

Intel® Xeon® Processor E5 Family

The Business Case



About this presentation:

Intel's latest addition to its processor products is the Intel® Xeon® processor E5 family, which addresses a broad array of IT usages, including enterprise infrastructure, workstations, public and private cloud installations, storage systems, and high-performance computing, as well as some embedded devices.

This new family of products is the successor to the Intel Xeon processor 5600 and 5500 series, which are among the most popular enterprise technology products of all time.

Adding the Intel Xeon processor E5 family to your data center is a smart, cost-effective move that can enhance IT's ability to respond to the business and provide new service models in today's challenging IT environment.

Audience: IT executives

Region: Worldwide

Usage Guidelines:

This presentation is meant to help you make the business case for adding Intel Xeon processor E5 family servers to your data center(s).

The slides are designed to drop into a larger presentation or stand alone. Use the slides most appropriate for your situation.

Use the updated ROI tool (intel.com/go/xeonestimator) to customize your presentation with cost data specific to your organization.

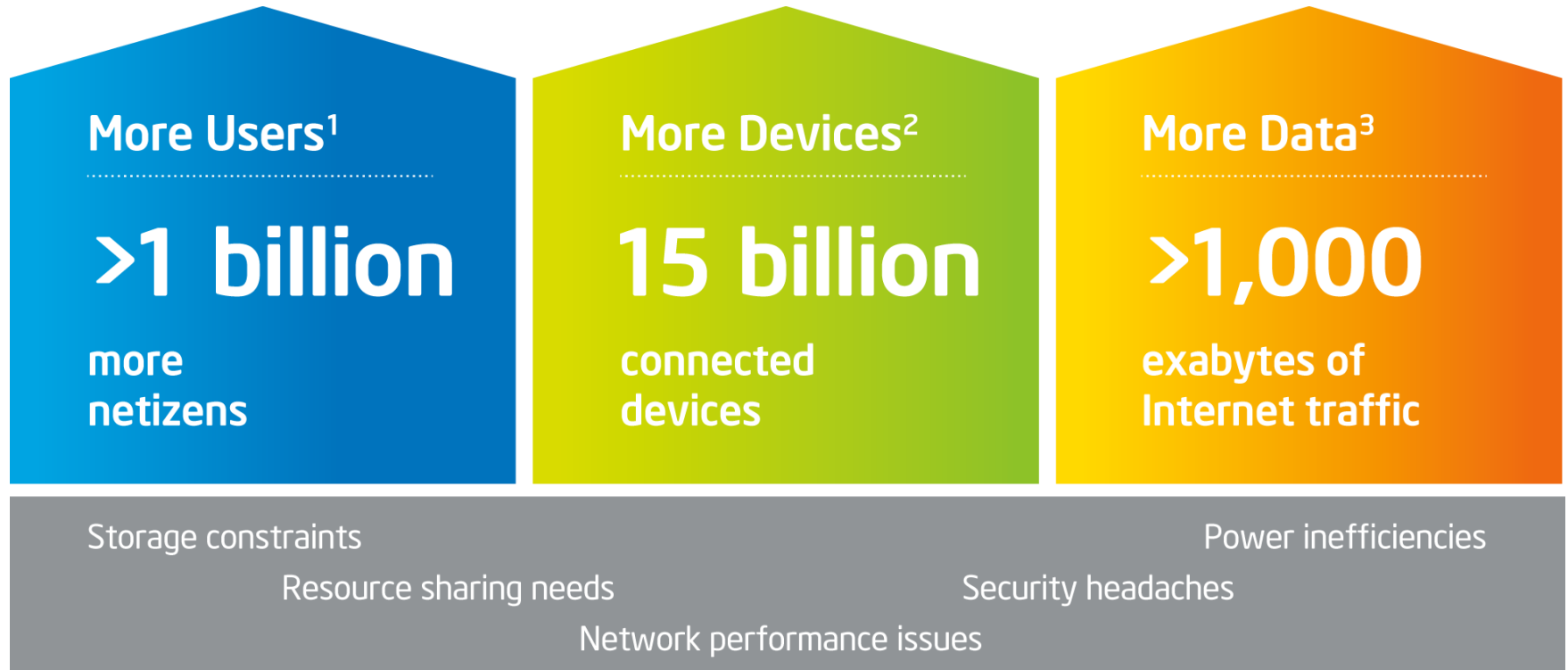
- All products, computer systems, dates, and figures specified are preliminary, based on current expectations, and are subject to change without notice.
- Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. Go to intel.com/products/processor_number.
- 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.
- Intel Virtualization Technology requires a computer system with an enabled Intel processor, a BIOS, and virtual machine monitor (VMM). Functionality, performance, or other benefits will vary depending on hardware and software configurations. Software applications may not be compatible with all operating systems. Consult your PC manufacturer. For more information, visit intel.com/go/virtualization.
- 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, a chipset, a 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 intel.com/technology/security.
- Intel Turbo Boost Technology 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 intel.com/go/turbo.
- Intel Advanced Encryption Standard New Instructions (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 software.intel.com/en-us/articles/intel-advanced-encryption-standard-instructions-aes-ni/.
- Intel Node Manager: Requires servers with Intel Node Manager and enabled monitoring or management software, such as Intel Data Center Manager.
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- TPC Benchmark is a trademark of the Transaction Processing Council. See [tpc.org](https://www.tpc.org) for more information.
- Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests such as SYSmark* and MobileMark* are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

Next-Generation Data Center IT Must Do More with Less



Escalating demands on IT drive need for the best combination of performance, efficiency, and cost

1 IDC. "Server Workloads Forecast" (2009).

2 IDC. "The Internet Reaches Late Adolescence" (December 2009, extrapolation by Intel for 2015). ECG. "Worldwide Device Estimates Year 2020—Intel One Smart Network Work" forecast.

3 Source: cisco.com/assets/cdc_content_elements/networking_solutions/service_provider/visual_networking_ip_traffic_chart.html, extrapolated to 2015

Next-Generation Data Center Intel® Xeon® Processor E5



Built-in performance and capabilities to support innovation such as cloud service delivery and high-performance computing

Significant performance gains

Improved networking

Scalable and optimized storage

Data and infrastructure protection

Optimized power

Next-Generation Data Center Stepped-Up Server Performance



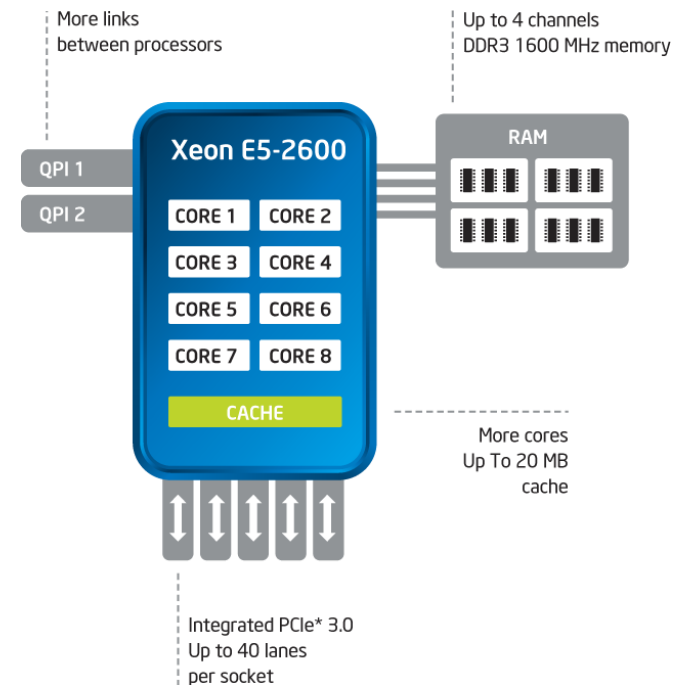
More power and faster connections

Up to **80% raw performance boost** vs. prior generations⁴ at consistent power level

Intel® Integrated I/O **cuts latency**⁵ while adding capacity and bandwidth

Adapts to workload spikes with Intel Turbo Boost Technology 2.0

Dramatically reduces compute time with Intel Advanced Vector Extensions for increased floating point operations per clock up to 2X⁶



⁴ Source: Performance comparison using best publications of SPECfp*_rate_base2006 benchmark available as of March 6, 2012. Score of 271 published on prior-generation 2S Intel Xeon processor X5690-based platform. Score of 488 published on new 2S Intel Xeon processor E5-2690-based platform. For additional details, please visit spec.org.

⁵ Intel measurements of average time for an I/O device read to local system memory under idle conditions. Improvement compares Intel Xeon processor E5-2600 family vs. Intel Xeon processor 5600 series.

⁶ Performance comparison using Linpack benchmark. See backup for configuration details. For more legal information on performance forecasts, go to intel.com/performance.

Next-Generation Data Center Unified Networking



Simplified network infrastructure

Consolidate⁷ multiple connections

GbE server connections



10 GbE server connections



Up to

45%

reduction
in power
per rack



Up to

80%

reduction
in cables and
switch ports



Up to

15%

reduction
in infrastructure
costs



Up to

2%

improved
bandwidth
per server



Unify network and storage traffic⁸



Local area network



Storage network



⁷ Ethernet consolidation source: Intel 10 GbE ROI Calculator. This ROI calculator is a cost comparison for a highly virtualized solution, using multiple 1 GbE connections, versus a dual-port 10 GbE implementation: event-management-online.de/LAD/calculator.aspx

⁸ Up to 2.3x I/O performance is 1S WSM vs. 1S SNB data for L2 forwarding test using 8x10 GbE ports.

Next-Generation Data Center Optimized Storage



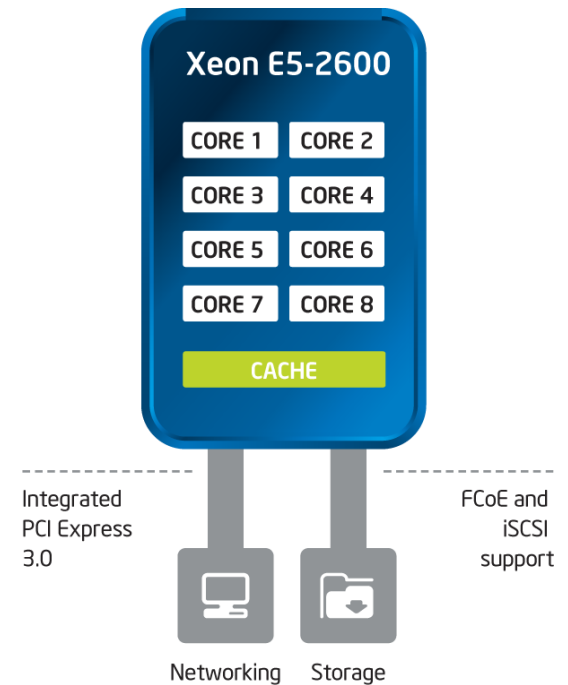
Scale out, optimize capacity, and balance storage

Fully capable storage server

Massive scalability

Open standards and interoperability

Enabled for intelligent storage solutions

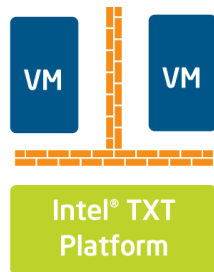


Next-Generation Data Center Faster, Stronger Security



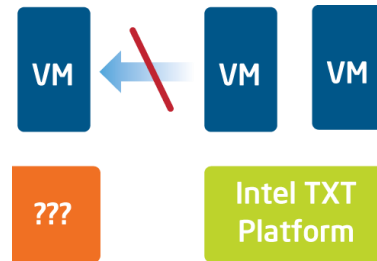
Isolate

Intel VT and Intel TXT
protect VM isolation
and provide a more secure
platform launch



Enforce

Intel TXT establishes a
"trusted" foundation to
control migration based
on security policy



Encrypt

Intel AES-NI delivers built-in
encryption acceleration up to
10 times faster⁹ for **better
data protection**



⁹ AES-NI performance source: Testing with Oracle* Database Enterprise Edition 11.2.0.2 with Transparent Data Encryption (TDE) AES-256 shows as much as a 10x speedup when inserting one million rows 30 times into an empty table on the Intel Xeon® processor X5680 (3.33 GHz, 36 MB RAM) using Intel IPP routines, compared to the Intel Xeon processor X5560 (2.93 GHz, 36 MB RAM) without Intel IPP.

Next-Generation Data Center Optimized Power



Power and efficiency management—
at the server, rack, zone, and data center levels

Monitor

Track actual power usage
directly from the server



Limit

Restrict maximum node
power to increase rack
density with confidence



Optimize

Use data and power
limiting to place workloads
for maximum efficiency



Survive

Automatically reduce
power to extend operations
during power events



Next-Generation Data Center Reduced Total Cost of Ownership



Simplified network infrastructure

Technical advancements since 2007

Intel® Turbo Boost Technology 2.0

Reduces hard workload spikes with higher frequencies

Intel AES-NI

Accelerates encryption

Intel Trusted Execution Technology

Defends against attacks during launch

Intel Advanced Vector Extensions

Increases FLOPS per clock

Intel Integrated I/O

Reduces I/O latency

Intel Hyper-Threading

Doubles the number of threads per core

Intel Virtualization Technology

Enhances virtualization performance with new platform capabilities

Intel Node Manager 2.0

Maximizes operating efficiency with power monitoring and limiting

Intel Data Center Manager

Provides data to enable improved dynamic workload placement and migration

Intel QuickPath Interconnect

High-bandwidth processor interconnect delivers greater bandwidth

Integrated Power Gates

Enables idle cores to go to near zero power draw

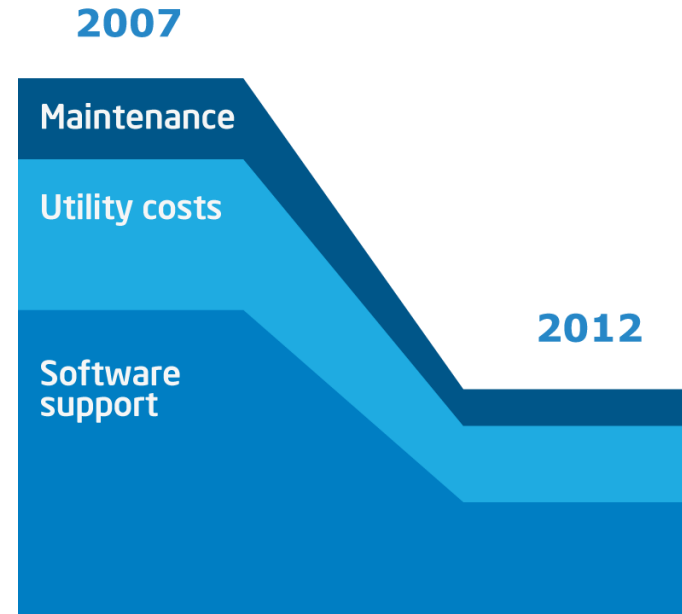
Next-Generation Data Center Reduced Total Cost of Ownership



Refresh and save

- Power management and increased efficiency can significantly reduce the power required to deliver a set level of performance
- Major performance gains every generation maximize output per software license potential savings over a system's life

Reduced TCO up to 66%¹⁰



¹⁰ Based on an Intel savings estimator tool, available to everyone, that helps estimate the savings from installing a new system vs. leaving existing servers in place. Results may vary. Find out more and estimate your savings potential at intel.com/go/xeonestimator.

Next-Generation Data Center Savings Potential



PLEASE READ BEFORE REMOVING AND REPLACING WITH YOUR RESULTS FROM THE INTEL ESTIMATOR TOOL:

The tool is an interactive tool that uses the information that you supply to provide an estimate of your possible IT costs and savings when replacing existing installed servers with Intel Xeon processor technology. The tool is intended to enable you to get a better understanding of how the purchase of systems with Intel Xeon processor technology, combined with a number of situation-specific variables (e.g., the number of platforms in your enterprise, the rate at which you upgrade or replace the platforms in your enterprise, the additional cost of servers with Intel Xeon processors charged by your OEM, the incremental per system configuration cost, additional ISV software license cost, additional ISV software installation cost, the number of employees that require training on Intel Xeon processor technology, or training each trainee will receive), might affect your future IT support cost and savings. The general accuracy of the estimate generated by the tool will depend on how closely the variables chosen by you match your actual circumstances.

The results generated or scenarios described in the tool are estimates and should only be used as a guide to evaluate the cost/benefit or feasibility of a future purchase of systems with Intel Xeon processors. The actual economic results realized as a result of a purchase of systems with Intel Xeon processors will vary, and there is no guarantee that you will actually realize the economic results forecast by the tool. There may be additional unaccounted-for costs related to the use and deployment of servers that are not or cannot be accounted for on this tool. Any estimate generated by the tool is not and should not be interpreted as either a promise of or contract for a given level of IT support cost and savings. Prior to purchasing any systems with Intel Xeon processors, you should consult with qualified IT professionals to ensure that any such purchases fit your particular circumstances. Intel does not and cannot guarantee the accuracy or reliability of the results generated by the tool or that you will actually realize any cost savings as forecast by the tool.

Results from [intel.com/go/xeonestimator](https://www.intel.com/go/xeonestimator).



For more information about the Intel® Xeon® processor family or other IT topics of interest, visit Intel.com/ITCenter