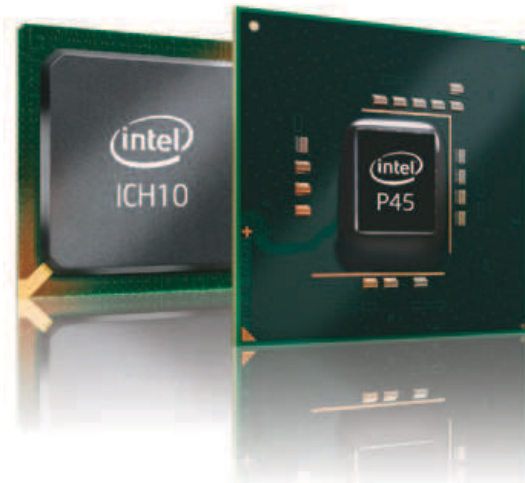# Intel® P45 Express Chipset

Tune Up Your PC for Accelerated Performance

Desktop PC platforms based on the Intel® P45 Express Chipset, combined with either the Intel® Core™2 Quad or Intel® Core™2 Duo processors, drive performance and state-of-the-art technology to mainstream and performance platforms. The Intel P45 Express Chipset supports the latest 45nm Intel® Core™2 processor family at 1333 MHz Front Side Bus, dual-channel DDR3, Intel® Extreme Memory Profile (Intel® XMP), dual PCI Express* 2.0 graphics, and Intel® Extreme Tuning.

The Intel® P45 Express Chipset

The Intel P45 Express Chipset continues to push innovation with capabilities designed to deliver quality, performance, and headroom to tune the fastest platforms. The Intel P45 Express Chipset achieves this performance by supporting the latest 45nm Intel dual- and quad-core processors, enabling increased system bandwidth by supporting industry-leading technologies, such as Intel Extreme Memory Profile, 1333 MHz System Bus speed, PCI Express 2.0 graphics, Intel® Fast Memory Access, and Intel® Turbo Memory. To push the bar even higher, overspeed protection has been removed and users have the ability to easily tune the system for optimum performance, enabling extreme power users to achieve performance levels beyond the Intel P45 Express Chipset's industry-leading baseline performance.

intel®
P45
EXPRESS CHIPSET

PCI Express* 2.0

The Intel® P45 Express Chipset is driving PCI Express* 2.0 to mainstream users, delivering up to 16 GB/s bandwidth, twice the bandwidth of PCI Express 1.0. The Intel P45 Express Chipset supports either a 1 x 16 or 2 x 8 PCI Express 2.0 configuration for expandable discrete graphics capability, enabling accelerated performance. PCI Express 2.0 provides greater flexibility and reliability in design because it is backward compatible with PCI Express 1.0 and can dynamically manage power and performance through software controls. The greatly improved 16 GB/s of graphics bandwidth capability enables much higher levels of performance on graphics-intensive applications such as high-end gaming and video rendering.

Faster System Performance

With the growing imbalance between CPU and memory performance, it is critical to optimize the memory controller design to obtain the maximum possible performance from the memory subsystem. The redesigned Intel P45 Express Chipset Memory Controller Hub (MCH) architecture significantly increases overall system performance through the optimization of available bandwidth with the 1333 MHz system bus and reduction of memory access latency with Intel® Fast Memory Access. These technology breakthroughs result in optimized system architecture with built-in intelligence, greatly improving system memory performance.

DDR3 Memory

The Intel P45 Express Chipset includes support for dual-channel DDR3 memory technology up to 1066 MHz. The key advantages of DDR3 are the higher bandwidth and the increase in performance at a lower power than DDR2. The DDR3 SDRAM devices operating at 1066 MHz offer peak data transfer rates of up to 17 GB/s (when operated in dual channel interleaved mode), enabling the Intel P45 Express Chipset to take advantage of the higher bandwidth, faster system performance, and higher performance per watt at 1066 MHz[1].

Intel® I/O Controller Hub (Intel® ICH10R)

The Intel® ICH10 I/O controller hub of the Intel P45 Express Chipset integrates several capabilities to provide flexibility for connecting I/O devices.
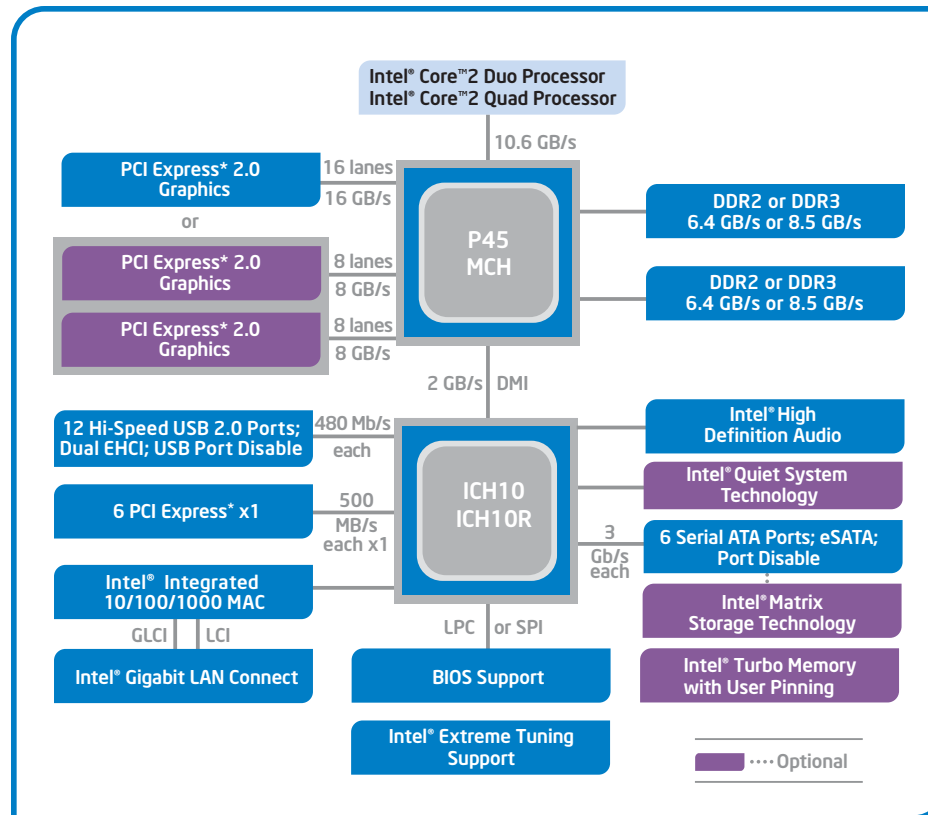
- **Intel® Matrix Storage Technology[2] (AHCI):** Native support of external SATA ports (eSATA), combined with Intel Matrix Storage Technology, provides the flexibility to add an external drive for increased data storage with up to 6 times faster performance than USB 2.0 or IEEE 1394 400[3]. Support for eSATA enables the full SATA interface speed of up to 3 GB/s outside the chassis. The Advanced Host Controller Interface (AHCI) provides easier expandability with support for eSATA devices and native hot plug, while boosting boot and multitasking performance with Native Command Queuing (NCQ). In addition, RAID levels 0, 1, 5, and 10 enable greater reliability for personal data or maximum storage performance for intensive applications.

- **Intel® Rapid Recover Technology:** With the ability to instantly boot off of a clone hard drive, Intel Rapid Recover Technology provides a fast, easy-to-use method for the end user to recover their data and return their system to an operational status.

- **Intel® Turbo Memory:** The Intel® P45 Express Chipset with the Intel® ICH10R also supports Intel Turbo Memory, an innovative flash memory-based overall system performance and boot-time accelerator. This feature is easily implemented using a PCI Express* x1 module and can be used with any SATA hard drive to improve system responsiveness. Intel Turbo Memory enables faster application loading and concurrent performance enhancements when used in conjunction with Intel Matrix Storage Technology. Intel Turbo Memory, paired with the Intel P45 or P43 Express Chipsets, also allows the user to easily control the applications or data in the cache using the new Intel® Turbo Memory Dashboard interface, boosting performance further.

- **Intel® Quiet System Technology:** Integrated in both Intel ICH10 and Intel ICH10R, Intel Quiet System Technology can help reduce system noise and heat through more intelligent fan speed control algorithms.

Intel® P45 Express Chipset Block Diagram

Intel® P45 Express Chipset Features at a Glance

Feature	Benefit
1333 / 1066 / 800 MHz System Bus	Supports the Intel® Core™2 Duo and Intel® Core™2 Quad processors with Intel® Virtualization Technology[4], and Intel® Celeron® processors.
PCI Express* 2.0 Interface	PCI Express 2.0 provides 16 GB/s bandwidth for platform graphics.
Intel® Fast Memory Access	Updated Graphics Memory Controller Hub (GMCH) backbone architecture that improves system performance by optimizing the use of available memory bandwidth and reducing the latency of the memory accesses.
Dual Channel DDR2 Memory Support	Delivers up to 12.8 GB/s (DDR2 800 dual 6.4 GB/s) of bandwidth and 16 GB maximum supported memory size for faster system responsiveness and support of 64-bit computing.
Dual Channel DDR3 Memory Support	Delivers up to 17 GB/s (DDR3 1066 dual 8.5 GB/s) of bandwidth and 8 GB maximum supported memory size for faster system responsiveness and support of 64-bit computing.
Intel® Flex Memory Technology	Facilitates easier upgrades by allowing different memory sizes to be populated and remain in dual-channel mode.
Intel® High Definition Audio[5]	Integrated audio support enables premium digital surround sound and delivers advanced features such as multiple audio streams and jack re-tasking.
Intel® Matrix Storage Technology[2]	With additional hard drives added, provides quicker access to digital photo, video, and data files with RAID 0, 5, and 10, and greater data protection against a hard disk drive failure with RAID 1, 5, and 10. Support for external SATA (eSATA) enables the full SATA interface speed outside the chassis, up to 3 Gb/s.
Intel® Rapid Recover Technology	Intel's latest data protection technology provides a recovery point that can be used to quickly recover a system should a hard drive fail or if there is data corruption. The clone can also be mounted as a read-only volume to allow a user to recover individual files.
Intel® Turbo Memory	Intel's innovative NAND cache is designed to improve the responsiveness of applications, application load times, and system boot performance. Intel Turbo Memory, paired with the Intel® P45 Express Chipset, also allows the user to easily control the applications or data in the cache using the new Intel® Turbo Memory Dashboard interface, boosting performance further.
Serial ATA (SATA) 3 Gb/s	High-speed storage interface supports faster transfer rate for improved data access with up to 6 SATA ports.
eSATA	SATA interface designed for use with external SATA devices. It provides a link for 3 Gb/s data speeds to eliminate bottlenecks found with current external storage solutions.
SATA Port Disable	Enables individual SATA ports to be enabled or disabled as needed. This feature provides added protection of data by preventing malicious removal or insertion of data through SATA ports. Especially targeted for eSATA ports.
USB Port Disable	Enables individual USB ports to be enabled or disabled as needed. This feature provides added protection of data by preventing malicious removal or insertion of data through USB ports.
Intel® Quiet System Technology	Intelligent system fan speed control algorithms use operating temperature ranges more efficiently to reduce system noise by minimizing fan speed changes.

For more information, visit the Intel Web site: www.intel.com/products/desktop/chipsets

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