



# Talking Architecture

May 29, 2007

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Today's presentation contains forward-looking statements. All statements made that are not historical facts are subject to a number of risks and uncertainties, and actual results may differ materially. Please refer to our most recent Earnings Release and our most recent Form 10-Q or 10-K filing for more information on the risk factors that could cause actual results to differ.



# Key Messages

- Making the investments to sustain the pace of innovation the market demands
- Intel's Tick-Tock model delivers substantial leads in both silicon manufacturing and microarchitecture
- 65nm Intel® Core™ processor family delivers performance and energy efficiency leadership
- 45nm Penryn products widen the competitive gap
- Nehalem extends the lead beginning in 2H'08



# A Look Back

## 2006 Strategy

### 1. Regain and sustain technology leadership

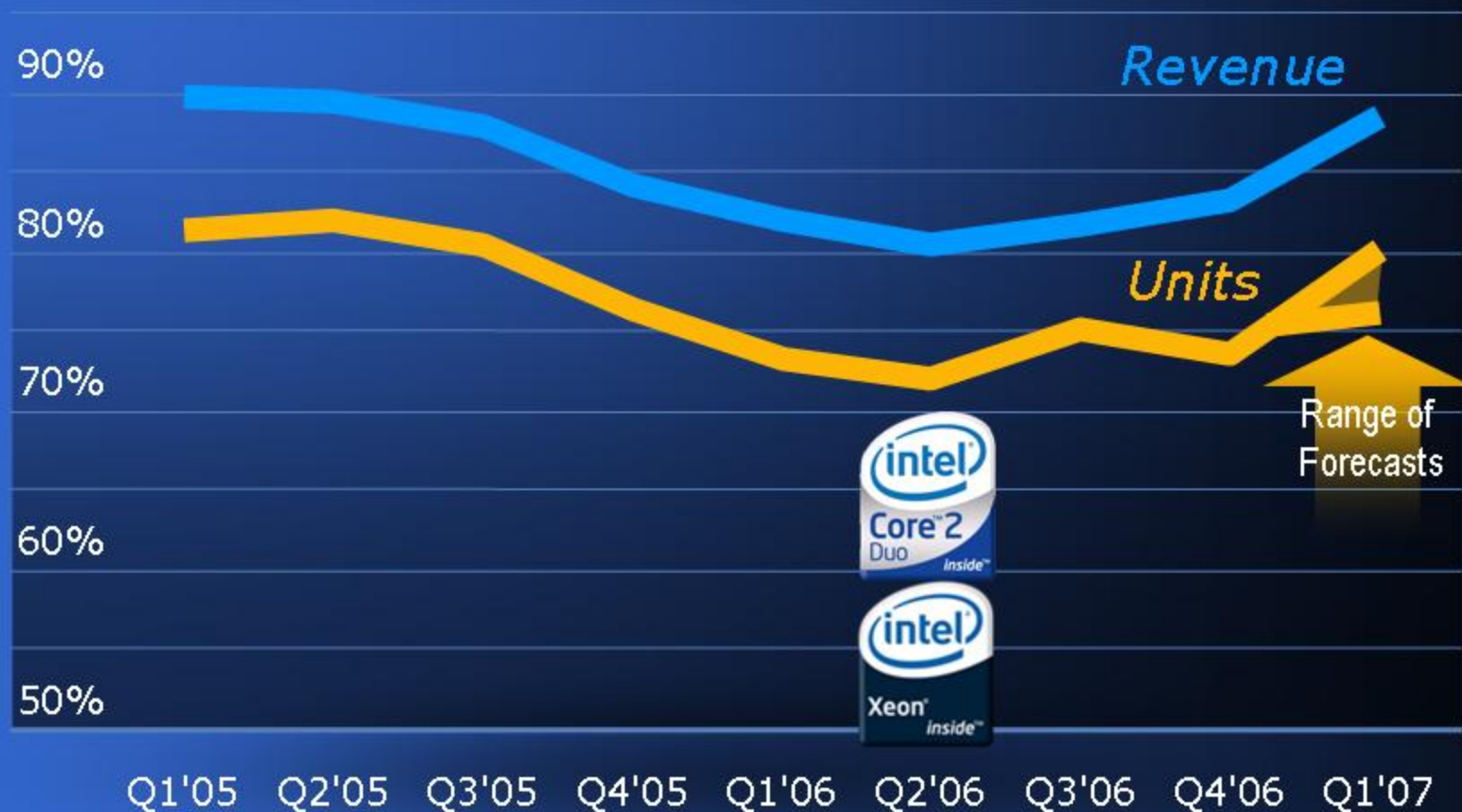
- Drive 65nm ramp as fast as possible *>120Mu CPUs Shipped to Date*
- Launch and Ramp Intel® Core™ microarchitecture products in all segments ✓
- Shift chipsets to 300mm, 90nm factories *Crossover Q3'07\**
- Ramp platforms for Digital Home, Mobility, Enterprise
  - Centrino® Duo *Shipping 4<sup>th</sup> Gen NOW*
  - vPro™ *\$1B in Cumulative Revenue This Qtr\**
  - ViiV™ *\$1B in Cumulative Revenue This Qtr\**
- Regain MSS ✓

### 2. Add equivalent focus to efficiency/costs ✓



\* Intel Forecast

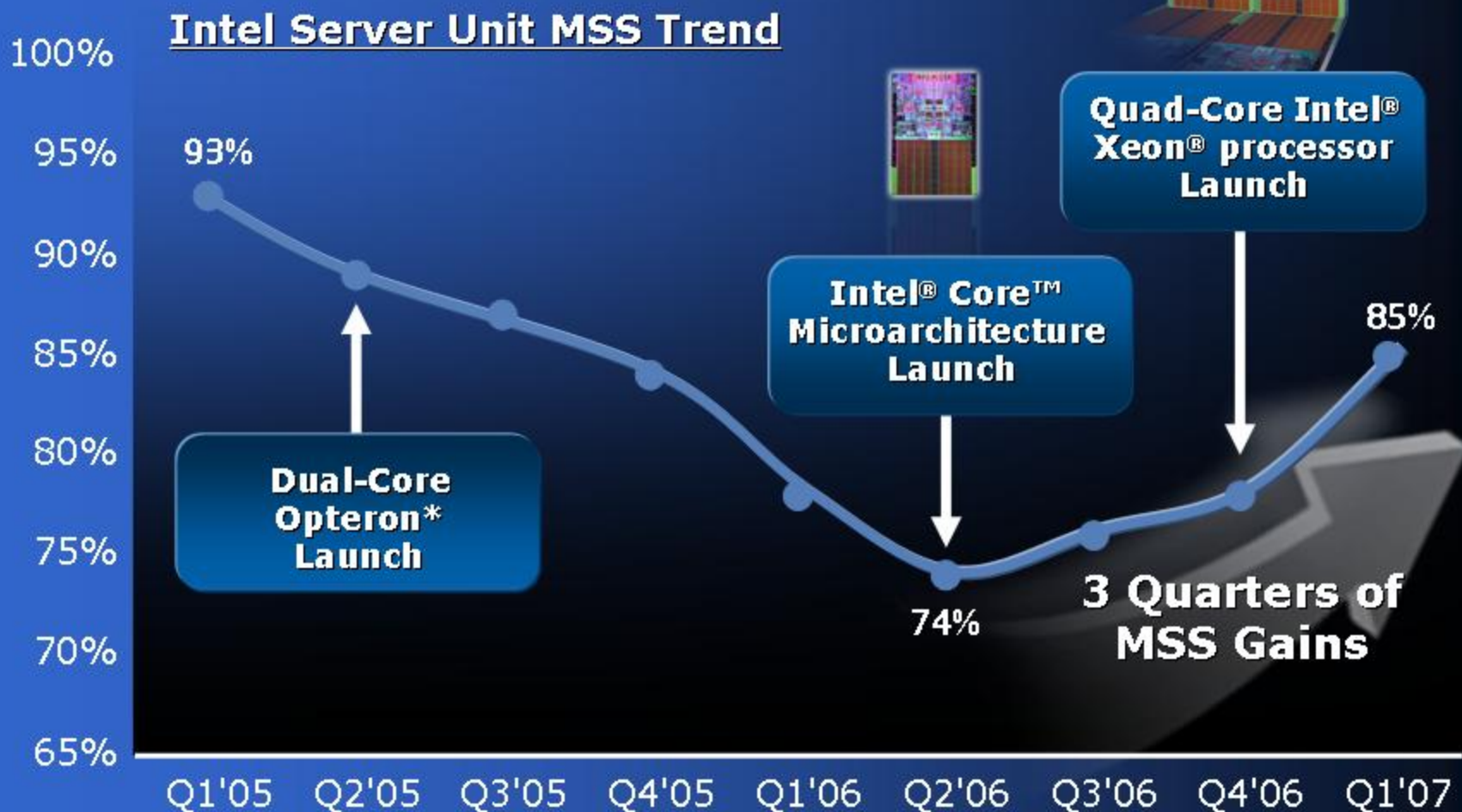
# Microprocessor Market Segment Share



Source: Mercury Research, GFK, Intel



# Intel Server Momentum with Intel® Core™ Microarchitecture

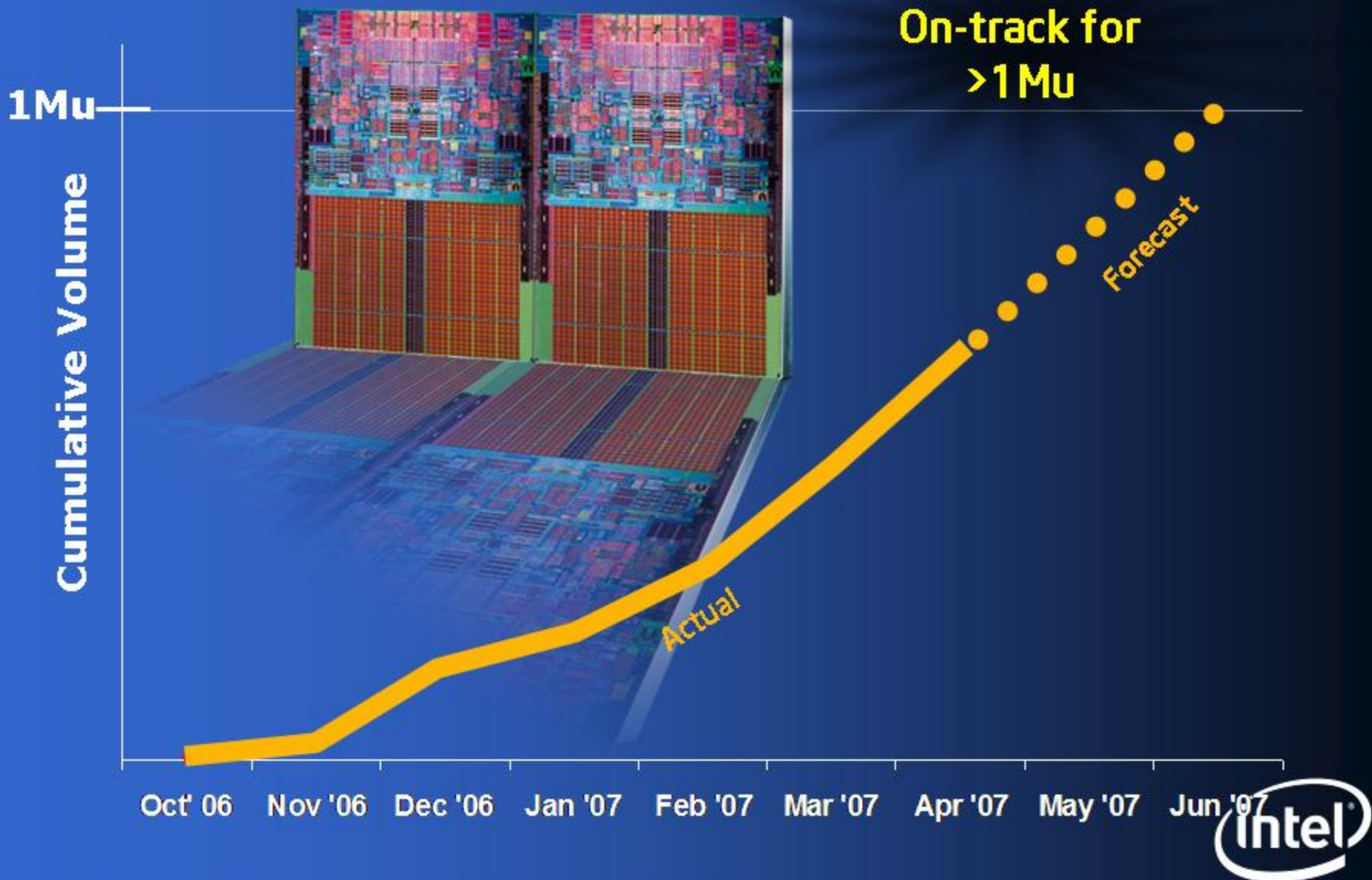


Source: Mercury Research report, April 2007

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# Quad-Core Microprocessor Ramp

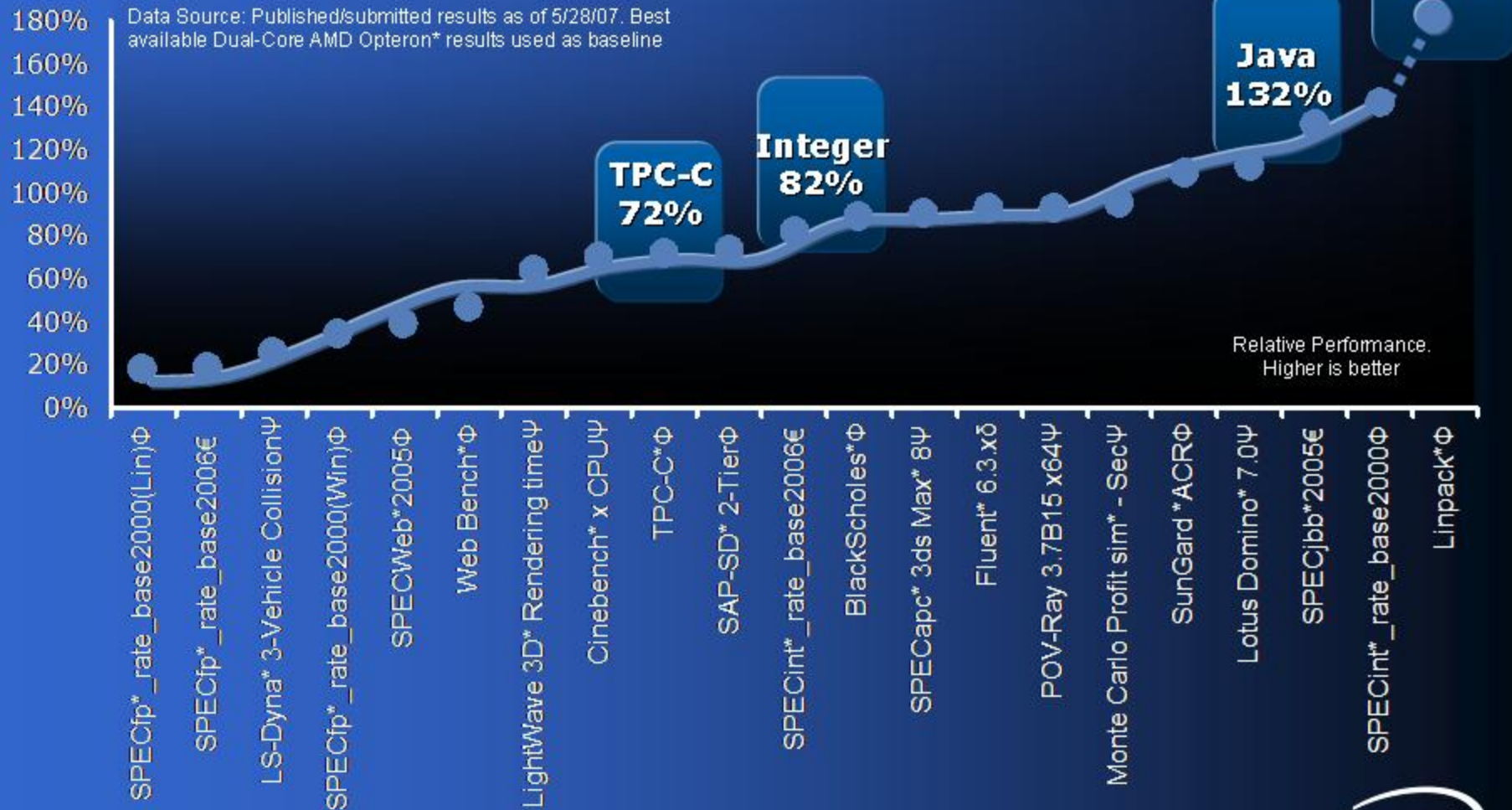


Source: Intel shipment and forecast data as of May 5, 2007, subject to change without notice



# "Tock" - Intel® Core™ Microarchitecture Leadership in Servers – Today

## Quad-Core Intel® Xeon® processor X5355 based platforms

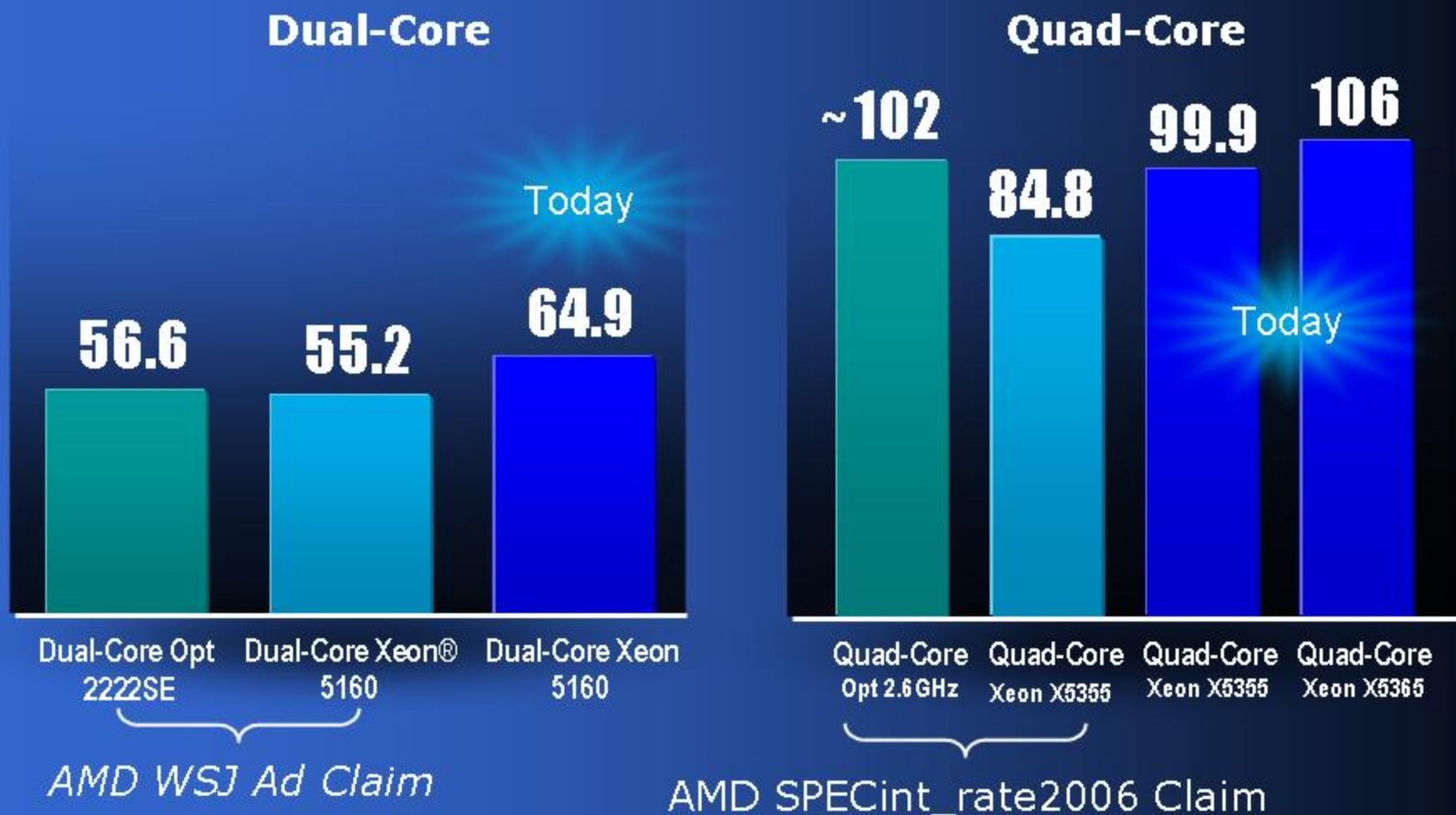


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Xeon X5355 - Quad-Core Intel® Xeon® Processor X5355; φ Dual-Core AMD Opteron® Model 2222SE φ Dual-Core AMD Opteron® Model 2220SE (2.80 GHz); ψ Dual-Core AMD Opteron® Model 285 (2.60 GHz) δ Dual-Core AMD Opteron® Model 280 (2.40 GHz)



# "Tock" Intel® Core™ Microarchitecture: Leadership SPECint\*\_rate2006 – Today



Based on published results used in AMD WSJ Ad claim. For AMD QC estimated at 20% above 4/16/2007 Intel results posted at spec.org as referenced in AMD claim. Today's Intel results based on results submitted to spec.org as of 5/28/2007. 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 <http://www.intel.com/performance/resources/limits.htm> or call (U.S.) 1-800-628-8686 or 1-916-356-3104. Copyright © 2006-2007, Intel Corporation.

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# Winning in Key Segments

## Internet Portal Data Centers

- High growth segment (20%+ CAGR)
- Focus area for industry innovation
- Collaboration: HW and SW optimizations

## Financial Services

- IT often a competitive differentiator
- Limited space → Energy efficiency is key
- Broad & unique account engagement

**~9X** Reduction In  
In Power Per Core

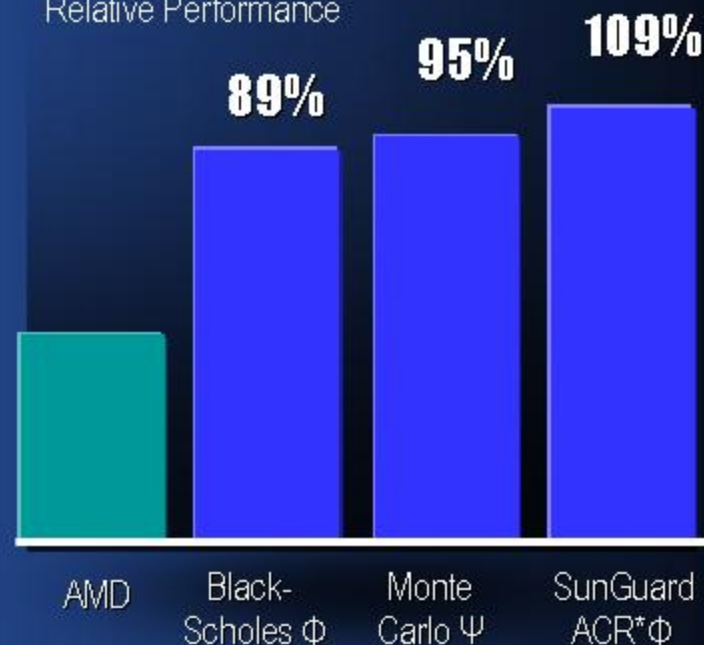


Single  
3.6 GHz

Quad  
Xeon 5320

**>3X** performance improvement

Relative Performance



AMD

Black-  
Scholes φ

Monte  
Carlo ψ

SunGuard  
ACR\* φ

Intel Xeon 5300 vs. AMD Opteron\* Best Published

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# Next In MP Servers – Intel® Xeon® processor 7300 Series

Continued performance leadership

Intel® Core™ Microarchitecture

50W SKUs for Blades

Up to 2X memory capacity<sup>1</sup>

OEM production volumes in Q3'07<sup>2</sup>



Less Power, 2x Cores



<sup>1</sup> Over previous generation <sup>2</sup> Intel Forecast

# Industry's 1st 45 nm High-K Process Technology

**~2x** Improvement In Transistor Density

**>20%** Improvement In Transistor Switching Speed

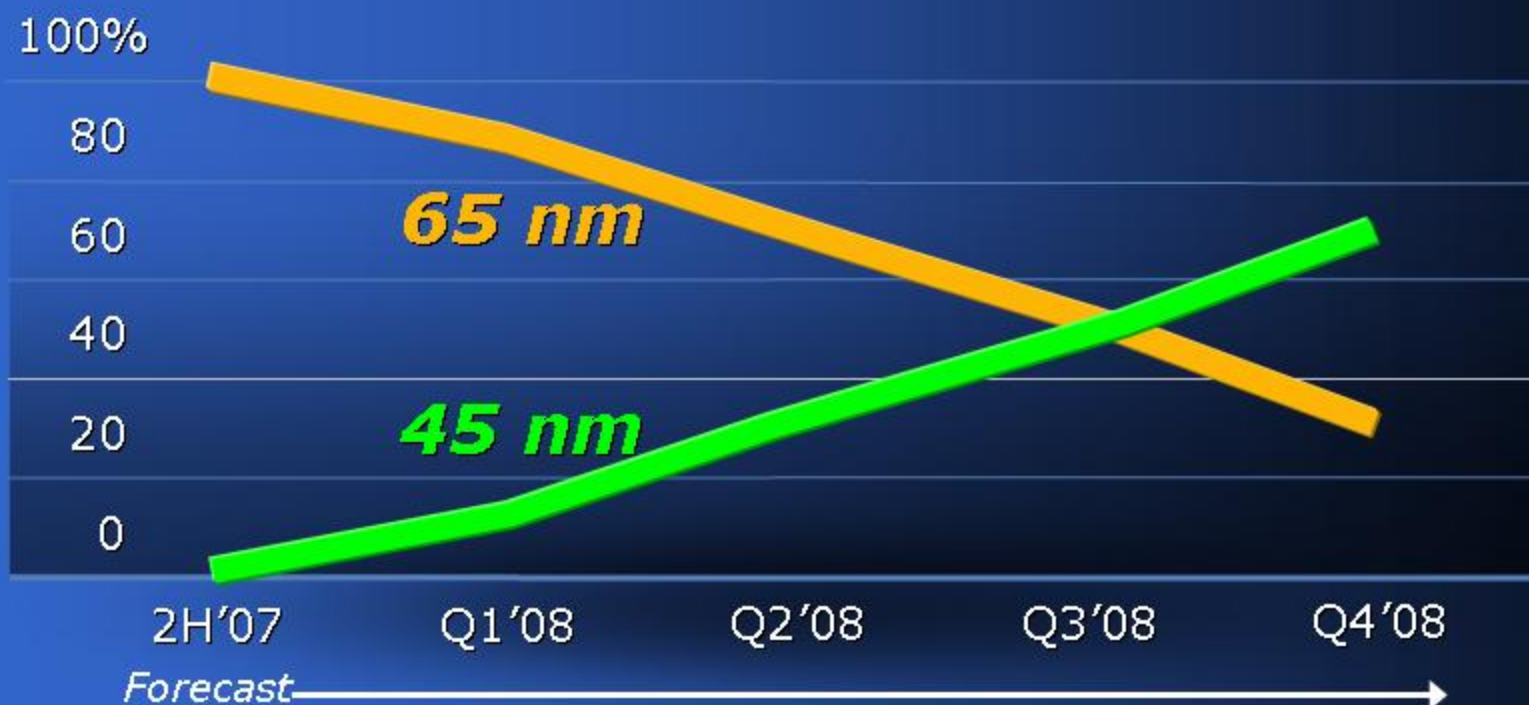
**~30%** Reduction In Transistor Switching Power

**Enables New Features, Higher Performance,  
Greater Energy Efficiency**

**"The implementation of high-k and metal materials marks the biggest change in transistor technology since the introduction of polysilicon gate MOS transistors in the late 1960s."**

***– Gordon Moore, Intel Co-Founder***

# CPU Shipments (65nm vs. 45nm)



Source: Intel

## 45nm Factory Network

D1D Oregon - 2H '07

Fab 32 Arizona - 2H '07

Fab 28 Israel - 1H '08

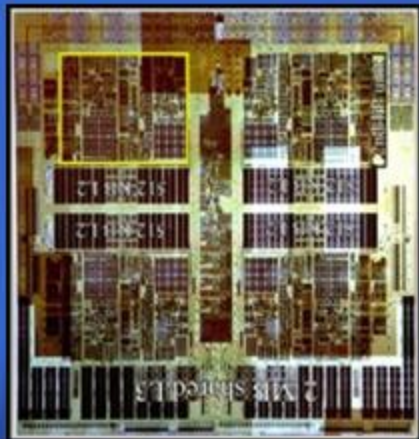
Fab 11X New Mexico - 2H '08



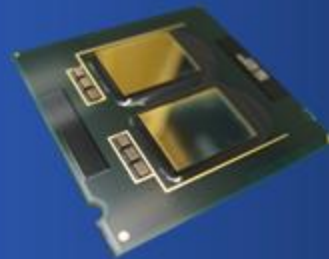
# Die Size Matters

*High-Performance Quad-Core Processors in Manufacturable Dual-Die Implementation*

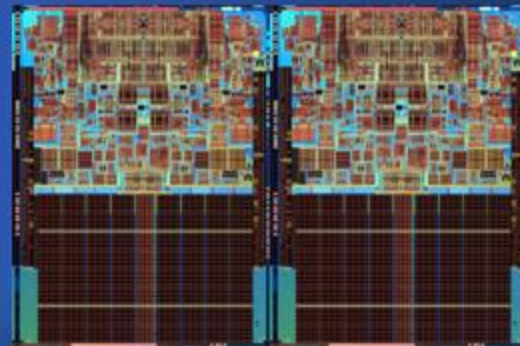
283 mm<sup>21</sup>



AMD Barcelona  
65nm  
463m Transistors<sup>1</sup>  
4 MB Cache<sup>1</sup>



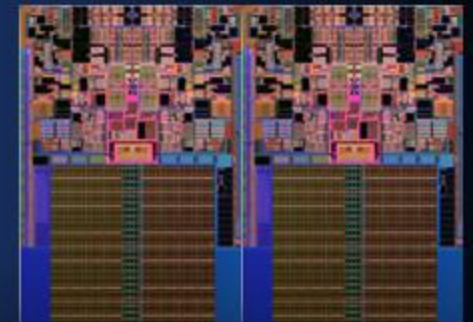
143 mm<sup>22</sup> 143 mm<sup>22</sup>



Intel® Xeon® (Clovertown)  
65nm  
681m Transistors  
8 MB Cache



107 mm<sup>22</sup> 107 mm<sup>22</sup>



Penryn Quad Core Server  
45nm Hi-k  
820m Transistors  
12 MB Cache

1)  
2)

Source: Electronic Design, Tuesday, February 13, 2007, IS SCC: Processor Methods, Part Two  
Source: Intel

AMD die size is an estimate based on publicly available sources; not actual measurements  
Intel die sizes are based on actual measurements



# Product Cadence for Sustained Leadership

2 YEARS

**TICK** Pentium® D, Xeon™, Core™ processor

**TOCK** Core 2 processor, Xeon processor

65nm

2 YEARS

**TICK** PENRYN Family

**TOCK** NEHALEM

45nm

2 YEARS

**TICK** WESTMERE

**TOCK** SANDY BRIDGE

32nm

- Restructured engineering 3 years ago

- Development model highly efficient

- 2+ generations proven delivery

All product information and dates are preliminary and subject to change without notice



# Penryn Family Optimized Microarchitecture

**Intel SSE4 instructions  
Fast Super Shuffle Engine**

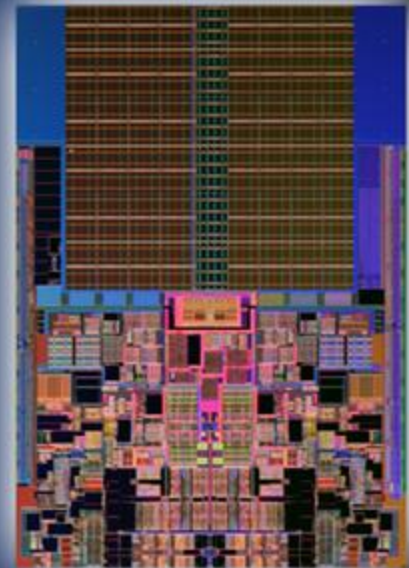
**Fast Radix-16 Divider Enhanced  
Intel Virtualization Technology**

**Larger Caches: 6MB, 12MB  
24-way Set Associativity**

**Split Load Cache Enhancement  
Higher Bus Speeds**

**Deep Power Down Technology  
Enhanced Intel Dynamic Acceleration Tech**

**> 3 GHz**



***Increased  
Performance and  
Energy Efficiency***



# Processor Microarchitecture Comparison

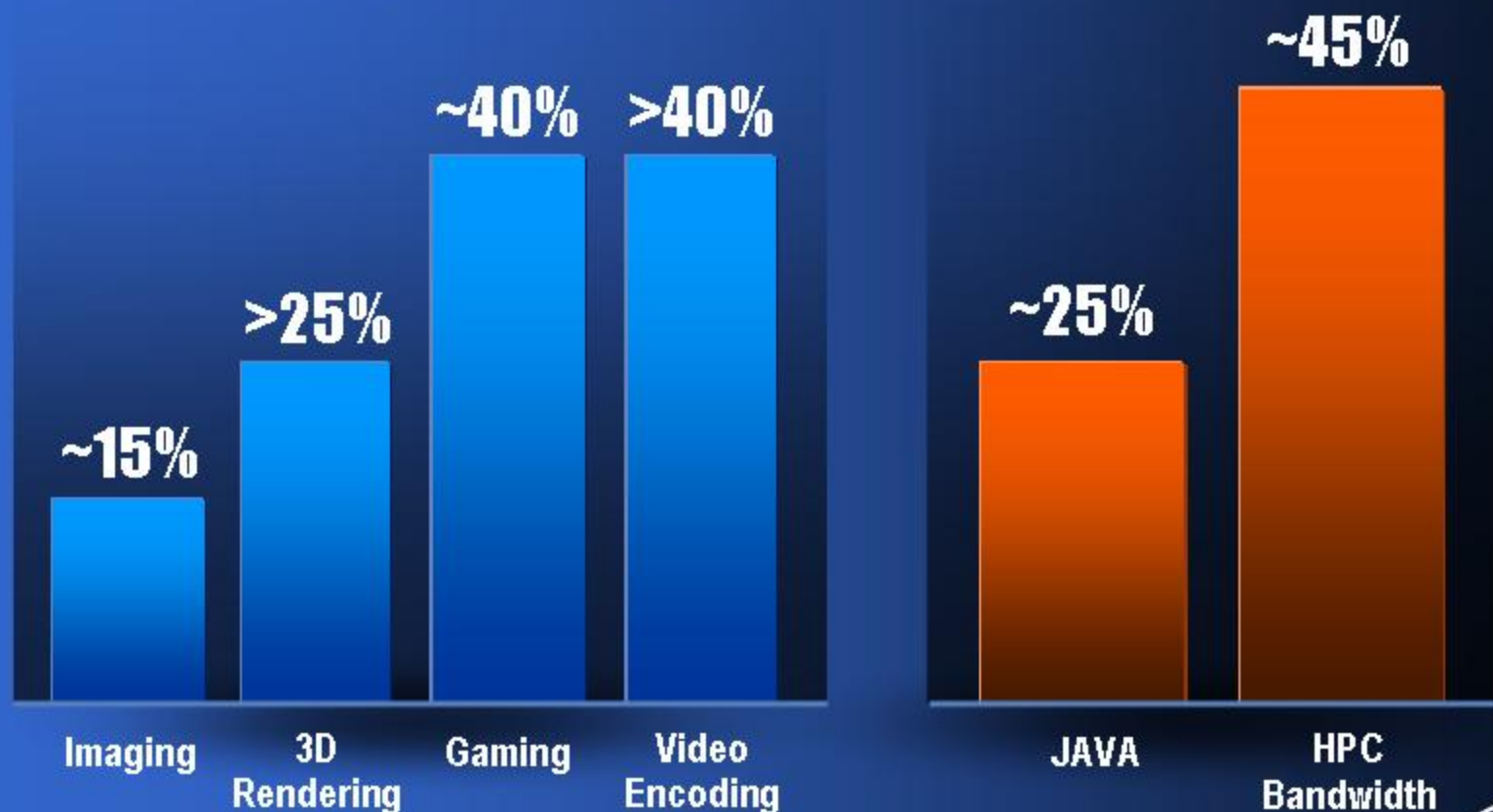
	65nm Intel® Core™ Microarchitecture	45nm Hi-k Penryn	AMD K8	Barcelona
<b>Production Date</b>	1H 2006	2H 2007	2003	2H 2007
<b>Clock Frequency</b>	3GHz	Up to >3GHz Demo'd 3.33GHz	3GHz	>2ghz Demo'd ?
<b>Technology</b>	Intel 65nm	Intel 45nm Hi-K+Metal Gate	90nm/65nm	65nm
<b>Cache</b>	Shared L2 Higher BW 256 bit data width	24 way Shared L2 Higher BW 256 bit data width	Dedicated L2 64 bit data width	Shared L3 128 bit data width
<b>Total L2/L3 Cache</b>	Up to 8MB	Up to 12MB	Up to 2MB	Up to 4MB
<b>Memory Access</b>	Improved Prefetch 3 Pre-fetchers Memory Disambiguation DDR-2/3	Decreased Latency 3 Pre-fetchers Memory Disambiguation DDR-2/3	Integ. Mem. Controller 2 Pre-fetchers DDR-2	Integ. Mem. Controller 2 Pre-fetchers DDR-2
<b>Issue Width</b>	4 Issue	4 Issue	3 Issue	3 Issue
<b>Pipeline Efficiency</b>	14 Stage Speculative OOO Loads/Stores Macro & Micro Fusion	14 Stage Speculative OOO Load/Store Macro & Micro Fusion	12 Stage No load/store re- ordering	12 Stage No load/store re- ordering
<b>System Bus</b>	Up to 1333 MHz	Up to 1600 MHz	1000 MHz	1000MHz
<b>SSE</b>	Intel SSSE3 ISA 128 Bits/Cycle	Intel SSE4 ISA 128 Bits/Cycle	SSE3 (Equiv) 64Bits/Cycle	SSE3 (Equiv) 128Bits/Cycle

# Penryn Family Performance Early Indicators

45nm High-k vs. 65nm Intel® Core™ 2 and Xeon™ Processors

*CLIENT (Quad Core)*

*SERVER (Quad Core)*



Source: Intel

All product information and dates are preliminary and subject to change without notice



# Nehalem

## Dynamic Scalability for Efficient Performance on Demand

Fully  
Unlocks  
Intel 45 nm  
High-k  
Silicon  
Benefits

Leverages 4  
Issue Intel®  
Core™ Micro-  
architecture  
Technology

Dynamically  
Managed  
Cores/  
Threads/  
Caches

Simultaneous  
Multi-  
threading

Multi-level  
Shared  
Cache  
Architecture

Performance  
Enhanced  
Dynamic  
Power  
Management

## Design Scalability Optimizes for Each Market Segment

New System  
Architecture

Scalable &  
Configurable  
Cache,  
Interconnects &  
Memory  
Controllers

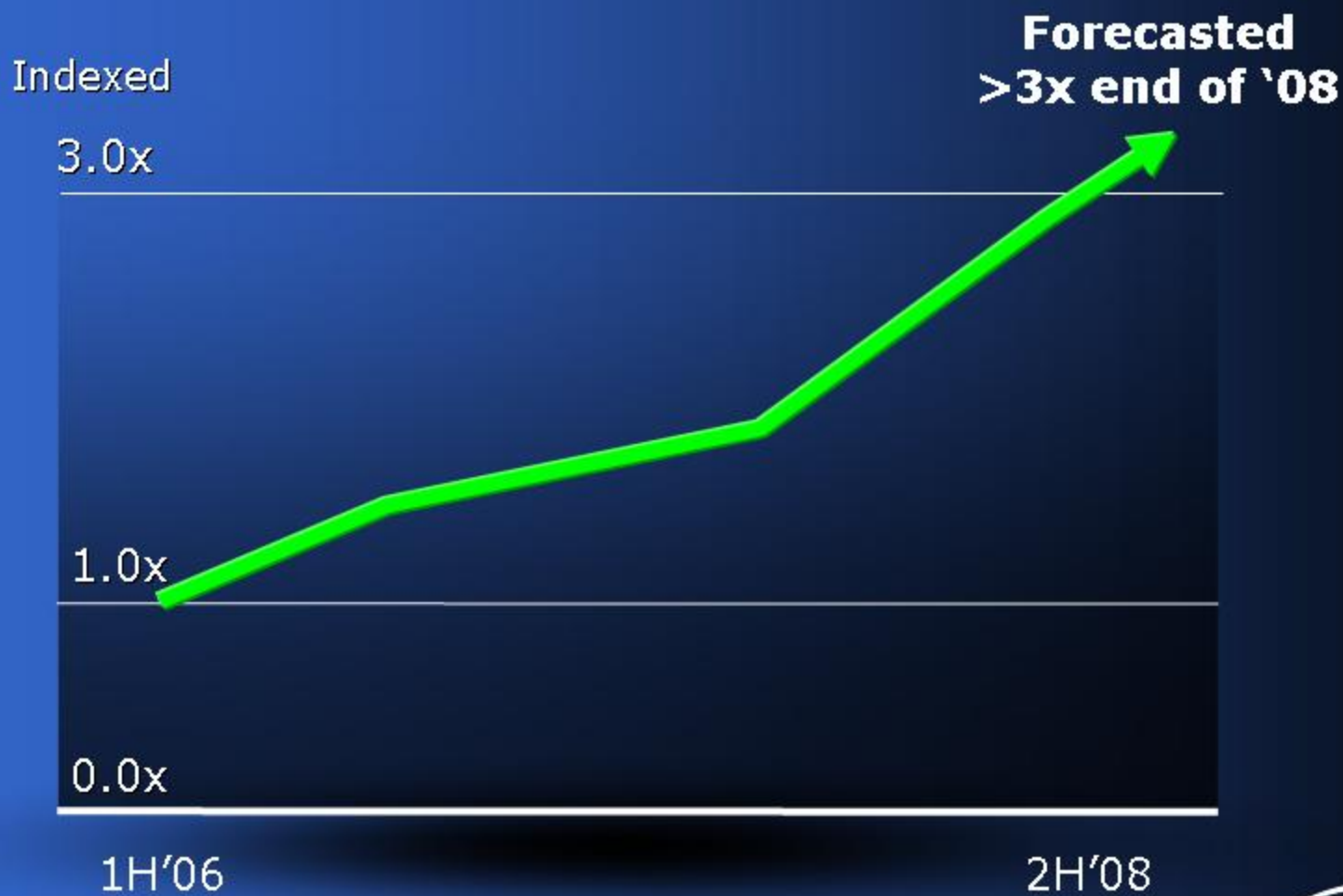
Optional High  
Performance  
Integrated  
Graphics For  
Client

Scalable  
Performance:  
1 to 16+  
Threads &  
1 to 8+ Cores

Initial Products  
in Production  
in '08

# Accelerating Server Performance

## Intel Server Performance Trajectory



Source: Intel

All product and performance information and dates are preliminary and subject to change without notice



# Summary

- Making the right investments
- Tick-Tock model is thriving
- Performance and energy efficiency leadership today
- Penryn widens the competitive gap
- Nehalem extends the lead in 2H'08



# *Questions*



# Risk Factors

This presentation contains forward-looking statements that involve a number of risks and uncertainties. These statements do not reflect the potential impact of any mergers, acquisitions, divestitures, investments or other similar transactions that may be completed in the future. The information presented is accurate only as of today's date and will not be updated. In addition to any factors discussed in the presentation, the important factors that could cause actual results to differ materially include the following: Intel operates in intensely competitive industries that are characterized by a high percentage of costs that are fixed or difficult to reduce in the short term, significant pricing pressures, and product demand that is highly variable and difficult to forecast. Revenue and the gross margin percentage are affected by the timing of new Intel product introductions and the demand for and market acceptance of Intel's products; actions taken by Intel's competitors, including product offerings, marketing programs and pricing pressures and Intel's response to such actions; Intel's ability to respond quickly to technological developments and to incorporate new features into its products; and the availability of sufficient components from suppliers to meet demand. Factors that could cause demand to be different from Intel's expectations include customer acceptance of Intel and competitors' products; changes in customer order patterns, including order cancellations; changes in the level of inventory at customers; and changes in business and economic conditions. The gross margin percentage could vary significantly from expectations based on changes in revenue levels; product mix and pricing; capacity utilization; variations in inventory valuation; excess or obsolete inventory; manufacturing yields; changes in unit costs; impairments of long-lived assets, including manufacturing, assembly/test and intangible assets; and the timing and execution of the manufacturing ramp and associated costs, including start-up costs. Expenses, particularly certain marketing and compensation expenses, vary depending on the level of demand for Intel's products, the level of revenue and profits and impairments of long-lived assets. Intel is in the midst of a structure and efficiency program which is resulting in several actions that could have an impact on expected expense levels and gross margin. The tax rate expectation is based on current tax law and current expected income. The tax rate may be affected by the closing of acquisitions or divestitures; the jurisdictions in which profits are determined to be earned and taxed; changes in the estimates of credits, benefits and deductions; the resolution of issues arising from tax audits with various tax authorities, including payment of interest and penalties; and the ability to realize deferred tax assets. Gains or losses from equity securities and interest and other could vary from expectations depending on equity market levels and volatility; gains or losses realized on the sale or exchange of securities; gains or losses from equity method investments; impairment charges related to marketable, non-marketable and other investments; interest rates; cash balances; and changes in fair value of derivative instruments. Intel's results could be affected by the amount, type, and valuation of share-based awards granted as well as the amount of awards cancelled due to employee turnover and the timing of award exercises by employees. Intel's results could be impacted by unexpected economic, social, political and physical/infrastructure conditions in the countries in which Intel, its customers or its suppliers operate, including military conflict and other security risks, natural disasters, infrastructure disruptions, health concerns and fluctuations in currency exchange rates. Intel's results could be affected by adverse effects associated with product defects and errata (deviations from published specifications), and by litigation or regulatory matters involving intellectual property, stockholder, consumer, antitrust and other issues, such as the litigation and regulatory matters described in Intel's SEC reports. Please refer to Intel's most recent Earnings Release and most recent Form 10-K or 10-Q filing for more information on the risk factors that could cause actual results to differ materially.



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**Results have been simulated and are provided for informational purposes only. Results were derived using simulations run on an architecture simulator. Any difference in system hardware or software design or configuration may affect actual performance.**

