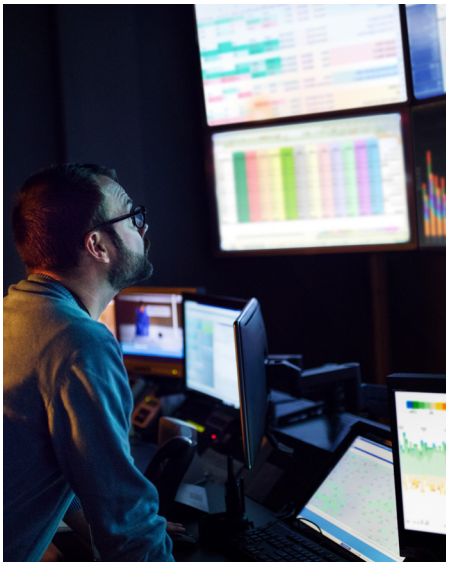
PRODUCT BRIEF

Intel® Xeon® Processor E3-1200 v6 Product Family

Essential Performance and Visuals for Professional Compute



The demands of your business computing needs are growing in sophistication and complexity. Servers and workstations that are just a few years old are no longer capable of supporting the demands of today's workloads which are increasing in capabilities to deliver business intelligence, acceleration, and agility. New business opportunities, new customers, and workloads drive a need for tools and technology that will help you win and stay ahead of the competition. With a wide-range of solutions in the marketplace to help you and your business, it can be difficult to identify the smart answer for your needs today and a solution that will help you win in the future. At Intel, we appreciate these challenges and have worked to understand your needs and demands. We have partnered with industry leaders and solution providers to deliver a professional-grade solution built from the ground-up with your needs in mind. The Intel® Xeon® processor family delivers trusted performance and proven innovation, starting with our entry Intel® Xeon® processor E3 product family. As your business grows and demands increase, so does the Intel Xeon processor family with performance scale and capabilities that extend up to our Intel® Xeon® processor E5 family and Intel® Xeon® processor E7 family of products. Entry workstation and entry server solutions built on the Intel Xeon processor E3-1200 v6 product family, establish a foundation of capabilities that support your growing and changing demands.

As your business grows and demands increase, so does the Intel® Xeon® processor family, with performance and scale capabilities to meet your needs.

Small business server customers are looking for solutions that deliver productivity, reliability, security, and complement their existing IT investments such as cloud-based services. An on-premise server delivers answers for a number of solution challenges, including the uncertainty for setup and ongoing cost of cloud services, support for legacy applications, regulatory compliance, and sensitive customer data protection. The balance between cloud service providers and those solutions kept in-house, provides the flexibility to choose and mix the correct balance for your business needs. The ability to have an on-premise server solution for critical business and performance needs are growing in demand. An entry server built with the Intel Xeon processor E3-1200 v6 product family is a smart investment positioning you for growth while providing a reliable, always available solution to protect sensitive customer data, financial records, and host critical business software solutions. Combine a hybrid of on-premise servers and cloud services for the best small business solution.

67% of small businesses say technology solutions help them run their business better.[1]

The entry workstation workloads of yesterday are evolving and expanding. Today's entry workstation workloads have an increasing number of software solutions and extensions that require high performing, multi-core, reliable, professional-grade solutions to support your growing workflows. These workflows include design, analytics, rendering, professional virtual reality (VR) visualization, production, and distribution. Comprehending the full demands of a growing workload and workflow is why the Intel Xeon processor E3-1200 v6 is the trusted choice for of professional CAD, media, and entry professional virtual reality (VR) workstation customers. In addition to gains in CPU performance, CPU performance per watt, support for faster memory speeds, and graphics performance for workstations, Intel Xeon processor E3-1200 v6 product family-based platforms offer fast access to data, helps protect the data integrity, and has proven reliability for a range of business needs.

Big Performance Increase Over Your Current Entry Server or Entry Workstation

Improvements in processor speed, enhanced memory capabilities, hardware-enhanced security and reliability, all with support for the latest Intel graphics, the Intel Xeon processor E3-1200 v6 product family delivers a suite of benefits that reflect the performance needs of today's small business servers and entry workstations customers. The impact of this benefit is significant, especially when compared to a hardware configuration of just a few years old. With up to a 56% performance improvement[2] compared to an Intel® Xeon® processor E3-1200 v2, the Intel Xeon processor E3-1200 v6 delivers performance to manage today's most professional workloads. The Intel® Xeon® processor E3-1280 v6 specifications supports up to 3.90 GHz base frequency with Intel® Turbo Boost Technology 2.0 frequency up to 4.20 GHz. Additionally, the Intel Xeon processor E3-1200 v6 product family supports enhanced memory speeds, with configurations of Error-Correcting Code (ECC) memory up to 64 GB DDR at 2400 MHz. This level of performance is required for today's complex workflows that add new and enhanced capabilities for CAD, media, entry professional virtual reality (Pro VR), and design. These workloads and especially entry Pro VR capabilities require the latest professional-grade hardware to support their increasing application and configuration requirements.

Intel® Xeon® processor E3-1280 v6: Up to 56% performance improvement[2] versus an Intel® Xeon® processor E3-1280 v2.

Enhanced Graphics Performance, Certified and Optimized for Your Workload

In addition to enhanced processor performance, and support for faster memory, the latest Intel® HD graphics P630 is available on select products within the Intel Xeon processor E3-1200 v6 product family. With discrete graphic performance included as part of the overall Intel Xeon processor E3 product family, you gain the added benefit of an on-board graphics engine to help drive an outstanding visual experience, and often at a lower total cost of ownership when compared to purchasing a separate professional-level graphics adapter. The value and performance of Intel® HD graphics P630 is reflected in a 3X graphics performance improvement[2] when compared to an Intel® Xeon® processor E3-1280 v2. The performance improve-ments extended to new HVEC 10-bit hardware acceleration, enabling enhanced decoding, and encoding of 4K video.

In addition, Intel delivers certifications and optimizations for the most popular third-party workstation applications and workloads, including (in alphabetical order): Adobe Photoshop CC*, Adobe Lightroom CC*, Autodesk 3dsMax*, Autodesk AutoCAD*, Autodesk Maya*, Autodesk Revit*, Autodesk Inventor*, Bentley Micro-station*, Bentley Microstation v8i*, Dassault Solidworks*, PTC Creo*, Siemens PLM SolidEdge*, Siemens PLM NX*, Siemens PLM Technomatix*, and Siemens PLM TcVis*.

These certifications showcase Intel's commitment to delivering enhancements and support for professionals. We work closely with third-party application developers to ensure product certification, performance, and unique optimizations to deliver the best experience on your Intel Xeon processor-based platform.

Intel® HD graphics P630: Up to 3X performance improvement[2] and new HVEC 10-bit hardware acceleration support.

Professional, Industrial, and Commercial Applications Require Professional Compute

There are many foundational capabilities and enhancements that differentiate a professional computing solution built on the Intel Xeon processor-based platform. Professional, industrial, and commercial applications require professional compute. There are significant differences between professional-grade and consumer-grade solutions.

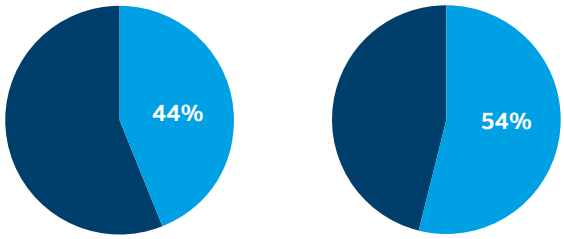
	7th Generation Intel® Core™ processor with Intel® HD graphics 630	Intel® Xeon® processor E3-1200 v6 with Intel® HD graphics P630
Error-Correcting Code (ECC) DDR4 Memory Support	No	Yes
Professional Class Graphics "P" Designator	No	Yes
Application Certifications and Optimizations	No	Yes
Professional Optimized Graphics Driver	No	Yes

Professionals Demand Hardware-Enhanced Security and Reliability

A primary motivator in considering a professional-grade entry server or entry workstation is the increasing need for hardware-enhanced security and reliability of the Intel® Xeon® processor family. The Intel Xeon processor E3-1200 v6 product family includes support for the following hardware-enhanced security features:

- **Intel® Data Protection Technology:** Accelerate encryption and decryption, enhance security, performance and protect your system using software enhanced with Intel® Data Protection Technology.
- **Intel® Software Guard Extensions:** Software enhanced with Intel® Software Guard Extensions help protect application code and data from disclosure and modification, helping enhance the security of your workloads and applications.
- **Intel® Authenticate Solution:** The Intel® Authenticate Solution delivers customizable multi-factor authentication options to fit your IT policy needs while giving you a comprehensive solution that is easy to deploy.

Percentage of businesses that have suffered data security breaches in the last year[3]



The Intel Xeon processor E3-1200 v6 product family includes support for the following hardware-enhanced reliability features, including:

- **Error-Correcting Code (ECC) Memory Support:** Avoid business interruptions with automatic data checking for errors, providing increased reliability for the storage of your business data and execution of your critical workloads. Intel® Xeon® processor E3-1200 V6 supports DDR4 memory speeds up to 2400 MHz, in configurations up to 64GB.
- **Intel® vPro™ technology:** Built in Intel® vPro™ technology provides hardware-enhanced security, remote manageability, and productivity-enhancing capabilities.
- **Intel® Active Management Technology (Intel® AMT):** Intel AMT uses integrated platform capabilities and popular third-party management and security applications, to allow IT or managed service providers to better discover, repair, and protect their networked computing assets, available anytime from anywhere.
- **Intel® Server Platform Services:** Designed for managing rack-mount servers, Intel® Server Platform Services provides a suite of tools to control and monitor power, thermal, and resource utilization.
- **Intel® Rapid Storage Technology:** Protect your critical business information with redundant storage capabilities that allow quick recovery in the event of a hard drive failure.

$8,220 to $25,601:
estimated hourly average cost range of downtime for an SMB.[4]

Entry Servers for Small Business Customers

No matter what the size of your business, the value of your data is enormous. Keep it accessible and better protected at all times with an affordable Intel Xeon processor E3-1200 v6 product family-based entry server. An on-premise server delivers answers for a number of small business customers including:

- Bandwidth constraints, latency, or heavy data usage that cause performance issues
- Uncertainty and inability to plan for setup and ongoing cloud service costs
- Preference for up-front payment over extended payment schedule
- Some legacy applications cannot be migrated to the cloud
- Regulatory, compliance, or data sovereignty requirements mandate that data must be secured on-premises

For a small or medium business, all of your data is your data center and is your connection to customers, sales, inventory, financial records, and ultimately growth. Help protect your customer, inventory, and financial records with a server that delivers the integrity and reliability of an all-day, all-night workhorse. Implementing a server is also a smart investment in growth. You'll gain the power to deploy new business-class applications and tools that can help you increase sales and improve margins. A server based on the Intel Xeon processor E3-1200 v6 product family lets you

access your information faster and respond to customers sooner from any device on your network. Help you and your employees become more productive and keep data safe. Position your company for growth with an affordable small business server based on the Intel Xeon processor E3 family.

While many small businesses are choosing cloud service solutions, you can own your own piece of the cloud by co-location your server with an IT managed service provider (MSP). You get the benefit of cloud accessible software services without the burden of housing and powering the server.

Professional VR Visualization with Entry Workstations

Virtual reality (VR) is one of the most exciting and revolutionary capabilities to impact professional workstation customers in recent years. One example is how professional designers can draft their CAD drawings and quickly visualize in full 3D/VR with a compatible hardware and software configuration that support a VR headset. The ability to view your design in VR delivers huge savings in design time, production, testing, and development. Previously, designs would often require rendering in 2D or limited 3D experiences, printing, assembly, or physical testing. Today, many of these tasks are streamlined and accelerated through the aid of commercial/professional VR usages and capabilities.

The Intel® Xeon® processor E3-1200 V6 product family supports the latest VR headset processor requirements from manufactures like HTC* Vive and Oculus* Rift. When paired with the proper memory and storage configurations and a VR-ready Pro GPU, you can add VR visualization to your Intel® Xeon® processor E3-1200 V6 entry workstation experience.

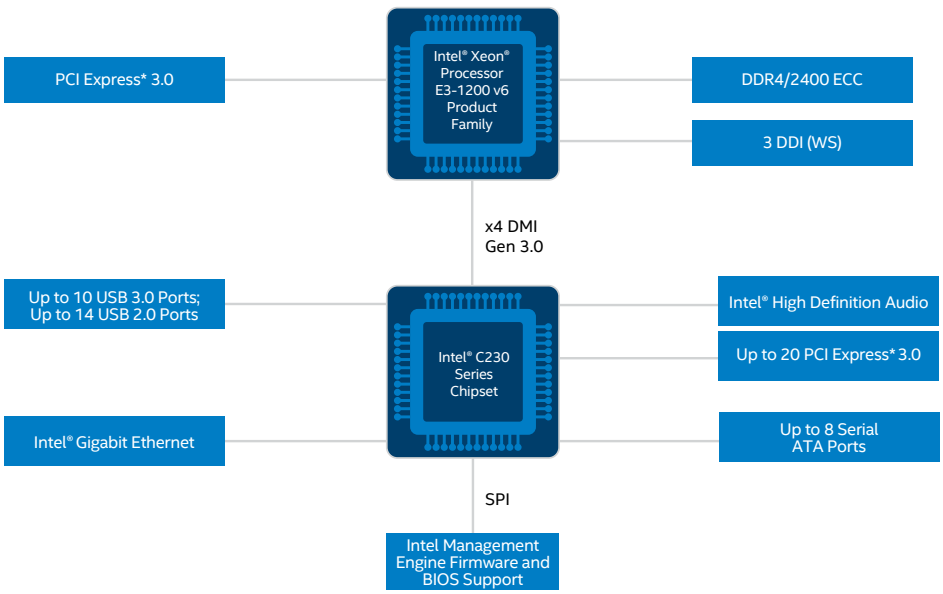
Additional scale and VR capabilities are possible with Intel® Xeon® processor E5 product family-based workstations that can support VR creation and visualization, allowing you to build, modify, visualize, and experience your designs in real-time.

Are you Pro VR ready? VR headsets require the enhanced performance found in Intel® Xeon® processors. Older workstations are not Pro VR ready.

Step Up to Professional Compute with the Intel Xeon Processor E3-1200 v6 Product Family

The unique, professional-grade benefits, of the Intel Xeon processor family set it apart from other computing solutions, showcasing the capabilities and enhancements that businesses demand to remain productive and competitive in a rapidly changing marketplace. The Intel Xeon processor E3-1200 v6 product family is a step up in performance and capabilities welcoming you to Intel Xeon processor family and its scalable performance, security and reliability. Entry servers and workstations powered by Intel Xeon processor E3-1200 v6 deliver a strong return on investment with improvements and enhancements to give you confidence in your professional compute to deliver on your growing workloads, workflows, and business needs.

Typical Intel® Xeon® Processor E3 Platform Configuration



Features may vary depending on processor and chipset SKUs.

INTEL® XEON® PROCESSOR E3-1200 V6 PRODUCT FAMILY OVERVIEW

FEATURES	BENEFITS
Intel® Xeon® Processor E3-1200 v6 product family	Enhanced performance, support for faster memory speeds, hardware-enhanced security and reliability for entry server and entry workstation customers. • Accelerate your business growth with up to 56% better performance[1] than the second generation of Intel Xeon processor E3-1200 product family
Intel® HD graphics P630	With built-in graphics capabilities, designers may no longer need a discrete graphics card for some of the most commonly used workloads. Optimized performance for a range of common workstation applications, Intel HD graphics P630 provides designers, engineers, and media creators with entry-level workstation performance and visuals. • Intel HD graphics P630 delivers up to 3X graphics[1] and is certified on many popular workstation applications when compared to the second generation of Intel Xeon processor E3-1200 family-based entry workstation
Skylake microarchitecture	Enhanced energy efficiency and performance • Intel's industry-leading 14nm process technology
Reliability and Security to Protect Your Business	
Support for error-correcting code (ECC) memory	Better data integrity and system reliability through automatic data correction • Intel Xeon processor E3-1200 v6 supports DDR4 memory speeds up to 2400 MHz
Intel® Rapid Storage Technology enterprise (Intel® RSTe) for servers	Uninterrupted operation and quick data recovery in the event of a hard drive failure • Supports latest server operating systems (OSes), including Red Hat* and SUSE* Linux* OSes
Intel® Rapid Storage Technology (Intel RST) for workstations	Uninterrupted operation and quick data recovery in the event of a hard drive failure • Dynamic storage acceleration—dynamically adjusts system power state policies based on I/O loading conditions and power profile
Intel® Data Protection Technology (with Advanced Encryption Standard New Instructions (AES-NI))	Improves security by encrypting data—without slowing response times
Intel Data Protection Technology (with Secure Key)	Enhances security and performance for a wide range of security applications • Enables faster, higher-quality cryptographic keys and certificates
Intel Platform Protection Technology (with Trusted Execution Technology (TXT))	Protects your business by increasing security against many digital threats • Helps to ensure that the system launches into a known good state
Intel Platform Protection Technology (with BIOS Guard 2.0)	Protects your system from malware and denial-of-service (DoS) attacks
Intel Platform Protection Technology (with OS Guard)	Improves security by strengthening malware protection • Provides hardware-based protection for your server operating system
Intel® Software Guard Extensions (Intel® SGX)	• Allows application developers to protect sensitive data from unauthorized access or modification by rogue software running at higher privilege levels, secures data[6] while in use in a Windows* or Linux* environment
USB Blocker for servers	Improves security and productivity • Helps prevent malware and unauthorized data transfers[5] by blocking classes of devices while enforcing company policies and allowing flexibility to white-list specific devices
Responsive Performance To Grow Your Business	
Intel® Advanced Vector Extensions 2 (Intel® AVX2)	Significant performance benefit for developers of imaging, video editing, modeling, and simulation applications.
Intel® Turbo Boost Technology 2.0	Higher performance when you need it most • Accelerates processor and graphics performance for peak loads
Intel® Hyper-Threading Technology (Intel® HT Technology)	Faster performance for many demanding business applications • Thread-level parallelism benefits multi-threaded and concurrently running applications
PCI Express* 3.0 ports	Extra capacity and flexibility for storage and networking connections • Up to double the I/O bandwidth of prior-generation PCIe* 2.0[5,6,7]
Serial ATA 3.0 (SATA 3.0)	Faster data access, system startups, and application load times • Doubles data throughput versus previous generation for faster hard drive performance[5,6,8]
Intel® Virtualization Technology (Intel® VT) for IA-32 and Intel 64 (Intel® VT-x)	Faster performance for core virtualization processes • Improves application performance, live migration, provisioning, dynamic load balancing, and disaster recovery
Intel Virtualization Technology (Intel VT) for Directed I/O (Intel® VT-d)	Built-in hardware support for I/O virtualization • Improves I/O performance, increases system reliability, and provides enhanced memory protection

INTEL® XEON® PROCESSOR E3-1200 V6 PRODUCT FAMILY OVERVIEW (continued)

FEATURES	BENEFITS
E3-1200 V6	
Thunderbolt™ 3 (for workstations)	A single compact port can now do it all—connect to Thunderbolt™ devices, any display, and billions of USB devices—all while supplying power.
Intel® vPro™ Technology	Built in Intel® vPro™ technology provides hardware-enhanced security, remote manageability, and productivity-enhancing capabilities.
Intel® Active Management Technology (Intel® AMT)	Intel® AMT uses integrated platform capabilities and popular third-party management and security applications, to allow IT or managed service providers to better discover, repair, and protect their networked computing assets.
Intel Server Platform Services	Designed for managing rack-mount servers, Intel Server Platform Services provides a suite of tools to control and monitor power, thermal, and resource utilization.
Intel® Optane™ Memory (accelerator) (for workstations)	Pairing Intel® Optane™ memory (accelerator) with slower media like that of a HDD or SATA SSD, gives you amazing performance and responsiveness in large capacities. Please check with your OEM for support of Intel Optane memory products in your entry workstation solution.
Intel® Authenticate Solution (for workstations)	• Manage critical security processes below the OS: Hardware is inherently less vulnerable to modification or corruption • Isolate critical security functions from the OS layer (often the target) • Built-in capability to provision, store, and enforce policies for IT Policy-based solution that supports soft and hard factors protected by the hardware layer
Intel® Node Manager	Robust suite of tools to control and monitor Power, Thermal, and Resource Utilization.

INTEL® XEON® PROCESSOR E3-1200 V6 PRODUCT FAMILY SKU LIST

Processor Number[Δ]	CPU Cores	Graphics Core	Speed	L3 Cache	Intel® Turbo Boost Technology 2.0	Intel® HT Technology	Intel® HD Graphics P630**	Power
Standard SKUs								
Intel® Xeon® processor E3-1280 v6	4	0	3.90 GHz	8 MB	●	●	–	72 W
Intel® Xeon® processor E3-1275 v6	4	2	3.80 GHz	8 MB	●	●	●	73 W
Intel® Xeon® processor E3-1270 v6	4	0	3.80 GHz	8 MB	●	●	–	72 W
Intel® Xeon® processor E3-1245 v6	4	2	3.70 GHz	8 MB	●	●	●	73 W
Intel® Xeon® processor E3-1240 v6	4	0	3.70 GHz	8 MB	●	●	–	72 W
Intel® Xeon® processor E3-1230 v6	4	0	3.50 GHz	8 MB	●	●	–	72 W
Intel® Xeon® processor E3-1225 v6	4	2	3.30 GHz	8 MB	●	–	●	73 W
Intel® Xeon® processor E3-1220 v6	4	0	3.00 GHz	8 MB	●	–	–	72 W

**Intel HD Graphics P630 requires the latest-version Intel Graphics Driver, Intel C236 chipset, and Intel Xeon processor E3-1225 v6, E3-1235L v6, E3-1245 v6, or E3-1275 v6 to enable workstation application optimizations. Optimized Intel HD Graphics P630 is only available on select models of the Intel Xeon processor E3 family. To learn more about Intel Xeon processors for workstations, visit intel.com/workstation. To learn more about Intel Xeon processors for small and medium businesses, visit intel.com/smallbusiness. To learn more about Certified Applications for the Intel Xeon Processor E3 family, visit intel.com/certifications

INTEL® C230 SERIES CHIPSET

Chipset	Intel® HD Graphics P630	Intel® AMT 11.0	Intel® Node Manager	Gen 3 PCIe*	USB 3.0 Ports	SATA Ports 6 GB/s	Intel® Rapid Storage Technology	LAN
Intel® C236	●	●	●	20+	10+	8+	●	Integrated MAC
Intel® C232				8+	6+	6+		Integrated MAC

+ Port counts are dependent on how I/O flexibility is configured between PCIe*, SATA and USB 3.0 for a total of 26 ports. Intel C236 will support SATA 1.5/3/6GB/s. Intel Anti-Theft Technology is not supported on any SKU of the Intel C230 series chipset.

For more information on the Intel Xeon processor E3-1200 v6 product family, visit intel.com/xeone3

Share with Colleagues

[Δ] Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor series, not across different processor sequences. See intel.com/products/processor_number for details. Intel products are not intended for use in medical, lifesaving, life sustaining, critical control, or safety systems, or in nuclear facility applications. All dates and products specified are for planning purposes only and are subject to change without notice.

[1] "SMB Group Technology Trends for 2015." SMB Group, 2015. http://www.smb-gr.com/wp content/uploads/2014/12/SMB_Group_TOP_TEN_SMB_TRENDS.pdf

[2] Intel® Xeon® Processor E3-1275 v6 compared to an Intel® Xeon® Processor E3-1275 v2.

System configuration benchmarks:
56% improvement:
SPECfp*_rate_2006:

Baseline: Intel® C216 chipset based Intel® Xeon® workstation platform with one Intel Xeon processor E3-1275 v2 (quad-core, 3.5GHz, 8M cache), ACRVMBY1.86C.0096.P00 September 9, 2012, Intel HT Technology enabled, 16GB memory (4x4GB DDR3-1600 ECC UDIMM), 2TB 7200RPM SATAIII HDD (WD2000FYYZ), RHEL v6.3 -2.6.32-278.e16.x86_64. Compiler version 13.0.0.133 of Intel C++ Studio XE and Intel Fortran. Source: Intel internal estimated measurements April2013. Scores: SPECfp*_base2006=65.1; SPECint*_base2006=52.5; SPECfp*_rate_base2006=130; SPECint*_rate_base2006=185

New: Intel® Xeon® Processor E3-1275 v6 (8M Cache, 3.80 GHz) on Intel® Server Board S1200SPL, CentOS7.1.1503 (Core) Kernel 3.10.0-229.14.1.el7.x86_64 Compiler: C/C++: Version 16.0 of Intel C++ Studio XE for Linux Intel SSD DC S3710 800GB BIOS: S1200SP.86B.02.01.0037.101720160816; CPU Power and Performance Policy: Performance; Memory Operating Speed: 2400; Set Fan Profile: Performance SPECfp*_rate_base2006=203.

3X graphics improvement:
SPECViewperf* 12 GeoMean:

Baseline: Processor Intel® Xeon® Processor E3-1275 v2 System CarlowReference Platform GPU Intel® HD graphics P4000 Sockets 1 Memory 16GB (4x4GB DDR3-1600MHz ECC UDIMM) Storage Western Digital WD2000FYYZ HDD Operating System Windows 7 SP1 64 Bit BIOS ACRVMBY1.86C Graphics Driver 8.15.10.2712.

Scores: catia-04 7.8 creo-01 6.62 energy-01 0.06 maya-04 2.56 medical-01 1.29 showcase-01 4.09 snx-02 2.64 sw-03 12.89.

New: Intel® Xeon® Processor E3-1275 v6 (8M Cache, 3.80 GHz) on Intel® Server Board S1200SPL, Windows 10 Professional 64-bit, 1x Intel® SSD 535 Series (480GB, 2.5in SATA 6Gb/s, 16nm, MLC), Graphics Driver: 21.20.16.4550; OS Resolution: 1920x1080, BIOS: S1200SP.86B.02.01.0037.101720160816; Primary Display : Display Port; VGA Port Output: Processor graphis; CPU Power and Performance Policy: Performance; Memory Operating Speed: 2400; Set Fan Profile: Performance, SPECviewperf* 12 SPECviewperfv12 Geomean(R) 7.53, SPECviewperf–CatiaCa-tiav12 (R)15.77, SPECviewperf-CreoCreov12 (R)13.52, SPECviewperf–Energy SPECWPC 2.0 -Energy (R)0.28, SPECviewperf–Maya Mayav12 (R) 14.14,SPECviewperf –Medical Medicalv12 (R) 4.28, SPECviewperf-Showcase Showcasev12 (R) 7.91, SPECviewperf–SNX SNXv12 (R) 11.9, SPECviewperf–SW SWv12 (R) 30.58.

[3] 2014 U.S. Small & Medium Business ICT & Cloud Services Tracker Overview.

[4] "The Growth Opportunity for SMB." IDC, April 2015.

[5] 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. For more complete information visit www.intel.com/benchmarks.

[6] Results have been estimated or simulated using internal Intel analysis or architecture simulation or modeling, and provided to you for informational purposes. Any differences in your system hardware, software or configuration may affect your actual performance.

[7] Eight gigatransfers (GT) per second and 128b/130b encoding in PCIe 3.0 specification enables double the interconnect bandwidth over the PCIe 2.0 specification. Source: pcisig.com/news_room/November_18_2010_Press_Release/.

[8] The SATA 3.x specification enables double the data rate (from 3 GB/s to 6 GB/s) of that enabled by the SATA 2.x specification. Source: sata-io.org/technology/6Gbdetails.asp.

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 informa-tion and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information visit www.intel.com/benchmarks.

Optimization Notice: Intel's compilers may or may not optimize to the same degree for non-Intel microprocessors for optimizations that are not unique to Intel microprocessors. These optimizations include SSE2, SSE3, and SSSE3 instruction sets and other optimizations. Intel does not guarantee the availability, functionality, or effectiveness of any optimization on microprocessors not manufactured by Intel. Microprocessor-dependent optimizations in this product are intended for use with Intel microprocessors. Certain optimizations not specific to Intel microarchitecture are reserved for Intel microprocessors. Please refer to the applicable product User and Reference Guides for more information regarding the specific instruction sets covered by this notice. Notice Revision #20110804

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.

Intel does not control or audit third-party benchmark data or the web sites referenced in this document. You should visit the referenced web site and confirm whether referenced data are accurate.

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