WinHEC Shows Road to Memphis

Delays in Transit Expected; Intel Will Help Push PC Platform Forward

by Peter N. Glaskowsky

Microsoft's annual WinHEC trade show was marked this year by a relative lack of new technology initiatives compared with last year's show (see MPR 5/6/96, p. 12). Instead of newer and better technology, WinHEC '97 focused on ways to make the PC experience simpler and easier.

The most significant announcement was a non-event: the next major releases of Microsoft's desktop operating systems have been delayed, probably until the first quarter of 1998. A limited beta of the follow-on to Windows 95, code-named Memphis, was distributed at the show; the beta release of Windows NT 5.0 is not expected until this fall.

Delays to Hurt AGP, DVD Hardware Vendors

The delays in Memphis and NT 5.0 represent a serious inconvenience for hardware vendors. Microsoft ruled out an intermediate update of Windows 95 or NT 4.0 with support for DVD-ROM and Intel's accelerated graphics port (AGP).

The lack of AGP support in a Microsoft operating system for 1997 will put a crimp in the marketing plans of several 3D-accelerator vendors that, as directed by Intel and Microsoft, rushed AGP-compliant chips to the market this year. These chips will still work properly in the AGP-based systems we expect to see in the third quarter, but many of the advantages of AGP will not be fully realized until Memphis/NT 5.0 upgrades, and faster motherboard designs, are shipped in 1998.

Shrewd end users should avoid the early AGP machines, instead waiting until they can purchase faster, fully functional systems with all the bugs worked out. This may cause a PC holiday-sales slump for the second year in a row, following the lackluster 1996 holiday buying season caused by the delayed release of MMX processors.

Users may also experience some confusion over the future of AGP. Even though vendors are only just beginning to introduce 533-Mbyte/s (so-called 2× mode) AGP chips, Intel has already announced plans for a 4× version of the interface. No details have yet been provided, but we expect 4× AGP will be tied to the 1999 debut of Direct RDRAM (see MPR 4/21/97, p. 12). SDRAM-based PC memory subsystems simply won't be able to provide data at this 1-Gbyte/s rate.

The situation for DVD vendors is even more unpleasant. Without Memphis, vendors will not have access to the Win32 Driver Model (WDM), a new hierarchical approach to device-driver development. Those hoping to sell DVD products this year must provide their own custom drivers and applications or miss the 1997 holiday season. There may be no way for OEMs to support the DVD-specific Universal Disk Format (UDF) in Windows 95, rendering DVD drives useless for DVD-ROM titles. DVD-Movie discs are already supported by some add-in DVD products, such as Creative Labs' PC-DVD and STB's recently announced DVD card (see MPR 5/12/97, p. 5). These products do not provide compatibility with UDF data on DVD-ROM discs, however.

These add-in DVD solutions will have a performance advantage over host-based DVD implementations for at least a year. After testing actual hardware, Intel and Microsoft have backed away from earlier claims that initial Pentium II systems would be fast enough for software-based DVD decoding. The latest word is that software DVD will require a 300-MHz Pentium II processor with 100-MHz SDRAM main memory plus a fast AGP graphics chip with DVD-compliant motion compensation, color-space conversion, and smooth-scaling circuitry. We believe that such PCs will not appear until 1H98.

Intel Muscles In on Microsoft's Hardware Guidelines

The most interesting political development at the show was the news that Intel will henceforth be a full partner with Microsoft in authoring the PC Platform Design Guide. The earlier 1995 and 1997 editions of this reference, used by Microsoft to set requirements for the "Designed for Microsoft Windows" logo, were written solely by Microsoft—albeit with "input" from other companies, including Intel.

Starting with the PC 98 design guide, however, Intel will coauthor the document. Sources say Intel was dissatisfied with the previous guides and was prepared to go ahead with its own competing document. Rather than risk confusing OEMs with mixed messages, Microsoft chose to yield to the inevitable and share the task with Intel (see MPR 5/12/97, p. 19).

Although PC 98 is expected to be released less than a year after PC 97, the current draft proposes several significant changes over the previous iteration. For example, the minimum CPU for most systems will be a 200-MHz Pentium or equivalent. ISA-bus devices on the motherboard, discouraged in PC 97, will finally be outlawed for most designs. Even ISA slots are disallowed for Network PC and Entertainment PC systems, finally allowing Microsoft to fulfill the promise of PCI-based plug and play.

While PC 97 defined three types of systems—Basic, Workstation, and Entertainment PCs—PC 98 describes no fewer than six, splitting the Basic system into Consumer, Office, and Mobile categories and adding a new category for Network PCs; the Workstation and Entertainment types are retained.

Microsoft and Intel recommend that OEMs design platforms to meet the general Basic PC 98 guidelines, then add features such as network adapters and video outputs to create

Consumer, Office, and Workstation models. Mobile systems would require independent designs, as might Network PCs. We believe that workstation designs should also be independent from the commodity Basic PC 98 architecture, which lacks adequate performance and scalability for high-end applications.

Compliance with PC 97 and PC 98 will be easier for OEMs to achieve than has been the case up to now. Starting in July, OEMs will have a self-testing option. The tools used by Microsoft's Windows Hardware Quality Labs (WHQL) to verify compliance with the logo requirements will be made available to OEMs, and by following strict disclosure rules, OEMs will be able to perform and complete their own testing. WHQL will continue to issue the actual logo approvals, however, and OEMs must still submit at least one system to WHQL along with its test results. WHQL reserves the right to perform random spot-checks, and OEMs that fail a check will have their logo approvals and self-testing privileges revoked.

Device Bay Debuts for Desktop and Mobile Systems

Device Bay will also make its first public appearance in conjunction with PC 98. This specification, developed by Compaq, Intel, and Microsoft and first described at WinHEC '96, has gone through many changes since then. The original vision of a universal expansion bay with PCI, IDE, USB, video, and power connections has given way to a simpler, less expensive standard based on a combination of USB and IEEE 1394B, a dual-speed (400 Mbit/s or 800 Mbit/s) version of the serial-bus interface used on some high-end camcorders. This is good news for the IEEE 1394 crowd, since it provides a solid timetable and a guaranteed market for 1394-based disk drives and should result in a more rapid adoption of 1394 than most in the industry had predicted.

Unfortunately, the Device Bay standard itself remains under NDA, and full information on the proposal is not available. Some information has been released, including the use of USB and 1394B, as well as some data on the size and shape of Device Bay modules. Still unclear is whether Device Bay will allow battery modules to provide power to the host, a critical feature for mobile systems.

Figure 1 shows the two form factors defined in the Device Bay specification. A module size of 6.275" × 7" × 1.25" has been set for desktops. This is large enough to accept a half-height 5.25" disk drive or other device. Desktop systems must provide an ejection mechanism and a mechanical interlock to prevent improper device removal.

Mobile systems have two shapes to choose from. The Mobile Bay will be 130 mm × 127 mm × 19 mm; an Ultra-Mobile alternative is also defined, reducing the vertical dimension to a mere 12.7 mm. (We hope the Device Bay signatories will standardize on either English or metric units before the final release of the specification.) Desktop systems will be able to use mobile modules by means of an adapter unit, and other adapters will be offered to connect the standard 1394B interface to IDE hard disks, CD-ROMs, and other peripherals.

Net PCs: Simpler and Easier But Less Flexible

Device Bay is an important component of the Microsoft/Intel Network PC vision. Network PCs are intended to reduce the total cost of ownership in corporate environments. Network PCs consist of sealed-case systems running so-called "zero-administration" Windows (ZAW), either NT 5.0 (preferred) or Memphis.

Such systems prevent their users from adding, removing, or modifying system configurations. Devices, drivers, and applications are put under the control of remote administrators in corporate information systems (IS) departments. This restriction is meant to eliminate the "futz factor," time lost to users making inappropriate changes to system settings. For example, the Windows Start menu could be reduced to just a few applications and documents.

Such systems can offer expansion options, but only if mechanical interlocks, such as those provided on desktop Device Bays, prevent the user from changing the system configuration. This could include software-controlled case-cover locks as well.

While ZAW may be welcomed by IS managers, we expect it to provoke significant resentment among sophisticated end users, who are likely to view these changes as evidence that they are not trusted to run their own computers. Some users will undoubtedly respond by besieging internal tech-support departments with requests to change their desktop color scheme or make other minor tweaks that users today handle on their own.

There are also serious drawbacks to the scheme. Many corporations still depend on DOS-based applications, and there is no practical way to enforce system security if the user has access to a DOS prompt. Also, employees who deal regu-
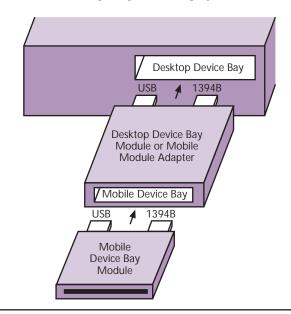

Figure 1. The Device Bay specification defines separate form factors for desktop and mobile systems. The mobile module can also be installed in a desktop system using an adapter. Connectors shown here are symbolic; actual details have not been disclosed.

larly with outside vendors require a great deal of flexibility in installing and running new applications. In fact, Microsoft itself distributes the PC 98 design guide only in the form of a self-extracting archive—a downloadable application program. It would be difficult, if not impossible, for a Network PC-based user to read this file.

DirectX 5.0 Simplifies 3D Programming

Microsoft also described the next release of its DirectX multimedia API. The most significant change lies in the Direct3D API, which has come under fire recently for being excessively complicated (see MPR 1/27/97, p. 13).

DirectX 5.0 introduces a new "DrawPrimitive" API that allows games and other 3D applications to draw triangles one at a time instead of using the awkward execute-buffer model of DirectX 4.0. New drivers will be required for optimal DrawPrimitive performance, however.

DirectX 5.0 will be released for Windows 95, so software vendors can start immediately to take advantage of these new features. Microsoft even described some of the features it has planned for DirectX 6.0, including various advanced 3D-rendering techniques and the Talisman architecture (see MPR 8/26/96, p. 5).

These announcements were not completely free of confusion, however. Microsoft has recategorized its multimedia architecture, distinguishing between the "DirectX Foundation" layer, which includes most low-level DirectX APIs such as the Direct3D immediate-mode interface, and the "DirectX Media" layer, including all ActiveX APIs as well as some high-level parts of DirectX, such as the Direct3D retained-mode interface. The previous division into DirectX and ActiveX may have been less technically pristine, but it was certainly easier to describe.

Microsoft has given up on its previous plan to create a common driver model for its Direct3D and OpenGL APIs.

This would have reduced the driver burden on 3D hardware vendors, which are currently obliged to write two completely separate device drivers for each 3D adapter if they wish to support both APIs.

NT 5.0 Starts Over on Plug and Play

Windows NT has long been a second-class citizen with regard to ease-of-use features. NT 4.0 lags far behind Windows 95 in power-management support and in Plug and Play. At WinHEC, however, Microsoft described a plan to bring PnP to the NT environment.

Unfortunately, the new scheme will not work with the vast majority of existing hardware. The new PnP approach requires ACPI-compatible motherboards and BIOSs. Existing systems will have "limited NT 5.0 PnP functionality," according to Microsoft; OEMs that developed Advanced Power Management (APM) or PnP BIOSs for their NT systems will derive little or no benefit from them under the new plan.

This announcement will be a disappointment to some OEMs, but in the long run it should satisfy the demand from many end users for better power management and PC Card compatibility on NT laptops.

Windows CE Slims Down, Bulks Up

Just two weeks before WinHEC, Sun's JavaSoft unit unveiled a roadmap for its Java Virtual Machine that defines three new variants. PersonalJava, EmbeddedJava, and JavaCard extend the Java environment down to systems as simple as a smart card. Microsoft fired back with more information on Windows CE, showing how it can be configured for systems with as little as 128K of ROM and 32K of RAM and no user interface. This configuration allows CE to cover the PersonalJava and EmbeddedJava target markets, but CE is still too large for a smart-card product.

At the other extreme, the planned 3Q97 update of the Windows CE OEM Adaptation Kit (OAK) will add many new features to the OS, including ActiveX, Visual BASIC scripting, support for LAN operations, printing, color displays, and even Java. OAK 2.0 will add support for x86 and PowerPC 821 processors to the current SuperH and MIPS options; ARM support has been promised, but no timetable has been announced.

Microsoft claims that more than 5,000 applications are currently being ported to Windows CE, but it's unclear how many of these might actually turn into products within the next year. For its part, Sun claims that 300,000 software developers are working on Java products.

New Initiatives Offer New Challenges

With WinHEC now behind us, we look forward to the hardware challenges facing the PC industry in the coming years, such as Intel's Slot 1, 4× AGP, 1394B, and ever-faster 3D chips. Today's leading OEMs will have to run even faster to stay in front of the pack as the pace picks up. Ⓜ