(intel®)

Essential Performance and Advanced Security
for Entry Server, Secure Cloud, and Entry Workstation Solutions

Performance and Security, Intelligently Designed for Growth

The demands of technology for small businesses, professional creators, and cloud services require intelligently designed solutions to fuel their growth

Business computing needs are growing in sophistication and complexity. Servers and workstations that are just a few years old are no longer sufficient to support the demands of today's workloads, which are increasing in capabilities to deliver business intelligence, acceleration, and agility. New business opportunities, 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, it can be difficult to identify the right solution for your needs of today and prepare for a winning 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 you a professional-grade solution built from the ground-up with your needs in mind. The Intel® Xeon® processors deliver trusted performance and proven innovation, starting with our new entry Intel® Xeon® E processor family. As your business grows and demands increase, so does the Intel Xeon processor portfolio with performance scale and capabilities that extend to our Intel® Xeon® Scalable processor family of solutions.

Entry servers, secure cloud services, and entry and mobile workstations built on the Intel Xeon E processor offer a foundation of capabilities that support your growing and changing demands.

67%

of small businesses say technology solutions help them run their business better[2]

80%

of small businesses report unplanned downtime costs of $82,220 to $256,000[3]

Learn more about Intel® Xeon® E processor for Small Business at **www.intel.com/xeone**

Entry server solutions for small business

Experience up to 48% more entry server performance for small business[1]

Small businesses are looking for server solutions that deliver productivity, reliability, and hardware-enhanced security, and complement other IT investment options such as cloud-based services. An on-premise server can help address a number of challenges, including the uncertainty for setup and ongoing cost of cloud services, support for legacy applications, regulatory compliance and the need to protect sensitive customer data. A mix of cloud services and in-house solutions provides the flexibility to choose and mix the correct balance for your business needs.

An entry server built with the Intel Xeon E processor is a smart investment positioning you for growth while providing a reliable, always available solution to protect your data and host critical business software solutions. No matter 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® E processor-based server.

A dedicated, 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

Implementing a powerful 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 E processor lets you access your information faster and respond to customers sooner from any device on your network. Keep valuable business data safe, help you and your employees become more productive, and position your company for growth with a powerful and affordable small business server based on the Intel Xeon E processor.

Hardware-enhanced security and reliability

A primary motivator in considering a professional-grade entry server or workstation is the increasing need for hardware-enhanced security and reliability of the Intel Xeon processor family. The Intel® Xeon® E-2100 processor 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.

- **Enhanced Intel® Software Guard Extensions:** Software enhanced with Intel® SGX protects application code and data from disclosure and modification, enhancing the security of your workloads and applications.

- **Intel® Authenticate:** Intel® Authenticate solution delivers custom-izable multifactor authentication options to fit your IT policy needs while giving you a comprehensive solution that is easy to deploy.

Advanced security for enhanced secure cloud services

Intel Xeon E processors feature an advanced security technology, known as Intel SGX, which can help protect selected code and data from disclosure or modification. Developers can use Intel® SGX to partition their application into protected areas of execution in memory known as processor-hardened enclaves to enhance security even on a platform that becomes compromised. Intel Xeon E processors with Intel SGX can be used in concert with existing data center infrastructure, to protect the most sensitive portions of an application or data being used in a workload or service.

Businesses and cloud service providers are using Intel Xeon E processors with Intel SGX to protect a variety of applications and data. Here are some examples of how businesses are using Intel SGX:

- Enables multi-party, joint computation on sensitive data, in a privacy-preserving manner

- Supports encrypted database operations

- Running unmodified applications within enclave

- Trust established for protecting and virtualizing network functions

- Protect encryption keys and/or Hardware Security Module (HSM) replacement

- Protecting keys on local file system; hardening disk protection, building scalable cloud Key Management Service (KMS)

- Secure transaction processing for Crypto currency, Secure Contracts, and Hyper ledger protection

- Secure IoT edge devices and cloud communications

Intel Xeon E processors deliver a powerful component in enhanced application and data protection.

Entry and mobile workstations, built for today's professional creators

Up to 39% more performance than a 2017 entry workstation[5]

The entry and mobile 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, professional-grade solutions to support your growing workflows. These workflows include design, analytics, rendering, professional virtual reality visualization, production, and distribution. Comprehending the full demands of a growing workload and workflow is why the Intel Xeon E processor is the trusted choice for of professional CAD and media customers. In addition to gains in processor performance and graphics performance for workstations, Intel Xeon E processor-based platforms offer fast access to data, protect the data integrity, and have proven reliability for a range of business needs.

44% SMALL BUSINESSES

54% MEDIUM BUSINESSES

percentage of businesses that suffered security breaches during the past year[4]

Learn more about Intel® Xeon® E processor with Intel® Software Guard Extensions and Secure Enclaves at **www.intel.com/sgx**

Are you **VR-based design** and **visualization**?

Experience the difference with VR-headsets and Intel® Xeon® processor-based workstations.

Learn more about Intel® Xeon® E processor for entry and mobile workstation at **www.intel.com/workstations**

Introducing the new Intel® Xeon® E-2100 processor

Improvements in processor speed, enhanced memory capabilities, hardware-enhanced security and reliability all with support for the latest Intel processor graphics technology, the Intel® Xeon® E-2100 processor delivers a significant impact, especially compared with hardware that is just a few years old. With up to a 39% overall performance increase[5], compared to a 2017 Intel® Xeon® E3-1200 V6 processor, the Intel® Xeon® E-2100 processor delivers performance to manage today's most demanding entry workloads. The Intel Xeon E-2100 processor supports up to 3.8 GHz base frequency with Intel® Turbo Boost Technology 2.0 frequency up to 4.7 GHz.

Intel® Xeon® E-2100 Processor Details	
Core Count and Threads	Up to 6 cores / Up to 12 threads
Maximum Base Frequency Supported	3.8 GHz
Maximum Intel® Turbo Boost Technology 2.0 Frequency Supported	4.7 GHz
Processor Cache Memory Support	Up to 12 MB Intel® Smart Cache
Processor Performance Support	Intel® Turbo Boost 2.0 Technology, Intel® Hyper-Threading Technology (Intel® HT)
Processor Graphics Support	Available with integrated Intel® UHD Graphics P630 (Maximum Video Memory up to 128 GB[6]), supporting up to 3 display outputs
Thermal Design Point (TDP)	Up to 95 Watts
Socket Type	LGA-1151 Socket
System Memory Support	2 channels of DDR4 ECC 2666 MHz, 2 DIMMs per channel
Maximum System Memory Supported	Up to 128 GB[6]
Supported Chipset	Intel® C246 Series Chipset
I/O	PCI Express* 3.0 – Up to 40 lanes (CPU + Chipset) USB* 3.1 – Up to 6 ports USB* 3.0 – Up to 10 ports SATA* 3.0 – Up to 8 ports DMI – Up to 4 lanes, Gen 3
Support for Intel® Optane™ memory (Storage acceleration)	Yes
Intel® Manageability Engine (Intel® ME)	Intel® ME v12; Intel® Active Management Technology (Intel® AMT); Intel® vPro™ Technology; and Intel® Server Platform Services
Intel® Rapid Storage Technology	Intel® Rapid Storage Technology PCIe* 3.0

Please contact your hardware or equipment manufacturer for a full list of supported features and capabilities.

Platform reliability, availability, and serviceability

The Intel Xeon E-2100 processor includes support for the following hardware-enhanced reliability features, including:

- **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® E-2100 processor supports DDR4 memory speeds up to 2666 MHz.

- **Intel® vPro™ technology:**
  Built in Intel® vPro™ technology provides hardware-enhanced security, remote manageability, and productivity-enhancing capabilities.

- **Intel® Active Management Technology:**
  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.
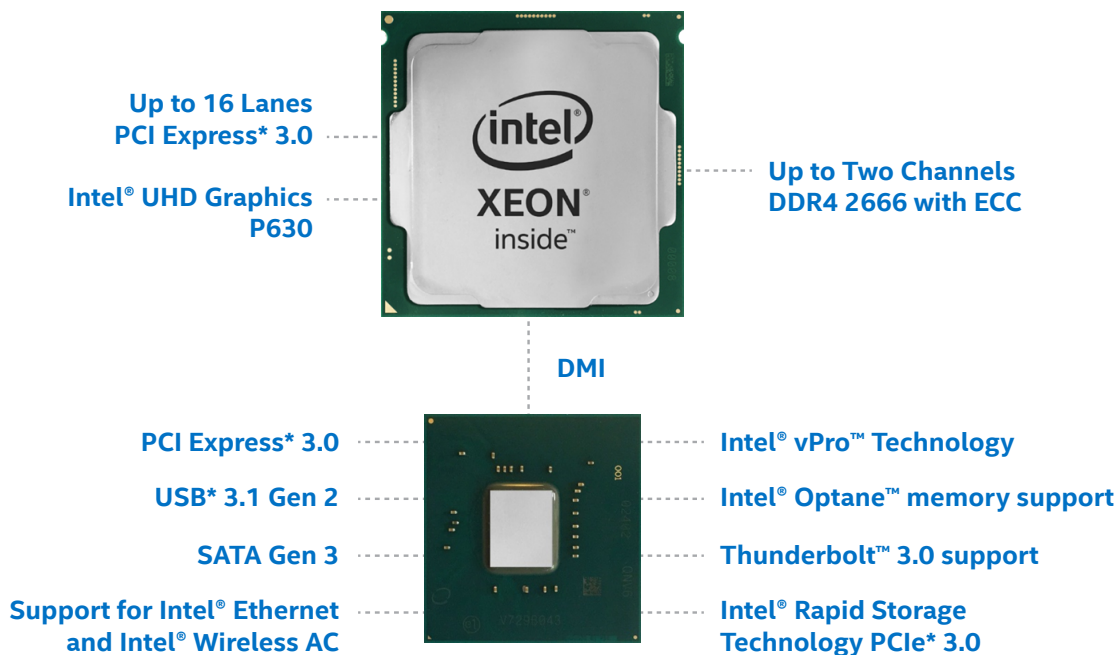
- **Intel® Server Platform Services (Intel® SPS):**
  Designed for managing rack-mount servers, Intel SPS provides a suite of tools to control and monitor power, thermal and resource utilization.

- **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.

Typical Intel® Xeon® E platform configuration

Up to 16 Lanes PCI Express* 3.0

Intel® UHD Graphics P630

Up to Two Channels DDR4 2666 with ECC

DMI

PCI Express* 3.0

USB* 3.1 Gen 2

SATA Gen 3

Support for Intel® Ethernet and Intel® Wireless AC

Intel® vPro™ Technology

Intel® Optane™ memory support

Thunderbolt™ 3.0 support

**Intel® Rapid Storage Technology PCIe* 3.0**

Processors, chipset, and diagram provided for illustration purposes only.
Not comprehensive of all features and capabilities.

Intel® Xeon® E Processor SKUs and chipset

SKUS						
SKU	**Cores**	**Base Speed (GHz)**	**Max Intel® Turbo Boost Technology 2.0 Speed (GHz)**	**Intel® UHD Graphics P630**	**TDP (W)**	**Processor Cache (MB)**
E-2186G	6	3.8	4.7	Yes	95	12
E-2176G	6	3.7	4.7	Yes	80	12
E-2174G	4	3.8	4.7	Yes	71	8
E-2146G	6	3.5	4.5	Yes	80	12
E-2144G	4	3.6	4.5	Yes	71	8
E-2136	6	3.3	4.5	No	80	12
E-2134	4	3.5	4.5	No	71	8
E-2126G[7]	6	3.3	4.5	Yes	80	12
E-2124G[7]	4	3.4	4.5	Yes	71	8
E-2124[7]	4	3.3	4.3	No	71	8

Product Name	USB 3.1/3.0	SATA* Gen 3	PCIe* Gen 3	Intel® Ethernet and Intel® Wireless	DMI
Intel® C246 Chipset	6 ports/10 ports	8 ports	40 lanes (CPU + Chipset)	Supported	x4 Gen3

Visit **intel.com/xeone** for a complete list of available Intel® Xeon® E processors.
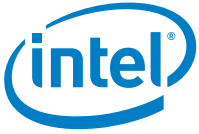
Statements in this presentation that refer to business outlook, future plans and expectations are forward-looking statements that involve a number of risks and uncertainties. Words such as "anticipates," "expects," "intends," "goals," "plans," "believes," "seeks," "estimates," "continues," "may," "will," "would," "should," "could," and variations of such words and similar expressions are intended to identify such forward-looking statements. Statements that refer to or are based on projections, uncertain events or assumptions also identify forward-looking statements.

Such statements are based on management's expectations as of April 26, 2018 and involve many risks and uncertainties that could cause actual results to differ materially from those expressed or implied in these forward-looking statements. Important factors that could cause actual results to differ materially from the company's expectations are set forth in Intel's earnings release dated April 26, 2018, which is included as an exhibit to Intel's Form 8-K furnished to the SEC on such date. Additional information regarding these and other factors that could affect Intel's results is included in Intel's SEC filings, including the company's most recent reports on Forms 10-K and 10-Q. Copies of Intel's Form 10-K, 10-Q and 8-K reports may be obtained by visiting our Investor Relations website at www.intc.com or the SEC's website at www.sec.gov.

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No computer system can be absolutely secure.

Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. For more complete information about performance and benchmark results, visit http://www.intel.com/benchmarks

Cost reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

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. Performance varies depending on hardware, software, and system configuration. For more information, visit http://www.intel.com/go/turbo

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Please refer to the applicable product User and Reference Guides for more information regarding the specific instruction sets covered by this notice.

The benchmark results may need to be revised as additional testing is conducted. The results depend on the specific platform configurations and workloads utilized in the testing, and may not be applicable to any particular user's components, computer system or workloads. The results are not necessarily representative of other benchmarks and other benchmark results may show greater or lesser impact from mitigations.

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.

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.

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The cost reduction scenarios described are intended to enable you to get a better understanding of how the purchase of a given Intel based product, combined with a number of situation-specific variables, might affect future costs and savings. Circumstances will vary and there may be unaccounted-for costs related to the use and deployment of a given product. Nothing in this document should be interpreted as either a promise of or contract for a given level of costs or cost reduction.

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Notice revision #20110804

[1] "Experience up to 48% more entry server performance for small business" Config: Tested at Intel Corp from 9/26/2018 to 10/12/2018. 1x Intel® Xeon® E-2124G Processor, Platform: Moss Beach, 4 x 8GB DDR4 2666 ECC(32GB 2666MHz) ,OS: Ubuntu 18.04.1 LTS (Kernel 4.15.0-29-generic) ,Benchmark: SPECrate*2017_fp_base (Estimated), Compiler: ICC 18.0.2 20180210,BIOS: CNLSE2R1.R00.X138.B81.1809120626, uCode:0x96, Storage: SSD S3710 Series 800GB, Score: 30.6 (Estimated) compared to 1x Intel® Xeon® E3-1226v3 Processor Platform: S1200RP, 4 x 8GB DDR3 1600MHz (32GB 1600MHz) ,OS: Ubuntu 18.04.1 LTS (Kernel 4.15.0-29-generic), Benchmark: SPECrate*2017_fp_base (Estimated), Compiler: 18.0.2 20180210,BIOS: S1200RP.8 6B.03.04.0007.082920181422, uCode:0x25, Storage: SSD S3710 Series 800GB, Score: 20.6 (Estimated)

[2] http://www.smb-gr.com/wp-content/uploads/2014/12/SMB_Group_TOP_TEN_SMB_TRENDS.pdf

[3] https://www.carbonite.com/globalassets/files/white-papers/carb-idc-smb-cloud-growth-opportunity-report.pdf

[4] 2014 U.S. Small & Medium Business ICT & Cloud Services Tracker Overview.

[5] "With up to a 39% overall performance increase, compared to a 2017 Intel® Xeon® E3-1200 V6 processor." Tested at Intel Corp from 9/26/2018 to 10/12/2018. 1x Intel® Xeon® E-2186G Processor, Platform: Moss Beach, 4 x 8GB DDR4 2666 ECC(32GB 2666MHz) ,OS: Ubuntu 18.04.1 LTS (Kernel 4.15.0-29-generic) ,Benchmark: SPECrate*2017_int_base (Estimated), Compiler: ICC 18.0.2 20180210,BIOS: CNLSE2R1.R00.X138.B81.1809120626, uCode:0x96, Storage: SSD S3710 Series 800GB, Score: 41.4 (Estimated) compared to 1x Intel® Xeon® E3-1285v6 Processor Platform: S1200RP, 4 x 8GB DDR4 2400 (32GB 2400MHz) ,OS: Ubuntu 18.04.1 LTS (Kernel 4.15.0-29-generic), Benchmark: SPECrate*2017_int_base (Estimated), Compiler: 18.0.2 20180210,BIOS: S1200S P.86B.03.01.0038.062620180344, uCode:0x8e, Storage: SSD S3710 Series 800GB, Score: 29.7 (Estimated)

[6] Support for up to 128 GB system memory capacity will be available in 2019 through a published BIOS update. Please contact your hardware provider for availability and support.

[7] Intel® Xeon® E-2126G, E-2124G, and E-2124 processors do not support Intel® Hyper-Threading Technology (Intel® HT technology)