

Evolution in Computing Extends to Industrial Platforms

Forty years after the formulation of Moore's Law, industry still upholds this benchmark. Nanotechnology has produced transistors that measure in fractions of microns, but this year's increase in computational power is due to improvement with respect to a number of performance metrics other than transistor density. Dual core, Hyper-Threading, and 64-bit Extended Memory are the most promising advances in processor technologies, increasing power without increasing the space required for it. Low voltage differential signaling (LVDS) is the basis for the next generation of I/O interfaces, which now include a new PCI standard, PCI Express, and a new ATA standard, Serial ATA. Vanderpool Technologies (VT), virtualization technology that enables one platform to function as several virtual platforms, is expected on the market later this year. Emerging from this convergence is the promise of an increase in processing performance not seen in recent years.

To extend the benefits of the cutting edge to customers, Advantech Co., Ltd. carries a full spectrum of industrial solutions. Products include industrial-grade ATX and micro ATX motherboards, cPCI platforms, single board computers, and versatile enclosures. In sync with progress, Advantech is developing a number of new products with the most advanced features currently available.

Hyper-Threading (HT) technology, introduced in 2002, is a key support for new processor technologies. HT enables multi-threaded software to execute threads in parallel, meaning more efficient use of resources for the processor and better performance for the user. This new level of performance is especially apparent for applications that place a heavy demand on computing resources, such as 3D graphics and animation.

Intel® Extended Memory 64 Technology (Intel® EM64T) is performance-enhancing technology that enables a 64-bit processor to run 64-bit code, giving access to more memory than the earlier 32-bit code. Platforms that have support for this technology can access larger amounts of memory, making better use of existing resources.

Bandwidth Revolution

In 2002, the PCI industry introduced the specification for a third generation I/O, the PCI Express (PCIe) bus. Although the PCIe standard is software-compatible with existing PCI

and PCI-compliant devices, it is based on LVDS technology and a serial architecture. The serial bus interface uses a point-to-point topology: Every peripheral device has a direct connection, or "link," to the switch. Because the signaling technology is high-speed and low-voltage, a single link can have up to 32 "lanes," each with a bandwidth of 250 MB/s in both directions. For platforms that currently use PCI or PCI-X, the new PCIe standard offers a high-capacity, scalable bus and a standardized option for peripherals that currently use an application-specific interface, such as video cards. The exponential increase in bandwidth creates new possibilities for Gigabit LAN, data transfer, storage solutions with a Serial Attached SCSI (SAS) interface, and applications that use greater bus bandwidth than PCI can offer.

Advantech Cultivates Next-Generation Solutions

For industrial computing, new technology enables the development of novel applications and more robust computing platforms. Advantech's first platforms with the Intel® 915G/GV chipsets and PCIe on board include micro ATX/ATX industrial-grade motherboards and a single board computer. These new platforms offer processing speeds up to 3.8 GHz, an 800 MHz system bus, and support for HT and EM64T technologies. Also in development is a motherboard with the next-generation Intel® 945 chipset, expected in Q4, 2005.

Advantech designs and manufactures a comprehensive selection of motherboards, CompactPCI single board computers, and rear transition boards. Versatile system packaging solutions include wall-mountable and rack-mountable chassis, available in 1U to 7U sizes, as well as compact chassis. Designs are based on standard form factors, and are thoroughly tested to minimize product revision. Products are built with industrial features such as extended longevity and reliability, resistance to heat and vibration, and optional system management modules for remote monitoring.



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