

# **New Developments in Processor and Cluster Technology for CAE Applications**

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# New Developments in Processor and Cluster Technology for CAE Applications

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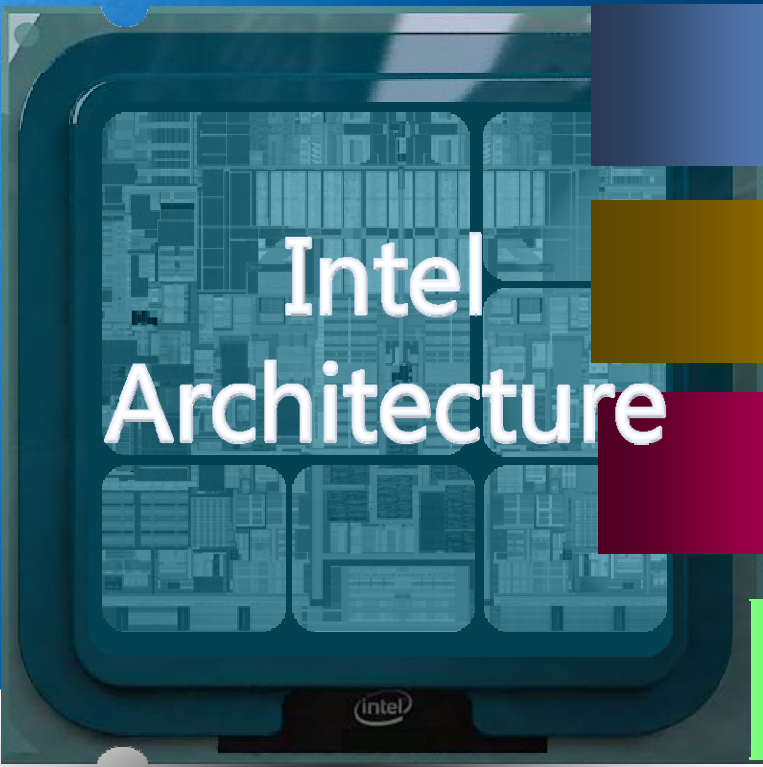


# Risk Factors

- 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, with the exception of the Numonyx transaction. Our forward-looking statements for 2008 reflect the expectation that the Numonyx transaction will close during the first quarter. 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: Factors that could cause demand to be different from Intel's expectations include changes in business and economic conditions, including conditions in the credit market that could affect consumer confidence; customer acceptance of Intel's and competitors' products; changes in customer order patterns, including order cancellations; and changes in the level of inventory at customers. Intel's results could be affected by the timing of closing of acquisitions and divestitures. 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 and product demand that is highly variable and difficult to forecast. Additionally, Intel is in the process of transitioning to its next generation of products on 45 nm process technology, and there could be execution issues associated with these changes, including product defects and errata along with lower than anticipated manufacturing yields. 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 and introductions, 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. 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, including variations related to the timing of qualifying products for sale; 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 that is resulting in several actions that could have an impact on expected expense levels and gross margin. We expect to complete the divestiture of our NOR flash memory assets to Numonyx. A delay or failure of the transaction to close, or a change in the financial performance of the contributed businesses could have a negative impact on our financial statements. Intel's equity proportion of the new company's results will be reflected on its financial statements below operating income and with a one quarter lag. The tax rate expectation is based on current tax law and current expected income. The tax rate may be affected by 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 fixed income and equity market 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 adverse economic, social, political and physical/infrastructure conditions in the countries in which Intel, its customers or its suppliers operate, including security concerns, 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. A detailed discussion of these and other risk factors that could affect Intel's results is included in Intel's SEC filings, including the report on Form 10-K for the fiscal year ended December 29, 2007.



# Going Forward



Intel  
Architecture

New Materials and Designs

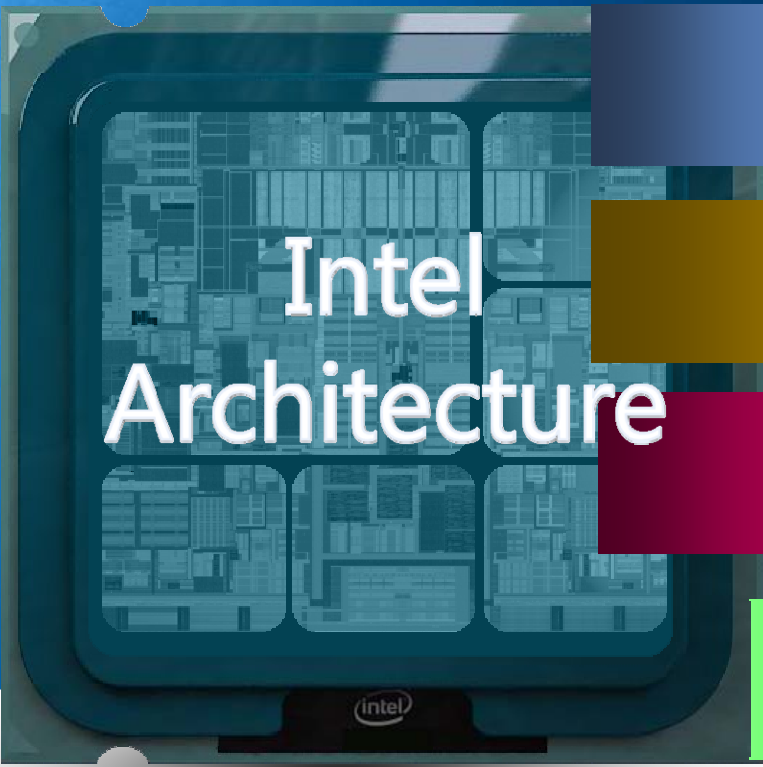
Single Core Enhancements

Multi to Many-Core

Platform Enhancements



# Going Forward



Intel  
Architecture

Tri-Gate, Nanotubes →

MMX → SSE → AVX →

Dual → Quad → Octo →

PCIe, IMC, QPI, SOC →



# Tick/Tock: Our Model for Sustained Microprocessor Leadership



<b>Intel<sup>®</sup> Core<sup>™</sup></b> NEW Microarchitecture 65nm 2006	<b>Penryn</b> Compaction/ Derivative <b>45nm</b> 2007	<b>Nehalem</b> NEW Microarchitecture 45nm 2008	<b>Westmere</b> Compaction/ Derivative <b>32nm</b> 2009	<b>Sandy Bridge</b> NEW Microarchitecture 32nm 2010
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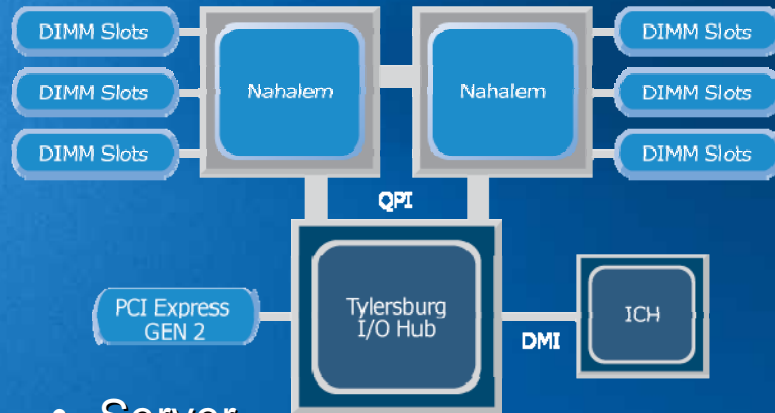
*ante portas*

Forecast



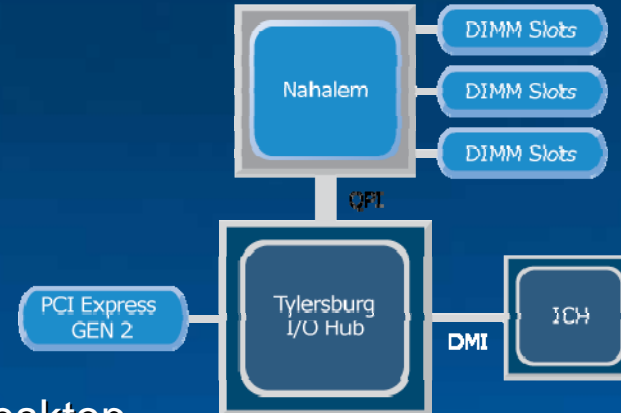
# Nehalem Processor based Platforms

## Server/Workstation and High End Desktop



- Server

- Intel® QuickPath Interconnect
- New point to point interconnect
- 2 links per CPU socket
- Up to 25.6 Gb/sec total bandwidth/link



- Desktop

- Integrated Memory Controller
- Next Gen DDR3 memory
- 3 channels per processor
- Massive Bandwidth
- Memory Latency Reduction

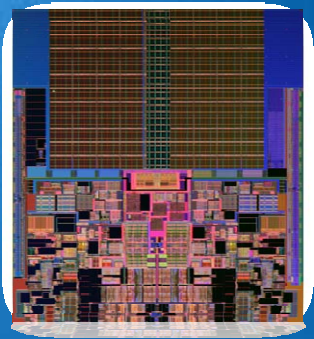


**Huge Latency Decrease and  
Bandwidth Increase over Prior Generation**



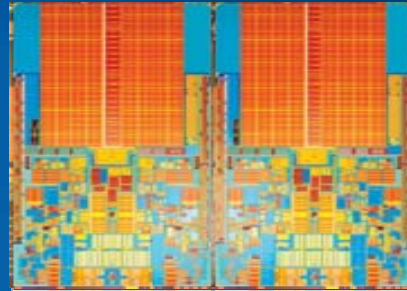
# Give me More ... Cores

2



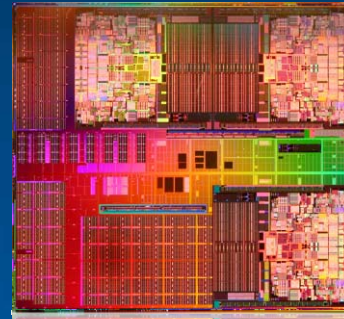
Intel® Xeon® 5200  
Processor Series

4



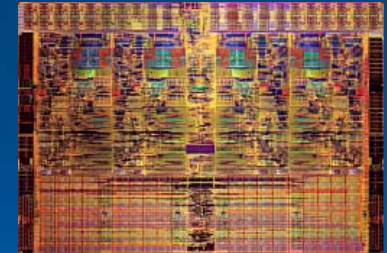
Intel® Xeon® 5400  
Processor Series

6



Intel® Xeon® 7400  
Processor Series  
(Dunnington, 2008)

8



Nehalem-EX  
(2009)





# Intel® Cluster Ready

## End User HPC Cluster Needs:

- To get their job done
- Cluster Server with Enterprise Characteristics

## Intel® Cluster Ready Is:

- A program to make it easier to buy, deploy and maintain clusters

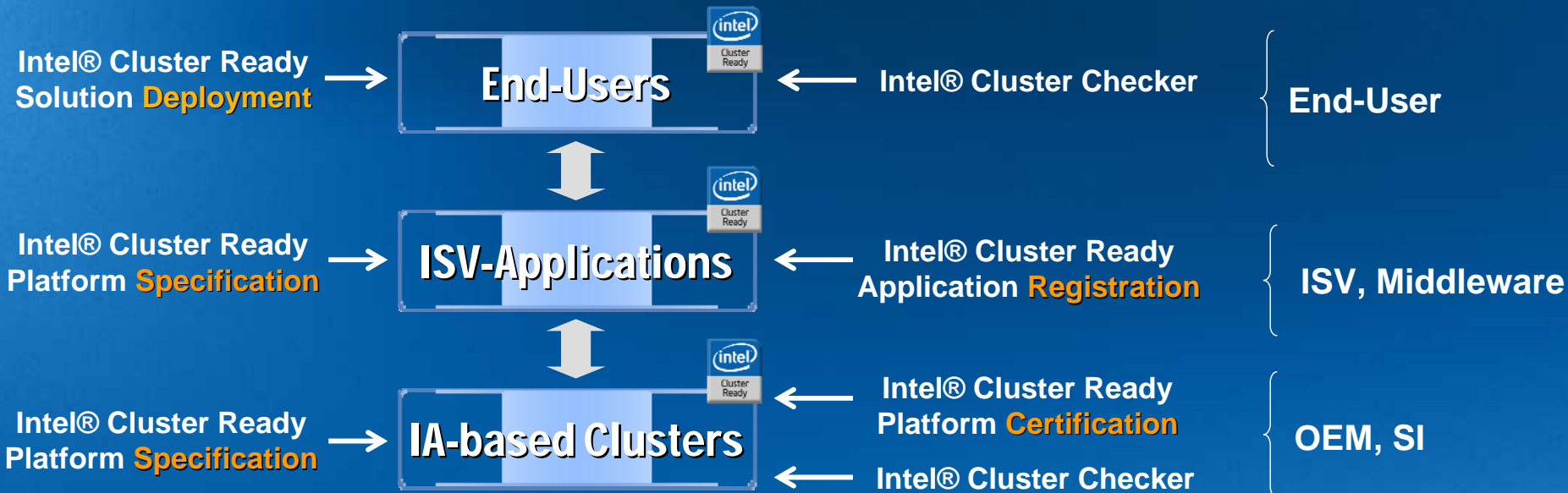


**Intel® Cluster Ready provides the confidence needed to build, deploy and maintain Clusters**





# Intel® Cluster Ready Community



[www.intel.com/go/cluster](http://www.intel.com/go/cluster)



# Intel® Cluster Ready Partners at LS-DYNA Forum 2008



# Software Partners in the Intel® Cluster Ready Community



\*Continuously updating list. Check the website for a complete record



# Hardware Partners in the Intel® Cluster Ready Community



\*Continuously updating list. Check the website for a complete record



# INTEL® ARCHITECTURE

Continuous Innovation and sustained Performance Leadership

Advanced Next Generation Nehalem Architecture

Going ahead to Multi/Many-Core Processors

Performance Easy to Use with Intel® Cluster Ready



