

The Intel® Q965 Express Chipset

Advanced capabilities for real business needs

Desktop PC platforms based on the Intel® Q Family of Chipsets (Intel® Q965 and Q963 Express Chipsets), combined with either the Intel® Core™2 Duo processor with Intel® Virtualization Technology¹ (Intel® VT) or Intel® Pentium® D processor 900^A sequence with Intel VT deliver innovative capabilities and usages for both Small and Medium/Large businesses.



The Intel® Q Express Chipset Family

The Intel Q Express Chipset family continues the Intel chipset legacy and extends it to new levels with purpose-built capabilities designed specifically to address the key needs of the office computing environment. With advancements in manageability, graphics, stability, data protection and, optimizations to support the most advanced business operating systems, the Intel Q Express Chipsets are designed to help all businesses better manage costs, provide a safer computing environment and deploy more responsive PCs.

Faster System Performance

With the growing imbalance between CPU and memory performance, it becomes critical to optimize the memory controller features to obtain the maximum possible performance out of the memory subsystem. The Intel Q965 Express Chipset incorporates Intel® Fast Memory Access, an updated Graphics Memory Controller Hub (GMCH) backbone architecture that significantly increases overall system performance through the optimization of available bandwidth and reduction of memory access latency. This updated GMCH with Intel Fast Memory Access also includes wider internal data buses that support dual-channel DDR2 memory technology at 800 MHz (up to 12.8 GB/s of peak memory bandwidth) for greater platform performance and memory flexibility.

The Intel Chipset Story

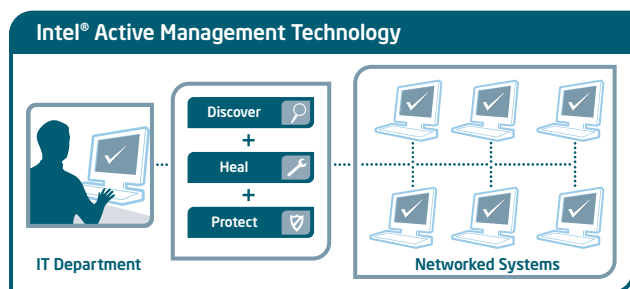
Since delivering its first chipset almost 25 years ago, Intel's Chipset Group has maintained a vision to design, develop and deliver the highest quality and most innovative chipsets to maximize the home and office computing experiences. A commitment to the highest levels in validation, interoperability, eco-system completeness and scalability goes into each and every Intel chipset. The work of over 2,500 people and Intel's annual investment of \$300M in platform validation combined with full chipset simulation a year prior to production shipment ensure the highest quality products are delivered on a predictable annual cadence. Bringing these chipsets to you requires the industry's most far reaching supply and services network. Intel chipsets mean innovation, completeness and reliability.

Intel® Graphics Media Accelerator 3000 (Intel® GMA 3000)

The Intel Q Express Chipsets family features Intel's fourth-generation graphics core. The new core allows for reduced power and noise without sacrificing the performance business users need. The Q965 Express Chipset is ideal for business users seeking support for advanced operating systems like Microsoft Windows Vista*. Both the Intel Q965 and Q963 Express Chipsets are capable of supporting the Microsoft Windows Vista Premium logo program.

The Intel Q965 Express Chipset supports both ADD2 and Media Expansion Cards (MECs). When combined with an ADD2 or MEC, this chipset can support dual independent display enabling a business user to expand their visual workspace without constant toggling between applications.

The single graphics driver capability of the Intel Q Express Chipset family allows businesses to reduce software qualification and maintenance costs across mobile and desktop platforms.



Intel® Active Management Technology provides IT departments with remote client manageability, out-of-band (OOB) diagnostics and asset tracking to help reduce TCO and improve productivity.

Intel® I/O Controller Hub (Intel® ICH8/R/DO)

The I/O controller hub of the Intel Q Express Chipset family integrates several capabilities designed to improve manageability, collaboration, data protection and performance of the business client.

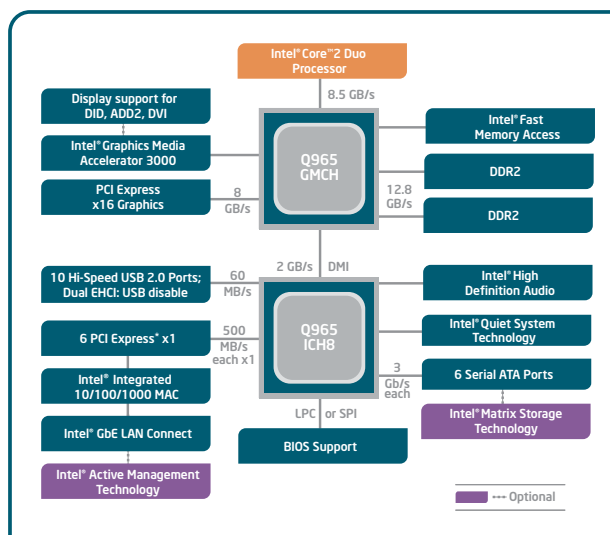
- Intel® Active Management Technology² (Intel® AMT) is a hardware- and firmware-based solution that is powered by the system's auxiliary power plane to provide 24 x 7 availability to IT administrators, provided the enabled system is connected to a power source and an active network port. Intel AMT stores hardware and software information in non-volatile memory and allows IT to "discover" assets, even while the enabled systems are powered off. With built-in manageability, it provides out-of-band (OOB) management capabilities to allow IT to remotely "heal" systems after OS failures. Intel AMT also helps "protect" networks by making it easier to keep software and virus protection schemes consistent and up-to-date across your business. The "protect" capability is raised to a new level in 2006 with the addition of the System Defense feature. Through inbound and outbound filtering and real-time agent presence, System Defense can help block incoming software attacks, isolate a client from the network if it does become infected and proactively alert IT if critical software agents are missing.

- Intel® Matrix Storage Technology³ (Intel® MST): With new support for external SATA* ports (eSATA), Intel MST provides flexibility to add a second external drive for increased data protection with up to 6 times faster performance⁴ than USB* 2.0 or Firewire* 400. HDDs. Support for eSATA enables the full SATA interface speed outside the chassis, up to 3 GB/s. Support for RAID levels 0, 1, 5 and 10 enables high reliability for personal data, or maximum storage performance for intensive applications. The Advanced Host Controller Interface (AHCI) provides easier expandability with support for eSATA devices and native hot plug, while boosting boot and multi-tasking performance with Native Command Queuing (NCQ).

Intel® Active Management Technology²: System Defense Feature Overview

Network filtering	<ul style="list-style-type: none"> These filters prevent inbound attacks before they get to the software and OS, proactively blocking incoming viruses, worms or other threats.
Isolation function	<ul style="list-style-type: none"> This isolation functionality stops infected systems from affecting others on the network by isolating clients and blocking outbound communication.
Real-time agent detection	<ul style="list-style-type: none"> Alerts the IT console if critical software agents go down on the client platform. System defense also proactively alerts when critical software agents are missing.

- Intel® High Definition Audio⁵ (Intel® HD Audio) enables premium digital sound in the PC. Support for multiple audio streams can enable users to conduct high-quality Internet phone calls and listen to ambient system sound simultaneously. When coupled with support for microphone array, Intel HD Audio can enable high-quality, low-cost Internet phone call implementations by eliminating the need for a separate discrete audio card.
- Intel® Quiet System Technology integrated into the Intel Q965 Express Chipset can help reduce system noise and heat through more intelligent fan speed control algorithms.
- In addition to expanded USB support (up to 10 ports), security has been enhanced with the addition of USB port disable capability. This capability provides for customized disabling – either by port or by controller – of USB ports to prevent theft or insertion of malicious data through the USB ports.



Intel® Q965 Chipset Block Diagram

Intel® Stable Image Platform Program

The Intel Q Express Chipset family is a critical element of the 2006 Intel® Stable Image Platform Program (Intel SIPP). Businesses can take advantage of this program to help reduce the cost of software image qualification and maintenance.

Intel® Q Express Chipset Family At A Glance

Feature	Intel® Q965 Express Chipset	Intel® Q963 Express Chipset	Benefit
1066/800/533 MHz System Bus	1066/800/533-MHz 2 threads	1066/800/533-MHz 2 threads	<ul style="list-style-type: none"> Supports the Intel® Core™ 2 Duo Processor with Intel® Virtualization Technology¹, Intel® Pentium® D processor 900² sequence with Intel® VT Intel® Pentium® 4 processor with HT Technology¹ and all other Intel® Pentium® processors and Intel® Celeron® processors in the LGA775 socket, with scalability for future processor innovations.
Intel® Fast Memory Access	Yes	Yes	<ul style="list-style-type: none"> 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.
PCI Express* x16 Interface	Yes	No	<ul style="list-style-type: none"> The PCI Express x16 graphics interface supports the latest high-performance graphics cards. The PCI Express x1 I/O ports offer up to 3.5X the bandwidth over traditional PCI architecture, delivering faster access to peripheral I/O devices.
Intel® Graphics Media Accelerator 3000	Intel® GMA 3000 with support Dual Independent Display and Media Expansion Card	Intel® GMA 3000 with support Dual Independent Display	<ul style="list-style-type: none"> Delivers richer visual color and picture clarity without the need for additional discrete graphics cards. Delivers performance for advanced operating systems like Microsoft Windows Vista*. Dual Independent Display expands the viewable workspace to two monitors.
Intel® High Definition Audio	Intel® HD Audio	Intel® HD Audio	<ul style="list-style-type: none"> Integrated audio support enables premium digital sound and delivers advanced features such as multiple audio streams and jack re-tasking. Intel HD Audio support for microphone array enables low-cost, high-quality Internet phone calling.

Intel® Q Express Chipset Family At A Glance (continued)

Feature	Intel® Q965 Express Chipset	Intel® Q963 Express Chipset	Benefit
Intel® Matrix Storage Technology ³	Intel® MST (ICH8R and ICH8DO only) 6 SATA, 3 Gbps eSATA	Intel® MST (ICH8R only) 6 SATA, 3 Gbps eSATA	<ul style="list-style-type: none"> Seamlessly protects against data loss from hard drive failure with RAID levels 0, 1, 5, and 10. Improved storage performance through high-speed efficient storage interfaces. External SATA provides the flexibility to add an external hard drive for RAID 1 data mirroring capability.
Intel® Active Management Technology ²	Intel® AMT with System Defense feature (ICH8DO only)	No	<ul style="list-style-type: none"> Enables remote, down-the-wire management of out-of-band networked systems regardless of system state, helping improve IT efficiency, asset management and system security and availability. The System Defense feature can help block incoming software attacks, isolate a client from the network if infected, and proactively alert IT if critical software agents are missing.
Dual-Channel DDR2 Memory Support	4 DIMMs, 2 devices per channel, DDR2 800/667/533-MHz, 8 GB	4 DIMMs, 2 devices per channel, DDR2 667/533-MHz, 8 GB	<ul style="list-style-type: none"> Delivers up to 12.8 GB/s of bandwidth and 8 GB memory addressability for faster system responsiveness and support of 64-bit computing.
Intel® Quiet System Technology	Yes	Yes	<ul style="list-style-type: none"> Intelligent system fan speed control algorithms use operating temperature ranges more efficiently to reduce perceived system noise by minimizing fan speed changes.
Intel® Stable Image Platform Program	Yes	Yes	<ul style="list-style-type: none"> Enables a consistent software image after qualification for at least 12 months from launch, helping reduce qualification and maintenance cost.
Intel® Flex Memory Technology	Yes	Yes	<ul style="list-style-type: none"> Facilitates easier upgrades by allowing different memory sizes to be populated and remain in dual-channel mode.
USB* Port Disable	Yes	Yes	<ul style="list-style-type: none"> 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.

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

¹Intel® Virtualization Technology requires a computer system with a processor, chipset, BIOS, virtual machine monitor (VMM) and applications enabled for virtualization technology. Functionality, performance or other virtualization technology benefits will vary depending on hardware and software configurations. Virtualization technology-enabled BIOS and VMM applications are currently in development.

²Intel® Active Management Technology requires a system with an Intel® Q965, 955X, 945G, or 945P Express Chipset, Intel® PRO/1000 PM network connection and appropriate third party software. The system must be plugged into a power source and connected to a LAN.

³Intel® Matrix Storage Technology requires a motherboard with the Intel® 82801HR (ICH8R), Intel® 82801GR (ICH7R), or Intel® 82801FR (ICH6R) I/O Controller Hub System. The system must also have the RAID controller in the BIOS enabled and the Intel Matrix Storage Technology software driver installed. Please consult your system vendor for more information.

⁴Performance based on interface speed and data transfer rate specifications for eSATA, USB 2.0 and Firewire 400.

⁵Intel® High Definition Audio requires a system with the Intel 965, 955, 945, 925, 915 or 910 Express Chipset and a motherboard with an appropriate codec and the necessary drivers.

⁶Hyper-Threading (HT) Technology requires a computer system with an Intel® processor supporting HT Technology and a 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 for more information including details on which processors support HT Technology.

⁷Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See http://www.intel.com/products/processor_number <http://proto-cps.cps.intel.com/products/processor_number> for details.

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