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21 Instant PC UPGRADES

Better, Faster & Stronger!
Release your PC's untapped potential! p. 22

6 BUDGET VIDEOCARDS: WHICH PASS, WHICH FAIL? p. 38

3 TRENDS THAT WILL SAVE PC GAMING p. 48

6 FIRFOX TWEAKS TO SUPERCHARGE YOUR BROWSER p. 61

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JULY

FEATURES

DEPARTMENTS

QuickStart

R&D

In the Lab

LETTERS

82

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My All-Time Top Five Greatest PC Upgrades

After 15 years of building and upgrading PCs, I've made some awesome upgrades to my own PCs. These hardware updates either opened the door to exciting new functionality, or served as force multipliers, greatly increasing my rig's performance in one fell swoop. Best of all, a killer upgrade can even revitalize a tired old rig.

Now, there's a subtle difference between upgrades and a complete system overhaul, but for my purposes, an upgrade is anything you can do without reinstalling Windows. Here's my definitive list of My All-Time Top Five Greatest PC Upgrades:

5. ATHLON 64 X2 4800 TO CORE 2 QUAD QX6600 When I upgraded my CPU from a dual-core Athlon to a quad-core Core 2, ripping my entire DVD collection suddenly became a real, tenable possibility. Where the X2 4800 took four hours to rip to DIVX or WMV 9, my trusty Q6600 could do more-demanding H.264 encodes at DVD resolution in just about real-time.

4. VOODOO 2 SLI TO GEFORCE DDR The launch of the original GeForce DDR marked the last time a 3dfx card graced my system. That first GeForce featured a hardware transform-and-lighting engine that was the precursor to today's infinitely programmable GPUs. That power finally convinced me to retire my pair of Voodoo 2 boards running in SLI.

3. WANG 386 SX 25MHZ TO PENTIUM 60 Let's face it, my old Wang was a slow, slow computer, even when it was brand new. The upgrade to a Pentium 60 opened the door to the world of photo editing and multiplayer gaming, with Doom, Duke3D, and eventually Quake.

2. GEFORCE 4 TI 4600 TO RADEON 9700 The launch of the Radeon 9700 marked the beginning of the modern programmable graphics era. With support for the nascent DirectX 9 standard in the form of Shader Model 2.0, the 9700 Pro not only opened the door to DirectX 9, it also was a performance beast in the DirectX 8 games I was actually playing.

1. PENTIUM 2 SL2W8 TO DUAL CELERON 300A The SL2W8 was the Celeron 300a's rich cousin—a 300MHz Pentium 2 designed for a 66MHz bus. It just so happened to run like gangbusters on a 100MHz bus, giving overclockers a cool 150MHz speed boost. I dropped the SL2W8 in a heartbeat when Abit launched the BP6—a dual-Socket 370, 440BX-equipped mobo designed to run two Celeron 300a procs running at 450MHz. It was an incredible machine, and opened the door to the world of Windows NT, CD ripping, and photo editing for me.

What was your best PC upgrade? I'd love to hear, either via email (will@maximumpc.com) or shoot me a message on Twitter—my username is @willsmith.

Will Smith

INSTANT UPGRADES

Overclock Your CPU page 35
Take Advantage of the Cloud page 32
Decrapify Your PC page 28

LETTERS POLICY Please send comments, questions, and fried chicken to will@maximumpc.com. Include your full name, city of residence, and phone number with your correspondence. Unfortunately, Will is unable to respond personally to all queries.

THE NEWS

High-Speed High Jinks

ISPs more concerned with their bottom line look to stomp out local competition and move to a bandwidth consumption-based business model -PAUL LILLY

In what's quickly turning into a public relations nightmare, Time Warner Cable (TWC) can't seem to open its mouth without alienating a portion of its customer base. It all started when the ISP jumped on the consumption-based billing bandwagon by testing bandwidth caps as low as 5GB in Beaumont, Texas. Already an unpopular concept, tacking on a $1 per gigabyte overage charge only fanned the flames. Making matters worse, TWC felt it necessary to address the ensuing public scrutiny in what essentially boiled down to a "you don't get it" defense. More specifically, while TWC contends that consumption-based billing is still the answer, it will hold off on further trials "while the customer education process continues."

Meanwhile, the ISP also delayed plans to roll out DOCSIS 3.0 with its wideband downstream channel bonding, which would pave the way for shared downstream data rates in excess of 100Mbps. TWC claims it costs too much to upgrade its network and pay for the added bandwidth without consumption-based billing. Never mind that other ISPs manage to offer better plans with more bandwidth—unlimited in some cases—for a lower monthly fee than TWC's trial plans. TWC's stance also seems to ignore its own 2008 10-K filing stating that high-speed data and per-subscriber connectivity costs are both down.

Fiber-optic networks and DOCSIS 3.0 promise blazing-fast broadband, but if ISPs get their way, your next plan may be based on bandwidth and not how fast you can connect.

IF TWC CAN'T PROVIDE YOU WITH 100MPBS INTERNET, THEN IT DOESN'T WANT ANYONE ELSE TO, EITHER

Ready for the kicker? If TWC can't provide you with 100Mpbs Internet, then it doesn't want anyone else to, either. At least that's the case in Wilson, North Carolina, a small city with less than 50,000 residents, where Time Warner, along with Embarq, is trying to stomp out the local competition. In Wilson, a city service called Greenlight not only offers triple-play packages (cable TV, high-speed Internet, and telephone) at better price points than TWC, but it also provides businesses up to 100Mbps through its fiber-optic network. As if TWC needed any more bad publicity, it and local provider Embarq have teamed up to persuade North Carolina's State Senate to propose bills banning community-owned ISPs.

AT&T has also come under scrutiny, but instead of abandoning its tiered broadband trials, the ISP recently expanded the experimental usage model to Reno, Nevada. Tiers range from 20GB to a much more generous 150GB, and like TWC, the company will charge $1 for every extra GB used. And then there's Comcast, who started this whole trend of capping bandwidth, and whose 250GB cap suddenly seems much more roomy, but still no easier to wear.

Artificial caps appear to be at odds with the recent push towards streaming high-bandwidth content, including television shows and high-definition movies, and consumer advocacy groups are looking to end anticompetitive practices by all involved. The group Free Press has been particularly outspoken, asking the House Energy and Commerce Committee to investigate download limits. If something isn't done, Free Press warns, "imposing arbitrarily low usage limits and arbitrarily high usage fees on Internet access may have substantial negative impacts on competition, innovation, and long-term economic growth."

Fenix TK11

Real geeks love flashlights. And why not? The switch to LED technology has led to a Moore's Law–like battle for the most efficient and brightest dies. Wrapped around one of the brightest and efficient LED's currently available, the Fenix TK11 ($78, www.4sevens.com) offers both low and high output settings, is water-proof, rugged, and features a smooth reflector for long-range, err, shining. Besides its "tacticool" look, the cheapskate in us really loves the TK11's ability to run off rechargeable long-lasting 18650 lithium-ion cells or disposable lithium cells. –GU

Three-Way Display on the Way

3Qi screen promises revolutionary tech at a low cost

Pixel Qi has been talking up a new display technology as of late, one which promises to change the landscape in a big way—as soon as this summer, according to company founder Mary Lou Jepsen. Pixel Qi's 10-inch 3Qi display will combine a low-power black and white mode, e-paper mode, and high-resolution color LCD mode in a single, affordable, sunlight-readable screen.

The focus on affordable isn't surprising, considering Jepsen co-founded the One Laptop Per Child project. It will be quite a feat if she and her company can pull off an affordable miracle display, and she's already looking ahead to adding touch gestures as well. –PL

While Pixel Qi is definitely involved with the upcoming OLPC XO-2 laptop, other product partners are not yet known.

Pirate Bay: Bloody but Unbowed

The latest from the copyright-infringement trial of four Pirate Bay operators: On April 17, Swedish judge Tomas Norström found all four defendants guilty of "assisting copyright infringement" and slapped them with a shared $3.5 million fine and a year of jail time. But who really won the trial?

The Pirate Bay operators immediately announced that they planned to appeal and had no intention of paying the fine, while thousands took to the streets in support of the Pirate Bay, protesting the verdict. Sweden's Pirate Party, which promotes copyright and patent law reforms, grew from 15,000 to 40,000 members in the wake of the verdict, making it the fourth-largest political party in Sweden.

And in more bad news for the copyright lobby, Norström, the presiding judge, has been outed as a member of two pro-copyright organizations: the Swedish Association for Industrial Legal Protection and the Swedish Copyright Association. The latter also counts as members three lawyers for the plaintiffs in the Pirate Bay trial. Lawyers for the defense immediately requested a new trial, accusing the judge of bias. Looks like this battle is far from over. –NE

Intel's Crystal Ball

In a rare example of limb-crawling, Intel's technical marketing manager recently made 10 predictions for the next 10 years. But he didn't crawl very far. Most predictions were boring references to long-standing development projects at Intel and elsewhere.

"Realistic computer-generated images." (Hey, Intel, we've already got that.) "New classes of portable devices with 10 times more battery life." (Who else saw that coming?) "Personal Internet devices will be truly personal." (Like I've been saying for years.) "Low-cost silicon photonics for faster, more reliable data transmission." (Intel and many others have been working on that technology forever.)

Nevertheless, two predictions are interesting. The boldest was "Malware will become a thing of the past." The idea is that microprocessors will incorporate security features to stop malicious software from attacking the operating system and application software. It'll be like a Roach Motel for malware—bugs crawl in, but they won't crawl out.

Bold as it may seem, that prediction is an extension of well-worn technology. For decades, many processors have been able to protect regions of memory from unauthorized accesses. Operating systems have long been able to run in a privileged mode that lets them perform operations forbidden to regular apps. These features have improved over the years, and they will keep improving. Will they ever make malware impossible? I doubt it. The weakest link is still the user. We need a Moore's Law for brains.

Another Intel prediction: "Interactive computing devices make 'composable computing' a reality."

The concept is that different wireless devices in close proximity could be linked to share data and computational resources. You could download a video to your iPod and beam it to an HDTV, wirelessly and effortlessly. Some digicams can already share photos wirelessly with PCs and printers, so this prediction isn't exactly a stretch goal.

Even so, anything that improves interoperability is fine with me. I've been computing since the 1970s and have a junk box of obsolete cables you wouldn't believe.

Tom Halfhill was formerly a senior editor for *Byte* magazine and is now an analyst for *Microprocessor Report*.

Sub-$1,000 DSLRs Come to Market

There's never been a better time to take up photography, with new DSLRs from Canon and Nikon debuting for less than $900 (including a 18-55mm lens) and sporting features that previously belonged to the high end only.

Nikon's D5000 (pictured below), for example, features a 12.3-megapixel DX-format CMOS image sensor and articulating 2.7-inch vari-angle LCD display. Photographers can still view photos with the LCD in its normal position, or it can be swung out to be rotated or tilted, opening the door to all kinds of contorted body positions when shooting images.

The D5000 is capable of recording HD movie clips in 720p, a feature that's somewhat new to DSLRs, starting with the Nikon D90 released back in August 2008. (Canon's new Rebel T1i goes a step further with 1080p support). —PL

Microsoft's Earnings Plunge 32 Percent

For the first time in 23 years, Microsoft has announced a significant drop in its quarterly sales and revenue. Despite analysts' high hopes, sales sunk six percent and net income plunged 32 percent.

However, the software giant is still profitable. While the drop in profits may be a sign of trouble, Microsoft's portfolio remains enviable. And the company may be able to pull itself out of its slump with the anticipated release of Windows 7 later this year.

Microsoft has had a tough year fraught with plenty of obstacles, stiff competition, and a recession that has made a big dent in computer sales. Additionally, netbooks are currently conquering the portable market, which affects OS licensing revenue. —FI

Nvidia Opens Up—Sort Of

Earlier this year, *Maximum PC* Editor-in-Chief Will Smith challenged Nvidia "to stop trying to convince us that closed APIs are good… embrace OpenCL." Fast forward to today and the graphics chipmaker has become the first to release an OpenCL driver and Software Development Kit (SDK) in pre-beta form. Nvidia says its goal is to solicit early feedback in anticipation of a beta release to be made available in coming months.

OpenCL, short for Open Computing Language, is an open programming framework paving the way for developers to tap GPUs for general-purpose computing. The open standard has the potential to work on most modern GPUs, and not just Nvidia hardware, such as the company's CUDA platform. Nevertheless, Nvidia is still committed to CUDA. Nvidia feels OpenCL reinforces the ideas behind CUDA and has three CUDA releases planned for 2009. —PL

GAME THEORY

MicroBucks

Some gamers treat the mere idea of microtransactions with contempt. "Pshaw!" they snort, "like I'd pay real money to buy *horse armor* in Oblivion...." And then they usually trail off into a semi-coherent rant about their rights as gamers and greedy corporate pigs.

But microtransactions—which allow you to spend a few dollars on things to enhance a game, such as extra weapons or spells—are here to stay, and gamers just need to come to terms with that.

My little epiphany came when I took my son to the local Games Workshop store for some Warhammer love. There, spread out before me on shelves crammed with figures, books, paints, and all the rest of the paraphernalia of the hobby, was the world of microtransactions writ large.

Back in the day (as I say when I want to clear a room), if you wanted to play as Eldar, you bought the Eldar books and figures separately (and spent at least $100). If you wanted to play as the Chinese in Advanced Squad Leader, you bought Gung Ho! (about $50). Collectable card games? Booster packs.

It's only in PC and video gaming that we expect to get everything in one neat little package, and then bitch if it isn't all there. How many times have we read, "$20 is too much to pay for 10 levels and a new race"? I've written it myself. We've gotten spoiled.

BattleForge, a nifty collectible card game/RTS game mashup, drove that point home for me. For the base price, you get the game and 3,000 points to spend on booster packs or other enhancements. If you burn through that, you can buy $5 worth of points, which will get you a couple of booster packs to expand your deck. We're likely to see more of this.

I'm not defending RPGs where entire classes are nerfed unless you pay extra money, or designs that punish people who don't spend extra. But the future of PC gaming will likely be driven by the "Korean model," in which hardcore gamers spend extra to support a game and expand their experience, while more casual gamers pay less or nothing at all for a simpler experience. The question will be: Which kind of gamer are you?

Thomas L. McDonald has been covering games for 17 years. He is an editor at large for *Games* magazine.

Opteron to Get 12 Cores, Quad-Channel RAM by 2010

AMD will rush to beat Intel in the multicore battle with new 45nm parts

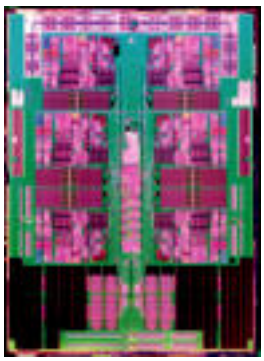
Not about to cede its grip on the server market to Intel, AMD says it plans to release a six-core 45nm Opteron this summer and will follow with a 12-core CPU as early as 2010.

AMD previously released deets of the new 12-core Magny-Cours but is now firming up features of the server CPU lineup. It will represent a shift from a dual-channel memory controller to quad-channel and feature an additional HyperTransport link (for a total of four) and additional cache. The Magny-Cours will go into 6000-series Opteron CPUs and use a multi-chip module design. Ironically, AMD has long chided Intel for building quad-core chips by welding two dual-cores under the heat spreader, but is now taking a similar tack. AMD, however, said it will use a new Direct Connection Architecture 2.0 to join the two dies.

AMD isn't sitting still on the desktop, either. Although Intel maintains performance superiority with its Core i7 lineup, AMD is entrenched in the jungle and fighting a guerilla war with a set of new AM3 Phenom II chips introduced this spring.

AMD IS ENTRENCHED IN THE JUNGLE AND FIGHTING A GUERILLA WAR

The new 3.2GHz Phenom II X4 955 can't compete with Intel's top Core i7-965 part, so AMD has priced it below the budget Core i7-920. With the down economy, this $100 to $150 savings to build an AM3-based system is winning AMD accolades for budget computing. **–GU**



AMD's hexa-core server CPU is due as early as this summer.

LOOKING BACK

Google News Timeline

News Timeline (http://newstimeline.googlelabs.com), Google Labs' latest experiment, charts how a news story develops. Stories are laid out in columns, where each column displays the top news stories for a particular day, week, month, or decade, depending on what the user opts for. Users can search for a particular news story within a specified timeframe and trace its course through history. –AS

BYTE RIGHTS

Going Too Far™

Trademark has been a way for creators to indicate the source of their work for hundreds of years. It makes sense—one of the reasons I don't buy that email-pitched V1agra is that I'm not sure I can trust Pf1zer. Trademark is in the same class of property rights that give us copyrights and patents.

No one else can call their drug Viagra, it's Pfizer's property. Recently, trademark law has been used to get domain squatters off common brand names, which I like when it really pertains to domain squatters and feel weird about when it targets the unfortunately named Viagra family's website.

Colleen Bell is an Austin roller derby girl who skates under the name Crackerjack, a word that means expert, but is more fun to say. She's trying to trademark her handle for inclusion in an upcoming video game featuring roller derby girls, presumably beating the crap out of each other. Fun!

Frito-Lay, owners of the Cracker Jack trademark for snack foods, caught wind of this and decided it was not so fun. They got legal, seeking to block Colleen's registration. Spokesperson Aurora Gonzalez sees possible confusion: "It's reasonable to imagine that a consumer would assume that the brand Cracker Jack is somehow sponsoring, affiliated with, or endorsing her if she is using the same name." Colleen's antipathy for Frito-Lay makes that seem unlikely.

Crackerjack has already been the name of two TV shows, an HTML editor, a Memphis band, and a sport-fishing charter in Alaska. But most importantly, crackerjack is an English word dating from the 19th century, before anyone made the tasty popcorn snack (its name came from a compliment at its World's Fair debut).

Because the brand is so widely known, Frito-Lay doesn't see anywhere that its trademark doesn't apply. Gonzalez confirmed that any commercial application of the word crackerjack should be associated with Frito-Lay's product. This is more than overreaching IP, it's an invitation to lawsuit-by-Google by any company lawyer looking for job security, and it damages my own beloved English language by taking away new uses of words.

Frito-Lay isn't the only company to appropriate language. Register a domain with Virgin in the name—I dare you.

Quinn Norton writes about copyright for *Wired News* and other publications. Her work has ranged from legal journalism to the inner life of pirate organizations.

THE LIST

The 9 Greatest Hollywood Hackers of All Time*

9 JOE TURNER
Three Days of the Condor's smart phreaker and the last suave hacker before Hollywood went "full nerd."

8 MICHAEL BOLTON

7 TRINITY
Patent leather plus UNIX equals ultimate badass.

6 CHLOE O'BRIAN
"Hello CTU, how may I assist you today?"

5 DAVID LIGHTMAN
His wargame brought us to the brink of battle with an acoustic modem and a 2MHz 8080.

4 THE LONE GUNMEN
Who doesn't want to live an *X-Files* conspiracy-filled publishing existence?

3 RAY ARNOLD
Enough is enough! He's had it with these Velociraptors at this Jurassic park!

2 ERWIN EMORY
Sneaker's Whistler can hack anything—sans videocard, even.

#1 R2-D2

This droid could hack any Imperial network or Hyperdrive computer, and social engineer gullible farm boys, to boot.

* And, no, Jeff Goldblum is not included, because hacking a flying saucer with a Macintosh is frigging stupid.

This month the Doctor tackles...

- Reactivating Windows
- MBR Rebuild
- Overclocking Core 2 Duo

SATA vs. IDE

I am planning on building a new video-editing system and have never configured SATA devices before. Does the SATA architecture work in a similar fashion as IDE (i.e., master and slave devices per channel) or are the ports single-homed? I was planning on building a system with RAID 1 OS drives, a separate swap file drive, and RAID 1 data drives. That would use up five ports if they are single-homed. Which brings me to my second question: Is there a benefit to having SATA optical drives or should I put them on the IDE channels?

—Matthew Miller

Matthew, SATA ports are single-homed and single-channel: one drive, one port. So you won't be able to run master-slave setups via SATA. The good news is that most modern motherboards feature on-board RAID controllers that will make setting up your arrays easy. One note of caution, however: Intel's ICHR south bridge chipsets won't let you designate certain ports as SATA and others as RAID after the fact very easily. That is, if you want to start with one drive and later add RAID to the other ports, the drive with the OS on it will usually stop booting because it has to be added to an array. But Nvidia's chipsets will allow you to, for example, set up four ports as RAID and one as a standard SATA.

There's no real advantage to running optical drives on SATA as opposed to IDE, provided you can still find a good IDE optical drive. That at least will allow you to free up your SATA ports for your RAID.

Another idea is to grab an inexpensive RAID controller, like the HighPoint RocketRAID 2640x4 (reviewed on page 89) to run your RAID, and keep your onboard SATA ports free for your swap and optical drives.

Reactivating Windows

After four years of running a very fine system that I built, I would like to upgrade it. I'm not sold on Vista yet, so I would like to know how far you can upgrade a machine and still be able to install/activate the computer's original Windows XP operating system. I want to upgrade the mobo, CPU, RAM, GPU, etc. I would also like to upgrade the hard drive. I have Googled this question but can't get a straight answer. What concerns me is that Microsoft will see my upgrade as a whole new computer and not allow me to activate.

–James G. McKinnis

James, you can upgrade your CPU, RAM, and GPU to your heart's content, but Windows Activation will likely spaz a little at your new motherboard. If after your upgrade Windows refuses to activate, a quick call to Microsoft should allow you to reactivate your operating system—provided you're using a full retail version of Windows XP. OEM versions are tied to the machine they're installed on. Bare disc "OEM" versions are also tied to the motherboard they were first activated on, but Microsoft has been known to let these pass on occasion.

Using nLite to create a slipstreamed Windows install disc is easy and saves you the hassle of having to re-apply Service Packs every time you do a clean install.

Get Rid of It

I recently downloaded a program called Zitec E-Z Checker from Download.com and installed it. I determined it didn't do what I was looking for and ran the uninstall program conveniently included with it. What I got was an error message, in Italian no less, that said the uninstall program was unable to uninstall the software, but offered no remedy. When I tried to use the Install or Add or Remove Programs feature in Windows XP, I got an error message that said it was unable to uninstall E-Z Checker due to a file sharing problem. I used another program (ZTREE) to attempt to manually remove the files, and got the same message about a file sharing error. I tried emailing Zitec, but they have not responded. I don't know what the "file sharing error" is or how to fix it so I can delete or uninstall the E-Z Checker software. Meanwhile, it was still popping up every time I rebooted. I removed the link in the startup menu, and it doesn't pop up any more. Various spyware and malware programs have not detected it as a threat, but I'd like to clean

it out. Any suggestions?

–Fred H.

E-Z Checker doesn't even appear on Zitec's product page any more. Try starting Windows in Safe Mode, in case E-Z Checker has some obscure process running that's causing the conflict. Then try uninstalling using Revo Uninstaller (www.revouninstaller.com). We've had great success removing hard-to-uninstall programs with Revo, which outperforms Windows Add/Remove Software in several respects, including scouring the Registry for anything left behind by the program. The good news is that Zitec E-Z Checker doesn't appear to be malicious, but we understand that lefover apps can be annoying.

REVO UNINSTALLER SCOURS THE REGISTRY FOR ANYTHING LEFT BEHIND BY THE PROGRAM YOU'RE UNINSTALLING

OC Your Proc

I bought an E6850 because I'd read how easy it is to overclock. I followed the instructions in your article about overclocking Intel CPUs and I can't get an extra 10MHz out of mine before it locks up! I'm running the CPU on an Asus Striker Extreme, with 2GB of Corsair Dominator RAM, a Raptor 150GB HD, an 8800 GTX, an Enermax 850W PSU, Win XP SP3, etc. The CPU and GPU are water cooled and run at about 40 C under load.

Each time I raise the front-side bus speed in the BIOS it boots fine and runs for about two minutes before locking up. I tried unlinking the RAM; still no luck. Everything is running at stock settings, but I want to be able to OC the proc. Any ideas on what the problem might be?

–Andy Saint

First, remember that overclocking can be risky and that it's no guarantee you'll get more out of your system. There are a few things you can check. One, you may have to increase the voltage to the CPU, chipset, and RAM to achieve higher overclocks. Second, you should check your BIOS version. If you're running a very old BIOS, a newer revision may actually let you hit higher speeds. For example, BIOS rev 1305 for your mobo "Enhances CPU overclock capability of FSB1333 processors." Also remember that your Core 2 Duo E6850 runs on a 333MHz front-side bus and has a 9x locked multiplier, so getting it to extremely high speeds would require very high front-side bus speeds. To get to 4GHz, you'd need to push a 450MHz front-side bus. Although overclocking techniques differ, the Doctor prefers pushing CPUs that have lower front-side bus speeds rather than those with higher speeds.

Even More RAM Timing

Doc, I recently built a new computer with the following specs: an EVGA Intel X58 motherboard, a Core i7 920 2.66GHz CPU, three sticks of 2GB OCZ Gold DDR3/1600 RAM, an EVGA GeForce GTX 280 SSC Edition 1GB GPU, and a Sound Blaster X-Fi Titanium soundcard.

When I installed the memory, the motherboard ran it at 1,066MHz, far below what my memory is supposed to do. I'm aware that memory sticks generally report the JEDEC speeds to the mobo, so I wasn't surprised by this. I just went into the BIOS and set it to what's written on the sticker on my RAM: 1,600MHz, 8-8-8-24, and 1.65V.

However, I just read your "Pushing Core i7" article (April 2009) and now I'm wondering. Even though the startup screen for my mobo now says the memory clock is at 1,600MHz, is it really running at that speed? According to the article, I'd have to change the uncore speed to double the desired memory speed, which I believe on a 920 would require changing the base speed. I didn't do anything other than change the memory settings in the BIOS. So what's my memory really doing?

—Matthew Alpert

If you are using a retail

SUBMIT YOUR QUESTION Are flames shooting out of the back of your rig? First, grab a fire extinguisher and douse the flames. Once the pyrotechnic display has fizzled, email the doctor at doctor@maximumpc.com for advice on how to solve your technological woes.

processor, your RAM is indeed running at the higher speed. There was some initial confusion with the lower-end Core i7 CPUs. Intel originally planned to lock the memory and QPI multipliers on non-Extreme CPUs but changed course at the very last minute. CPUs supplied to the hardware vendors and reviewers for testing, however, still featured the locked memory and QPI multipliers.

A Job for nLite

I have a problem installing Windows XP Pro. I started with an Intel D975XBX motherboard and could not get XP to install. It would BSOD every time at 38 percent completed and then just stop. I tried every conceivable hardware configuration possible with no success. I purchased another Intel board, a DP43TF, with the same results loading XP Pro. In exasperation I purchased an MSI motherboard and XP loaded without a hitch and is working fine. I wanted to build another computer and purchased a new Intel quad-core CPU. I tried both motherboards with the same results. I contacted Intel tech support and was told that to load XP Pro with an Intel motherboard you need an install disc with at least SP2. This provides the drivers for the PCI Express ports, which SP1 does not have, and that is why it's blue-screening. Is this true? If it is, how do I get a copy of XP Pro with SP2 on it? I have five versions of the OS, all with SP1 or earlier. I do not want to pay a $59 service fee to obtain a copy of SP2 when you can download it for free. Can you give me some help in getting the right disc? I am tired of giving money to either Intel or Microsoft.

–Gary Lichtenstein

Intel, apparently, speaks the truth. Although it's confusing to the Doc why it doesn't slip up your MSI board (assuming that it's an Intel chipset, too), we did confirm issues trying to install XP Pro onto a modern Intel motherboard with just SP1 integrated on the disc. Moving to SP2 or SP3 worked fine. So how do you do it for free, Gary?

Provided you have your install CD and an Internet connection, there's an easy solution. Nlite (www.nliteos.com) allows you to create a slipstreamed Windows XP installation disc that includes the latest Service Pack files and patches, as well as drivers for your hardware. You'll need a PC with a CD burner and an Internet connection, access to your XP disc, and a copy of the SP3 install file from Microsoft's website. we have detailed instructions at bit.ly/kY7Nh.

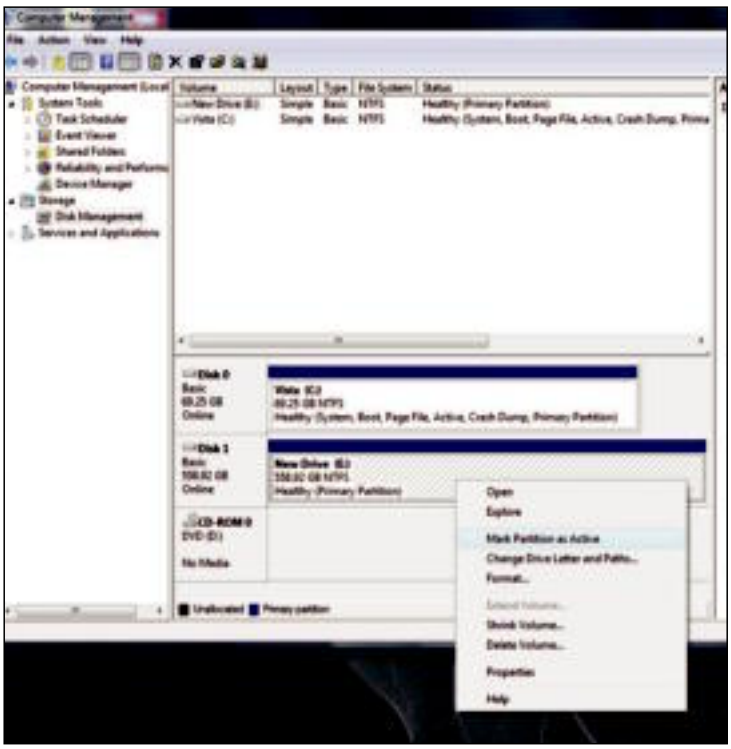
Bite the Hand

Outlook is driving me crazy. Instead of the pointer, my cursor is the little grabby-hand thing. I can't get it to select text or do anything other than scroll the page. Help me before I kill again.

–Bill

Bill, that grabby-hand thing is the Panning Hand, and it's functionally identical to the hand you're familiar with from PDF readers like Adobe Reader. If you're stuck with the hand, you should have a hand icon just above the right scroll bar in your message pane; click that to get back to the pointer. Or hit ESC to get it back.

You probably either have a tablet PC or Tablet PC software installed on your computer (it comes standard with some versions of Windows, for some reason). If you don't have a tablet, consider uninstalling the Tablet PC Windows component entirely (Control Panel > Add/Remove Programs > Add/Remove Windows Components).



Click "mark partition as active" to tell Windows you want to be able to boot from that drive, then use an install disc to repair your master boot record.

Moving the MBR

I have two hard drives in my system. I had XP on my C: drive and I installed Vista on drive G: after a virus ran rampant through my XP system. I had it set up as a dual-boot machine for a while until I got a chance to get everything installed and running under Vista. Now I want to format the XP drive, but I realized that Windows can't because the Master Boot Record is on that drive. Is there any way to move the MBR from the XP drive to the Vista drive so I can set the latter as the primary boot drive in my BIOS?

—Ian Klasovsky

Ian, provided you have your Vista install disc, there's a fairly easy solution. Boot into Vista and enter Computer Management, and click Storage, then Disk Management. Right-click your Vista drive and select "Mark Partition as Active." This tells Windows you'll be booting from this drive. Restart your computer and enter your BIOS. Set your boot order as follows: Optical Drive > Vista Drive > XP Drive. Save and exit. Boot into your Vista install disc, and go to the recovery console. Run Setup Repair and you should get a fully functioning Master Boot Record on your Vista drive! Afterwards, you can set your Vista drive back to top of the boot order, then boot into Vista, and use Computer Management to quick-format your old XP drive. Presto!

MAKE YOUR PC BETTER. FASTER. STRONGER. *—For Free!*

BY GORDON MAH UNG

A sucker buys a new PC at the first signs of a slowdown. A savvy power user gives his aged PC a fighting chance for redemption. From tweaking your OS to compressing files to overclocking your videocard or CPU, there are plenty of ways to tune up a computer, and none require a trip to Bob's House of New PCs. Follow along as we show you some of our favorite techniques for making a PC better, stronger, and faster—for free.

PHOTOGRAPH BY MARK MADEO

Secure Your Applications

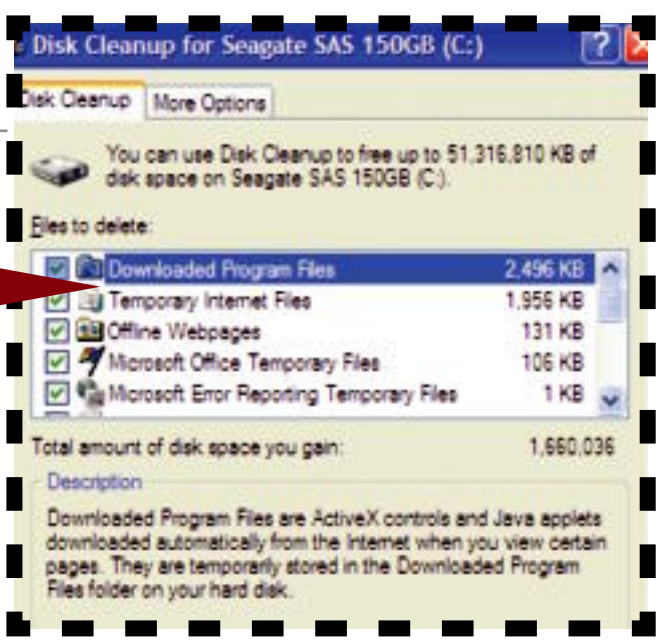
You know to update your antivirus definitions and run Windows Update, but did you know about that massive security hole in Acrobat 8.0 or the potential risks of running that obscure unzipping app you favor? Probably not. That's where Secunia's Personal Software Inspector (http://secunia.com) comes in. PSI uses its massive database of security holes to monitor all the apps on your machine and let you know which ones need updating. PSI even provides a link to any available patches and is on constant vigilance for new application security holes as they arise.

Clean Your PC

Depending on the environment, you can breed an entire warren of dust bunnies inside your PC within a few months. That may sound harmless, but the build-up can easily slow or even jam the various fans in your system and impair performance. Just as you vacuum out the dust from your refrigerator's condenser on occasion (you do that, right?), you should also clean out the dust that's jamming the fans in your rig. A vacuum cleaner will work on the larger case fans and filters, but we shudder at the thought of capacitors being sucked off the surface of the motherboard. Instead, bring the PC outside (or inside if you don't care about your office) and use a can of compressed air to clean out the more sensitive areas.

Clean Up Windows

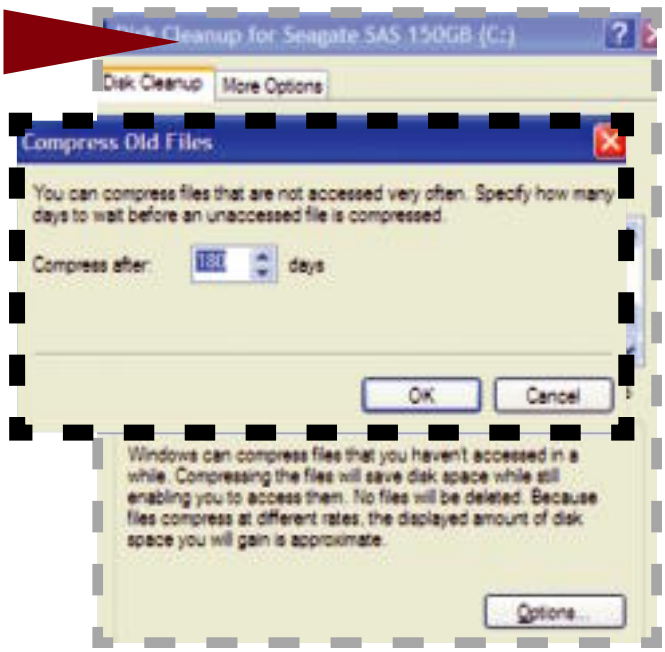
Some of the built-in functionality in Windows is underrated. The Disk Cleanup does a pretty handy job of wiping out junk you don't need such as Microsoft Office temp files and old error reports. To run Disk Cleanup, open My Computer. Right-click the drive the OS is installed on and click Properties. Under the General tab, you'll see a Disk Cleanup button. Click it and the app will run an analysis of the machine. You can dump the Downloaded Program Files, Temporary Internet Files, Offline Webpages, Microsoft Error Reporting Temporary Files, Recycle Bin, Temporary Files, Web Client/ Publisher Temporary Files, Temporary Offline Files, Offline Files, and Catalog Files for the Content Indexer with no ill effects.



Compress Your Files

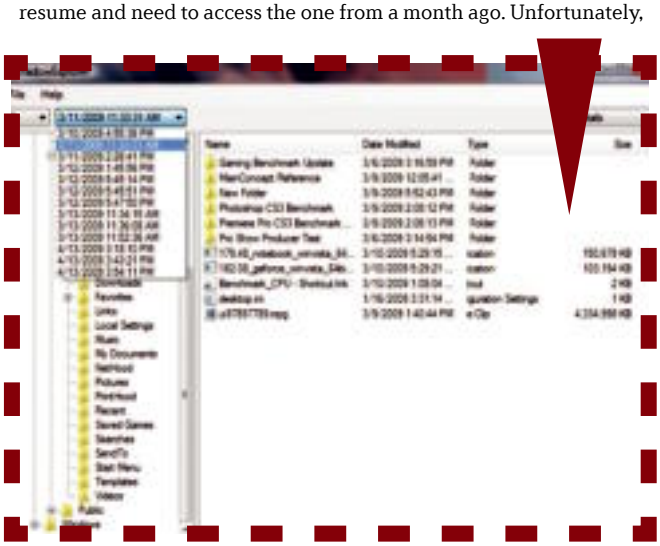
It's a known fact that hard drive performance plummets as you approach the drive's maximum capacity. Folks with 2TB drives may never see that day, but for the peeps subsisting on a nearly full 160GB or 250GB drive, it's a very real and performance-crippling problem. Assuming you don't have an additional drive to move the content to, your choices are pretty slim. But before you take a machete to your files, you might want to consider simply compressing them.

We don't mean firing up WinZip and archiving all the files—that would be too much work. Instead, use Windows' built-in compression tool, which will make accessing the files no different than it currently is. You can access the feature by opening My Computer, right-clicking on the drive you want to compress, and selecting Properties. Click Disk Cleanup and make sure Compress Old Files is checked. Click Options and specify the age of the files you want Windows to compress. Click OK and Windows will compress only the files you haven't accessed in more than, say, six months. Once Windows is finished compressing the files, you'll see that the names of those files are colored blue. The names of the untouched files will appear in black. We've found that with even mid-level CPUs, such as a 2.4GHz Core 2 Duo, the time it takes to decompress a file is minimal. For even older machines, you shouldn't see too much of an impact as most of the files that are compressed haven't been accessed in some time. On one of our machines, we went from 8GB free to 30GB free by compressing older files.



Take Advantage of ShadowCopy

Windows Vista includes a nifty feature that makes incremental "shadow copies" of your document files. This lets you revert to a previous version of a file if you, say, suddenly realize you screwed up your resume and need to access the one from a month ago. Unfortunately,



ShadowCopy is one of those premium features that's only included with Windows Vista Ultimate (or Business). Home Premium users can go pound sand. Or so Microsoft thought. Apparently, all Microsoft really did was remove your ability to *access* those previous versions— the documents are still backed up if you have System Protection enabled in Microsoft Vista. To make sure it's switched on (it is by default), right mouse-click My Computer, click the System Protection link, then the System Protection tab. There should be a check mark for each drive you want shadowed.

To access the previous versions of your file, download the free app ShadowExplorer from ShadowExplorer.com, install it, and *voila*, you can now browse through the tons of backed-up files. A drop-down on the upper left-hand side of the window lets you view the backups by date.

One more thought: If you're suddenly a little freaked out that almost all of your documents are secretly being backed up and, for the most part, hidden from you by Vista, you can erase all of those backups by turning off System Restore (right-click My Computer, select Properties, then System Protection, and uncheck the C: drive), or purge all but the last system restore point (go to Disk Cleanup, select More Options, then Clean Up, and delete what's unneeded).

Scan for Updates

You know to keep your drivers updated, but keeping track of them is like trying to remember to change the water filter on the refrigerator. (Did you last do it in 2008 or 2007?) One way to do a quick and easy scan for outdated drivers is to run Phoenix Technologies' web-based DriverAgent. Just go to DriverAgent.com and click the Web Scan button on the left. The app will run a quick check of your drivers against Phoenix's database of updated drivers and tell you what devices need updating. You can either shell out for the service, which finds the updated drivers for you, or freeload like us and simply take note of the devices you want to upadate, and go find the updated drivers yourself.

Search and Destroy Malware

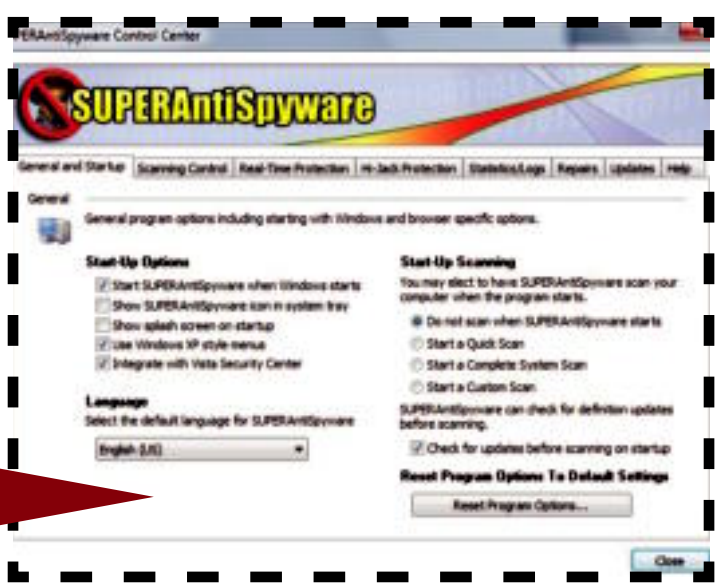
Malware is a common scourge of computing performance, not to mention the severe security risks that it poses. You could pay some guy in a white shirt and black tie to clean up your PC for $200, but why do that when you can do the job yourself?

First, start with SuperAntiSpyware (www.superantispyware.com). After installing the app, you can opt to have it protect your home page or not. When you get to the General and Startup tab, select "Start SuperAntiSpyware when Windows Starts," "Use Windows XP Style Menus," and "Integrate with Vista Security Center." Also select "Do not scan when SuperAntiSpyware starts" and "Check for updates before starting on startup." Perform a complete scan and nuke anything that moves.

Now, download Malwarebytes Anti-Malware (www.malwarebytes.org). Install it, run an update, and have it conduct a scan. Again, wipe out anything that moves.

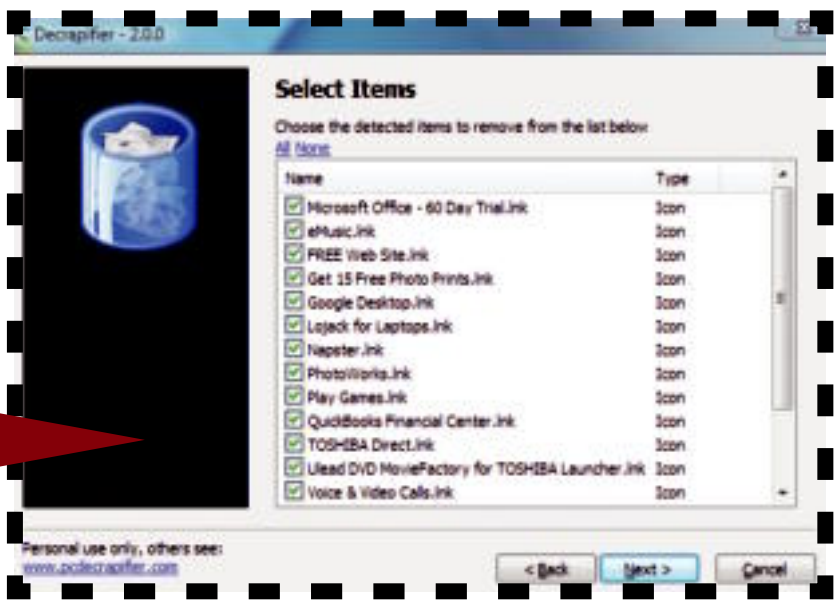
In addition to the antivirus software running on your machine (you do have updated definitions, right?), you'll want to conduct another sweep using Panda Activescan 2.0 (www.pandasecurity.com/activescan/index). This is a web-based scanner that may not fix anything, but it'll give you an additional level of scrutiny.

If you want a more thorough description of the steps we've taken, visit http://bit.ly/PAZyY for a full write-up.



Decrap Your Drive

Ever wonder how a new PC can be bought for $400 *with* a new monitor? Part of the answer is the software subsidies. Fire up any low-cost PC and the desktop looks like it got hit with a 12-gauge load of icons. These icons lead to trialware, which when expired, do nothing but decompose on your hard drive and waste space. On some PCs, the amount of trialware has gotten so bad that it takes a few hours just to scrub it off. Now there's an easier way to zap those apps without spending four hours in front of your parent's new laptop. PC Decrapifier (www.pcdecrapifier.com) will automatically uninstall and delete the majority of trialware applications that are preinstalled on new PCs. Just download the free app, install, and run it. It will ask you if the PC is new or not. If you select not new, the app will create a system restore point. Otherwise, it will continue to the next step and scan your computer for the various trailware apps. You should then be presented with a list of apps you can uninstall. Once you're ready to remove the offending trailware, click Next and PC Decrapifier will automatically remove the junk.



Archive Your Files

So, you know that hard drives get slower as they approach their full capacity. If you're lucky enough to have more than one hard drive in your PC (and most power users do), why is your host OS drive so full of crap you don't need? To improve the overall performance of your PC, move your old documents and games that you don't regularly use onto the secondary drive.

Get S.M.A.R.T

Modern hard drives feature Self-Monitoring, Analysis, and Reporting Technology, or S.M.A.R.T., which can warn you if your hard drive is starting to fail—before it actually does. Unfortunately, the OS doesn't pay attention to these warnings. So, even though you could have known a few months in advance that your drive was about to go tango uniform, the OS kept it a secret. There are a number of good free tools available that can relay the message, such as SpeedFan (www.almico.com/speedfan.php) and DiskCheckup (http://passmark.com), but their interfaces can be a bit overwhelming for the average Joe or Jane. For something so simple that anyone can understand it, we run HDD Health (www.panterasoft.com). Install it, configure it to run at launch, and it will alert you (even by email) if enough S.M.A.R.T. errors occur to rate a possible impending drive failure. A simple temperature bar and health bar will also help you decide if it's time to start doing daily backups of the drive.

Revo Uninstaller

Do you have an application that you just can't get rid of? Think of Revo Uninstaller as a stain remover for software. If some beotch app is dug in like an Alabama tick, Revo Uninstaller (www.revouninstaller.com) will rip it out, head and all. Once you've installed and executed the app, you'll be greeted with a palette of applications you can uninstall. When you choose an unwanted app and click Uninstall, you're given four levels of uninstall to choose from. The first is the Standard uninstall. The Safe uninstall builds on the Standard uninstaller and searches the registry and hard drive for leftovers. Moderate and Advanced build on Safe by increasing the scope of the search for leftovers from the application. For most apps, Safe is fine. An additional Hunter mode lets you use a sniper-scope view to track down such things as which application is responsible for a toolbar whose origins are unknown.

S3 Fixes

Utilizing your PC's S3 standby state can help make your machine more energy efficient—if only it weren't such a pain to implement, we could write a whole book on S3 problems. To help you on your way, here are some very common fixes that might solve the S3 standby problems you're having.

■ Update the video drivers. If your machine fails to come out of standby, you should obtain the latest videocard drivers directly from the chip manufacturer's website (Nvidia, ATI, Intel).

■ Update the BIOS: a motherboard's BIOS can greatly affect how standby works on a PC, and updating it may fix your problem. Make sure you're running the latest BIOS from your motherboard maker.

■ Insomnia. If your system mysteriously wakes up, it may be caused by the USB devices or NIC. To disable a device from waking your system, go into the Device Manager (right-click My Computer, click Properties, and select Hardware and Device Manager in Windows XP. In Vista, right-click My Computer, select Properties, and select the Device Manager link on the left-hand pane). Double-click your NIC, select the Power Management tab. Uncheck "Allow this device to bring the computer out of standby." Now go back, select the mouse, and do the same.

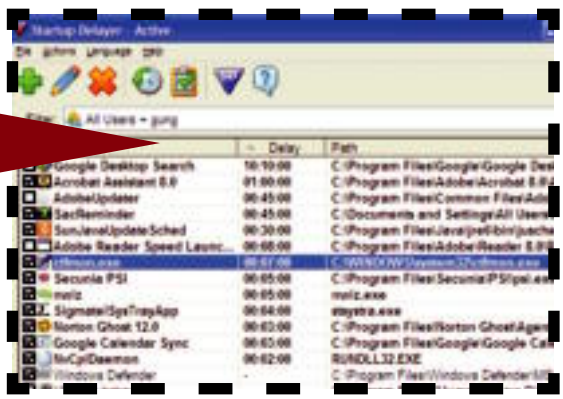
Sometimes in XP you'll find that after installing a new USB mouse or keyboard, your system won't sleep properly. To correct that, you may have to use regedit to create the following registry entry: HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\usb "USBBIOSx"=DWORD:00000000

If the machine still won't sleep after entering the registry key, you may have to unplug USB devices one by one until you find the one that's causing the problem. Alternatively, you can also see if the BIOS lets you disable "USB resume from suspend," which would prevent USB devices from waking the machine. Not all BIOSes have this flag, though.

Optimize Your Startup

Windows Vista features new settings for developers to specify when an app should or should not load. No such thing exists in Windows XP. Instead of applications or applets starting in an orderly manner, it's more like the front-door bum rush at Walmart for $25 Black Friday laptops. There are two ways to fix the problem. One, simply stop some of those applications from loading; and two, schedule when you actually want those programs to start. We use R2 Studios's Startup Delayer (www.r2.com.au) to work as the bouncer outside our PC.

First, download and install the app. Once you've launched it, you'll be greeted with a list of applications that are scheduled to run. You can disable apps you don't want to launch, like the annoying Adobe Updater, by unchecking them. Once you've eliminated the things you don't want launched, you can start to prioritize your other applications. Obviously, you'll want any antivirus or antimalware applications to have priority, so you can leave those alone. Sun's Java Update scheduler, however, can be shoved to the back of the line. To do this, double-click the item and you'll get a window with various options. We're most interested in the delay setting, which you can specify in hours:minutes:seconds. It's important that Java polls the mothership to check for updates, but not when you first boot your PC, so we set ours to 30 minutes after the machine boots.



You can do the same for other applications that you feel should be forced to stand in line with such plebes as the Acrobat Assistant. Once you've set up the priorities, you can click the inverted red triangle icon. Select the graphical version if you want to see a display of the countdown before apps are launched, or simply choose the invisible version so it doesn't get in your face. Reboot and see if the delay order you created works for you or not, and tune to your liking.

USING THE CLOUD

Get More from Your PC by Looking Beyond it

By now, you'd have to be living in a spider hole to not have heard about the "cloud"—a term for sharing resources across the Internet. There are two really great things about this latest brand of computing hype—it's free for the most part and some of it is actually very useful. To wit: Here are three free cloud services that can enhance your computing experience.

DROPBOX This handy app lets you store and share files online. With a client installed on your PC, you create a dropbox, to which you can drag and drop files you want shared and synced with other machines. This may seem no different than Yahoo's failed Briefcase, but it's far easier to use. It runs in the system tray. Double-clicking it opens a traditional Windows folder where you store files that you can access remotely very easily. The freebie account gives you 2GB. For $10 a month or $99 a year, you get up to 50GB. www.getdropbox.com

ZOHO Think of Zoho as a good version of Google Docs. You get a free browser-based spreadsheet app, word processor, and presentation app, plus a ton of other productivity tools that will probably do just about everything a normal civilian would need. You get 1GB to store your docs online for free. To get 5GB costs about $3 a month, but given the tiny size of office document files, it's unlikely you'd need that much room. www.zoho.com

QUAKE LIVE We can still remember being agape over the system specs required to get a decent frame rate out of Quake III Arena. These days, you can get the same game experience in your browser. Believe it or not, this free version of Q3A plays and feels much like the original. www.quakelive.com

Ditto

The cut, copy, and paste shortcuts are the most mashed keys on the PC, but sadly, the Ctrl+ function only buffers a single item. Ditto is like Windows Clipboard on steroids. Capable of storing hundreds of copy and paste entries as well as pasting HTML as text (handy when copying and pasting from your browser to Word), the app is one of those little things that make Windows XP (sorry, no Vista support) *better*. Download it from http://sourceforge.net/projects/ditto-cp/.

Tweak It

Windows XP power users should be familiar with Microsoft's collection of PowerToys (http://bit.ly/18bITQ), which let you greatly increase Windows XP's capabilities. Our favorites include Tweak UI for changing dozens of options, from how fast the menus respond to whether to put the My Documents folder or My Computer icon first on the desktop.

Oddly, Microsoft has made no such applets for its current OS, Windows Vista, but as Yoda said, "There is another…."

TweakVI from Totalidea.com contains a wealth of handy little tweaks for Vista. You can change the OEM contact info for Windows, vary the level of transparency, sort the Start menu, shorten the Start menu lag, add or remove icons from the desktop, order Vista to keep as much data in RAM instead of paging it out to the hard disk, etc. There are also a few cache optimization checkboxes for certain CPUs, but we didn't find any performance boost from them. We're more interested in the app's ability to change those annoying little things like which icon appears in the upper-left side of the screen.

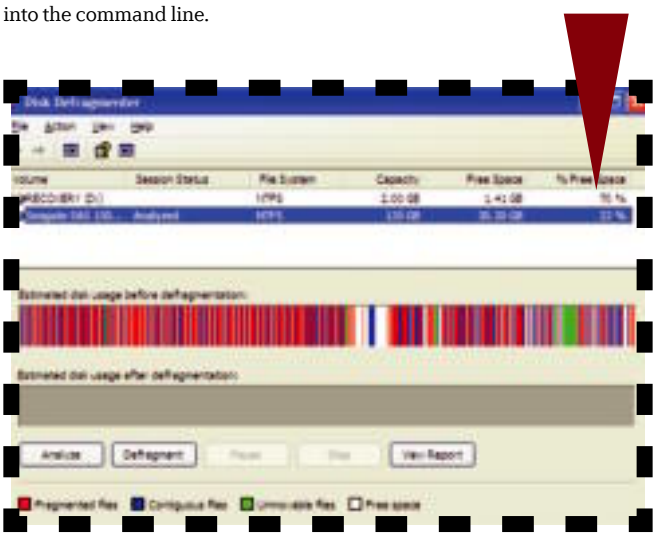
Defrag Your Drive

We know, being told to defragment your hard drive is about useful as telling you to brush your teeth at least twice a day (and after meals.) It's not exactly the latest in PC performance tips but it's a basic step that everyone should take on occasion.

Windows XP's defragger provides a good base level of defragmentation, but under very heavy fragmentation and with limited space, it doesn't cut the mustard. Neither do two popular free defraggers, in our experience: Auslogics Defrag (http://auslogics.com) and IOBit's Smart Defrag (www.iobit.com). For extreme fragmentation issues, Diskeeper 2009 (www.diskeeper.com) aced the three other options and fully defragged our drive. Not everyone will have the fragmentation issues we did, but if you do, sometimes you gotta pay to get the job done.

Windows Vista is a different story. We previously did some testing with Vista's defragmentation tool and found that it works surprisingly well, even though it's as communicative as a Trappist monk. Vista quietly works in the background to defragment the drive during downtime but it has one weakness that will irk many users: It won't defragment files larger than 64MB.

Why not? Microsoft said its tests show that fragments larger than 64MB have a minimal impact on disk access and it's just not worth spending the disk and CPU cycles to do it. Still, there are times when you will want a full defrag, such as with video, where having pieces of your video spread all over the disk platter could very well impact performance. Fortunately, there's a way around this. You can order Vista to perform a full defragmentation. You do this by going to Start, typing CMD, right-clicking the Cmd.exe app that it finds, and selecting "Launch as administrator." Now type `defrag c: -v -w`. The –v option is for verbose and –w is for full defragmentation. Those are the basics you need to know; to see all of the available options, type `defrag /?` into the command line.



Overclock Your GPU

GPU overclocking isn't for the faint of heart and doesn't always give you significant results. That's because most GPUs, especially high-end ones, are sorted at the manufacturer, so you can bet a bucket of KFC Original spicy thighs and legs that the majority of parts capable of running at hyper-clocked speeds are already being sold that way.

Still, why not take what you can get? As with CPUs, GPU overclocking poses the threat of breakage, but at least you don't lose data—you just might have to crank the clocks back down, or worse, replace the card.

One of the most popular tools for GPU overclocking today is RivaTuner (www.guru3d.com). Download and install it. You'll also want to run the latest reference drivers from either Nvidia or ATI before continuing. After you've started RivaTuner, select the Customize option in the Main tab and select Low-Level System Settings. Check "Enable driver-level hardware overclocking." For Nvidia cards, there's a drop-down menu that lets you set the standard 2D, low-power 3D, and performance 3D. Select performance 3D. Begin increasing the clock speeds of the core clock, which will also increase the clock speeds of the shader clock. Bump up the memory clock, as well. How far you can go will depend on your card and the cooling in your system. Click Apply and fire up a game you like and play for a bit. Look for visual artifacts such as corruption of textures. This will indicate that you're on the edge of stability. Go back to RivaTuner and back it down a bit and click Apply. Rinse and repeat. For ATI cards, it's a bit simpler with RivaTuner; simply select your core speed and memory speed overclocks and proceed with the same methods.

Once you're at a stable speed, you can check the "Apply overclocking at Windows Startup" checkbox. This will overclock your card whenever you start Windows. Again, the bang-for-the-buck proposition of GPU overclocking is debatable, but for some folks, every penny and megahertz counts.

Optimize Your RAM

If you paid the kid next store to build your PC, do you really know if he or she built it the right way? One very common mistake is to misconfigure the RAM modules. Phenom II and Core 2 CPUs both support dual-channel modes for the highest bandwidth, while the new Core i7 supports tri-channel mode. The easiest way to tell what mode you're in is to download CPU-Z (www.cupid.com). Decompress it and launch the executable. Click the Memory tab. Under Channels # it should list Dual or Triple. If it lists Single and you've got two or more DIMMs installed, they're misconfigured on the motherboard. (If you have only one DIMM, you'll need another stick of RAM to run in dual mode.)

Go to the SPD tab. You should see a drop-down menu labeled Slot #. It will give you information about every DIMM installed on your PC and their respective slots. To properly configure your RAM, refer to your motherboard manual and read the section on which slots to put your RAM in for dual (or triple) mode, power down your machine, unplug it from the wall, and rearrange the memory modules. Note, this likely won't give you any kick-in-the-pants kind of performance boost, as the large on-die cache of most new CPUs ameliorate memory-bandwidth issues, but on an older CPU, such as the Pentium 4, going to dual mode would add as much as 10 percent in bandwidth-intensive applications.

You'll also want to make sure your RAM is running at the correct speed. Most boards will properly configure RAM, but some won't. Again, go to CPU-Z, click the Memory tab, and look at the DRAM Frequency. This shows the base clock speed. To compute the DDR/DDR2/DDR3 speed, double the number shown. For example, 333MHz is DDR2/667. If you were expecting your RAM to be set at DDR2/800 speeds, you'll have to reboot, go into the BIOS by hitting DEL, F1, or F2 during boot, and look for a section that will let you specify the memory speed.

Change Your Boot Order

Even if you boot your PC just once a day, you can save six or eight seconds of time spent waiting by changing the boot order of the devices in your machine. Instead of the PC checking on an old floppy drive or CD drive to see if it can or should boot from those devices, it will go straight to your hard drive.

To do this, go into the BIOS (hit DEL, F1, or F2 during boot) and search for the boot order. It's usually plainly labeled as "Boot" or the like. Make the primary hard drive that the OS resides on the first thing to boot. Now, just relish the thought of what you can do with the time you save.

The Mother of All Upgrades

Overclocking your CPU is the surest way to gain PC performance for free —although it comes at a risk

Have you seen this forum post: "There's a secret Microsoft doesn't want you to know. The company intentionally slows down the OS at the request of Intel, AMD, and Cyrix so the chip companies can sell faster CPUs. But by adding the setting PC = "go fast" to the speed.ini file, you can increase the speed of your PC by 1,000 percent!!!"?

That's a crock of Bantha dung. Very few OS tweaks ever guarantee performance gains for everyone. There's only one guaranteed performance enhancer: CPU overclocking.

It's dangerous, could corrupt your data, and can kill hardware, but it's the only way to get "free" performance in just about every application you use. Fortunately, modern CPUs almost always offer some overclocking capability.

Even if you didn't buy into overclocking previously, you may be more inclined now because a) your system is older and you're not as protective of it, and b) you just plain don't have the cash to get performance in a safer way.

CPU overclocking runs the gamut from hyper-complex to stupid-easy. The easiest way to get your feet wet is to use the built-in overclocking tool on your motherboard. Any MSI, Asus, or Gigabyte board worth its salt will include an overclocking applet that runs in Windows. More advanced boards will also feature it in the BIOS.

If your board doesn't have an app you can use, you can still overclock it from the BIOS (unless you have a standard cheapie PC from HP, Dell, or Gateway, which prevent any form of overclocking).

Go into the BIOS by pressing the DEL, F1, or F2 key during boot. You should be in a DOS-like text environment. Since 95 percent of the world uses locked CPUs, there's only one way to increase the proc's clock speed: Pump up the front-side bus (Core 2 / Celeron / Pentium / Pentium 4), the base clock (Core i7), or the CPU Frequency clock (Athlon 64 / Sempron / Phenom / Phenom II).

Core i7 overclocking is done by increasing the base clock from its stock 133MHz.

Find the setting for the FSB / bclock / CPU clock in your BIOS and begin increasing it. Start by overclocking the CPU by around five percent. Remember, the clock speed of the CPU is generated by multiplying the FSB / bclock / CPU clock by the multiplier. For example, an Intel Core 2 Quad Q9300 has a fixed multiplier of 7.5. This is multiplied by the base clock of the front-side bus, which is 333MHz for an overall speed of 2,500MHz, or 2.5GHz. You cannot change the 7.5, but you can increase the 333. To get a five percent clock boost, you would need to increase the front-side bus to about 350MHz. To get a 10 percent clock bump, you would need to increase it to about 366MHz. The same basic overclocking method applies to Phenom II and Core i7.

How much performance gain should you expect? There's no guarantee, but it's safe to say you should be able to gain five percent at a minimum, with 10 percent quite attainable on stock equipment, and many folks reporting much higher speeds. Remember, this is not for the faint of heart, but you will achieve real performance gains in anything that's limited by your CPU.

There's obviously a lot more to overclocking. For details, check out our own Core i7 overclocking guide at http://bit.ly/ZbTCK. For other CPUs check out http://bit.ly/Q0DZn.

Windows-based overclocking is similar to BIOS overclocking.

Penny Wise Performance Foolish?

We grab six low-cost videocards from the bargain shelf to see whether enthusiast-class gaming performance can be had on a miser's budget

BY MICHAEL BROWN

We're constantly on the hunt for top-shelf PC performance—you're not reading *Bottom-Feeder PC*, after all. When rendering our review verdicts, we do factor in price, but recommending a subpar product just because it's cheap is sacrilege to us. Pricing can be relevant, but when it comes to videocards, we typically anchor our opinions on the toughest criteria we know of: 3D performance in the most demanding games on the market, at resolutions of 1920x1200 and higher and with all eye candy enabled.

While our editorial mantra might best be expressed as "better, faster, stronger" (hey, we should do a cover story on that!), there's no escaping the fact that the videocard market boasts a broad spectrum of inexpensive—and intriguing—alternatives. In fact, as AMD and Nvidia have been battling for supremacy at the top of the market, we've watched the entry points for penultimate-performance videocards gradually but consistently come down to earth. Sure, playing Crysis on a 30-inch panel might be out of the question if you're running one of the lower-priced cards, but we still wanted to discover the 3D tipping point—the point at which you're better off giving up PC gaming altogether because the card you're running is horribly, utterly lacking in horsepower.

To hack our way through the 3D puzzle, we assembled a field of six videocards, ranging in price from less than $100 to a maximum of $250. We asked AMD and Nvidia to pick three of their best third-party representatives within this spectrum, but it must be noted that we're not pitting the two companies against one another. This article is not an AMD versus Nvidia cage match. In a nutshell, we wanted to know how little you could spend before your 3D firepower became woefully incapable, and for this reason we'll be presenting our six reviews in street-price order, from lowest to highest.

In our book, an acceptable gaming card must be capable of running Far Cry 2 and Crysis at 60 frames per second with a resolution of 1680x1050. Anything short of this performance metric falls below our basic expectations (though for these two games we *are* willing to sacrifice antialiasing and some other high-end features). Similarly, an acceptable card must be able to play Call of Duty 4 at 60fps at that same 1680x1050 resolution with 4x antialiasing.

Nonetheless, all "frame rate is king" posturing aside, we're also of the opinion that you don't necessarily have to be a hardcore gamer to be a PC enthusiast, so we also examined each budget card's feature set to evaluate its home-theater capabilities. And after taking price, performance, and feature set into consideration, we awarded a pass-or-fail rating to each card—this in addition to our usual numeric verdict. Bottom line: If a card receives a fail mark, it's not worth your money, no matter how cheap it sells for.

So, PC enthusiasts don't have to be gamers, but can they be skinflints? Let's find out.

PHOTOGRAPH BY MARK MADEO

$90

PowerColor Radeon HD 4830

Chop, chop!

The Radeon HD 4830 at the heart of this card is a cut-down version of AMD's second-best graphics processor, the RV770. The 4830 has 640 stream processors, compared to the 800 processors in a higher-end card such as the Radeon HD 4870.

The 4830 is designed to run at slower clock speeds, too, and PowerColor sets this model to operate its core at 575MHz and its 512MB of GDDR3 memory at 900MHz. These are pretty hobbled specs compared to those of the reference-design Radeon HD 4870, which boasts core and memory clock rates of 780MHz and 1GHz, respectively.

PowerColor also departs from AMD's reference design by slapping on an oversized cooler. The RV770 is known to run warm, so we applaud the decision. Bear in mind, however, that the heatsink and fan will obscure whatever slot is adjacent to the card.

We also cheer the company's decision to include an HDMI port right on the mounting bracket, eliminating the need for an adapter that will add nearly two inches to your PC's overall depth. When you shove your computer into your entertainment center, two inches can mean the difference between success and failure.

But the Radeon HD 4830 fails to meet our minimum gaming performance requirements, delivering Crysis at 53.5fps and Far Cry 2 at 52.7fps. And since this particular card is too noisy to be considered for a home-theater PC, we can't recommend it to enthusiasts for that application, either.

If PowerColor's Radeon HD 4830 didn't have such a noisy fan, we could at least recommend it as a home-theater solution.

:-(FAIL **VERDICT 5**

PowerColor Radeon HD 4830 (model AX4830 512MD3-H)
$90, www.powercolor.com

$130

PowerColor Radeon HD 4850

A solid value, especially for a home-theater PC

Whereas AMD's Radeon HD 4830 resembles a Radeon 4870 after a partial lobotomy, the Radeon HD 4850 that sits between these two cards comes with a full complement of 800 stream processors. But don't make the mistake of thinking you can overclock a 4850 board to achieve the same performance as one based on the 4870: The latter uses GDDR5 memory while the former is limited to GDDR3.

PowerColor nudged this card's core clock speed a wee bit to 635MHz (10MHz above stock), but left its 512MB of memory running at a stock 993MHz. Here again, PowerColor attached a decidedly non-stock cooler to the GPU and memory, though it proved to be quieter than the larger fan on its Radeon HD 4830 board. In addition to a dual-link DVI port, PowerColor provides both an HDMI port *and* a DisplayPort connector on the mounting bracket—the only card in this roundup to offer such a complete array of outputs.

Delivering higher benchmark results at a street price that's $20 lower than EVGA's GeForce 9800 GT, PowerColor's implementation of the Radeon HD 4850 delivers an excellent price/performance ratio. The card falls just short of our minimum performance requirements for Far Cry 2 and Crysis, but it turned in a great performance with CoD 4. Its quiet nature and native HDMI support render it worthy of consideration for a home theater.

We never thought we'd give even a qualified recommendation to a $130 videocard, but we can give this one a thumbs-up.

:-) PASS **VERDICT 7**

PowerColor Radeon HD 4850 (model AX4830 512MD3-H)
$130, www.powercolor.com

$150

EVGA GeForce 9800 GT

What's in a name?

Nvidia's GeForce 9800 GT is really just a rebadged GeForce 8800 GT, which makes it the only card in our roundup based on a previous-generation GPU architecture: Nvidia's 65nm G92. Despite its age, however, the G92 helped EVGA's GeForce 9800 GT best PowerColor's Radeon HD 4830—at least in terms of gaming performance.

EVGA runs the 9800 GT's core at 600MHz, but takes full advantage of its 112 shader processors' capacity for operating at much higher frequencies: 1,500MHz in this implementation. The card has a 256-bit memory interface to a full gigabyte of GDDR3 memory running at 900MHz.

The 9800 GT's gaming benchmark performance edge, however, was limited to single-digit percentages. As with PowerColor's Radeon HD 4830, EVGA's card fell short of delivering what we consider to be the minimum acceptable frame rate (60fps) with Far Cry 2 and Crysis on a 22-inch display.

So we can't recommend this card from a gamer's perspective. Is it any better for home-theater applications? Barely. It's relatively quiet, but not every HTPC enclosure will accommodate its nine-inch length. And while it does have a S/PDIF input, so you can add digital audio to the signals being output to its DVI ports (provided there's a S/PDIF header on your motherboard), EVGA doesn't include the DVI-to-HDMI adapter needed to transmit both audio and video over a single cable.

EVGA's GeForce 9800 GT fails to meet our minimum gaming performance requirements; it's not an ideal solution for home-theater applications, either.

:-(FAIL **VERDICT 6** EVGA GeForce 9800 GT (Model 01G-P3-N981-TR) $150, www.evga.com

$200

EVGA GeForce GTX 260 Core 216

OK, now we're getting somewhere

This card is based on Nvidia's most current GPU architecture, the GT200. Priced at $200, it's the least expensive model we tested that's capable of running Crysis at 60-plus frames per second.

If you shop for a GeForce GTX 260 card, make sure you're comparing apples to apples: Core 216 models like the one you see here are manufactured using a 55nm process, and are outfitted with 216 shader processors. Conversely, cards based on the original 65nm GTX 260 GPU remain on the market but possess only 192 processors. Both versions have a 448-bit interface to 896MB of GDDR3 memory.

EVGA overclocks the core in this particular model to 626MHz (up from a stock 576MHz) and gooses its memory to 1,053MHz (Nvidia reference designs run at 999MHz). The shader clock runs at 1,350MHz (up from a stock 1,242MHz).

The GTX 260 Core 216 has two six-pin power sockets, and you'll need at least a 500-watt power supply to run it. EVGA provides Molex adapters if your PSU isn't outfitted with the appropriate cables. The company also provides a DVI-to-HDMI adapter and the S/PDIF cable needed to pipe audio from your motherboard to the videocard.

Buyer beware: There are two versions of the GeForce GTX 260. The original model has 192 shader processors, while the Core 216 has—you guessed it—216.

This card served up Crysis at 64.9fps and Call of Duty 4 at an even more impressive 103.2fps. Oddly enough, it achieved only 58.7fps in Far Cry 2—but that's close enough for the guys we swing with.

:-) PASS **VERDICT 7** EVGA GeForce GTX 260 Core 216 (model 896-P3-1255-AR) $200, www.evga.com

SEPARATION OF POWERS

AMD vs. Nvidia: Competing Features

AMD and Nvidia both trumpet extra "features" that are exclusive to their respective platforms. Nvidia's unique technologies are CUDA, PhysX, and GeForce 3D Vision, while AMD has ATI Stream, an integrated digital audio engine capable of sending audio over HDMI without any internal cabling, and support for DirectX 10.1 and Shader Model 4.1. Of these features, the only one that's of any significant value to someone buying a cheap videocard is AMD's solution for routing audio through HDMI. The RV770 has an integrated Realtek 7.1-channel audio device, so it can output surround sound directly to DVI or HDMI. All Nvidia solutions require an internal S/PDIF cable.

CUDA and ATI Stream are the two competitors' respective GPGPU technologies. GPGPU stands for "general purpose graphics processing unit," and enables a GPU to run applications that are typically handled by a CPU. Despite the hype, neither company's approach has gained significant traction in the marketplace, and by the time they do (if they ever do), you'll be ready for another videocard.

PhysX is an API for accelerating physics processing in games. Nvidia likes to advertise it as a "free" benefit, but it's not free in terms of computational power. To wit: If a card based on the GeForce 9800 GT can't run Crysis at 60fps, it doesn't have any reserve horsepower for physics processing. The same goes for GeForce 3D Vision, Nvidia's stereoscopic vision product.

AMD's support for DirectX 10.1 and Shader Model 4.1 is largely irrelevant, since so few games take advantage of this interim release.

$220

HIS put two dual-link DVI ports and an S-Video output on the mounting bracket; you'll need a DVI-to-HDMI adapter to connect to a digital home-theater system.

HIS IceQ 4+ Radeon HD 4870

This thing's got ultraviolet bling

The 55nm RV770 is one of the best arrows in AMD's GPU quiver, so it's a good thing the part has proven to be both versatile and powerful. As deployed in the Radeon HD 4870, the RV770 has a full complement of 800 stream processors—just like the Radeon HD 4850—but in this design, the GPU is paired with GDDR5 memory.

GDDR5 memory boasts a very high data rate (ranging from 3.6Gb/s to 6.0Gb/s, compared to GDDR3's 1.0Gb/s to 2GB/s). This enables AMD to deliver nearly the same memory bandwidth through a relatively narrow and inexpensive 256-bit bus as it would with a much wider and costlier 512-bit bus.

High-end Radeon HD 4870 cards feature 1GB of GDDR5, but HIS's budget-oriented model is outfitted with 512MB. That might leave you a little constrained, as game developers have come to expect that gamers will own videocards with large frame buffers. Nonetheless, as you can see from our benchmarks, a halved memory allotment didn't cause undue punishment in the games we tested.

This card is priced $20 higher than the EVGA GeForce GTX 260, but delivers far better performance in Far Cry 2 and Crysis. It also came within spitting distance of our top budget performer, EVGA's GeForce GTX 275, which costs $30 more.

The RV770 tends to run hot at high clock speeds, but HIS's IceQ 4+ heatsink/fan design keeps temperatures manageable without polluting your environment with noise. This chip has never exhibited a great deal of headroom for overclocking, but HIS managed to squeeze out a few extra cycles: The core runs at 780MHz (compared to 750MHz stock) while the memory hums along at 1,000MHz (compared to 900MHz stock).

Finally, if you enjoy a bit of bling inside your PC, you'll dig this card, as the plastic shroud over the cooler reacts to ultraviolet light. Install a cold-cathode UV light in your case, and the entire shroud will emit a deep blue glow.

:-) PASS VERDICT 8

HIS IceQ 4+ Radeon HD 4870 (model H487QT512P)
$220, www.hisdigital.com

$250

The GeForce GTX 275 is basically a crippled GTX 285, created for the sole purpose of filing a particular price point to compete with AMD's Raedon HD 4890.

EVGA GeForce GTX 275

Here's why competition is so essential

Nvidia pretty much owns the top end of the GPU market, thanks to the mighty, dual-GPU GeForce GTX 295. But no manufacturer can survive by selling low-volume parts, no matter how pricey they may be. Selling oodles of moderately priced products is where the real money is made. And that's where the GeForce GTX 275 comes in.

Nvidia would never have concocted the GTX 275 had AMD not launched the Radeon HD 4890. Competition is the consumer's friend.

The GTX 275 is based on the same 55nm silicon as the GTX 285, and all of its 240 shader processors are enabled. However, for this reference design, Nvidia does disable one of the chip's raster operations (ROP) partitions, reducing its ROP count from 28 to 16 and narrowing the memory interface from a width of 512 bits down to 448. While this interface is much wider than the one AMD uses in the Radeon HD 4870, don't forget that AMD pairs its GPU with higher data rate GDDR5 memory, whereas Nvidia continues to rely on the much slower GDDR3 (there is 896MB of it in this design). This gives ATI a hefty advantage in the memory bandwidth battle between even the older Radeon 4870 and the GTX 275, to say nothing of the newer Radeon 4890.

EVGA adds just a touch of overclocking to Nvidia's reference design, bumping the core clock speed to 648MHz (from a stock 633MHz), the shader processor speed to 1,458 (from a stock 1,404MHz), and the memory speed to 1,188MHz (from a stock 1,134MHz). But for all that, the GTX 275 proved to be only marginally faster than the less-expensive Radeon HD 4870.

At 10.5 inches long, the GTX 275 is too big for the typically cramped quarters of a home-theater PC (or even many midtowers). It would also likely be too warm, since it can consume up to 219 watts of power.

:-) PASS VERDICT 8

EVGA GeForce GTX 275 (model 896-P3-1170-AR)
$250, www.evga.com

FRAME RATE BOOSTER

Sacrificing Eye Candy for Speed

You can't have your cake and eat it too. If you want to boost your game's frame rate on an inexpensive videocard, you'll need to sacrifice some of the game's visual features. It's best to do this on a game-by-game basis, either by setting up individual profiles using the videocard's control panel, or by accessing the game's graphics options menu. This way, you can utilize antialiasing on a game like Call of Duty 4, but turn it off when you play a more computationally intense title like Crysis.

Alternatively, you can make your tweaks using the global settings in the videocard's control panel, which will affect every game. Here are our suggestions, in order of their impact on frame rate (from highest impact to least).

- **Lower the resolution. While it's true that any game will look better running at the display's native resolution, playing a slide show is no fun at all.**
- **Turn off or reduce the level of advanced visual features such as DirectX 10 features, soft shadows, shadow filtering, soft smoke edges, water reflections, and so on.**
- **Reduce the game's antialiasing level or turn it off entirely. This will result in jagged edges, but it will take a big load off the GPU.**
- **Reduce the level of anisotropic filtering. This will reduce the quality of textures viewed at an oblique angle, such as those applied to objects on the horizon.**
- **If the game supports it, try switching from high dynamic range lighting to bloom lighting.**

And in the Final Analysis...

Start collecting those pennies for your next budget PC building project—inexpensive videocards aren't always crap

Considering there's only a $90 price gap separating the least-expensive GeForce GTX 275 card (arguably the best budget solution) from the most-expensive GeForce GTX 285 card (arguably the best high-end choice, if you exclude dual-GPU cards), should enthusiasts give *any* budget videocard a second thought?

In our view, the price/performance ratio of the high-end cards more than justifies their steeper price tags. But $90 is $90, and if you're a gamer and $250 is the absolute most you can spend on a videocard, you have a plethora of choices to consider. In this roundup, HIS's $220 Radeon HD 4870 card delivered the best bang for the buck. EVGA's GeForce GTX 275, meanwhile, didn't deliver a significant jump in gaming performance—certainly not enough to justify a $30 price bump. On the other hand, PhysX does lend visual flair to the few games that take advantage of it, and PhysX is available only on Nvidia GPUs.

If you're looking for other forms of computer entertainment—movies, for instance—you won't gain anything by moving up to a more expensive class of videocard. In fact, these cheaper cards will serve your needs *better* because they require less cooling and therefore produce less noise. If you're looking for a videocard to drop into your home-theater PC, PowerColor's Radeon HD 4850 is the best choice among the cards we tested, thanks to the Radeon's integrated HD audio and the presence of an HDMI port on the card's mounting bracket.

Nvidia's solution—using an internal S/PDIF cable—is something of a kludge, and it won't work at all if your motherboard doesn't have a S/PDIF header. Then again, DRM restrictions prevent any PC from transporting HD audio from a Blu-ray disc (we're talking Dolby TrueHD and DTS-HD Master Audio) to an A/V receiver.

Bottom line: There's never been a better time to be in the market for a new videocard. And you don't have to drain what's left of your massacred 401(k) to pay for it.

BENCHMARKS

	PowerColor Radeon HD 4830	PowerColor Radeon 4850 HD	EVGA GeForce 9800 GT	EVGA GeForce GTX 260 Core 216	HIS IceQ 4+ Radeon HD 4870	EVGA GeForce GTX 275
Driver Version	9.4	9.4	182.5	182.5	9.4	182.5
Far Cry 2 (fps)	52.7	56.9	55.0	58.7	68.3	**68.8**
Call of Duty 4 (fps)	64.2	74.6	66.7	103.2	93.9	**113.8**
Crysis (fps)	53.5	56.2	55.1	64.9	68.0	**69.0**
3DMark Vantage Game 1 (fps)	12.3	15.6	12.3	23.9	26.8	**27.6**
3DMark Vantage Game 2 (fps)	13.3	15.8	13.3	21.8	**27.5**	24.8

Best scores are bolded. Benchmarks run on an Intel Core 2 Duo E8600 with 4GB of DDR3 memory in an Asus P5Q3 Deluxe motherboard running Windows Vista (64-bit Home Premium). All games tested at 1680x1050 resolution. 3DVantage games tested using Performance preset, Crysis and Far Cry 2 tested without AA, Call of Duty 4 tested with 4x AA.

IS PC GAMING

- [ ] A) Dead?
- [x] B) Changing?
- [x] C) Growing?

Anyone who answered A, go and stand in the corner. If you answered either B or C, have a cookie and pat yourself on the back. That said, every man and his blogging dog seem to have their own pet theory on the state of PC gaming, and that can make things wildly confusing. Compounding this is the fact that "PC gaming" has become an astonishingly broad term. Are MMOs, for instance, a mere part of PC gaming, or do their players' tendency to stick with one game for years now make them a separate industry of their own? Should the independent developers churning out inspired Flash games and mods be lumped in with the mega-budget Need for Speeds and Crysises of this world?

Here's how we see it.


WARCRAFT
grand theft auto IV
ACCOUNT
PASSWORD
LOGIN
BLIZZARD
STEAM
Wii

THINK BEYOND THE BOX

While, yes, it's true that retail sales of most PC games in plastic boxes might not be in the hardiest of health right now, PC gaming as a whole is expanding. Visit Kongregate or Newgrounds and you'll leave with a justified impression that there are more people currently making PC games than ever before. Meanwhile, Google ads on a host of gaming sites reveal an unending slew of MMOs you've never heard of. Some are diamonds in the browser-based rough, others are soulless grinds, but they're all out there making money even when the PC games shelves in brick-and-mortar stores are increasingly barren and dust-covered.

To put some hard numbers on that decline, data compilers NPD recently announced that U.S. retail sales of PC games fell 14 percent from 2007 to 2008. As a worrying context, total game software retail sales in the U.S. jumped a mighty 26 percent from 2007 to 2008—largely driven by the Nintendo Wii. It's painfully easy to draw the worst conclusions from this: The PC is the Latin of the gaming world. The immediate response to such doomsaying is that, while NPD has been the go-to source for game sales figures for many years, its numbers don't include digital distribution—so no Steam, no GameTap, no Metaboli, no GamersGate, no Impulse, no EA Store, and no ongoing MMO subscriptions either, for that matter. Any document of the state of PC gaming that doesn't reference the crazy money pot that is World of Warcraft's 11 million–plus monthly global subscribers is hardly telling the real truth about the ol' IBM Compatible's health.

ON THE DOWNLOAD

While paid game downloads are still a relatively new kid on the block, their impact can't be discounted either: That -14 percent figure is all but meaningless as a prediction of PC gaming in 2008/9. Stardock—publisher/developer of recent big sleeper hits such as Sins of a Solar Empire and Galactic Civilizations 2—is a PC-only outfit that sees the merit of both forms of distribution: "On day one, digitally distributed games do better," reveals Stardock's CEO and founder Brad Wardell. "Then for the next six months, the boxed version dominates. Then after six months, the digital versions start to catch up again."

Valve's Doug Lombardi is similarly nonpartisan: "Most of the data we've seen from Steam and from others who sell products at retail and online is that retail remains more or less steady and the majority of the growth seen recently, and projected in the years to come, is from digital sales/revenue. So, it's healthy and it's growing. We don't look for retail to go away, but instead see online as a multiplier for sales overall, and a vehicle for creating better products and services." Of course, for as long as retailers are still earning good money, slump or not, any publisher would be crazy to call them extinct just yet. What is clear is that the download market isn't some tangential newcomer anymore: It's big business, and a major signpost as to the future of the PC.

Valve's Steam is one of the bigger download stores, but not the be-all and end-all. GameTap remains a major rival in the United States.

A recent poll of gamers' buying habits, conducted by gaming website RockPaperShotgun.com, revealed that a whopping 47 percent of them were regularly purchasing

AROUND THE GLOBE

PC Games Enjoy Dominance in Non-Western Countries

While you could be forgiven for thinking consoles currently rule the U.S. and U.K., in much of the rest of the world the PC remains the top dog. Take South Korea and the former USSR, where the influx of Japanese consoles and American console games we enjoyed in the late '80s and early '90s never quite materialized. South Korea's huge game scene is thus dominated by a raft of MMOs you've never heard of and, famously, by old man Starcraft. Gaming is a fundamental part of Korean pop culture, finding its way into TV, celebrity, news, and more—and the games in question are almost exclusively on PC. A fascinating difference between their PC gaming and ours is that much of it happens in Baangs—large web cafes that are social hubs for the nation's youth as much as they are gaming dens.

Russia and splinter nations such as Ukraine, meanwhile, are fairly new to their own gaming industry, but in recent years they've been more than making up for time lost during the Cold

For a second there, it looked like Warhammer Online and Age of Conan might steal a piece of Warcraft's pie. Then the Lich King expansion arrived....

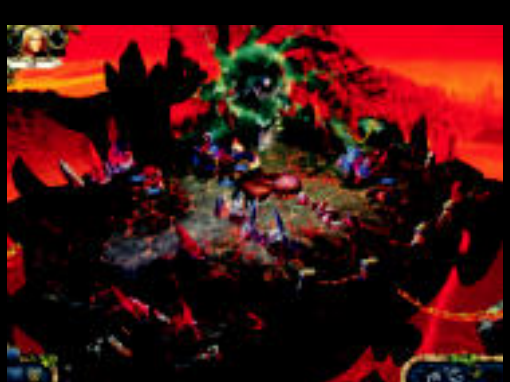
downloaded games. While admittedly that's a survey of a fairly passionate group of PC gamers rather than the unwashed masses, it still suggests that those fear-mongering NPD reports are pretty worthless in their current state. "In just under four years," says Lombardi, "Steam has grown from zero to 15 million accounts. And our installed base is still growing rapidly as more core and casual games are added to the offerings." When asked if the day is coming when Steam might house any game you care to name, Lombardi offered this: "This holiday Steam had Call of Duty: World at War, Spore, Far Cry 2, Fallout 3, Left 4 Dead, Football Manager 2009, World of Goo, Dead Space, Grand Theft Auto IV, and many more. For the most part, I think you can make that statement now."

Meanwhile, Good Old Games (Gog.com) is a thriving new home to cheap retro PC games, emphasizing that, unlike the consoles, this is a platform with a vast history. Given its game library is in the millions, it's not going away any time soon.

PIRATES ATE MY GOLD

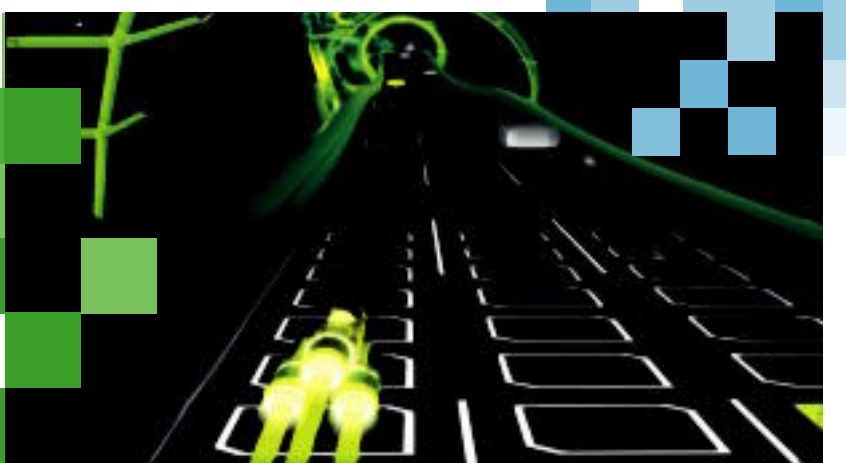
Unfortunately, there's a looming threat to both types of PC game distribution, and one that's often identified as a smoking gun for those troubled retail sales: piracy. Numerous developers and publishers have waded into the argument claiming BitTorrent is harming them, while the formerly PC-centric likes of Epic and Crytek have even claimed it's a major factor in their decision to now turn their attentions primarily to consoles.

Research into the scale—and most of all the real-world fiscal effects—of piracy remains fairly limited, and this shortage of empirical proof one way or another has made the unending online debate on the matter peculiarly confusing and often vicious. On the one hand, you have 2D Boy, the chaps behind indie mega-gem World of Goo claiming that more than 80 percent of the game's players had pirated it, but calmly stating that it hadn't harmed sales.



RPG-strategy curio King's Bounty, developed by Vladivostok, is part of a captivating second wave of Russian PC games.

War. What they lack in development experience, they most certainly have in enthusiasm and invention, coming up with astoundingly ambitious stuff like Pathologic—full of great ideas but presented terribly. Of late, however, these irrepressible enthusiasts have got a few games under their belt, which is why we've enjoyed the excellent likes of S.T.A.L.K.E.R. and King's Bounty: The Legend. Another factor that ensures the PC's dominance in Russia is the unbelievable prevalence of piracy—you can even find copied games for sale on the street. While this doesn't put any smiles on the faces of Western publishers, the PC platform is number one over there for the time being.



Dylan Fitterer's near one-man project, Audiosurf, earned him a small fortune through digital download sales.

On the other side of the argument, there's developer Cliff Harris of one-man studio Positech (best known for thoughtful indie fare such as life-management game Kudos and the sprawling politicking of Democracy): "Nobody can say with a straight face that having well-known sites where people can get your product for free has zero effect on sales. To pretend anything else is just silly," he says. "One of the things nobody ever talks about is the psychological effect piracy has on games developers. If you work 10 hours a day for a year to make something, then find people taking it for free 24 hours after release, you just cannot begin to describe how depressing that feels."

INDIE, WE LOVE YOU

The crux of the piracy debate often hinges on the question of whether someone who BitTorrents a given game would otherwise have been a customer of it. On the one hand, that person is clearly not paying to play your game. On the other, there's every chance that the only reason they're playing it is because they didn't have to pay. Meanwhile, the anti-piracy camp calls it theft, while the pro-piracy guys claim that making a digital duplicate of immaterial code is hardly the same thing as physically swiping an item. It's a semantic and ethical war which only further obfuscates an issue that's increasingly dominating all discussion about the PC as a gaming platform. Recently, id's John Carmack even claimed that PC hardware manufacturers were taking advantage of the current ubiquity and ease of piracy to help peddle more of their gear.

Still, one glance at the most leeched torrents reveals that it's the big-name games such as Call of Duty that attract the most illegal downloaders. Indie developers might have more to lose, but not yet being mainstream is to their advantage. That's perhaps one of the reasons why

ANOTHER WORLD

MMOs: a Help or a Hindrance?

For a few years now, there's been this assumption that massively multiplayer online games are the logical future of not just PC gaming, but all gaming. World of Warcraft's 11 million subscribers and its slew of imitators seemed to promise an endless money fountain. That is, as Stardock's Brad Wardell observes, a two-edged sword: "They've taken a lot of revenue out of the game industry in general and concentrated it into a few specific areas. For instance, in the 'old days,' the demographics were that 20 percent of the PC gaming population represented 80 percent of the revenue of PC games. But now, a good chunk of that hardcore are subscribed to an MMO and are no longer buying six to 12 games a year, but buying two to three games a year, which is a huge hit."

Other publishers smelled gold and a ton of big-name MMO launches appeared: Warhammer Online, Age of Conan, Hellgate, and Tabula Rasa. Two of those are dead already. The smart money thinks Conan's on borrowed time. And, just a few weeks back, EA revealed that Warhammer's promising near-million subscribers have fallen to 300,000. Suddenly the future's not so bright. On the other hand, there are two opposite poles of MMOdom in the pipeline. On the big-budget, mass-appeal end of the scale is BioWare's Star Wars: The Old Republic, which could be the first mainstream MMO to truly move beyond the World of Warcraft model. On the other is mesmerizing one-man art-project Love, which is a heartening signal that MMOs have a lot of new places to go.

On a third hand, MMOs continue to do gangbusters in Korea and China. And more casual, kid-charming games such as Maple Story and Neopets also have massive player bases. The former, across all its various global variants, has a startling 50 million subscribers. So while Warcraft clones might be in shorter supply than anticipated over the next few years, there's a good chance that browser-based and/or low-spec casual MMOs will do far more to define the future of PC gaming.

Sins of a Solar Empire topped the U.S. retail charts by identifying a specific audience rather than being all things to all gamers.

there's a thriving indie scene, both paid and free, despite Big Publishing's doom-saying about the PC. "There is widespread acceptance of indie gaming, and it's easier for indies to be taken seriously as a creative force," says Positech's Cliff Harris, who recently released Kudos 2 to a warm response. "Also, advances in PCs mean that you no longer have to optimize the hell out of C++ to run a game at 30fps, so you don't need my phenomenal coding skillz to be an indie developer any more. There are lots of reasons for the big budget games to die out. The graphics arms race is definitely slowing down. In terms of profitability, indie devs like 2DBoy or even me are probably more profitable per employee than Activision."

Valve's Steam has quickly become a major portal for some of the higher-profile indie games—the low-budget likes of World of Goo and Audiosurf have been big hits on the download service. "They're very profitable," agrees Valve's Doug Lombardi. "And that's the beauty of the indie gaming scene: one person to a handful of people can make a game and if it hits at all, it's money hats for everyone." Rumor even has it that Valve literally made a money hat to congratulate Audiosurf's Dylan Fitterer on the MP3 racing game's huge and lucrative success.

Of course, if indie games do become the dominant force on the PC, it's bad news for Nvidia and ATI-AMD. We're already at the point where there's little reason for most PC owners to have anything beefier than a midrange graphics card, and with the Xbox 360 and PS3 now entering their latter years, we can't expect many console ports—currently the major source of big-name PC titles—to demand especially high-end PCs. Meanwhile, Intel is pushing back with efforts to make the CPU rather than GPU the key component in a gaming PC, as well as readying its hybrid CPU/GPU Larrabee chip. Unless there's an unexpected new glut of PC-exclusive graphics-fests, as with that double-whammy of Half-Life 2 and Doom 3 back in the day, there could be dark days ahead for high-end 3D cards.

TIMES ARE CHANGING

Stardock's Brad Wardell has a slightly different take: "We experienced a temporary change from the trend that had existed for many years prior. In the 1980s, consoles dominated and PCs were the exception. But then there was a meltdown in the console market that allowed PC games to dominate. What we've been seeing since has been the gradual reassertion of consoles and the PC gradually returning to its core strengths. Action games, sports games, and other console-centric games were never the types of games that were the PC's to lose."

Stardock makes what you could call traditional PC games—high-strategy, role-playing, 4X. To a casual observer, space RTS Sins of a Solar Empire might be living up to every stereotype of PC gaming, but it's paying off—it was the number one PC game at U.S. retail earlier last year. And that's despite the good chance that most gamers have never heard of it. It appeals directly to a specific audience, which is in stark contrast to a big FPS's attempts to appeal to as wide an audience as possible, thanks to the relative genericism of shooting men in the face. The latter approach potentially means more sales, but the former means getting the game exactly right for a certain group of people, and without having to rely on costly, time-consuming graphical prowess to lure an audience. It's an approach we can expect to see more of—you can even argue that the higher-profile, glossier likes of Dawn of War 2 and Left 4 Dead are taking a similar approach. They're games in which the mechanics are far more important than the appearance.

Declining retail sales and the BitTorrent bogeyman aren't, then, a death knell for PC gaming. Whether it's growing into something new, beautiful, and impressively independent or returning to the ideals it was founded upon back before Doom brought about the age of graphics and adrenaline, PC gaming is in probably the most exciting state it's been in for years. Viva la evolution!

WHITE PAPER

Surge Suppression

Stamp out power surges before they stomp on your PC

-MICHAEL BROWN

The surge suppressor is one of the unsung heroes of the computer world. Often valued more for its ability to multiply one electrical receptacle into many than for its role as protector of all things electronic, the surge suppressor is your first line of defense against transient power surges that can damage or destroy sensitive components inside your PC. Let's take a look at how they work.

Before we tackle the concept of surge suppression, we should first understand what exactly a surge is. In the United States, electrical energy flows through standard household wiring at an average rate of 120 volts. Because the system used is alternating current, the voltage level of every AC cycle reaches a peak value that's roughly 1.414 times higher than 120 volts. A surge occurs when the voltage level suddenly rises significantly higher than that. A lightning strike on a power line, for instance, will cause a transient spike in the electrical power entering your house. Problems with your utility company's equipment (anything from a downed power line to a defective transformer) can also cause power surges.

Appliances and other electrically powered devices *inside* your home, however, are much more common causes of power surges. Any device that requires a large amount of energy to switch on or off—examples include refrigerators, vacuum cleaners, and air conditioners—can disrupt the flow of voltage through your home's electrical wiring. Surges such as these don't pack as much destructive power as a lightning strike, but they can cause as much damage, instantly or over time.

THE FIRST LINE OF DEFENSE

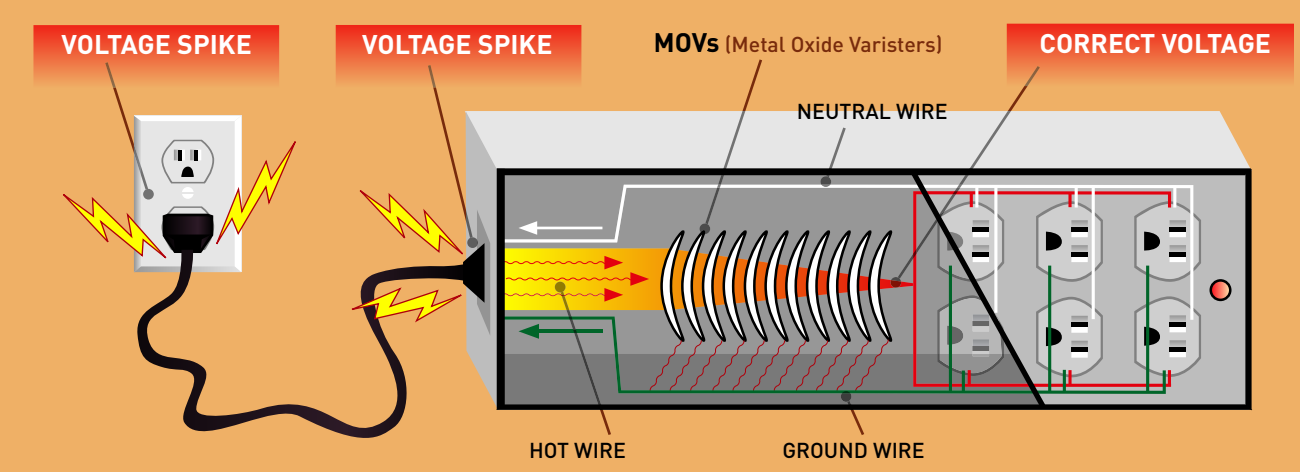
When you plug a surge suppressor into an electrical outlet in your wall, it will pass the electrical current from your home's wiring to each of the devices plugged into its several receptacles. But the current will first pass through at least one component called an MOV, which stands for metal oxide varistor. If the voltage entering the MOV is higher than a specified value, the MOV will conduct the extra electricity either to the surge suppressor's neutral wire or to its grounding wire.

WHEN THE VOLTAGE IS BELOW A DEFINED LEVEL, THE ELECTRODES PRESENT VERY HIGH RESISTANCE

An MOV consists of a mass of metal oxide grains (typically zinc oxide, with small amounts of bismuth, cobalt, and manganese) sandwiched between two metal plates that function as electrodes. One electrode is

HOW IT WORKS

Surge Suppressor



As abnormally high voltage surges into the outlet strip, the MOVs respond by decreasing their resistance, channeling the excess voltage to ground. As the surge diminishes, the MOVs' resistance increases so that the correct amount of voltage reaches the receptacles.

connected to the surge suppressor's hot wire (the one carrying the electrical current) and the other is connected to its neutral or ground wire. These electrodes exhibit variable resistance (hence the term "varistor") dependent on the voltage passing through them.

When the voltage is below a defined level, the electrodes present very high resistance, so the current bypasses the MOV and runs through to the outlet strip's receptacles. When the voltage exceeds that defined level, the electrodes change character and present very low resistance. At this point, the MOV absorbs some of the excess current (dissipating the energy in the form of heat) and conducts more of it to the ground wire to bleed off the excess voltage. As the surge passes and the voltage in the hot wire returns to normal, the MOV reverts to its previous state of high resistance.

SURGE SUPPRESSOR RATINGS

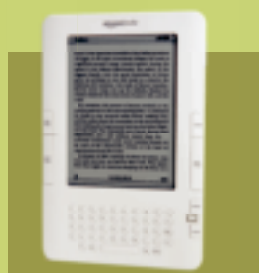
A surge suppressor's clamping voltage rating specifies the amount of voltage that will cause its MOVs to conduct electricity into its ground wire. A reputable manufacturer will submit its surge suppressor to Underwriters Laboratory for testing according to its UL 1449 standard. A lower value indicates better protection, but 330 volts is the minimum clamping value a manufacturer can claim according to the UL standard. A surge suppressor's joule rating, which defines now much energy it can absorb and/or dissipate before it fails, provides a second means of measuring its effectiveness at smoothing energy spikes. In this case, a higher number indicates better protection.

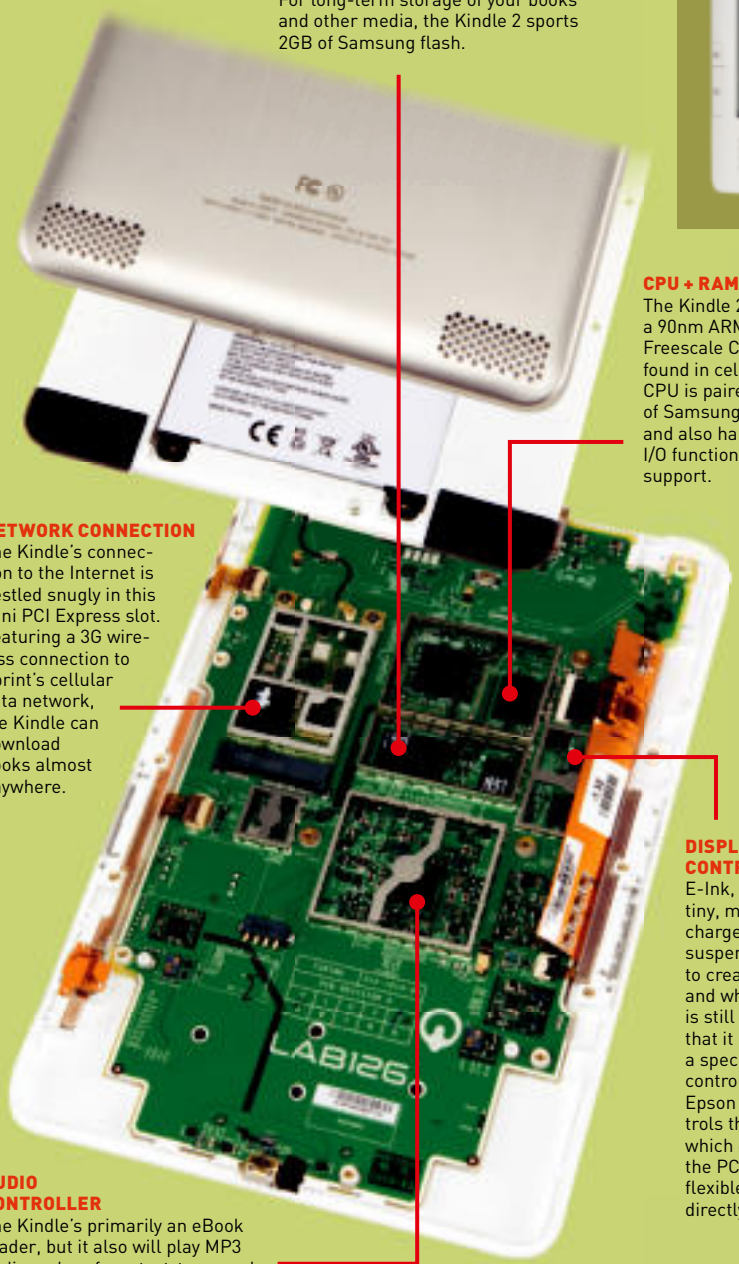
There will always be a slight delay before a surge suppressor can respond to a power surge; the longer the delay, the longer the devices connected to it will be exposed to the surge. Fortunately, surges also take a few microseconds to reach their peak voltage, which gives the surge suppressor time to react. A suppressor with a one-nanosecond response time will be fast enough to shield connected devices from damaging energy spikes.

MOVs degrade after responding to a few major surges or many smaller ones. A fully degraded MOV offers no protection, but it also won't prevent power from reaching the outlets. A high-quality surge suppressor will include a thermal fuse or a circuit breaker that can cut off power if a particularly strong surge exceeds the MOVs' capacity to absorb it or redirect it to ground. A good surge suppressor will also feature an LED to indicate that its MOVs remain viable. When the LED fails to light, the surge suppressor should be replaced.

Amazon Kindle 2

While it's easy to admire its E-Ink screen without cracking the Kindle 2's case, we wanted to see what other hardware lies inside this tiny wonder.





FLASH MEMORY
For long-term storage of your books and other media, the Kindle 2 sports 2GB of Samsung flash.

CPU + RAM
The Kindle 2's CPU is a 90nm ARM-based Freescale CPU commonly found in cell phones. The CPU is paired with 128MB of Samsung DDR SDRAM, and also handles many I/O functions, like USB support.

NETWORK CONNECTION
The Kindle's connection to the Internet is nestled snugly in this Mini PCI Express slot. Featuring a 3G wireless connection to Sprint's cellular data network, the Kindle can download books almost anywhere.

DISPLAY CONTROLLER
E-Ink, which uses tiny, magnetically charged pellets suspended in fluid to create a black and white image, is still new enough that it requires a special display controller. This Epson chip controls the display, which connects to the PCB using the flexible connector directly above.

AUDIO CONTROLLER
The Kindle's primarily an eBook reader, but it also will play MP3 audio and perform text-to-speech on your books. The Freescale audio processor handles those tasks.

SUBMIT YOUR IDEA Ever wonder what the inside of a power supply looks like? Don't take a chance on destroying your own rig; instead, let us do the dirty work. Tell us what we should crack open for a future autopsy by writing to comments@maximumpc.com.

HOW TO

Step-by-Step Guides to Improving Your PC

THIS MONTH

YELLOWTAIL NETWORKING

NORMAN CHAN
ONLINE EDITOR

While fumbling around with multiplayer connection issues in Stardock's Demigod game this month (see our review on page 91), I rediscovered Hamachi (http://bit.ly/96Al), a free app that we've recommended in the past for quick and easy virtual networking. With Hamachi, my gaming buddies and I were able to simulate LAN games for pain-free multiplayer sessions, completely bypassing Stardock's broken online servers. This got me thinking about the benefits of running a VPN and other practical uses for Hamachi.

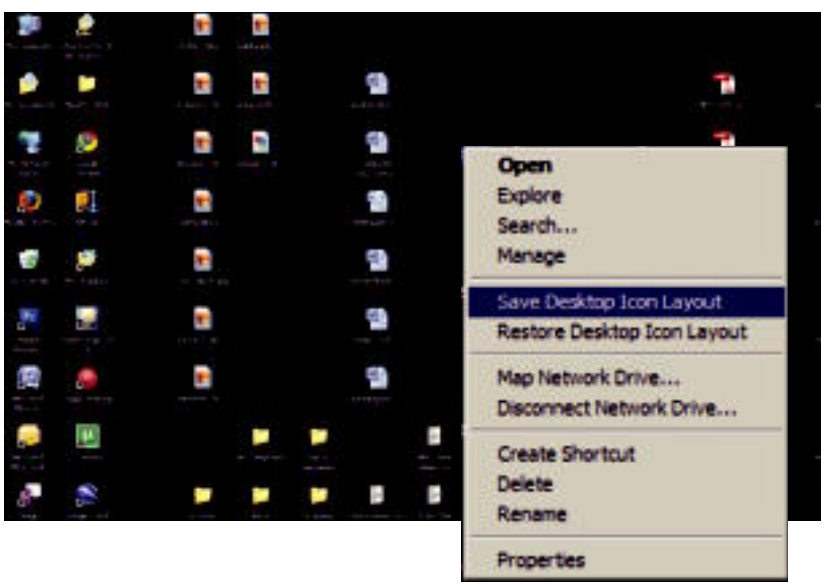
One obvious use is legacy support for older games that don't have Internet multiplayer browsers. Emerging online retail services like Good Old Games (www.gog.com) are breathing new life into classic games like Duke Nukem 3D and Freespace 2, but gamers have limited multiplayer options since the original servers have long been shut down. Hamachi to the rescue.

Another practical use for Hamachi is to pair it with other networking applications, like remote desktop clients. One favorite of mine is Ultra VNC (www.uvnc.com), which is open source and works well with Windows XP. Have any other cool uses for Hamachi? Write in and let me know!

SUBMIT YOUR IDEA
Have a great idea for a How To project? Tell us about it by writing to comments@maximumpc.com.

WINDOWS TIP OF THE MONTH

Do the Desktop Icon Dance



Sometimes, playing a game or updating videocard drivers automatically resizes your display resolution, jumbling up your meticulously placed desktop icons. A custom .dll and registry file (http://bit.ly/5jAD0) will add a right-click menu option for My Computer to save your icon layout to restore at any time. Just drop the included layout.dll file into your C:\Windows\System32 folder and double-click the layout.reg registry file. (This only works in 32-bit versions of Windows.)

Get the Most from Your SSD

SSDs are all the rage for performance-oriented builders these days, but they aren't without problems. Even the largest solid state drive is too small to hold all the stuff we need to store on the C: drive—games, photos, music, videos, etc.—and the inexpensive models max out at around 64GB of capacity. And there's the performance problem, to boot. All but the most expensive SSDs suffer from very slow write speeds, which can have a significant impact on your real-world performance.

So what's the solution? We're going to show you how to set up your Windows install like a Linux setup—with the OS and primary apps on the SSD, and your user profile and space-hogging games on a traditional hard disk. This gives us the best of both worlds—the folders we write to most frequently are on a traditional disk, while our boot and app load times can benefit greatly from the fast read speed and low random-access time of an SSD. Best of all, you can use even a tiny 64GB SSD without having to constantly manage disk space—picking and choosing which apps and media will be stored on the small drive. -WILL SMITH

1 INSTALL WINDOWS ON YOUR SSD

While you can change the default path of your user profile using the Windows Pre-Install Kit, it's more trouble than it's worth to do it that way. Instead, we're going to tweak Windows after it's already in place. The first thing you'll need to do is install Windows on your SSD, which is essentially no different than any other time you've installed Windows. When you're prompted to create an account at the end of the install, don't use the account name you actually want; use a temporary placeholder instead. You'll create the actual account you'll use later. Don't install any applications until after you've moved your user profile.

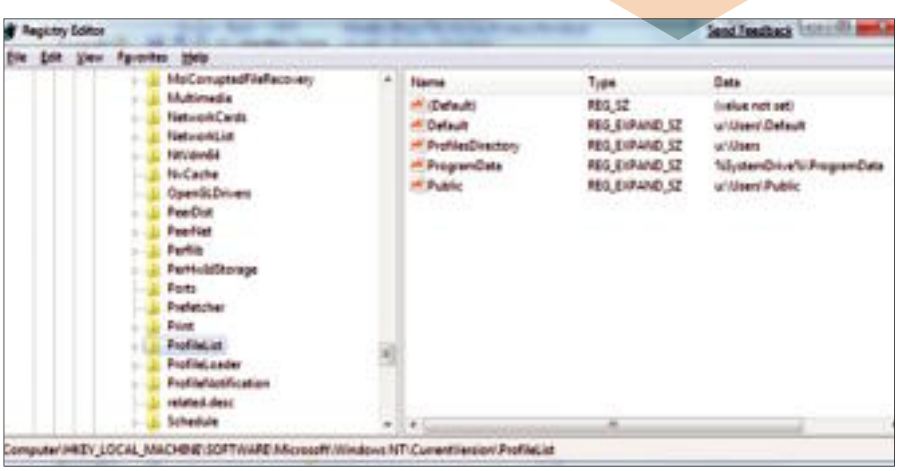
Once Windows is installed, you should create the user account you intend to use. Go to the Control Panel and search for Add User. Create your account, but don't log in yet.

We've tested our procedure with Windows Vista and Windows 7 RC, but it should work with XP as well if you adjust the paths yourself (Vista and Windows 7 store user profile in C:\Users by default, XP in C:\Documents and Settings). Once Windows is installed and updated with drivers and security patches, you'll need to set up the partitions on your hard disk.

We created two partitions on our hard disk, one for the user profile and one for games and other large applications. To access the partitioning tools, right-click Computer in the Start Menu and click Manage. Go to Disk Management. Then, right-click your hard disk and create a new partition. We made each partition roughly half of the drive, but if you have a lot of media files, you may want to make your user profile partition larger than your game partition. Once the two partitions have been formatted as NTFS, you can continue to the next step.

2 COPY YOUR PROFILES

Next, you'll want to assign a drive letter to your user profile drive. We chose U:, but you can use whatever letter you prefer. In U:, you'll need to create a folder called Users. Now, reboot your computer and



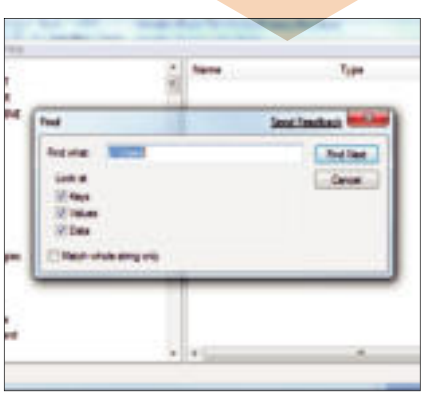
go into Safe Mode by pressing F8 as it boots. Once you're in Safe Mode, go to C:\Users and copy the Default and Public folders to U:\Users\Default and U:\Users\Public. You'll likely find some *.tmp files that simply won't copy; it's OK to skip them.

After that's done, you should open the registry editor (press the Windows key on your keyboard and type regedit). Navigate to HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\ProfileList. In that folder, you need to change the value of the Default key to U:\Users\Default, the Public key to U:\Users\Public, and the Profiles Directory to U:\Users. Reboot your PC and log in using the account you created in step 1. During the login, Windows will create your new user account, which should be in U:\Users.

3 WRAPPING UP LOOSE ENDS

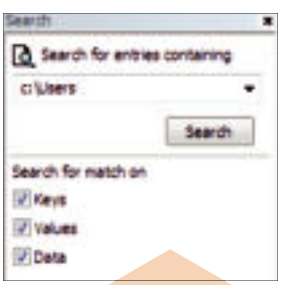
If you didn't take our advice in step 1 and start with a clean install, this is the point at which you should copy the contents of your old user profile into your new directory. Rather than doing a wholesale copy and paste of the entire directory, it's safer to only pull the files you need.

You'll also want to open the registry and do a Find for C:\Users. We found about 20 instances on our test machines, even in a fresh account. While there are some tools that will do an automatic find and replace on the registry, we chose to manually use regedit so we could verify each change ourselves. Open regedit (type regedit after pressing the Windows key), click Computer at the top of the left pane, and then go to the Edit menu and click Find. Type C:\Users and click Find. Then manually change each key to U:\Users. Press F3 to find the next instance, and keep at it until you've changed all the entries. Reboot your PC, then restart regedit and search one final time to ensure you didn't miss any entries.



If you're doing this on a machine that's been used, there will likely be a massive number of registry changes necessary. In that case, download the 30-day trial of Registry Finder (www.acelogix.com/regfinder.html) to automate some of the process. While it's not perfect, Registry Finder will find and change many of the entries for you. You'll still want to do a manual search with regedit, but Registry Finder could save you an hour of copy/pasting.

At this point, you could delete C:\Users if you so desire. We find that it's better to leave the folder, so that even poorly behaved apps that use a hardcoded profile path will continue to work. You should, however, occasionally check the C:\Users folder to see if any files have popped up there.

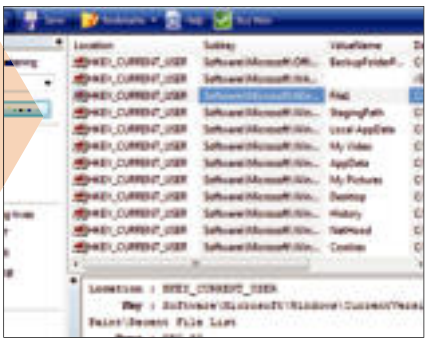


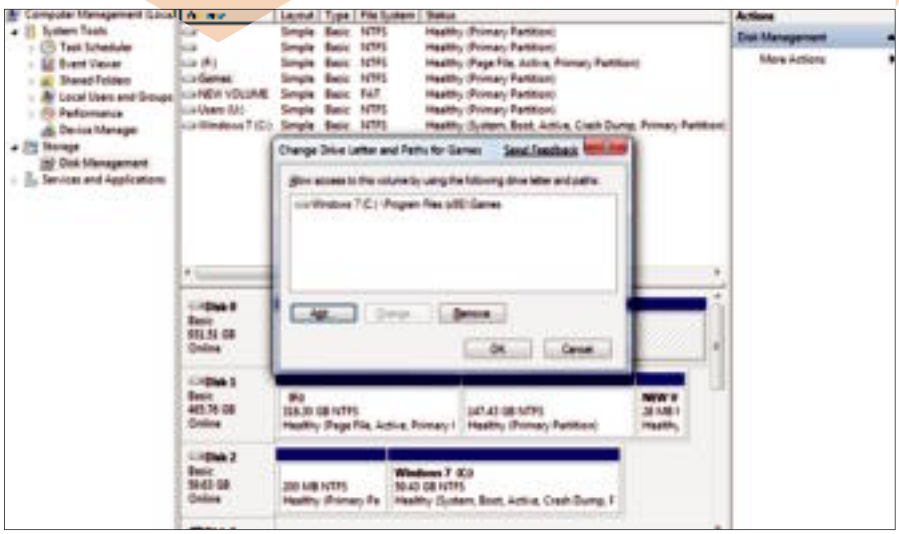
At this point, your Windows install is ready to go. However, before you install any big apps, you should mount your games partition so you don't waste precious space on the SSD for games.

4 CREATE A PLACE FOR GAMES

Now we're going to mount your games partition in the file system. First, you create a folder in your C:\Program Files directory (or C:\Program Files (x86) on 64-bit Windows) called Games. Go back to the Computer Management console and

click Disk Management. Right-click the Games partition and select Change Drive Letter and Paths. Select any drive letters that are currently being used and click Remove, then click Add. Select "Mount in the following empty NTFS folder", and browse to the Games folder you just created. Now anything you install at C:\Program Files\Games will actually be stored on your hard disk, and not your SSD. Paths and permissions will also be inherited. Be sure not to mount your Games folder to any additional drives.





Speed up and Secure Firefox

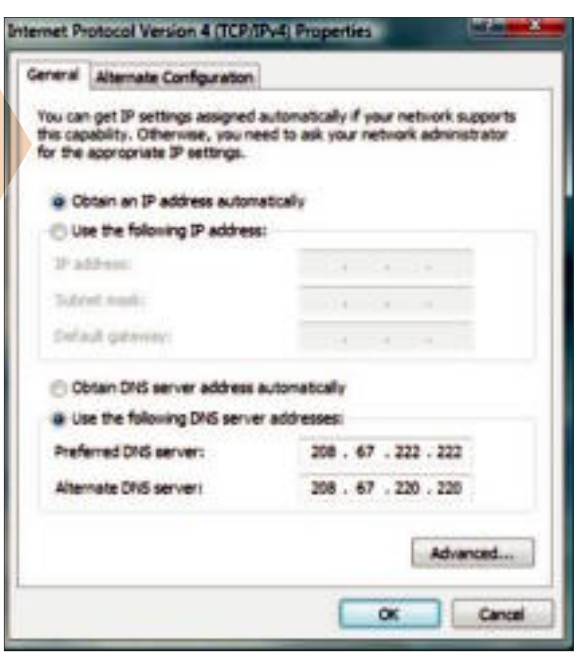
The web browser is probably the most essential application on your PC; there's no better, practical way of staying connected to news and your friends. Each of today's popular web browsers has different strengths and weaknesses. Our current favorite browser, Mozilla Firefox, is feature-heavy and relatively fast, but can become unwieldy when crammed with juicy add-ons.

In this guide, we show you the essential initial tweaks everyone should use to secure Firefox and make it perform better. Whether it's accelerating browser page-load performance, boosting security, or just improving the look of the interface, we teach you the tweaks that we think should be implemented the first time you start up Firefox after installation.

–JOSH KAMPSCHMIDT

1 BROWSE WITH OpenDNS

OpenDNS is a replacement DNS server for your computer or router. In a nutshell, DNS is the phone book for the Internet. It translates a friendly Internet domain like www.maximumpc.com into a routable IP address, which your computer then uses to navigate the Internet. Each time you visit a new website, a DNS query is issued in the background, and you're none the wiser. Internet service providers supply DNS to all their customers, but these servers tend to be overpopulated. Even if your smoking-fast fiber-optic connection can handle 18Mbps, if your ISP's DNS server wastes several



seconds looking up your favorite website your connection will be sitting in limbo in the meantime. Generally, the OpenDNS server is faster and more stable than the one provided by your ISP.

The easiest and fastest way to get up and running with your new DNS settings is to simply key them into your network card's configuration within the OS (in our case, Vista). Keep in mind that if you ever format your machine or install a different network card, you will have to go through these steps again.

Go to your Windows Control Panel and click View Network Status and Tasks. Click the View Status button next to your Local Area Network and select Properties. Choose Internet Protocol Version 4 (TCP/IPv4) and go to its Properties. Click the "Use the following DNS server addresses" radio option and type the following in the form:

Preferred DNS Server: 208.67.222.222
Alternate DNS Server: 208.67.220.220

Click OK and close the connection properties window. To see if you are using OpenDNS correctly, go to http://bit.ly/ye0eG. If you see a welcome message, then you are using OpenDNS and no further configuration is necessary.

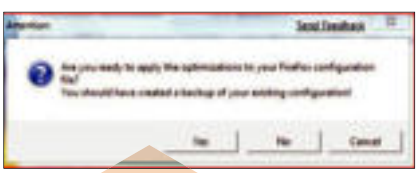
Depending on the operating system you are using, OpenDNS may have a different setup. Our guide works for Vista, but you can find the other setup guides at http://bit.ly/4FAjmb.

2 INSTALL FIRETUNE

You might have heard of accessing Firefox's hidden preferences using the about:config command in the browser's address bar. You can use this to access tons of tweaks to make Firefox load faster, browse faster, download faster, etc. How these tweaks work depends on your computer and ISP connection speeds, and your technical knowledge.

FireTune (http://bit.ly/Lgx8E) takes this approach one step further. It gives you a simple graphical interface to get the most tweaking out of Firefox without spending all day trying to comprehend what the about:config tweak is trying to do. Unzip the FireTune ZIP file and double-click the FireTune application executable. On the main menu, click "Create backup of configuration." This ensures that you will be able to restore your original configuration files if something goes wrong with the optimization. When backed up properly, you will see a Backup Successful message.

You are now ready to tweak Firefox. If you have a relatively fast computer and speedy broadband connection, select the Fast computer / Fast connection option from the main program window. Otherwise, choose one of the other options that match your system specs. The program will alert you that you should have created a backup of your configuration files, if you have already, click Yes.



You will get a prompt alerting you that you need to close Firefox or the optimizations will fail. As the prompt suggests, close all running instances of Firefox and then click the OK button. FireTune now creates the tweaks that will optimize Firefox on your system.

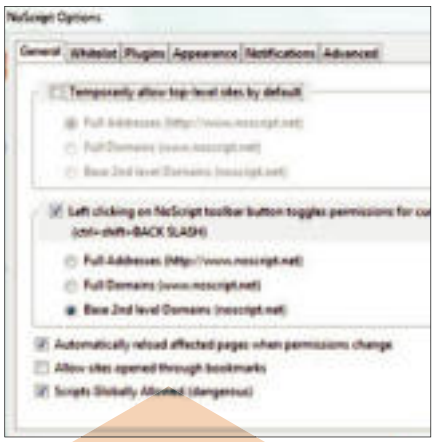
Open Firefox again and check out the results of running FireTune. Close FireTune if the tweaks were successful. If they failed for whatever reason, click the Restore original configuration button on the main window. After restoring, try tweaking again until you get the results you want.

3 DISABLE SCRIPTS

If you rarely (or don't ever) use Java or Flash, you can use an add-on called NoScript to disable these from running. It's a good idea to disable these since most malware infects your PC by exploiting one of these services. By using this tool, you can avoid getting malware from a Java or JavaScript source.

Download NoScript from its website (http://noscript.net/getit). NoScript is a typical Mozilla Firefox extension, so add to it Firefox like you would any other add-on and restart the browser.

Click the NoScript button in the lower right-hand corner of the browser window and select Options. Since we want to dis-



able Java, JavaScript, and Flash, we need to change some settings. On the General tab, uncheck Scripts Globally Allowed to disallow this dangerous option. When enabled, the program will allow any website to execute a script.

Now, click the Plugins tab and select the Forbid Java and Forbid Adobe Flash checkboxes. This will disable Java and Flash by default. You can always create an exception later in case you want to access Java or Flash on a particular website. Click OK to save the changes.

If a website doesn't work after enabling some of these options, click the NoScript button again and manually allow the options that you want to run. This lets you whitelist the content you want to run on your PC, rather than letting any website run any script at any time.

4 ENTER THE WEB OF TRUST

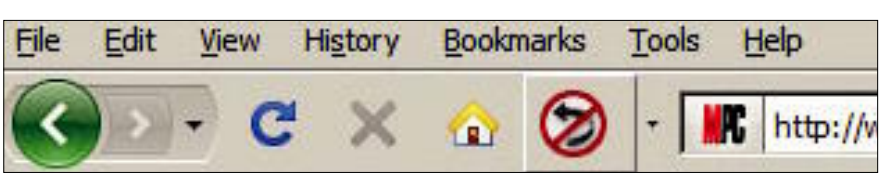
Web of Trust (http://bit.ly/u4U5) is a very useful Mozilla Firefox add-on that warns you about risky and potentially dangerous websites. It labels website links and addresses with a red-to-green color spectrum, and acquires its ratings from user reviews. Red means the website has been confirmed as malicious, yellow indicates potentially hazardous, green designates an approved website, and grey means the website has not been rated yet or does not have enough user ratings to generate a consensus.

Download and install Web of Trust, and then restart Firefox to enable the add-on. WOT will open a new tab and start the configuration process. We recommend that you choose the Maximum Safety since it not only reports harmful sites, but blocks them as well. If you can't stand the slight browsing delay (while WOT searches through its database), choose the Light Protection option. With Light Protection, you still receive all the ratings, but won't receive any pop-ups when you click through links.

5 DIRECT YOUR REDIRECTS

If you browse many websites throughout the day, chances are you are redirected from site to site. Normally, this type of redirection is harmless, but occasionally you may be redirected to a rogue website and end up infected with malware. With the Redirect Remover add-on (http://bit.ly/1sOvp), you control which sites and web domains are allowed to redirect you with links and images and which ones cannot.

After installing the add-on, right-click anywhere by the address bar and select Customize.

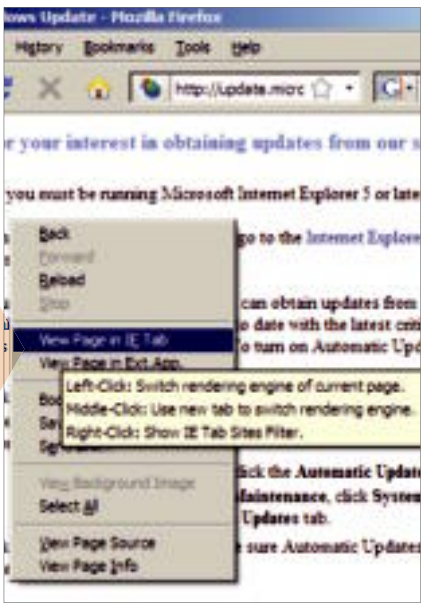


You want to customize the toolbar to make it easier to turn Redirect Remover on or off. In the Customize toolbar window, scroll down until you find the Switch RDR on/off button. Drag this button next to the Web of Trust icon (or Home button if you didn't install WOT) and to the left of your address bar. Click Done to close the window and return to the browser window.

6 EMULATE INTERNET EXPLORER

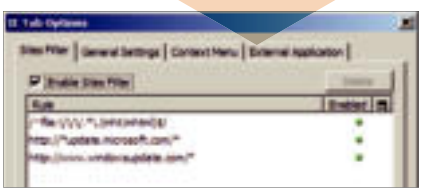
Since we use Firefox, we are often prohibited from using some websites with features that only work in Internet Explorer, such as Windows Update. IE Tab (http://bit.ly/Ames) is an add-on that remedies this annoying problem. It will emulate Internet Explorer within the Firefox window and allow you to use most of the websites that require Internet Explorer.

After installation, you'll see a Firefox



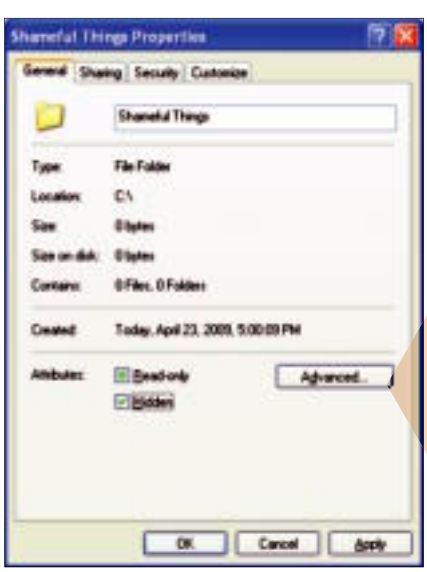
icon on the bottom right-hand corner of your browser window. When you want to change to the IE engine, just click the logo and the page will refresh using the new renderer. The icon will change to reflect the IE status. Just click it again to revert back to Firefox, which will bring the Firefox icon back up in place of the IE icon.

Additionally, you can middle-mouse-click the Firefox or IE icon to switch rendering engines on the page in a new tab. Right-clicking the icon will open the IE Tab add-on options, where you can edit general settings and specific site filters.

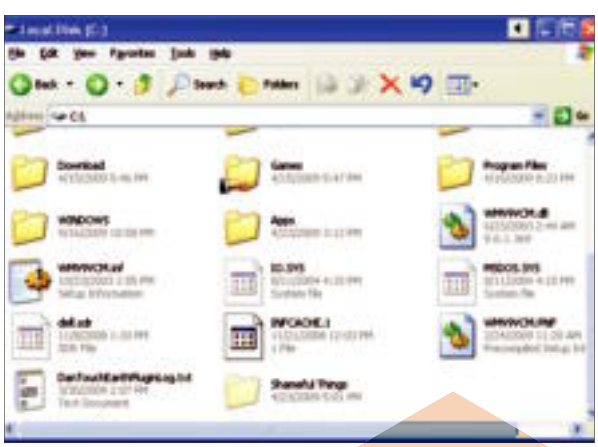


Keep Your Files Hidden and Protected

These days, privacy is pretty hard to come by. Your boss checks your Facebook profile, your mom subscribes to your YouTube channel, and anyone who performs a Google search on your name can find out about that embarrassing incident at the IHOP.



That's why we think you should at least be able to find some peace of mind on your own PC. With that in mind, we've prepared a quick guide for keeping files and folders on your computer hidden from prying eyes. We'll cover four different ways to accomplish this, from the mundane to the nigh-unbreakable. -ALEX CASTLE



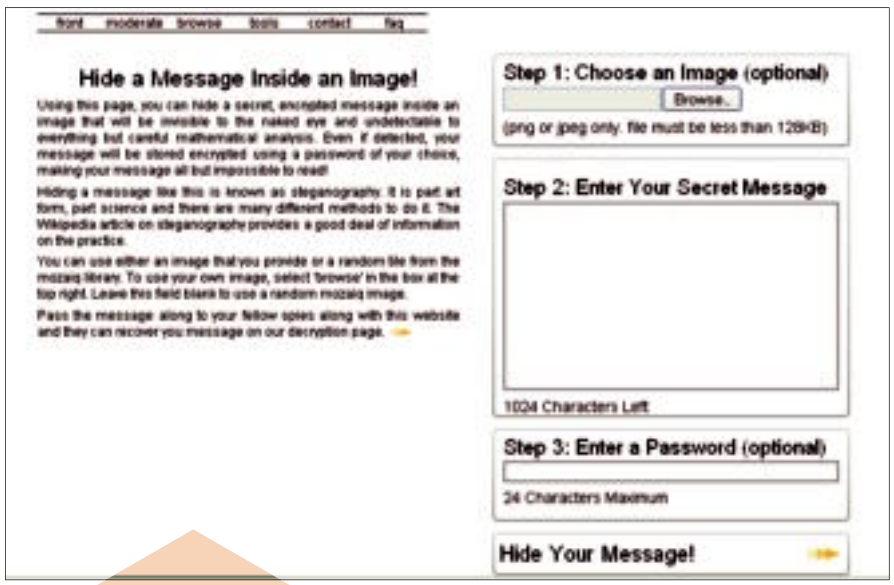
1 HIDE FOLDERS

The first and easiest method for hiding files is the one that's built into Windows. You're almost certainly already familiar with it: The good old fashioned "Hide Folder" option. To hide a folder this way, all you do is right-click it, go to Properties, then click the Hidden checkbox.

This will make the folder invisible to Windows Explorer, as long as the "Do not show hidden files and folders" setting is selected in the folder options. If this option is not selected, the folder will still be visible, but slightly ghosted. Because it's so easy to find folders hidden this way, it's a technique that should only be used against someone who isn't actually *trying* to snoop through your files.

2 STEGANOGRAPHY

Let's get down to the James Bond stuff. Steganography is like cryptog-



raphy, in that its goal is to hide a message from third parties. But it goes a step further, demanding that the third party be unable to tell that the hidden data even exists. Commonly, this is done by disguising one sort of file as another sort of file, or hiding it in a big pile of random data.

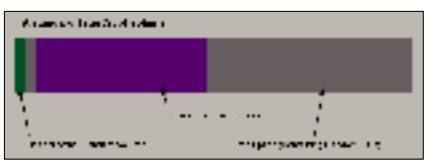
How can you get started with steganography? If you just want to impress your friends, you can use one of a couple of web apps. Mozaiq (http://bit.ly/egFMl) is a site that allows you to hide a secret text message inside a .png or .jpeg image. It's relatively limited (128Kb image, 1,024 characters max for your secret message), but it couldn't be any easier: Just upload your picture (or choose one of the stock photos), enter your message and an optional password, then click Hide Your Message! You can give the picture and password to anyone you want, and they can read the hidden message by going to the Mozaiq decryption page.

If you want to hide a whole file, and not just a secret message inside another file, the maxant Steganography web app (http://bit.ly/jwTPz) has you covered. Load the data file you want to hide along with the image file container on the maxant website.

3 TRUECRYPT

Finally, it's time for the big guns: TrueCrypt. We've mentioned TrueCrypt several times before (as a means to secure a USB thumb drive, for instance) and for good reason; it's simply the best free solution for encrypting your data. However, it has another, sneakier feature that we haven't yet covered, which allows you to place a hidden volume inside another encrypted volume.

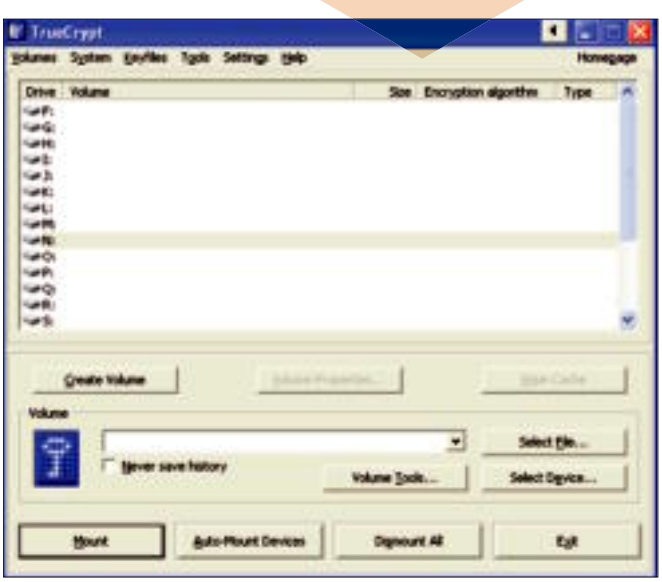
To understand that, you need to know how a standard TrueCrypt volume works. When you create an encrypted volume with TrueCrypt, you specify its size, like you would when creating a disk partition. The hidden volume will always occupy exactly this much space, regardless of how many files you put into it. Any space in the volume not occupied by encrypted data is filled with random data. To anyone without the password, the encrypted data is completely indistinguishable from the

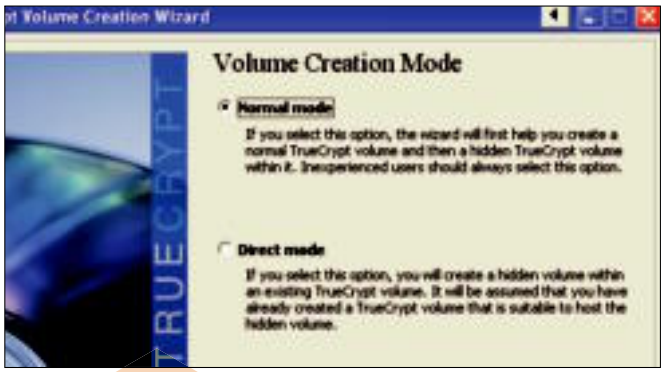


random data. To anyone with the password, the encrypted data can be decrypted, but the unused space remains totally random.

This creates an opportunity to hide more data. By encrypting additional data with a different passphrase and inserting it among the random data at the end of a volume, TrueCrypt creates an encrypted volume with two different passwords, each of which provides access to a different set of data. You can fill one of these volumes with decoy data, so that even if you ever need to give away a password you can give up the decoy, and nobody will ever be able to prove that another volume exists.

Download TrueCrypt from www.truecrypt.





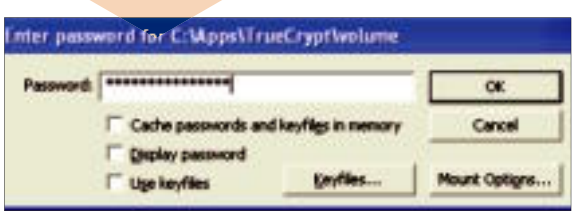
org. Run the executable; it doesn't matter whether you choose to extract or install it. Go to where you extracted the files and run truecrypt.exe. Click the Create Volume button.

Choose Create an encrypted file container, then Hidden TrueCrypt Volume, then Normal Mode.

You will now be guided through the necessary steps to create an outer volume. Choose a filename for the volume, a size, and a password. Don't worry about messing with the encryption settings. When TrueCrypt has finished prepping the volume, press Format (don't worry, this won't format your hard drive).

Once the first (outer) volume is completed, repeat the process for the hidden volume. Choose a size that gives you enough room to plant decoy data in the outer volume, and pick a significantly different password.

There! You've created your hidden volume. Now you can access it at any time by clicking Select file, browsing to the volume, then clicking Mount from the main TrueCrypt screen and entering either the decoy or real password.



REVIEWS

Tested. Reviewed. Verdictized

INSIDE

ONLINE

- EVEN MORE REVIEWS!
- BEST OF THE BEST
- EDITORS' BLOGS
- THE NO BS PODCAST

Polywell X5800A-Extreme

Sassy black machine

A little boring, but fast nonetheless.

We've seen systems with Serial Attached SCSI (SAS) before, but no vendor has been sassy enough to break from the de rigueur SATA VelociRaptor or SSD drives in favor of the tech—until now.

Of course, this is Polywell's M.O.—not content to do things like any other system vendor, Polywell usually tucks in a curve ball to brush you off home plate when you don't expect it. Sometimes Polywell's pitch doesn't work (think really nice $5,000 gaming rig with an $8 keyboard and mouse), but time we were intrigued with its 300 gigabytes of RAID 0, 15,000rpm, connected using SAS. The onboard SAS support in the Asus P6T Deluxe mobo achieved sequential read speeds of about 192MB/s with 6.8ms access times—that's purty durn good considering that our VelociRaptor-equipped systems see roughly 166MB/s reads with about 7+ms access times.

Elsewhere, Polywell plays it safe and sane: an Intel Core i7 clocked up to 3.66GHz on air and an Nvidia GeForce GTX 295 card along with 6GB of DDR3 at 1,450MHz and an LG Blu-ray drive stuffed into an Antec 900 case make it a well-rounded rig—albeit a bit bland.

In the performance curve, the X5800A-Extreme is definitely fast, but not quite where we expected it to land. Compared to all of the other Core i7 rigs we've reviewed, the X5800A-Extreme is a mix. The benchmark records for Premiere Pro CS3, ProShow Producer, and MainConcept Reference are still, amazingly, held by Velocity Micro's Raptor Z90 that we reviewed in the Holiday 2008 issue. The Polywell is faster than the 3.33GHz Falcon Northwest box (reviewed in May) in Premiere Pro CS3 and Photoshop CS3, but is tied with the Falcoln in ProShow Producer. The Polywell also outscores the 2.93GHz i7 Gateway (reviewed in April) in Premiere and MainConcept but again loses in ProShow Producer. Why the odd mix of scores? We're not exactly sure but it's possible the Hyper-Threading plus quad-core i7 is to blame. We've seen unpredictable results on occasion with the new Intel chip. But since our scores are the result of an average of three test runs, we're at a bit of a loss.

In gaming, the fearsome multi-GPU GeForce GTX 295 turns in an admirable performance. The X5800A-Extreme's 42fps make it faster than other PCs equipped with just a single card, including the Radeon HD 4870 X2-based Gateway rig. And in Unreal Tournament 3, we actually saw Polywell's X5800A-Extreme take the benchmark crown with its 172fps. While that may not sound like much, it's a higher score than SLI, CrossFire, and Tri-SLI machines have produced. Granted, UT3's aging engine has rapidly turned into a CPU test these days.

The best news is the price. Polywell prices the rig at $3,300, which makes it a pretty decent deal for the amount of hardware you get. It's not quite as budget as Gateway's FX6800 i7 rig with its Intel SSD, but the Polywell X5800A-Extreme is a competent machine that doesn't make too many apologies. —GORDON MAH UNG

VERDICT 9

POLYWELL X5800A-EXTREME

+ TV DINNERS	− FISH STICKS
All-around good performance without being garish.	Still, it could use a little pizzazz to push it over the top.

$3,300, www.polywell.com

BENCHMARK

	ZERO POINT	
Premiere Pro CS3	1,260 sec	583 (116%)
Photoshop CS3	150 sec	86
Proshow	1,415 sec	667 (112%)
MainConcept	1,872 sec	1,079
Crysis	26 fps	42
Unreal Tournament	83 fps	172 (107%)

0 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Our current desktop test bed consists of a quad-core 2.66GHz Intel Core 2 Quad Q6700, 2GB of Corsair DDR2/800 RAM on an EVGA 680 SLI motherboard. We are running two EVGA GeForce 8800 GTX cards in SLI mode, a Western Digital 150GB Raptor and a 500GB Caviar hard drive, an LG GGC-H20L, Sound Blaster X-Fi, and PC Power and Cooling Silencer 750 Quad. OS is Windows Vista Home Premium 64-bit.

SPECIFICATIONS

Processor	Intel Core i7 @ 3.6GHz
Mobo	Asus P6T Deluxe X58
RAM	6GB DDR3/1450
Videocard	GeForce GTX 295
Soundcard	Integrated
Storage	Two Seagate 150GB Cheetah 15K.5 in RAID 0, Seagate 1TB Barracuda 7200.11
Optical	LG GGC-H20
Case/PSU	Antec 900 / 750 Watt Thermaltake ToughPower

Samsung 256GB MLC SSD

Expensive, but worth it

Samsung's new 256GB SSD crushes the competition in capacity and write speeds.

Solid state drives show immense promise with regards to reliability and read speeds, but current-generation models are rife with drawbacks. Due to NAND flash memory's architecture, writing data to a block (after the first time) requires copying the entire contents of that block to cache, erasing it, and rewriting it with the added data. Large numbers of small writes run the risk of overloading the SSD's disk cache, causing high latency. Multi Layer Cell (MLC) solid state drives, especially those utilizing JMicron's JM602 controller, are particularly susceptible.

Fortunately, Samsung's SSDs, like Intel's (whose X25-M is the gold standard for solid state drives), use their own controllers, and the results are impressive. This 256GB SSD reached sustained average read speeds of 175MB/s, just 12 percent slower than the Intel drive and 75 percent faster than a Western Digital VelociRaptor. Better still, the Samsung drive's average sustained write speeds topped 150MB/s, much faster than the 64.3MB/s average offered by the Intel drive. Oddly, Intel's X25-M still reigns supreme in our Premiere Pro encoding test, beating the Samsung drive by nearly two minutes. The Samsung's random access times, while slightly slower than the X25-M's, still average at under .2ms for read and write.

The Samsung drive's PCMark Vantage score, at 14,088, is less than half that of the Intel drive's, but still double that of any standard hard drive.

Now to that pesky random-write latency issue that vexes SSDs: The Samsung controller hung up only a few times, once giving a random-access write latency of 294.5ms, which is enough for a noticeable lag. However, this occurred infrequently enough that the average random-access write latency was .16ms, several thousand times faster than the CSX 128GB SSD, for example, which used the flawed JMicron controller.

The Samsung 256GB SSD, then, exhibits blazing-fast read speeds, and its write speeds are not just fast but consistently fast, at an average of 150MB/s, which is a nice change from the status quo. Even better, this SSD has a high enough capacity to run both the OS and applications (like games and media-creation apps) that can benefit from its high read and write speeds and low latency.

Samsung doesn't currently plan to offer the 256GB MLC SSD through normal retail channels, but it's available on NewEgg and other aftermarket retailers for $670, and as an OEM add-in in some Dell and Alienware computers for $500–$700. Its read speeds are nearly on par with the X-25M, its writes are much faster, and it has three times the capacity. If you've got the scratch, this is one of the few SSDs currently out that we can unreservedly recommend. —NATHAN EDWARDS

MAXIMUM PC KICK ASS!

VERDICT **9**

SAMSUNG 256GB MLC SSD

+ SING	− DING
Blistering read and write speeds, high capacity (for an SSD).	Expensive (natch). Occasional high latency, but nowhere near as bad as other controllers.

$670 (est), www.samsung.com

BENCHMARKS

	Samsung 256GB MLC SSD	Intel X25-M	Western Digital VelociRaptor
Capacity	256GB	80GB	300GB
Average Sustained Transfer Rate Read (MB/s)	175.1	**206.65**	98.31
Average Sustained Transfer Rate Write (MB/s)	**150.1**	64.30	98.22
Random Access Read (ms)	0.16	**0.12**	7.24
Random Access Write	0.12	**0.09**	3.42
Premiere Pro (sec)	945	732	**383**
PCMark Vantage Overall Score	14,088	**30, 322**	6, 082

Best scores are bolded. All drives were tested on our standard test bed using a 2.66GHz Intel Core 2 Quad Q6700, EVGA 680i SLI board. HDTach 3.0.1.0, h2benchw, and Premiere Pro CS3 were obtained in Windows XP, PCMark Vantage 2005 scores were obtained in Windows Vista Home Premium 32-bit.

Gateway P-7808u FX

A little too much of the same

For several months we've been talking about what a great value Gateway's P-7811 FX gaming notebook was (reviewed October 2008). So we were anxious to see how the update to that model, the P-7808u FX, holds up.

At first glance, "update" seems too strong a word for Gateway's latest 17-inch performance-oriented notebook. The P-7808u FX looks identical to its predecessor, sporting the exact same black-and-orange chassis as the P-7811 FX, the exact same arrangement of ports— three USB, FireWire, eSATA, HDMI, VGA—and the exact same right-angle power connector that we griped about the first go-round.

The P-7808u FX even features the same videocard, a GeForce 9800M GTS. This card helped last year's P-7811 FX win us over with impressive scores in our standard gaming benchmarks and the new P-7808u FX's performance in those tests was equally strong. But compared with a dual-GPU notebook such as CyberPower's Extreme M1 (May 2009), Gateway's graphics solution shows its age. When faced with a more graphically intensive title like UT3, the P-7808u FX mustered a score of 64fps compared with the Extreme M1's 114fps—and it would no doubt fare worse in more modern titles.

Where the P-7808u FX most differs from its predecessor is in processing power.

The P-7808u FX is identical to last year's P-7811 FX, but with a lower-resolution screen.

The P-7808u FX features a Core 2 Quad; and while it's 10 percent slower than the P-7811 FX's Core 2 Duo, it's the cores that really count in multithreaded apps. In our Premiere Pro, ProShow, and MainConcept benchmarks, for instance, the 2GHz P-7808u FX surpassed its 2.24GHz sibling by 42 to 78 percent. The P-7808u FX also did better than its predecessor in Photoshop, albeit by just four percent.

It's interesting that Gateway focused its improvements on the applications side and yet went with a lower-res screen for its new P-series model. The drop from 1920x1200 to 1440x900 makes sense for gaming—if this notebook were actually capable of truly demanding games—but for applications work, a higher resolution is generally preferable. Another questionable change was moving from a 7,200rpm hard drive to the 5,400rpm in the P-7808u FX, although we welcome the capacity jump from 200GB to 500GB.

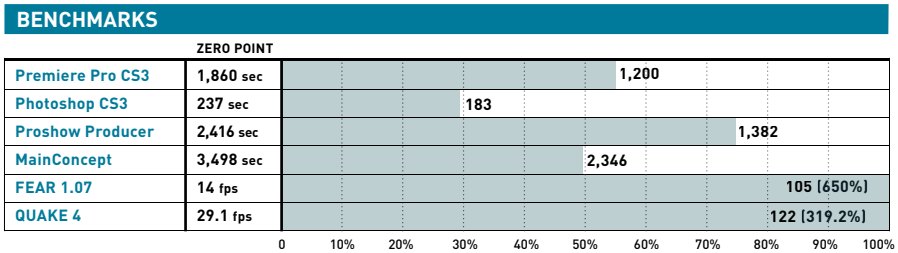
The P-7808u FX's 9-cell battery maintained a charge for approximately two and a half hours in power-saving mode—enough time to get through most movies, and a pretty good run for a notebook of this size. And as far as big, honking 17-inch notebooks go, the P-7808u FX at least has a slim, and slightly less-cumbersome formfactor.

Nevertheless, we can't help but feel disappointed. While the P-7811 FX hit just the right mix of price and gaming performance for its time, the P-7808u FX is more expensive than its predecessor, yet offers gamers last year's tech. **—KATHERINE STEVENSON**

SPECIFICATIONS

CPU	Intel 2GHz Core 2 Quad Q9000
RAM	4GB DDR3/1,066MHz
Chipset	Intel PM45
Hard Drive	500GB Western Digital WDC WD5000DEVT-22ZATO (5,400rpm)
Optical	HL-DT-ST DVDRAM GSA-T50F
GPU	Nvidia GeForce 9800M GTS
Boot/Down	61 sec / 19 sec
Lap/Carry	8 lbs, 15.4 oz / 10 lbs, 8.4 oz

BENCHMARKS



Our zero point notebook uses a 2.6GHz Core 2 Duo E6700, 2GB of DDR2/667 RAM, an 80GB hard drive, a GeForce Go 8600M, and Windows Vista Home Premium.

VERDICT 7

GATEWAY P-7808U FX

+ ADAPTATION	− STUCK ON YOU
Quad-core performance; budget price.	Same 'ol look and feel; same 'ol game performance.

$1700, www.gateway.com

Diamond ATI Radeon HD 4890 XOC

Killer performance at a fantastic price

It's s no secret that ATI's RV770 GPU, which first appeared in the Radeon 4870 and 4850 last year, is a performance beast. The spring refresh of the GPU, which offers increased core and memory clocks, along with a slight redesign of the GPU, tells an interesting story to anyone who isn't yet running a second-gen DirectX 10 card (GeForce 2xx series or Radeon 48xx series). However, if you've already upgraded, there's not much to get excited about here.

The Radeon 4890 is built on a 55nm process, just like the 4870 and 4850, but the company made significant tweaks to the architecture to accommodate higher clock speeds, which is evidenced by the fact that Diamond overclocks this board from 850MHz to 925MHz out of the box. Diamond also overclocks the card's 1GB of memory 100MHz faster than the default, to 1,050MHz. The Radeon 4890 sports quad-pumped GDDR5 memory running on a 256-bit bus. The real stars of the Radeon 4890's show are its pixel shaders, though, with 800 shader units running at the GPU's core clock speed. The massive number of shader units gives the 4890 a significant advantage over comparable Nvidia cards in shader-limited benchmarks like Crysis.

The ATI card doesn't fare as well in memory-limited benchmarks. Even though it's using more advanced GDDR5 memory than the competition, the 512-bit-wide memory bus on comparable Nvidia cards gives those cards an advantage in games that are fillrate bound, as you can see from our Call of Duty 4 scores.

The wild cards, as has been the case for the last few months, are the proprietary technologies supported by the different cards. On the Nvidia side, you have Nvidia's general-purpose GPU computing spec CUDA, as well as hardware acceleration of PhysX apps. On the ATI side, you have DirectX 10.1, which improves visual quality or performance in games that support the spec. Fortunately for people shopping for videocards, neither side has a decisive advantage. There are just a handful of consumer applications that take advantage of CUDA, and just a few decent games that support PhysX or DirectX 10.1. By the time any of these technologies are mainstream, you'll have upgraded this graphics card.

The Diamond Radeon HD 4890 XOC is an extremely capable DirectX 10 card that you can find online for around $250. With a full 1GB frame buffer and enough shader processors to play most demanding games at 24-inch panel resolutions, there's a lot here to like. –WILL SMITH

SPECIFICATIONS

	Diamond 4890 HD XOC	GeForce GTX 285
Driver Version	Catalyst 9.4	182.08
Crysis 4X AA/Very High (fps)	**22.2**	20.32
Crysis no AA/ Very High (fps)	**25.97**	24.76
Call of Duty (fps)	63.57	**74.6**
Vantage Game 1 (fps)	16.4	**19.45**
Vantage Game 2 (fps)	12.4	**14.26**
Far Cry HQ, 1920x1200, no physics, no AI (fps)	51.8	**57.91**
Far Cry HQ, 1920x1200, no physics, no AI (fps)	56	**65.11**

Best scores are bolded. Benchmarks are run on an Intel Core 2 Quad Q9770 Extreme with 4GB of memory running Windows Vista Home Premium. Crysis and 3DMark Vantage are run at 1920x1200 with 4x AA and 8x anisotropic filtering, unless otherwise noted. Call of Duty is run at 2560x1600 with 4x AA.

VERDICT 8

DIAMOND ATI RADEON HD 4890 XOC

+ TOPAZ

Tons of shader power; the fastest single-GPU Radeon you can buy; overclocking headroom.

– EMERALD

Noisier than a 4870; marginal upgrade from other RV770 GPU boards.

$250, www.diamondmm.com

The Diamond Radeon 4890 HD looks like a stock card, but both its GPU core and GDDR5 memory are factory overclocked.

Hiper Osiris

A well-constructed workman-like case, with fewer frills than we expected

A classy cartouche, nice optical bezels, and an all-around attractive midtower...

Hiper may not be well-known in the States, but in Europe it's big in the power supply and chassis markets. Now, Hiper is branching into the American market and has brought at least one solid contender to the great case race.

The Hiper Osiris is a midtower ATX case constructed of 6063-T5 aluminum alloy, which makes it very sturdy. The top, clip-on front panel, and side panels are all finished in black brushed aluminum, which looks quite fine. Frankly, we'd expect a little less heft from an all-aluminum chassis, but the beast clocks in at more than 18 pounds. On the other hand, it's certainly not going to break on you.

Inside, the Osiris is finished in black, except for the unpainted motherboard backplate, which takes up only the space required for an ATX motherboard, leaving plenty of room for cable routing and tie-downs (with the included Velcro straps). The Osiris includes three 12cm fans—front, top, and rear. PCI slot covers are of the flimsy snap-off variety, but Hiper includes several ventilated replacement covers—a nice touch.

The five optical drive bays are made from solid black-painted aluminum. Drives slide in on little shelves and are screwed into the side of the bay—no toolless slots here. The front panel includes fancy bezels for the top two optical drives, and Hiper includes a mounting bracket for a floppy drive or media card reader.

A four-slot hard drive rack works the same way as the optical bays, but lies on its side. The front panel faceplate must be removed, along with two thumbscrews, to slide the whole rack out, front fan and all, before drives can be added. Once secured by four black-painted thumbscrews, the drives are held solidly in place, with little foam-rubber strips on the inside of the bay to dampen vibrations.

The side panels are worth a special mention—thanks to a set of nifty latches at the top, they are easily removed but hold firmly when in place. The left-side panel even has a mesh-covered plastic window.

The Osiris's front-panel connectors (increasingly a misnomer as many modern cases, including the Osiris, have theirs on top) include two USB 2.0 ports, audio in/out, eSATA, and a line-in jack for home recording or auxiliary inputs like MP3 players, as well as power and reset buttons.

Provided you're up for a little screwdriver action, the Osiris install process is relatively painless. It's surprisingly roomy for a midtower case, and we had no problems fitting big graphics cards in it. The aforementioned hard drive installation is the only marginally annoying part of the process, but you'll be secure in the knowledge that your drives aren't going anywhere.

...but a little friendlier install would be welcome.

The Osiris is a solid, roomy case with a workman-like feel to it. You're not going to find too many fancy features here, like a slide-out motherboard tray, removable fan filters, or even toolless drive bays. Which is a shame, considering the price: about $180 MSRP. It's a good case, but we can't help but wish for more.

—NATHAN EDWARDS

VERDICT 8

HIPER OSIRIS

+ OSIRIS	− OZYMANDIAS
Great construction and build quality. Cool side panels.	Lacks many of the fancy features we're used to. A bit pricy.

$180, www.hipergroup.com

Thermalright Ultra-120 eXtreme-775 RT

Big, heavy, simple, and powerful

The last Thermalright cooler we reviewed, the IFX-14 (November 2008), actually bested our then-champion Thermaltake DuOrb in performance, but its enormous size cost it the crown. The slimmer Ultra-120 eXtreme, while still a skyscraper of finny goodness, is much skinnier than the IFX-14, and (happily) includes one 12cm clip-on fan—the older model supported two fans, but included none.

Five nickel-plated copper heat pipes rise from opposite sides of the base through a large stack of heat-dissipating fins, cooled by a 12cm fluid-dynamic bearing fan. The included fan connects to the motherboard fan socket with a 3-pin connector, so there's no onboard fan-speed control.

The Thermalright Ultra-120 eXtreme rises 6.3 inches from the CPU socket and looks like nothing more than a large apartment building, at two inches deep and 5.2 inches wide (not including the fan). At two and a half pounds, it's as heavy as the Cooler Master V10 (reviewed in April), but not nearly as cumbersome, and unlike the V10 its bulk is directed upwards—it doesn't overhang the RAM or stand in the way of crucial components.

Installation of the Ultra-120 on an LGA 775 or 1366 socket motherboard is trickier than we'd like—even if your case has a removable motherboard tray with a cutout for the backplane, you'll find the cooler much easier to install if you take the motherboard out first. The folding retainer bracket is a pain in the arse to keep in place, but once you've fastened the spring-loaded screws into the backplane, everything becomes much easier.

The good news is that once the cooler is installed and the 12cm fan is clipped to its front, the Ultra-120 easily outperforms our current champion air cooler, the Zalman CNPS 9900. Thermalright's cooler decreased idle temps by two degrees more than the Zalman, and nearly eight degrees at full burn. For that matter, the Ultra-120 outperformed our stock Intel cooler by a shocking 25 degrees at full burn.

The Thermalright Ultra-120 eXtreme isn't the newest air-cooler out there—it came out in early 2007, but we missed it the first time around. Now that we've finally put it through its paces, we're glad we caught it. It's the new (old?) air cooler to beat. –NATHAN EDWARDS

BENCHMARKS

	Thermalright Ultra-120 Extreme	Zalman CNPS 9900	Stock Cooler
Idle (C)	**29**	31.25	46.5
100% Burn (C)	**43.5**	51	67

Best scores are bolded. Idle temperatures were measured after an hour of inactivity; load temp eratures were measured after an hour's worth of CPU Burn-In (four instances). Test system consists of a stock-clock Q6700 processor on an EVGA 680i motherboard inside a Cooler Master ATCS 840 case with stock fans.

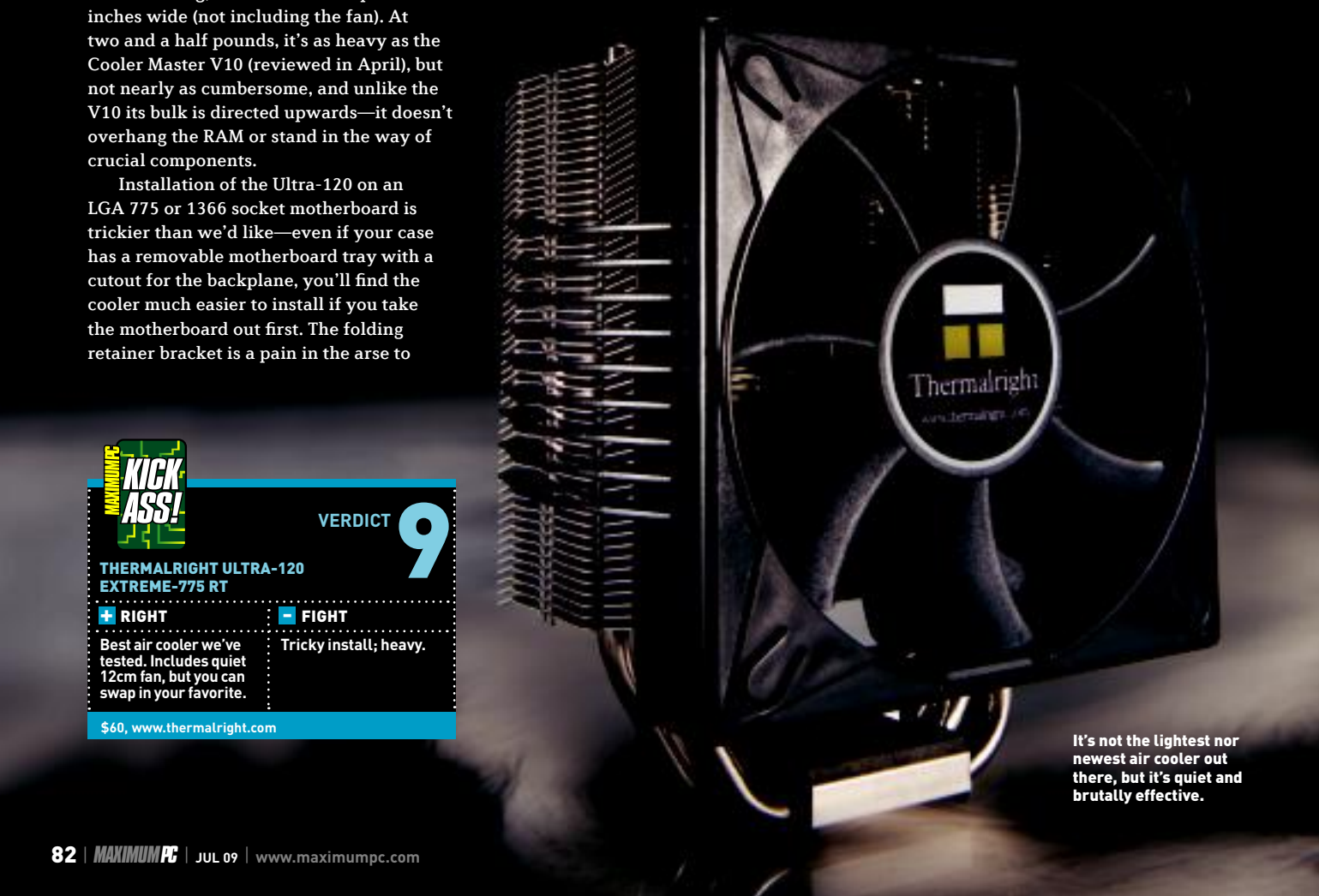
MAXIMUM PC KICK ASS!

VERDICT 9

THERMALRIGHT ULTRA-120 EXTREME-775 RT

+ RIGHT	– FIGHT
Best air cooler we've tested. Includes quiet 12cm fan, but you can swap in your favorite.	Tricky install; heavy.

$60, www.thermalright.com



It's not the lightest nor newest air cooler out there, but it's quiet and brutally effective.

Western Digital 1TB MyBook World Edition

Don't store it vertically

Western Digital wants you to have a NAS box. Yes, you, Joe Consumer. A NAS box so easy your grandmother can set it up, but powerful enough that you can use it from anywhere. WD's solution: a one-drive, non-user-serviceable slab of white plastic called the MyBook World Edition. Similar in form to the MyBook external hard drive, but with Gigabit Ethernet replacing the USB port, the MyBook World aims to be your family's go-to repository for backup, sharing, and streaming.

Western Digital packages its single-drive MyBook World with either 1TB or 2TB Caviar Green low-power-consumption drives, wrapped in a sleek white "book" shape, with ventilation holes through the "pages." The spine of the MyBook World features a white LED strip that displays status and capacity indicators; on its opposite side are a power jack, Gigabit Ethernet port, power button, reset hole, and USB host port for attaching additional storage.

The MyBook World ships with a handy WD Discovery utility that will auto-detect your MyBook on the network, let users map network drives, and configure the drive via a web interface. The included 30-day trial of the WD Anywhere backup software is not particularly noteworthy except for its ease of use—better backup options exist, especially once your trial runs out.

We dig the MyBook's easy iTunes and TwonkyMedia streaming—the former lets you share an iTunes library across your local network, and the latter streams video to the Xbox 360 and PlayStation 3. The services run automatically, so all you have to do is drag media files to their respective public folders on the MyBook and you can access them via iTunes or your game console—and, of course, via Explorer on your PC.

WD's MioNet lets you access your MyBook from outside the home network, but more advanced users will doubtless prefer to VPN into their home network for access, as the web console is clunky and the desktop service (which includes more features) costs $7.99/month.

Despite its use of Caviar Green drives, which aren't noted for extreme performance, the MyBook World offers decent speeds, transferring 2.79GB to the NAS in three minutes, 10 seconds, and copying the same file from NAS to PC took just a minute and a half over Gigabit Ethernet.

The one fatal flaw in the MyBook World is that it's easily tipped over. We actually had to request a second review unit after we knocked the first one over and couldn't access it afterwards. We wish WD had shipped it with a stand. Our recommendation: Keep yours on its side. Aside from that (and the fact that it's not user-serviceable), the MyBook World is an easy-to-use family NAS that's hard to beat. —NATHAN EDWARDS

BENCHMARKS

	WD MyBook 1TB	Qnap TS-109 Pro II
Size	N/A	N/A
PC to NAS, small (min:sec)	**0:47**	0:55
PC to NAS, large (min:sec)	**3:10**	3:45
NAS to PC, small (min:sec)	**0:25**	0:39
NAS to PC, large (min:sec)	**1:31**	2:34

Best scores are bolded. We used the contents of *Maximum PC*'s November 2007 CD for the small-file testing, and a single 2.79GB file for the large-file testing. All scores are averages of three transfer trials.

VERDICT 8

WESTERN DIGITAL 1TB MYBOOK WORLD EDITION

+ FIRST EDITION	− MASS MARKET
Easy to configure; easy media streaming; stylish.	Easy to knock over if stored vertically; not user-serviceable.

$190, www.wdc.com

Razer Mamba

An amazing mouse with an awful battery

There's really nothing worse than an otherwise wonderful product with one fatal flaw that brings its whole score down. The Razer Mamba is a wonderful wireless gaming mouse, with an absolutely devastating power problem.

For the Mamba, Razer tweaked the kick-ass shape of the now-classic DeathAdder design—perfect for palm-grip mousers—to sneak in a pair of sensitivity adjustment buttons. The changes paid off: The Mamba is eminently comfortable for long-term gaming sessions, and the sensitivity buttons fix our only complaint with the DeathAdder, which offered imprecise on-the-fly sensitivity adjustments using the mouse wheel.

The Mamba's 1,000MHz laser sensor is wonderful as well. After side-by-side testing, we couldn't differentiate between the Mamba's 5,600dpi sensor and the 5,000dpi sensor on the Logitech G9x, but that's a good thing. With five different sensitivity levels, which are tweakable using the mouse's software, there's absolutely nothing about this mouse's sensor that will prevent you from fragging with wild abandon.

What *will* prevent you from reaching your maximum gaming potential is the Mamba's quick-death battery. Because the battery only lasted through about 12 hours of gaming before behaving sporadically, it's a damn good thing that the Mamba also offers the option of plugging directly into the provided USB cable so you can continue playing after your battery inevitably dies. The bad news is that the USB cable is pretty chunky, and making the mouse/cord connection is fiddly at best. Worse, it's hard to unplug. It required two hands and took us several minutes of fighting to remove every time we wanted to return to untethered fragging. On top of those problems, we absolutely detest that the only sure-fire way to get a full charge on the mouse is to turn off the physical power switch on its underbelly every single time you charge it. That's just lame.

At the end of the day, we simply stopped using the Mamba as a wireless mouse, instead preferring to leave the cord permanently plugged in. We'd much rather have an awesome wired mouse (at a wired mouse price) than have the battery conk out during a heated TF2 match, when there's nary a moment to connect the cord. As it is, the Mamba is a great wired mouse at a price that's high, even for a wireless mouse. –WILL SMITH

The Mamba would make one helluva wired mouse, but battery-life problems make us wary of its $130 price tag.

VERDICT **7**

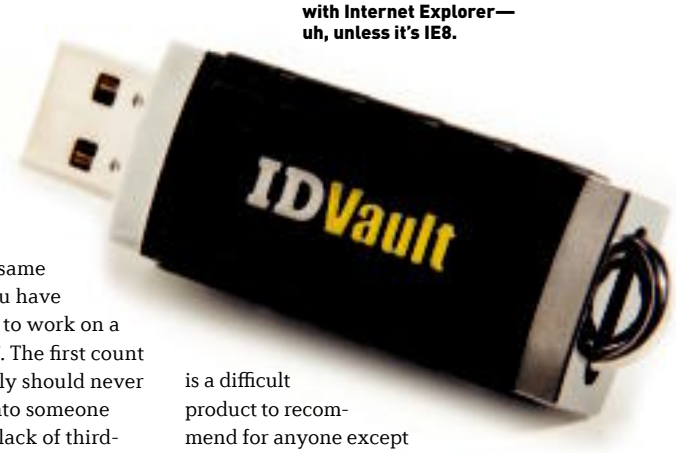
RAZER MAMBA

+ SNAKES	– PLANES
Amazing sensor, great shape, wired option.	Fiddy USB connector, anemic battery, super-chunky USB cable.

$130, www.razerzone.com

ID Vault 2009

Lock up your sensitive data



The ID Vault will only work with Internet Explorer—uh, unless it's IE8.

In the two years since we reviewed the first version of ID Vault, phishing attacks have increased by more than 180 percent, identity theft is up 25 percent, and organized crime has figured out ways to hijack financial sites and DNS servers.

For the most part, putting financial information into a browser is about as safe as walking through Central Park in one of those Chuck Bronson *Death Wish* movies.

So, you'd think ID Vault would be one of those tools you'd put on a chain and wear around your neck everywhere you go, but it isn't. For those not up on ID Vault, it's an encrypted USB key that stores your user names and passwords. If you want to go to your bank, eBay, or Amazon, you plug in the ID Vault and use a virtual keyboard to punch in a code (to thwart key loggers). The ID Vault client on your PC then goes to the site, makes sure you're actually on a legitimate IP address for that particular website, and logs in for you.

It sounds like the perfect way to conduct your business without losing sleep over security. Unfortunately, ID Vault 2009 has the same warts it did two years ago. You have to install client software for it to work on a PC and it only works with IE7. The first count could be excused, as you really should never enter sensitive information into someone else's computer, anyway. But lack of third-party browser support is the killer. And it doesn't help that the freaking thing doesn't yet support Internet Explorer 8, which most security conscious people have already adopted. D'oh! IE8 support is expected sometime this summer, but that doesn't help you out now, does it?

Then there's the cost. The initial unit costs $49 with one year of service included. An additional year costs $39. We know the product claims to be one of the few ways to prevent pharming (mass router or DNS hijacking), but that's pretty steep for just 12 months.

Given all these negatives, ID Vault 2009 is a difficult product to recommend for anyone except the truly paranoid who are willing to live with its quirks. —GORDON MAH UNG

ID VAULT 2009

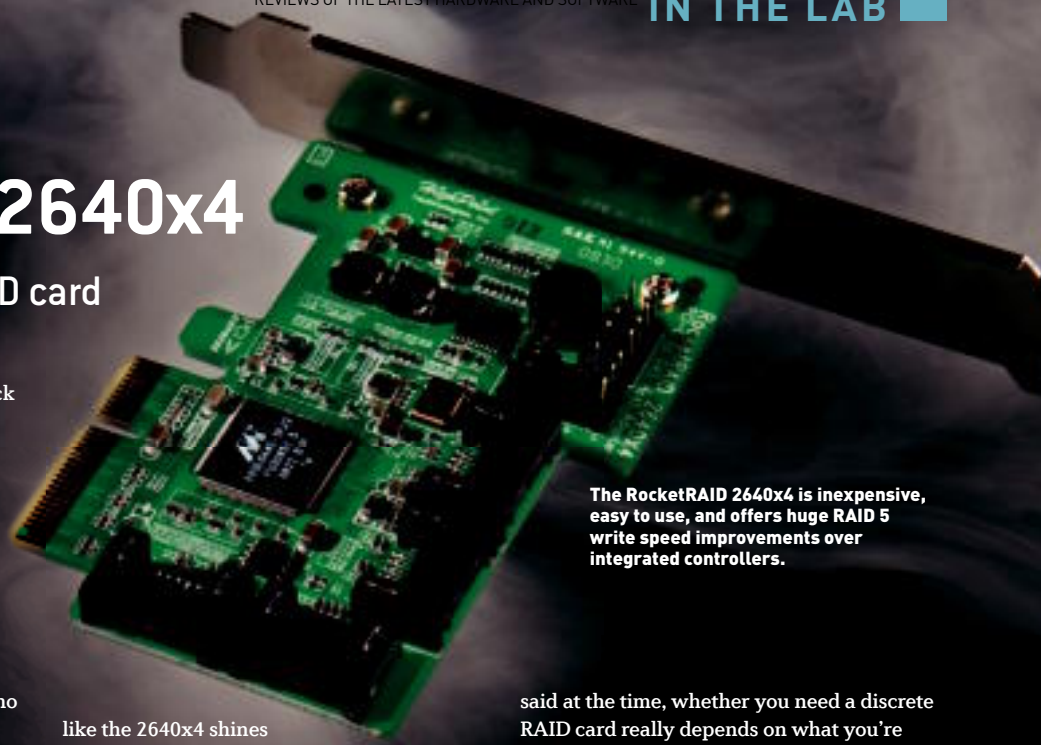
VERDICT 5

+ SNEAKERS	− HACKERS
One of the few ways to prevent pharming attacks.	IE only, buggy, and pricey yearly subscriptios.

$60, www.idvault.com

HighPoint RocketRAID 2640x4

A decent entry-level RAID card



The RocketRAID 2640x4 is inexpensive, easy to use, and offers huge RAID 5 write speed improvements over integrated controllers.

Power users who want to take advantage of RAID are typically stuck between a rock and a hard place: their motherboard's integrated RAID (the quality of which can vary wildly between chipsets) and expensive discrete controllers. HighPoint's RocketRAID 2640x4 attempts to bridge the gap by offering better-than-onboard performance at a price much lower than fancier discrete cards.

As expected, the RocketRAID 2640x4, which has four SAS/SATA 3Gb/s ports but no onboard processor or memory, performed better than our test bed motherboard's onboard RAID controller but couldn't match the performance of the $450 Adaptec 5405, which boasts an onboard 1.2GHz processor and 256MB DDR2 cache.

Setting up the RocketRAID 2640x4 is simple: Drop in the card, hook up the drives, power up your computer, and hit Ctrl+H during boot. HighPoint's BIOS makes creating and maintaining RAID a snap, and its Windows drivers are easy to install from the included disc.

In two-disk RAID 0, the RocketRAID averaged 174MB/s reads and 148MB/s writes, slightly better than the EVGA's 166MB/s and 135.9MB/s, but no match for Adaptec's 210MB/s and 209MB/s. RAID 5, however, is where the difference between onboard RAID and even an inexpensive discrete card like the 2640x4 shines through. Echoing results from our May 2008 RAID controller showdown (http://bit.ly/raidcont), using a discrete RAID controller rather than onboard upped RAID 5 write speeds nearly tenfold: 216.5MB/s on the 2640x4 versus only 25.3MB/s onboard. The 2640x4 even surpassed Adaptec's much more expensive RAID controller in RAID 5 writes, though the Adaptec far outstripped the RocketRAID's read speeds.

In our previous RAID card roundup, the RocketRAID 3510 took high honors for speedy RAID 5 performance on the cheap, and the 2640x4 continues that trend. As we said at the time, whether you need a discrete RAID card really depends on what you're doing with it. For RAID 0, an entry-level RAID card like the 2640x4 offers modest boosts over the motherboard's controller, while a more expensive card will give you bigger gains. In RAID 5, adding a drop-in card will immediately give you a significant increase in average write speeds.

The HighPoint RocketRAID 2640x4 isn't the most feature-rich RAID card we've ever tested, but you get a lot of performance for $140, especially if you want to run RAID 5. The low price point, decent performance, and ease of use make this a good choice for an entry-level RAID controller. –NATHAN EDWARDS

SPECIFICATIONS

Connection	PCI Express x4
RAID Support	0, 1, 1+0, 5, JBOD
Processor	None
Memory	None
Connection	Four SAS/SATA ports

VERDICT **8**

HIGHPOINT ROCKETRAID 2649X4

+ ROCKETMAN (SONG)	– ROCKETMAN (FILM)
Cheap; easy to install and use; improved RAID 5 over onboard controllers.	Lacks stripe size options; RAID 0 not much better than onboard; no onboard processor or memory.

$140, www.highpoint.com

BENCHMARKS

	RocketRAID 2640x4	Adaptec 5405	EVGA 680i mobo
RAID 0 (two-disk)	RAID 0 (2-disk)	RAID 0 (2-disk)	RAID 0 (2-disk)
HDTach Avg Read (MB/s)	174.8	**210**	166
HDTach Avg Write (MB/s)	148.6	**208**	135
HDTach Burst Read (MB/s)	394	**876**	328
HDTach CPU Utilization (%)	3	**2**	5
HDTach Random Access (ms)	7.4	7.3	7.4
Premiere Pro (sec)	642	**633**	655
PCMark Vantage	7,282	**8,173**	6,900
RAID 5	RAID 5 (4-disk)	RAID 5 (4-disk)	RAID 5 (4-disk)
HDTach Avg Read (MB/s)	161.6	**247.7**	154.5
HDTach Avg Write (MB/s)	**216.5**	206	25.3
HDTach Burst Read (MB/s)	373.5	**815**	348
HDTach CPU Utilization (%)	**2**	3	4
HDTach Random Access (ms)	7.5	7.5	7.4
Premiere Pro (sec)	651	**632**	843
PCMark Vantage	7,724	**8,547**	4,059

Best scores bolded. All RAID controllers were tested on a stock-clocked Intel QX6700 on an EVGA 680i SLI motherboard, using 300GB WD VelociRaptor drives. HDTach 3.0.1.0 and Premiere Pro encoding tests done in Windows XP 32-bit; PCMark Vantage tests run on 32-bit Windows Vista.

OWC Mercury Pro 8x Blu-ray External

Blu-ray has enough troubles without products like this

On the surface, OWC's Mercury Pro Blu-ray external drive could seem appealing. The cabinet is attractive and sturdy; it offers FireWire 400, FireWire 800, USB 2.0, and eSATA interfaces—including all the requisite cables; and it holds a Pioneer BDR-203 drive, which is rated at 8x for BD-R writes—the highest rating available—and 16x for DVD+/-R. Yet, after using the device, we're unimpressed.

We first tried to test the drive with the eSATA interface but it failed to work with any of our test beds, which use the nForce 680i SLI chipset. It was recognized by motherboards using Intel's P45 and X58 chipsets as well as those boards' auxiliary Marvell controllers. However, we benchmarked using USB 2.0 on our standard test bed for continuity.

Standard DVD testing went well, with the OWC Mercury Pro writing 4.38GB of data to a single-layer disc in 6:15 (min:sec)—a decent time, but not as good as LG's GBW-H20L, which took 5:43. On a brighter note, the Mercury Pro was able to rip a dual-layer DVD movie to the hard drive in 10:49 (min:sec)—a time that rivals the best standard DVD drives and far outstrips the Blu-ray drives we've tested (the GBW-H20L took almost twice as long, for example).

But problems arose again when we moved to our Blu-ray tests. We simply could not write data to either BD or BD-RE media when using Nero DiscSpeed—the app we use for all our optical drive tests. Whether we used Verbatim, TDK, Memorex, or Panasonic media, we were met with an error message almost instantly. Tech support at OWC said they were able to use the app with no problem, but that wasn't our experience. Since the version of the Mercury Pro we reviewed doesn't come with software, we used the latest version of Nero 8 to test the drive's Blu-ray skills. Like we said, the Pioneer drive inside the unit is rated for 8x BD-R writes—yet it took 52:17 (min:sec) to write 22.5GB of data to disc. Compare that with the 6x-rated LG GBW-H20L's time of 22:16. A second test produced a similar result (52:26). Oddly, the drive performed more predictably when writing to BD-RE, taking 45:19 to fill a rewriteable disc, compared with the LG drive's 39:35 (both drives are rated at 2x for BD-RE media).

We're not sure what to make of this mish-mash of issues; we just know that $400 is a lot to spend on a *really good* drive—we wouldn't even consider spending a fraction of that on this product. **—KATHERINE STEVENSON**

BENCHMARKS

	OWC Mercury	LG GBW-H20L
DVD Write Speed Average	11.52x	**12.07x**
DVD Read Speed Average	**11.96x**	9.10x
Access Time (Random/Full)	169/357ms	**100/175ms**
DVD Ripping	**10:49**	15:19
Time to burn 22.5GB to BD-R (min:sec)	52:17*	**22:16**
Time to burn 22.5GB to BD-RE (min:sec)	45:19*	**39:35**

Best scores are bolded. All tests were conducted using Nero CD DVD Speed and Verbatim media, except OWC Blu-ray tests (*), which were performed using Nero Burning ROM. Our test bed is a Windows XP SP2 machine using a 2.66GHz Intel Core 2 Quad Q6700, 2GB of Corsair DDR2/800 RAM on an EVGA 680 SLI motherboard, one EVGA GeForce 8800 GTS card, a Western Digital 500GB Caviar hard drive, and a PC Power and Cooling Turbo Cool PSU.

VERDICT 4

OWC MERCURY PRO 8X BLU-RAY EXTERNAL

+ MERCURY	− URANUS
Attractive; includes cables for all the ports; excellent DVD rips.	OWC doesn't seem to care as much about QA as it does about product design.

$400, www.macsales.com

We're not sure whether this product's flaws are the fault of the Mercury Pro enclosure or the Pioneer BDR-203 within it, or both.

Demigod

An epic battle of wannabe gods, Internet permitting

It is said that a great game is easy to learn but difficult to master. Demigod has the latter part down—the former, not so much. Veterans of the Warcraft III mod Defense of the Ancients, from which this game draws much of its inspiration, will have an easy time grasping the excellent concept, but to most other players it's a very new form of multiplayer role-playing game, and the lack of tutorials makes learning the ropes a challenge.

To make a long, superfluous story short, portals on both sides of a symmetrical map spew out waves of AI-controlled troops that clash in the middle. Controlling a single powerful character, your goal is to push the tide of battle back at the enemy and topple their citadel. It sounds fairly simple, but thanks to a blizzard of game elements such as eight character classes, structure and minion upgrades, item purchasing, and flag capturing, Demigod becomes extremely complex.

Epic battles rage as escalating waves of minions break against powerful demigods.

The demigod characters, all of which have loads of personality and detailed fighting animations, are divided into high-damage assassins and supporting generals (teams can mix classes freely), and each has a unique skill tree. Assassins, like the enormous Rook, specialize in dealing damage directly, while generals, like the spirit-rising Oak, outsource some of that duty to summoned minions. Neither type has a clear upper hand, but generals tend to be more demanding to master and are more vulnerable to the game's subpar pathfinding, which strands minions on every corner.

Battle is extremely tactical, and victory depends on knowing when to give up pursuit of a wounded enemy, when to retreat behind defenses yourself, when to seize a window of opportunity as the enemy waits to respawn, how to best use your demigod's powers to complement your allies, and finding a balance between spending your money on improving your demigod with items or your team with citadel upgrades to buff up minions and tower defenses. After both teams have gotten the hang of things, it's a very suspenseful and fluid sort of war where the tides of battle can swing wildly back and forth, and victory is seldom certain. The only thing that's difficult to overcome is if you allow the other team to gain experience and level up significantly faster than you do—then your godly goose is cooked.

But for what is primarily a multiplayer game (single-player skirmish and tournament options are identical to multiplayer, except against bots), Demigod has some extremely finicky online matchmaking. Stardock and Gas Powered Games have been very aggressive in issuing patches to resolve the maddening problems, but as of this review, it takes a lot of gentle coaxing and crossed fingers to get everyone connected properly for a custom six-player game. The reward for suffering through the connectivity issues is great, but spending 20 minutes setting up a game only to be dropped moments from victory has a way of dampening enthusiasm.

—DAN STAPLETON

The Vampire Lord raises an army of tick-like soldiers from defeated enemies to do his bidding.

VERDICT **6**

DEMIGOD

+ HOLY	− DAMNABLE
Great tactical RPG combat; visually amazing maps; interesting demigod characters.	Poor documentation; weak pathfinding AI; connectivity problems.

$40, www.demigodthegame.com, ESRB: T

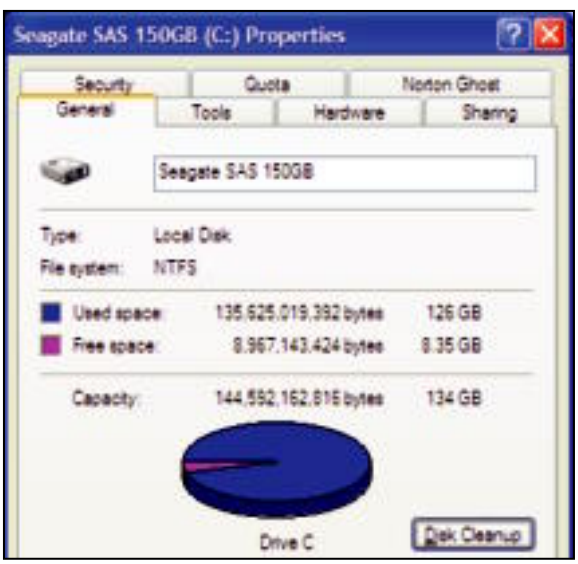
LAB NOTES

My Rig the Guinea Pig

How I learned firsthand how to get a better PC without paying anything

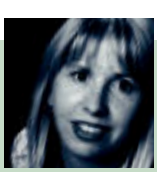
GORDON MAH UNG
SENIOR EDITOR

The words "free" and "performance" don't often go together, but I honestly think I found a good meeting point in writing this month's "Better, Faster, Stronger" article (page 22). For my tests, I subjected my own work machine, the one I drive the most, to the majority of our tips. In the end, my employer-provided PC—a 2.4GHz Core 2 Duo E6600—is indeed running better, faster, and stronger. Among the tips that made the most difference were compressing older files on the machine to free up space, defragging the hard drive, using Startup Delayer to speed up boots, and installing HDD Health to monitor the hard drive. My machine has gone from being almost useless to useful, and I no longer have to wait 10 minutes from a cold boot. I'm also now keeping a closer eye on one 500GB drive in the machine, which registers 81 percent health.



NORMAN CHAN
ONLINE EDITOR

For the last month, I've enjoyed playing Stardock's Demigod—even though it takes 30 minutes to set up a multiplayer game. Still, network code this buggy is appalling, especially since Stardock's own Gamers Bill of Rights states that "gamers have the right to demand that games be released in a finished state."

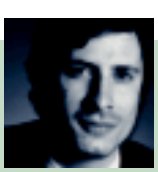


KATHERINE STEVENSON
DEPUTY EDITOR

I'm in the process of gathering ultra-portable notebooks for a review roundup I'll be conducting next month. These petite notebooks are facing stiff competition from the ever-expanding netbook market, so it will be interesting to see what the higher cost of an ultra-portable notebook actually gets you these days.

WILL SMITH
EDITOR-IN-CHIEF

After four short months of use, I retired my Windows 7 Beta install for…Windows 7 RC. There aren't a ton of major tweaks, but I like the new Windows XP–compatibility mode, as well as the changes to Libraries that Microsoft made. Overall, I remain pleased with the way Win7 is shaping up and am looking forward to the eventual release later this year.



NATHAN EDWARDS
ASSOCIATE EDITOR

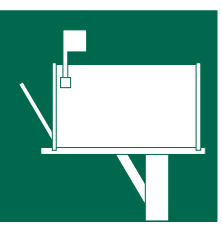
It's been a good month in my beats: Thermalright's Ultra-120 Extreme CPU cooler and Samsung's new 256GB SSD both got Kick Ass ratings. On the home front, I've been customizing my Asus Eee 1000HE netbook with a fancy skin, more RAM, and hacked visual styles, and playing the hell out of Zeno Clash.

ALEX CASTLE
ASSOCIATE
ONLINE EDITOR

Since writing software how-to articles is a big part of my beat, my work computer gets subjected to an enormous number of application installs. It's not a coincidence that out of all of those programs, my favorite is Revo Uninstaller—I get a grim satisfaction from purging bad apps from my hard drive with extreme prejudice.

We tackle tough reader questions on...

Screws vs. toolless
Gmail Drive Tips
Video Streaming Bandwidth



What Would Gordon Do?

I'm stuck with the question of whether I should go out and spend $3,000 for the ultimate PC or just wait until the end of this year for Windows 7 and all the new SSDs. I'm currently running a Pentium 4 HT and I need a new computer to play the hottest games. So what would you do?

–Josh Peters

Senior Editor Gordon Mah Ung: I'm no fan of Windows Vista, so I'd be inclined to wait until November when Windows 7 comes out to build a new supermachine. However, gaming on a single-core Pentium 4 is like not gaming at all, and Windows Vista is workable, especially with $3,000 worth of hardware kicking its butt up the hill, so you really might want to consider just biting the bullet and building a machine today. Another alternative is to download the Windows 7 Release Candidate now, and upgrade to the full version when it becomes available.

Putting the Screws to Us

You guys often rate cases with the idea that needing a screwdriver is a bad thing. I have built a lot different rigs over the years and have seen a lot of bad ideas for retaining my expensive hardware. I much prefer a good old-fashioned screw. Another downfall of all the different methods is that they have to be kept with the case they came with. Over the years, things get separated or lost. I would much rather retain my optical drives, hard drives, and expensive videocards with a nice, solid screw that will fit just about anything. About as toolless as I will go is a thumb screw. I think you guys put way too much emphasis on "toolless" designs when rating cases.

–Scott Mulkerin

Associate Editor Nathan Edwards responds: It's our opinion that there are places where screws are great, and places we'd rather do without them. PCI-E slots? Sure, screw that expansion card in. Optical drives? Sure, we guess, but elegant toolless bays from Cooler Master and Silverstone have spoiled us, and using screws again seems like a step backward. For hard drives though, we're unabashed in our appreciation of screwless enclosures and hot-swap bays. Even if we have to screw the drive into a tray, the tray should remove easily.

More on Gmail Drive

I just want to make you aware of two things about the Gmail Drive how-to in your June 2009 issue. First, you didn't mention a file size limit. Right now the size of attachments is limited to 20MB officially, but is actually about 24MB. The article made it seem like file size was not a problem. Second, and this is the most important part of Gmail Drive use, you have to have Internet Explorer running when you try to access your Gmail account through Gmail Drive. Sometimes it will work on its own but normally you have to have IE up and running, otherwise you get a login error and a message that you can't log in because Google changed the settings or something. Please let your readers know about this and they will have endless fun with Gmail Drive.

Finally, you missed the best part of Gmail! I use several accounts as storage space for music since Gmail has a built-in player for MP3s. Just load the music file

NOW ONLINE

Give Your Laptop a Clean Start

We taught you how to properly give your PC a clean start in our February issue, but not all the same rules apply when you want to give your laptop a system-cleansing format. Our web-exclusive feature walks you through ridding your laptop of bloatware and helps you juggle those enigmatic mobile drivers after a new Windows install. Learn how to give your aging notebook a new lease on life at http://bit.ly/EbFgt.

to Gmail Drive and play it from your account.

–Brian Mahoney

How Much Speed is Needed to Stream?

I live in Hawaii and currently have DSL service provided by Hawaiian Telcom. My download speed is 2.87Mb/s and my upload speed is 659Kb/s. My question is, if I build the "Ultimate TV & Movie PC" (May 2009), would my current DSL service provide enough download and upload speed to watch these programs?

–Beverly Mililani

Editor in Chief Will Smith Responds: Yes, that should be more than sufficient bandwidth for most video streaming, assuming that's actually the speed you're getting and not just the speed your ISP promises. To find out, point your browser at Speedtest.net and run the speed test from a local server. While you may not be able to stream all high-def content, you should get a decent experience with anything that includes a buffer, such as Netflix or Hulu.

Organization Is Our Bag

Regarding the "Essential Gear and Gadgets in Our Geek Bag" (The List, June 2009), how do you manage to separate all that equipment so the items don't scratch each other or make the bag just a pool of clutter? Are there enough pockets of sorts to fill?

—John Lee

Online Editor Norman Chan Responds: Just as Batman would never cram all of his wonderful toys into one pouch on his utility belt, we keep all our gadgets in separate pockets for ease of access. Luckily, the Acme Cylde bag we picked for The List has seven individual compartments to keep our laptop safely isolated from our multi-tool and batarangs.

Alternative Essential Apps

Just a quick note on your "32 Essential Apps" article (June 2009). One of the pieces of software you mention, Secunia PSI, is indeed useful, but I use a similar app called Update Checker from FileHippo.com to keep a number of my programs updated. Like Secunia, Update Checker scans your computer and comes back with a list of programs that have available updates and provides a link to download the update.

Also, the website keeps a list of app revisions for those times when you might have an old Windows OS and need something that will run on it. Speaking of revisions, another useful program is File Hamster from MogWare.com. Set it to watch a program or folder, and it will save every revision you make to the associated files. I used to use GoBack (which has saved my butt on more than one occasion) but it doesn't install on my RAID system.

—David Thiel

Password Power

In your software selections for "32 Essential Apps" I noticed that you have both KeePass and Dropbox. A lot of people don't realize that you can actually sync your KeePass Database using Dropbox. Create the Database as usual, or take your existing database and drop it in the Dropbox folder. Point KeePass to the Dropbox folder's password database and log in as usual. This particular one-two punch actually saved me big time. My password database was corrupted and Dropbox allowed me to revert to a previous version. I may have lost one or two passwords... but WAY better than losing the whole kit and caboodle. Hope this helps you and your readers.

–Paul Warner

JUST LOAD THE MUSIC FILE TO YOUR GMAIL DRIVE AND PLAY IT FROM YOUR ACCOUNT

CUTCOPY**PASTE**

On page 63 of our June 2009 issue, we added an unnecessary hyphen to our shutdown shortcut. The correct command is: `shutdown -s -t 60 -c "Computer will shut down in One Minute"`

LETTERS POLICY Please send your questions and comments to comments@maximumpc.com. Include your full name, city of residence, and phone number with your correspondence. Letters may be edited for space and clarity. Due to the amount of mail we receive, we are unable to respond personally to all queries.

NEXT MONTH

COMING IN

MAXIMUM PC's Funny Phrase Goes Here AUGU ISSUE

>>Disaster-Proof Your PC

If you care at all about preserving the integrity of your PC and your data, you must read our guide to thoroughly safeguarding a system.

>>History of the PC

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>>Ultra-Portable Notebooks

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FULL-TOWER CASE

Cooler Master ATCS 840

Lian Li's PC-P80R held our top full-tower case spot for almost a year, but the king has finally been dethroned. In its place is the masterfully designed Cooler Master ATCS 840 (reviewed April 2009), a resurrection of the company's famous ATCS line that combines old-school good looks with smartly innovative features. We feel comfortable working in the 840's roomy interior and are completely smitten by the ease of swapping out parts. Other highlights: the slide-out motherboard tray—complete with CPU-backplate cutout—and three silent 23cm fans. Say goodbye to gaudy LEDs and plastic finishes; the slick look of brushed metal is back, baby! www.coolermaster.com

THE REST OF THE BEST

Extreme Processor
Intel Core i7-965 Extreme Edition
www.intel.com

Budget Processor
Phenom II X4 940
www.amd.com

LGA 1366 Motherboard
MSI Eclipse SLI
www.msi.com

Socket 775 Motherboard
Asus Striker II Extreme
www.asus.com

Socket AM2 Motherboard
MSI K9A2 Platinum
www.msicomputer.com

$500 Videocard
Nvidia GeForce GTX 295
www.nvidia.com

$250 Videocard
ATI Radeon 4870
www.ati.com

Capacity Storage
Seagate Barracuda 7200.11 1.5TB
www.seagate.com

Performance Storage
Western Digital VelociRaptor
www.wdc.com

DVD Burner
Samsung SH-S223
www.samsung.com

Blu-ray Burner
LG GBW-H20L
www.lge.com

Monitor
Gateway XHD3000
www.gateway.com

Mid-Tower Case
Silverstone Fortress
www.silverstonetek.com

Air Cooler
Thermalright Ultra-120 Extreme
www.thermalright.com

Gaming Mouse
Logitech G9x Laser Mouse
www.logitech.com

Keyboard
Microsoft Natural Keyboard 4000
www.microsoft.com

Games We're Playing

Left 4 Dead
www.l4d.com

Demigod
demigodthegame.com

Zeno Clash
www.zenoclash.com

The Chronicles of Riddick: Assault on Dark Athena
www.riddickgame.com

For even more Best of the Best entries, such as speakers and budget components, go to http://www.maximumpc.com/best-of-the-best

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