



HOW ABLY CAN  
A PC SERVE AS  
THE CENTER  
OF THE HOME-  
ENTERTAINMENT  
UNIVERSE?

# MEDIA CENTER: serving video to screens large and small

**R**iches await the companies that develop a product that gains wide acceptance as the nerve center of the modern connected home. Players ranging from PC makers to consumer-electronics giants to service providers are all seeking the magic formula with products such as entertainment-oriented PCs, network-enabled PVRs, DVD recorders, and extensible TV set-top boxes. The home hub of the future will surely store and stream video delivered via satellite, terrestrial broadcasts, cable or phone lines, and the Internet. Moreover, the hub will serve clients throughout the home, as well as mobile devices such as cellular handsets and portable media players. Does such a product exist today? A PC running Microsoft's ([www.microsoft.com](http://www.microsoft.com)) WMCE (Windows Media Center Edition) comes the closest. A hands-on evaluation in our Digital Den seeks to discern whether the PC can take the prize.

I believe that TiVo ([www.tivo.com](http://www.tivo.com)), had the company adopted a more open architecture, might have already won the home-hub battle. For instance, TiVo should have allowed external storage from the start rather than trying to make money bundling disk drives. Years ago, a TiVo executive insisted that content owners required that the storage be internal. But that battle is one that TiVo should have fought on behalf of consumers. In addition, the company should have much earlier made available video distribution to multiple TVs, PCs, and portable devices. TiVo had a chance to become the operating system and user interface of the connected home. Now, it may become irrelevant as cable and satellite companies pitch their own PVRs.

Still, can a PC perform media functions in a consumer-friendly way? If it can, it will breathe new life into the PC industry—including not only the PC makers, but also the community that sells add-on tuners and other video-centric products, as well as media “extenders” and home-networking gear.

I've tested PVR functions on a PC several times over the years. I've been a fan of the ATI ([www.ati.com](http://www.ati.com)) All-In-Wonder family of graphics cards that also integrate a

TV tuner. But, frankly, I've found the PVR software that ATI ships balky at best, even though the analog tuner works well. I now suspect that the main culprit in my past tests was the software-video encoder that ATI relies on. The ATI graphics chips do have some hardware-assistance features for MPEG-2 encoding, but a big part of the codec runs in software.

## OFFICE OR LIVING ROOM?

PC vendors offer WMCE PCs in two basic forms. Some manufacturers, such as Sony, package WMCE PCs in a shape and color akin to their audio/video products for the living room. After all, outside perhaps a college dorm, TV on a PC is a niche concept, so a media PC has to feed the big screen. The second approach relies on a PC not in the living room, but in a home office or similar space. This type of WMCE PC connects to TVs through a wired or wireless network and a Media Center Extender (a Microsoft-branded media receiver). Companies such as Linksys sell extenders as part of their home-network lines for approximately \$300.

I believe the second approach is more

## AT A GLANCE

At least for now, a PC based on WMCE (Windows Media Center Edition) represents the state of the art in home-media hubs.

Microsoft and its partners must clean up installation difficulties, especially those centering on incompatibility with add-on TV-tuner cards.

Media Center's user friendliness and ability to transcode HDTV for presentation on small screens make it a contender for domination of media in the home.



The PC and TVs connected to Media Center Extenders, including the Xbox 360, replicate the Windows Media Center user interface.

likely to achieve widespread success. The noise from cooling fans is a no-no in the living room, so you can't use the fastest processors. Moreover, the media-center application demands a high-end system that probably costs more than \$1500. You can buy much cheaper WMCE PCs, but a truly useful one needs multiple tuners and lots of disk space. Compared with PVRs, the price of living-room PCs looks steep.

A WMCE PC in the office, by contrast, can do double duty as a home PC. In fact, such a system is a perfect match for the dual-core processors that Intel ([www.intel.com](http://www.intel.com)) and AMD ([www.amd.com](http://www.amd.com)) are pushing. Intel has said that 70% of its shipments will be dual-core by the end of the year. A second core would allow PVR tasks to run without any impact on typical PC use.

The requisite extender adds cost, both for the extender itself and for the network connection. Moreover, early Media Center Extenders couldn't handle HDTV, and HDTV for all intents and purposes requires a wired-network connection, which entails expense and wire-stringing difficulty for most homeowners.

## ENTER THE 360

I had already installed a 100-Mbps Ethernet link to the living room to support a Slingbox and an Akimbo Internet-based PVR. And I'd long wanted to experiment with WMCE, despite less-than-stellar reviews and the extender problem. My purchase of an Xbox 360

finally prompted me to build a WMCE PC. The Xbox, it turns out, has built-in Media Extender capabilities and supports HDTV. I bought the Xbox 360 as a birthday gift for my son, but it's yet to leave our living room—both due to games in HDTV resolution and the extender functions. Also, the \$450 price tag looks like a bargain when you compare it with dedicated extenders.

Microsoft discourages and attempts to prohibit consumers from building their own WMCE PCs (see **sidebar** "Building your own media PC"). But I wanted to see how difficult building one could be. Moreover, I had a relatively state-of-the-art system that I built 18 months or so ago with a 3-GHz Pentium 4, SATA hard drives, 512 Mbytes of RAM, and an ATI All-In-Wonder 9600 with an integrated tuner. So, I bought a copy of WMCE on eBay.

WMCE is just Windows XP with bolted-on media features. The basic installation of WMCE is simple. I formatted the disk to start clean and had no problems adding drivers for graphics and sound. The real issues—and the tech-support grief that Microsoft avoids by not selling the OS to consumers—come with adding tuners. Little help is available out there, save a few user forums, including the WMCE newsgroup (**Reference 1**).

You need a tuner that Microsoft has deemed compatible with WMCE. Early on, in the case of analog tuners, Microsoft

mandated tuners with hardware MPEG-2 encoders. Encoding isn't an issue with digital tuners because digital signals include an MPEG-2 data stream. But digitizing and storing analog programming for the PVR function requires video encoding.

But compatibility gets tricky. ATI claims that my card is WMCE-compatible. Originally, however, the graphics capability was compatible, but the integrated tuner was not because it relies on a software encoder. I found conflicting information on the Web about using the software codec; presumably, it now is compatible. Some people in the newsgroup claim to have WMCE working with the software encoder, although they generally report poor quality. I never got it to work.

I installed the WMCE drivers for the All-In-Wonder tuner without incident. But the Media Center application could not find the tuner. Rather than troubleshooting that problem, I decided to simply install another tuner, because HDTV was my ultimate quest anyway. I installed an approximately \$120 ATI HDTV Wonder add-in card that integrates both digital and analog tuners. Again, I installed the drivers without problems, but Media Center couldn't find the tuners, and I could find no help.

I scoured the newsgroup and found a lot of clues. I firmly believe that Microsoft should make a how-to guide available. The company allows PC manufac-

tuners to sell systems without tuners, but a buyer of such an entry-level WMCE PC would be stuck just where I was. Here's what I learned.

### DEBUGGING IN BABY STEPS

First of all, you have to have an analog tuner working before you can add a digital tuner. That requirement seems to result from the fact that the first WMCE release supported analog video only; the way the company added digital support relies on some features in the analog software. Unsupported patches available from third parties allow you to add a digital tuner without an analog one. My digital tuner didn't work because the Media Center application recognized neither the analog tuner on the All-In-Wonder nor the one on the HDTV Wonder.

The advice I found on the newsgroup was "buy a tuner with a hardware encoder," but it was nighttime, and I wanted to get the system working. Searching further on the newsgroup, I learned that, if you want to use the ATI software encoder, you have to install it in addition to the other drivers. Sure enough, I found and downloaded the software, which is part of the ATI PVR application. After installing what's essentially an MPEG-2 encoder, Media Center could finally see the analog tuner. I'm not sure whether it sees the one on the graphics card or the one on the HDTV Wonder. And, even

though it recognizes the tuner, I've yet to get the TV application to tune an analog channel. The TV application reports no signal.

But, because the system now recognized the analog tuner, I got past the roadblock to using the digital tuner. Unfortunately, Media Center now recognized the digital tuner but reported another error: no decoder. At first, I didn't realize I had made progress, but another round of searching the newsgroup yielded the answer. Microsoft does not bundle an MPEG-2 decoder with WMCE, and the system needs a decoder to play the digital-TV MPEG-2 stream.

Microsoft recommends that you get the needed decoder by adding DVD-player software. The company lists several compatible players and offers a utility that tests compatibility of WMCE with your decoder. Among the suggestions was Cyberlink ([www.cyberlink.com](http://www.cyberlink.com)) PowerDVD, and I had a Cyberlink CD handy, so I installed it. Then, I tested the application with the Microsoft utility. The utility recommended a newer version of PowerDVD to take full advantage of WMCE. So, I paid about \$20 to download the newest version.

Once I installed the DVD decoder, I could select digital channels, but I still got no video. The configuration utility reported strong signals on several channels



A digital tuner, such as the ATI HDTV Wonder, enables a media-center PC to tune terrestrial digital broadcast for viewing or the PVR application, but the analog tuner is a poor fit for Windows Media Center Edition because it relies on a software MPEG-2 encoder.

that I get from a rooftop antenna. I connected speakers and could hear the audio but still received no picture. I found a couple of similar stories on the newsgroup that suggested that new drivers for the graphics board would solve the problem. I thought that the Microsoft WMCE installation had grabbed the latest drivers, but, apparently, it had not. After downloading the latest ATI WMCE drivers, I finally had working video.

Linking the WMCE PC to the Xbox 360 proved relatively straightforward, requiring downloading some free software for the PC from the Xbox 360 site. Within minutes, I could use the Xbox 360 remote control in the living room to operate the tuning and PVR actions on the PC. The Media Center user interface is identical in both places. Recording and playing HDTV programming has worked flawlessly.

### ENTER THE SMALL SCREEN

With the big screen working, I turned my attention to the small screen on my Creative ([www.creative.com](http://www.creative.com)) Zen Vision portable media player. When I got the Zen, I immediately added a lot of music, but I wanted to watch video on the VGA-resolution screen during my frequent plane flights. You can download some free Windows Media videos from Microsoft, and you can buy downloadable movies from online stores such as CinemaNow ([www.cinemanow.com](http://www.cinemanow.com)). But I wanted to carry some local TV, and I wanted access to the hundred or so DVD movies that we own.

Before embarking on the tuner installa-



The PVR application in Windows Media Center can equally well feed the HDTV in the living room and small screens, such as that on the Creative Zen portable media player.

tion, I attacked the DVD goal. The Zen came with the Video Vault from Diversified Multimedia ([www.diversifiedmultimedia.com](http://www.diversifiedmultimedia.com)). Video Vault allows you to import, transcode, and export movies. The software doesn't import DVDs with CSS (content-scrambling-system) copy protection. But numerous descramblers are available on the Web. If you load a descrambler before loading Video Vault, then Video Vault will import protected DVDs.

Mind you, I'm not advocating piracy. I simply believe my intention to watch a DVD that I purchased on the device of my choice qualifies as fair use. So, I used Video Vault to import a number of DVDs. I stored the DVDs in full original quality and then transcoded them for the Zen. Video Vault knows about the Zen, and a number of other media players, and

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you can select the Zen as the target in the transcoding process. Importing a movie takes about 15 minutes, and transcoding takes an hour or two. Once I transcoded the movies I'd stored to VGA, they took 500 Mbytes to 2 Gbytes of disk space.

Watching the Zen isn't exactly like watching my HDTV, but the device pro-

vides surprisingly high quality. Moreover, the Zen boasts far longer battery life than a notebook PC and is far more convenient than a portable DVD player.

#### DVD JUKEBOX

Having stored the DVDs at original quality, I also discovered that the Xbox 360 will play them over my network. You simply use the Media Center menus to navigate through the hard disk on the WMCE PC and choose the DVD you want to play.

I figured that the final piece of the puzzle, getting recorded TV shows from the WMCE PC to the Zen, would involve a transcoding step and some complexity. In fact, I worried that it might be impossible to get HD-quality shows onto the Zen. For this reason, I first tried to transcode a show using Video Vault, but the software churned away for hours without reporting any progress on the status bar.

For us techies, it's disappointing when things are simple. I had Windows Media Player set to synchronize with the Zen. When I plugged the Zen into the USB cable, Windows Media Player—without any action on my part—found the files that the Media Center PVR had recorded, transcoded the files on the fly, and downloaded them to the Zen.

WMCE's capabilities are encouraging. Microsoft needs to work on the installation problems, and the price of Media Center Extenders needs to come down because I'd like to have access in other rooms. But it's neat to record in HD and play wherever you want at the appropriate resolution. Supposedly, the setup will even support my Treo, but I haven't yet tried that. EDN

## BUILDING YOUR OWN MEDIA PC

Microsoft doesn't sell WMCE (Windows Media Center Edition) the way it sells its other operating systems. Whereas you can buy a copy of Windows XP from your local retailer, you can officially buy WMCE only installed on a PC. Microsoft refuses to make copies available even to the trade press. Complexity and compatibility issues presumably would make tech support of WMCE a nightmare. But Microsoft has softened its stance a bit, and experienced do-it-yourselfers can build their own.

Originally, Microsoft offered WMCE only to major manufacturers, such as Hewlett-Packard ([www.hp.com](http://www.hp.com)), Dell ([www.dell.com](http://www.dell.com)), and Gateway ([www.gateway.com](http://www.gateway.com)). Now, the company also sells the software to local PC shops, albeit with the stipulation that they bundle it with hardware. Nevertheless, you can easily find a copy at places such as eBay ([www.ebay.com](http://www.ebay.com)) for around \$125. Most of the sellers bundle the software with some hardware trinket, such as a remote control, supposedly staying within the legal bounds of Microsoft's requirement that the OS be bundled with hardware. My copy came sealed with the requisite Microsoft license to activate the operating system, although, with eBay, buyer beware.

Because Microsoft doesn't sell WMCE to the public, the Microsoft Web site offers little help for self-installers. The site does not even provide a convenient and accurate list of compatible hardware. The site does have a Media Center Community page ([www.microsoft.com/windowsxp/expertzone/communities/mediacenter.msp](http://www.microsoft.com/windowsxp/expertzone/communities/mediacenter.msp)), but it mostly targets using rather than installing the software. A WMCE newsgroup is the best source I found for installation tips.

Microsoft's decision to withhold details is actually disingenuous. Microsoft allows PC makers to sell PCs with the OS and without hardware that's requisite to the Media Center task. For example, all of the major PC makers sell low-end systems that lack a tuner, yet a tuner is required to both watch TV and perform the PVR functions the OS offers. Installing WMCE on a system without a tuner is no more difficult than installing XP; choosing and configuring the tuner take some doing, however.

#### REFERENCE

■ Microsoft WMCE user forum news group ([www.microsoft.com/windowsxp/expertzone/newsgroups/reader.msp?dg=microsoft.public.windows.media.center](http://www.microsoft.com/windowsxp/expertzone/newsgroups/reader.msp?dg=microsoft.public.windows.media.center)).

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