intel®
Leap ahead™

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SSGS010

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FORUM

Agenda

- Quick Sync: Audience Interests
- Intel Corporate Vision
- Key Enterprise Trends
- Intel Response: Technological & Manufacturing Leadership
- Q&A

Questions Can Be Asked In Real-time

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What do you want to discover today?

Intel and the Ecosystem
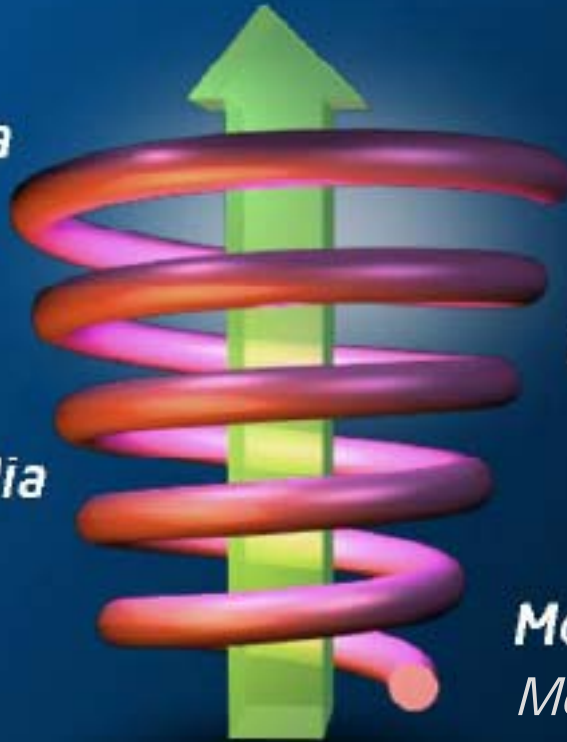
An Internet Spiral

Drives Need for Performance

Richer Media
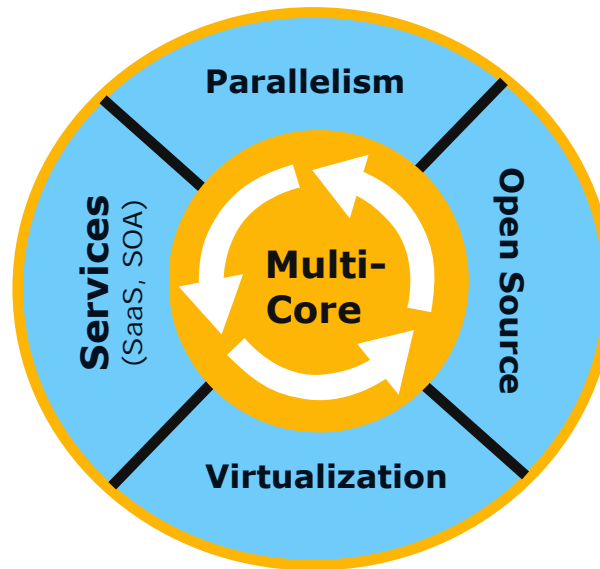*More Data*

Richer Media
More Data

More Users
More Uses

More Users
More Uses

Expectations continue to accelerate ...

The SW Ecosystem Is Adapting, Driving Even More Change

Open Source

"...A five-year [CAGR] of 24.3%""
Source: Gartner Dataquest*; Feb. 2007

Circular Diagram:
- Parallelism (top)
- Open Source (right)
- Virtualization (bottom)
- Services (SaaS, SOA) (left)
- **Multi-Core** (center)

Software as a Service

- "**61%** of North American companies with sales over $1 billion **plan to adopt one or more SaaS applications over the next year.** "
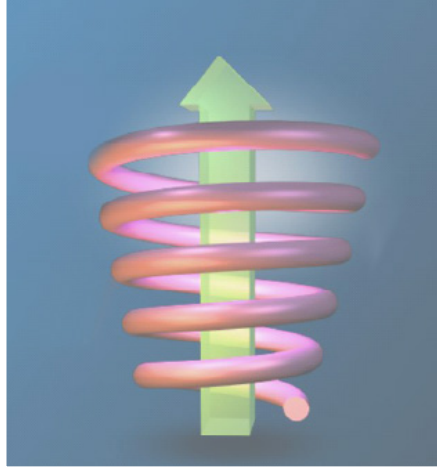- SMB will spend more on SaaS than regular SW licenses by 2010

Source McKinsey & Company*

Virtualization

- **Nearly zero** virtualized servers shipped just three years ago
- **Nearly 500,000** virtualized servers shipped in 2006
- Predicted to grow to **1.2 million** by 2009

Source: IDC*

By the end of 2008, **8 of 10 Intel products** shipped will be **Multi-Core**

ISV Opportunity from Intel

Hardware Innovations

- Multi-Core CPUs
- Virtualization
- Highly parallel, IA-programmable architecture
  - *In development*

Software Enabling

- Open Source
- Virtualization
- Parallelism

Key Trend: Virtualization
A long-utilized technology goes mainstream with x86

What it means
Enormous growth in virtualized servers
- **Nearly zero** virtualized servers shipped just three years ago
- **Nearly 500,000** virtualized servers shipped in 2006
- Predicted to grow to **1.2 billion** by 2009
    Source: IDC*

What it provides to ISVs
Rapidly expanding potential market segment share
- Virtual appliance deployment = single app
- Relationship, partnerships = your app in a stack

Marketing opportunities
- "Virtualization ready"
- "Virtualization tested"
- "Easy to deploy & manage in a virtualized environment"
- "Recommended with…", etc.

The value to ISV customers

"Survey respondents praised [virtualization's] ability to reduce data center space requirements, slash staffing and power costs, and save the day at times of natural disaster or hardware trouble."
Source: CIO.com*

Top Uses of Virtualization

1. **Legacy consolidation**
2. **Flexible provisioning**
3. **Test & development**
4. **Dynamic load balancing**
5. **Disaster recovery**

Source: **Intel.com**

Key Trend: Service-Oriented Architecture
A long-existing technology evolves into a business strategy

The Evolution toward SOA
1. **Corporate silos** develop "home-grown" solutions
2. **Corporate standardization** of home-grown solutions
3. **Proprietary solutions** adopted to reduce TCO
4. **SOA** **helps enterprise** regain solution flexibility & control

What it means
- Independence from traditional applications
- SW features, functionality, services become 'objects' on call as needed.
- Proprietary *and* standards-based SOA solutions

What it does
- Creates efficiencies, improves enterprise solution flexibility, removes software redundancies.
- Adds complexity: requires commitment to planning, resources and management.

Key Trend: Software as a Service (SaaS)

What it is

- Network-based access & management of software
- Activities managed from central locations
  - enabling customers to access applications remotely via the Web
- Application delivery that typically is closer to a one-to-many model
  - including architecture, pricing, partnering, and management

What it means

- New ISV revenue potential for existing & new assets
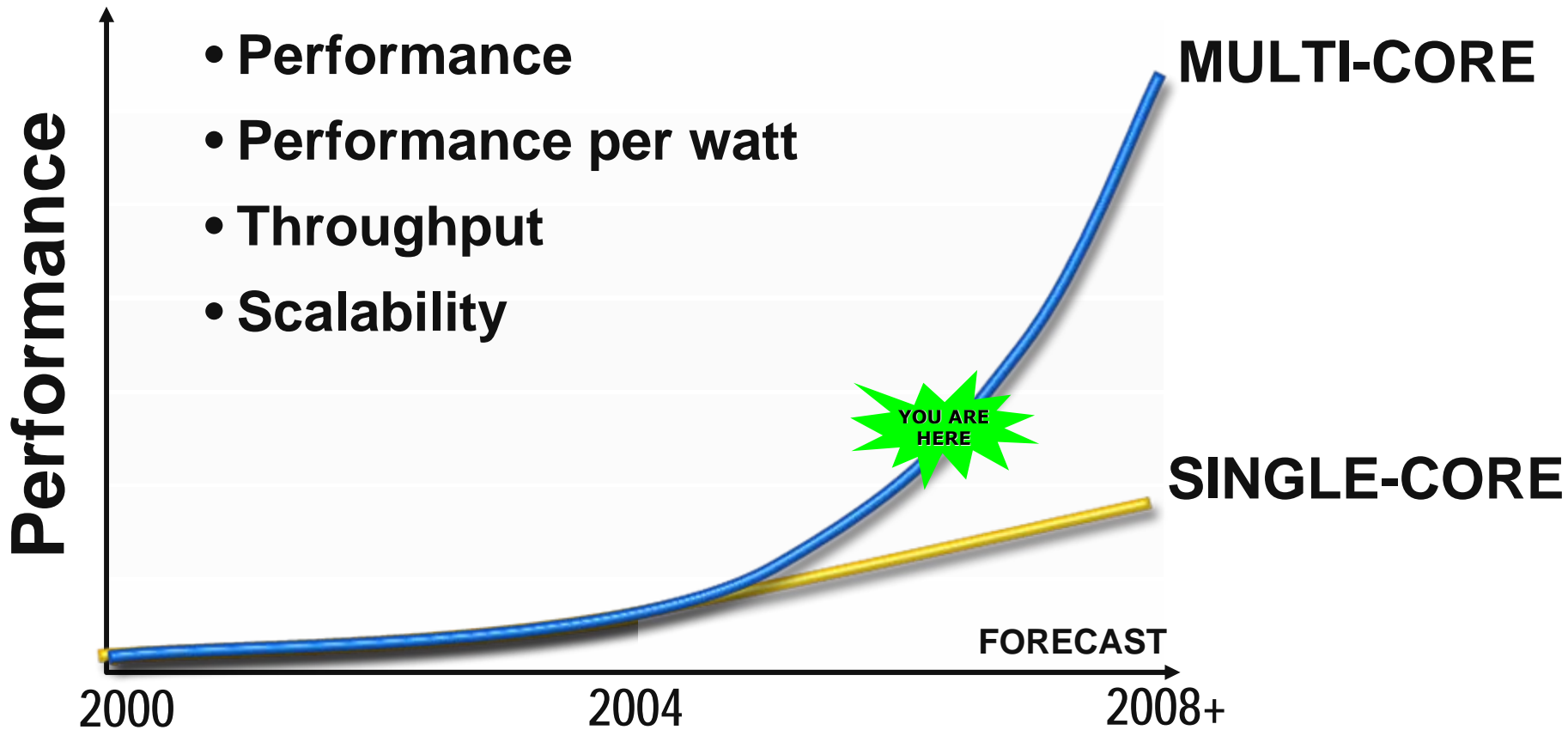
What it does

- Addresses an increasingly mobile & dispersed workforce
- Offers CIOs:
  - Lower up-front costs
  - Lower total ownership costs
  - Faster implementation
  - Increased vendor accountability
  - Increased application ROI

  Source: IDC*

> "[in 2006]
> **61%** of North American companies with sales over $1 billion
> **plan to adopt one or more SaaS applications over the next year,**
> ...38% ...were planning to install SaaS apps in 2005."
>
> Source: McKinsey & Company*

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Key Trend: Multi-Core

- **Performance**
- **Performance per watt**
- **Throughput**
- **Scalability**

Performance (vertical axis)

MULTI-CORE

YOU ARE HERE

SINGLE-CORE

FORECAST

2000   2004   2008+

**Multi Core Extends The Performance Value
Of The New Intel® Core™ Microarchitecture**

Key Trend:
Rich Graphics & Media Going Mainstream
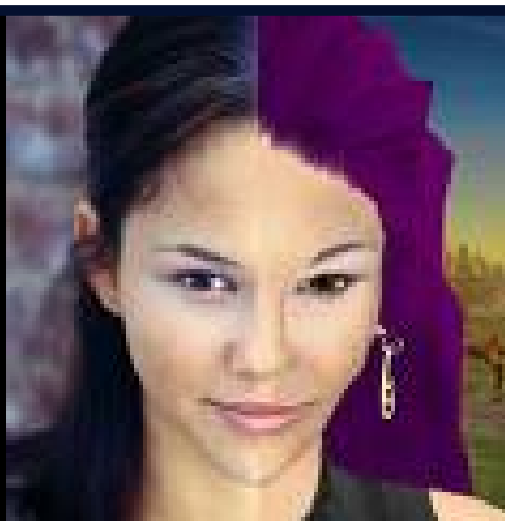
Making it 'real and personal': redefining market segments

Apple*   Second Life*   Luxology*   Google* Maps

Intuitive Access   Customized   Real-time   Distance
                      Environments   Responsiveness   Immersion

Intel Technical Leadership

Performance Once Only in Datacenters
is Now Under Desks (and in homes too)...

Living with 8 Cores Workstations

"When I move to the [Intel®] V8 [from AMD* '4x4'],
the only way I can even get it close to its limits
is to start a massive workstation application that analyzes DNA.
Even with it running and all 8 cores at 99%,
there is still enough headroom to run a video game.
...this is a level of performance that is well ahead
of anything else on the market."

Rob Enderle, The Enderle Group, DigitalTrends.com

Plan Your Products to Take Advantage, Create Differentiation

Our Customer's Current Requirements
a predictive enterprise that include:

- Lower power

- Higher performance

- Reliability

- Security

- Consolidation

- Scalability

- Dynamic resource allocation

- Anytime, anywhere access

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Manufacturing Process Leadership

- 65nm accounted for over 50% of processors shipped beginning in Q3 '06

- Over 70 million 65nm processors shipped in 2006

- 45nm is on track for production in 2007

- Intel believes we are more than a year ahead of the industry on 45nm

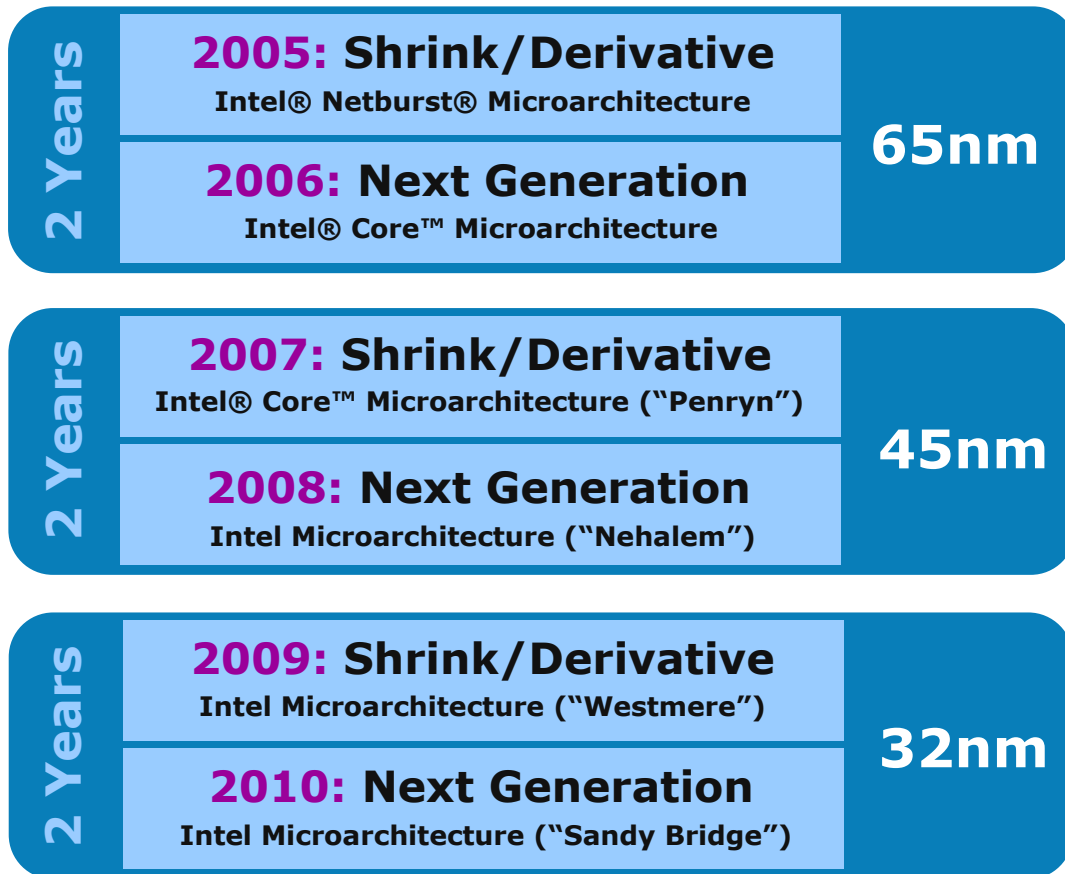- Three 45nm factories will be in production in 2008

Product Leadership

- Customers are embracing dual and quad core
  - Over 50% of processor shipments were dual core by Q4 '06
- Quad-core leadership and Intel™ Core™ microarchitecture provide overall performance leadership
  - Intel shipped over 1 million quad-core processors by mid-2007
- 15 45nm products under development
  - First on track for production in 2H '07
  - Sample units running 4 operating systems and various applications today

> **"AMD* now faces some harsh realities.**
> **For one, ['Barcelona'] is not going to capture the overall performance**
> **lead from Intel soon, not even in "Q4," which is when higher-clocked parts**
> **like the Opteron* 2360 SE are expected to arrive." TechReport.com 9/10/07**

R&D Cadence for Sustained Technology Leadership

| 2 Years | **2005: Shrink/Derivative**
Intel® Netburst® Microarchitecture | 65nm |
| | **2006: Next Generation**
Intel® Core™ Microarchitecture | |

| 2 Years | **2007: Shrink/Derivative**
Intel® Core™ Microarchitecture ("Penryn") | 45nm |
| | **2008: Next Generation**
Intel Microarchitecture ("Nehalem") | |

| 2 Years | **2009: Shrink/Derivative**
Intel Microarchitecture ("Westmere") | 32nm |
| | **2010: Next Generation**
Intel Microarchitecture ("Sandy Bridge") | |

Principles

- One microarchitecture for high volume segments
- Optimized for performance/watt
- Parallel design teams
- No waiting on new process technology
- Chipset cadence offset for fast ramp

All products, computer systems, dates, and figures specified are preliminary based on current expectations, and are subject to change without notice.

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Key Intel® 2007 Updates

- **Award-winning[1] Intel® Core™ microarchitecture moves to Intel® Xeon® MP**
  - 40% more performance, 40% less energy than previous generation
  - Additional features and performance for 2007
    - ✓ Four-way dual and quad-core available (up to 16 cores), Intel® I/O Acceleration 2, FB-DIMM, snoop filter, new instructions for text-search

- **Future-proofed with industry-leading 45nm processors**

**"Intel…
has overhauled the
basic building block of the information age,**
paving the way for a new generation
of faster and more energy-efficient
Processors [with 45nm]."

New York Times, Jan. 27, 2007
(front page)

High-k + Metal Gate Transistors
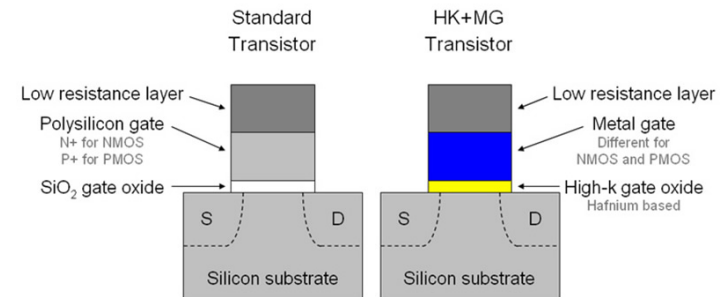
High-k + metal gate transistors provide significant performance
increase and leakage reduction, ensuring continuation of Moore's Law

1. 2006 PC Magazine Technical Excellence Awards

Purpose Built Server Processors

Mission Critical (MC)
- Best RAS, largest scalability
- 2-512 processor sockets

Intel® Itanium®2 processor 9000 sequence platforms

Mission-critical servers delivering ultimate scalability (up to 512-way), flexibility and reliability, these 64-bit dual-core servers are ideal for large scale database, ERP, business and data analytics solutions featuring unparalleled choice of OS, applications and system vendors compared to RISC.

Expandable (EX)
- RAS, Memory, I/O scalability
- 2-32 processor sockets

Intel® Xeon® processor 7000 sequence platforms

Scalable (up to 32-way), reliable, powerful 64-bit quad/dual-core servers for enterprise applications offering increased memory & I/O capacity, power efficiency, flexibility and service uptime with unique features ideal for server consolidation.

Efficient Performance (EP)
- Energy efficiency
- 1-2 processor sockets

Intel® Xeon® processor 5000 sequence platforms

Versatile (up to 2-way) 64-bit quad/dual-core servers for all your infrastructure, high-density and HPC applications with features that enable optimal performance and power savings for the data center. Workstations and Servers.

Entry (EN)
- Cost optimized
- 1-2 processor sockets

Intel® Xeon® processor 3000 sequence platforms

Economical (up to 2-way) dependable general purpose 64-bit servers well-suited for small businesses, basic enterprise server needs and low cost HPC.
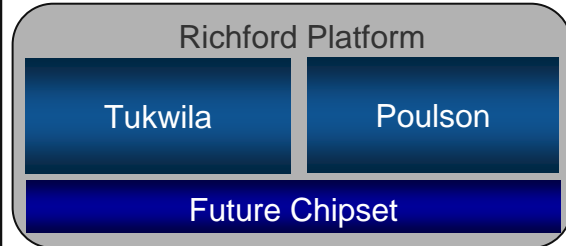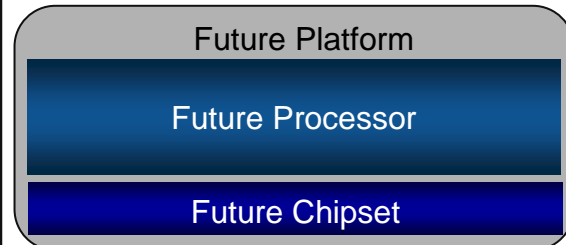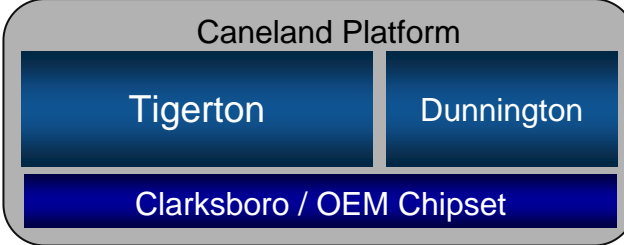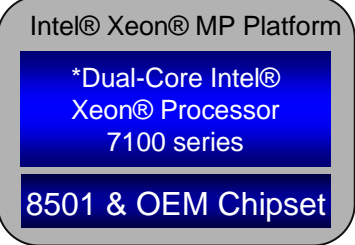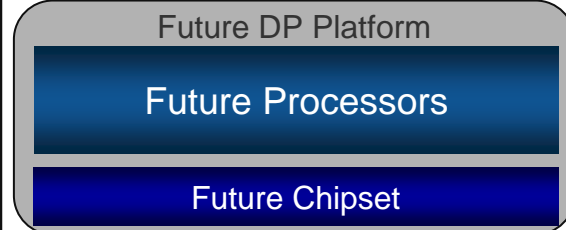
Intel® Server Platform Roadmap

	2007	**2008**	**Future**

Intel® Itanium® 2 9000 Sequence

Intel® Itanium® 2 Platform		Richford Platform	
Dual-Core Itanium® 2 Processor 9000 Series	Montvale	Tukwila	Poulson
Intel® E8870 & OEM Chipsets		Future Chipset	

Intel® Xeon® MP 7000 Sequence

Intel® Xeon® MP Platform	Caneland Platform		Future Platform
*Dual-Core Intel® Xeon® Processor 7100 series	Tigerton	Dunnington	Future Processor
8501 & OEM Chipset	Clarksboro / OEM Chipset		Future Chipset

Intel® Xeon® DP 5000 Sequence
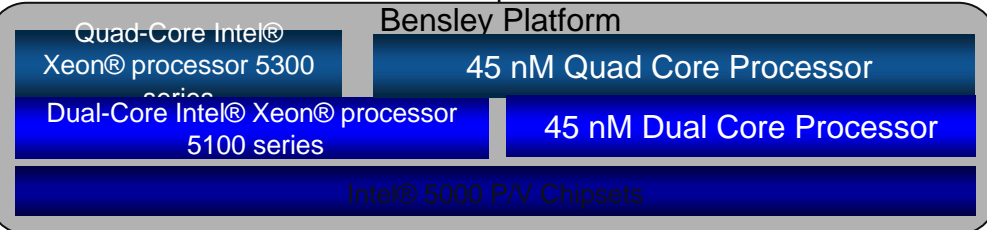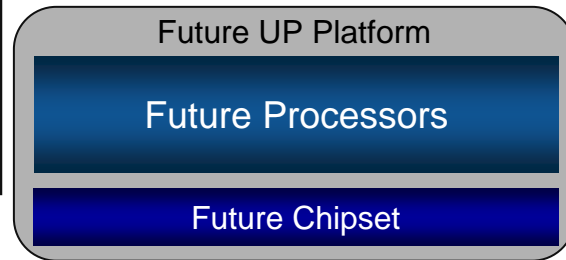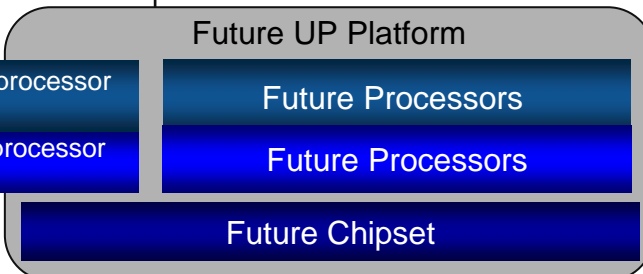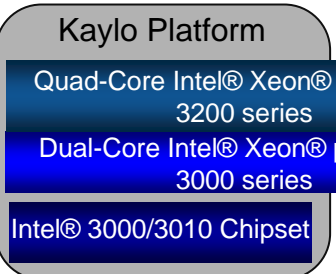
Bensley Platform		Future DP Platform
Quad-Core Intel® Xeon® processor 5300 series	45 nM Quad Core Processor	Future Processors
Dual-Core Intel® Xeon® processor 5100 series	45 nM Dual Core Processor	
Intel® 5000 P/V Chipsets		Future Chipset

Intel® UP Server

Kaylo Platform	Future UP Platform	Future UP Platform
Quad-Core Intel® Xeon® processor 3200 series	Future Processors	Future Processors
Dual-Core Intel® Xeon® processor 3000 series	Future Processors	
Intel® 3000/3010 Chipset	Future Chipset	Future Chipset

"Larrabee"
Bringing IA Programmability and Parallelism to High Throughput Computing
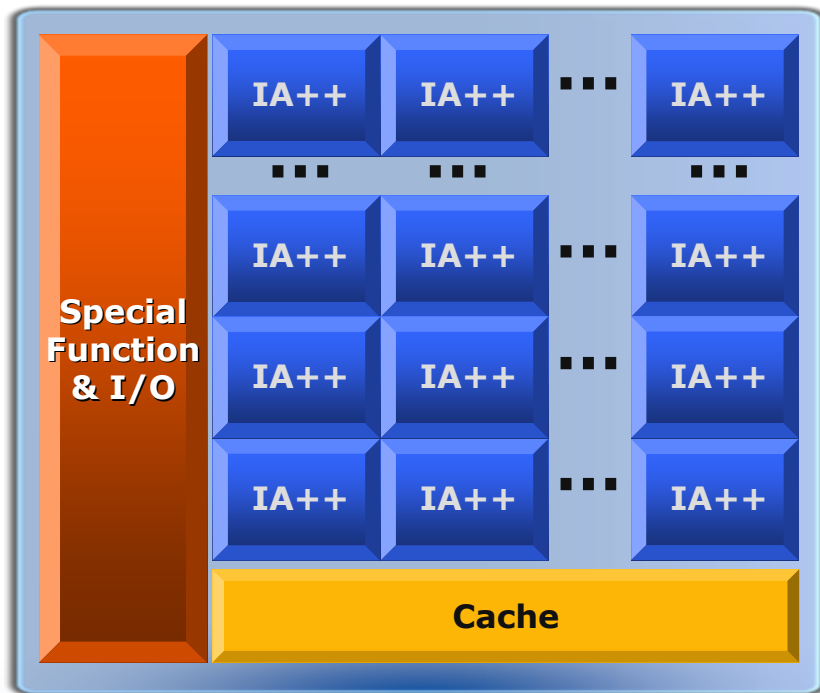
- Highly parallel, IA programmable architecture in development

- Ease of scaling for software ecosystem

- Array of enhanced IA cores
  - Scientific Computing, Research-Mining-Synthesis, Visualization, Financial Analytics & Health applications

- Teraflops of performance

Technology demos expected: 2008

Enterprise ISV Recommendation Summary

- **Plan Products to make the most of growing headroom**

- **Thread** your applications for n-core

- Take advantage of new SSE4 instructions
  - Penryn-based CPUs, available in '08, and Nehalem-based CPUs in '09

- Tune applications for new Intel® QuickPath™ Interconnect
  - Available in late '08/early '09

- **Upgrade your performance collateral & sizing guides**

- **Validate applications** on virtual machines & in appliances

- **Examine licensing and support models to make the most of multi-core & virtualization trends**

Q&A

Risk Factors

This 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 available on our website for more information on the risk factors that could cause actual results to differ.

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Server Platform Technologies
Projected ISV Enabling Effort and End-User Benefits

Technology	IT/End-User Benefit	ISV Effort	Intel® Xeon® Processor	Intel® Itanium® Processor
Performance Enhancements				
Common System Interconnect (CSI)	**Improved scalability for many, many CPUs & I/O devices sharing the same memory (up to 1024 nodes); common interface between desktop, mobile, and server processors**	**Low – update performance / sizing collateral**	**2008**	**2008**
Integrated Memory Controller (iMC)	**Increases overall system performance by addressing memory bottlenecks**	**Low – update performance / sizing collateral**	**2008**	**2008**
PCIe2	**Offers bandwidth and latency improvements**	**Low – update performance / sizing collateral**	**2007**	**n/a**
Dual Independent Bus (DIB), Quad Independent Bus (QIB) Architecture	**Increases bandwidth and performance over single-bus processors**	**Low – update performance / sizing collateral**	**2006 (DIB) 2007 (QIB)**	**2006**
Fully Buffered DIMM (FBD)	**Application responsiveness -- high bandwidth, high capacity (≤ 64GB) memory. Designed/optimized for dual/multi- core platforms**	**Low – update performance / sizing collateral**	**2006**	**2008**
Intel® I/O Acceleration (IOAT)	**Improved application response time, I/O performance and reliability over the network. Performance scales with platform improvements.**	**Low – update performance / sizing collateral**	**2006**	**2008**

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Server Platform Capabilities
Projected ISV Enabling Effort and End-User Benefits

Capabilities	IT/End-User Benefit	ISV Effort	Intel® Xeon® Processor	Intel® Itanium® Processor
Virtualization				
Intel® Virtualization Technology (VT)	**Smaller footprint hypervisor; support for 64-bit guest & unaltered operating systems (i.e Windows runs on Xen)**	**High – enable VMM** / **Low – validate applications**	**Today**	**Today**
Demand Based Switching (DBS)	**Cut power bills by reducing average power consumption -- enables server to go into reduced power state during periods of low utilization**	**Low: Remove unnecessary CPU loading (spin-wait loops)**	**Today**	**2007**
Manageability				
Intel® Active Management Technology (Intel® AMT)	**Allows IT managers to have out-of-band management for remote administration of workstations**	**Low: Validate with mgmt applications**	**2007**	**n/a**

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