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Relative performance is calculated by assigning a baseline value of 1.0 to one benchmark result, and then dividing the actual benchmark result for the baseline platform into each of the specific benchmark results of each of the other platforms, and assigning them a relative performance number that correlates with the performance improvements reported.

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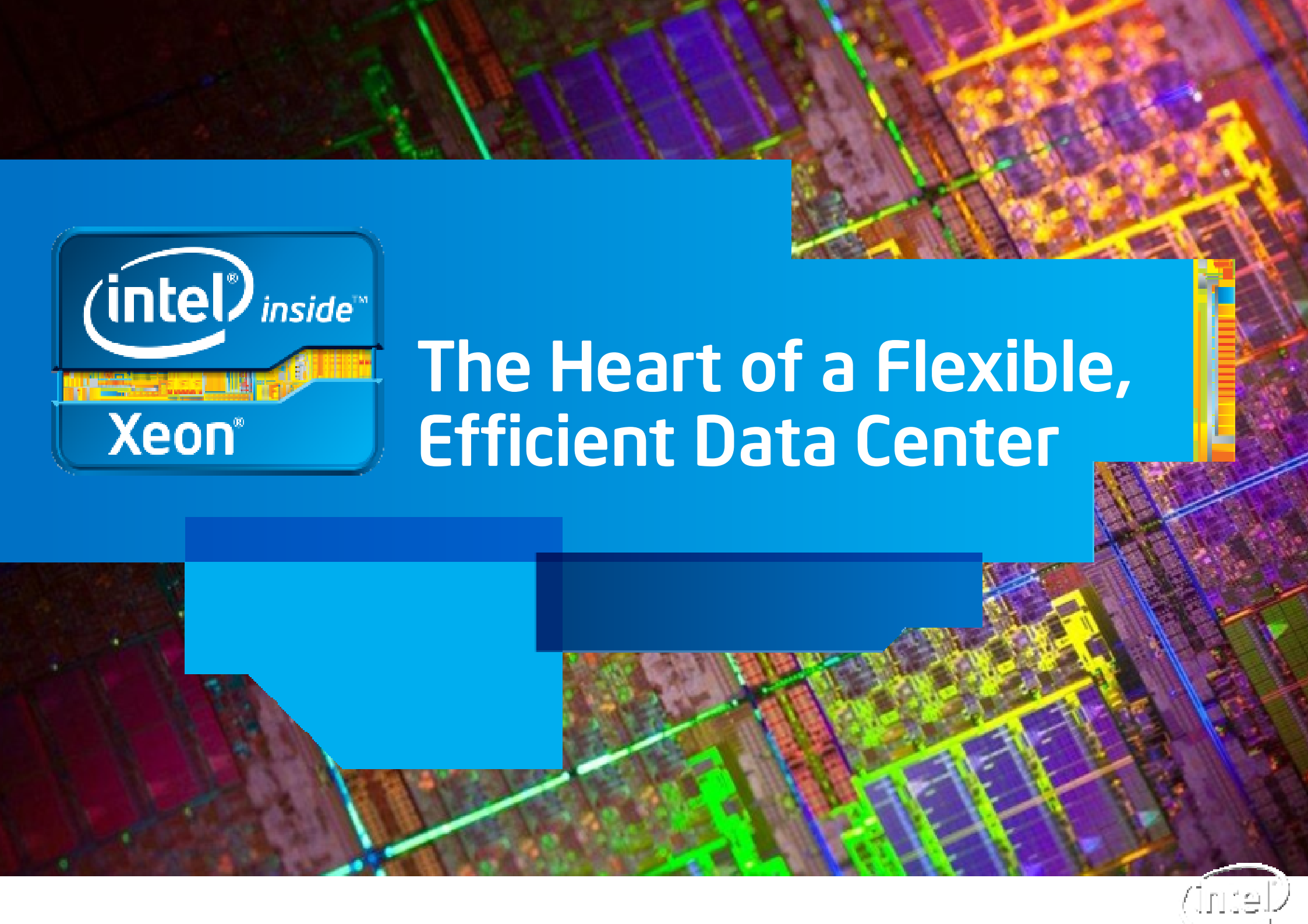
Built to Scale: The Intel® Xeon® Processor E7 and E5 Families in Cisco UCS

Petar Torre

Lead Architect

Service Provider Group

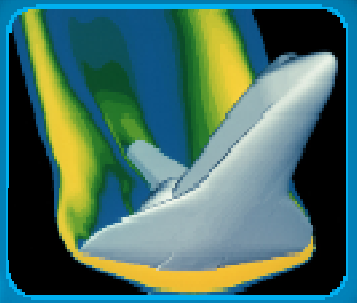


The Heart of a Flexible, Efficient Data Center


More Devices
More Data
More
Options
More Users
More
Connections

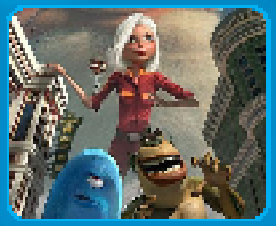
Compelling
User Experiences

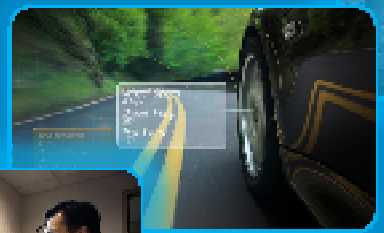








IT: **Be** the Business

IT: **Support** the Business

Cloud

Consumerization

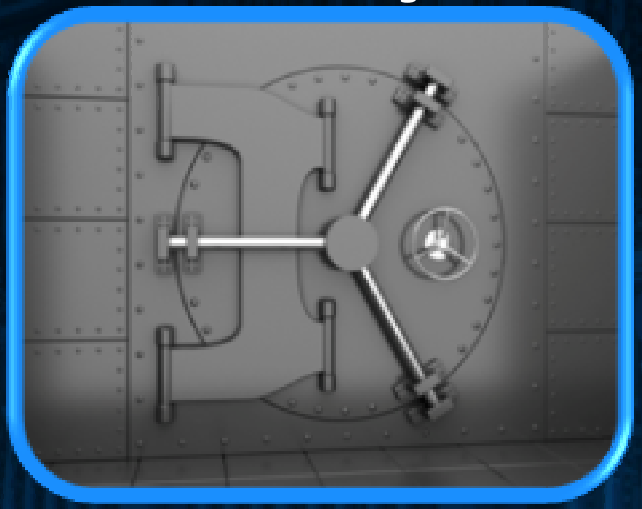
Big Data

Internet of Things

IT Must Scale!

Data Storage

Security

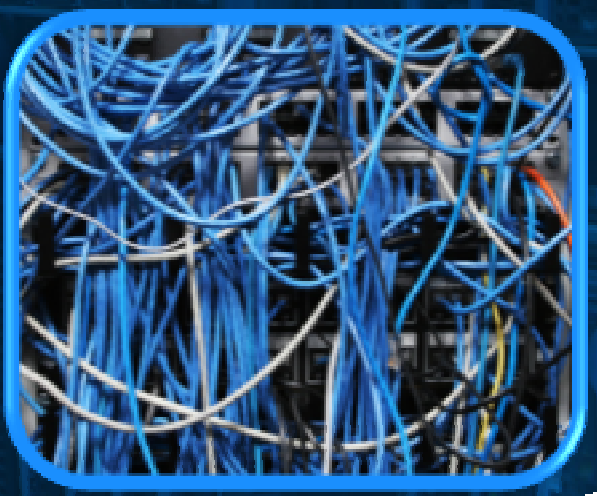


Power Costs

Interoperability

IT Staff Constraints

Network Bottlenecks



On Track For Cloud 2015 Vision

FEDERATED
Share data securely across public and private clouds

AUTOMATED
IT can focus more on innovation and less on management

CLIENT AWARE
Optimizing services based on device capability

Open, Industry Standards

Intel Cloud Builder Partners

Solutions to Help You Scale

IT Needs the Best Combination of Performance, Built-in Capabilities, and Cost-effectiveness

To Scale IT Must Address:

I/O Bottlenecks

Security Challenges

Energy Efficiency

Storage & Switching

Constraints

Mission Critical Workloads

Transaction Processing

- 1,000s – 1,000,000+ online users
- Support large transactional databases
- 24 x 7 operation

Business Intelligence and Analytics

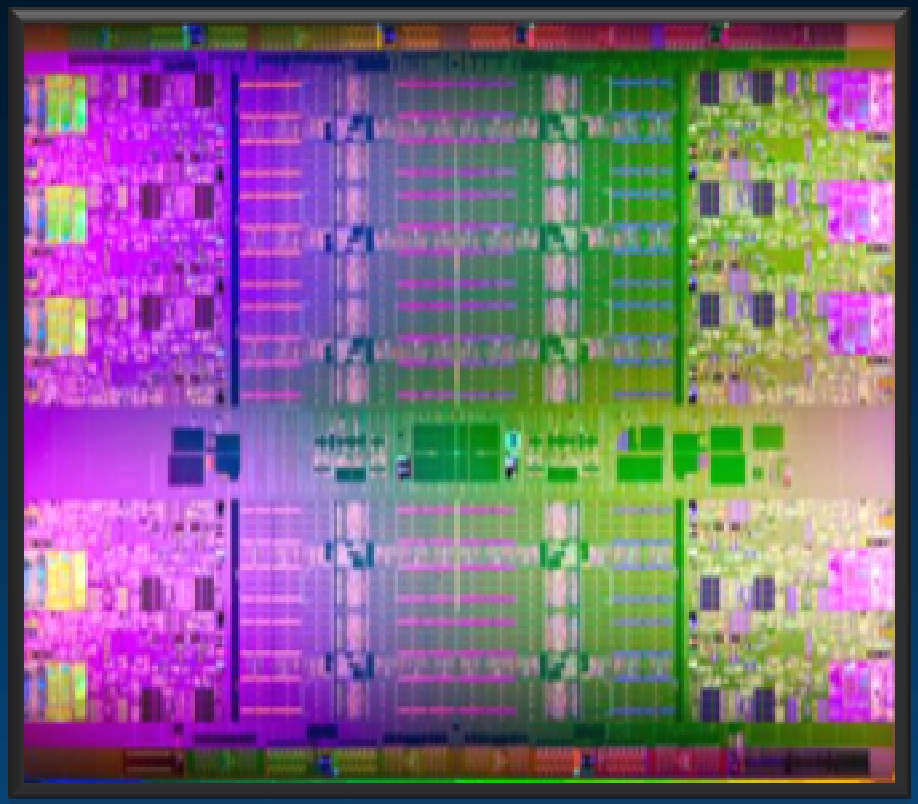
- Enable all users
- Complex queries
- Multiple data sources
- Large data warehouse

Database

- Large scalable enterprise databases
- No single point of failure
- Extremely fast operational speed

An Hour Of Downtime Can Mean Millions In Lost Revenue

Intel® Xeon® Processor
E7-8800/4800/2800 Product Families



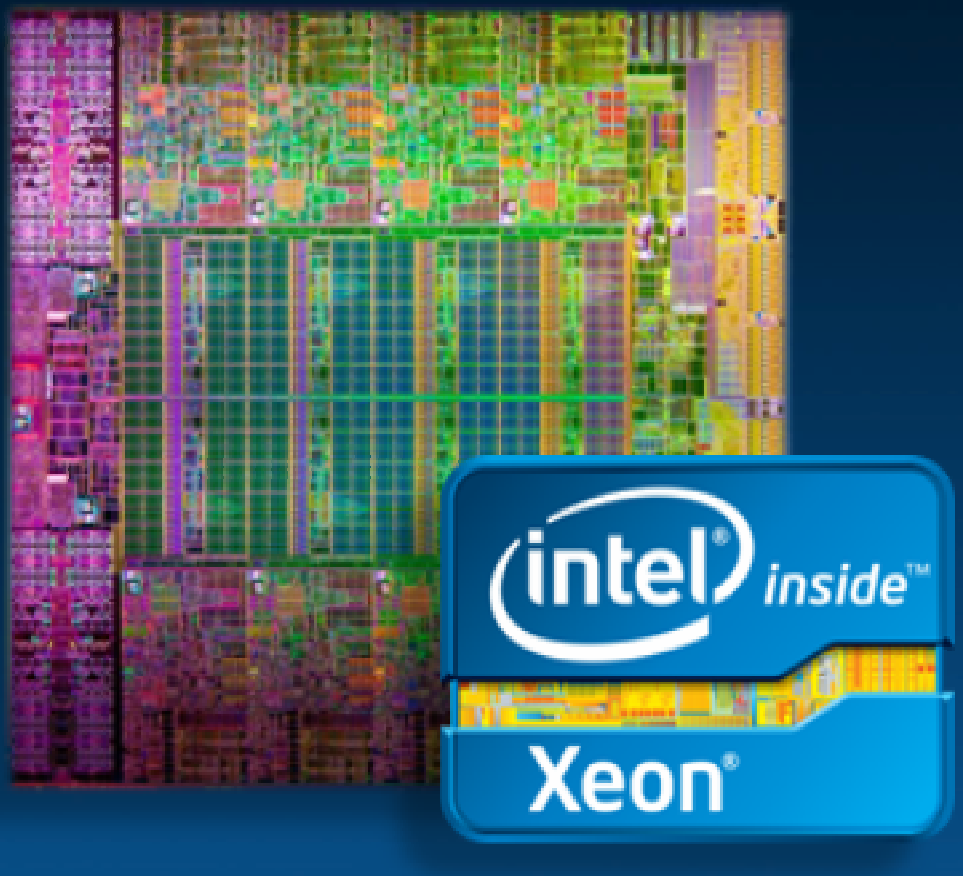
Top of the Line Performance
Up to 10 Cores and 20 Threads & 30MB of on-die cache

More Scalability
Up to 2 Terabytes of DDR3 Memory[1] and low voltage DIMM support

Advanced Data Protection
New reliability features & Intel® TXT and AES-NI

Innovative Cisco UCS Implementation:
B260 M2 and B440 M2 Blades
C260 M2 and C460 M2 Rack Mount

Introducing the Intel® Xeon® Processor E5 Family



Leadership Performance

Breakthrough I/O Innovation

Trusted Security

Exceptional Energy Efficiency

The Heart of a Flexible, Efficient Data Center Built to Scale

Intel® Advanced Vector Extensions

"The new Xeon processor E5-2600 with Intel® AVX allowed us to enable full stereo dual stream video processing in real time at high frame rates required for surgery."

— Alex Chanin, President and CEO, Visionsense

"Facial recognition solutions must process huge amounts of digital photo uploads accurately and at manageable costs. Using the Intel® Xeon® processor E5 family with Intel® AVX, we were able to reach a photo processing throughput unmatched by any world-class facial recognition solution."

— Yaniv Taigman, CTO of face.com

Trusted Security

Intel® Trusted Execution Technology

Average organizational costs of a data breach over $7M per incident[2]

Intel® Advanced Encryption Standard New Instructions

Use of AES encryption[1] has nearly tripled in the last 10 quarters

ttp://www.akamai.com/html/about/press/releases/2011/press_102411.html

Trusted Security

"Intel® TXT as part of our Xeon-based servers provides added levels of security and a hardware root of trust that enhances our compliance monitoring capabilities."

Hai Zhu, PhD, Manager, DuPont Central Research & Development

DUPONT
The miracles of science™

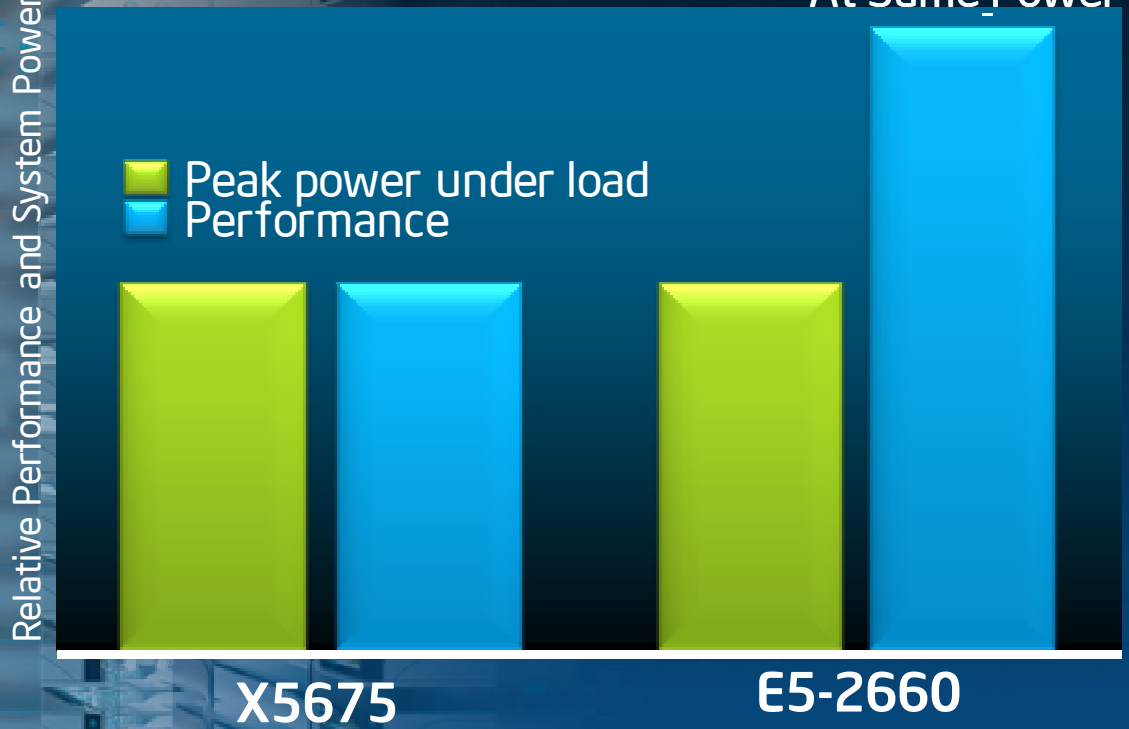
"We need a way to scale our encryption capabilities to handle more data, from more customers, without affecting end-user performance. Using Intel AES-NI, we can scale our services and protect information while sustaining high performance."

Janakan Rajendran, CIO, GNAX Health

GNAX HEALTH
HEALTHCARE TECHNOLOGY. DELIVERED.

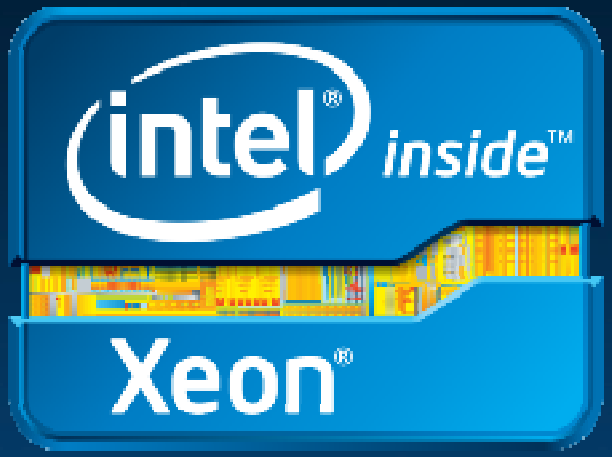
Xeon® Processor Energy Efficiency

~50%[1]
higher Performance
At Same Power



Best Data Center Performance per Watt[1]

The Intel® Xeon® Processor E5 Family



Leadership Performance: 15 New x86 World Records

Breakthrough I/O Innovation: Up to 3X I/O Performance

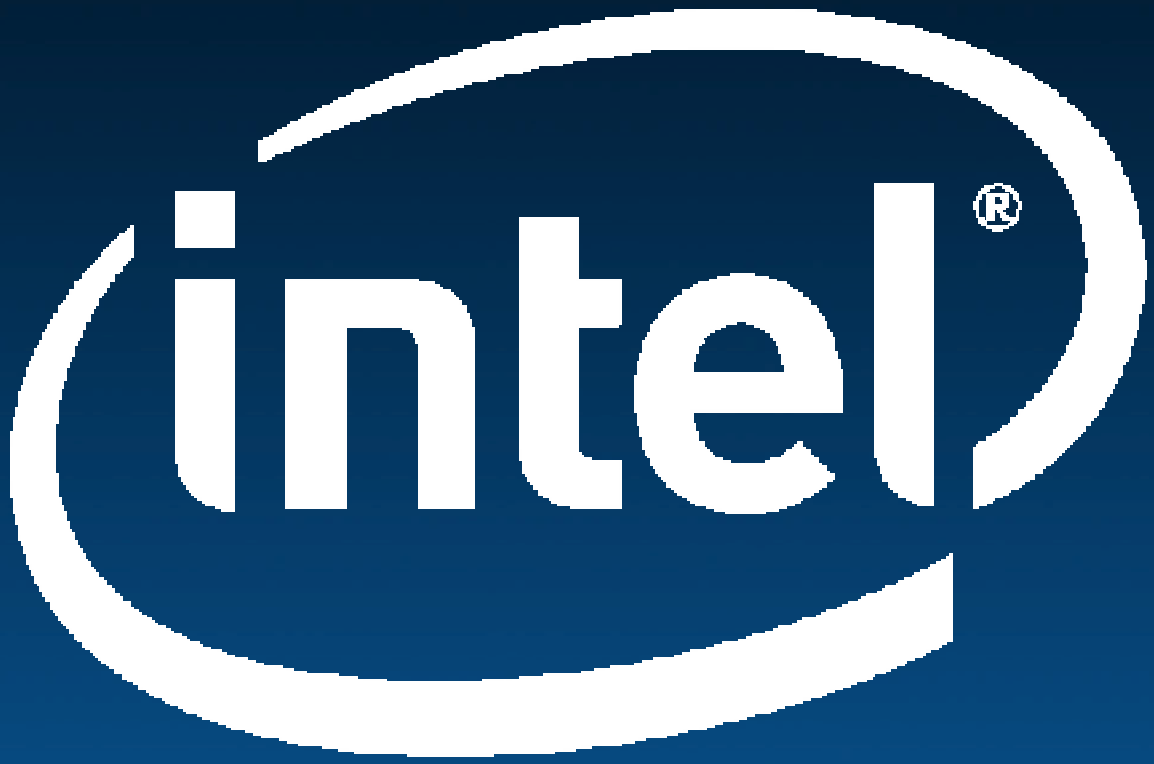
Trusted Security: Trusted Hardware Security

Exceptional Energy Efficiency: Best performance per watt

Cisco Servers: B200 M3, C220 M3 and C240 M3

The Heart of a Flexible, Efficient Data Center that's Built to Scale

Learn More at: www.intel.com/datacenter


intel

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Intel, processors, chipsets, and desktop boards may contain design defects or errors known as errata, which may cause the product to deviate from published specifications. Current characterized errata are available on request.

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No computer system can provide absolute security under all conditions. Intel® Trusted Execution Technology (Intel® TXT) requires a computer system with Intel® Virtualization Technology, an Intel TXT-enabled processor, chipset, BIOS, Authenticated Code Modules and an Intel TXT-compatible measured launched environment (MLE). Intel TXT also requires the system to contain a TPM v1.s. For more information, visit http://www.intel.com/technology/security

Requires a system with Intel® Turbo Boost Technology. Intel Turbo Boost Technology and Intel Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your PC manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit http://www.intel.com/go/turbo

Intel® AES-NI requires a computer system with an AES-NI enabled processor, as well as non-Intel software to execute the instructions in the correct sequence. AES-NI is available on select Intel® processors. For availability, consult your reseller or system manufacturer. For more information, see http://software.intel.com/en-us/articles/intel-advanced-encryption-standard-instructions-aes-ni/

Legal Information – Configuration Details

(30% I/O Latency) Source: Intel internal measurements of average time for an I/O device read to local system memory under idle conditions comparing Intel® Xeon® processor E5-2600 product family (230 ns) vs. Intel® Xeon® processor 5500 series (340 ns). Baseline Configuration: Green City system with two Intel® Xeon® processor E5520 (2.26GHz, 4C), 12GB memory @ 1333, C-States Disabled, Turbo Disabled, SMT Disabled. New Configuration: Meridian system with two Intel® Xeon processor E5-2665 (2.4GHz, 8C), 32GB memory @1600 MHz, C-States Enabled, Turbo Enabled. The measurements were taken with a LeCroy* PCIe* protocol analyzer using Intel internal Rubicon (PCIe* 2.0) and Florin (PCIe* 3.0) test cards running under Windows* 2008 R2 w/SP1.

(PCIe 3.0 2X Bandwidth) Source: 8 GT/s and 128b/130b encoding in PCIe* 3.0 specification enables double the interconnect bandwidth over the PCIe* 2.0 specification. Source: http://www.pcisig.com/news_room/November_18_2010_Press_Release/

(DDIO) 1 Up to 2.3x I/O performance is 1S with a Xeon processor 5600 series vs. 1S Xeon Processor E5-2600 data for L2 forwarding test using 8x10GbE ports. Configuration details: 64B L2 Forwarding Benchmark, Rose City CRB, 8x2GB DDR3-1333MHz, 1xSNB-EP 8C B0, 2.8GHz (2.7GHz + turbo), Green City Platform, 6x2GB DDR3-1333MHz, Xeon 5680

(Energy Efficient Performance) Source: Performance comparison using best submitted/published 2-socket single-node server results on the SPECpower_ssj*2008 benchmark as of 6 March 2012. Baseline score of 3,329 ssj*_ops/watt published by Hewlett-Packard on the ProLiant DL360 G7* platform based on the prior generation Intel® Xeon® processor X5675. Score of 5,093 ssj*_ops/watt submitted for publication by Fujitsu on the PRIMERGY RX300 S7* platform based on the Intel® Xeon® processor E5-2660. For additional details, please visit http://www.spec.org.