Harness the Performance, Features, and Edge-to-Cloud Scalability to Build Tomorrow's IoT Solutions Today

Product overview

Intel is proud to announce its Intel® Xeon® processors E3-1275 v6, E3-1505M v6, E3-1505L v6, E3-1501M v6, and E3-1501L v6. Manufactured on the latest 14 nm technology, these processors offer rich visual experiences with the latest 4K Ultra HD graphics improvements, amazing CPU performance, and great power efficiency, with the same range of power options and latest advanced features to boost edge-to-cloud Internet of Things (IoT) designs.

The Intel® Xeon® processor E3-1200 v6 and E3-1500 v6 product families maintain the ball grid array (BGA) parts for mobile workstation computing needs. The BGA parts are 45W (35W cTDP) and 25W. The Intel® Xeon® processor E3-1200 v6 LGA part runs at 80W TDP.

The Intel Xeon processor E3-1200 v6 and the E3-1500 v6 product families deliver quad-core processing and intelligent performance capabilities, including Intel® Turbo Boost Technology 2.0 and Intel® Hyper-Threading Technology (Intel® HT Technology). Additionally, they boost performance to integer/matrix-based calculations through Intel® Advanced Vector Extensions 2 (Intel® AVX2). These features make the processor family ideal for a wide range of IoT applications, including industrial control and automation equipment, retail devices, and military, aerospace, and government systems.

Power-efficient performance

The new Intel Xeon processor E3-1200 v6 and the E3-1500 v6 processor families make a powerful difference on the efficiency front as well. The E3-1200 v6 processor family promises up to 16 percent multithreaded performance and 10 percent faster graphics. The E3-1500 v6 processor family promises up to 15 percent faster multithreaded CPU performance and up to 26 percent faster graphics—all at the same or similar thermal design power (TDP) as the prior generation. Develop more flexible designs with the same high-speed I/O as the previous generation and tap into fast memory performance utilizing DDR4 1.2V up to 2133, 64 GB max capacity with 8 GB density.

Other important features include Intel AVX2, which provides optimized instructions to drive enhanced performance on floating point-intensive apps, and Intel® Ready Mode Technology or PCIe* storage for improved data reliability and greater levels of performance, responsiveness, and expandability.

For more complete information about performance and benchmark results, visit intel.com/benchmarks.
The Intel Xeon processor E3-1200 v6 and the E3-1500 v6 product families enable more flexible designs with configurable I/O, offering the same high-speed ports compared to the previous generation. More high-speed input/output (HSIO) means improved flexibility with up to 26 total HSIO ports, including up to 20 PCIe 3.0 ports and up to 10 USB 3.0 ports. The LGA parts are paired with the Intel® C236 series chipset while the BGA parts are paired with the Intel® CM238 series chipset.

**Advanced security and manageability**

The Intel Xeon processor E3-1500 v6 product family helps protect IoT systems and data at rest and in flight through hardware- and software-based security hardening. Keep increasingly connected devices more secure and enhance the firmware trusted platform module (TPM) with Intel® Platform Trust Technology (Intel® PTT), Intel® Software Guard Extensions (Intel® SGX) to help protect data while in use, Intel® Memory Protection Extensions (Intel® MPX) to help protect memory from buffer-overload attacks, and Intel® Boot Guard to securely boot machines.

Intel® vPro™ technology allows you to remotely configure, diagnose, isolate, and repair an infected PC—even if it is turned off. In addition to helping secure the IT environment, hardware-based KVM Remote Control enables you to address issues remotely by seeing what users see.

**Stunning visual performance**

The Intel Xeon processor E3-1200 v6 and the E3-1500 v6 product families utilize the latest in 4K Ultra HD, 10-bit HEVC and VP9 encode/decode, and integrated HDCP 2.2—all leading to faster performance by up to 26 percent. Video playback is also faster and smoother, thanks to hardware-robust DRM and industry standards—based HDR. Experience richer visuals with a wider color spectrum and HDMI 2.0a with LSPCON*. Users will also enjoy efficient and fluid playback with 1.75x faster YouTube® video, smoother multitasking, support for additional formats of 4K Ultra HD and 4K 360 content streams, and optimized 4K videoconferencing with accelerated 4K hardware media codecs HEVC (10-bit), VP8, VP9, and VDENC encoding, decoding, and transcoding. Together, the stunning visual performance enhancements add up to more immersive computing experiences.

**Broad design range**

Intel Xeon processors deliver the best experience for computing- and graphics-intensive environments. Applications span multiple industries and solutions ranging from medical workstations and CAT scans to industrial controller solutions and military and aerospace applications. Operating system support ranges from small-footprint real-time operating systems (RTOSs) to feature-rich OSs to optimize choice, flexibility, and OS investment protection.
### KEY FEATURES

#### INTEL® BUILT-IN VISUALS

**NEW Accelerated 4K hardware media codecs**: Enhances high-density streaming applications and optimizes 4K videoconferencing with HEVC (10-bit), VP8, VP9, and VDENC encoding, decoding, and transcoding.

**NEW 4K Ultra HD support**: Provides stunning display resolutions, now up to 4096 x 2304 pixels, and supports performance across three independent displays with audio.

**NEW Integrated HDCP 2.2 support**: Provides integrated content protection capabilities.

- **Gen9 graphics**: Supports the latest graphics APIs DirectX® 12 (Windows® only) and OpenGL® 4.5 for improved 3D rendering performance at low power.
- **Intel® HD Graphics**: Plays HD video with exceptional clarity; permits viewing and editing of even the smallest image details.
- **Intel® Quick Sync Video**: Delivers excellent videoconferencing capability, fast video conversion, and fast video editing and authoring.
- **Intel® Clear Video HD technology**: Provides visual quality and color fidelity enhancements for spectacular HD media playback.
- **Multiplane overlay**: Enables faster, smoother, higher-quality video playback and improved 3D graphics.
- **Intel® Iris™ Pro Graphics (GT4e)**: Access a broad range of 3D rendering capability options that fit low-, medium-, and high-performance applications.

#### PERFORMANCE

**Intel Advanced Vector Extensions 2 (Intel AVX2)**: Provides optimized instructions to deliver enhanced performance on floating point-intensive apps, adding 256-bit integer instructions and new instructions for fused multiply add (FMA), which delivers better performance on media and floating-point computations.

**Intel Turbo Boost Technology 2.0**: Dynamically increases the processor’s frequency, as needed, by taking advantage of thermal and power headroom when operating below specified limits.

**Intel Hyper-Threading Technology**: Delivers two processing threads per physical core; highly threaded applications can get more work done in parallel, completing tasks sooner.

**HSIO**: Increases flexibility from 18 to 26 total HSIO ports, from up to 8 PCIe 2.0 to 20 PCIe 3.0 ports, and from up to 6 USB 3.0 to 10 USB 3.0 ports.

**Faster memory performance**: Offers new DDR4 memory support, including new support for DDR4 1.2V up to 2133, 64 GB max capacity with 8 GB density.

**Intel® Smart Cache**: Dynamically allocates shared cache to each processor core, based on workload, reducing latency and improving performance.

**Error-correcting code**: Detects multiple-bit memory errors; locates and corrects single-bit errors to keep a system up and running.
**KEY FEATURES**

### SECURITY

**Intel® Identity Protection Technology (Intel® IPT) with multifactor authentication (MFA):** Provides enhanced security by verifying the boot portion of the boot sequence, protects your one-time password (OTP) credentials and PKI certificates, and adds a layer of encrypted second-factor authentication for online transactions.

**Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI):** Helps provide security for a variety of encryption apps, including whole-disk encryption, file-storage encryption, conditional access of HD content, Internet use, and VoIP. Consumers benefit from more protected Internet and email content, plus fast, responsive disk encryption.

**Intel® OS Guard:** Helps protect the OS kernel and aids in preventing the use of malicious data or attack code located in areas of memory marked as user-mode pages from taking over or compromising the OS kernel. Intel OS Guard is not application specific and protects the kernel from any application.

**Intel Platform Trust Technology with BIOS Guard:** Safeguards credential storage and key management, while helping reduce BOM cost and board space.

**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 while in use in a Windows* or Linux* environment.

**Intel® Data Protection Technology (Intel® DPT) with Intel Boot Guard:** Helps prevent unauthorized software and malware takeover of boot blocks critical to a system’s function, thus providing added level of platform security based on hardware.

**Intel Memory Protection Extensions (Intel MPX):** Identifies errant pointer usage which, if left undetected, puts an application at risk of data corruption or malicious attack via buffer overruns and overflows. By adding extensions to the underlying architecture, Intel MPX achieves improved performance over software-based solutions.

**Intel® Secure Key:** Generates high-quality keys for cryptographic (encryption and decryption) protocols, and provides quality entropy that is highly sought after for added security.

**BIOS Guard:** Augments existing chipset-based BIOS flash protection capabilities targeted to address the increasing malware threat to BIOS flash storage; protects from modification without platform manufacturer authorization, helps defend the platform against low-level denial of service (DOS) attacks, and restores BIOS to a known good state after an attack.

**VMCS shadowing:** Allows a virtual machine manager (VMM) running in a guest (nested virtualization) to access a shadow VMCS memory area using the normal VMRead/VMWrite instructions, reducing overhead for a more natural and responsive user experience and allowing users to take control of their personal and professional data and apps while being protected by game-changing security.

### POWER EFFICIENCY

**Integrated memory controller:** Supports DDR4 and offers stunning memory read/write performance through efficient prefetching algorithms, lower latency, and higher memory bandwidth as compared to previous generations.

**Intel® Power Optimization and processor c-states:** Increases periods of silicon sleep state across the platform ingredients—including the CPU, chipset, and third-party system components—to reduce power.

**PCI Express* 3.0 interface:** Offers up to 8 GT/s for fast access to peripheral devices and networking with up to 16 lanes—PCI Express ports can be configured as x1, x2, x4, x8, and x16 depending on motherboard designs.

**Intel Ready Mode Technology:** Provides quick access to your PC with applications that are up-to-date and constantly connected.

**Intel® Intelligent Power Technology:** Reduces power consumption through automated energy efficiency.

**Automated low-power states:** Adjusts system power consumption based on real-time processor loads.

**Fully integrated voltage regulator:** Simplifies power delivery by integrating legacy power delivery onto processor package/die.

### INTEL® VPRO™ TECHNOLOGY

**Intel® Active Management Technology (Intel® AMT):** Remotely monitors, maintains, updates, upgrades, and repairs PCs through hardware and firmware technology for remote out-of-band management.

**Intel® Trusted Execution Technology (Intel® TXT):** Helps protect embedded devices and virtual environments against rootkit and other system-level attacks. Using an industry-standard TPM 1.2 to store keys and other protected data, this portion of Intel vPro technology boots the BIOS, operating system, and software into a trusted execution state, verifying the integrity of the virtual machine and protecting the platform from unauthorized access.

**Intel® Virtualization Technology:** Allows one hardware platform to function as multiple virtual platforms; offers improved manageability by limiting downtime and maintaining productivity by isolating computing activities into separate partitions.
**SUSTAINABILITY**

**Green technology:** Manufactured with lead-free and halogen-free component packages.

**Conflict-free:** Products do not contain conflict minerals (tin, tantalum, tungsten, and/or gold) that directly or indirectly finance or benefit armed groups in the Democratic Republic of the Congo (DRC) or adjoining countries.

**SOFTWARE OVERVIEW**

The following independent operating system vendors provide support for these platforms.

<table>
<thead>
<tr>
<th>OS VENDOR</th>
<th>OPERATING SYSTEM (TARGETED FOR SUPPORT)</th>
<th>DISTRIBUTION</th>
<th>SUPPORT</th>
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</thead>
<tbody>
<tr>
<td>Microsoft</td>
<td>Windows® 10 Enterprise (64b)</td>
<td>Microsoft</td>
<td>Intel/Microsoft</td>
</tr>
<tr>
<td></td>
<td>Windows 10 IoT Enterprise (64b)</td>
<td>Microsoft</td>
<td>Intel/Microsoft</td>
</tr>
<tr>
<td>Linux*</td>
<td>Fedora® 24 or later (mid-2016; 64b)</td>
<td>Open source</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ubuntu®, SUSE, Red Hat Enterprise (64b)</td>
<td>Canonical Ltd., Attachmate Group, Red Hat, and open source</td>
<td></td>
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<tr>
<td></td>
<td>Yocto® v2.2 “Morty” (Kernel 4.8) tool-based Embedded Linux (64b) distribution</td>
<td>Yocto Project® Community</td>
<td>Commercial Linux support from Wind River</td>
</tr>
<tr>
<td>Google</td>
<td>Chromium® (Chrome®) (64b)</td>
<td>The Chromium Projects</td>
<td>Open Source Community Google</td>
</tr>
<tr>
<td>RTOS</td>
<td>Wind River VxWorks® 7 (64b)</td>
<td>Wind River Systems</td>
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Not all features are supported. Contact your local Intel representative for more information.

**INTEL® XEON® PROCESSOR E3-1200 V6 AND E3-1500 V6 PRODUCT FAMILIES FOR INTERNET OF THINGS SOLUTIONS**

<table>
<thead>
<tr>
<th>PROCESSOR NUMBER</th>
<th>CORES/THREADS</th>
<th>BASE FREQUENCY</th>
<th>1 CORE TURBO (MAX)</th>
<th>INTEL® SMART CACHE</th>
<th>THERMAL DESIGN POWER</th>
<th>PACKAGE</th>
<th>INTEL® AES-NI</th>
<th>INTEL® AVX</th>
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<tbody>
<tr>
<td>Intel® Xeon® processor E3-1275 v6</td>
<td>4C/8T</td>
<td>3.6 GHz</td>
<td>4.2 GHz</td>
<td>8 MB</td>
<td>80W</td>
<td>LGA1151</td>
<td>Yes</td>
<td>Intel AVX2</td>
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<tr>
<td>Intel® Xeon® processor E3-1505M v6</td>
<td>4C/8T</td>
<td>3.0 GHz</td>
<td>4.0 GHz</td>
<td>8 MB</td>
<td>45W (cTDP 35W)</td>
<td>BGA1440</td>
<td>Yes</td>
<td>Intel AVX2</td>
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<td>Intel® Xeon® processor E3-1505L v6</td>
<td>4C/8T</td>
<td>2.2 GHz</td>
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<td>8 MB</td>
<td>25W</td>
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<tr>
<td>Intel® Xeon® processor E3-1501M v6</td>
<td>4C/4T</td>
<td>2.9 GHz</td>
<td>3.6 GHz</td>
<td>6 MB</td>
<td>45W (cTDP 35W)</td>
<td>BGA1440</td>
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<tr>
<td>Intel® Xeon® processor E3-1501L v6</td>
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## INTEL® VPRO™ TECHNOLOGY

<table>
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<tr>
<th>PROCESSOR NUMBER</th>
<th>INTEL® TURBO BOOST TECHNOLOGY 2.0</th>
<th>INTEL® HYPER-ThREADING TECHNOLOGY</th>
<th>INTEL® VIRTUALIZATION TECHNOLOGY</th>
<th>INTEL® ACTIVE MANAGEMENT TECHNOLOGY 11.6</th>
<th>INTEL® TRUSTED EXECUTION TECHNOLOGY</th>
<th>ERROR-CORRECTING CODE</th>
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<tr>
<td>Intel® Xeon® processor E3-1275 v6</td>
<td>Yes</td>
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<td>Intel® Xeon® processor E3-1505L v6</td>
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<tr>
<td>Intel® Xeon® processor E3-1501L v6</td>
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## INTEL® CHIPSETS FOR INTERNET OF THINGS SOLUTIONS

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>PRODUCT CODE</th>
<th>PACKAGE</th>
<th>FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® CM236 Chipset</td>
<td>GL82C236</td>
<td>FC-BGA13</td>
<td>Supports ECC and Intel® Active Management Technology 11.6; up to eight SATA ports (6 Gbps); 14 total USB ports (up to 10 USB 3.0); up to 20 PCIe gen 3.0 (x1, x2, x4 configuration options); 1x16, 2x8, or 1x8 + 2x4 PCIe graphics support; memory channels/DIMM per channel = 2/2</td>
</tr>
<tr>
<td>Intel® CM238 Chipset</td>
<td>GL82C238</td>
<td>FC-BGA13</td>
<td>Supports ECC and Intel Active Management Technology 11.6; up to eight SATA ports (6 Gbps); 14 total USB ports (up to 10 USB 3.0); up to 20 PCIe gen 3.0 (x1, x2, x4 configuration options); 1x16, 2x8, or 1x8 + 2x4 PCIe graphics support; memory channels/DIMM per channel = 2/2</td>
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</table>
Intel® Xeon® Processor E3-1200 v6 and E3-1500 v6 Product Families and Intel® C236 and CM238 Series Chipsets