Intel®
Enterprise Solutions

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Intel’s figures 2003/Q104

- Revenue 2003: $31 billion
  - first Quarter 2004: $8.1 billion
- R&D Investments 2003: $4.2 billion
- 22 Factories
- 82,100 Employees
  - 17,000 working in the Intel Software Solution Group
Beyond Processors

Enterprise Competitiveness: A Total Vertical Approach

Commitment to Enterprise

END-TO-END HARDWARE BUILDING BLOCKS

SOLUTION BUILDING BLOCKS

ENTERPRISE INVESTMENT & TESTING

$9.5 Billion R&D & CapEx
25,000 Hours of Compatibility Testing

ROBUST SOLUTION ECOSYSTEM
Investing in all critical elements for the enterprise
Intel®
Enterprise Solutions Strategy
2004 and longterm

2003: Milestone Year for Intel® in Enterprise

- Record shipments: Xeon & Itanium processors
- Record performance: Surpassing RISC on #1 TPC
- Significant RISC to IA migration – enterprise and HPC

![Graphs showing trends in shipments and performance](image-url)
Complementary Intel Architecture solutions provide maximum flexibility for end to end solutions

- **Scale up**
  - Multi processor
  - Capable

- **Scale out**
  - Dual processor
  - Capable

**2P, 4P, 8P-64P+ High-end Servers**
- EPIC technology delivers new levels of compute parallelism
- Extends IA for the most demanding applications
- Intel® NetBurst™micro-architecture and HyperThreading technology
- Industry leading compute power and throughput for e-Business and enterprise server applications

**Low power server blades**
- 2P rack optimized, pedestal servers
- 4P, 8P, 8P+ rack optimized, pedestal servers
- 2P, 4P, 8P-64P+ High-end Servers

**Value and flexibility for internet infrastructure and departmental/SMB server applications**

**Intel Enterprise Technologies Vision**

- **Deliver features and value demanded by business today and tomorrow**
- **Cores & Threads**
  - Supports larger number of software threads for greater performance
- **Virtualization**
  - Robust, higher performance virtual partitions
- **RAS**
  - Comprehensive data integrity & error recovery
- **System Management**
  - Common management standards for lower TCO
- **I/O and Memory**
  - Higher bandwidth & reliability features; flexibility of industry standards

**Server advancements led by Intel**

3. LS-DYNA FORUM 2004
14.-15. October 2004, BAMBERG
Technologies Enhance All Platforms

- Demand Based Switching (XPF)
- Technology to reduce cost of power & cooling
  - Power safety mechanism that right sizes power & cooling
- PCI Express (XPF)
- Adds memory scaling advantages
- Silos Technology
  - More robust platform reliability & performance through partitioning
- Dual core
  - Two physical processors on a single die
- Multithreading (ITP)
  - Two threads running on one core when execution units are under utilized

- Demand Based Switching (ITP)
- ACPC
  - Power safety mechanism that right sizes power & cooling
- PCI Express (ITP)
- FC-DIMM
- Adds memory scaling advantages

- EM64T (XPF)
- Extended memory addressing for select workloads
- ACPC
  - Power safety mechanism that right sizes power & cooling
- PCIE-Express (ITP)
- FB-DIMM
  - Adds memory scaling advantages

- Silvervale Technology
  - More robust platform reliability & performance through soft partitioning
- Dual core
  - Two physical processors on a single die
- Multithreading (ITP)
  - Two threads running on one core when execution units are under utilized

Delivering the flexible real-time enterprise

Intel® Xeon™ Processor Family Innovations

2003 & Prior Enhancements
- Hyper-Threading Technology
- Intel® Netburst™ micro-architecture
- SSE & SSE2 instructions

2004 Planned Enhancements
- New SSE3 instructions
- PCI Express®
- 800MHz FSB
- 64-bit extension technology

Future Enhancements
- Virtualization
- User defined power thresholds
- Dual core CPUs
- Fully buffered DIMMs

Intel focus on platform innovations that deliver performance, reliability and manageability to all enterprise segments
Significant platform performance enhancements make NOW the optimal time to upgrade from older systems.

Intel® Xeon™ Processor Technologies Extensions

Intel focus on platform innovations that deliver performance, reliability and manageability to all enterprise segments.

2004 Platform Enhancements

<table>
<thead>
<tr>
<th>Processor</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® Xeon™ processor with 533MHz system bus</td>
<td>Intel® Xeon™ processor with 800MHz system bus</td>
<td></td>
</tr>
<tr>
<td>Intel® NetBurst™ microarchitecture</td>
<td>Intel® NetBurst™ microarchitecture</td>
<td></td>
</tr>
<tr>
<td>Intel® EM64T</td>
<td>Intel® EM64T</td>
<td></td>
</tr>
<tr>
<td>Intel® Extended Speed Step Technology</td>
<td>Intel® Extended Speed Step Technology</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>3.2 GHz</td>
<td>3.60 GHz</td>
</tr>
<tr>
<td>Chipset</td>
<td>Intel® E7501, E7505</td>
<td>Intel® E7520, E7525, E7526</td>
</tr>
<tr>
<td>System Bus Frequency</td>
<td>533MHz</td>
<td>800MHz</td>
</tr>
<tr>
<td>System Bus BW</td>
<td>4.5 GB/s</td>
<td>6.4 GB/s</td>
</tr>
<tr>
<td>Memory</td>
<td>DDR2 533</td>
<td>DDR2 400</td>
</tr>
<tr>
<td>Memory BW</td>
<td>4.3 GB/s</td>
<td>6.4 GB/s</td>
</tr>
<tr>
<td>I/O</td>
<td>PCI Express 8x</td>
<td>PCIe® x8</td>
</tr>
<tr>
<td>I/O BW</td>
<td>3.2 GB/s</td>
<td>12.0 GB/s</td>
</tr>
<tr>
<td>Graphics</td>
<td>AGP 8x</td>
<td>PCIe® x16</td>
</tr>
<tr>
<td>Graphics BW</td>
<td>2.0 GB/s</td>
<td>4.0 GB/s</td>
</tr>
<tr>
<td>I/O</td>
<td>Intel® IOP331, 600MHz DDR200, PCI-X</td>
<td>Intel® IOP331, 800MHz DDR200, PCI®-Express</td>
</tr>
</tbody>
</table>

2003

Hyper-Threading
SSE2 Instructions
NetBurst Architecture
FSB533
DDR Memory
PCI-X
AGP-8x

2004

Better Hyper-Threading
New SSE3 Instructions
Improved NetBurst Architecture
EM64T Extension
FSB800
DDA2 Memory
PCI-Express I/O
PCI-Express GFX
Demand Based Switching

2005+

Dual-Core CPUs (Socket)
Improved Hyper-Threading
Additional Instructions
Enhanced Micro-Architecture
EM64T Extension
FSB1066
Fully-Buffered DIMM Memory
PCI-Express I/O
PCI-Express GFX
Demand Based Switching
Rack-based Power Mgmt.
Virtualization Technology
Security Technologies

CAE / IT II
3. LS-DYNA Anwenderforum, Bamberg 2004

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## Intel® Itanium® 2 Processor

### Performance
- Targeted for up to 2X higher performance than Xeon

### Cost
- Lowering TCO with scalable platforms
- Cost parity with Xeon based platforms (via common infrastructure by ’07)

### Technology
- Dual Core / Multi-core
- Multi-thread
- Foxton, Pellston, Silvervale
- Power Management

### Volume
- >100,000 CPU’s in ’03
- On track to exceed RISC competitors in next 3-4 years

## Intel® Itanium® Processor Family Innovations

### 2004 & Prior Enhancements
- EPIC architecture
- Enhanced Machine Check Architecture
- FMAC for floating-point leadership
- Largest on-die resources for demanding workloads
- Multi-core
- Virtualization
- I/O and memory
- Enhanced RAS
- Up to 2X higher performance than Xeon based platforms

### Next Planned Enhancements
- Foxton Technology (performance feature)
- Pellston Technology (cache reliability)
- PCI Express
- Fully-buffered DIMMS (FB0), DDR2

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Momentum – New Advances

Examples of recent product releases, wins, etc.

ISVs Releasing Software
- Abaqus
- Accelrys
- Adina
- Autodesk
- BMC
- Borland
- CA
- Fujitsu
- EMC
- Hyperion
- i2
- IBM
- Microsoft
- NastQ
- Oracle
- SAP
- Symantec
- Sybase
- Veritas

End Users
- 10,240 CPU
- SGI Altix
- SAFEWAY
- VOLVO
- Morgan Stanley
- Pier 1 Imports
- Bank of America
- Toyota
- united
- CASIO

>2000 applications now available

>30% of Global 100 now deployed, including 9 of top 10

Hardware
- Unisys adds Linux support for ES7000 line
- 4P Dell PowerEdge 7250
- 2P Fujitsu Siemens Primergy RXI300
- 32P Bull NovaScale 6000

Performance
- 61 Itanium® 2-based systems on Top500 Supercomputer list, including #2 spot
- New records with Unisys, SGI, and NEC

Itanium® processor family success continues to build

RISC / UNIX Migration to Intel® Itanium® 2 Processor

IDC Forecast (Q1 04)

RISC & Itanium-based Server Volumes (ku)

8 of 9 RISC vendors delivering Itanium platforms...and many others, totaling over 50 vendors

Customers migrating include: CompUSA, First Trust, BMW, Wells Fargo, Citibank, ...
Itanium architecture delivering >2X Moore’s Law Performance

- Up to 2X higher performance than Xeon™ processor-based platforms expected by ‘07
- Itanium’s EPIC architecture + smaller core than IA-32 enable up to 2X more cores/die

* Increasing the performance pace at lower platform cost

Intel® Itanium® 2 Processor Plans

Lowest Cost of Ownership

- Itanium processor-based platforms expected to be reduced to same cost as Xeon-based platforms by ‘07

Intel® Itanium® Processor Technologies Enhancements

- 2004
  - EPIC Architecture
  - 2.0+GHz
  - 24MB iCache
  - FSB400/667
  - DDR Memory
  - PCI-X
  - AGP-GFX

- 2005+
  - Dual-Multi-Core CPUs (Socket)
  - Multi-Threading
  - Enhanced EPIC Architecture
  - Additional Instructions
    - 2.0+GHz
    - 24MB iCache
    - FSB400/667
    - Fully Buffered DIMMs Memory
    - PCI Express (x4)
    - PCI Express GFX
    - Virtualization Technology
    - Foxton/Pellston Technologies

Intel focus on platform innovations that deliver performance, reliability and manageability to all enterprise segments
Intel-based Platforms Span Enterprise

<table>
<thead>
<tr>
<th>Workstations</th>
<th>Front-End (Edge)</th>
<th>Mid-Tier (Enterprise)</th>
<th>Backend (Databases)</th>
<th>High Performance Computing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Intel® Itanium™ 2 Processor</td>
</tr>
<tr>
<td></td>
<td>Intel® Xeon™ Processor</td>
<td></td>
<td></td>
<td>Xeon Processor</td>
</tr>
</tbody>
</table>

**Best for general purpose IT infrastructure: Workstation, front-end & mid-tier solutions**

<table>
<thead>
<tr>
<th>Price/Performance</th>
<th>Highest Performance (over Xeon and RISC processors in enterprise and HPC apps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database Data Integrity</td>
<td>Intel's highest Reliability &amp; Availability features</td>
</tr>
<tr>
<td>Scale-Out &amp; Up</td>
<td></td>
</tr>
</tbody>
</table>

**Intel’s highest Reliability & Availability features**

Itanium 2 processors for world-class performance and reliability features in back-end & mid-tier & Xeon processors for price/performance front-end & mid-tier

Intel® Software Tools

**Optimized for**

- Linux
- Windows

**on**

- Xeon
- Itanium

Intel® Software development products

**Intel® Performance Libraries**

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Thank You!

http://www.intel.com/eBusiness

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