Product Brief
**Intel® Xeon® Processor E5-2600 v3, E5-1600 v3, and E3-1200 v5 Product Families**

# Intel® Xeon® Processors for Workstations

## Enabling better designs and faster time to market

In many industries, the demand for faster time to market, design optimization, and cost reduction is driving the rapid adoption of workstation products. Not long ago, workstations were reserved for high-end design work such as complex mechanical assemblies, architecture, and aerospace design. Today, workstations are used in every major industry for tasks ranging from financial modeling to medical diagnostics. Workstations have become standard equipment for engineers, content creators, analysts, and others who need the highest levels of performance, visualization, and data integrity.

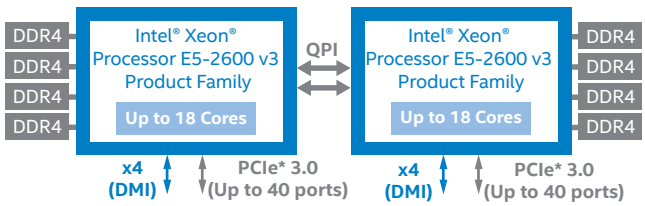
Increasingly, design professionals and engineers are using Intel® Xeon® processor-based workstations to create, test, and modify new ideas almost as fast as they can think of them. Derived from server processors, workstation processors typically are optimized for higher frequency, improved graphics, and application certification for better performance and reliability.

## Selecting the Right Platform

MORE FEATURES, MORE PERFORMANCE

### Intel® Xeon® Processor E5-2600 v3 Family

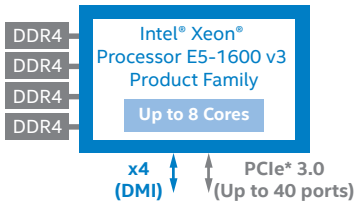
**Highest Performance and Maximum Memory**
Accelerate discovery and improve your innovation throughput.




The Intel® Xeon® processor E5-2600[1] v3 product family is designed to solve your biggest problems fast. With support for two processors, it can power integrated design software that combines creation with analysis, simulation, rendering or ray-tracing requirements.

### Intel® Xeon® Processor E5-1600 v3 Family

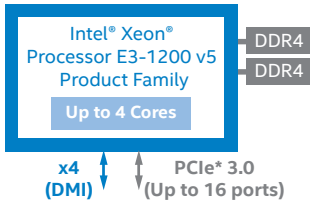
**Increased Expandability, Incremental Performance**
Supplying the bandwidth and capacity you need to explore larger projects.




The Intel® Xeon® processor E5-1600[1] v3 product family is Intel's most robust processor for single-processor workstations. It offers larger cache, more cores, more memory and more I/O than any other Intel® Xeon® processor designed for a single-socket workstation.

### Intel® Xeon® Processor E3-1200 v5 Family

**Expanded Feature Set vs. Desktop**
The workstation advantage that just replaced your business desktop.




The Intel® Xeon® processor E3-1200[1] v5 product family brings entry-level workstation performance to designers, engineers, and others who thought such capabilities were out of reach. With Intel® HD Graphics P530[2] built in, this processor delivers the visual performance and quality demanded for professional-grade CAD and media/entertainment applications.

## Moving Data – Processing More – Helping You Innovate Faster

What makes Intel Xeon processor-based workstations so powerful? It is not just about adding more computational cores, it is about a powerful infrastructure that accelerates the opportunity for processors and cores to act on data and change it into actionable information faster than ever before. The Intel® Xeon® processor E3 and E5 product families include the following features:

| FEATURE | BENEFIT |
|---|---|
| Advanced multi-core, multi-threaded processing | • Up to 18 cores and 36 threads per processor for running the highest performance applications |
| Larger cache and faster memory | • Up to 45 MB of last level cache for fast access to frequently used data<br>• Fast memory speeds, up to DDR4-2133 |
| Higher performance for demanding workloads | • Intel® Advanced Vector Extension 2.0 (Intel® AVX 2.0) supports wider vector units and new instructions to perform more work per clock cycle<br>• Intel® Turbo Boost Technology 2.0 takes advantage of power and thermal headroom to automatically increase core frequencies during peak workloads |
| Intel® Hyper-Threading Technology (Intel® HT Technology) | • Faster performance for many demanding applications |
| Intel® HD Graphics P530[2] | • Enhanced graphics capability for CAD and high-performance video editing professionals, using integrated processor graphics |
| PCI Express 3.0 ports | • Extra capability and flexibility for graphics and storage expansion |
| Support for error-correcting code (ECC) memory | • Enables better data integrity and system reliability through automatic data correction |
| Intel® Rapid Storage Technology[3] | • Improved performance for disk-intensive retrieval applications, such as simulation and video editing |

## Speeds up to 4.1x faster than your 4-year-old workstation[4]

Comparisons based on Intel® Xeon® processor E5-1600 v3-based workstation vs. 4-year-old machine

### When Your Work Really Matters, Protect It with ECC Memory

Recent studies from Google and others suggest that as many as one in three computers will experience a memory error.[5] Lambda Diode suggests that a computer has as much as a 96 percent chance of having a bit error in three days without ECC RAM.[6]

The impact of a memory error can vary from hardly noticeable to catastrophic:

- A memory error changes the tone of one pixel of color —no big deal.
- A memory error causes a program to crash — annoying hours of lost productivity as you recreate your work.
- A memory error corrupts irreplaceable customer data or design details – disaster!

### Intel® vPro™ Technology

Now, the entire line of Intel Xeon processor-based workstations offers the hardware-assisted security and manageability of Intel® vPro™ technology. Protecting workstations and securing data are among the great challenges facing modern businesses. Intel vPro technology is built into these Intel Xeon processors, Intel® chipsets, and network adapters serving the workstation market to simplify and accelerate these critical IT functions.

### Conclusion

Choosing a workstation that's optimized for your job is a wise investment. A balanced workstation is essential to maximizing your productivity.

### Intel® Xeon® Processor E5-2600 v3 Product Family – Powerful Ideas Deserve Powerful Compute

Workstations using the Intel Xeon processor E5-2600 v3 product family are designed and engineered for demanding multi-tasking and parallel workflows. They are not only certified and tested with professional software titles, they are optimized to deliver the compute, memory and I/O performance demanded by these applications.

## Intel® Xeon® Processor Product Family Comparison

| WORKSTATION | EXPERT (2S) | PROFESSIONAL (1S) | ENTRY (1S) |
|---|---|---|---|
| **Processor Type** | **Intel® Xeon® Processor E5-2600 v3 Product Family** | **Intel® Xeon® Processor E5-1600 v3 Product Family** | **Intel® Xeon® Processor E3-1200 v5 Product Family** |
| **Product Positioning** | Expert workstations using Intel Xeon processor E5-2600 v3 product family are designed to power the design suites that let you seamlessly combine creation with analysis and simulation.<br>Expert workstations enable "mega-tasking" for fast, efficient interaction with models while concurrently executing simulations, renderings, ray tracing, and modeling on the same workstation. | Professional workstations using Intel Xeon processor E5-1600 v3 product family are ideal for demanding workloads and efficient multitasking.<br>Professional workstations offer excellent performance for advanced model generation and complex applications. | Entry workstations using Intel Xeon processor E3-1200 v5 product family bring workstation performance to designers, engineers, and scientists.<br>With integrated Intel® HD Graphics P530 entry workstations provide the visual performance and quality demanded by professional CAD and media/entertainment applications. |
| **Intel® QuickPath Interconnect** | 2 | N/A | N/A |
| **Maximum Memory Channels** | 8 (4 per processor) | 4 | 2 |
| **Maximum Memory Speed** | DDR4-2133 | DDR4-2133 | DDR4-2133 |
| **Maximum Memory Capacity** | 1536 GB (768 GB per processor) | 768 GB | 64 GB |
| **Maximum Last Level Cache** | 45 MB | 20 MB | 8 MB |
| **Maximum PCIe* 3.0 Ports** | 80 (40 per processor) | 40 | 16 |
| **Intel® HD Graphics P530[2]** | N/A | N/A | Yes |
| **Maximum Core Count** | 36 (18 per processor) | 8 | 4 |
| **Maximum Intel® Hyper-Threading Technology Threads** | 72 (36 per processor) | 16 | 8 |
| **Intel® Integrated I/O[7] (Intel® IIO)** | Yes | Yes | N/A |
| **Intel® Data Direct I/O[7] (Intel® DDIO)** | Yes | Yes | N/A |

### Intel Xeon Processor E5-1600 v3 Product Family – Adding Fuel for More Innovation

Workstations using the Intel Xeon processor E5-1600 v3 product family represent our most powerful single processor for professional workstation users. Unlike the Intel Xeon processor E3-1200 v5 product family, this processor is modeled after the Intel Xeon processor E5-2600 v3 product family and delivers richer I/O and expanded memory capability, making it possible to design, measure, analyze, and improve more designs than when using entry-level processors.

### Intel Xeon processor E3-1200 v5 Product Family – Transforming the Technical Desktop

Workstations using the Intel Xeon processor E3-1200 v5 product family with Intel® HD Graphics P530[2] provide technical users an application-optimized platform to view and interact with the complex data they need in order to make the right product decisions – from planning and development through manufacturing and support data.

### Learn More

Choosing the right workstation is a smart investment that can accelerate how you create, test, and optimize your ideas. Find more information and resources at www.intel.com/workstation.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at intel.com.

[1] Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/

[2] Intel HD Graphics P530 only available on select models of the Intel® Xeon® processor E3-1200 v5 product family. For more information, visit www.intel.com/workstation.

[3] Intel® Rapid Storage Technology requires the workstation to have an Intel RST-enabled Intel chipset, RAID controller in the BIOS enabled, and the Intel Rapid Storage Technology software driver installed. Please consult your system vendor for more information.

[4] 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. Intel does not control or audit the design or implementation of third party benchmark data or Web sites referenced in this document. Intel encourages all of its customers to visit the referenced Web sites or others where similar performance benchmark data are reported and confirm whether the referenced benchmark data are accurate and reflect performance of systems available for purchase.

[5] Source: http://www.cs.toronto.edu/~bianca/papers/sigmetrics09.pdf.

[6] Source: http://lambda-diode.com/opinion/ecc-memory.

[7] Features only available on Intel® Xeon® processor E5-1600/2600 product families.

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, reference www.intel.com/software/products.

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