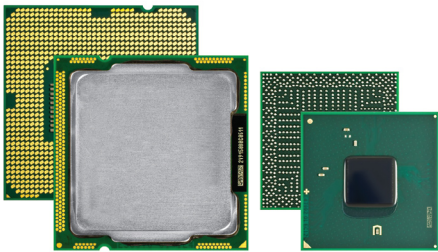


# Intel® Xeon® Processor 3400 Series for Embedded Computing



## Product Overview

Based on 45nm process technology, the Intel® Xeon® processor 3400 series features quad-core processing and intelligent performance capabilities, including Intel® Turbo Boost Technology<sup>1</sup> and Intel® Hyper-Threading Technology<sup>2</sup>; to meet the computing needs of demanding, embedded applications. When paired with the Intel® 3450 chipset, this platform provides Error Correcting Code (ECC) and flexible PCI Express\* capabilities, making it ideal for a wide range of embedded applications, including point-of-service terminals and ATMs, gaming platforms, digital security surveillance applications, and industrial control and automation equipment.

This platform includes Intel® vPro™ technology, supporting operating system-absent manageability and down-the-wire security even when the device is powered off, the operating system is unresponsive, or software agents are disabled. While incorporating advanced technology, these processors remain software-compatible with previous IA-32 processors.

The high-speed, 1333 MHz dual-channel DDR3 memory controller is integrated into the processor, providing lower memory latency in a two-chip solution that offers board real estate savings over previous three-chip platforms. Developers can create one board design and scale their product line with different processors, using the same socket.

## Product Highlights

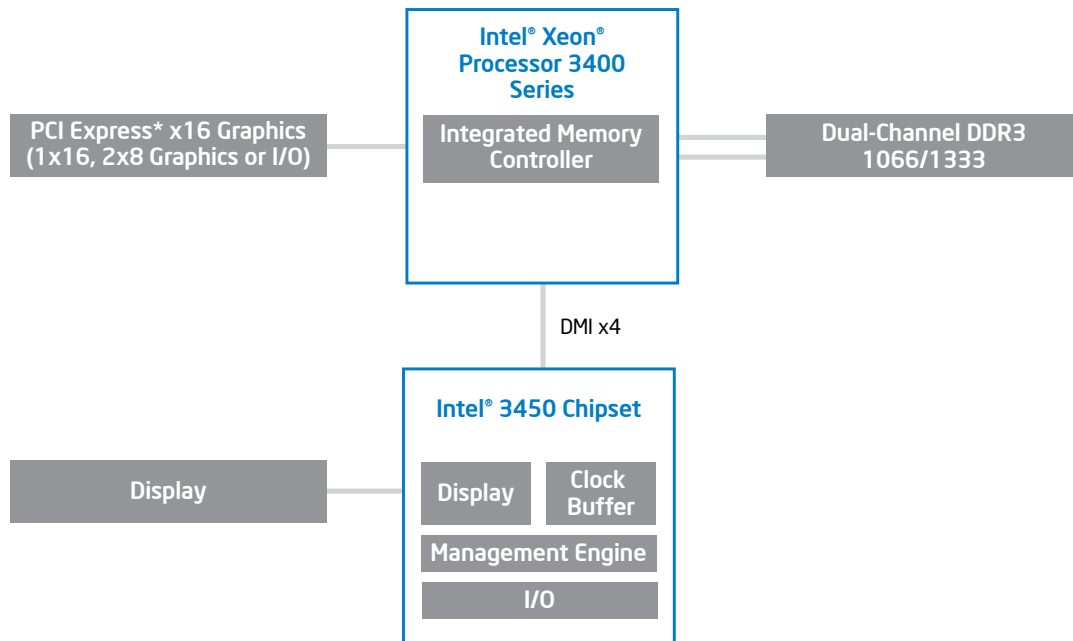
**Memory Error Correction:** When paired with the Intel 3450 chipset, ECC corrects memory errors without requiring system reset – enhancing performance, uptime and autonomous operation – essential for remote, embedded applications.

**Intel® Intelligent Power Technology<sup>3</sup>:** Reduces power consumption through architectural improvements such as integrated power gates and automated low-power states.

**Intel® Turbo Boost Technology:** Accelerates performance up and down to match heavy workloads and manage power. Automatically speeds up the processor when a device needs extra performance.

**Intel® Hyper-Threading Technology:** Enables simultaneous multi-threading to help boost performance for parallel, multi-threaded applications (Intel® Xeon® processor X3450<sup>A</sup> only).

**Intel® vPro™ Technology:** Delivers robust platform-level remote maintenance and management capabilities with Intel® Virtualization Technology<sup>4</sup>, Intel® Active Management Technology<sup>5</sup>, and Intel® Trusted Execution Technology<sup>6</sup>.



## Software Overview

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

### OPERATING SYSTEM

Vista\* SP2  
 Windows Server\* 2003/2008  
 Windows\* 7  
 Windows 7 Embedded  
 Microsoft Windows\* XP SP3  
 Microsoft Windows Embedded Standard (XPe)  
 Microsoft Windows Embedded POSReady (WEPOS)  
 Red Hat Enterprise Linux\* 6  
 Fedora Core\* 10  
 SUSE SLE\* 11  
 Wind River Linux\* 3.0  
 Wind River VxWorks\* 6.8

### CONTACT

Intel provides drivers<sup>7</sup>  
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 Intel provides drivers<sup>7</sup>  
 Red Hat  
 Red Hat  
 Novell  
 Wind River  
 Wind River

### BIOS

American Megatrends  
 Insyde Software  
 Phoenix Technologies

## Features and Benefits

FEATURES	BENEFITS
Supports key embedded platform requirements	<b>Ideal for compute-intensive embedded applications.</b>
Extended life cycle product support	Protects system investment by enabling extended product availability for embedded customers.
Embedded ecosystem support	Along with a strong ecosystem of hardware and software vendors, including members of the Intel® Embedded Alliance ( <a href="http://intel.com/go/eca">intel.com/go/eca</a> ), Intel helps to cost-effectively meet development challenges and speed time-to-market.
Intelligent performance	<b>Delivers optimum efficiency by adapting performance to embedded application needs.</b>
Intel® Turbo Boost Technology <sup>1</sup>	Boosts performance for specific workloads by increasing processor frequency.
Intel® Hyper-Threading Technology <sup>2</sup> (Intel® Xeon® processor X3450 only)	Enables simultaneous multi-threading within each processor core, up to two threads per core, or up to eight threads per processor; reduces computational latency, making optimal use of every clock cycle.
Intel® Advanced Smart Cache	Large on-die shared Last Level Cache reduces latency to data, improving performance and power efficiency.
Error Correcting Code (with Intel® 3450 chipset)	Detects multiple-bit memory errors; locates and corrects single-bit errors to keep the system up and running.
Intel® Intelligent Power Technology <sup>3</sup>	<b>Reduces power consumption.</b>
Integrated power gates	Reduces idle processor cores to near zero power when not in use to help conserve power and lower operating costs.
Automated low-power states	Adjusts system power consumption based on real-time processor loads.
Intel® vPro™ Technology	<b>Remote management, flexible virtualization and enhanced security capabilities enable solutions that are trusted and cost-effective.</b>
Intel® Active Management Technology <sup>5</sup> 6.0	Remote management of networked embedded devices lowers support costs by reducing the number of on-site visits required. As part of Intel vPro technology, this technology helps perform remote asset tracking and checks the presence of management agents virtually anytime. Also, devices can be remotely turned on/off to reduce energy consumption during non-peak operating times.
Intel® Virtualization Technology <sup>4</sup>	Speeds the transfer of platform control and movement of data between the virtual machine monitor (VMM) and other platform agents (including guest OSs and I/O devices). By lowering workload on the VMM, this technology addresses many embedded system design challenges, like migrating legacy software, increasing real-time performance, and making applications more secure.
Intel® Trusted Execution Technology <sup>6</sup>	Protects 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® Xeon® Processor 3400 Series for Embedded Computing

PROCESSOR NUMBER <sup>A</sup>	CORES/ THREADS	CORE FREQUENCY (GHz)				LAST LEVEL CACHE	THERMAL DESIGN POWER	PACKAGE	
		BASE FREQUENCY	1 CORE TURBO	2 CORE TURBO	3 CORE TURBO				4 CORE TURBO
Intel® Xeon® processor X3450	4/8	2.66	3.20	3.20	2.80	2.80	8 MB	95 W	LGA1156
Intel® Xeon® processor X3430	4/4	2.40	2.80	2.67	2.53	2.53	8 MB	95 W	LGA1156

PROCESSOR NUMBER <sup>A</sup>	INTEL® vPRO™ TECHNOLOGY					
	ERROR CORRECTING CODE	INTEL® TURBO BOOST TECHNOLOGY	INTEL® HYPER- THREADING TECHNOLOGY	INTEL® VIRTUALIZATION TECHNOLOGY	INTEL® ACTIVE MANAGEMENT TECHNOLOGY 6.0	INTEL® TRUSTED EXECUTION TECHNOLOGY
Intel® Xeon® processor X3450	▪	▪	▪	▪	▪	▪
Intel® Xeon® processor X3430	▪	▪		▪	▪	▪

## Intel in Embedded and Communications: [intel.com/embedded](http://intel.com/embedded)

<sup>A</sup> 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/processor\\_number](http://www.intel.com/products/processor_number) for details.

<sup>1</sup> Intel® Turbo Boost Technology requires a Platform with a processor with Intel Turbo Boost Technology capability. Intel Turbo Boost Technology performance varies depending on hardware, software and overall system configuration. Check with your platform manufacturer on whether your system delivers Intel Turbo Boost Technology. For more information, see [www.intel.com/technology/turboboost](http://www.intel.com/technology/turboboost).

<sup>2</sup> Hyper-Threading Technology requires a computer system with a processor supporting Hyper-Threading Technology and an HT Technology enabled chipset, BIOS and operating system. Performance will vary depending on the specific hardware and software you use. See [www.intel.com/info/hyperthreading/](http://www.intel.com/info/hyperthreading/) for more information including details on which processors support HT Technology.

<sup>3</sup> Intel® Intelligent Power Technology requires a computer system with an enabled Intel® processor, chipset, BIOS and for some features, an operating system enabled for it. Functionality or other benefits may vary depending on hardware implementation and may require a BIOS and/or operating system update. Please check with your system vendor for details.

<sup>4</sup> Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain computer system software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

<sup>5</sup> Intel® Active Management Technology requires the computer system to have an Intel® AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. It may also require modifications of implementation of new business processes. With regard to notebooks, Intel AMT may not be available or certain capabilities may be limited over a host OS-based VPN or when connecting wirelessly, on battery power, sleeping, hibernating or powered off. For more information, see [www.intel.com/technology/platform-technology/intel-amt/](http://www.intel.com/technology/platform-technology/intel-amt/).

<sup>6</sup> 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, chipset, BIOS, Authenticated Code Modules and an Intel TXT-compatible measured launched environment (MLE). The MLE could consist of a virtual machine monitor, an OS or an application. In addition, Intel TXT requires the system to contain a TPM v1.2, as defined by the Trusted Computing Group and specific software for some uses. For more information, see <http://www.intel.com/technology/security>.

<sup>7</sup> Drivers available at: [downloadcenter.intel.com](http://downloadcenter.intel.com) (enter chipset name).

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