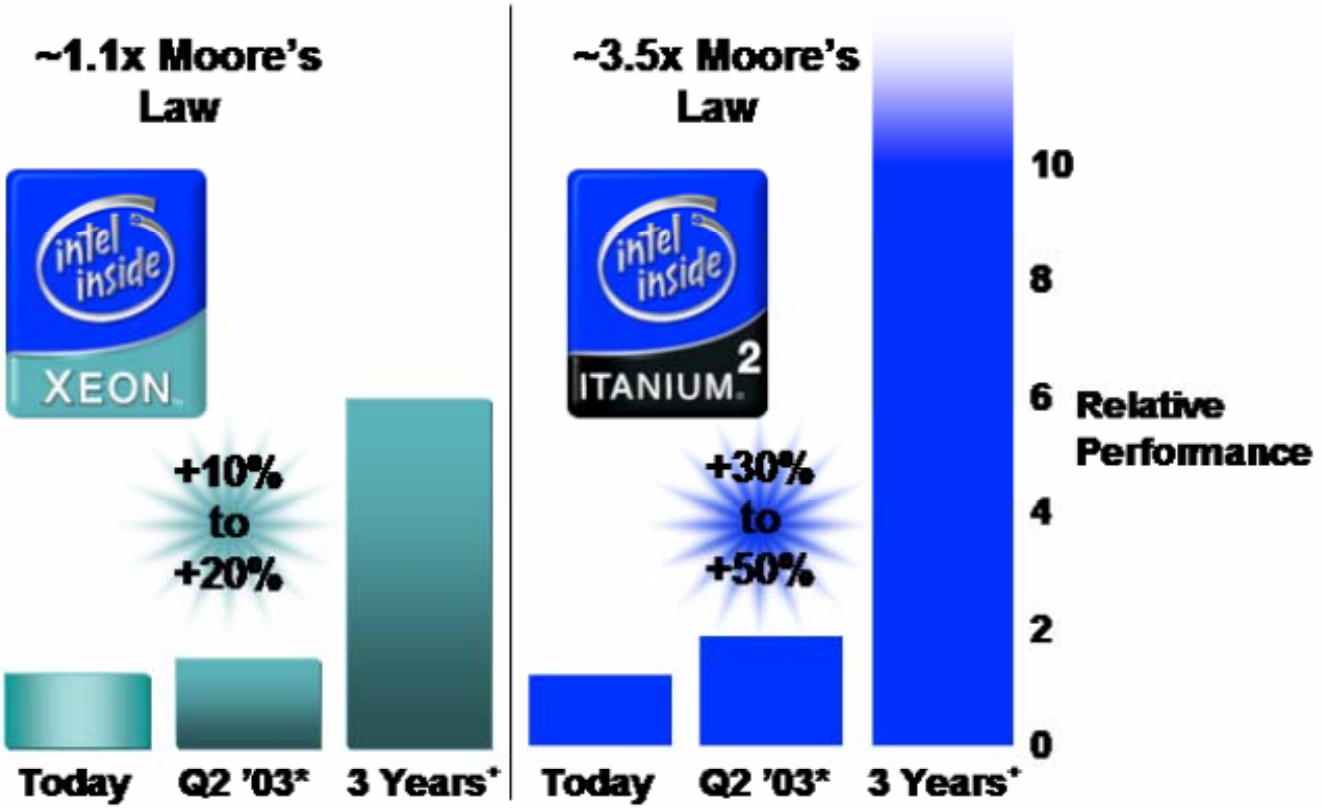
Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit www.intel.com/sites/sites/Pacific.htm or call (U.S.) 1-800-628-8686 or 1-916-356-3104

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

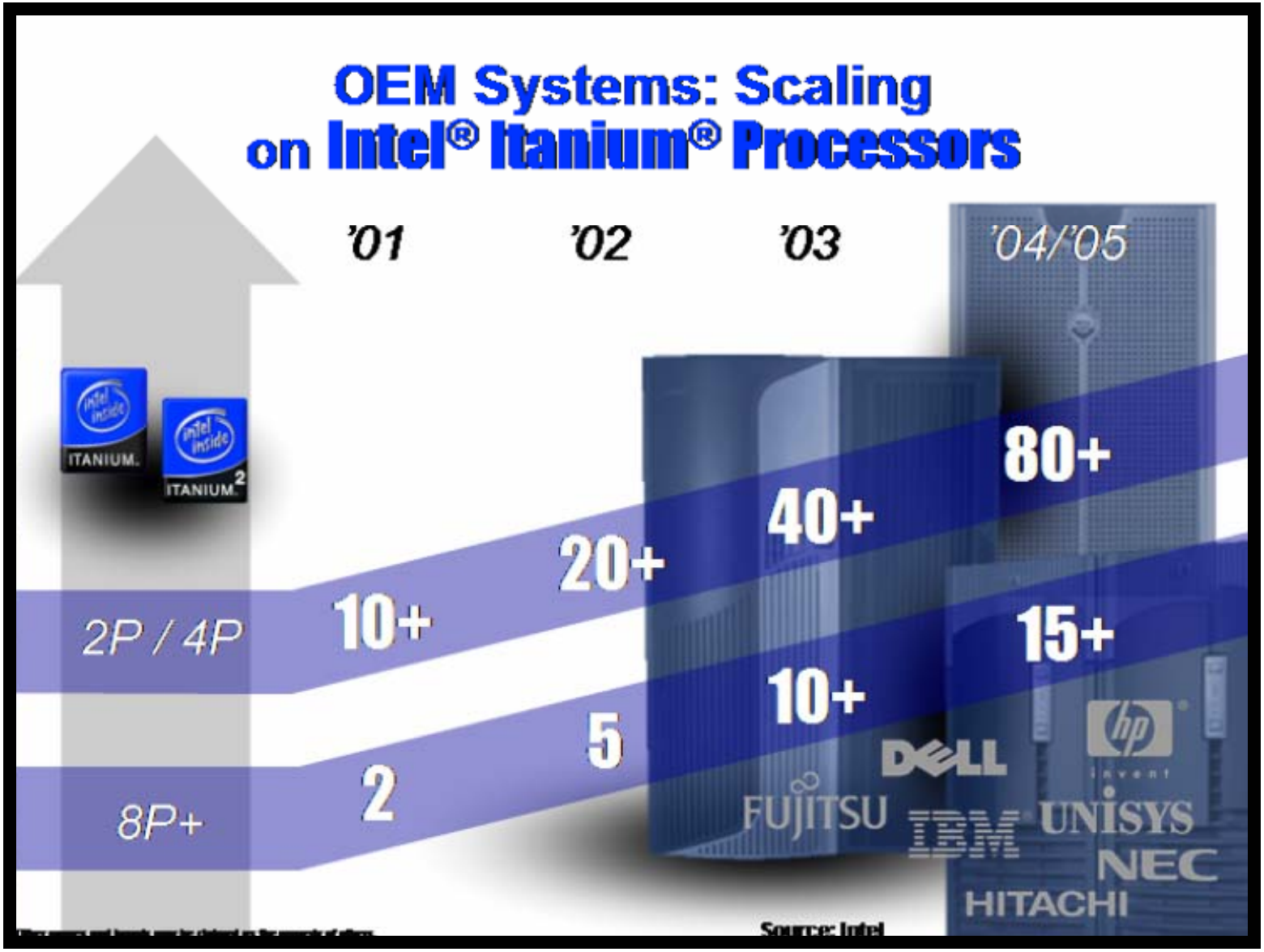
## Intel® Xeon® Processor and Intel® Itanium® Processor Families

# Continuing to Win: Short and Long Term




*"Q2 '03" is a performance range based on an average increase measured and estimated across workloads that include: SPECint2000, SPECjbb2000, SPECweb99_SSL, TPC-C, and SAP SD 2-tier benchmarks on 4-way servers with Intel Itanium® processor at 1.5 GHz with 6MB L3 cache and Intel Xeon™ MP processor at 2.8 GHz with 2MB L3 cache. + 3 Year performance is based on Intel internal projections using an OLTP workload

# OEM Systems: Scaling on Intel® Itanium® Processors



# Innovation's Role

*" I believe business will come back when we get some products that people want to buy."*

***Charles F. Kettering, 1933***
Founder of Delco
Director of General Motors R&D

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# Backup for TPC-C

| | TPC-C Version 5 results | | | |
|---|---|---|---|---|
| Year | 2001 | 2002 | 2003 | 2003 |
| Best RISC tpmC | 455818 | 455818 | 455818 | 680613 |
| $/tpmC | 28.58 | 28.58 | 28.58 | 11.13 |
| Availability date | 2/28/2002 | 2/28/2002 | 2/28/2002 | 11/5/2003 |
| System name | Fujitsu PRIMEPOWER 2000 c/s w 66 Front-Ends | Fujitsu PRIMEPOWER 2000 c/s w 66 Front-Ends | Fujitsu PRIMEPOWER 2000 c/s w 66 Front-Ends | IBM eServer pSeries p690 Turbo 7040-681 |
| Best IA tpmC | 165218 | 342746 | 514034 | 658278 |
| $/tpmC | 21.33 | 12.86 | 11.5 | 9.8 |
| Availability date | 3/10/2002 | 3/31/2003 | 10/22/2003 | 10/23/2003 |
| System name | Unisys e-@ction Enterprise Server ES7000 | NEC Express5800/ 1320Xc C/S w/Express5800/120Rd- | NEC Express5800/1320 Xc | HP Superdome |

Source: www.tpc.org. Results as of 5/12/03

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit www.intel.com/software/products/benchmarks.htm or call (U.S.) 1-800-628-8686 or 1-916-356-3104

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