

OCZ IBIS HSDL
SSD (240GB)

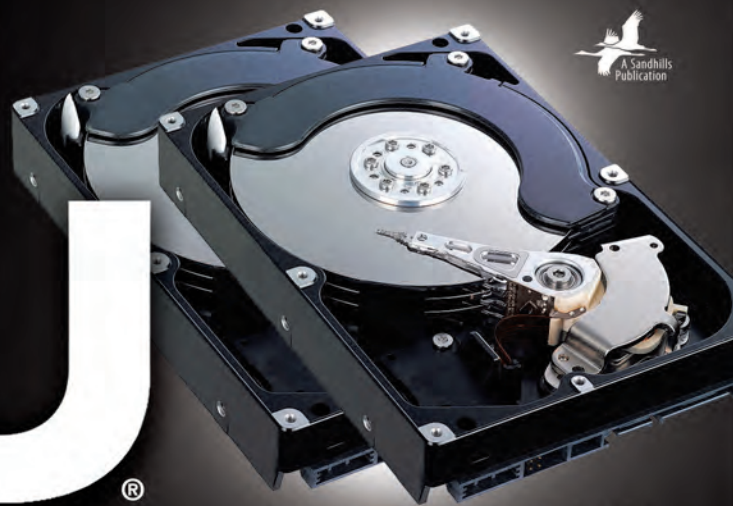
Nvidia GeForce
GTX 580

Antec
LanBoy Air



cpu®

COMPUTER POWER USER



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Q&A WITH JACK WANG
SHUTTLE USA'S PRESIDENT
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PAGE 110



RA X10 LIQUID



NEVER HAS A CASE BEEN SO COOL

Introducing our new World Class Ultimate Water Cooling System for servers and extreme gaming systems – An enhanced version of the 2008 Computex Innovation Award Winner – RaX10. This system comes with a pre-installed water cooling system that employs the same advanced technology used in the current automobile industry, a quantum leap above our competitors who use the same old fashioned refrigerator cooling process.

Our water cooling system is comprised of dual high performance all-aluminum radiators containing anti-oxidation coolant bundled with our customized SIM – System Intelligent Management, a software to control and monitor fan speed in 5 different groups. This case is equipped with many advanced features including:

STRATEGIC DESIGN

- Dual Power Supply Capability – One located in the bottom and one positioned at the top of the case
- Dual radiators with a total of 12 cooling fans [two of them are 14cm large fans on the top and rear and with two 12cm fans on the front]
- Supports longest VGA cards with Crossfire and SLI ready features
- Removable Rack for up to 6 HDD
- HDD can be mounted either face in or face out for better cable management
- Tool-less design

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Infinite Loops

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Editor's Note

As PC enthusiasts, we are almost always looking forward. We have our eyes fixed firmly on the tech horizon, scanning for the earliest indication as to what our next CPU, graphics card, or mass storage unit might be, and we have a permanent itch to get the latest browser, the latest game, or the latest iteration of our favorite productivity app downloaded and installed.

Every once in a while, though, it's fun to pause for a moment and take a fond look backward; to reminisce about the tech we've enjoyed and/or admired the most over the past 12 months. That's what we're doing this issue, our annual best-of awards feature, starting on page 48.

We realize, of course, that your mileage may have varied, possibly to a somewhat drastic degree, but let's face it: The disagreements we have over stuff like this are far more interesting than when we agree. Either way, we think you'll have fun looking back through the eyes of *CPU's* editorial staff at the best components, peripherals, and software from 2010, and when you've wrung those articles dry, keep reading so you can see what we're predicting for the year ahead. After all, as I mentioned earlier, this sort of anticipation is part of our nature—it's the "early" in "early adopter."

Elsewhere, be sure and check out our first look at Nvidia's GeForce GTX 580, our roundup of six outstanding X58 motherboards, a look at what's going on with NAND flash, and our discussion with David Allred of Sezmi, whose vision of what TV should be might interest those of you who are ready for something new. We also had an interesting chat with Shuttle's Jack Wang, who shared some insights into the SFF market and DIY notebooks.

In short, you have some great stuff ahead of you; we hope you have as much fun reading it as we did putting it together for you.



Chris Trumble, Publication Editor, *CPU*



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computers & electronics

TigerDirect.com

mwave.com

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COMPILED BY BLAINE FLAMIG

Two Entirely Different Small PCs

As parents, we wince every time our kids use our laptop. PeeWee PC's PeeWee Pivot 2.0 could help tame our nerves. Not only does the \$599 netbook-looking Pivot 2.0 feature Windows 7, 15 educational titles, and an Intel Atom N450, but it also sports such features as a 180-degree rotating touchscreen, water-resistant keyboard, non-slip grips, hard plastic exterior, and two security suites. Taking the "pee wee" theme to the adult level is the intriguing Xi3 Modular Computer whose aluminum sides measure less than 4 inches each. The Xi3 needs less than 20W to run, comes in 10 color options, and supplies six USB 2.0 and two eSATA ports; DVI, VGA, and HDMI; a choice of three AMD CPUs (including 2.2GHz Athlon 64 4200+); up to 4GB DDR3 RAM; and 1080p playback. Perhaps most alluring are the rig's three swappable boards, including one that contains the CPU, graphics chip, and RAM and another with video, input, and USB connections. "We reject the



concept that computers should have a useful life of only two to four years," says Xi3 CEO Jason A. Sullivan. Sans input devices, the Xi3 starts at \$849 with Linux Suse included. ■

Verbatim Shrinks Its MediaShare NAS Server

"Would you like that NAS media server with or without storage, sir?" That's the question you'll need to ponder if shopping for a NAS media server at Verbatim. With the recently released MediaShare Mini (\$90), the company is now providing a non-storage alternative to its previously released MediaShare unit. The MediaShare, meanwhile, comes with up to 1TB of onboard storage (\$199). If you go the mini route, you'll have four USB ports at your disposal to plug in your own drives. As with the MediaShare, you're getting remote Internet support; file accessibility from an iPhone, iPod touch, Android, and other smartphones; Facebook and Flickr integration; and streaming through the PS3, Xbox 360, and DLNA-compliant adapters. ■



WATCHING THE CHIPS FALL

Here is the pricing information for various AMD and Intel CPUs.

CPU	Released	Original Price	Company Pricing*	NewEgg.com Retail Price*
AMD Phenom II X6 1090T (Black Edition)	4/27/2010	\$295	\$295**	\$229
AMD Phenom II X6 1055T	4/27/2010	\$199**	\$199**	\$179
AMD Phenom II X4 965 (Black Edition)	8/13/2009	\$245	\$165**	\$165.99
AMD Phenom II X4 955 (Black Edition)	4/23/2009	\$245	\$145**	\$155.99
AMD Phenom II X4 945	11/4/2009	\$165**	\$145**	\$135.99
AMD Phenom II X2 555 (Black Edition)	1/25/2010	\$105	\$93**	\$91.99
AMD Phenom II X2 550	11/4/2009	\$93	\$93**	\$87.99
AMD Athlon II X4 Quad-Core 640	5/10/2010	\$122**	\$99.99**	\$99.99
AMD Athlon II X4 Quad-Core 645	9/21/2010	\$122	\$122**	\$117.99
AMD Athlon II X3 Triple-Core 445	5/10/2010	\$87**	\$76**	\$73.99
Intel Core i7-980X Extreme Edition	3/11/2010	\$999**	\$999**	\$999.99
Intel Core i7-975 Extreme Edition	6/2/2009	\$999**	\$999**	\$979.99
Intel Core i7-970	7/18/2010	\$885**	\$885**	\$879.99
Intel Core i7-930	Q1 2010	\$294**	\$294**	\$279.99
Intel Core i7-875K	5/28/2010	\$342**	\$342**	\$329.99
Intel Core i5-760	7/18/2010	\$205**	\$205**	\$204.99
Intel Core i5-750	9/8/2009	\$196**	\$196**	\$199.99
Intel Core i5-655K	5/28/2010	\$216**	\$216**	\$179.99
Intel Core i3-550	Q2 2010	\$138**	\$117**	\$129.99
Intel Core i3-540	Q1 2010	\$133**	\$117**	\$119.99

* As of November 2010

** Manufacturer's estimated price per 1,000

Creative Joins The 1080p Web Cam Party

If you thought Microsoft and Logitech were the only gunslingers in town firing 1080p bullets out of their Web cams, think again. Creative has entered the fray with its new Live! Cam Socialize HD 1080 (\$89.99), which in addition to doing true 1080p video captures at up to 30fps, sports integrated dual adaptive array mics with noise-cancellation and Live! Scan scanning software with touchscreen and multitouch support. Elsewhere, Creative recently also announced the Creative ZiiO 7" (starts at \$278) and ZiiO 10" (starts at \$332) Pure Wireless Tablets in 8GB and 16GB sizes both running Android 2.1 and including Creative's X-Fi technology and ZMS-08 processor, which reportedly has ties to the 1GHz ARM CPU. Creative states that apps for the tablets are available in its ZiiStore. ■



Hardware Mole

SSD, Flash Drive & External Drives For The Taking

Another month, another batch of new storage options for your consideration, including the MiniStation Stealth and DriveStation Axis LED external drives from Buffalo Technology. The 4.5 x 3.03 x 0.55-inch MiniStation comes in capacities of as much as 640GB (\$104.99) and draws its power from one USB cable. The DriveStation Axis LED, meanwhile, will start shipping in January at a top 2TB (\$159.99) capacity and include a built-in LED-drive capacity meter. Also in storage news, beyond a new 480GB UltraDrive MX SSD (reportedly \$1,200; 250MBps read and 180MBps write) with dual SATA II and mini-USB interface, Super Talent recently made available a USB 3.0 Express Duo flash drive in 8GB and 16GB sizes for a mere \$14 and \$29, respectively. USB 2.0 backward-compatible, the stick can surpass 67MBps reads when slipped into a USB 3.0 port, Super Talent states. ■

Mice, Mice & More Mice

No matter where you turn these days there's seemingly a new, flashy mouse scampering on the scene, including Asus' puckish, tilting, 2.4GHz WX-DL (\$80) with touch-sensitive pad. Elsewhere, there's the Elecom 800/1,600dpi Bluetooth 3.0 Lazer (about

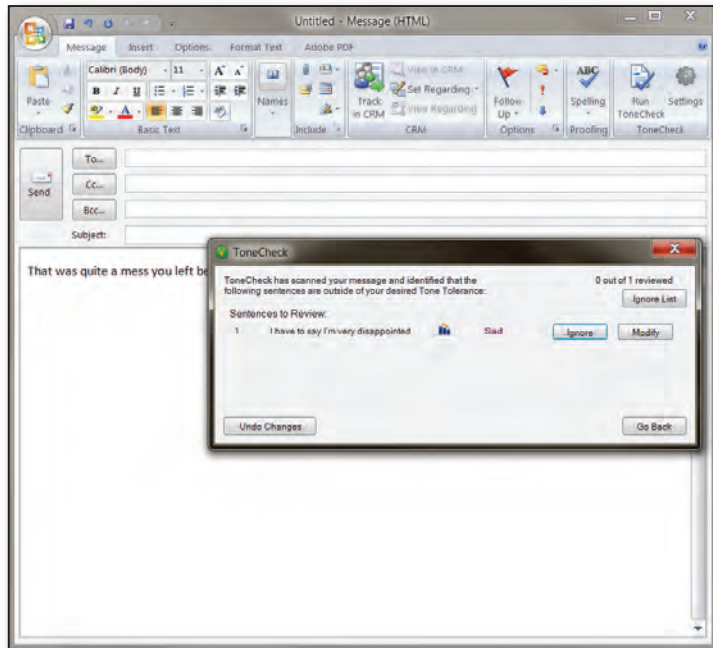


\$52) and Tt eSports' Azurues optical gaming mouse (pricing still to come) with

400/800/1,600dpi options, "weight-in" design, and black rubber exterior for better gripping in FSPs. Really piquing our interest, however, is Roccat Studios' Kone [+] (about \$110). This monster of a gaming mouse gives you direct access to 22 functions via a built-in EasyShift [+] button (one of 12 onboard buttons), 6,000dpi Pro-Aim Laser Sensor with built-in TDCU (tracking and distance control), five profiles you can save to the 576KB of integrated memory, and a slick four-LED system you can configure with various effects. ■

New Headsets Are Here, You Say?

Sure, you can technically game without chatting, but having a headset, whether you use it to talk a little junk or a little strategy, makes the experience that much more satisfying. To that end, it's out with the old and in with the new at Sony, which is replacing its 2008-released Bluetooth Headset for the PS3 with a more streamlined, 30% smaller model (that costs \$49.99) with dual mics, automatic PS3 pairing (via USB cable), mute button, charging cradle, LED in-game indicator, new noise-cancelling ability, and three-way calling and call-waiting support. Sennheiser, meanwhile, is also gifting gamers with new headset options via a new headset line led by the flagship PC 360 (\$299.95) with Open-Aire acoustics technology. The PC 163D (\$209.95) and PC 333D (\$239.95), meanwhile, both pack Dolby Headphone technology for 7.1 virtual surround sound. Finally, the PC 330 G4ME (\$169.95) provides a nice automatic muting ability when pushing the boom mic upward. ■



“Don’t Send The Wrong Message”

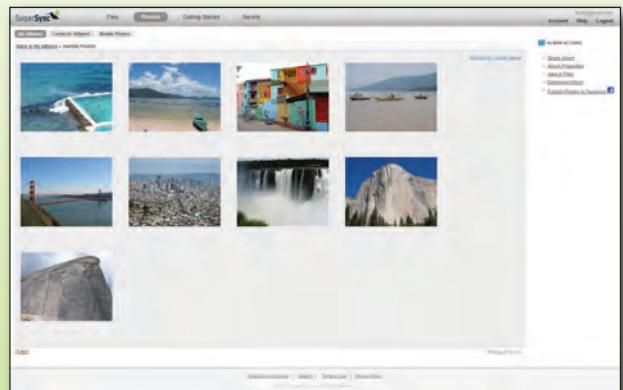
According to Lymbix, the maker of such products as TweetTone and ToneFilter, a study from the Journal of Personality and Social Psychology indicates people misinterpret email messages 50% of the time. (We’ll leave it to you if the stat still holds up considering the study is from 2005.) To that end, Lymbix offers the ToneCheck, a free beta plug-in that promises to “stop email confusion before it happens” by evaluating and flagging words and phrases “for the intensity of eight primary emotions.” Compatible with Outlook 2003/2007/2010, ToneCheck is said to work as easily and intuitively as a spell checker. Features include an Editor, an Alert that notifies of potential “uh-ohs” upon pressing Send, Tolerance tool for adjusting what you deem tolerable, and a new Ignore Function to manually add terms to an Ignore List. ■

BullGuard Gives A Security Nod To Gamers

Seeking an Internet security suite that protects without denting system game performance? BullGuard believes it has the answer via the Game Mode it includes in its new Internet Security 10 (\$59.95), which offers 5GB online storage and such new features as Behavioral Detection technology (rated to snag 65% more malware than standard virus apps), Safe Browsing (alerts you to registered, unsafe sites in search results), and Inspector (tracks down outdated software). Game Mode was actually added in Internet Security 9 to filter system resources toward gaming performance, thus “ensuring maximum performance without compromising safety.” In 2009, BullGuard worked with SteelSeries on a BullGuard Gamer’s Edition, for which it conducted a study of 2,000 gamers. Interestingly, 20% claimed to not use any security while gaming, while roughly half of the remaining 80% cited complaints about security software hindering gameplay. ■

SugarSync Sweetens Its Free Storage Offer

A recent announcement from online storage provider SugarSync is a win-win situation for current users and those who have yet to tap into the company’s backup and file-sharing service. Previously, SugarSync offered anyone 2GB free online storage to keep and manage their goods from any device, including Android, Apple, and BlackBerry mobile gear. The company more than doubled the offering to 5GB in mid-November, however; citing the limit as the “most generous, free sync-and-share offering for the personal cloud.” Those already signed up for 2GB plans were upgraded to 5GB, as well. “Statistics show people’s storage needs double every two years so this larger plan is better suited for today’s mobile consumer,” says Laura Yecies, SugarSync CEO. “This is by far the most robust free, cloud-based service for consumers on the market.” ■



TRUE INNOVATION



MAINGEAR SHIFT Pushes the Limits

Great engineering and innovation has won MAINGEAR the prestigious CES 2011 Innovation Honoree Award for its unique SHIFT Chassis design. The SHIFT rotates the internal components of the PC so that the natural tendency of hot air to rise is exhausted through the top vents and cool air is drawn in from the bottom of the chassis without taking away from the design aesthetics. Staying true to pushing performance, the MAINGEAR SHIFT offers latest and fastest in computer technology including the Intel® Core™ i7 Extreme Edition processor overclocked to 4.5GHz, NVIDIA® GeForce® GTX 580 graphics solutions and tons of space for expansion that rolls up to be one hell of a beast that runs silent, cool and powerful. Experience the MAINGEAR difference.



Visit: WWW.MAINGEAR.COM/CPU to learn more

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Software Shorts

Political Hacks Gone Awry

No matter your opinion of Fox News pundit Bill O'Reilly or 2008 VP candidate Sarah Palin, two sentences recently handed out for hackers who attacked the pair's digital property provide an interesting glimpse at how varied cybercrime sentences can be. In O'Reilly's case, Mitchell Frost of Bellevue, Ohio, was sentenced to 30 months prison and ordered to pay \$40,000 for hacking O'Reilly's Web site. David Kernell, meanwhile, was sentenced to 12 months and a day in custody for hacking Palin's email account during her 2008 campaign. Kernell could have been sentenced to 18 months prison. Further, the judge presiding over his case recommended the time be served in a halfway house. Both men were students. Frost, of the University of Akron, however, was also allegedly responsible for hacking Ann Coulter's and Rudy Giuliani's sites, launching a DDoS attack on the university's server, and other breaches. ■

Are Many Microsofts Better Than One?

Despite a Goldman Sachs analyst reportedly suggesting recently that Microsoft would be worth \$52 billion more if it broke the company up into numerous entities followed by an investor asking CEO Steve Ballmer during an annual shareholders meeting if it is time to do just that, Ballmer and Bill Gates rejected the notion. Ballmer responded that he didn't believe the move would be useful and added his "natural genetic makeup" precludes him from thinking in such a way. Gates, meanwhile, cited "synergy across the company" as being a strength, and "I don't think there's a line where you'd find net simplicity by trying to create a new company." The Motley Fool, meanwhile, wrote that "even adjusted for dividends, Microsoft's stock has essentially gone nowhere over the past decade," adding Microsoft "shot the two biggest arrows in its quiver" with Windows 7 and Office 2010 yet is still "one of the few tech giants to be trading lower this year." For his part, Ballmer sold \$1.3 billion of his Microsoft stock in early November, reportedly just 12% of his overall stake. ■



The Dreaded Dirty Dozen

Web browsers don't fare well in the 2010 version of the fourth annual Bit9 report of the top 12 applications containing reported "high severity" security vulnerabilities. Topping the list was Google's Chrome with 76 reported vulnerabilities followed by Apple's Safari with 60. Charting in the fifth position was Mozilla's Firefox (51), while Microsoft Internet Explorer finished eighth (32). Overall, Apple and Adobe make the list most often, with Reader and Acrobat accounting for 54 reported vulnerabilities, Shockwave Player 35, and Flash Player eight. Apple's WebKit totaled nine vulnerabilities and QuickTime six. "The reality is every enterprise, including our own, is likely using at least one of the applications, and unpatched vulnerabilities are often used as the access point for the targeted enterprise attacks making headlines these days," says Harry Sverdlow, Bit9 CTO. Bit9 compiled the list using the U.S. National Institute of Standards and Technology's vulnerability database and various criteria. ■

Wikipedia Is Counting On You

It's that time of year again when Wikipedia is taking its cause to the Internet streets and asking all fine online citizens to help the site stay ad-free. The community-driven encyclopedia—which founder Jimmy Wales claims in a personal online donation plea sees roughly 400 million visitors each month (including sister sites) and is the fifth most-popular site globally—needs \$16 million from users to keep the ads at bay. Wikimedia Foundation, the nonprofit group that oversees the site, indicated it raised \$8 million for last year's fund-raising effort. This year, it needs \$20.4 million overall due to increased operating costs. Wikimedia is hoping to raise the funds over a two-month stretch. If you want to help, the foundation will gladly accept your credit card or PayPal donation. ■

Vint Cerf's Details Top Three Worries

In an interview with *Computer Weekly*, Internet pioneer Vint Cerf outlined three major crises he feels that if left unchecked could stall the Internet's potential as a tool for economic growth and communications vehicle. Beyond the rapidly approaching dearth of IPv4 addresses for doling out—Cerf suggests providing businesses serious about switching to IPv6 tax credits—Cerf sees security and reliability on networks and adapting the Internet for mobile use as major concerns. “If people don't trust the applications on the 'net, the network won't be as widely used or be the basis for growing GDP, creating new jobs and businesses,” he stated. Mobility-wise front, Cerf says the Internet's original design didn't take into account how much mobile access would be required, thus “it doesn't do it very well.” ■

Internet Scams Not Kind To Women

A study that British organization Knowthenet.org recently conducted concerning Internet scams doesn't put women ages 25 to 34 in a favorable light. To help users better protect themselves online, security experts ran an experiment that measured the ability of more than 2,000 online consumers to spot seven scams (fake social networking pages, sale of counterfeit products, etc.) and react accordingly. In six of seven tests, women were most likely to fail, with women ages 25 to 34 most likely to get conned. (Where “confidence trick scams,” or those aimed at persuading someone to send money to help a person in distress, 53% of men failed.) “Our research shows that even confident Web users can be vulnerable,” states Phil Kingsland, site director of Knowthenet.org. Take the test yourself at www.knowthenet.org.uk/threattest. ■

Site Seeing

OpenCulture.com Sucks Your Time Intelligently

Thanks a lot, OpenCulture.com. There's another Saturday we can't get back. No worries, though. Spending the better part of the day at this site is well worth it for appreciators of free, intelligent, engrossing Web 2.0-presented, high-quality video and audio. With a mission to centralize, curate, and provide access to such content via audio books, ebooks, online courses, movies, and more, the site succeeds magnificently. Take, for example, recent posts providing a heads up on the download availability of the 1910 film version of “Frankenstein” via the Internet Archive, a link to an animated version of the Gettysburg Address, or an entry devoted to a conversation on transcendental meditation between David Lynch and Sir Paul McCartney. Excellent, organized, and well-linked, the site offers apps for Apple and Android devices. ■

Amazon.com Studios Wants Your Best Pitch

Ever had a great idea for a Hollywood flick only to let it fade into the ether because you lacked the means to get the script into the hands of some hotshot studio exec? Us, too. Well, Amazon.com is hoping to change that scenario with the recent launch of Amazon Studios, which plans to use “21st-century technology” to create “opportunities to make and share movies and scripts more easily than ever.” Amazon has forged a “first-look deal” with Warner Bros. to present the highest regarded projects as deemed by judges and users to the studio. Amazon will also hand out \$1.1 million in prizes next year, including \$1 million to the Best Movie and \$100,000 to the Best Script. You have until Dec. 31, 2011 to enter. Once you post your work, other filmmakers and screenwriters can offer revision suggestions and advice. ■



Gamer Paladin D815

- Intel® Core™ i3-540 Processor
- Genuine Windows® 7 Home Premium 64-Bit Edition
- ASUS® P7H55 Motherboard
- NVIDIA® GeForce™ GT 430 1GB Video Card - DirectX 11 Support
- PSI CyborgX Gaming Case + 450W Power Supply
- Liquid CPU Cooling System with 120mm Radiator
- High Definition Surround 3D Premium Sound
- Optional: NVIDIA® 3D Vision Glasses and Monitor (+\$499)



Components included with system

\$629



• Intel® Core™ i7-880 Processor	\$1149
• Intel® Core™ i7-875K Processor	\$864
• Intel® Core™ i7-870 Processor	\$824
• Intel® Core™ i5-760 Processor	\$729
• Intel® Core™ i5-680 Processor	\$824
• Intel® Core™ i5-660 Processor	\$724
• Intel® Core™ i5-655K Processor	\$729
• Intel® Core™ i5-650 Processor	\$699
• Intel® Core™ i3-540 Processor	\$629

• Intel® Core™ i7-880 Processor	\$1329
• Intel® Core™ i7-875K Processor	\$1044
• Intel® Core™ i7-870 Processor	\$1009
• Intel® Core™ i5-760 Processor	\$914
• Intel® Core™ i5-680 Processor	\$999
• Intel® Core™ i5-660 Processor	\$899
• Intel® Core™ i5-655K Processor	\$909
• Intel® Core™ i5-650 Processor	\$879
• Intel® Core™ i3-540 Processor	\$799



\$799

LAN Warrior II-55

- Intel® Core™ i3-540 Processor
- Genuine Windows® 7 Home Premium 64-Bit Edition
- Gigabyte H55M-USB3 Motherboard
- NVIDIA® GeForce™ GTX460 2GB Video Card - DirectX 11 Support
- NZXT® Vulcan Gaming Case + 700W Certified Power Supply
- High Definition Surround 3D Premium Sound
- Optional: NVIDIA® 3D Vision Glasses and Monitor (+\$499)



Components included with system

Gamer Paladin D855

- Intel® Core™ i7-950 Processor
- Genuine Windows® 7 Home Premium 64-Bit Edition
- Intel® X58 Chipset Motherboard with USB 3.0 Card
- NVIDIA® GeForce™ GTS 450 1GB Video Card
- NZXT® Guardian 921RB Gaming Case + 700W Power Supply
- Liquid CPU Cooling System with 120mm Radiator
- High Definition Surround 3D Premium Sound
- Optional: NVIDIA® 3D Vision Glasses and Monitor (+\$499)



Components included with system

\$984



• Intel® Core™ i7-980X Processor Extreme Edition	\$1819
• Intel® Core™ i7-970 Processor	\$1629
• Intel® Core™ i7-960 Processor	\$1299
• Intel® Core™ i7-950 Processor	\$984

• Intel® Core™ i7-980X Processor Extreme Edition	\$2009
• Intel® Core™ i7-970 Processor	\$1854
• Intel® Core™ i7-960 Processor	\$1524
• Intel® Core™ i7-950 Processor	\$1199



\$1199

Gamer Paladin D875

- Intel® Core™ i7-950 Processor
- Genuine Windows® 7 Home Premium 64-Bit Edition
- ASUS® Sabertooth X58, USB3 + SATA3 Motherboard
- ATI® Radeon™ HD 5770 1GB Video Card - DirectX 11 Support
- Antec DF-35 Gaming Case + 700W Power Supply
- Kingston® 30GB SSD (Boot) + 1TB SATA3 HDD (Data)
- Liquid CPU Cooling System with 120mm Radiator
- High Definition Surround 3D Premium Sound



Components included with system

Gamer Paladin D895

- Intel® Core™ i7-950 Processor
- Genuine Windows® 7 Home Premium 64-Bit Edition
- ASUS® Sabertooth X58, USB3 + SATA3 Motherboard
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Job Of The Month

The mobile apps model that took smartphones and tablets by storm is storming onto the Mac desktop in early 2011. Want to be among the first to have a look? As Apple ramps up its app store for the Mac OS, the company has issued a call for a Mac Application Reviewer to join the team that works with developers on their projects. Apple has asked its worldwide network of software creatives to start submitting their best work, and if you make the cut, you'll be one of those guys who decides what apps still need work and which are ready for prime time. Experience with Mac OS X is required, of course, and our guess is that you will most likely have plenty to do. "Candidate needs to be able to organize and prioritize a heavy workload," the job description says. Consider yourself warned.

(bit.ly/d1ZLIN)



What Motivates Consumers to Engage With Companies Online?

Discounts and giveaways remain the most effective lures brands can use to capture the interest of consumers online.

- 77% Offered an incentive (free product, coupons, etc.)
- 46% Solved a problem (customer service)
- 39% Solicited feedback on product
- 28% Entertained me (access to premium content)
- 26% Offered new ways to interact with their brand (widgets, mobile apps, games, etc.)
- 21% Marketed to me (banner ads)

(Cone)

LBS? NSF

Location-based services such as Foursquare, Facebook Places, and Gowalla are all the rage among the digerati and investors. It seems that everyone is "checking in" when they enter their neighborhood Applebee's. Or are they? According to the latest Pew Internet & American Life Project poll, only 4% of online adults use such "geosocial" services, and on any given day only 1% use them. To be sure, 7% of mobile Internet users do access these services. But the line to "check in" at your local Starbucks may not be as long as the hype suggests.

RAW Numbers

87%

Percent of U.S. Internet users who access social media (Harris Interactive)

60%

Percent of Fortune 500 companies with active Twitter accounts (U. Mass)

26%

Percent of Web users who spend more time communicating with friends online than face to face (Yazino)

148.4
Million

Unique U.S. visitors to Facebook.com in September 2010 (comScore)

Youth's Big Internet Shift

According to Edison Research, the amount of time 12-24-year-old Americans spend online has nearly tripled in the last 10 years, while time spent listening to radio, talking on the phone, and reading newspapers and magazines has plummeted.

In the last 24 hours, how much time did you spend . . .

On the Internet	Watching television	Listening to the radio	Playing videogames	Talking on the telephone	Reading magazines	Reading newspapers
2000: 0:59	2000: 2:37	2000: 2:43	2000: 0:42	2000: 1:44	2000: 0:24	2000: 0:17
2010: 2:52	2010: 2:47	2010: 1:24	2010: 1:10	2010: 1:04	2010: 0:11	2010: 0:08

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Better With Age

Two Years Later, X58 Is Still Intel's Champion

Intel launched its Nehalem architecture more than two years ago, and even today, Core i7 processors based on the company's quad-core Bloomfield and hexa-core Gulftown designs remain the fastest desktop CPUs available.

Yes, Intel is planning to launch new Sandy Bridge processors at the start of 2011, but those will be mainstream parts with integrated graphics, PCI-E, and a dual-channel memory controller. And although Sandy Bridge will certainly be interesting to power users on a budget, enthusiasts willing to spend a little more will want to stick with the LGA1366 processor interface a little bit longer. LGA1366 won't be replaced at the high-end until the second half

no standard in place for connecting USB 3.0-compatible motherboards and enclosures. ASRock is the first manufacturer we've seen try to solve that conundrum with a header at the bottom of its X58 Extreme6 board. Recognizing that it'll take time for chassis manufacturers to catch up, ASRock also includes an accessory that slides into a vacant 3.5-inch drive bay, exposing two front-panel USB 3.0 ports.

Everything else about the X58 Extreme6 screams premium functionality, even if this remains one of the most affordable X58-based motherboards in our roundup. A trio of NEC controllers delivers six total USB 3.0 ports, while three Marvell controllers contribute six total 6Gbps SATA ports. The board's voltage regulation

platform cannot be denied. Match it up to a Core i7-950 and a couple of GeForce GTX 460s in SLI, and you're looking at a beefy yet affordable enthusiast machine.

Asus Rampage III Formula

Enthusiasts don't always need the motherboard with the highest price and longest spec sheet. Rather, it's more important to include the features that enable the best performance. Asus' Rampage III Formula sets out with high-end features, but nothing we'd consider over the top.

It's clear that Asus designed the Rampage III Formula with aesthetics in mind. The red and black color scheme looks great inside a windowed case. But beyond its pretty



X58 Extreme6

\$239

ASRock

www.asrock.com.tw



Rampage III Formula

\$299

Asus

www.asus.com



X58B-A3 SLI

\$189

ECS

www.ecs.com.tw



of 2011, which is why motherboard vendors continue refreshing their X58-based lineups. Today we're looking at six revamped X58 platforms sporting modern takes on a 2-year-old chipset.

ASRock X58 Extreme6

We're increasingly seeing motherboard vendors tying 6Gbps SATA and USB 3.0 into current-gen Intel platforms. Intel's existing chipsets don't natively support either, necessitating third-party controllers.

Including SATA 6Gbps is easy enough. The connector looks exactly the same, and it's predominantly an internal interface, anyway. But USB 3.0 employs an all-new connector. Unfortunately, most cases with front-panel USB access still employ second-generation ports because there is

circuitry is cooled passively, though we suspect the heatsink would be more effective without a decorative cap on top.

ASRock puts ample space between its first, second, and third 16-lane PCI-E slots, so even if you're using dual-slot boards in CrossFire or SLI, there's still one slot of breathing room between each card. Of course, the X58 chipset comes with 36 total lanes of PCI-E 2.0 connectivity. Between the X58 Extreme6's slots and onboard controllers, it greatly exceeds that ceiling. So ASRock uses a PLX switch to ensure each component gets ample bandwidth.

The X58 Extreme6 employs a small eight-phase voltage regulation circuit, so it's not going to be the best for hardcore overclockers. However, the value of this

face, the platform boasts a smart layout. A trio of 16-lane PCI-E slots accommodate up to three cards in CrossFire or SLI. Should you run such a potent configuration, one slot will operate at full speed, while the other two are split into eight-lane links.

USB 3.0 and 6Gbps SATA are both included in moderation (two ports for each), but most of the Rampage III Formula's capabilities revolve around the challenges of overclocking. For example, a pair of BIOS chips comes in useful when an abundance of ambition puts one out of commission prematurely. ROG Connect links the motherboard to your laptop of choice via USB, relaying POST code and hardware status readouts, in addition to facilitating BIOS updates. Probelt is Asus' marketing term for eight onboard

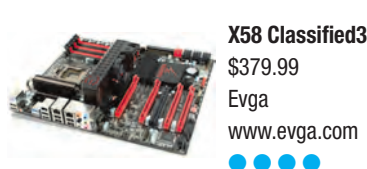
measurement points, used to double-check the voltages of critical components.

Extras such as LN2 Mode and a QPI voltage jumper work around issues specific to the folks who tweak their machines competitively. A total of eight fan headers virtually guarantee that you'll never run out of cooling. And three headers for thermal monitoring ensure you always have access to the health of sensitive components.

In essence, the Rampage III Formula feels like the product of every lesson we've ever learned about overclocking and wished we had an answer to. Of course, it helps that the board is both fast and stable, too.

ECS X58B-A3 SLI

ECS' X58B-A3 SLI enjoys the distinction of being the least expensive motherboard in our comparison. Of course, a price tag well under \$200 means that power users are going to look to ECS as the baseline for value.



X58 Classified3

\$379.99

Evga

www.evga.com



Intel's ICH10 controller. There is no USB 3.0 in play here, but ECS does add a Gigabit Ethernet controller and FireWire. The two PCI-E x16 links that support SLI and CrossFire are perhaps most interesting to enthusiasts.

With a bit more polish, ECS' X58B-A3 SLI could be the ideal no-frills performance motherboard. As it sits now, though, you're better off paying a little extra for ASRock's more well-rounded X58 Extreme6.

Evga X58 Classified3

Power users who can afford it will enjoy Evga's massive heatpipe-based chipset cooler, 10-phase digital PWM, and red and black color scheme that begs for a windowed case. Like Asus' Rampage III Formula, this platform is pointed squarely at overclockers. The emphasis is on driving as much juice to the CPU as possible through a combination of the standard 24-pin ATX connector and two 8-pin +12V auxiliary lines; Evga claims



Gigabyte X58A-UD7

\$349

www.gigabyte.us



users in very demanding environments, we've learned from experience in an unforgiving test lab that the company often generously honors the warranties on products it knows were overclocked. The premium Evga asks for its X58 Classified3 is substantial, but if you're worried about getting the right support as you tune a value-oriented Xeon E5620 or Core i7-950, paying extra for peace of mind might be worthwhile.

Gigabyte X58A-UD7

With Evga's X58 Classified3 just \$30 more expensive and Asus' Rampage III Formula \$50 cheaper, what sort of value can Gigabyte hope to add with its X58A-UD7? Well, first of all, the X58A-UD7 includes an extra long list of additions. Second, it's one of the only X58-based motherboards ready to be watercooled, right out of the box.

Just because the X58A-UD7 *can* be watercooled doesn't mean it has to be,



MSI X58A-GD65

\$249.99

us.msi.com



As it turns out, dipping below the \$200 mark might be too good to be true. The X58B-A3 SLI only has one BIOS file available—its initial release. That wouldn't be a detractor if the board operated like a mature product, but it doesn't. Even with all of the board's USB functionality turned on (and recognized in the Windows 7 Device Manager), none of the mice and keyboards we plugged in would work. Thankfully, ECS includes legacy PS/2 ports for both I/O devices; those functioned normally.

That's not to take away from the X58B-A3 SLI's performance or stability, though. Once we worked past the board's idiosyncrasies, it was able to put down excellent benchmark scores without a hiccup in reliability.

Of course, a budget board won't include a ton of extras. Storage is limited to the six 3Gbps SATA ports native to

the X58 Classified3 is able to deliver a maximum of 600W to the processor. Other enthusiast-friendly features include Vdroop control, which helps maintain load voltages to stabilize aggressive overlocks, onboard voltage read points (similar to Asus').

The X58 Classified3 doesn't turn in the highest stock benchmarks, but its BCLK is also set to 132.7MHz by default, resulting in a CPU running about 20MHz lower than the rest of the boards. Of course, a board like this was never meant to ride at the speed limit.

Beyond the features or benchmark scores Evga's board is able to generate, there's one reason enthusiasts keep going back to the company's premium products: the always difficult to quantify variable called service. Despite the fact that Evga knows its boards are used by power

though. Gigabyte ships the board with a heatsink covering Intel's X58 chipset. Two grooves toward the rear of the sink accommodate an included Hybrid Silent-Pipe module, which stretches from the voltage regulation circuitry to the chipset and out the back of a chassis. Or, you have the option to replace the heatsink altogether with a bundled waterblock (compatible with 3/8-inch inside diameter tubing).

Gigabyte's feature list includes dual Gigabit Ethernet controllers, up to 12 SATA devices (two 6Gbps), up to 14 USB ports (two USB 3.0), FireWire, and two- or three-way SLI/CrossFire support. Although the X58A-UD7 isn't as well suited to hardcore overclocking as the Asus or EVGA boards, it does offer a number of LED banks that indicate voltage, overclocking, and temperature status.

Out of the box, the X58A-UD7's BIOS automatically overclocked our Core i7-970 processor by 40MHz by goosing the BCLK to 135MHz. Just to keep things fair, we manually specified a 133MHz setting and ran the 3.2GHz CPU through its paces. In spite of the normalized clocks, Gigabyte still turns in some of the fastest results. And it does so with unwavering stability, too.

MSI X58A-GD65

It's difficult to gauge value in the X58 motherboard space. After all, these are platforms designed to maximize performance, not fit within tight budgets. And yet MSI's X58A-GD65 joins ASRock's X58 Extreme6 as one of the most affordable platforms armed with 6Gbps SATA and USB 3.0. The ASRock board includes more of each next-gen interconnect and is slightly less expensive. However, MSI brings over some of the features found on its higher-end

boards to give the X58A-GD65 a more enthusiast-oriented angle.

For example, MSI makes a big deal about its military-class components, which include higher-end capacitors and chokes. According to the company, these help enhance reliability when the board is subjected to long-term loading. Though that's admittedly a difficult claim to quantify, the highly-conductive polymerized capacitors are clearly visible near the X58A-GD65's LGA 1366 interface. In comparison, ASRock employs solid capacitors. If MSI's claims hold true, you'll be looking to upgrade long before one of these capacitors fails. MSI also arms the X58A-GD65 with active phase switching, which optimizes efficiency by turning power phases on and off in response to load.

A lack of active cooling on the voltage regulation circuitry, northbridge, or southbridge translates to a more limited overclocking experience. (There isn't much headroom for increasing

voltages to overcome BCLK-based limitations.) However, the X58A-GD65 is very well suited to multi-card graphics configurations, thanks to its three PCI-E x16 connectors spaced two slots apart. Indeed, MSI claims three-way CrossFire and SLI compatibility, and includes one of each bridge connector in its accessory pack.

More than anything, the X58A-GD65 is a practical motherboard. It doesn't go overboard with integrated extras. Its rear I/O panel includes a solid mix of legacy PS/2 connectivity, USB, eSATA, FireWire, and analog/digital audio output. A series of LEDs relays useful information about the board's status. Power and reset buttons, plus an overclocking-oriented DIP switch simplify basic functionality on an open-air bench. And, of course, the board is a capable performer, easily matching pricier platforms in our roundup. ■

BY PAUL CROSS

Specs & Scores	ASRock X58 Extreme6	Asus Rampage III Formula	ECS X58B-A3 SLI	Evga X58 Classified3	Gigabyte X58A-UD7	MSI X58A-GD65
Form factor	ATX	ATX	ATX	EATX	ATX	ATX
DIMM slots	6 (Up to 24GB DDR3-2000)	6 (Up to 24GB DDR3-2200)	6 (Up to 24GB DDR3-1600)	6 (Up to 24GB DDR3-1600+)	6 (Up to 24GB DDR3-2200)	6 (Up to 24GB)
SATA 6x 3Gbps	6x 6Gbps, 6x 3Gbps	2x 6Gbps,	6x 3Gbps 6x 3Gbps	2x 6Gbps, 6x 3Gbps	2x 6Gbps, 6x 3Gbps	2x 6Gbps,
USB 3.0	6	2	No	2	2	2
Gigabit Ethernet	1	1	1	2	2	1
FireWire	2	2	2	2	3	1
PCI-E	3x PCI-E x16, 2x PCI-E x1	3x PCI-E x16, 2x PCI-E x1	2x PCI-E x16, 1x PCI-E x4, 2x PCI-E x1	4x PCI-E x16, 1x PCI-E x1	4x PCI-E x16, 2x PCI-E x1	3x PCI-E x16, 2x PCI-E x1
eSATA	2	2	2	No	2	2
MSRP	\$239	\$299	\$189	\$379.99	\$349	\$249.99
CPUs	●●●●●	●●●●●	●●●●	●●●●●	●●●●●	●●●●●
	ASRock X58 Extreme6	Asus Rampage III Formula	ECS X58B-A3 SLI	Evga X58 Classified3	Gigabyte X58A-UD7	MSI X58A-GD65
3DMark Vantage	14310	14320	14256	14224	14299	14235
GPU Score	12224	12159	12148	12149	12139	12091
CPU Score	29323	30672	29566	29172	30674	30399
WinRAR x64 (334 MB Archive)*	1:03	0:51	0:54	1:02	0:51	0:57
HandBrake 0.9.4 Transcode*	5:13	4:58	5:03	5:08	4:57	4:57
iTunes 10.0.1 AAC Conversion*	1:21	1:18	1:19	1:21	1:19	1:17

*minutes:seconds

CPU Ranking : ○ = Absolutely Worthless | ●●● 2.5 = Absolutely Average | ●●●●● 5 = Absolutely perfect

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LaCie d2 USB 3.0

As we expand our collection of media, which now includes HD video, high bit-rate MP3's, and high-resolution images, transfer speed should be one of the key concerns when looking for external storage. USB 2.0 provides a theoretical maximum transfer speed of 60MBps, with real-world speeds often settling around 30 to 40MBps. The LaCie d2 USB 3.0 is an external hard drive that features a USB 3.0 connection, which can offer a theoretical maximum transfer speed of 600MBps, and LaCie installs a 7,200rpm hard drive that allows the d2 to copy data at up to 130MBps.

We tested the 1TB version of the d2 USB 3.0, but a 2TB version (\$249.99) is also available. LaCie designed the d2 USB 3.0 with fanless cooling; the whole aluminum exterior of the external hard drive serves a large heatsink. During our testing,

the external drive occasionally felt a little warm, but it was never hot. The d2 can sit vertically or horizontally, and we like that LaCie included a heavy stand that screws to the external drive and provides a solid base when the unit stands upright.

We connected the LaCie d2 USB 3.0 to a test system with USB 3.0 ports and ran PCMark Vantage's HDD Suite and SiSoftware Sandra's Physical Disk tests. The external hard drive posted a 108.79MBps read performance and 13ms random access time, which are both comparable to the

d2 USB 3.0

\$149.99

LaCie

www.lacie.com



transfer speeds of a 7,200rpm internal hard drive. The drive's PCMark Vantage scores were also respectable.

With its quick performance, the d2 USB 3.0 is ideal for those with a PC with USB 3.0 ports who often transfer large media collections from one system to another. Power users who regularly back up large sets of files will also benefit from the USB 3.0 connectivity. ▲

by Nathan Lake

Gigabyte GeForce GTS 450 (GV-N450-1GI)

Gigabyte recently sent us its entry-level take on the GF106-based GeForce GTS 450. Like Nvidia's reference design, this card has a \$129 price tag, but unlike that card, the core and memory clocks are bumped slightly, from 783MHz and 900MHz to 810MHz and 902MHz, respectively.

Gigabyte's GTS 450 is a dual-slot card that sports an oblong plastic heatsink shroud, but it only covers the top of the radial aluminum heatsink, so it's more of a cape than a shroud. The heatsink features a copper core, which adds appreciably to the card's weight, and according to Gigabyte, lowers temps by 14%. Another bonus you get with this card is a three-year warranty. A single six-pin PCI-E power connector supplies juice to this card, and you have a pair of DVI ports and a mini HDMI port for display connectivity.

Due to the similarity in price, we benchmarked the Gigabyte GTS 450 against

a reference Radeon HD 5750, though the latter card could be had for slightly less if you're willing to fuss with rebates. Even despite a new Catalyst driver (one that boasts improved S.T.A.L.K.E.R.: Call of Pripyat performance), the GTS 450 still has an edge on the elder Radeon card (even in S.T.A.L.K.E.R.). Between the two, DirectX 9 performance appears to be a wash, but DX11 titles seem to favor Gigabyte's card. ▲

by Andrew Leibman

GeForce GTS 450 (GV-N450-1GI)

\$129.99

Gigabyte

www.gigabyte.us



Benchmark Results

LaCie d2 USB 3.0

PCMark Vantage HDD Tests (MBps)

Windows Defender	25.75
Gaming	14.1
Importing Pictures To Windows Photo Gallery	53.73
Windows Vista Startup	17.44
Video Editing Using Windows Movie Maker	41.77
Windows Media Center	81.94
Adding Music To Windows Media Player	9.62
Application Loading	4.401

SiSoft Sandra 2010 SP1 Physical Disks

Drive Score (MBps)	108.79
Random Access Time (ms)	13

Specs: GPU: GF106; Core clock: 810MHz; Memory: 1GB GDDR5 (902MHz); 192 CUDA cores, 32 texture units, 16 ROPs

Specs & Scores

	Gigabyte GTS 450	Radeon HD 5750
Price	\$129.99	\$129.99
Core Clock	810MHz	850MHz
Memory Clock	902MHz	1,200MHz
Memory Interface	128-bit	128-bit
Memory	1GB GDDR5	1GB GDDR5
3DMark Vantage Performance	Performance (1,280 x 1,024)	
Overall	10638	9546
GPU Score	8736	7766
GPU1 (fps)	26.1	23.88
GPU2 (fps)	25.06	21.58
CPU Score	30661	30572
CPU1 (Plans/s)	4310.1	4287.98
CPU2 (Steps/s)	38.95	39.08
Games	1,280 x 1,024	
Left 4 Dead 2 (8XAA, 16XAF)	70.7	69.75
S.T.A.L.K.E.R.: CoP (4XAA)	24.9	19.5
Aliens Vs. Predator (8XAA)	22.4	20.9
	1,920 x 1,200	
Left 4 Dead 2 (8XAA, 16XAF)	45.24	49.63
S.T.A.L.K.E.R.: CoP (4XAA)	15.26	12
Aliens Vs. Predator (8XAA)	14.2	13.9
Drivers: ForceWare 260.63/Catalyst 10.9		

Test system specs: Processor: 3.33GHz Intel Core i7-980X Extreme Edition; Motherboard: Intel DX58SO; RAM: 3GB Qimonda PC3-8500; Storage: 128GB Patriot Zephyr SSD; PSU PC Power & Cooling TurboCool 1KWSR

Specs: Capacity 1TB; Ports: USB 3.0; Support: Windows XP, Windows Vista, Windows 7, and Mac OS X 10.5 and 10.6; Dimensions: 2.3 x 6.6 x 7.2 inches (HxWxD)

Antec LanBoy Air

If modular PSUs can help you customize your build, why couldn't a modular chassis do the same? The LanBoy Air is a totally modular, open-air chassis built with the capacity to provide some serious cooling, which is obvious when you see that the case is practically all mesh wrapped around a frame.

Starting with the outside tour of the LanBoy Air, we were impressed with a design that makes it possible to completely reconfigure the front panel, unscrew the varying sizes of side panels, and store tools in an onboard utility box that's conveniently hidden at the bottom of the front panel.

Not unlike tearing down and rebuilding a tower of Legos, the LanBoy Air is a joy to take apart and piece back together. Technically, you can reorganize the case 34,800 different ways if you're really enthusiastic. If you prefer your PSU

top-mounted (as opposed to the bottom-mounted stock arrangement), remove the back panel, motherboard tray, PSU cage, plus any support rails, and move the PSU cage with rails under the top panel.

We outfitted the LanBoy with a liquid-cooled combination of a Gigabyte GA-X58-USB3 motherboard, Intel Core i7-980X EE, Radeon HD 6850, 6GB Patriot Sector 7 DDR3, and the Antec TruePower Quattro 1,200W power supply. Installing components was made infinitely easier by the fact that you could get to almost any nook by completely removing pieces of the case.

For some, this case's starkly unique aesthetic, a byproduct of its take-no-prisoners modular design, may make it a hard sell. But it is a tweaker's dream, and for those who like the way it looks—or

who are just craving something besides a plain, black box with a window—the LanBoy Air is a rare confluence of form and function. ■

BY JOANNA CLAY



**Antec
LanBoy Air**

\$219.95
Antec
www.antec.com

Specs: Case type: Fully modular; Motherboard compatibility: Mini-ITX, microATX, Standard ATX; Bays: 3 5.25-inch external, 6 3.5-inch internal, 2 2.5-inch internal (bottom-mounted); Dimensions: 20.4 x 8.7 x 19.3 (HxWxD); Standard fans: 2 120mm front, 1 120mm rear, 2 120mm side; Optional fans: 1 120mm, 6 120mm side fan bays, 1 120mm top; Front ports: 2 USB 2.0, 1 USB 3.0, audio I/O

Scythe USB Foot Switch Triple

As an everyday writer, I press CTRL-C, CTRL-V, and CTRL-S 500 times a day if I press them once—admittedly not the most strenuous of chores but time-consuming nonetheless. With Scythe's extremely handy USB Foot Switch, engaging such key combos is foot-stomp quick. Take that quickness and apply it to a favorite FPS, racing title, video-editing app, etc., and potential benefits become obvious.

Scythe sells one- (\$33), two- (\$44), and three-pedal switches. I tested the three-pedal version. An obvious question of all versions is "Will the pedals hold up?" The answer is, "Yes." Screwed to a thick, hard-plastic slab, the pedals resemble a guitar pedal setup with grooved, rubber mats covering each pedal. Rubber feet on the bottom prevent slippage on carpet, though they aren't as successful on hardwood floors. The nearly 5-foot integrated USB cord,

meanwhile, is plenty long enough to route neatly out of the way.

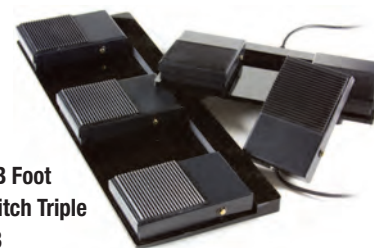
Software on an included CD helps assign functions to each pedal. (No drivers are needed to immediately use the switch, however.) The process could be clearer (the user installation guide is somewhat vague) but doesn't take long to conquer. By default, the pedals provide basic left, right, and double-click mouse functions. Drop-down menus provide further options (My Computer, Log Off, etc.), but the real payoff is the seemingly endless CTRL, ALT, and SHIFT combinations you can designate.

In Windows Media Player, for example, setting Play/Pause, Rewind, and Fast Forward abilities to the pedals immediately paid dividends while practicing guitar parts along to songs. Game-wise, changing weapons, reloading, jumping, and similar tasks become all the faster.

One note, racers: The pedals offer all-or-nothing functionality, meaning no variable throttling or braking.

Roughly \$55 seems sizable coin for a device that essentially doesn't provide anything your mouse and keyboard don't, but give the USB Foot Switch even a half day's chance and it's possible you'll think it's worth every penny. ■

BY BLAINE FLAMIG



**USB Foot
Switch Triple**

\$53
Scythe
www.scythe-usa.com

Specs: 29.05 ounces; 2.1 x 14.2 x 5.12 inches (HxWxD); Windows 2000/XP/Vista/7; 1 million-time switch life; mechanical switch type

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Gamer Infinity 8800 Pro SE

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Genuine Microsoft™ Windows® 7 Home
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Extreme i7-980X 3.33Ghz	\$ 2259
i7-970 3.20Ghz	\$ 2095
i7-960 3.20Ghz	\$ 1779
i7-950 3.06Ghz	\$ 1485

From

\$1485

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Intel® Core™ i7 Processor

i7

(8MB L3 Cache, 1066Mhz)	
Extreme i7-980X 3.33Ghz	\$ 1885
i7-970 3.20Ghz	\$ 1719
i7-960 3.20Ghz	\$ 1405
i7-950 3.06Ghz	\$ 1109



From **\$1109**

Zalman ZM-MH200 U3 Dual HDD Docking Station

When reviewing hardware, the best products are sometimes the hardest to write about because there's not much fodder for criticism. Such is the case with the Zalman ZM-MH200 U3 Dual HDD Docking Station.

The ZM-MH200 U3 features two top-loading slots for either 2.5- or 3.5-inch

hard drives; you can just pop in a drive like bread in a toaster and push the eject button to remove it easily. It has a USB 3.0 interface, and the cable is included.

The docking station supports dual mode (the drives in each slot are recognized as two separate drives), JBOD, RAID 0, and RAID 1. Setting the drives to your desired configuration is refreshingly simple: Set the two switches on the back of the unit to one of the four possible combinations and push the reset button. Then, under Disk Management

on your computer, you format the partition(s) accordingly. Done.

In terms of supported capacity, the docking station supports up to 6TB (3TB per slot), and it supports hot-swapping and plug and play, so you can switch drives in and out in seconds. To conserve energy, the drives will switch to standby mode after 10 minutes of inactivity, requiring some startup time when they're re-engaged.

When I first picked up the ZM-MH200 U3, I was a little concerned that the mostly plastic device would be too flimsy to handle two big 3.5-inch drives, but that proved to be an unfounded fear, as the wide cylindrical base doesn't wobble one iota. It also has little rubber feet to prevent it from sliding around.

There just aren't any apparent flaws in the ZM-MH200 U3. ■

BY SETH COLANER



ZM-MH200 U3 Dual HDD Docking Station

\$79.99

Zalman

www.zalman.com

Specs: Hard drive support: 3.5- and 2.5-inch SATA (1.5Gbps and 3Gbps) up to 6TB (3TB per slot); Ports: USB 3.0; OS support: Windows 2000 or higher, Mac OS X 10.2 or higher; Dimensions: 3.54 x 6.22 x 6.22 inches (HxWxD)

Zalman ZM-PCM1 & ZM-VPM1

Power consumption meters have their uses, but most only tell you the overall draw of your entire PC. Sometimes, however, you need to ascertain the energy usage of a single component, such as a CPU or GPU destined for a green application. Sure, you may have your chip's or card's TDP specs on hand, but how much do you trust marketing figures?

Zalman now makes it easier to monitor the actual wattage, voltage, or current drop of a processor or PCI-E graphics adapter with these modular drive bay accessories. The ZM-PCM1 CPU power consumption meter comes mounted in a 5.25-inch drive bay bracket, which has room for the ZM-VPM1 VGA meter and a future gauge alongside it.

Each meter makes use of an included gender-changing module and extension harness to connect inline with one of their subjects' power supply leads. In the CPU meter's case, a 4+4-pin extension



ZM-PCM1

\$59.99

Zalman

www.zalmanusa.com



ZM-VPM1

\$44.99

Specs: Power: 10 to 240W, Current: 0 to 20A, Voltage: 3 to 15V; Connectors: ATX 12V CPU 4-Pin or EPS12V 8-pin (ZM-PCM1), 6+2-pin PCI-E (ZM-VPM1)

mates to the 4- or 8-pin power connector on the motherboard. As for the GPU meter, its 6+2-pin cable fits into a 6- or 8-pin input on a PCI-E video card. Fit and finish is impressive, as one would expect from Zalman, although you'll need to supply your own double-sided tape or zip tie to secure the soap-shaped gender-changing modules out of the way.

Once you know which workloads push your major power-sucking components to the limit, you can tweak your power policies and other settings to balance performance against energy efficiency. Moreover, the current gauge can help you

determine whether a new part is overtaxing your power supply, while the voltage meter can give you runtime feedback on your under- or overvolting efforts in the BIOS.

We wish the Zalmans could be set to record the maximum readings received instead of solely displaying real-time data. However, we like the fact that they remember their readout settings, such as wattage, after a soft reboot (they default to voltage after a system shutdown). And those retro LEDs certainly evoke our Radio Shack childhood. ■

BY MARTY SEMS

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Gigabyte Aivia K8100

Gamers demand much from a keyboard: appropriate key sensitivity, a usable macro facility, and the ability to press multiple keys at once, for example. The K8100 delivers all of these and adds an attractive housing plus several additional features.

All keys are not created equal, and the K8100's designers recognized the fact that some keys get more—and harder—use than others. The K8100's keys are divided into force regions, with some keys (Spacebar, W, A, S, D, etc.) requiring more pressure (70 grams) than less frequently used keys that instead require only 50 or 60 grams. It's hard to tell the difference in pressure without engaging in some seriously long-term gaming, but the key action itself is excellent. The keyboard features a 20-key antighosting feature: Up to 20 keys can be pressed simultaneously.

Aivia K8100
\$69.99 • Gigabyte • www.gigabyte.com



Specs: High-impact plastic case; Color: Red, black, or yellow; Weight: 2.8 lbs.; Silicone key protector; Up to 100 macros, 25 loaded at any one time; variable keystroke sensitivity; 2 USB 2.0 ports; Spare rubberized WASD keys with key removal tool; removable wrist rest; LED key backlights

The K8100 is a programmable gold mine, with features to gladden the hearts of serious macro users. With five macro buttons available in each of five modes (and with other sets that can be loaded via Gigabyte's Ghost Macro Engine software for a total of 100 macros), there are enough options here to allow gamers to set up complex interactions and still dedicate a few keys as media buttons. The K8100's onboard memory means that you can easily switch machines, carrying your macros with you.

The K8100 offers a few more features that gamers will appreciate: rubberized

replacement WASD keys and switchable LED backlit keys, for example. Even non-gamers will like the keyboard's sturdy construction, routable braided cable with gold connectors, and silicone protective key overlay.

Gigabyte's entry into the gaming keyboard market is a solid contender, comparing favorably with other keyboards in—and beyond—its price range: It provides everything you need for both gaming and non-gaming use, and very little that you don't. ■

BY ROD SCHER

OCZ IBIS HSDL SSD (240GB)

OCZ has been designing innovative offerings with cutting-edge SSD technologies for some time now, and as of late, the company has really been pushing the envelope. With the IBIS drive, OCZ has actually pioneered a new SSD interface.

OCZ's HSDL (High-Speed Data Link) interface makes use of optimized PCI-E-based links with an x8 connection over a standard SAS connector. The solution uses a small half-height PCI-E card that plugs into any x4 slot. OCZ bundles a PCI-E x4 card and an HSDL cable in with the drive.

The IBIS drive we tested is a 240GB variant, though sizes up to 960GB are available. The drives come enclosed in 3.5-inch metal casings, so they slide right in to legacy hard drive racks, as well.

The drive itself sports a total of four SandForce SSD controllers, among other control logic chips, in a RAID 0 configuration. The SandForce controllers not only serve up killer performance but also keep the drive responding that way, with SandForce's excellent garbage collection algorithm.

The IBIS drive definitely runs at a premium over standard SSDs, but if you're hell-bent for some of the fastest disk throughput on the market today, the IBIS delivers. ■

BY DAVE ALTAVILLA



IBIS 240GB HSDL
\$739 • OCZ • www.ocztechnology.com

Benchmark Results	OCZ IBIS 240GB HSDL	100GB Sandforce-Based SSD
PCMark Vantage HDD (MBps)		
Vista Startup	285.53	178.23
Application Loading	259.3	181.99
Gaming	164.05	149.59
Windows Photo Gallery	294.43	187.91
Windows Defender	226.32	180.43
Windows Media Player	170.15	144.58
Windows Movie Maker	200.39	140.12
Windows Media Center	507.22	196.27
Sandra Physical Disk Benchmark (MBps)		
Read Drive Score	695.78	254.34
Write Drive Score	560	217.61
IOMeter (IOPs)		
Database Access		
Pattern, QD 144	49,871	20,082
Workstation Access		
Pattern, QD 144	43,406	17,153
Raw File (100MB per file, 2.5GB total) Transfer Test (seconds)		
Read	7.8	7.9
Write	6.4	17.2

Specs: Capacity: 240GB (223GB formatted); Maximum read/write (advertised): 740MBps/720MBps; Sustained write (advertised): 600MBps; MTBF: 2 million hours; Three-year warranty

Test system specs: CPU: 3.2GHz Core i7-970, Motherboard: Gigabyte GA-EX58 Extreme, RAM: 6GB Kingston HyperX DDR3-1333, Storage: WD Raptor 150GB (OS drive), Graphics GeForce GTX 285, Windows 7 Ultimate x64

Gigabyte GeForce GTX 480 SOC

A handful of overclocked GeForce GTX 480s are currently on the market, but few are as extreme as the Gigabyte GeForce GTX 480 Super Overclocked edition. What makes the Gigabyte GeForce GTX 480 SOC so interesting are its ultra-high clocks and custom cooler (dubbed Windforce 3X).

In addition to being faster, the GeForce GTX 480 SOC is also quieter than reference cards, thanks to its custom triple-fan cooling setup. And, somewhat surprisingly, Gigabyte's offering—despite its higher frequencies—actually consumes less power than slower reference cards. The

power savings are a result of more efficient voltage regulation circuitry on the GTX 480 SOC, as well as Gigabyte's aggressive binning of the GPUs themselves.

Everything about the Gigabyte GeForce GTX 480 SOC screams "power user." This card is easily one of the most attractive GTX 480-based cards on the market. At under \$470, it is priced competitively. The only thing that may give potential consumers pause is the recent arrival of the slightly faster GeForce GTX 580, which can be had for only an additional \$30. ■

GeForce GTX 480 SOC

\$469

Gigabyte

www.gigabyte.com



BY MARCO CHIAPPETTA

Benchmark Numbers

	Gigabyte GeForce GTX 480 SOC	Stock GeForce GTX 480
Unigine Heaven v2.1 (Extreme Tessellation)*		
Score	793	742
FPS	31.5	29.5
3DMark Vantage Extreme		
Overall	11634	10097
GPU Score	11162	9679
GPU Test 1 (fps)	34.9	30.23
GPU Test 2 (fps)	30.42	26.41
Aliens vs. Predator*		
1,920 x 1,200	41.3	37.1
2,560 x 1,600	26.1	23.5

Test system specs: CPU: 3.2GHz Intel Core i7-965; Motherboard: Gigabyte EX58-UD5; RAM: 6GB OCZ DDR-1333; Storage: WD Raptor 150GB; Windows 7 Ultimate x64; GeForce Drivers v260.99

Specs: GPU: GF100; Core clock: 820MHz; Memory 1,536MB GDDR5 (950MHz); 480 shader cores; Memory bus: 384-bit

Patriot Memory Viper Xtreme 4GB (PX534G2000ELK)

The main attraction of Patriot Memory's recently released line of Viper Xtreme memory kits is its new heatsink design. The new Viper Xtreme kits have much heavier and thicker aluminum heatsinks, fused with copper heat plates that feature ridged fins along the top. The end result is a better-performing heatsink that's able to more quickly absorb and dissipate heat.

Patriot's Viper Xtreme DDR3 kits are available in capacities ranging from 4GB to 12GB, with rated frequencies of 1,600MHz or 2,000MHz. The kit I tested, model PX534G2000ELK, boasts a 4GB capacity (2x 2GB, dual channel) with a rated speed of 2,000MHz. It also supports XMP profiles for easy

configuration on compatible motherboards and latencies of 9-10-9-27 at 1.65V.

Performance of the Patriot kit was quite good. According to SiSoft Sandra, bandwidth hovered around the 20.5GBps mark, which is great for a dual-channel kit. A low-res Crysis benchmark yielded frame rates just north of 211fps.

Because the main feature of this new memory is its heatsink design, I also checked temperatures under various conditions and came away impressed. When running at a full 2,000MHz, with no additional cooling,

the temperature of the hottest part of the memory peaked at only 48.5 degrees Celsius under a sustained load, which was just warm to the touch. With an active memory cooler in place, temps peaked at only 33.1 C. The bottom line: This memory runs cool.

At a little over \$150 for a 4GB kit, Patriot's Viper Xtreme Series memory isn't cheap, but it is worth the extra investment if you're in the market for a high-quality memory kit. ■

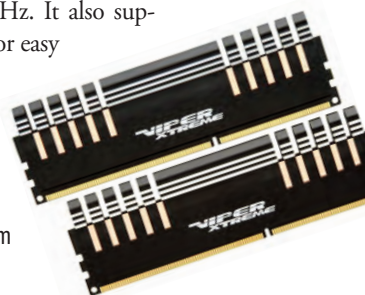
BY MARCO CHIAPPETTA

Viper Xtreme 4GB (PX534G2000ELK)

\$154.99

Patriot

www.patriotmemory.com



Specs: Capacity: 4GB (2x 2GB); Speed: PC3-16000 (2,000MHz); Latency: 9-10-9-27; Voltage: 1.65V; XMP-ready; Lifetime warranty

Benchmark Numbers

	Patriot Viper Xtreme 4GB
SiSoft Sandra 2010 SP2	
Aggregate Memory Performance (GBps)	20.52
Integer Buffered iSSE2 (GBps)	20.68
Floating Point Buffered iSSE2 (GBps)	20.37
Access Latency	61ns
Crysis CPU benchmark	
800 x 600 (Low Quality)	211.03

Nvidia GeForce GTX 580

Fermi Shows Its True Colors

“With this stunningly quiet-running card, Nvidia absolutely trounces AMD’s top-end single-GPU graphics card and even comes close to dethroning the dual-GPU Radeon HD 5970.” We *might* have said that six months ago if Nvidia had released Fermi as it currently exists in the guise of the GeForce GTX 580. Instead, the GF100 in the flagship of the 400 series was hot, noisy, and ran on one SM shy of a full deck. The GF110 inside the GTX 580 is a tweaked GF100 without the crutches, but having said that, this card shows Fermi at its full potential.

How New Is This GPU?

The GF110 ships with every last one of its 16 SMs enabled, which gives it 512 CUDA cores, 64 texture units, and the same ROP count as the GTX 480 (48). Nvidia also took some of the tweaks that made the GTX 460 such a champ and applied them to the GF110, including improved FP16 texture filtering, which lets the GPU filter twice the number of FP16 pixels per clock as the GF100. The GF110 also features a new Z-culling/rejection engine designed to improve rendering in games. The GF100’s leaky transistors have been sufficiently caulked, resulting in a 244W TDP (the GTX 480 has a 250W TDP) even despite a 10% boost in core clock (to 772MHz) and an 8% boost in memory clock (to 1,002MHz). The memory subsystem is the same 384-bit bus with 1.5GB of GDDR5.

Much Quieter & Less Hot

Nvidia seems to have effectively fixed Fermi at the die level, but the changes don’t stop there. The GTX 580 ships with a significantly improved vapor chamber-based cooler. It works by evaporating liquid from the hot floor of the closed chamber where it touches the GPU and allowing the vapor to condense on

the ceiling of the chamber. The transferred heat then disperses via the more traditional heatsink and fan combo. Thanks to the highly efficient cooler, the GTX 580 is also significantly quieter than the GTX 480.

The Numbers

Against an overclocked GTX 480 from Gigabyte, the GTX 580 was between 1% and 6% faster in our game tests, but it yielded a 12% gain in 3DMark. That’s enough to give the GTX 580 the



GeForce GTX 580

\$499

Nvidia

www.nvidia.com



single-GPU crown, but remember, it takes that trophy from the lackluster GTX 480.

The GTX 580 is still a very hot graphics card; Gigabyte’s overclocked vapor chamber-equipped GTX 480 outperforms Nvidia’s stab at the technology. It remains to be seen whether Nvidia’s latest card can stave off a challenge from AMD’s forthcoming 6970. Our advice, wait and see. ■

BY ANDREW LEIBMAN

Specs & Scores	Nvidia GeForce GTX 580	Gigabyte GeForce GTX 480 Super OC	Radeon HD 5970
Price	\$499	\$479	\$499
Idle temp	39.1 C	34.3 C	42.9 C
Load temp	87.0 C	75.5 C	72.9 C
Max noise output	65.2 dBA	68.1 dBA	65.4 dBA
3DMark Vantage Extreme			
Overall	X13159	X11561	X13970
GPU Score	12762	11183	13564
GPU1 (fps)	39.63	34.89	44.24
GPU2 (fps)	35.05	30.56	35.06
Games 1,920 x 1,200			
Left 4 Dead 2 (8XAA, 16XAF)	133.29	127.3	158.16
S.T.A.L.K.E.R.: CoP (4XAA)	43.22	42.7	43.7
Aliens vs. Predator (4XAA)	43.2	41.3	50.6
2,560 x 1,600			
Left 4 Dead 2 (8XAA, 16XAF)	88.02	83.15	115.63
S.T.A.L.K.E.R.: CoP (4XAA)	27.3	26.9	23.2
Aliens vs. Predator (4XAA)	27.2	26.1	31.2
Driver: Catalyst 10.10 & ForceWare 262.99/260.99			
Specs: GPU: GF110; Core clock: 772MHz; Memory: 1.5GB GDDR5 (1,002MHz); 512 CUDA cores; 64 texture units; 48 ROPs			
Test system specs: Processor: 3.33GHz Intel Core i7-980X EE; Motherboard: Gigabyte X58-USB3; RAM: 6GB Patriot Sector 7 DDR3; Hard drive: 128GB Patriot Zephyr SSD; Antec TruePower Quattro 1,200W PSU			

CPU Ranking : ○ = Absolutely Worthless | ●●● 2.5 = Absolutely Average | ●●●●● 5 = Absolutely perfect

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Sapphire Radeon HD 6850 Toxic Edition

AMD recently gave its partners the green light to introduce overclocked Radeon HD 6850s, and Sapphire is the first out of the gate with its Toxic Edition. Although the GPU under the hood is the same as the stock 6850 we tested last month, Sapphire bolted this one to the same PCB it uses for the more power-hungry 6870 cards. Here, too, you'll find dual six-pin power connectors, which provide more than enough juice to handle the overclocked 820MHz core clock (from 775MHz) and 1,100MHz memory clock (from 1,000MHz), as well as any overclock you manage to score on your own.

To that end, Sapphire did overclockers one better and installed its vapor chamber-equipped cooler on this beast, which is significantly more efficient than the heatpipes and aluminum fin-based coolers found on most graphics cards. Don't take our word for it, just ask Nvidia, which used a vapor chamber to silence the GeForce GTX 580. (See page 32 for more details.) Another nod to overclockers comes in the form of



Radeon HD 6850 Toxic
\$219.99 | Sapphire
www.sapphiretech.com

Sapphire's TriXX overclocking utility, which lets you tweak core clocks, voltage, and memory clocks to get even more performance out of the card.

In the benchmarks, we found Sapphire's HD 6850 Toxic to be measurably superior to both the stock 6850 and Evga's overclocked GTX 460. With such a hearty cooler, the larger thermal/power envelope, and your own overclock, you can easily leave both cards in the dust. ■

BY ANDREW LEIBMAN

Specs & Scores	Evga GeForce GTX 460 SuperClocked	Sapphire Radeon HD 6850 Toxic
Price	\$210.00	\$219.99
Core Clock	675MHz	820MHz
Memory Clock	900MHz	1,100MHz
Memory Interface	256-bit	256-bit
Memory	1GB GDDR5	1GB GDDR5
3DMark Vantage Performance		
Overall	P15488	P15598
GPU Score	13190	13296
GPU1 (fps)	39.71	39.92
GPU2 (fps)	37.53	37.94
Games		
Left 4 Dead 2 (8XAA, 16XAF)	75.54	90.2
S.T.A.L.K.E.R.: CoP (4XAA)	22.86	20.3
Aliens Vs. Predator (4XAA)	23.1	24.8
Left 4 Dead 2 (8XAA, 16XAF)	47.91	61.5
S.T.A.L.K.E.R.: CoP (4XAA)	12.96	11.8
Aliens Vs. Predator (4XAA)	13.9	15.2
Driver: Catalyst 10.10 & ForceWare 260.99		
Specs: GPU: Barts Pro; Core clock: 820MHz; Memory: 1GB GDDR5 (1,100MHz); 960 Stream Processors; 48 texture units; 32 ROPs		
Test system specs: Processor: 3.33GHz Intel Core i7-980X EE; Motherboard: Gigabyte X58-USB3; RAM: 6GB Patriot Sector 7 DDR3; Hard drive: 128GB Patriot Zephyr SSD; Antec TruePower Quattro 1,200W PSU		

Mukii TransImp SATA/IDE to USB 3.0 Adapter

Have an old hard drive lying around that you'd like to use as an external drive? Want to be able to hot-swap among a few extra drives? Mukii's TransImp SATA/IDE to USB 3.0 adapter provides an external connector that features 2.5- and 3.5-inch IDE connectors and a 3Gbps SATA port to let you hot-swap any storage drive without needing to open up your PC. Additionally, the drive features a USB 3.0 interface for fast data transfer.

In addition to current SATA drives, the TransImp SATA/IDE to USB 3.0 adapter lets you work legacy IDE drives. Many newer motherboards no longer offer IDE ports, so the adapter may let your PC access drives that it couldn't before. We also like the portability of the adapter; if you need to travel with large amounts of mass storage, you could easily throw it in the pocket of a laptop bag.

Setup is so straightforward that you won't need the manual to figure it out. The

adapter works on both USB 2.0 and USB 3.0 ports, but, obviously, it'll run faster when connected to a USB 3.0 port. For example, we tested the TransImp SATA/IDE to USB 3.0 adapter with a 74GB WD Raptor connected via USB 3.0, and it produced a speed of 40.26MBps in SiSoftware Sandra 2010 Lite's Physical Disks Read Performance test. Performance dropped to 26.9MBps when we connected via a USB 2.0 port.

Mukii also includes its M One Tuning System software, which lets you format the connected drive, set up an automatic backup schedule, and create partitions on the drive. Overall, we think the Mukii TransImp SATA/IDE to USB 3.0 adapter could be a great device for someone who wants to turn their extra hard drives into portable storage. ■

BY NATHAN LAKE

TransImp SATA/IDE to USB 3.0 Adapter
\$49.99 | Mukii
www.mukiiusa.com



Specs: Ports: 2.5-inch IDE, 3.5-inch IDE, and 1.5/3Gbps SATA; Interface: USB 3.0/2.0

Benchmark Numbers	Mukii TransImp SATA/IDE to USB 3.0 Adapter
PCMark Vantage HDD Tests (MBps)	
Windows Defender	15.61
Gaming	11.15
Importing Pictures To Windows Photo Gallery	13.59
Video Editing Using Windows Movie Maker	36.19
Windows Media Center	55.6
Adding Music To Windows Media Player	10.6
Application Loading	4.59
SiSoft Sandra 2010 SP1	
Physical Disks	
Drive Score (MBps)	40.26
Random Access Time (ms)	7.33



soundscience rockus ^{3D}_{2.1}

Antec soundscience rockus 3D | 2.1

3D Quality, Crystalline Clarity

Would you watch a 3D Blu-ray movie or burn through the campaign mode of your favorite FPS without a commensurate speaker system? Of course not. And with the release of the rockus 3D | 2.1 speaker system from soundscience, a new subsidiary of Antec, you won't have to.

The rockus speakers are designed to deliver high-fidelity audio coupled with realistic 3D sound, all from a 2.1 configuration. The immersive virtual surround experience for games and movies is achieved with soundscience's 3Dsst™ technology, which takes incoming stereo signals, analyzes them with DSP algorithms, and creates a 3D sound field from the data.

The dedicated music mode is designed to faithfully reproduce stereo sound including deep lows, wide mids, and highs that sing.

The system is an excellent complement to a high-end PC, but thanks to the included optical TOSLINK input, it is equally at home delivering the sound from your Xbox 360, PS3, or other digital audio gear.

You can control the system with the included remote control pod, which lets you adjust the volume, select between 3D and music modes, toggle between digital and analog input selection, and mute the sound.

To combat the all-too-common problem of rattling and distortion noise with PC speakers, the rockus satellites are built from anodized aluminum. The subwoofer is small but packs a disproportionately sized wallop; it features a passive radiator that delivers a deep, extended low-frequency response that keeps pace with the performance of larger subwoofers.

The total output of the speakers is 150W (with a 95dB maximum output SPL), with each satellite delivering 25W and the subwoofer kicking in 100W. Total frequency response is 10Hz to 20kHz.

Setup is simple and uncluttered with the included cables, so you can easily set it up in different locations for a variety of applications.

Altogether the speaker system weighs in at 18.7 pounds and has a small footprint at just 5.7 x 4.7 x 6.3 inches for each satellite and a 13.8 x 7.7 x 10.6-inch (HxWxD) subwoofer.

The soundscience rockus 3D | 2.1 speaker system is protected by the Antec Quality 2-year (AQ2) Limited Warranty on parts and labor and is now available for \$249.99 MSRP. ■

Cobra-matic

If you ask 10 modders what modding is, you are likely to get 10 answers that are at least different to a degree if not completely distinct. To some folks, modding is strictly a function of taking an original computer case and making it your own through physical mods and paint; to others, a mod is a custom fabrication where no original case ever existed. To yet another group, modding can sometimes mean finding items that began life as something else and turning them into world-class PCs. This last group is where you'll find this month's Mad Reader Mod winner, Alvin "Mach" Barber.

"I get inspired by everything—too many things, really," Barber says. "My girlfriend won't go to the hardware store with me anymore because I spend way too much time wandering around figuring out how I can mod everything I pick up."

Barber is especially intrigued by appliances from the last century. "To think that a guy 75 or

100 years ago said, 'I know it's a toaster, but it'll be the coolest toaster that I can make,' and someone paid him to do it . . . that's awesome!" he says.

In the case of Cobra-matic, the object of Barber's inspiration was a 1951 Zenith Cobra-Matic H664 phonograph and radio. The Zenith is primarily constructed of Bakelite, a precursor to modern plastic that was used to make all manner of stuff and was very popular until it was overtaken in the 1950s.

"Bakelite is phenomenal-looking material when it's polished, like a cross between marble and wood burl," Barber says. "After searching eBay for a few months and losing numerous auctions, I finally found an ideal donor case, a rough phonograph that was passed over by collectors but perfect for me. Then the planning began in earnest."

Barber spent around 300 hours on the Cobra-matic, and it shows. The mod has a beautifully rich, warm look, thanks to Barber's expert use of copper, brass, and

steel. Highlights include the modded (windowed) DVD player that sits where the Cobra-matic's turntable used to be and the gorgeous steel fan grille that replaces the original's radio dial.

Cobra-matic's component list includes an Intel Core 2 Quad Q6600, 4GB of Corsair Dominator XMS2 RAM, and a Gigabyte 9800 GT video card, all plugged into a Gigabyte 965P-DQ6 motherboard. A Seasonic S12 550 PSU powers the machine, and cooling comes via Thermalright's XP-90C CPU cooler and fans from Antec and Arctic Cooling.

As its parts list suggests, Cobra-matic is a capable gaming machine, and Barber's time playing BioShock and BioShock 2 provided him with an idea for his next mod, a BioShock 2 tribute based on a 1940s-era Arvin space heater.

"So yes," Barber says, "I've got a few ideas for the next couple mods, and if not, the hardware store is only a few minutes away." ■



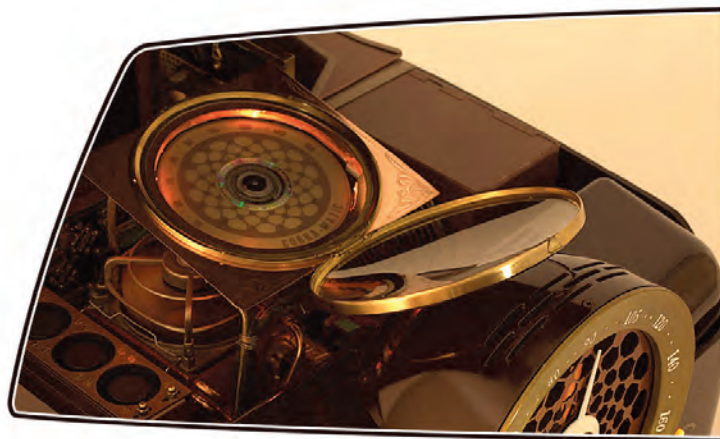
Give Us Your Mod

Have a computer mod that will bring tears to our eyes?

Email photos and a description to madreadermod@cpumag.com.

If we include your system in our "Mad Reader Mod" section, we'll send you \$1,500 and a one-year subscription to CPU.

Olivia "Mach" Barber

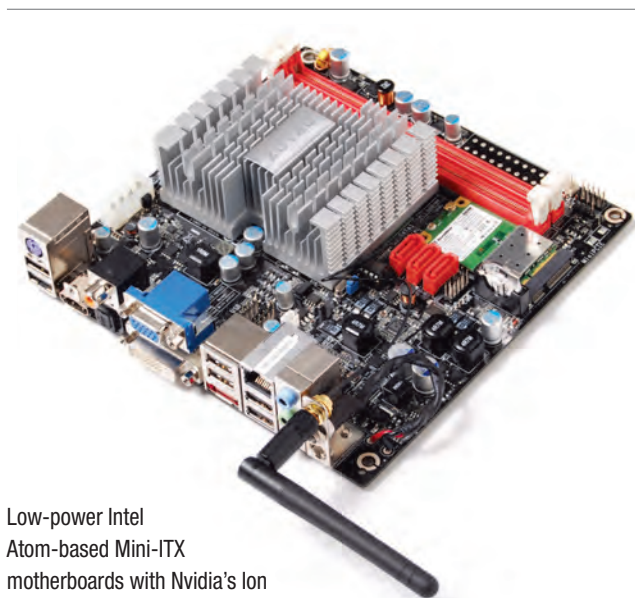


Get informed answers to your advanced technical questions from *CPU*. Send your questions along with a phone and/or fax number, so we can call you if necessary, to q&a@cpumag.com. Please include all pertinent system information.

Each month we dig deep into the CPU mailbag in an effort to answer your most pressing technical questions. Want some advice on your next purchase or upgrade? Have a ghost in your machine? Are BSODs making your life miserable? CPU's "Advanced Q&A Corner" is here for you.

Stephen O. asked: Last year I upgraded the sound system in my car and added a head unit that had a digital video input so I could watch movies in the car. I also built myself a car computer using a Shuttle XPC with integrated graphics. The XPC is one of the standard toaster-sized Shuttle boxes, and I have an old Core 2 Extreme QX6850 in it.

I'm having a ton of problems with my whole setup, though. For one, the XPC is horrible at playing back HD movies I have ripped to the hard drive. I also don't like the mess of adapters and the 120V AC inverter I have to use to get power to the XPC. And my car audio guy says that I'm probably going to burn out my alternator at some point because I'm pulling too much power when I have everything turned on in the car. Any advice on how to clean things up and maybe save some power in the process? I'm open to spending a few bucks if I have to.



Low-power Intel Atom-based Mini-ITX motherboards with Nvidia's Ion graphics processor, such as this Zotac board, are great for car-computer-type applications.

A: That Core 2 Extreme QX6850 is a 130W processor, and Intel's older integrated graphics chips weren't very well suited to playing back high-quality HD movies. Our advice would be to scrap that XPC and incorporate something that's going to use much less power, have better video playback capabilities, and eliminate the need to use any DC-to-AC inverters at all. Something like one of Zotac's IonITX-A Atom N330-based motherboards would fill the bill quite nicely. You would be sacrificing a lot of CPU performance, but we doubt you're actually doing anything that requires the horsepower of a Core 2 Extreme, anyway.

Zotac's IonITX-A boards, however, feature Nvidia Ion graphics processors, which are far better suited to HD video playback than the integrated Intel graphics you're using now. The IonITX-A also has a DC power input that will eliminate the need to use an inverter if you connect the power directly to your car's DC electrical circuitry. The Zotac board technically requires a 19V input; you may have to use a DC-to-DC 12V-to-19V step-up converter, but we've actually seen them work when connected directly to a car's 13.4V feed. If your car's power isn't very stable, though, a \$30 universal DC notebook adapter with a 19V output would do the trick and still eliminate the need for the inverter.

Ana R. asked: I have a 24-inch Dell LCD monitor that has a bunch of inputs on the back, including HDMI, DVI, VGA, and DisplayPort. Ever since I first bought the monitor, I have been using the DVI connection to my PC. But my graphics card recently bit the dust, so I bought a new one (a Radeon HD 5770) that also has DisplayPort on it.

I was chatting with some friends of mine, and they told me I should be using the DisplayPort output on the card to get the best possible picture on my monitor. Is this true? If so, can I just buy a DisplayPort cable and use the input on my monitor without having to do any special setup, calibration, etc.?

A: Let's answer your second answer first, Ana, because that's a quick one. Yes, you can simply buy a DisplayPort cable and start using the DP input on your monitor without having to do any special setup, other than to switch to the correct input in your Dell monitor's OSD. You should be able to just plug and play, so to speak.

With regard to your first question about image quality differences between DVI and DP, in your particular situation, there would be none. If you switched from the DVI to the DP

“DisplayPort offers more effective video bandwidth, can run multiple video streams from a single connector, and is less prone to EMI, among other things.”

input, you wouldn't notice any image quality differences. But, as an interesting aside, you may actually introduce some minor annoyances. For example, here in the lab, we've started using DisplayPort to test the current generation of graphics cards (on Dell 24-inch and 30-inch panels, we might add) and have noticed that when using a DP connection, the monitors take much longer to sync when first powered on. When using the DVI inputs, these same screens would sync immediately. But with DP, there were times when we couldn't even see the POST; the first image displayed on the screen was the Windows boot animation. The screens have also occasionally displayed garbled images when switching resolutions. We've had to power them off and turn them back on to clear things up.

With that said, on a technical level, DisplayPort is superior to DVI, but you need the right monitor, graphics card, and source material to show off the differences. DisplayPort offers more effective video bandwidth, can run multiple video streams from a single connector, and is less prone to EMI, among other things. DP is also an open, royalty-free standard that has the backing of all of the major players in PC graphics, so its widespread use is all but guaranteed moving forward.

Paul K. asked: I have a failing HDD in a RAID 1 setup. Data loss is irrelevant, as the drive has only Windows 7 and programs on it. I'm going to make an attempt to save my installation using Windows recovery tools and try to move it to a new RAID array. However, how do I identify my failing drive? I know from experience: Repeated check disks is the first sign, and Intel's RAID manager has rebuilt the array three times already. (It doesn't have much time left.) But this doesn't tell me which drive is moving good info and which one is being rewritten.

I have no problem tossing the bad drive, but I don't want to toss a good one. Spare drives are always a good thing, even if mine is a little small by today's standards. Any ideas?

A: There's no question identifying which drive is failing can sometimes be a tricky process. The real issue is that desktop RAID management software has never been as extensive as server-quality HBA (Host Bus Adapter) RAID cards that offer great diagnostics on volume health. That said, Intel's latest RST (Rapid Storage Technology) software should definitely help identify the bad drive, but only at the time it's actually failing.



Intel's RST (Rapid Storage Technology) software will give you an indication of the status and health of each drive in your RAID array but will only indicate a failing drive after it has fallen out of the array.

First, make sure you have the latest version of the software that is available for your operating system and motherboard chipset. You can find them here: downloadcenter.intel.com. Once you've downloaded and installed the utility, fire up the RST manager by right-clicking it in Win7 Taskbar Tray pane and selecting Open Application. Once you're in the RST control panel, click the Manage button. Here you can view the status and health of each drive in your array. When the suspect drive is failing and has fallen out of the array, the software will flag it with a red X.

If you select the drive in the RST Manage utility, you'll see its port number and location. If, for example, the drive is listed as attached to port 0, then find SATA ports that the array is plugged into and determine which of the SATA ports is designated with the lowest number. You'll find this on the silkscreen etch of the motherboard. Some manufacturers list ports starting at 1; others start at 0. In either case, Windows will list port 0 as the first drive attached to the first port in your bank of SATA ports, so start from there and work your way up if necessary. ■

BY DAVE ALTAVILLA AND MARCO CHIAPPETTA,
THE EXPERTS OVER AT HOTHARDWARE.COM.

The Radeon 6800 Series

New Display Options Highlight AMD's Latest Graphics Cards

If you're someone who dismissed the recent announcement of the AMD Radeon HD 6800 series of graphics boards because (at first glance) the GPU doesn't look like a significant improvement over last year's Radeon HD 5800 series, you may want to take another look.

While it's true that the Radeon HD 6800 series uses the same 40nm manufacturing process, uses the same basic architecture, and uses fewer transistors than the 5800 series, AMD has made enough improvements to the feature set and efficiency of the 6800 series to make it an interesting option.

By using fewer transistors and by using components, such as GDDR5 memory, that have dropped in price in the past



Radeon HD 6850 vs. Radeon HD 6870

Compute Power	1.5 TFLOPS
Core Clock Speed	775MHz
Stream Processors	960
ROPs	32
Frame Buffer	1GB GDDR5
Memory Width/Speed	256 bit, 4.0 Gbps
Load/Idle Board Power ¹	127W / 19W
Power Connectors	Single 6-pin
Display Outputs ²	2xDVI + 2x mDP + HDMI



The Radeon 6870 offers more high-end features than the 6850, as you can see from this list of specifications. The Radeon 6870 costs a little more than \$200, while the 6850 is a little less than \$200.

Source: AMD

Compute Power	2.0 TFLOPS
Core Clock Speed	900MHz
Stream Processors	1120
ROPs	32
Frame Buffer	1GB GDDR5
Memory Width/Speed	256 bit, 4.2 Gbps
Load/Idle Board Power ¹	151W / 19W
Power Connectors	Dual 6-pin
Display Outputs ²	2xDVI + 2x mDP + HDMI



Tweaking The 6800 Series Architecture

The Radeon HD 6870's GPU has a smaller die size and fewer transistors than the Radeon HD 5850, but other enhancements to the 6800 series architecture (shown at bottom right) allow it to provide more power in some areas at a better price point.

"The core architecture is essentially the same," Nalasco says. "We just rearranged some things."

As with the 5800 series Cypress architecture, the 6800 series Barts architecture includes 80 stream processors (SPs) per SIMD (single instruction, multiple data) engine. However, AMD has dropped the number of SIMD engines from 18 to 14 in the 6800 series.

"That's something that really benefits you in some areas," Nalasco says. "It seems like an area where we can sacrifice a bit by saving some silicon without significantly affecting performance."

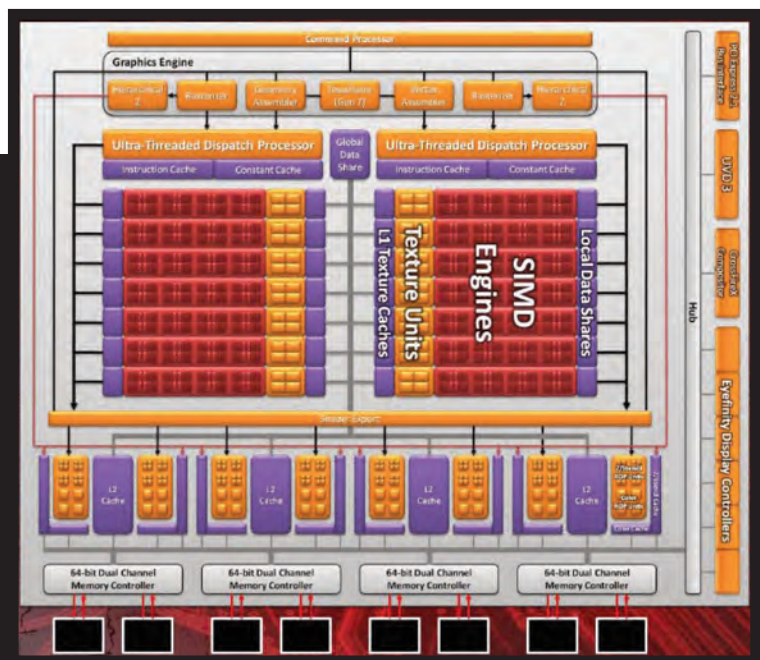
Each SIMD core still contains four texture units, a 16KB L1 cache for texture processing, and an 8KB L1 cache for compute processing.

In part because the 6800 series uses fewer transistors and a smaller die size, it also uses less power at idle than the 5800 series.

Source: AMD

	ATI Radeon™ HD 5850	AMD Radeon™ HD 6870
Die Size	334mm	255mm
Transistor	2.15 billion	1.7 billion
Memory Bandwidth	128.0 GB/sec	134.4 GB/sec
Geometry Throughput	725 million polygons/sec	900 million polygons/sec
SIMD Engines	18	14
Stream Processors	1440	1120
Texture Units	72	56
Z/Stencil ROPs	128	128
Color ROPs	32	32
3DMark Vantage	X7403	X7730
Max Board Power*	151W	151W
Idle Power*	27W	19W

* Based on internal AMD testing



year, AMD is able to offer the 6800 series at very competitive prices.

"Basically, it's a refinement of the DirectX 11 architecture we introduced late [in 2009]," says David Nalasco, senior technology manager for the GPU Division of AMD. "It still uses DirectX 11, and the 40nm transistor manufacturing process is the same. We're taking the existing technology and finding new ways to hit some new price points."

DirectX 11 support is a key component to the potential success of the Radeon 6800 series, Nalasco says.

"With DirectX 11 in the GPU, we've had very good success with gamers supporting it," Nalasco says. "Frankly, it's a large number

of games supporting DirectX 11. Typically, a new DirectX version is adopted a bit more slowly."

AMD's HD 6870 and HD 6850 graphics boards both use the GPU code-named Barts. The Barts GPU is the first chip in the Northern Islands family of GPUs from AMD. The Barts GPU is a smaller chip than the Cypress GPU that's found in the Radeon 5800 series.

Although the Radeon 6800 series has seen improvements in some areas, performance is lower than the 5800 series in a few other areas. However, Nalasco says AMD made enough improvements and maintained enough performance in the Radeon 6800 series that the graphics

cards can still deliver good performance, while entering what AMD has found is an important segment of the graphics card market—cards priced around \$200. AMD is pricing the Radeon HD 6870 at \$239 and the Radeon HD 6850 at \$179, prices that are lower than what was available with the 5800 series.

"Where the 6800 sits is in what we call the 'sweet spot' of the market," Nalasco says. "It's priced around the \$200 range, and that has historically been where you get some really nice characteristics for gaming." ■

BY KYLE SCHURMAN

Toggle Mode NAND Flash

Samsung, Toshiba May Open More Markets For NAND

If you're tired of hearing about the full potential for solid-state drives, and you're ready for some action, then you may want to pay close attention to the development of Toggle Mode NAND flash during the next several months.

SSDs have tantalized computer users since they first appeared in the 1970s. The potential replacement for hard disk drives, SSDs making use of nonvolatile NAND flash memory have received plenty of media attention, but they just haven't been able to hit a price point for their performance

to seriously challenge HDDs in the mainstream markets.

Toggle Mode NAND flash, which increases data transfer speeds over legacy NAND flash by more than three times—and by 10 times when an upgraded version likely is released next year—potentially could provide SSDs with the performance levels they need to seriously challenge HDDs. Toggle Mode NAND won't be limited to SSDs, though, as it potentially will replace legacy NAND flash in a variety of products, including memory cards.

Introducing Toggle Mode

Toshiba and Samsung are leading the development of Toggle Mode NAND flash, which supports transfer speeds of up to 133Mbps. (Toshiba usually refers to the transfer speed as 133MTps, or megatransfers per second; both measurements essentially are the same.) Legacy NAND flash supports transfer speeds up to 40Mbps.

In addition to the faster transfer speeds, Toggle Mode NAND requires less power to operate. For legacy NAND flash technologies, the I/O voltage is 3.3V, but

Toggle Mode NAND Up Close

Toggle Mode NAND flash works by generating I/O signals on both the rising and falling edge of the write enable and read enable signals. With the additional I/O signals, Toggle Mode NAND flash can achieve the greater data transfer speeds. The bi-directional DQS pin/DQS signal, which is a change in Toggle Mode NAND from legacy NAND, accesses the I/O pins/signals, allowing for use of both the rising and falling edge of the signal to transfer data.

In the legacy NAND graphic's

write area, you see the write enable pin shift "low," allowing it to capture the data from the I/O pin. A similar process occurs with the read process, where the read enable pin shifts "low," allowing it to collect the data from the I/O pin.

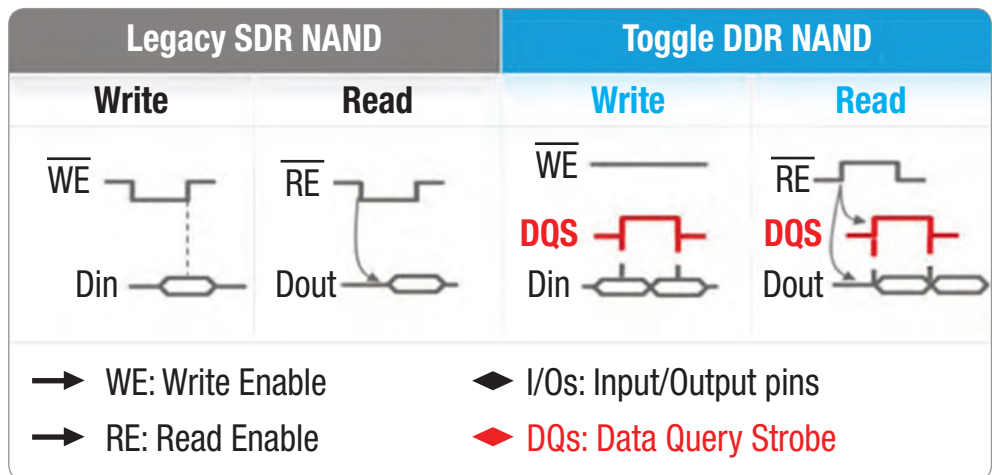
In the Toggle Mode NAND graphic's write area, however, the write enable pin remains "high," allowing it to use both edges of the DQS signal for writing data, using two I/O pins. The read process occurs in a similar fashion, where the read enable pin remains "high," collecting data on both edges of the DQS signal from a pair of I/O pins.

"It's really a different interface mode for NAND flash solutions," says Doug Wong, senior member of Toshiba America Electronics Components' technical staff. "Toggle Mode transfers data on two edges now."

By transferring data on the rising and falling edge of the memory signal, Toggle Mode DDR NAND flash is similar to DDR DRAM.

"It's acting like a bi-directional pin," Wong says of the DQS in Toggle Mode. "When you're writing data into the device, the controller toggles the DQS pin. Data is transferred on both the rising and falling. The same is true when the host is reading data from the device." ■

Source: Samsung



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N460GTX HAWK



MSI N460GTX HAWK / SPECIFICATIONS

Model Name	V238
GPU	GeForce GTX 460
Codename	GF104
CUDA Cores	336 Units
Core Clock	780 MHz
Shader Clock	1560 MHz
Memory Clock	3600 MHz
Memory Size	1024MB GDDR5
Memory Bus	256 bits
Output	Dual DVI-I + mini HDMI
TDP	180W
Form Factor	238 x 111 x 37 mm
DirectX	11
OpenGL	4.0
CUDA	Y
SLI	Y
PhysX	Y
PureVideo HD	Y
HDCP	Y

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for more info, visit us at **us.msi.com**

Toggle Mode NAND flash can operate with voltages as low as 1.8V. (It supports 3.3V, as well.)

“High performance and low power consumption would be the biggest advantages [of Toggle Mode NAND],” says Steve Weinger, director of NAND flash marketing for Samsung Semiconductor.

Both Samsung and Toshiba already have announced products using Toggle DDR NAND flash. By using DDR with Toggle Mode NAND, Samsung and Toshiba provide backward-compatibility with legacy NAND flash for data transmissions.

Using DQS

Toggle Mode NAND flash makes use of a bi-directional DQS (data query strobe) pin and DQS signal for data read and write operations that allow for increased data transfer speeds. Toggle

Mode NAND flash can read and write a bit on both the rising and falling edges of the signal, while legacy NAND only allows one bit per signal.

Toggle Mode NAND flash also doesn’t require a continuous clock signal, which consumes additional power. Instead, the DQS signal serves as the clock when one is needed. And the DQS signal only operates whenever a data transfer is occurring, meaning it uses less power than a continuous clock signal.

The lack of a clock signal makes Toggle Mode NAND an asynchronous interface.

“I don’t know of any asynchronous interface that’s similar to it,” says Doug Wong, a senior member of the technical staff of Toshiba America Electronics Components. “It’s a little different approach.”

NAND flash that uses a clock signal is a synchronous interface.

“The clock is a reference signal, and other control signals of the memory are synchronized with the clock,” Weinger says of synchronous NAND interfaces, “so the device is consuming power all the time, even when it is not activated.”

Weinger says one advantage of using a synchronous interface is that the clock can control both the internal and external operations of the NAND flash memory.

“External operations include data transfer between host and memory, and internal operations include address decoding, data sensing, etc.”

With this in mind, using a synchronous interface works best when the internal operations require a short amount of time. Meanwhile, an asynchronous interface is advantageous when seeking high-speed data transfers, which could be limited by a continuous clock signal. Being forced to use a

Legacy NAND vs. Toggle Mode NAND

One of the primary differences between legacy NAND flash and Toggle Mode NAND flash is the incorporation of the DQS pin and DQS signal with Toggle Mode, as shown in this illustration of the signals.

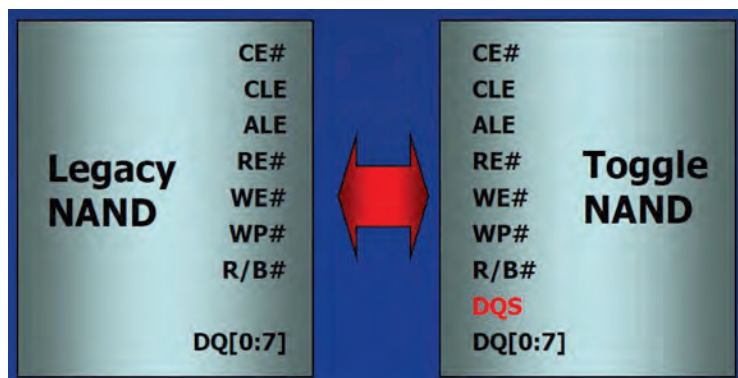
The bi-directional DQS pin allows for faster read and write operations vs. legacy NAND. The bi-directional DQS can support high-frequency operation, and the operating frequency is flexible. As the chart indicates, Toggle Mode supports a cycle time between 15 and 25 nanoseconds, while legacy NAND is limited to 25ns.

Using a 15ns cycle with SLC NAND results in a 66MHz frequency, Doug Wong, Toshiba senior technical staff member, says, which translates to 66MTps in data transfer speeds. With MLC, the data transfer speed would be about 133MTps, he says, because of the two bits per cell. Toggle Mode 2.0 will use a faster cycle time, translating to faster data transfer speeds.

“We’re transferring two pieces of data, one on the rising and one on the falling, over an 8-bit bus,” Wong says.

Toggle Mode DDR NAND flash uses many of the same signal functionality, pins, and status read operations as legacy NAND flash—outside of the addition of DQS—which makes the migration to Toggle Mode easier for manufacturers. However, legacy controllers and firmware will not be able to take full advantage of Toggle Mode NAND flash’s performance improvements.

“The data transfer is where the change is,” Wong says. ■



	Legacy NAND	Toggle-mode DDR NAND
Page Size	8KByte	8KByte
Block Size	512KByte	512KByte
Cycle Time	25ns	15ns~25ns
Interface	Legacy	Toggle-mode DDR

Sources: Samsung, Toshiba

synchronous continuous clock with both the internal and external operations would slow down the overall operation, because external operations would be hamstrung by the clock for slower internal operations.

"For NAND flash, there is a huge difference between external operations . . . and internal operations," Weinger says.

High-Speed Flash Options

Toshiba's Wong says the research and development of Toggle Mode NAND flash has occurred primarily during the past two years.

"There weren't a lot of requests for this speed 1.5 to two years ago," Wong says.

Part of the demand for high-speed flash occurred because of work by the ONFI (Open NAND Flash Interface). ONFI involves dozens of companies working on another high-speed flash specification.

ONFI has plans to release an ONFI 3.0 specification by the end of 2010, which will match the projected 400MTps data transfer speeds expected from Toggle Mode NAND 2.0.

The work by the ONFI helped spark Toggle Mode's development, Wong says.

"Vendors would ask, 'What kind of high-speed NAND interface are you working on?' Before that, there wasn't a whole lot of demand for it," Wong says.

With the demand in place, Toggle Mode NAND appears on the fast track. It's rare for a version 2.0 of a technology to be announced well before version 1.0 products are widely available, but that's what has happened with Toggle Mode NAND 1.0 and 2.0. Then again, it's also pretty rare to achieve a tenfold performance improvement in such a short amount of time, as Toggle Mode 2.0 expects to do over legacy NAND's data transfer speeds.

If Toggle Mode NAND flash lives up to its promise, it also could create an evolution that finally allows SSDs to live up to their potential. ■

BY KYLE SCHURMAN

Potential Markets For Toggle Mode NAND Flash

NAND flash devices currently are used commonly in the consumer sector with MP3 players, cell phones, and digital cameras. Most flash devices in use today are 2-bit MLC devices with a 10,000-write endurance. NAND flash is flexible, though. For example, a 3- or 4-bit MLC could work well with products aimed at content distribution. They can hold more data but have a lower endurance, around 1,000 write uses, ideal for markets where a lot of data is required but where writes aren't common.

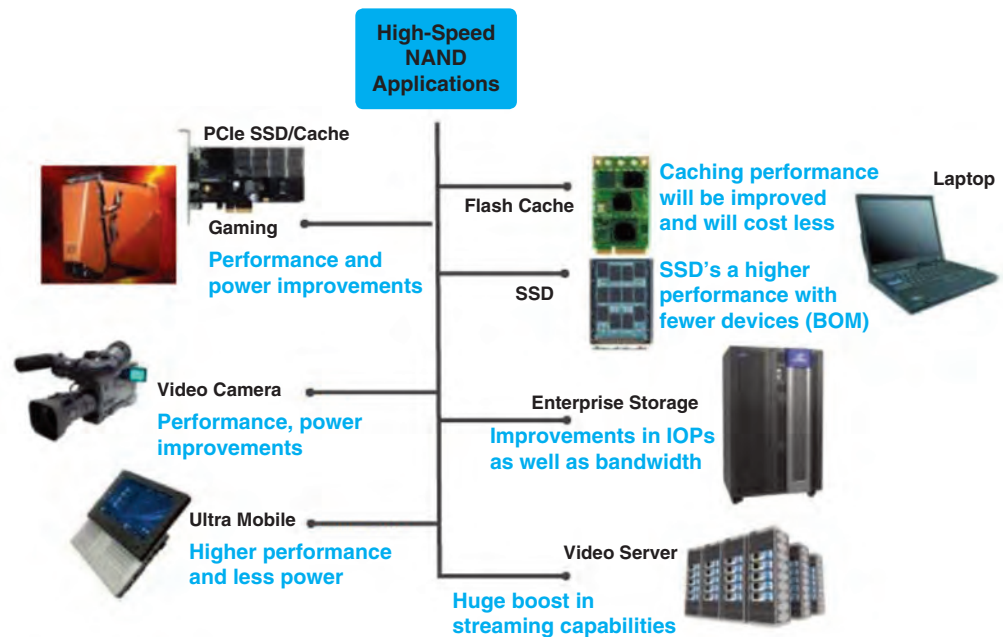
Toggle Mode DDR NAND flash would seem to fit well within an enhanced performance NAND flash category for the server, computing, and enterprise markets, because of its ability to deliver data quickly.

"The advantage of the Toggle DDR interface is high-operation speed in writing time and reading time," Samsung's director of NAND flash marketing Steve Weinger says. "In that sense, we expect that SSD products will benefit the most. However, adopting the Toggle DDR interface eventually will improve all kinds of NAND flash-based products, including memory cards."

"People are looking at hybrid drives, with faster SSDs and faster video caching arrays," Doug Wong, Toshiba senior technical staff member, says. "A lot of Internet servers are limited because the number of input/outputs are limited by the hard drive's 15,000rpm. . . . You just can't spin any faster."

Wong says the introduction of USB 3.0 will be a key component to helping make the faster Toggle Mode NAND more popular. ■

Sources: Denali, Samsung, Toshiba

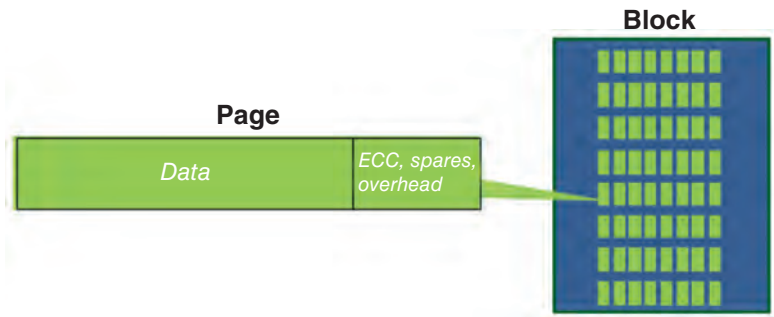


NAND Flash Memory Basics

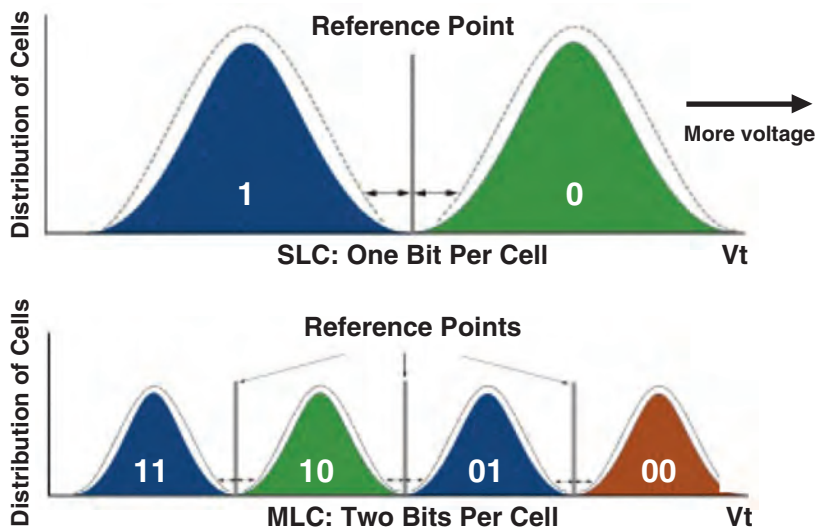
NAND Flash Cells

A NAND flash cell consists of blocks and pages. A page is the smallest component of the NAND flash cell, while a block consists of many pages. Each page consists of a data area and a secondary data management area, which contains items such as an error correction code.

The NAND flash controller can perform write and read operations on individual pages. However, an erase operation can only be performed at the block level. In other words, all of the pages in a block must be erased at the same time. Once the controller writes to a page, it cannot write to that page again without performing an erase operation at the block level. ■



Source: Dell



SLC & MLC

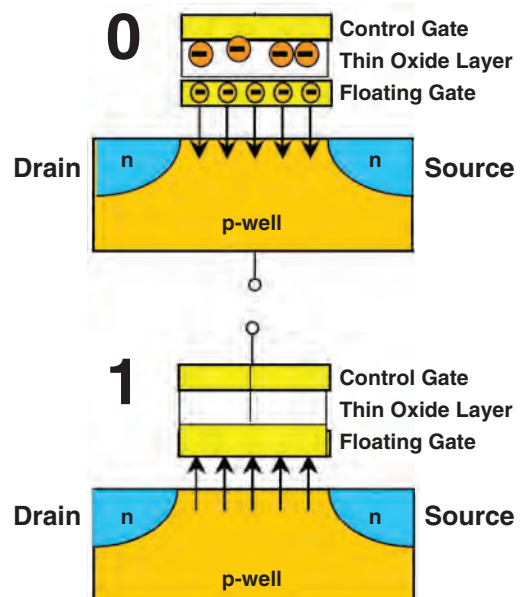
NAND flash is available in two configurations: SLC (single-layer cell) and MLC (multilayer cell). With SLC, each cell stores one bit of data, with a binary value of either 1 or 0, depending on the voltage level (represented by "Vt") of the cell (low voltage or high). With 2-bit MLC, each cell can store two bits of data, meaning up to four binary value combinations are available (11, 10, 01, or 00). To achieve the four combinations, each cell can recognize four voltage levels (low, medium low, medium high, or high). MLC can support three or four bits, as well, by adding recognition of more voltage levels. ■

Sources: IBM, Storage Networking Industry Association

NAND Transistors

A flash memory transistor is similar to other types of transistors. A thin oxide layer separates a floating gate and a control gate. With little or no voltage in the thin oxide layer, the control gate and floating gate are connected, resulting in a 1. When a large amount of voltage is applied to the thin oxide layer, the connection is broken, as the layer of electrons acts like a barrier, and the transistor contains a 0. A cell sensor monitors the amount of voltage and determines the cell's value. ■

Sources: Toshiba, Samsung





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CPU'S YEAR-SIZED REVIEW OF THE BEST IN TECH

We've come a long way since the first issue of *CPU*. In 2001, Chief Fruit Man Steve Jobs was trying to convince the world it needed to listen to music on an iPod. Intel's flagship desktop CPU was a Pentium 4; AMD's counterpart was an Athlon XP. Forget about multicore computing, unless you wanted to operate a system with each hand. Double-data rate SDRAM was finding its way into enthusiasts' machines, and a little GPU called Radeon had been challenging Nvidia's GeForce for about a year. Speaking of challengers, Microsoft jumped into the videogame console business, introducing its Xbox to face off against the mighty PlayStation 2, with Nintendo's GameCube seemingly left to eat the table scraps.

Online, it's a similar story. People were Googling, to be sure, but they were also Asking and Lycos . . . ing. No one was Facebooking, tweeting, or YouTube-ing. A healthy chunk of folks were still dialing-up the Internet.

So, nine years later, how we doin'? Nowadays, it's iPod iconoclasts who are working at least as hard to persuade you not to buy an iSomething. "More cores" is 2001's "more gigahertz." Both Intel and AMD have solidly embraced DDR3, and it won't be too long before they'll embrace DDR4. This year, we saw Nvidia finally introduce Fermi, its answer to AMD's Cypress. Microsoft and Sony, four years after the Wii, leveled the motion-sensitive playing field with Move and Kinect, respectively, as the casual gamer became too big to ignore.

Although all the big names in silicon gave us plenty to talk about (such as multiple hexa-core processors and a 3-billion-transistor GPU architecture, for starters), some of the top tech storylines developed online. Google decided that picking fights against other tech companies wasn't a big enough challenge and took on the People's Republic of China itself, announcing it would no longer filter its search results

for Google.cn. And Google didn't stop with China, either, when a number of countries raised concerns after discovering Google's fleet of Street View cars harvested—inadvertently or not—data from a number of private Wi-Fi networks. The Net Neutrality movement saw its efforts throttled, when the U.S. Court of Appeals ruled that the FCC had no authority to regulate Comcast's activity. Facebook became the most popular Web site in the world. It also became a movie and an email address.

Mobile and gaming had big years, too. The iPad had people talking tablets, and The Steve told us we were holding our phones the wrong way. Android gained ground without, interestingly enough, a lot of help from the much-hyped yet woefully undersold Nexus One (you might remember it as the Googlephone); don't hold your breath for a Nexus Two. The videogame industry continued to state its case as mainstream entertainment, with more than 20 titles shipping 1 million units in 2010 (saying nothing of this year's late additions, *Call of Duty: Black Ops* and *World of Warcraft: Cataclysm*). And, for the first time, it also stated its case to the Supreme Court in *Schwarzenegger v. Entertainment Merchants Association*, a case involving the legality of banning the sale of certain violent videogames to minors.

But all of this, really, is periphery. You're here to hear about the best hardware and software of 2010. Rest assured, we have that—pages of that. We have the best processors, motherboards, graphics cards, LCDs, printers, media apps, and more. So, if you somehow discovered how to hibernate for the last 12 months, fear not. We'll fill you in on what you missed. And in "Best Of The Next" on page 72, we declare our predictions for the best loot of 2011, just in case you're debating whether you should slip into another yearlong slumber.

So, as we put 2010 in our rearview, get ready to kick off another wild decade in tech. A lot can change in a little time. ■

BY VINCE COGLEY

THE 2010 CPU ALL-STAR TEAM

The Parts You Care The Most About

In technology, 2010 was a year where the jumps were big ones. We got our hands on six-core processors, big GPUs (both the GF100 from Nvidia and Cypress from AMD), RAM with frequencies up to 2,533MHz, and SSDs that can actually take advantage of the 6Gbps SATA interface. Before we start in on what we thought was the best of 2010, we'll give you a little recap of the technology highlights of each of the key PC components.

Processors

Cores and threads were a common theme if you shopped for a processor in 2010. AMD and Intel both released models with six cores, while the quad-core models got a little faster. We also saw a greater number of unlocked processors from Intel. Unlocked Intel CPU options include the Intel Core i7-980X, the Core i7-875K, and the Core i5-655K. To find AMD's unlocked processors, you can just look for the Black Edition label.

Winner: Intel Core i7-875K

\$342; www.intel.com

The Intel Core i7-875K supports Hyper-Threading, Turbo Boost, and 8MB of Smart Cache. And because the Core i7-875K comes with an unlocked multiplier,



you can overclock the CPU without adjusting related QPI speeds on the computer. That freedom means you don't have to worry about making sure that the memory timings, ratios, and voltages are also stable with your overlocks. In some cases, issues with instability in the related interconnects may actually keep you from reaching your peak CPU overclock.

For an Intel processor with a stock clock of 2.93GHz and 8-way processing (four cores with Hyper-Threading), the Core i7-875K is competitively priced. And many enthusiasts have found that the unlocked CPU is capable of reaching 4GHz with an aftermarket CPU cooler, which is a little more than a 35% performance increase. Its ability to reach higher frequencies via overclocking means you get a lot of value for the money. The Core i7-875K also offers instruction set extensions for SSE4.2, which improves visual performance on tasks such as video encoding or image processing.

The Core i7-875K's 296mm² die provides room for memory, DMI, and PCI-E (16 lanes that can be run as one x16 lane or two x8 lanes) controllers. For memory, there's dual-channel support for up to DDR3-1333 memory. We also like that Intel's Turbo Boost supports speeds up to 3.6GHz, which will come in handy for those who don't want to push clock speeds too far above the stock 2.93GHz. Intel indicates that the CPU has a 95W max TDP.

First Runner-Up: AMD Phenom II X6 1090T Black Edition

\$229; www.amd.com

It's a comparatively affordable six-core processor, and the Phenom II X6 1090T Black Edition offered AMD's Turbo Core, which is similar to Intel's Turbo



Boost. With Turbo Core, the Phenom II X6 1090T can automatically boost the frequency on three active CPU cores by up to 400MHz when the processor's workload allows it. You can also use AMD's OverDrive utility to manage the Turbo Core settings. In the September 2010 issue of *CPU*, we were able to push the Phenom II X6 1090T from its 3.2GHz stock clock to 4.1GHz using an Arctic Cooling Freezer 64 Pro cooler. (See page 40.)

As you may expect, the Phenom II X6 1090T is AMD's fastest processor. It features a TDP of 125W and offers 6MB L3 cache. Similar to other Phenom II processors, it supports both DDR2 (up to 1,066MHz) and DDR3 (up to 1,333MHz) memory, though we've seen very few Phenom II-compatible motherboards that use DDR2 memory. In our tests, the Phenom II X6 1090T was capable of competing with the majority of Intel quad-core processors, and it was particularly good in multithreaded applications.

Second Runner-Up: Intel Core i7-980X Extreme Edition

\$999; www.intel.com

It's the world's highest-performance desktop CPU. This 12-way processing



powerhouse blew away our benchmark records, but you'll also be shelling out a little under \$1,000 for it, which is why it's our second runner-up. The Intel Core i7-980X Extreme Edition is based on Intel's 32nm process technology, which enabled Intel to deliver the faster processing speed, improved functionality, and overall greater computing capability.

There's 12MB of L3 Smart Cache, an on-chip memory controller for triple-channel DDR3-1066 memory, QPI, Turbo Boost, Hyper-Threading, and support for Intel's Extreme Memory Profiles. We saw many builders in our Dream PC contest push the Core i7-980X Extreme to 4.2GHz and beyond, so it also has the chops to provide even more processing power. If performance were our only concern, the Intel Core i7-980X Extreme Edition was the cream of the crop.

Motherboards

Chipsets often follow the lead of processor technology, so support for six-core processors was a big modification in high-end motherboards. Intel introduced the H55 and H57 chipsets, similar to the P55 chipset with the addition of the H models letting you take advantage of the graphics capabilities built into some Core i3 and Core i5 processors. AMD announced the 890GX, which offers a built-in Radeon HD 4290 graphics core and six native 6Gbps SATA ports, as well as the 890FX chipset, which supports AMD's six-core

processors and two graphics cards in CrossFire at full x16 speed.

Winner: Evga X58 FTW3

\$289.99; www.evga.com

The Evga X58 FTW3 was by far the most popular choice for builders in our Dream PC roundup, and it's certainly designed for enthusiasts. The X58 FTW3 includes Evga's EVBot for handheld overclocking, an onboard CPU temperature monitor, and Evga's EZ Voltage read points. The 8-phase power design combines with a large passive heatsink to offer high overclocking potential, and there's a handy onboard Clear CMOS button for when your frequencies go too high. If you run into trouble, we also like the onboard diagnostics LED readout, and the feature came in handy to help us figure out what was wrong with a test system. With Evga's E-LEET tuning utility, you can adjust the system overclock within the OS.

The motherboard features three PCI-E slots, and you can run two cards in SLI or CrossFire at full x16 speed or three graphics cards with one running at x16 speed and the other two at x8. This X58 board also offers a wide variety of connectivity for your storage devices and peripherals. There are two 6Gbps SATA ports, six 3Gbps SATA ports, two USB 3.0 ports, and support for 12 USB 2.0 ports (eight external, four internal). RAID 0/1/0+1/5 configurations are available. For memory, the X58 FTW3 offers six DIMM slots that can hold up to 24GB of DDR3-1600. Evga tops it off with a three-year limited warranty.

First Runner-Up: Gigabyte 890FXA-UD7

\$245.99; www.gigabyte.com

This 890FX motherboard offers an XL-ATX form factor, which gives the space to support up to 4-way CrossFire and another add-in card. In total,





there are six PCI-E x16 slots. Gigabyte designed the board so that you install graphics cards in the first, third, and fifth slots, which work at either x16 or x8 speed depending upon how the other PCI-E slots are filled. The 890FXA-UD7 also natively supports Phenom II X6 processors, giving you the ability to use AMD's top performers.

There are six 6Gbps SATA ports and two 3Gbps SATA ports, along with 14 USB 2.0 ports (eight external, six internal) and two USB 3.0 ports. On/Off Charge technology lets Apple products (iPhone/iPad/iPod touch) draw more power than standard USB ports to charge faster. Another feature we like is Gigabyte's Auto Unlock support to turn on a previously disabled core on AMD Phenom II dual- or tri-core processors. The built-in power, Clear CMOS, and reset buttons make it easy for you to tinker with BIOS settings and return your PC to a working order if something goes wrong.

Second Runner-Up: MSI P55A-GD85

\$229.99; www.msi.com

MSI started the year off with a bang by releasing the P55-GD85, which includes a Marvell chip to add two 6Gbps SATA ports, an NEC chip to add two USB 3.0 ports, and a PLX PCI-E bridge chip to improve PCI-E bandwidth and

maintain the capacity necessary for the 6Gbps SATA and USB 3.0 connectivity. Power users will also appreciate the P55-GD85's DrMos (a technology to stabilize power delivery) and SuperPipe heat dissipater, which is a full copper 8mm heatpipe. In short, the board is ideal for those who want to overclock their Intel LGA1156 processor.

The P55-GD85 supports up to 16GB of DDR3 memory running at up to 2,133MHz, and there are four DIMM slots. There are two PCI-E x16 slots (one runs at x16 speed, while the second can run at x8), and the board supports either SLI or CrossFire. We also like that those not familiar with overclocking can use the OC Genie to easily boost their computer's speed.

Graphics Cards

For Nvidia, 2010 was the year of Fermi, the GPU architecture found on the GeForce GTX 480, 470, 465, 460, and 580 graphics cards. Earlier, AMD launched the Radeon HD 5670, 5570, and 5450, which were designed to appeal to the budget gamer and HDTV crowd.

We also saw the Radeon HD 5870 Eye-finity Edition, which allows for six-monitor gaming setups. Recently, AMD released the 6870 and 6850 to compete at the midrange level.

Winner:

Nvidia GeForce GTX 460 (1GB)

\$199.99; www.nvidia.com

The GeForce GTX 460 was a top midrange performer in 2010, and it helped show what Nvidia's Fermi architecture is capable of. The GTX 460 is built using the GF104 GPU, which is an update from the GTX 480 and 470's GF100 GPU. As a midrange card, it features two GPCs (Graphics Processing Clusters)—whereas the GTX 480 had four—but compared to the GF100 GPU, Nvidia has improved the GPCs by adding an additional 16 CUDA cores and twice the number of special function units and texture units. The result is an affordable graphics card that still provides you the ability to play today's newest games at high frame rates.

Nvidia offers two versions of the GTX 460, one with 768MB of GDDR5



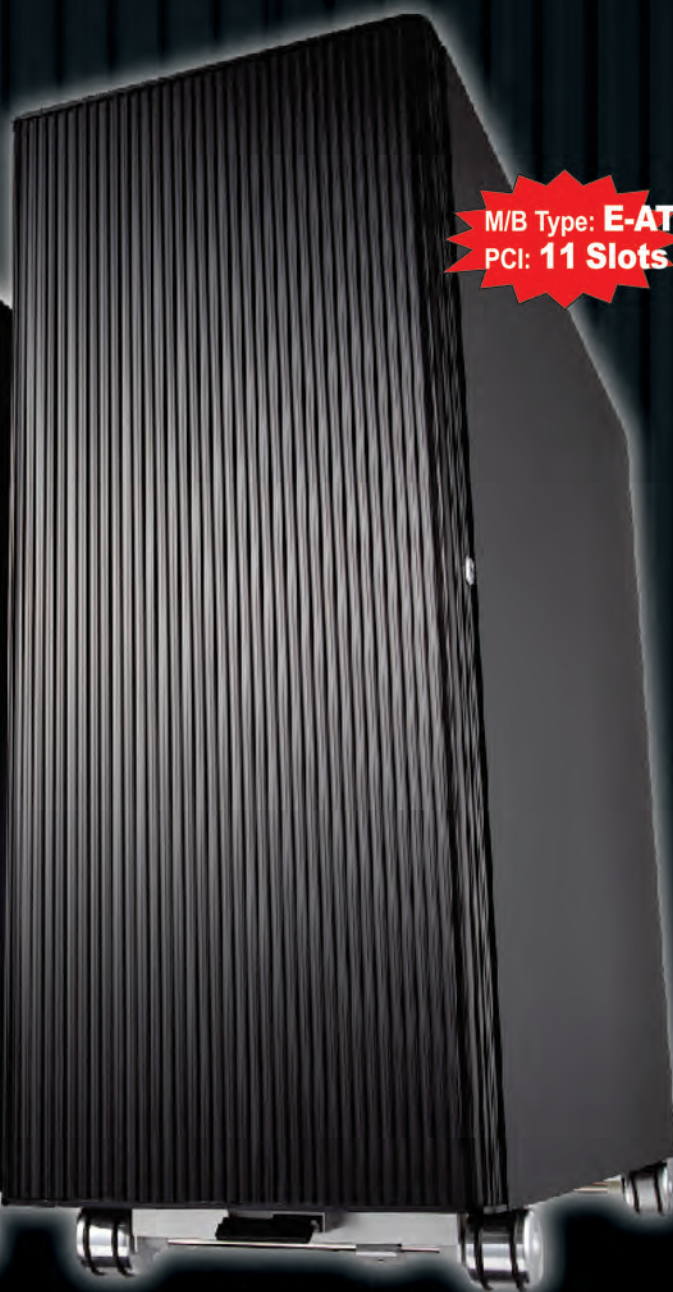


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I/O Ports: **USB 3.0 x 4**, E-SATA x 1, HD Audio

Dim. : 220 x 518 x 491 (W, H, D)

PCI: 8 Slots

Color: Silver / Black / Red

Bay: 5.25" x 5 (can be convert to 3.5" internal x 3),
3.5" internal x 10 (can be convert to 2.5" internal x 5),
2.5" internal x 2

M/B: HPTX / E-ATX / ATX / M-ATX (Slide out M/B tray)

Fan: 140mm x 3, 120mm x 2

I/O Ports: **USB 3.0 x 4**, E-SATA x 1, HD Audio

Dim. : 235 x 620 x 635 (W, H, D)

PCI: 11 Slots

Color: Silver / Black / All Black

memory and one with 1,024MB. The 1GB version offers 32 ROPs and a 256-bit memory controller, while the 768MB version features 24 ROPs and a 192-bit memory controller. Core (675MHz), shader (1,350MHz), and memory (1,800MHz) frequencies are identical on both versions. There are 336 stream processors and 56 texture units to improve your computer's ability to process large amounts of parallel tasks.

For outputs, the GTX 460 offers two dual-link DVI ports and a mini HDMI port. Those with limited space in their case will also like that the GeForce GTX 460 is only 8.25 inches long. It requires two 6-pin PCI-E power connectors, and Nvidia suggests that your power supply should be 450 watts or greater.

First Runner-Up: AMD Radeon HD 6850

\$179.99; www.amd.com

In late October, AMD released the Radeon HD 6800 series, and the Radeon HD 6850 was a top performer in terms of price/performance. The Barts GPU found in the Radeon HD 6850 is a redesigned version of the Cypress GPU found in the 5800 series. The Barts GPU took 25% of the engines for compute, shader, and texture performance and reassigned them to handle rasterization, tessellation, and ROP. The changes meant that even though the Radeon HD 6850 offers a half a billion fewer transistors than the 5850, it can deliver gaming performance close to what you

experience with the 5850, and you'll pay \$50 to \$70 less for the 6850.

The Radeon HD 6850 features a core clock of 775MHz and 1GB of GDDR5 memory that runs at 1,000MHz. There are 960 stream processors, 48 texture units, and 32 color ROP units. AMD also improved the technology for video outputs. There's a DisplayPort 1.2 connector that allows a max resolution of 2,560 x 1,600 per display, and the HDMI 1.4a port allows for stereoscopic 3D and high bit-rate audio. There are also two dual-link DVI outputs. The Radeon HD 6850's integrated audio controller can provide 7.1-channel surround sound over either the HDMI or DisplayPort connections. Finally, the card features support for DirectX 11, Shader Model 5.0, OpenGL 4.1, and AMD's Eyefinity.

Second Runner-Up: Nvidia GeForce GTX 580

\$499; www.nvidia.com

The GeForce GTX 580 is the newest iteration of Fermi, and it attempts to make amends for the heat and noise problems found in the GTX 470 and 480. The GeForce GTX 580 also captured the single GPU performance crown over the GTX 480, because it offers more stream processors, faster clock speeds, and more texture units.

Overall, clock speeds are around 10% faster than the GTX 480. Even better, Nvidia claims that the GTX 580 offers lower power consumption than the GTX 480, so you'll battle fewer heat issues. In

terms of specs, the GeForce GTX offers 512 CUDA Cores, 1.5GB of GDDR5, and a 384-bit memory controller. It supports DirectX 11, OpenGL 4.1, and Shader Model 5.0.

Storage Devices

The cost of SSDs dropped rapidly over the course of 2009 and 2010, making an SSD feasible for most any build where you want snappy responsiveness with boot-up and application loading. Of course, capacity vs. cost is still an issue, but many drives now offer enough space to handle Windows 7 and some the games you want to play. For multimedia storage, HDDs are still ideal, and you'll find a number of 1TB and 2TB options on the market.

Winner: OCZ Vertex 2 (240GB)

\$599.99; www.ocz.com

The OCZ Vertex 2 features the SandForce SF-1200 controller, which offers a significant performance increase over the Indilinx Barefoot, including a nearly 100MBps increase in the max write speed (from 180MBps to 275MBps). The 240GB OCZ Vertex 2 has a maximum read speed of 285MBps, and OCZ indicates that it can produce sustained write speed up to 250MBps.

The OCZ Vertex 2 includes native TRIM support, which erases blocks of NAND flash before they are re-written, so that the SSD doesn't slow down over time. Note that you'll need to be running Win7 or a version of Linux with kernel 2.6.33 to benefit from TRIM.





The Vertex 2 can also be used with OCZ's Toolbox Software, which lets you quickly update the Vertex 2's firmware, securely erase the drive, and optimize the sectors to match the OS. OCZ also throws in a 3.5-inch desktop adapter bracket, so you don't need to find any creative ways to stow the SSD in your build. The 240GB Vertex 2 is backed by a three-year warranty from OCZ and offers a 2-million hour MTBF.

First Runner-Up: Crucial RealSSD C300

\$599.99; www.crucial.com

Crucial added a Marvell 88SS9174-BJP2 controller to provide native support for 6Gbps file transfers, and the 256GB RealSSD C300 is built using 34nm Micron ONFI 2.1-compliant MLC NAND flash memory. Crucial indicates that the 256GB RealSSD C300 offers read speeds up to 355MBps and write speeds up to 215MBps. Even though it was introduced in April, the RealSSD C300 is still one of the fastest consumer SSDs around.

There's a 128MB built-in cache, where Crucial stores mapping levels and access history for quick performance with recent tasks. Of course, you'll want to pair the Crucial RealSSD C300 with motherboard that features a 6Gbps SATA interface to take full advantage of the SSD's speed. Otherwise, the RealSSD C300's maximum read speed drops to 265MBps. Crucial offers a three-year limited warranty on the SSD and indicates it should last 1.2 million hours.



Second Runner-Up: 3TB Western Digital Caviar Green

\$239.99; www.wdc.com

Due to a 2.2TB limit in the maximum size of the master boot record used in our PCs, manufacturers have been hesitant to create drives greater than 2TB. With the 3TB Caviar Green, Western Digital includes an AHCI-compliant Host Bus Adapter that enables the operating system to support all the space on the hard drive. The 3TB Caviar Green is built using a 750GB per platter areal density and Advanced Format technology. The latter increases the media format efficiency, so it can read and write more data in same amount of space than it could before.

The Caviar Green line offers Western Digital's IntelliPower technology, which optimizes spin speed, transfer rate, and caching to save power. Western Digital indicates that the 3TB can hold up to 1,150 hours of DVD-quality video or up to 750,000 MP3s. The drive is covered by a three-year limited warranty.

Memory

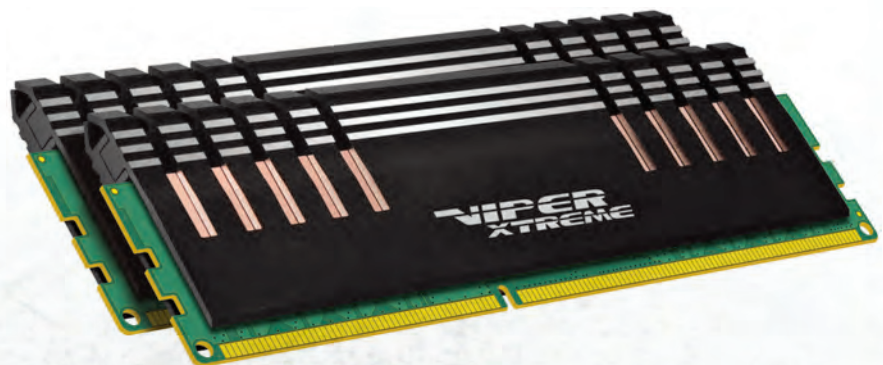
Other than the typical jumps in frequency speeds, RAM didn't change too much in 2010. Intel's X58 chipset is still the only one that works with triple-channel memory, while every other Intel and AMD chipset features a dual-channel configuration. The increase in RAM frequencies has led to greater heat, so there's a greater need for cooling, including tall finned heat spreaders and fans for many memory modules faster than 1,800MHz.

Winner: 8GB Patriot Viper Xtreme Series DDR3-2000MHz (PX538G2000ELK)

\$249.99; www.patriotmemory.com

Patriot's Viper Xtreme series features an extruded aluminum shield that's built around 6 grams of copper to efficiently cool the modules. Stock timings are 9-10-9-27 at 1.65V. Patriot indicates that the 8GB DDR3-2000 kit has been optimized for performance on P55 chipsets. The modules are Intel XMP-ready, so you can easily overclock the memory using recommended settings and voltages.

We also like that this kit is comparatively affordable for an enthusiast-level 8GB set that consists of two 4GB modules. And because the 8GB only takes up space in two slots, you have space to add more memory in the future. In CPU's test of the 6GB triple-channel version, we experienced above average results in 3DMark Vantage, MainConcept, and WinRAR





benchmark tests. The Viper Xtreme Series timings also give you flexibility when overclocking.

First Runner-Up: 12GB Corsair Dominator GT DDR3-2000 (CMT12GX3M3A2000C9)

\$403.99; www.corsair.com

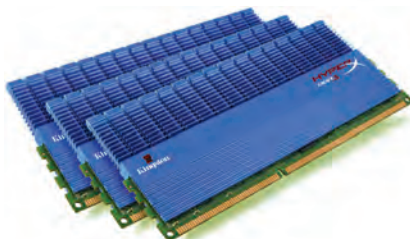
This 12GB kit consists of three 4GB modules and was one of the most popular choices for memory in our Dream PC issue. The Corsair Dominator GT triple-channel DDR3 memory runs at 2000MHz and includes Corsair's Airflow fan to cool the modules, so you won't need to invest in any third-party memory cooling. The red and black modules feature Corsair's DHX (Dual-path Heat Xchange) design with tall finned heat spreaders to cool the fast memory.

The 12GB Corsair Dominator GT DDR3-2000 kit features timings of 9-10-9-27, and you can use one of the Intel XMP settings to overclock the memory or configure your own settings. We also like that the Corsair Dominator GT module's fins are removable, so you can add extended fins, or connect a liquid-cooler such as Corsair's Hydro Series H30 memory cooler, to customize the modules to meet your overclocking needs. Corsair offers a limited lifetime warranty on the 12GB Corsair Dominator GT DDR3-2000 kit.

Second Runner-Up: 6GB Kingston HyperX T1 DDR3-1866 (KHX1866C9D3T1K3/6GX)

\$142.99; www.kingston.com

The HyperX T1 series is the top of the line for Kingston, and this 6GB kit includes three 2GB DDR3 modules



that can run at up to 1,866MHz. The affordable kit features impressive latency timings of 9-9-9-27, and you can program a CAS latency of 5, 6, 7, 8, 9, or 10. The extra-tall HyperX T1 heat spreaders (the modules measure 2.4 inches high) give Kingston the ability to push memory frequencies and timings. Each module of the 6GB HyperX T1 DDR3-1866 kit features a PCB made of 16 128MB 8-bit chips. The kit is Intel XMP-ready and comes with a limited lifetime warranty from Kingston.

Power Supplies

PSU vendors focused more on efficiency in 2010, and if a power supply offers an energy efficiency of greater than 80%, you can bet that it'll be listed prominently on the box. Other popular additions include thermally regulated fans, sleeved cables, and quiet fan

bearings. Most newer power supplies now include split PCI-E connectors to support a variety of graphics cards.

Winner: Enermax EMG800EWT MODU87+ 800W

\$249.99; www.enermax.com

The Enermax EMG800EWT MODU87+ was one of our favorites in the June issue because of its Dynamic Hybrid Transformer topology, which improves the power supply's ability to deliver consistent output with dynamic loads. The keys to the Dynamic Hybrid Transformer include a resonant transformer array that combines a resonant choke, the main transformer, a driver transformer, and a standby transformer; dynamic voltage transforming to provide power saving when idle; and dynamic frequency transforming for energy efficiency under load.

Overall, Enermax indicates the EMG800EWT MODU87+ 800W can deliver at least 87% efficiency at 20% and 100% load. Enermax also installs a 13.9cm Twister-bearing fan to reduce noise and improve the lifespan (100,000 hours MTBF) of the power supply. It



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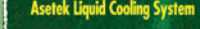
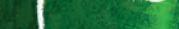
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offers ATX12V v2.3 support, so you can power the latest Intel and AMD processors, and the EMG800EWT MODU87+ 800W is also CrossFireX- and SLI-ready. The 24-pin ATX, +12V auxiliary, and two 6+2 pin PCI-E connectors are built into the power supply; the rest of the power cables are modular. Enermax includes four 6+2 PCI-E plugs, 12 SATA connectors, and eight 4-pin Molex plugs.

We also like that Enermax includes its HeatGuard, SafeGuard, and CordGuard technology to protect the power supply's circuitry and prolong use. For instance, the HeatGuard technology keeps the EMG800EWT MODU87+ running for 30 to 60 seconds after shutdown to remove the heat remaining in the power supply. Because of the unit's 80 Plus Gold certification, it's ideal for enthusiasts with a high-performance processor and one high-end or two midrange graphics cards.

First Runner-Up: Corsair Professional Series Gold AX1200

\$277.99; www.corsair.com

We checked out the Corsair Professional Series Gold AX1200 in the August issue (see page 25) and found that it was ideal for power users. Some of the features of the AX1200 include

a 100A (1,204.8W) single +12V rail, a fully modular cable system, and a low-noise design based around a thermally-controlled 140mm fan. For power efficiency, the AX1200 offers individual DC-DC regulation for the +3.3V, +5V, and +12V rails. On the secondary side of the AX1200's circuitry, Corsair employs low-loss MOSFETs in the synchronous rectification circuitry and in a four-layer modular connector board. Overall, the Professional Series Gold AX1200 meets the 80 Plus Gold efficiency standard.

Another benefit of the Professional Series Gold AX1200 is Corsair's Zero Voltage Switching and Zero Current Switching technology, which minimizes switching losses to improve efficiency and reduce waste heat. The 1,200 watts of power means that this Corsair power supply can handle pretty much any system you throw at it.

Second Runner-Up: PC Power & Cooling Silencer Mk II 750W

\$159.99; www.pcpower.com

PC Power & Cooling rates the Silencer Mk II 750W as 88% efficient and indicates that the +3.3V, +5V, and +12V DC outputs run within 2% of regulation. We checked out the unit in the September issue (see page 29) and found that Silencer lived up to its name, because it was nearly noiseless during the testing process. To accomplish the quiet design, PC Power & Cooling installed a 135mm, ball-bearing, thermally-controlled fan. The Silencer MkII 750 offers four PCI-E (two 6-pin, two 6+2 pin) connectors, eight SATA connectors, and support for both ATX12V and EPS12V motherboards. PC Power & Cooling offers a seven-year warranty on the Silencer MkII 750W. ■

BY NATHAN LAKE



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Your Ports Demand These Peripherals

You've taken care of business. Your main system is squared away. And if there was only you and it in the world, what could be simpler? But simplest is not sweetest. There's still this chasm between you and the system that needs to be bridged with peripherals.

All told, 2010 was a pretty decent year in the peripheral world. There weren't any crashing breakthroughs in the core components categories, so the industry had a chance to turn its attention toward spicing up its extras. Some of our picks are forward-looking, hoping the products are great examples of even greater things to come. Some are just standout examples of things we think the manufacturer did better than anyone else this year.

In any case, kick back and enjoy our top picks for this year's best peripherals.

Monitors

We won't sugarcoat the truth: This was a pretty slow year for desktop displays. DisplayPort still hasn't dislodged HDMI (doubtless much to AMD's chagrin). 1080p is still the norm for video, and screens look amazing. If there's a compelling reason to buy a desktop touchscreen, we still haven't found it. Nevertheless, there are still some new, in-freaking-credible displays out there.

Winner: Dell UltraSharp U3011

\$1,499; www.dell.com

We were all set to declare the much-drooled-for 27-inch U2711 this year's victor, but then the 30-inch version came along; if you're going to dream, dream bigger. The U3011 features a 2,560 x 1,600 resolution in a 16:10 aspect ratio. The specs promise a 1,000:1 typical contrast ratio and a 370 cd/m² typical brightness, which is less than some, but in real life the U3011 is plenty bright. In fact, some may find it a bit too bright



and wish Dell had provided a wider luminance control range. The in-plane switching panel is simply drop-dead gorgeous, with a 178-degree viewing angle and 7ms gray-to-gray response time. The U3011 actually does have one DisplayPort along with two HDMI, two DVI-D, one VGA, component, a four-port USB hub, and even an integrated flash card reader. Blacks are deliciously deep with only minimal edge bleeding. Even the touch-sensitive OSD controls are second to none. When money is no object for your eyes, look no further.

First Runner-Up: Sony Internet TV

\$599.99 (24-inch) to \$1,399.99 (46-inch);
discover.sonymstyle.com/internettv

What's the difference between a monitor and a TV these days? Where and

how it's mounted. Starting at 24 inches with integrated 1080p upscaling, four HDMI ports, S/PDIF out, composite, component, and four USB 2.0 ports, the Sony Internet TV looks like another high-end, stylish display. Only this display happens to integrate an Intel Atom CE processor, 802.11n, 10/100 Ethernet, and a remote control that includes a QWERTY keyboard. These TVs embed the Google TV platform, complete with Chrome browser, bundled apps, and coming access to a Google TV app store in 2011. Nearly identical in Google TV function to both the Logitech Revue and Sony's own Google TV-powered Internet TV Blu-ray Disc Player (\$399.99), the Internet TV leaps beyond prior Ethernet-enabled TVs and their smattering of widgets. No doubt, there will be rival platforms besides Google TV embedded in our living room displays, but this is the living room monitor of the future.

Second Runner-Up: Asus 23.6-inch VG236H

\$499.99; usa.asus.com

The verdict is far from in on the long-term viability of 3D technology. For the options that are available, though, we have yet to find a higher-quality



3D desktop display than the VG236H from Asus. We prefer this unit above the 3D competition for two reasons: It ships with Nvidia's 3D Vision kit (the VG236HE, sans kit, is \$349.99), and, in a category plagued by 3D image ghosting, Asus displayed the least ghosting of any set we've tested to date. Add to this its gaming mode presets that conveniently boost the brightness of dark scenes. With the regular list of excellent specs for non-3D use, we claim the VG236H as the pick of the 3D crop.

Mice & Keyboards

Compared to monitors, mice and keyboards remain a hotbed of imaginative outpouring. Vendors continue to devise new models based on game branding, which is fine so long as the underlying hardware is top-quality and innovative. (In general, it is.) We'd like to see the market pay more attention to ergonomics, but at least vendors are taking build quality and button layout more seriously than ever.

Winner: SteelSeries Shift

\$89.99; www.steelseries.com

If you liked Ideazon's old Zboard series, you'll love its reincarnation as the SteelSeries Shift. The core concept remains unchanged: You can overlay game-specific keysets onto an ultra-rugged keybed. The Shift includes a conventional, generic keyset for everyday productivity, but you'll want to invest in dedicated keysets for your favorite RTS, FPS, and MMO titles, such as StarCraft II, World of Warcraft: Cataclysm, and Medal of Honor. Fully firmware-upgradeable and



outfitted with gold-plated stereo/mic audio ports and two USB ports (one powered), the Shift also boasts software that's fully configurable in just about every way you could ask. Every key can be mapped; you can record up to three levels of macros on the fly; and a toggle mode lets you switch between F-key and numeric keypad function profiles without breaking stride. Antighosting of up to seven keys ensures that no new keystrokes are missed when you already have multiple keys depressed.

For gaming, build quality is paramount, and SteelSeries doesn't disappoint. Despite the detachable keysets, the base is so solid and the locking mechanism so firm that you really can't tell you're dealing with two separate pieces during use. The rubber dome key mechanisms are highly durable and designed to hold up well beyond a standard keyboard's lifespan. Interestingly, the amount of pressure needed to depress these domes varies depending on the use frequency of the key. For example, the WASD keys require only 60 grams of pressure to depress while ENTER requires 70g and the multimedia keys 85g. This is great for preventing accidental keystrokes and reducing finger fatigue. Both the wrist rest and feet are rubberized to prevent slippage, and you can set the feet to three different height levels. Interestingly, the media keys are now separate from the keyset. SteelSeries' updates to the Zboard are subtle but welcome, making this a must-have for gaming fanatics who missed the Zboard on the first go-round.

First Runner-Up: TiVo Slide Remote

\$89.99; www.tivo.com

The trouble with peripherals such as an Xbox 360 Messenger Kit or wireless living room keyboards in general is that they're so dang big and ugly. Being able to message from your TV is great, but having another clunker gadget cluttering your couch is not. So until the day arrives when we're all controlling our TV-based



messaging from our smartphones (*a la* Logitech's app for Google TV), the TiVo Slide is the smartest solution around. The remote sports TiVo's hallmark peanut shape and button layout, although it's significantly shorter than a typical TiVo remote. The remote uses Bluetooth and ships with a dongle that you plug into your TiVo set-top (or PC, if your regular keyboard happens to spontaneously combust). The phone-inspired slide design reveals a curved QWERTY thumbboard, D-pad, and numeric keypad. This ingenious, effective alternative to TiVo's on-screen keyboard finally makes TiVo Search a usable tool. We hope the Slide inspires other manufacturers to follow suit with their smart remotes going forward. Brilliant!

Second Runner-Up: Logitech Solar Keyboard K750

\$79.99; www.logitech.com

If we could award runner-up status only to the solar panels on the K750, we would. If you want sizzle, check out Logitech's diNovo Edge (\$179.99), a svelte marvel of touch-sensitive style. And we're typing this review on Logitech's ergonomic, smile- and wave-shaped K350 on which we've never, not once, used the media controls along the top. Why not create a "K350S," where the media keys are



replaced by the K750's solar panels? That would make sense.

As it is, the K750's traditionally straight key deck is fine. It's comfortably spacious, wireless, and whatnot. But it's totally unremarkable. We're awarding runner-up status here in the hope that Logitech and others will take encouragement and expand their solar usage to more (and more exciting) models. Because solar will cut down on not only battery consumption but also the number of batteries in our garbage can.

Printers

Gone are all the headlines about higher resolutions and faster print speeds. Even if manufacturers somehow figured out how to improve these specs, few people would care, because what we have now is already ridiculously good. Instead, the challenge is making printers more usable.

Winner: Lexmark Pinnacle Pro901

\$249.99; www.lexmark.com

Strange but true, our choice for this year's printer winner boils down to two words: cheap black. Specifically, Lexmark's 105XL high-yield black ink cartridge is rated to output 510 black-and-white pages for \$5, or a penny per page. Industry average black costs range from two to 10 cents per page. Sure, we like the Pinnacle Pro901's 4.3-inch touchscreen controls, 30ppm top color print speeds, 802.11n support, 1,200 x 4,800dpi flatbed scanning, integrated duplexing, and decent photo output. But let's face it: Today's printer industry lives to give away hardware and gouge on consumables. The Pinnacle Pro901, now available under \$200 online, is a welcome run in the opposite direction.



When you want good quality, acceptable speed, and rock-bottom long-term cost of ownership, the Pro901 delivers.

First Runner-Up: Canon Selphy CP800

\$99.99; www.usa.canon.com



Portable dye-sub photo printers have been around for years, but the CP800 earns recognition for taking lab-quality 4 x 6 printing to new price lows (under \$90 online) while improving print speeds. This little marvel (2 pounds and smaller than your hand) slams out a borderless postcard in only 47 seconds. A few warnings: The battery is optional, but when was the last time you printed away from an outlet? You'll need to buy printer paper immediately, because Canon only includes five sheets. If you want to print from your phone, you'll want the BU-30 Bluetooth option (\$49.99), and know that there's no Wi-Fi support.

However, dye-sub photos are rated to last for up to a century; the flip-up, 2.5-inch LCD is decent; and new post-processing features, such as red-eye correction, noise reduction, and skin smoothing, make printing from either flash memory sources or a USB-attached PC pleasantly surprising.

Second Runner-Up: HP Photosmart eStation

\$399.99; www.hp.com

The Photosmart eStation places for runner-up because of its slick concept: You can do more with your printer if your control of that printer wanders around with you. How many times do you sit on the couch or stand in the kitchen, thinking something like, "I need a recipe for a Long Island Milkshake—if only I could print that *right now!*" Now, savvy users might use their tablets to view that recipe and dispense with a hard copy. HP thinks you'll want the tablet viewing *and* the hard copy. So we have the eStation, a 33ppm black, 32ppm color printer/scanner/copier with a bundled, dockable, 7-inch, Android-based tablet. Crazy, no?



If we ignore the tablet momentarily, this is a very good—if mostly unoriginal—printer. Borderless printing, 802.11n, a 125-sheet input tray, and HP's habitually engorged software make this a great general use multifunction unit. But it's the tablet, named Zeen, that makes or breaks this printer concept. The Zeen is an Android 2.1 tablet with a four- to six-hour battery life and SD slot, but there's no access to the Android Market. HP does integrate full Web access, but the apps are *really* there to get you closer to the content you'll likely want to print. We like the Zeen not for what it is but because it embodies an application. This is not the Droid you're looking for, but it does point the way toward making the printer a much more integrated part of the digital, wireless home.

Networking Devices

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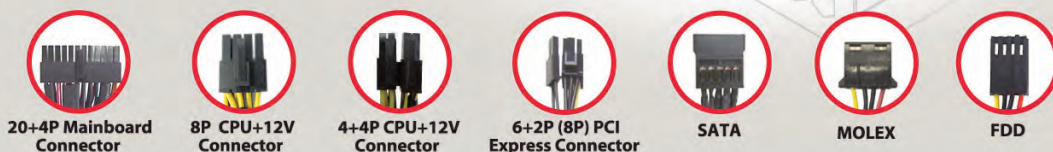


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smoothly and suddenly critical when there's a problem. With the exception of Bigfoot, no one seems to be doing much to improve wired circulation beyond router-based QoS. MoCA and powerline networking continue to show promise at the fringes, but we're still waiting to see 500Mbps Powerline AV+ arrive. With wireless, there's some positive action. Most of all, we look forward to seeing new ways in which LANs and the cloud will soon connect.

Winner:
Bigfoot Networks Killer 2100

\$89.99; www.bigfootnetworks.com

Just as a dedicated sound card offloads audio processing from the CPU, so the Killer 2100, the latest in network processing adapters from Bigfoot, shoulders the weight of gaming IP packet traffic. Now, in the same way that some people can't tell the difference between integrated audio and quality discrete audio, some people won't tell the difference between 7ms latency on an onboard NIC vs. 0.2ms latency on the Gigabit Ethernet Killer 2100. Some will, though, and for the ultra-sensitive gamer, the Killer 2100 may supply that extra bit of edge. If nothing else, we like the Visual Bandwidth Control tool for modifying how much bandwidth different apps can seize and the idea that there's still

room to improve a vital system function that we normally overlook.

First Runner-Up: D-Link DIR-665 Xtreme N 450 Gigabit Router

\$229.99; www.dlink.com

Let's be honest. If you think buying a 3x3 MIMO router that specs 450Mbps is going to revolutionize your Wi-Fi throughput, we have to disappoint you. The dual-band DIR-665 will pull in multistream, sustained TDP throughput in the 70 to 100Mbps range, not because it's bad but because 3x3 wireless is still immature. There are very few 3x3 client adapters on the market. With time, we hope to see 150Mbps+.

The DIR-665 is made for users who know their way around a router's options. Although it doesn't support *simultaneous* dual-band, its QoS is decent, and this is still the best 450Mbps router on the consumer market.



Second Runner-Up: Netgear RNDU4000 ReadyNAS Ultra 4 (Diskless)

\$599.99; www.netgear.com

If streaming media to three or four devices around your home doesn't make you a NAS believer, losing the storage on your main system will. In our minds, NAS is practically as indispensable today as the PC itself. Western Digital, Synology, and many others make great NAS appliances, but our nod this year goes to the recently released ReadyNAS Ultra. Available in two-, four-, or six-bay designs, Netgear's box has a great aesthetic for closets (that's like having a great face for radio), but it has three USB ports, sports two Gigabit ports, can act as a print server, supports remote Internet access, and offers a free trial for cloud-based data replication. More importantly, Netgear's X-RAID2 auto volume expansion lets you upgrade the hot-swappable drives and grow your volume(s) without reformatting.

As with most modern home NAS products, the RNDU4000 supports DLNA for streaming to consoles and such, but it will also serve as storage expansion for TiVo. Netgear's software bundle, featuring Orb and Skifta, makes quick work of transcoding and sending streams to various devices. All told, a terrific NAS solution for media-friendly homes. ■



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If there's one thing you learn from the software industry, "new" doesn't always equal "good." So, to find the best software of the year, you need to do more than just check out what's new. You need to really use it and see if that magic combination of features, usability, speed, and value is there, and if that combination beats all other comers. That's where we come in.

Security Applications & Suites

Though it didn't seem possible, malware in 2010 became more pervasive, sneakier, and generally harder to remove without advanced tools. Thankfully, those advanced tools received improvements, as well, and generally continued the trend started two years ago to be smarter, simpler, and more streamlined.

Winner:

Norton Internet Security 2011

\$69.99 (3 PC License); us.norton.com

In the past, security suites, including those from Symantec, were thorough but dumb, comprehensive but intrusive, and feature-laden but performance-sapping. Sensing the backlash, Symantec led the charge to correct these deficiencies just a few years ago, and the latest version of Norton Internet Security hits the sweet spot of security vs. performance vs. unobtrusiveness. NIS 2011 is a complete

package that the competition just can't touch, with a fair price, too.

Like most security products, NIS 2011's anti-malware engine has a definition-based component that does very well against already identified viruses, but it still leads the pack against Zero Day malware with its reputation-based identification component: It utilizes a constantly updated database of *all* the Windows executables all Norton users around the globe have seen to spot executables that no one has ever seen before; in today's landscape of one-off compiled viruses, these never-before-seen files are what need special attention.

Toss into this mix a known-Web-exploit blocker, truly full-featured parental controls, antiphishing browser plug-ins that actually offer more security than those built into current browsers, and a password locker/form field autocomplete tool that's really as good as some standalone password utilities, and you have a suite that's tough to beat. Of course there's room for improvement (the antispam module isn't half as good as free alternatives), but for comprehensive security with minimal system impact, NIS 2011 remains the Gold Standard.

First Runner-Up: Kaspersky Internet Security 2011

\$79.99 (3 PC License); usa.kaspersky.com

If you've been burned by Symantec before and refuse to give Norton products another chance, or if you like to be a little more hands-on with your security, then Kaspersky's latest suite has a lot going for it. Its anti-malware modules, though lacking Norton's reputation-based feature, do an admirable job identifying malware both young and old, and its smart firewall



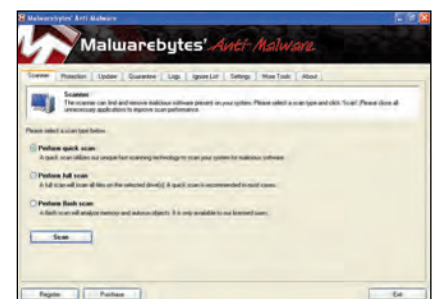
identifies legitimate programs and threats without bothering you.

KIS adds something almost unique: a built-in sandboxing feature called Safe Run For Applications. The idea is if you encounter a dubious program, you can run it in the Safe Run sandbox, where it can't interact with the Registry or file system (causing an infection). This also goes for Web browsers: when sandboxed, they are totally isolated from the core computer system, meaning that nothing the browser does or downloads can interact with Windows in any meaningful way, and programs running outside the sandbox can't see what the browser is doing.

Second Runner-Up: MalwareBytes' Anti-Malware

Free; www.malwarebytes.org/mbam.php

Security suites do their best to clean up an infected system at the time of installation, but they're really made to keep a clean system clean. When you have a system that's already infected



with malware and you want to clean it off, your best chance at success with an automated tool comes in the form of MalwareBytes' Anti-Malware.

The free version of MBAM is a relatively simple foreground scanner: Just download and install it, let the automatic updater update the definitions file, and then click the Complete Scan button. Once MBAM finishes the scan, it lists all the stuff it found, offering you a chance to review it. If you don't like what it found, click the Clean button and let it reboot. Usually, the result is a spotlessly clean system.

System/Drive Utilities

There was a time when every company had a utility suite to compete with Norton SystemWorks or Norton Utilities, but that was also a time when Microsoft Windows was a lot less—dare we say it—reliable than it is now. Now, there isn't even a SystemWorks sold. Perhaps for these reasons, our best system/drive utilities look a little different than they used to. Such is progress!

Winner: Paragon Hard Disk Manager Professional 2010

\$99.95; www.paragon-software.com

Paragon Hard Disk Manager Professional is the kind of jack-of-all-trades disk utility software that you might think wouldn't excel at any one thing, but in fact, it really is great at everything it does. And though you can amass a collection of free software that does most of what it can

do almost as well, there are some things Hard Disk Manager Pro does that free software alternatives can't match.

But what does it do? At its most basic level, Hard Disk Manager Pro is a hard disk and partition manager, able to create, nondestructively resize, move, copy, delete, undelete, and cleanly wipe hard disk partitions, but it adds a lot of other tricks that are really fantastic. For example, it can add a boot manager to the beginning of a hard drive to let you boot WinXP, Win7, or Linux, all without any of the operating system's native boot loaders knowing about the other OSes. It can copy partitions and drives to other drives, to different areas of the same drives, or to burnable CDs or DVDs. It also works on a file level, meaning it can back up specific files within a partition or load a backup image and restore specific files. You've seen most of these tricks elsewhere, but trust us: Hard Disk Manager Pro does it slicker than the competition.

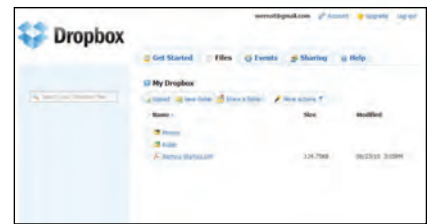
It also has some extra neat abilities we haven't seen before. It can convert your disk images into virtual disk images that are compatible with VMware or Microsoft's Virtual PC. It can also take a Windows image, complete with all of its drivers that make it work with one particular PC, strip out those drivers, set it to boot on a system with completely different hardware, and then manage to reload the appropriate new drivers. (We didn't think it would work either, but it does.)

No, it isn't cheap, especially facing free substitutes. Then again, feature for feature, there really aren't any true substitutes.

First Runner-Up: Dropbox

Free (2GB storage); www.dropbox.com

There are quite a few online backup programs out there (and keep reading to learn about our favorite), but Dropbox is something else. At its most basic level, Dropbox is a combination

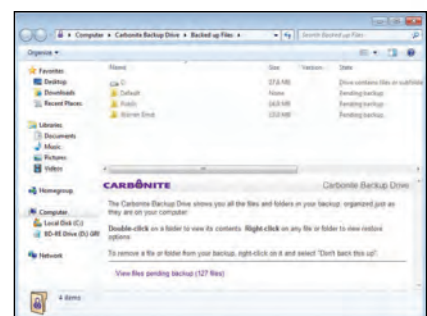


of software and Web service that syncs a single folder on all of your computers to each other. When installed on your Linux, Mac, or Windows computer, it creates a single Dropbox folder. Drag a file into that folder on any of your computers, and it appears in the Dropbox folder of all your other computers almost immediately, plus a copy is stored on the Dropbox servers for private or shared online access.

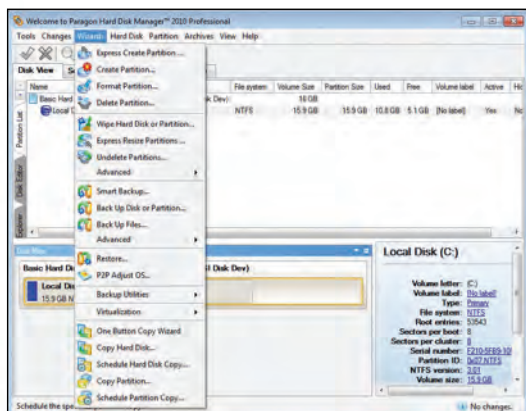
Dropbox gives you 2GB of online storage free, but you can purchase up to 100GB for \$19.99 a month. On top of this, there are Dropbox clients for Android, iOS, and BlackBerry, so you have mobile access to your files, too. Clever users have figured out many uses for Dropbox; you can use it to do more than its authors ever intended.

Second Runner-Up: Carbonite

\$54.95; www.carbonite.com



With high-speed broadband becoming the norm, Internet-based backup software is becoming more common, and the competition between established vendors is really heating up. Most companies offer backup services and pricing plans that are different enough that all are at least worth checking out if you want to back up to the cloud, but for our money, the best



general-purpose online backup program is Carbonite, and for two reasons. First, it offers unlimited storage for just \$54.95 per year per computer, so you can really let it back up absolutely everything if your connection is good enough. Secondly, Carbonite is drop-dead simple to use: Small dots appear on your folders and files to indicate their backup status right within the Explorer window (green: backed up, yellow: pending backup, none: not backed up), and you can just right-click files, point to Carbonite, and click Backup to add them to the backup job.

Media File Apps

It used to be that simply playing back media files in a useful and friendly way was enough to have the world beat a path to your door. Not anymore. Today, the best media apps also shepherd content to you and then manage to usher it out to whatever portable device you happen to have. Two of our top three follow this trend pretty well.

Winner: Apple iTunes 10

Free; www.apple.com/itunes

Apple isn't one to rest on its laurels, and the continual evolution of iTunes is proof. Available for Windows and Mac users, iTunes combines powerful audio and video playback features (though frustratingly, with a relatively small set of file formats), a well-stocked online store, a darn-near foolproof way to sync content to the most popular portable device platform (that is, the iPhone/iPod touch/iPad), a remote sharing and playback option, and now a

social network to make finding new music you like and making friends easier.

iTunes still looks familiar after all these years, although a tweaked layout is now better optimized for widescreen monitors, with more columns and new functionality added to the sides of the window rather than the top or bottom. And if you've never used iTunes or forgotten how, nine well-done built-in tutorial videos show you how everything works. Another nice tweak is a color-coded bar that shows how the capacity of your portable device is being used by apps, photos, music, videos, and such.

The online component of iTunes received the lion's share of improvements with version 10. The iTunes store now offers television episodes to rent from several (though not all) of the major television networks and many cable networks. The biggest new feature is Ping, Apple's social network for sharing music-related conversations and recommendations that's integrated within the iTunes window. The service is still quite young and has something of a comment spam problem, but the potential to discover new music is vast.

First Runner-Up: doubleTwist

Free; www.doubletwist.com

Frequently described as "an iTunes for Android and everything else," doubleTwist connects to and syncs with practically any USB-connected portable multimedia player (almost any smartphone or media player, including iPod) and knows about the capabilities of several hundred. This last bit is important, because doubleTwist can transcode video files from their current format to whatever format your device can play them as, and it needs to know that your Zune can handle different files than your Droid, for example.

doubleTwist has direct links to the Amazon.com

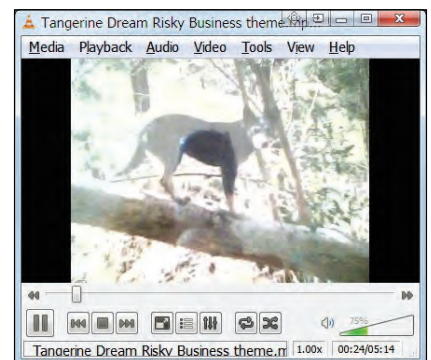


MP3 store and Android App Market, offering a faux-iTunes Store experience, and can subscribe to and sync podcasts just like iTunes, too. It also "speaks" iTunes, as well, so it automatically syncs your iTunes library and playlists to your devices, letting you manage your entire media library with only iTunes, if you like.

Although doubleTwist is still prone to annoying bugs, it fills a strong need and works well enough for us to recommend it to anyone outside the Apple fold.

Second Runner-Up: VideoLAN VLC Media Player

Free; www.videolan.org/vlc



VLC lacks some of the flash and polish of iTunes and doubleTwist, and it doesn't have direct access to an online store. That said, VLC is the indispensable media player for the modern age. It runs on Windows, Mac, and Linux computers, and has enough built-in codecs to handle practically any format of audio and video file you throw at it. It also plays DVDs and Blu-ray Discs, and, if your hardware supports it, ignores disc region codes.

VLC has two other big plusses: First, there are a wide variety of skins available





SSDNow V100 Series (Desktop bundle)
Kingston's SSDNow V100 Series drives are available in 64GB, 128GB and 256GB capacities and in bundled kits that include all the accessories needed to upgrade.

**Upgrade to the drive
for the future — today.**

SSDNow V100 Series (Notebook bundle)
Kingston's SSDNow V100 Series drives extend the life of notebooks and are available in 64GB, 128GB and 256GB capacities and in bundled kits with all the accessories needed.

SSDNow V+100 Series
(Desktop/Notebook bundle)

SSDNow V+100 drives dramatically improve the speed and performance of existing systems. They're available in 64GB, 128GB, 256GB and 512GB capacities and in bundled kits.



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that change its layout in addition to its appearance (so you don't have to live with its Windows 98-like default appearance). Second, it can convert/transcode/extract audio and video files from one format into almost any other format, either from a batch-file-friendly command line or directly, with its straightforward GUI.

Miscellaneous Utilities

These miscellaneous products don't fit any of the major categories. Still, there is a common trend: They tend to make use of the Internet in ways not originally intended.

Winner: Cloudmark DesktopOne

Free; www.cloudmarkdesktop.com

Email spam is either "no big deal" or "the bane of your existence," and your opinion of it is largely based on whether you get your email from a large corporate email server at your job or if you still get mail from a conventional POP3 or IMAP server. If it's the former, then your spam is likely caught by cloud-based filtering, where millions of users collectively mark spam for what it is and automatic routines then remove it from your inbox before you even see it. If it's the latter, then you probably make do with automated Bayesian filters, which do OK but not so good that you can stop looking through your spam folder for false positives.

Cloudmark DesktopOne combines the best of both worlds. It runs in the background and talks to the Cloudmark cloud—millions of users fingerprinting and marking spam messages. Then, it talks to your email servers and client programs to remove spam before you see it. If you use Outlook, Outlook Express, or

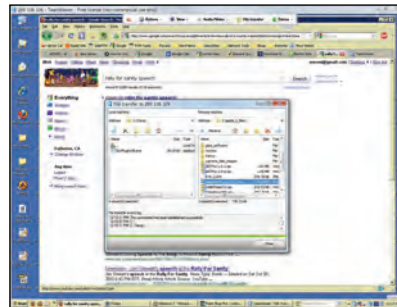
Thunderbird, a handy toolbar for marking missed spam and good messages appears automatically. You need to use the friendly Cloudmark interface if you use another program, but in all likelihood you may not ever need to. In our tests, it was literally 100% effective at catching all spam while allowing all personal mail, even newsletters and desired coupon messages, through.

Though there's no mobile version, you could rig something up via IMAP to have a desktop PC automatically cull spam before your smartphone got to it, which is a neat trick.

The Pro version (\$19.95/year) is just as effective as the free version, but it works on more than one email account per computer and is reasonably priced, too.

First Runner-Up: TeamViewer 5

Free; www.teamviewer.com

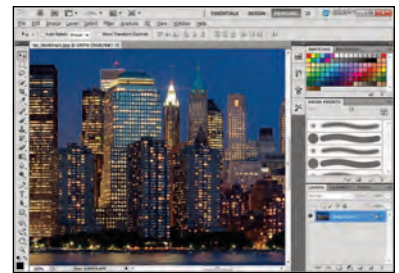


Thanks to aggressive advertising, remote access services such as GoToMyPC and its semi-free competitor LogMeIn are fairly popular, so why should we be excited about TeamViewer? It comes down to flexibility, features, and price. TeamViewer lets you remotely control, transfer files, and even make a VPN connection with Windows, Mac, and Linux computers. Just install the program and keep track of the unique serial number and password (the latter of which you can change) it generates. Then, to access that computer, install TeamViewer on your computers and enter that serial number and password. TeamViewer works through firewalls, NAT, and other roadblocks that frequently hinder this sort of thing.

The software can run from a flash drive or CD without being installed, if you like, and it is easy to set up an impromptu remote tech support session without having to subscribe to a service. Best of all, TeamViewer is free for personal use, and almost all the good features are enabled for home users.

Second Runner-Up: Adobe Creative Suite 5 Master Collection

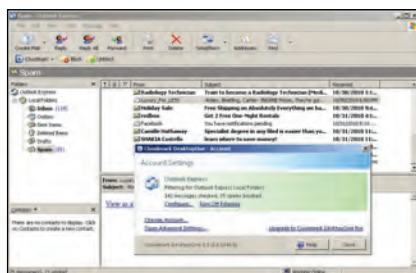
\$2,599; www.adobe.com



You might say that if a software collection costs \$2,600 it had better be excellent, and we wouldn't disagree. However, the reason Adobe can charge this much money for its top-tier suite of creativity software (including Photoshop, Illustrator, Flash, Dreamweaver, After Effects, Premiere Pro, InDesign, Soundbooth, and several ancillary programs) is that each individual program is (arguably, in a few cases) the best in its category. Premiere Pro takes advantage of modern multicore CPUs to blast through video editing faster than before. Photoshop now works in 3D. Flash generates iPhone applications in a, well, you know.

More impressively, each of the programs shares a common look and feel, and most can "round-trip" artwork between each other: Create part of an image in one program, another part in a different CS5 program, and work on them at the same time, and the updates pass through seamlessly and instantly. Combine this with good integration to Adobe's new online collaboration and libraries, and you have an unparalleled creativity package. ■

BY WARREN ERNST



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BEST_{OF THE} NEXT

We Know What You'll Want Next Summer

Technology advances at a break-neck pace, especially in the PC realm. It seems as if today's flagship processors and graphics cards are relegated to the bargain bin the moment they're burned in. We may be exaggerating a bit, but the sentiment is absolutely true. Keep track of how much you spend on your next round of upgrades and then check their prices a few months later. With a few rare exceptions, you're going to find that that expensive, first-tier component isn't nearly as pricey (or exclusive) as it once was.

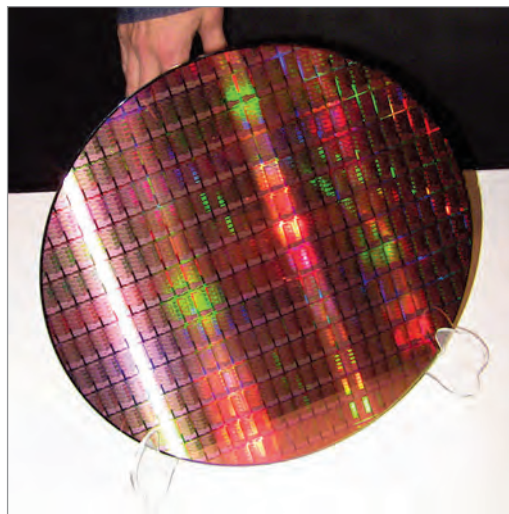
And if you think PC technology advanced quickly in 2010, wait until you see what's on tap for 2011. 2010 might have been filled with some hot products that pushed the envelope in terms of performance and value, but 2011 is shaping up to be one of the most game-changing years yet. We're sure you've heard statements like that in previous years, as well, but 2011 should be a special year. Both Intel and AMD are poised to release new processors that have been redesigned from the ground up. Nvidia, which regained its footing in 2010, is again ready to fight tooth and nail with AMD in the battle for DX11 dominance. Virtually all of the major players in the storage space are readying new products that will most likely make the current crop of solid-state and hard drives seem slow in comparison.

Here is but a glimpse of a few of the technologies coming down the pipeline in 2011. As exciting as some of the products may be, keep in mind that they are all currently unreleased; some of what we reveal here may not come to fruition when the

final retail products hit store shelves. We're confident in many of the details, but who knows what unforeseen difficulties may arise between now and a given product's arrival.

New Microarchitectures Abound

As we've already mentioned, both Intel and AMD have new processors coming in 2011, targeted at virtually every market segment. AMD's Fusion-based processors and APUs (accelerated processing unit) code-named Zacate, Ontario, Llano, and Bulldozer (among others) are all slated to arrive at varying times throughout the first half of 2011 in machines ranging from ultra-low-power netbooks to high-end servers and gaming PCs. AMD has some exciting stuff lined up, but it's Intel's Sandy Bridge microarchitecture that's likely to command the broadest swathe of the PC market next year.



Processors based on the Sandy Bridge microarchitecture will be manufactured using Intel's 32nm high-K metal gate process.

In early 2011, Intel plans to release a smorgasbord of Sandy Bridge-based processors to both the mobile and desktop markets. The new processors will carry Core i3, i5, and i7 branding like today's offerings, but make no mistake: Sandy Bridge is a new microarchitecture that employs many new technologies.

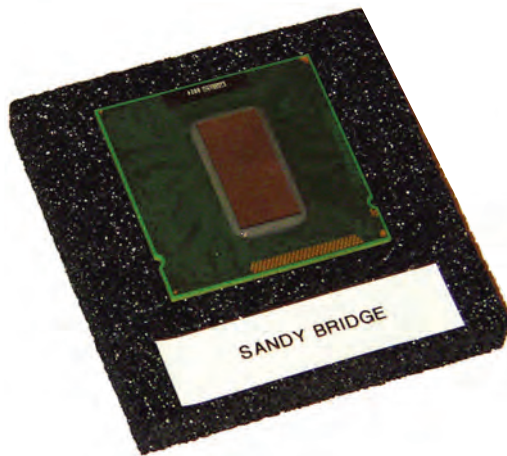
In addition to completely redesigned execution cores, which Intel has optimized for better performance and power efficiency, some of Sandy Bridge's most prominent features are its integrated graphics core, which will offer significantly better performance than any previous Intel-designed graphics processor, its dedicated media encoder, and a new ring bus that connects the processor cores, integrated GPU, and last-level cache (formerly known as L3 cache). Initial Sandy Bridge processors, which are rumored to arrive in January 2011, will feature dual- and quad-core CPUs, but

Intel has mentioned that six- and eight-core processors derived from the Sandy Bridge microarchitecture are coming at some point in 2011, as well.

Let The Motherboard Onslaught Begin

Accompanying Intel's Sandy Bridge-based processors to market will be the company's 6-series chipsets, which will undoubtedly make their way to a slew of motherboards in 2011. In the months leading up to Sandy Bridge's arrival, a number of Intel's premium motherboard partners showcased 6-series chipset-based boards targeting many different market segments. We've seen everything from Mini-ITX designs that will take advantage of Sandy Bridge's integrated graphics core, to high-end,

Initial Core i3, i5, and i7 series processors based on the Sandy Bridge microarchitecture will feature on-die graphics, dedicated media encoding capabilities, new AVX (Advanced Vector Extensions) instructions, and an enhanced version of Intel's Turbo Boost technology that will allow the processor to exceed its TDP for short periods of time, among other new features. The integrated heat spreader has been removed from this processor to expose the die beneath.



enthusiast-class offerings designed for hardcore overclocking.

To support Sandy Bridge, 6-series chipset-based motherboards will sport a new LGA1155 socket. The boards will also support native 6Gbps SATA over a pair of SATA connectors, while the remainder of SATA ports will support 3Gbps transfers. Other features of the 6-series chipsets include eight lanes of PCI-E 2.0 connectivity and DMI 2.0 bus interface support with a 4GBps bus speed.

The initial 6-series chipset lineup will consist of the enterprise-oriented B65, Q65, and Q67; the mainstream H67; and the premium P67. The chipsets differ in their number of available SATA ports, support for Sandy Bridge's CPU graphics, and in their ability to dynamically configure the PCI-E lane configuration in SLI and CrossFire setups. Obviously, the chipset that will be featured on the broadest range of enthusiast-class 6-series chipset-based motherboards is the P67.

The P67 is very much like the P55, which Intel introduced to support Lynnfield, but it has been tweaked for the intricacies of the Sandy Bridge microarchitecture. Many P67-based motherboards are due to arrive in conjunction with the first batch of Sandy Bridge processors in January 2011 at prices similar to early P55-based boards.

One of the most interesting designs we've seen is the Asus Sabertooth P67. The Sabertooth is a member of Asus'

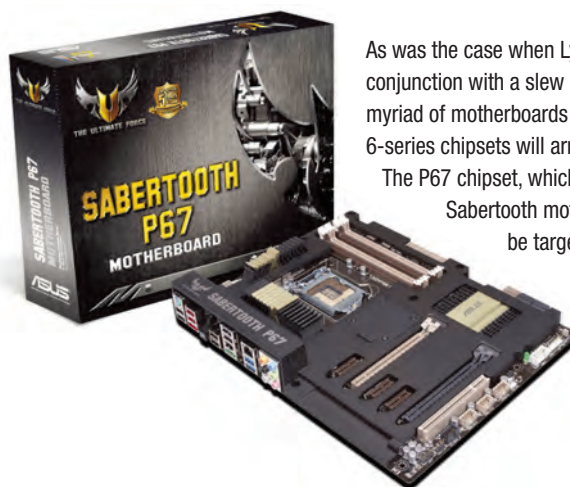
TUF motherboard line, designed for users who seek enhanced reliability. The board is designed using military-grade electrical components and is put through a rigorous test routine that includes wide temperature swings and varying humidity levels. One of the more unique features of the P67 Sabertooth is the large sheath that covers much of the board. In addition to protecting surface-mounted components, the sheath also features channels on its underside designed to direct airflow from the CPU cooler to specific components underneath.

AMD & Nvidia Aplenty

The first quarter of 2011 should also mark the arrival of AMD's most powerful graphics cards to date, the Radeon HD 6990. The Radeon HD 6990 is

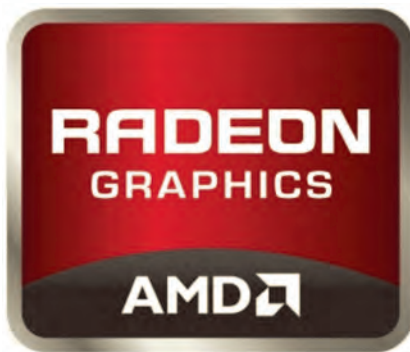
code-named Antilles and features a pair of AMD's 40nm Cayman GPUs, which will debut in the Radeon HD 6970 and 6950 in mid-December 2010. Detailed (and accurate) specifications of Antilles were scarce at press time, but considering the fact that the dual-GPU Radeon HD 5970 offers roughly equivalent performance to Nvidia's recently released flagship GeForce GTX 580, it's a safe bet the Radeon HD 6990 will be the undisputed performance leader when it arrives. The card's feature set should be roughly equivalent to the already released Radeon HD 6800 series, just at significantly higher performance levels. Rumored features include vastly improved geometry processing, redesigned shader cores that will offer increased performance and efficiency, CrossFireX enhancements, and anti-aliasing modes.

Sometime later in 2011, AMD will follow up with its Southern Islands family of graphics processors, which will be produced using a more advanced 28nm manufacturing process. Because the Northern Islands family of GPUs at the heart of the Radeon HD 6000 series uses the same 40nm process as the older Radeon HD 5000 series, AMD wasn't able to beef up the cores quite as much as it would have liked with Northern Islands, while also keeping die sizes in check. Southern Islands, on the other hand, should change that and result in yet another family of higher-performing GPUs.



As was the case when Lynnfield first hit the scene in conjunction with a slew of new P55-based boards, a myriad of motherboards based on Intel's upcoming 6-series chipsets will arrive alongside Sandy Bridge.

The P67 chipset, which is at the heart of this Asus Sabertooth motherboard pictured here, will be targeted at enthusiasts.



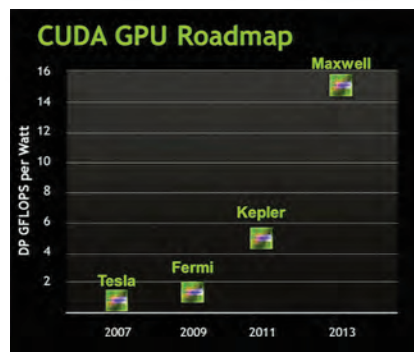
AMD will ring in 2011 with the Radeon HD 6900 series, code-named Antilles, which will be powered by a pair of 40nm Cayman GPUs. Later in 2011, the 28nm refresh of the Radeon HD 6000 series, codenamed "Southern Islands" is due to arrive.

Of course, Nvidia has new GPUs on tap for 2011, as well. Details are virtually nonexistent at this point, but Nvidia CEO Jen-Hsun Huang did reveal that the company's Kepler GPU architecture is due to arrive in 2011 and that it will offer roughly two to three times the double-precision floating point performance per watt of the current Fermi architecture found in the GeForce GTX 400 and 500 series. What exactly that means for gamers isn't exactly clear, but rest assured Nvidia will have new, uber-powerful hotness ready next year.

All About Solid State

2011 is shaping up to be a big year for PC storage. Hard drive manufacturers will continue to push the capacity envelope and introduce drives that surpass the 3TB mark, while also introducing next-gen hybrid drives that feature some solid-state storage to help boost performance. Spindle speeds and cache sizes aren't likely to change much, but increases in areal density and controller optimizations should push HDD performance up a few notches.

The hottest commodity in the storage space in 2011 will continue to be SSDs, however. Enthusiast favorites Intel, Indilinx, and SandForce (among others) are all poised to introduce new solid-state

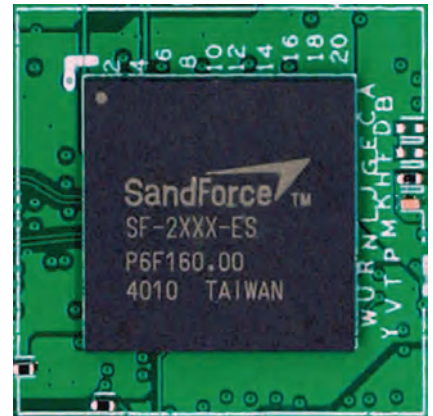


At Nvidia's GPU Technology Conference, which took place in September 2010, CEO Jen-Hsun Huang revealed part of the company's GPU roadmap for the very first time. Details were sketchy, but after Fermi comes Kepler in 2011, followed by Maxwell in 2013.

controllers that should push performance well past current-generation drives. SandForce in particular has some exciting stuff on tap with its upcoming SF-2000 family of SSD processors. SF-2000 SSD processors build upon the current SF-1500/SF-1200 series of controller used in many of today's most popular SSDs by adding 6Gbps SATA support, integrating a more powerful encryption engine, and adding support for emerging flash memory technologies. The SandForce SF-2000 family of SSD processors will also offer SAS bridge support for non-512 byte sectors, enhanced ECC and BCH features, and new power/performance throttling technology for "green" computing applications. According to SandForce, the enhanced capabilities of the SF-2000 will culminate in a controller that's capable of 500MBps sequential reads and writes with roughly 60,000 random 4K IOPS, or roughly double current-gen drives.

Memory: Lower Power, Higher Capacities

One area where we're not likely to see many major advancements in 2011 is PC memory. All of the new high-volume processors and motherboards slated to arrive in 2011 will continue to



SandForce made a big splash in 2010 with its SF-1200 series SSD controller, which powers a number of today's most popular solid-state drives. In 2011, the company's SF-2000 series of controllers is slated to arrive, with support for 6Gbps SATA interface speeds, a more powerful encryption engine, and support for new flash memory technologies.

use DDR3 memory, and much of the DDR3 memory available today already supports frequencies well in excess of those that will be officially supported by next-gen processors.

With that said, new DDR3 memory kits will likely arrive in 2011 that support even higher frequencies than today's high-end kits (think in the 2,600 to 3,000MHz range), plus increased capacities and tighter latencies. Advances in manufacturing will allow for lower voltages, which will in turn lower power consumption and heat output. Memory manufacturers should continue to innovate with new heat spreader and heatsink designs and other cooling methods, as well.

The Future Looks Bright

If you're not excited about 2011 yet, you should be. The new technologies set to arrive in 2011 will redefine the PC landscape and usher in newfound levels of performance, exciting new form factors, and efficiency that today's systems could never match. ■

BY MARCO CHIAPPETTA



SSD-N, SSD-S

Zalman Unveils Performance, Value SSDs

Zalman's (www.zalman.com) latest move should surprise no power user, least of all readers of CPU. After all, the company's commitment to silent performance is undisputed. Perhaps it was only a matter of time before it made the move into SSDs.

And Zalman has come out swinging, but intelligently. Rather than trying to knock one out of the park with problematic, bleeding-edge tech—not something smart users want to bet their data on—Zalman rounds the bases with a couple of surefire hits.

First up to bat is the mighty SSD-N series of performance drives. This dynamic duo pairs a blazingly fast SandForce controller with MLC NAND flash memory to take full advantage of a 3Gbps SATA interface. SSDs easily surpass RAIDed consumer hard drives in random access times as a matter of course, but the SSD-N series' 280MBps read and 270MBps write capabilities win the sequential data transfer contest, too.

A notable characteristic of the SSD-N series is that it retains its high speed ratings no matter which capacity you specify. There's a 64GB model for your OS and apps, as well as a 128GB edition with enough room for your video workspace or game installations.

In the other dugout is the SSD-S series based on a JMicron controller. Fielding a bigger team—you can buy a 32GB boot drive as well as a 64GB or 128GB slugger—this line of drives is constructed with value foremost in mind.

Part of this series' value proposition stems from its versatility. Each SSD-S

comes with USB 2.0 connectivity as well as SATA, so you can easily clone a notebook or netbook's hard drive to it without extra hardware. And of course, you can use an SSD-S as a pocketable flash drive in a pinch. There's an included cable with dual type A connectors for bus-powered operation with even legacy systems.

Both the SSD-N and SSD-S series of drives support AHCI and the ATA TRIM command, which maintains write performance over time. Zalman adds its gleaming reputation and a three-year warranty, unruffled by the fact that SSD is a whole new ball game. ■

Zalman SSDs	Capacity	Read/write max. (MBps)
SSD-N	64GB	280/270
(SandForce)	128GB	280/270
SSD-S	32GB	260/60
(JMicron)	64GB	260/120
	128GB	260/210

Inside The World Of Betas

Evernote 4.0.1 Beta 1

Evernote is something of a paradox: There aren't many programs that are so full-featured, so incredibly useful, and available on so many different platforms that also have such fundamental usability problems. Now, we love Evernote so much we're willing to deal with the eccentricities that the clients of the different platforms each possess, so we're pleased to see the latest Windows beta does its best to quash the previous version's occasionally bizarre behavior.

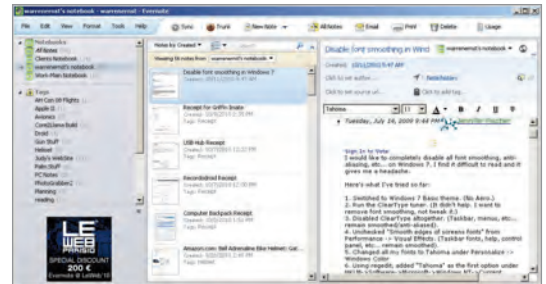
Evernote is a program that captures text, images, Web sites, lists, and attached files in a master database of "notes." The stack of notes is easily tagged, and everything is searchable. The neat part is that images and scans are searchable for text, too, because Evernote's image processing technology inspects images for text during idle periods, meaning you can snap photos of signs with

Evernote 4.0.1 Beta 1

Publisher and URL: Evernote,
www.evernote.com

ETA: Q1 2011

Why You Should Care: The best way to keep notes on all aspects of your life keeps getting better and better.



your cameraphone or scan business cards at your desk and be able to search them later. The different versions of Evernote sync with each other and the Evernote Web site, so your data is always available.

The new Windows client makes much better use of screen space, obeys your system-wide ClearType settings, consumes far less memory, and is generally much more attractive. That said, Evernote 4.0 measures fonts by the pixel rather than the point size, so many notes either appear

too big or too small, and several keyboard shortcuts that made the old version quick to use are mysteriously absent. Perhaps for these reasons, the old version and the beta happily coexist on the same system, with the online syncing routing keeping all your data sorted out between versions.

Because this is the case, regular Windows Evernote users have no reason not to check out the beta to see what's in store. ■

BY WARREN ERNST

Actual Multiple Monitors 3.0 Beta 1

With the price of flat-panel monitors dropping every month, and with even the most basic video cards sporting two video ports, it's never been easier or cheaper to run a multimonitor rig. You might think that doing so is as simple as connecting a few cables and telling Windows "Hey, use all these monitors." (And, to a certain extent, you'd be right.) Soon, though, you'd start to notice all sorts of annoyances with how Windows manages them. Actual Multiple Monitors is one of the more popular tools to get rid of those annoyances while adding lots of functionality.

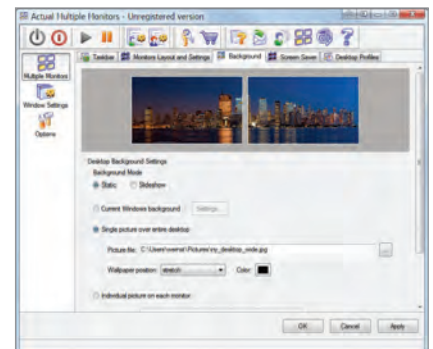
Out of the box, Windows puts a lot of limitations on the secondary monitor. You can't have a Taskbar (along with a Start menu and Taskbar Tray) there. It can't have a different wallpaper image, and you certainly can't stretch one large image across all of your monitors to create a single, unified image. With AMM, you

Actual Multiple Monitors 3.0 Beta 1

Publisher and URL: Actual Tools,
www.actualtools.com

ETA: Q1 2011

Why You Should Care: If you run multiple monitors and want them all working seamlessly, this is the app for you.



can just kiss those limitations (and more) goodbye immediately.

But AMM also offers enhancements. The best adds a set of new buttons on the Title bar of each application window, next to the Minimize, Maximize, and Close buttons. These buttons can maximize a program to span all your monitors at once, or to instantly switch a program window from one monitor to another. It can keep track of the preferred Desktop location of any open window and ensure

the window reappears in that same spot the next time you launch AMM.

We looked at Beta 1, and publisher Actual Tools has already released Beta 2, adding hotkeys to move the mouse pointer from one window to another, as well as the ability to use the mouse wheel to scroll inactive windows. We think these are worthwhile improvements, and well worth the \$30 the final version will command. ■

BY WARREN ERNST

Upgrades That'll Keep You Humming Along

There's good news for lovers of alternative browsers Maxthon and Avant Browser, as well as devotees of Thunderbird and RealPlayer: Your upgrades are here this month.

Software Updates

Adobe InCopy CS5 7.0.3

For the professional-grade word processor that works with InDesign (see below), Adobe fixes a problem with packaging assignments that were created in CS4. Update 7.0.3 also resolves a problem with retaining notes in tables when exporting to PDF from Layout view.

www.adobe.com

Adobe InDesign CS5 7.0.3

The latest update to Adobe's popular publishing design and workflow software resolves positioning problems with Adobe Illustrator and PDF files that were created in InDesign CS, CS2, or CS4 yet opened in CS5. Adobe has also fixed some manual kerning problems with TrueType and Type 1 fonts.

www.adobe.com

Avant Force Avant Browser 11.8.0.123

This release issues a number of fixes for the fast and resource-efficient alternative browser. Now, closing the browser should no longer force the download window to close, and you should be able to properly refresh Web pages that failed to load.

www.avantbrowser.com

CCEnhancer 1.5 Beta 6

This add-on for the widely used system maintenance utility CCleaner lets you add up to 270 application-specific options to the file-cleaning tool. This beta update supports CCleaner 3.0.

thewebatom.net/programs/ccleaner-enhancer

CPUID CPU-Z 1.56

The CPU identifier and diagnostics program adds support for Intel Core i3/i5/i7 2000 series (aka Sandy Bridge) processors, as well as the Core i7-970 and

P67 chipset. For the AMD camp, version 1.56 adds support for Phenom II, Athlon II, and Sempron II CPUs.

www.cpuid.com

Evernote 4 For Windows

The cross-platform program for storing notes and clippings boasts a re-engineered Windows interface. Evernote's developers claim that the rewritten code is much faster and more memory-efficient than older versions. The interface and layout have been completely redone to simplify creating and searching for notes. Clipping within other programs now lets you assign snippets to notebooks without leaving the program.

www.evernote.com

FeedDemon 4.0.0.9

The new version of the popular feed reader offers a wealth of new features, including a search box in the Newspaper view and RSS-to-Atom Twitter feed conversion. This incremental update to the new version introduces a "Speed Reader" newspaper style and an option to display thumbnail images. It squashes a number of bugs, as well.

www.feeddemon.com

Maxthon 3.0.18.1000

The alternative Web browser adds support for third-party downloading tools and adds keyword sync for Multi-Search. Version 3.0.18.1000 adds a number of fixes, including a Save As problem when viewing source code, page rendering errors in the WebKit core, and a flickering problem with the Smart Address Bar's drop-down menus.

www.maxthon.com

Mozilla Thunderbird 3.1.6

If you use Mozilla's powerful open-source email client, take note: Version

3.1.6 patches a serious security problem that could allow remote code to execute on the host PC.

www.mozillamessaging.com/thunderbird

Piriform CCleaner 3.0

The favorite system cleaner receives a major upgrade this month with a new 64-bit engine. A new Drive Wiper function can perform a deep erase on free areas of the drive.

www.piriform.com/ccleaner

Real Networks RealPlayer

Yes, that old media player is still around, now in its 14th iteration. The new RealPlayer is a media library and player designed to reach across devices and platforms. This version now shows all connected devices (including smartphones) for drag-and-drop file management.

www.real.com/realplayer

SeaMonkey 2.1 Beta 1

This all-in-one Internet suite now supports OpenSearch plug-ins. The Data Manager brings together cookie, password, permission, and form data management. SeaMonkey plug-ins now run processes independently of the program and won't crash the main program when they go down.

www.seamonkey-project.org

Driver Bay

Linksys E3000 Ver. 1.0.03

This important update for Linksys' popular top-of-the-line dual-band routers fixes a slowdown in WAN performance that required a reboot to remedy. With the new firmware, the router now supports display language detection in Guest Access.

homesupport.cisco.com

BY STEVE SMITH



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HARD DRIVE DOCK PLUS



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MUKii TransImp Series HDD external enclosure is comprehensively designed based on the needs of time saving/power saving/safety to satisfy all of your data transmission needs.



MUKii Technology Inc. www.mukiiusa.com

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"This is simply one of the fastest PCI Express based SSD solutions we've tested to date and its price/performance ratio literally shatters anything we've seen thus far." — **Hot Hardware**

"It simply rocks. It's hands-down the fastest SSD we have used and its elegant simplicity in use and installation makes it all the more appealing for users of all levels." — **Legit Reviews**

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When it comes to your desktop, solid-state storage shouldn't be limited by the SATA interface. Using PCI-Express, the OCZ RevoDrive X2 SSD eliminates the SATA bottleneck making it the fastest SSD on the market. Unlike competing PCIe SSDs, the X2 is bootable to provide an even more responsive PC experience compared to traditional hard drives. Delivering over 700MB/s and up to 120,000 IOPS, say bye-bye to bottlenecks and hello to high performance.

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RevoDrive X2
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Sony Creative Software ACID Music Studio 8

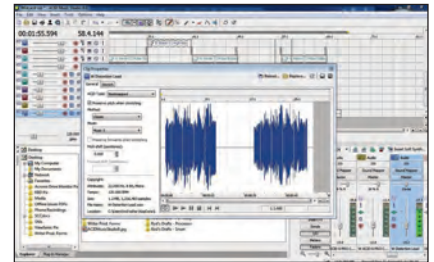
If you're an amateur musician or sound buff—or a pro on a budget—consider Sony Creative's ACID Music Studio 8. It's a powerful audio creation and editing app that contains just about every tool the aspiring musician or soundtrack editor might need.

ACID makes it easy to record, edit, and mix vocal tracks and instruments, combine the mix with MIDI, add a soundtrack to video, and then share the results by sending them to CD, iPhone, MP3, or other formats.

The newest version of ACID adds advanced features, including tempo curves, click-track countoffs, time stretching, and pitch shifting.

Much of this app is dedicated to the creation and use of MIDI files, so if you're into MIDI, this is an especially appropriate tool, and it comes with a large collection of premade MIDI tracks, loops, and sounds.

If you've never used a sophisticated audio app before, the interface may look intimidating. Although you can reconfigure the layout, by default, the screen is divided into five areas: The section at the top left includes sliders and effect controls for each track. To the right of those controls is a timeline showing the contents of each track; as with most audio- and video-editing suites, you can select a track and move, copy, or delete the contents. At lower left is an explorer window that lets you access media files stored on your drives. To the right of that panel is a window showing the properties of any currently selected clip. At the bottom right is the mixing console, with controls and meters for each track. If you need some hand-holding, the program offers interactive tutorials, a quick-start manual, and a full-blown 44-page PDF users manual to ease the way.



Sony Creative's ACID Music Studio 8 is a great addition to your media tool chest. It does what it promises and offers flexible, powerful tools that are easily the equal of those provided in much more expensive applications. ■

BY ROD SCHER

ACID Music Studio 8

\$69.95 (\$64.95 download)

Sony Creative Software

www.sonycreativesoftware.com



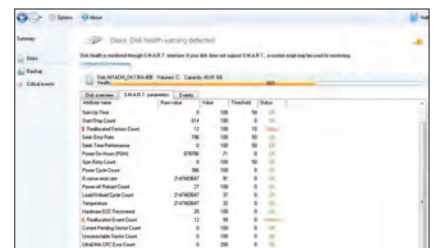
Acronis Drive Monitor

You're well aware that a conventional drive is the system component most prone to failure: After all, a HDD platter spins almost constantly, sectors constantly get written and then rewritten, and a mechanical arm continually reaches out to snag data from the spinning platter—all of this occurring in a hot, enclosed metal-and-plastic box. Let's face it, you have every right to cringe every time you think you hear your drive make an untoward noise. In reality, you're always only a few clicks and hiccoughs away from a dead drive.

But if your drive is S.M.A.R.T.-compliant (or if you can muster the script-writing skills required to interface the app with your non-S.M.A.R.T. HDD), you have an ally in Acronis Drive Monitor. The free downloadable utility runs in the background, constantly checking and then reporting on the health

of your ever-vulnerable hard drives. If it spots a problem, it warns you so that you have time to make a (possibly final) backup and take steps to resolve the problem or replace the drive.

Acronis Drive Monitor constantly logs critical events and measures the performance of 24 distinct drive parameters, including seek error rate, reallocated sectors count, drive temperatures, spin-up time, and write error rate. It uses the results of those tests to arrive at an overall health rating for the drive, expressed as a percentage. A drive with a 90% reading is quite stable and secure, while one rated at 70% is beginning to show issues. The utility resides peacefully in the System Tray until the user opens the app's main interface window or an alert is triggered, at which point the system can notify the user via a pop-up or an email. (The latter option is especially useful, of course,



for monitoring remote systems, including servers in an office or third-party data center.)

Acronis Drive Monitor is nothing fancy, but it's a well-executed, helpful tool that may one day save your butt . . . er, data. For the price (Free! Did we mention that?), that sort of safety net is hard to beat. ■

BY ROD SCHER

Acronis Drive Monitor

Free

Acronis

www.acronis.com



SHARK

with tri-rings effect



Evil Black Edition
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Blue Edition
(4 x Blue LEDs)

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Pinguy OS: Linux For Dummies

It's an old trope, one that has almost entirely lost its meaning over time, but there's another Linux distro that is designed for the average (or slightly below average) computer user.

This one, however, is about as close as any have come to creating an idiot-proof Linux distro. Pinguy OS (www.pinguyos.com) is based on Ubuntu and is mighty fun to play with.

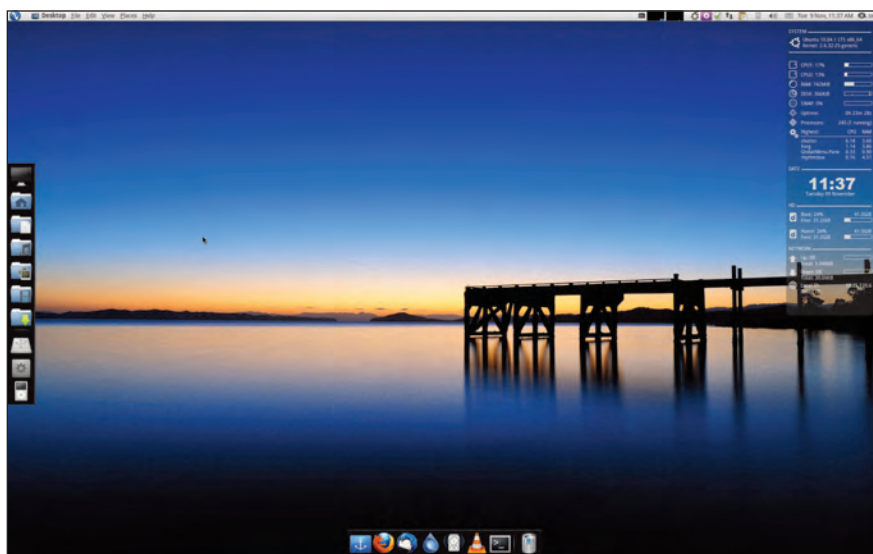
A Little Background

Pinguy OS was built by a fellow named Antoni Norman who wanted a Linux OS that he could give to friends and family—without having to constantly provide tech support. He'd been recommending Ubuntu but grew frustrated with how stark it was. Even though it's relatively easy to add software, codecs, and the like with Ubuntu's repositories, he found that many novice users were still having trouble finding everything they needed to make their system work as they wanted it to.

He looked at what his family and friends wanted to do with their computers, determined which applications would satisfy those needs in the most user-friendly way possible, and then decided to install those applications along with anything needed to make them run properly.

Along the way, Norman hit on an interesting problem with Linux repositories: It's great that virtually any and every application you could possibly want is right there for the taking, but most users don't know which applications they really want or need.

For example, everyone wants a word-processing application, a photo editor, a music player, and so on, but which one should you choose? The options can be overwhelming. Pinguy OS is kind of like having a personal shopper; you still have 50 choices for spaghetti



Pinguy OS (www.pinguyos.com) is an Ubuntu-based Linux distro that is optimized for novice users.

sauce, but Pinguy OS more or less removes the decision-making process for you.

Pinguy OS is a simple and smart, if slightly counterintuitive, approach to a Linux distro. Instead of giving the user his or her own tabula rasa operating system as the user-friendly Ubuntu does, Pinguy OS packs in all the programs, patches, browser plug-ins, and other tweaks that (he's pretty sure) the average user will want, and it's all designed to be optimized from the get-go. He also used a variety of programs to tweak the interface so it's as attractive as possible, such as using MintMenu for the main menu. The result is an operating system that should “just work” and looks pretty, to boot.

A Tour

It was somewhat jarring to boot a Linux OS and be greeted by a relatively busy desktop. On the left side of the screen is a vertical dock with folders for documents, music, pictures, and so on, and another

dock on the bottom of the screen displays applications. Docky (which, as it happens, created both on-screen docks), Firefox, Mozilla Thunderbird, the Deluge BitTorrent client, Rhythmbox, VLC media player, Terminal, and a trash can are pinned to the dock (again, created by Docky) by default, but it also displays any open applications.

The top of the screen has a straightforward file menu (*not* created by Docky), which contains Places, System, Applications, and Search; Desktop, with a Spotlight-like search bar; and the predictable File, Edit, View, Places, and Help.

One item that seems to clash a bit with Pinguy's *raison d'être* is the large, transparent widget that displays information about CPU usage and other under-the-hood information about your system. Although this is a nice tool for knowledgeable computer users, Pinguy OS's target audience probably won't even know what it's for, and it takes up a lot of screen space. It seems rather unnecessary.



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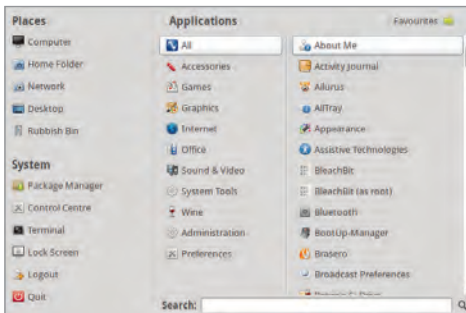
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Test Drive

For the most part, Pinguy OS is as advertised. Everything is intuitive, smooth, and responsive, and I was able to watch streaming video from a number of sites without having to install anything. (Netflix streaming was a no-go, however.) Little things make the overall experience enjoyable, such as the use of Elementary-Nautilus to pull album art meta data into Rhythmbox.

Although Norman set up Pinguy OS to open a given file in the “right” program, it didn’t always work that way. For example, video opens in VLP Player and images open in Image Viewer by default, which is great, but my test MP3 files opened in Movie Player for some reason. (A similar oddity occurs when you connect an iOS device—the system didn’t recognize an iPod as a music player, although it worked fine after forcing the system to open it in Rhythmbox.) It’s not difficult to change those settings, but the whole point of Pinguy OS is that you shouldn’t have to.

Some of the chosen applications make a lot of sense. For example, the office application (OpenOffice), Web browser (Firefox), and email application (Thunderbird) are great options. However, there seem to be a few applications



The main menu is well-organized and easy to navigate.

with overlapping functions that add to the already large number of programs. Do we really need the Deluge *and* TED BitTorrent clients; Dropbox and Ubuntu One for online storage; Brasero and DeVeDe to burn discs; and GNOME MPlayer, VLC, and Rhythmbox to play media, to name a few?

At the same time, Pinguy OS is smart about efficiency in other areas. For example, under Gaming, instead of littering the section with a dozen casual games, Pinguy OS has just one entry: PlayOnLinux, which lets you play a lot of PC gaming titles on your Linux machine.

In Sum

What’s somewhat amusing about Pinguy OS is that it has a certain Mac feel to it. It’s pretty, it makes heavy use of docks, and everything is all set up for you

ahead of time. Further, for the most part, it removes the need for people to choose which programs to use.

This is a terribly un-Linux-like approach and no doubt drives some purists crazy, but that’s OK because, of course, Pinguy isn’t for the purists. It’s designed to reach out a bit further than even Ubuntu does, to the less-experienced user looking for a bona fide OS option beyond Mac or Windows machines. In fact, Pinguy OS is a rather logical evolution for many people looking to get on the open-source bandwagon (or people trying to convince others to do so).

Hopefully, Norman will continue to work on Pinguy OS and the open-source community will continue to support it. It’s well worth the effort. ■

BY SETH COLANER

Preinstalled Applications

Pinguy OS is packed with applications so you don’t have to mess with it. Here is the complete list; judge for yourself whether it’s too much, too little, or incomplete.

Accessories:

Activity Journal
AllTray
Catfish
CoverChooser
CoverGloobus
Gloobus Preview
GNOME Do
Pastie
Xpad
Shutter

Graphics:

gpicview
pinta
Rapid Photo
Downloader
Shotwell
Simple Scan

Internet:

Deluge
Dropbox
Empathy
Firefox
FrostWire
Gwibber
Thunderbird
pms-Linux
Skype
TED: Torrent Episode
Downloader
Xchat

Office:

OpenOffice

Sound & Video:

Brasero
DeVeDe
GNOME MPlayer
gtkpod
HandBrake
mvPod
OpenShot
Rhythmbox
VLC 1.1.2

System Tools:

Ailurus
BleachBit
D?j? Dup Backup Tool
Phone Manager
VirtualBox
hardinfo
Ubuntu Tweak
Wine
PlayOnLinux

Other:

Preload
GDM2Setup
gtkorphan
BootUp-Manager
(bum)
MintMenu
Webilder
Remastersys Backup
gnome2-globalmenu
Gufx Firewall

The Intelligent Alternative

Plaster Networks Reinvents Powerline Networking

We all know that running Cat 5 cable all over a room (or through walls and floors) is not always possible—or desired. Yet, there are rooms in your home or office that your Wi-Fi signal simply can't reach—or can only *barely* reach, resulting in a slow or erratic connection; powerline technology helps your network reach rooms that ordinarily receive weak Wi-Fi signals that cause slow-downs, drop-offs, and lost packets. A working powerline solution lets you use your existing power lines to allow broadband access to the Web and facilitates the reliable high-speed transfer of data, including demanding, bandwidth-intensive applications such as streamed music and video.

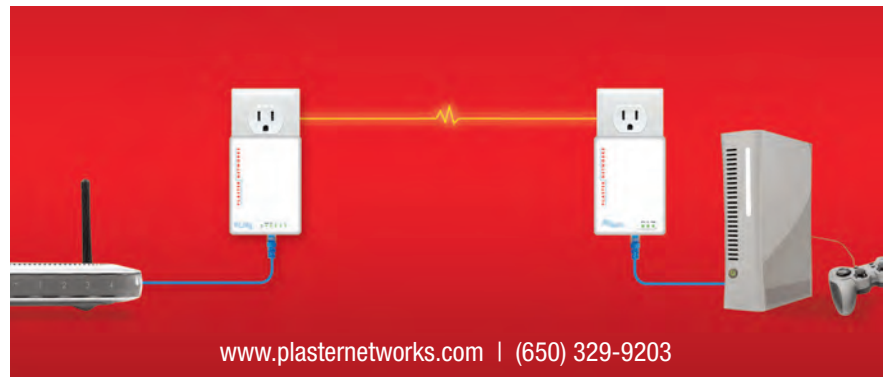
And thanks to Plaster Networks' PLN3 technology, setting up a reliable high-speed powerline network that can complement your wireless setup has never been easier.

What You'll Need

To set up a powerline network, you'll need at least two adapters (although a single PLN3 adapter can provide your network with Plaster Networks' management, configuration, and diagnostics features). Plaster Networks sells a Starter Kit bundle of one PLN3 adapter and one AV200 adapter for the reduced rate of \$129.90. You can purchase additional PLN3 adapters for \$89.95 and AV200 adapters for \$64.95. The adapters are compatible with the HomePlug AV standard, so they can work with many existing powerline adapters.

Easy To Set Up, Easy To Use

The whole point of powerline networking, of course (aside from getting rid of ugly cables snaked across your floor), is its ease of use. Plug one of the PLN3 adapters into a wall outlet near your router, and then connect the adapter to one of the router's Ethernet ports. Plug the second adapter into a wall outlet near the device you want to add to your network. Run the supplied Ethernet cable between the adapter and device, and the device will have immediate access to the network. (Each PLN3



adapter features two ports, so you can connect a second device if desired.)

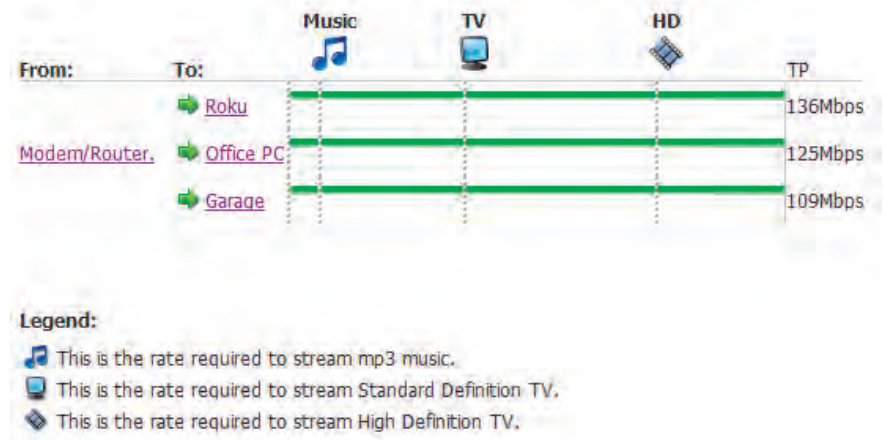
We've mentioned some advantages of powerline networking, but there are other potential benefits: Now you can locate your networked game console, BD player, or HDTV wherever you like, rather than wherever you can drop a cable. (Of course, online gamers will also benefit from the steady Internet access for their Xbox, PlayStation, or Wii consoles, because the Plaster Networks powerline connection greatly reduces the chance of dropped connections that can ruin the gaming experience.)

Plaster Networks' specialized diagnostic and troubleshooting software is another key

benefit. In addition to providing remote network management, the software can evaluate each node's performance in real time, making it easy to isolate your network's trouble spots.

The Smart Networking Alternative

Thanks in part to technologies developed by Plaster Networks, powerline networking has matured to the point where it's possible for even demanding users to enjoy an affordable, reliable, simple networking alternative and to replace portions of an unreliable Wi-Fi network. For a limited time only, go to www.plasternetworks.com/CPU and get free ground shipping on your order; just enter coupon code **CPU0111** at checkout. ■



A real-time view of network status and performance over the powerline.

Mobile Wars

The Battle Over The Next Great Computing Platform

The battle for digital hearts and minds is starting to move off of the desktop and on to mobile handsets. Over a year ago, respected Morgan Stanley analyst Mary Meeker proclaimed that mobile platforms were on a considerably steeper adoption curve than the PC and Internet had been before it. Mobile technology represents the next major tech cycle of the last century, after mainframes (1950s/60s), mini computers of the '70s, and desktop computers and the Internet in the '80s and '90s. When she predicted that within five years the number of people accessing the Internet over mobile devices would exceed the number coming from the desktop, the race to dominate the handset was on.

The competition for mobile market share among the major smartphone players in the United States, Apple, Research in Motion (BlackBerry), Google Android, and the newly launched Windows Phone 7, starts from a very fragmented state. According to an August 2010 comScore report, RIM continues to lead in the domestic subscriber market with 37.6%, but its share is falling rapidly. Apple has 24.2% of smartphone customers and is holding its own against main challenger Google Android, which holds 19.6% of the U.S. market and is growing faster than any other mobile operating system. Microsoft's legacy Windows Mobile OS is at 10.8%, and Palm's WebOS rounds out the top 5 at 4.6%. Nokia's Symbian OS remains a strong force internationally, but Nokia has failed to make a mark in the United States.

So where does this leave the race for mobile supremacy? Ultimately, consumers will decide, but in the meantime, we asked four of the leading voices in the mobile field to evaluate the relative positions of each platform and handicap the race.



BlackBerry: Trying To Stay Relevant

After Apple and Google put pressure on RIM's BlackBerry phones with an extensive catalog of apps and a better browsing experience, RIM is fighting back this season with a revised BlackBerry 6 OS (on its Torch phones) and new emphasis on app and Web app development.

"OS 6 is betting on the ubiquity of the mobile Web," says Erik Rickson, director of mobile analytics for mobile metrics firm Webtrends. Rickson's company recently partnered with RIM to offer developers measurement tools for BlackBerry native and Web apps. He says the new OS strengthens support of apps but is especially strong on HTML5, which gives mobile Web sites app-like functionality.

RIM is legendary for its enterprise email security and adoption, but now the company is aiming for both consumer

and business markets at once. This may be a rough go, warns Coupons.com CTO and former Android engineering lead Steve Horowitz. (See sidebar.)

"With their Torch phone, [RIM] is trying to straddle both worlds," Horowitz says. "They continue to play on [their] strengths but add in a touch-based user experience and new models for developers. Their challenge is going to be getting developers and consumers to accept the device on both fronts and to compete with the 'from scratch' designs of Android and iOS."

With the announcement of a tablet, the BlackBerry PlayBook, running on a more Android/iOS-like QNX-based OS, RIM is signaling that it plans to bring this fundamentally new platform to phones eventually, too. But that may be too little too late, says veteran mobile expert J. Gerry Purdy, principal analyst, Mobile & Wireless, at MobileTrax.

"They are a walled garden, like Apple, and don't license BlackBerry to others," Purdy says. Squeezed by Apple and Google's smoother app and Web experiences, RIM needs to work on being warmer and cuddlier.

"You need to do more than just work," says Purdy. "You need to appeal to satisfactions and emotions."

Apple: The Pace Car

Although second to RIM and losing share to Google Android, Apple continues to set the pace in design and app development.

"[Apple's] reputation rests on two pillars—the App Store ecosystem and the connection to media consumption," says Neil Strother, mobile practice director, ABI Research. Despite Apple's closed OS and its strict control over the App Store approval process, there are 300,000 downloadable apps available through the App Store. Apple also boasts unrivaled



Google's Android has been a hit with manufacturers like Motorola because the open OS allows handset makers to customize the interface, as with this DEFY handset running the Motorola Blur skin.

partnerships with TV, music, and film studios. And now there's the iPad. For consumers who want utility and fun, Apple iOS remains enormously compelling, experts admit.

Although the iPhone rewrote the rules of mobile, many still believe that its growth is hampered by the company's closed OS and limited distribution.

"There is only one place I can get an iPhone app," says Rickman, "and they control the review and approval process." Rickman sees Apple pushing many developers toward more open systems and mobile Web development.

"That they won't run Flash is, to me, totally unprofessional," Purdy complains. As other platforms show greater flexibility, the limitations that Apple's policies impose on users could become more obvious to consumers who expect a full Web experience on their phones.

Android: The Relentless Robot

It may not be quite as warm and cuddly as the iPhone, but with multiple interface iterations across Motorola, HTC, Samsung, and other phones, Google's Android platform appeals to consumers' desires for choice and variety. Its multicarrier support

gives the OS unrivaled marketing muscle, as well. By giving the OS away free to manufacturers, Google lets them target different market segments, such as Motorola's Motoblur, which streams social network updates, news, and messaging to the phone home page.

Strother says that Verizon's big Android support of Droid models has given the platform serious credibility with users. "And Google is a great consumer brand," he says. "People search like crazy on their phones. [Any Android-based phone] is a PC on a phone and so very familiar."

Differentiation in the market can be a strength and a weakness, however. The fully open Android app platform has attracted more than 100,000 programs already. But without quality control and gatekeepers, the Android Marketplace may also invite porn, deceptive apps, and even viral outbreaks. Additionally, although a 3.0 release coming later this year may tweak the UI to invite better game designs, game developers and players still favor Apple over Android for their fun.

And as handset makers skin Android in their own ways and are free to tie the OS to special hardware capabilities, application developers have to contend with a fragmented market. Right now, though, none of our experts sees Android fragmentation threatening its strong momentum in the market. "But it is an issue going forward if Google doesn't somehow make it less 'fork-able' so the apps and hardware don't get too fragmented and developers don't know which phones to

Microsoft's Windows Phone 7 comes into the market with an interface that emphasizes a user's social network, at-a-glance updates, and connections with the Xbox.

program to," Strother says. For now, Google's aggressive entry into the market is stealing market share from everyone else.

Microsoft's Wild Card

It may be hard to recall that Windows Mobile OSes were some of the earliest smartphones that had success in the corporate world because of their integration with Exchange email servers and Office apps. Even Microsoft understands that it dropped the ball in recent years to let RIM, Apple, and Android eat its market share away.

The new Windows Phone 7 may be the company's last shot at regaining a toehold in the market. Built and rethought for mobile, this OS emphasizes a "people hub" of social networking updates from your contact list, as well as an enhanced Zune media player and integration with Xbox Live. An interface using oversized "Live Tiles" that are frequently refreshed with messages, shared photos, and social posts is designed for at-a-glance updating.

The experts we spoke with were generally bullish that Microsoft could return to mobile greatness. "I am not counting them out," says Horowitz. "They have a lot of tenacity and strong partnerships in the industry."

"They are trying to make a dramatic change," says Rickson, "moving from ap-

pealing to the nerdy Microsoft fanboys to the consumer. They are making it easier with a very social set of functions, and it plays into the idea that you can continue to walk down the street and look down quickly to get the latest information."

Strother says that the success of Windows 7 with consumers has restored some of Microsoft's credibility, and that may translate to mobile. However, he adds that things such as in-store shopping experience, carrier plan



pricing, and Microsoft's ability to educate the market quickly all will determine whether Redmond can pull out of its mobile market share nosedive. "If Windows Phone 7 and developers and carriers can get it together in the first half of 2011, I think there will be enough adopters taking a look."

Purdy is optimistic. "They will be a major long-term player. They finally have the right ingredients."

Mobile In Motion

Despite the dogfight between Google and Apple in the smartphone arena, the battle for mobile dominance remains wide open for RIM or Microsoft to

Despite the dogfight between Google and Apple in the smartphone arena, the battle for mobile dominance remains wide open for RIM or Microsoft to exploit, most experts say.

exploit, most experts say. With smartphone penetration still estimated below 25% of the U.S. market, there's enormous room for expansion and even for new players to grab some share.

"We will see multiple operating systems succeed for many, many years," Purdy predicts. The good news for

consumers is that all of the major players will need to be on their "A" game to one-up each other with features, power, and pricing. We are years away from a fully mature marketplace where even two or three platforms emerge as leaders. ■

by Steve Smith

Android Architect Sees Two Or Three Winners . . . Eventually

When Google decided to get serious about the mobile market and develop its own mobile operating system, the company tapped Steve Horowitz as engineering director overseeing the development team. Horowitz had already worked with two heavyweights that had already come to the mobile arena, Microsoft and Apple (where he started his career). Now CTO for Coupons.com, where he develops couponing solutions for all platforms, Horowitz still has a soft spot for Android, as well as the importance of open platforms on mobile.

CPU: Is there really room for more than two or three major mobile operating systems in the U.S. market? Is this going to shake out anytime soon?

Horowitz: It is going to be hard even for major companies to make the level of investment necessary to do an OS and get developer attention. My guess is we are looking at the two to three,

and I don't think it will be as large as four or five. But I don't think there will be only one.

CPU: As more developers release apps across platforms (and WebKit/HTML rises in importance), does it really matter to consumers which OS they use on a phone? Will differentiation among OSes diminish over time?

Horowitz: It depends on the consumer. If they are coming from an old feature phone, then they will be thrilled with any of these OSes. They will have apps and features they never had before. On the other hand, each of these devices does have strengths and weaknesses. If you are tied to Exchange in the corporate world, then you may favor BlackBerry or Microsoft. But consumers likely want a choice of apps, and that leads to Android and Apple, which have a substantial lead if you want choice of apps.

CPU: Many in the development and tech world love

the "openness" of Android. But with 300,000+ apps in Apple's App Store, has Apple's "closed-ness" really hurt its customers in any real way? Does this open platform issue really touch consumers?

Horowitz: It affects consumers fundamentally in two ways. One is choice. The fact that it is open, free, and given away to handset manufacturers means consumers aren't tied to one or two carriers. They can choose among handsets and carriers. Consumer choice matters. The other thing that impacts consumers is that openness affects the way developers perceive the OS.

CPU: But some developers and publishers are already complaining that Android's openness is causing fragmentation and uncertainty about whether a given app really works with all Android phones.

Horowitz: Android fragmentation is something developers have to be aware of.

But if they are careful, they can make sure their apps run on one of the various API levels and they can be sure it will run on any handset that supports that level. Google also has a test suite that ensures that the handsets are compliant with the core versions of the OS. Like anything, with openness you have to be careful.

CPU: Has the arrival of the smartphone app shifted the center of power in mobile away from carriers?

Horowitz: They are the ones subsidizing these handsets. Carriers are in a different position of influence. Before, they controlled the deck. What you are finding with carriers now is they are not as engaged in the app side of the world but very influential in promotions, subsidies, data plans, and user experience. For the first time with the iPhone, people became acutely aware of the need for good infrastructure. ▲

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Yeah, we know you have blogs to post, video to encode, reports to write, and code to compile. We do, too, but you have to take a break once in a while (and maybe blow some stuff up). That's why each month we give you the lowdown on what to expect from the latest interesting PC and console games.

CALL OF DUTY BLACK OPS

\$59.99 (X360, PS3, PC)
\$49.99 (Wii) • ESRB: (M)ature
Activision
callofduty.com/blackops

The Manchurian Candidate—by Dr. Malaprop

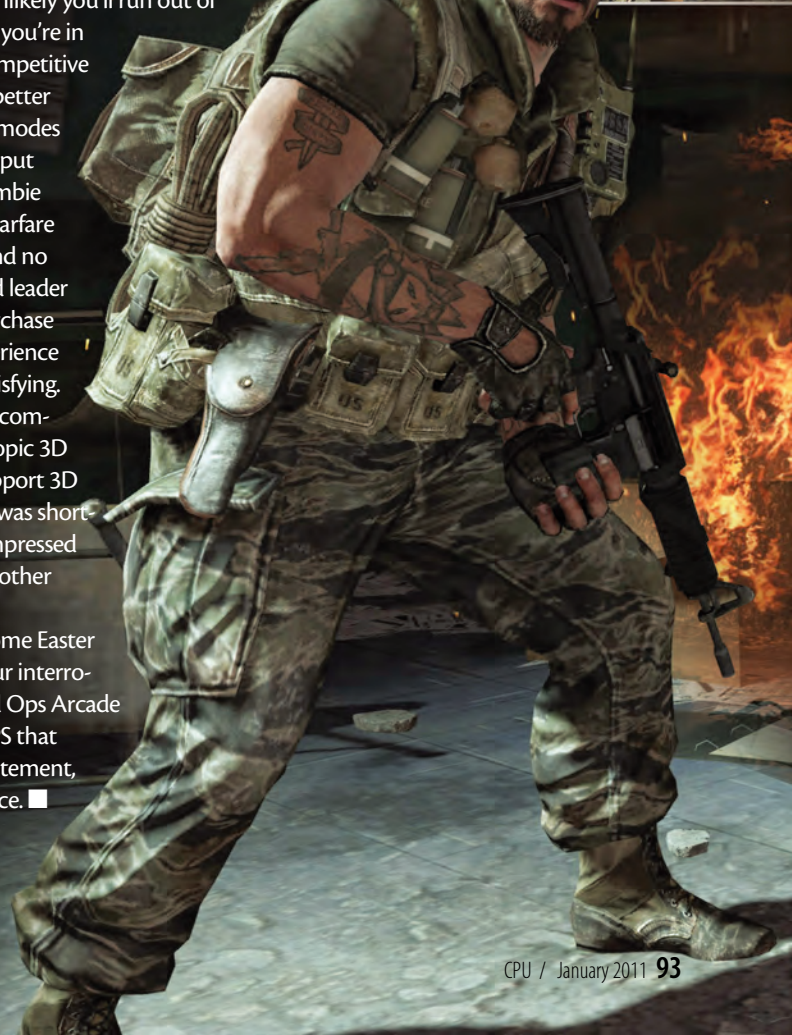
Another year, another Treyarch-developed Call Of Duty game. Last year was Infinity Ward's Modern Warfare 2. This year, Treyarch brings its A-Game with Call Of Duty: Black Ops. Always good for a snicker, you can call it CodBIOps. That's a light-hearted nickname for a seriously good game that you should give serious attention if you derive any pleasure from FPSes and multi-player FPS combat.

The single-player story focuses on the 1960s and the Cold War. As Alex Mason, you awake in a chair as you are being interrogated about numbers—numbers you don't know but that are locked away in your head... numbers that may determine the balance of the Cold War. The storyline plays out more interestingly than Modern Warfare 2, but the cutscenes can inspire headaches if not outright epileptic seizures. Still, you'll be too busy being constantly amped to eleven in scenarios entailing the Cuban Bay of Pigs, a Russian prison camp, Vietnamese jungles and tunnels, and an unrelenting drive for adrenaline. As things come to a close, you'll reach the game's ending—but sit through the credits. The additional ending will throw you for a loop.

CodBIOps is jam-packed with content, and if you play it online, it's unlikely you'll run out of things to do in the foreseeable future. If you're here for the multiplayer, you're in to play competitively. Silky-smooth shooter controls and numerous competitive multiplayer modes improve over Modern Warfare 2 with significantly better balancing. To boost your Prestige, you'll also find standard multiplayer modes along with Contracts that change every 24 hours, four wager modes to put your in-game money where your mouth is, and a four-player co-op Zombie mode. We should note here that we were passionate about Modern Warfare 2's two-player co-op-only Spec Ops mode and were disappointed to find no upgrade to that mode in Black Ops. Taking out Nazi zombies as a world leader is entertaining and arguably provides more depth by letting players purchase new weapons and unlock new areas, but we felt the co-op tactical experience of going through selected single-player maps in Spec Ops was more satisfying.

We liked that the PC version of the game features dedicated servers, command console, and support for mods. The PC version features stereoscopic 3D if you have the right hardware and cables. The console versions also support 3D gameplay if you have the right A/V gear. Our 3D Black Ops experience was short-lived, and we reverted to normal gameplay with no regrets. We were impressed to discover that the Wii version carried the same core campaign as the other platforms, albeit with less refined graphics and no KillCams.

And as if this game didn't already have enough, don't miss the awesome Easter Eggs thrown in for good measure. You'll find a Unix-style console in your interrogation room (you'll need to free yourself first) where you can play Dead Ops Arcade and Zork. There's not a shadow of doubt that CodBIOps is a triple-A FPS that holds its own in a sea of shooters. It brings blockbuster production, excitement, polish, narrative, and deep FPS competitive multiplayer with a vengeance. ■



Fallout NEW VEGAS

They Just Don't Make 'Em Like This Anymore —by Dr. Malaprop

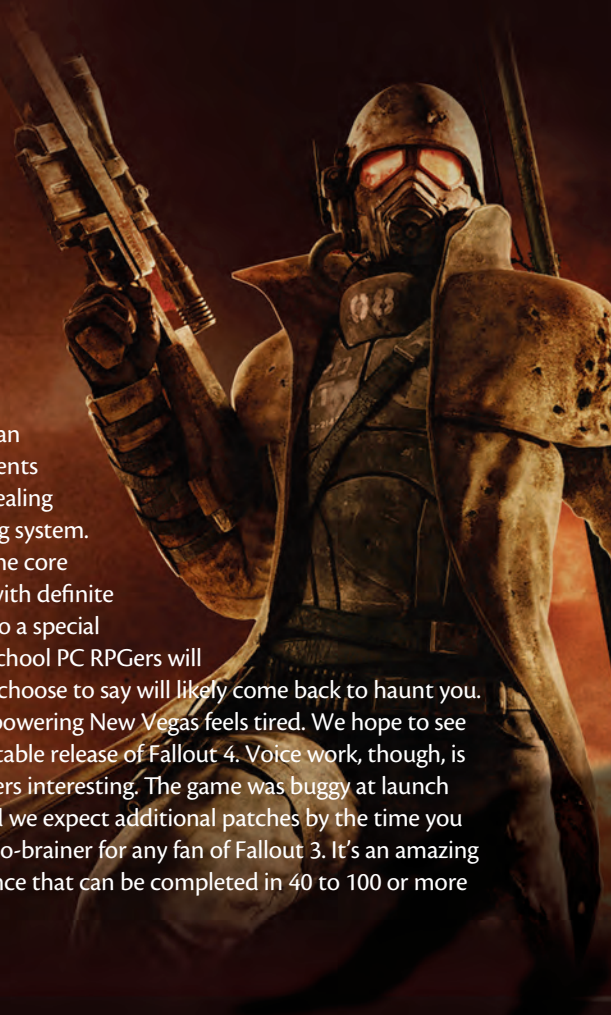
\$59.99 (X360, PS3), \$49.99 (PC) • ESRB: (M)ature • Bethesda Softworks • fallout.bethsoft.com

New Vegas opens with you, a nameless courier, being shot and buried by a well-dressed man. Lady Luck is on your side, though. A doctor from the town of Goodsprings resuscitates you from your near-death experience and gets you back on your feet. Here you customize your character's look and skills. Your goal is to find out more about the package for which you were knocked off and to track down those who did you in, but side quests are intriguing and worth the effort.

The mutated Wild West you encounter in the Mojave Desert is unlike anything you'd find in Red Dead Redemption. New Vegas features lots of improvements. For example, gunplay has evolved with iron sights (more FPS-friendly), streamlined interaction with party members, a new (and quite significant) faction system for relating to the various

factions you'll encounter, an ability to combine ingredients to create power-up and healing potions, and a new crafting system. So you're still playing on the core Fallout 3 framework but with definite improvements. There's also a special hardcore mode that old-school PC RPGers will appreciate, and what you choose to say will likely come back to haunt you.

The Gamebryo engine powering New Vegas feels tired. We hope to see a new engine for the inevitable release of Fallout 4. Voice work, though, is superb and keeps characters interesting. The game was buggy at launch but has been patched, and we expect additional patches by the time you read this. New Vegas is a no-brainer for any fan of Fallout 3. It's an amazing single-player RPG experience that can be completed in 40 to 100 or more hours of your life. ■



STAR WARS THE FORCE UNLEASHED II

A Perfect Game, This Is Not —by Josh Compton

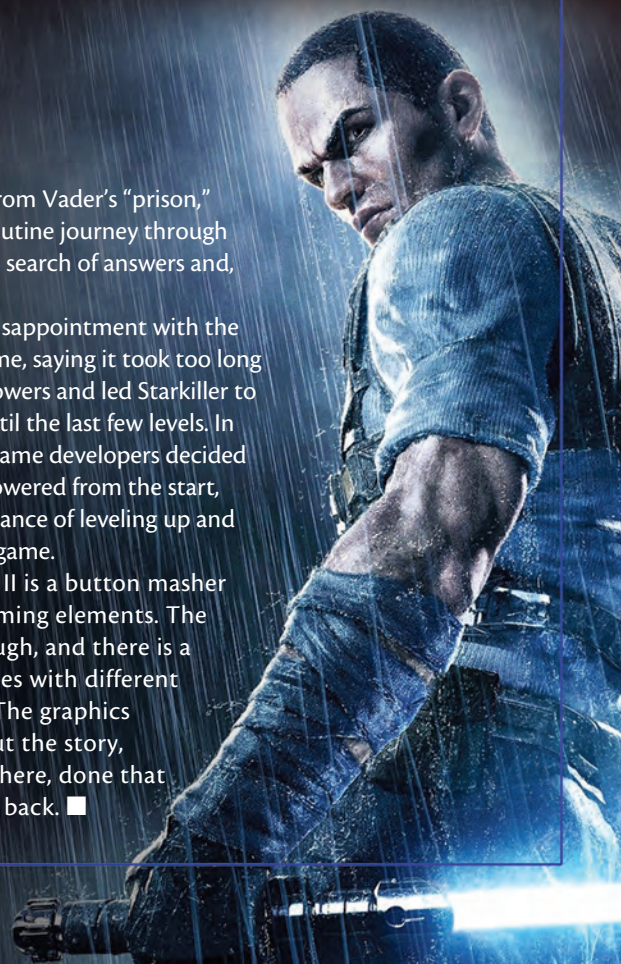
\$59.99 (X360, PS3); \$49.99 (Wii); \$39.99 (PC); \$29.99 (NDS)
ESRB: (T)een
LucasArts Entertainment
www.lucasarts.com/games/theforceunleashed2

About 45 minutes into playing Star Wars: The Force Unleashed II we couldn't help but feel a sense of déjà vu. Though there are noticeable graphical improvements and a few minor tweaks to gameplay in this third-person action game from LucasArts, it feels very much like its predecessor, which is understandable but no less disappointing. You play as a clone of Starkiller, the protagonist from the first game, and start as the underling of Darth Vader once again. However, you are haunted by visions of the original Starkiller's past, including ones involving Juno Eclipse, the first game's love

interest. After escaping from Vader's "prison," you embark on a fairly routine journey through the Star Wars universe in search of answers and, ultimately, Eclipse.

Some players voiced disappointment with the first Force Unleashed game, saying it took too long to progress their force powers and led Starkiller to seem underwhelming until the last few levels. In The Force Unleashed II, game developers decided to make Starkiller overpowered from the start, which lessens the importance of leveling up and makes for a less difficult game.

The Force Unleashed II is a button masher with some light platforming elements. The controls work well enough, and there is a decent variety of enemies with different weaknesses to exploit. The graphics are truly remarkable, but the story, progression, and been there, done that gameplay hold this one back. ■





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— CPU Magazine, October 2010, Dream PC Edition



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FABLE III

The Revolution Is The Easy Part –by Chris Trumble

\$59.99 (X360) • ESRB: (M)ature • Microsoft Game Studios • lionhead.com/fable/fableiii

Like its predecessors, Fable III is an action-RPG that lets you create a character and set off on all manner of adventures in the fictional land of Albion. The game takes place 50 years after the events of the first sequel, and your character is the child of Fable II's protagonist, who eventually became the ruler of the land. You are also sibling to King Logan, the current monarch, and as the game opens you discover that Logan is not a very popular guy.

Logan's shenanigans soon prompt you to leave the comfortable confines of the castle and your life of privilege and wealth in order to raise an army and challenge your odious brother's claim to the throne. You'll do this by travelling around the land from place to place, working to become a bona fide hero and to endear yourself to the people.

Once you become king (or queen, depending on your character's gender), things quickly get pretty serious, and

the kinds of choices that the Fable series is famous for present themselves with increasing frequency. This is a stark contrast to the light-hearted adventure that leads up to your coronation, and in this regard Fable III is sort of like two games in one.

The game is a great deal of fun to play and is very solid technically, aside from some problems with your loyal canine companion's AI: Your pooch, who helps out in combat and can find buried treasure, tends to get stuck behind corners and other obstacles in the terrain a little too easily, forcing you to sometimes backtrack or risk missing stuff he'd find. On the plus side, though, the game's combat (you'll use a combination of melee, firearms, and magic to impose your will) is loads of fun, and Fable III has an engrossing storyline that you help create. In many ways, Fable III is a tantalizing glimpse of where games may be headed, and if so the future is bright. ■



MINECRAFT

\$14 (PC) • ESRB: N/A • Mojang Specifications
www.minecraft.net

The Most Literal Sandbox Game You Will Ever Play –by Andrew Leibman

Surely you've seen the video of the industrious Minecrafter who created a 16-bit ALU or the Trekkie who fashioned the Enterprise-D to scale. These and other in-game concoctions allude to Minecraft's amazing possibilities, but they're just one facet of this work in progress. Minecraft is a first-person sandbox game that drops you into a randomly generated world consisting solely of 1x1-unit cubes that represent raw materials that you can move, combine, forge, and carve into tools, building blocks, weapons, torches, and the list goes on. From the outset, you can access a 2x2 grid to transform logs (from trees) into wood, which you can then use to create a workbench, which in turn yields a 3x3 grid, opening up a world of crafting possibilities.

The blocky pixel-based art style belies the game's visual splendor. A typical map features a large central island surrounded by smaller landmasses, water in all directions, cubic clouds drifting slowly overhead; mountains, caves, forests, and deserts litter the vast landscape. Above ground is full of impossible formations and majestic vistas, but as the name of the game implies, the underground is just as interesting; with subterranean rivers, lava-filled caverns, and valuable ores and stones to be plundered. There are good NPCs, or mobs, in Minecraft, such as cows, sheep, and pigs; and there are bad ones. If exploring and creating are Minecraft's carrot, then the bad mobs (zombies, spiders, skeletons, and creepers) are the stick. When the sun sets, you'd better have a safe place to hide.

At press time, Minecraft's Sweden-based creator, Markus Alexej Persson, or Notch, was tweaking the Alpha single and multiplayer versions of the game (less than \$14). The final release is TBD, but those who buy now get access to the final version at no additional charge. Even in its unfinished state, this game digs a very deep hole for gamers. And how you get out is half the fun. ■



Digs Into Its Roots —by Dr. Malaprop

\$59.99 (X360, PS3, Wii); \$99.99 (Rock Guitar Bundle);
\$179.99 (Rock Super Bundle)
ESRB: (T)een • Activision • guitarhero.com

Guitar Hero: Warriors of Rock is focused on a story-based Quest mode narrated by Gene Simmons. You play through set lists to recruit prebuilt GH characters, where each character has a unique power. You'll work on collecting enough stars in each set list to trigger a character mutation that unlocks a special song for completing that "level." It's a novel effort, but the narrative ultimately feels like something out of last year's *Brütal Legend* and ends up being a modified Career mode.

Warriors Of Rock features 93 songs. If you count yourself a hardcore Guitar Hero fan, then this game will keep you jamming with the likes of Rush's seven-part 2112 as well as Black Sabbath, Deep Purple, and more. We appreciated that prior GH downloads imported into Warriors of Rock automatically.

The Party Play mode is still here, and QuickPlay+ rewards the impatient, providing challenges for various combinations of instruments and the chance to compete against friends' scores. We were miffed to find that certain songs were unavailable in the Party Play or QuickPlay+ modes until they were unlocked in the Quest game. Ultimately, if you're a fan of the series, Guitar Hero: Warriors of Rock will satisfy. ■



Kinect Let Your Body Be The Controller

\$149.99 (X360) • CPU Rating: ●●●●● • Microsoft • xbox.com/kinect

Kinect is a glossy, three-eyed rectangular sensor on a motorized platform placed above or below your TV. It features an emitter to bounce infrared light around a room, a CMOS sensor to interpret the bounced-back infrared light for depth, and an RGB camera used for in-game photos and facial recognition. Last but not least, the four-microphone array enables voice commands, party chat without a headset, and lets Kinect suppress ambient noises.

We tested the Kinect primarily in a cluttered play area of 5 x 7 feet. Rear-ranging furniture for multiplayer games proved to be the biggest drawback. The sensor gets top marks for voice recognition in the Kinect Dashboard and during Zune and ESPN navigation. (Netflix has yet to add voice control.) Navigating with hand gestures was simple but slower than a controller. Motion-based games control as advertised and make Kinect feel like a next-gen Wii successor.

Kinect is available solo or bundled with refreshed 4GB or 250GB Xbox 360s, which feature a special powered Kinect port in the back. All versions come with Kinect Adventures, an all-ages, motion-based collection of five single/multiplayer games. In the future, we expect to see Kinect on the PC, but in the interim search online for already available Kinect hacks.

Laudable Launch Games

\$49.99 each • Microsoft • Dance Central - ESRB: (T)een
Kinectimals - ESRB: (E10)veryone • Kinect Sports - ESRB: (E10+)veryone

We've tried many of the 17 launch games that debuted with Kinect. Some, like Ubisoft's *Your Shape: Fitness Evolved* and EA Sports Active 2, track your movements as you "play." (Think personal workout coach.) Others are games, including these highlights:

Dance Central: The creators of *Rock Band* empower a player to dance to songs by Lady Gaga, Rihanna, Beastie Boys, and more. Kinect tracks dance moves 1:1 with your mirror image, on-screen, dancing avatar. It's a great party game that can double as a workout.

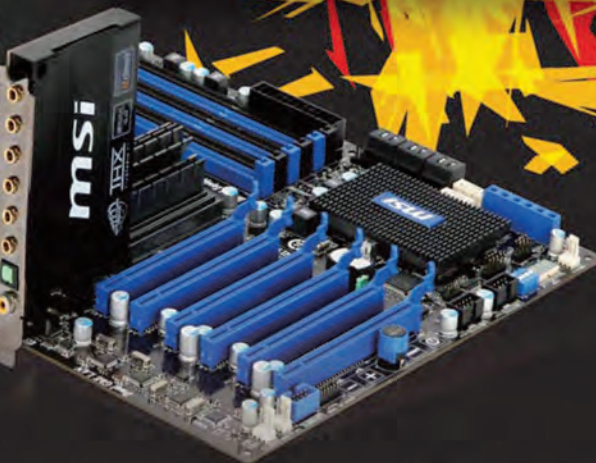
Kinect Sports: A close correlation to *Wii Sports* but with more accurate motion control and a much greater likelihood of kicking up your heart rate during single and multiplayer challenges. Cheating doesn't work. Sports include Beach Volleyball, Soccer, Table Tennis, Track & Field, Boxing, and Bowling.

Kinectimals: Your kids can select from one of five wild cat cubs, with additional unlockable cubs. Players interact with cubs via motions to pet, tickle, and teach cubs to get around obstacle courses. Dare we say cute and cuddly? ■



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Group Policy Editor: Experience Tweaker Nirvana

Registry Tip Of The Month

Here's an example of using the downloadable GP Reference Guide (see main text) to locate and tweak Registry keys. For the GPE tweak to alter the appearance of the Windows Security screen, do a search in the reference guide for "Ctrl+Alt+Del" to find the references to these GPE options. You will see a cluster of entries with that title. The Registry Information column designates the Registry Key where the command should be located and the Value Name that controls, for instance, the Change Password option. And so in the Registry Editor, find the HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\System key. The Value Name that controls the presence of the Change Password option in the Windows Security screen DisableChangePassword. You likely will see that this Value Name (and possibly the System key itself) doesn't exist in the right pane. To create it, right-click to make a New DWORD named DisableChangePassword and set the value to "1."

Although many people might argue that buying Windows 7 Ultimate or Professional adds little value over what's already present in Win7 Home Premium installation, veteran tweakers know of at least one worthy tool found in Pro/Ultimate—Local Group Policy Editor. The GPE is the mother lode of system tweaks. This often-overlooked console gives the user direct access to thousands of Win7 levers that alter appearance, security settings, access privileges, notifications, etc. This month we focus solely on this console and sample some of the goodies.

But for those of you with Win7 Home Premium, don't go away. You can perform all of the tweaks in the GPE in the Registry. In fact, Microsoft itself has provided a rough guide.

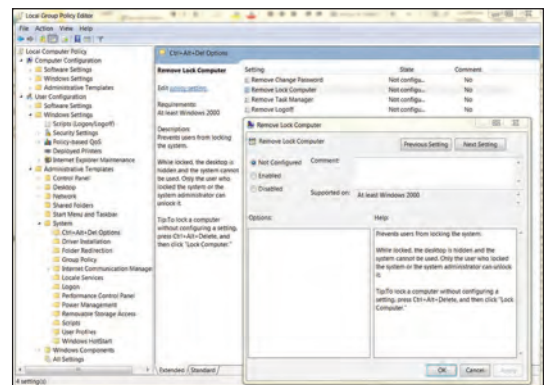
Dive In

Although the GPE is easier to traverse than the Registry, the same dangers lurk in the former as the latter. In some cases you can make substantial changes to your system's behavior; undoing the changes can be hard. So, as with major Registry edits, we suggest you set a restore point before any major tweaking sessions.

To access GPE, type **group policy** in the Start search box; "Edit Group

Policy" will appear as the top result. You can surface the MSC file directly by typing **gpedit.msc** in the Start Search box. Tweakaholics may want to pin the command to the Start menu or create a Desktop shortcut.

In the GPE, you will want to use the Extended tab at the bottom of the



The Group Policy Editor in Win7 Professional/Ultimate is a massively powerful front end for tweaking all aspects of the operating system through a series of settings that are thoroughly explained in the GPE itself.

console, which adds a column of very helpful descriptions.

Addition By Subtraction

To acquaint yourself with how the GPE works, let's start with a basic tweak for editing the icons that appear in your Control Panel. In the left pane, drill into the User Configuration\Administrative Templates\Control Panel branch. In the right panel, double-click Hide Specified Control Panel Items to bring up another panel. Click the Enabled radio button and then click the Show button in the bottom-left pane. In the resulting dialog box, enter the name(s) of a Control Panel icon (Sound, Windows Defender, etc.). Click OK twice to make the change; the effect is immediate.

Windows Tip Of The Month

Microsoft publishes up to a dozen new documents, guides, add-ons, software updates, etc., each day. You can keep abreast of the latest releases at the Microsoft Downloads page (www.microsoft.com/downloads), where the latest releases and most popular items are found and indexed. Drop-down menus at the top of the page will help you filter for product type, download type, and so forth. This is an invaluable resource for finding documents and files, such as the GPE reference guide we used this month.

1. Scope	Policy Path	Registry Information
116 User	Control Panel\Personalization	HKCU\Software\Microsoft\Windows\CurrentVersion\P
117 User	Control Panel\Personalization	HKCU\Software\Microsoft\Windows\CurrentVersion\P
118 User	Control Panel\Personalization	HKCU\Software\Microsoft\Windows\CurrentVersion\P
119 User	Control Panel\Personalization	HKCU\Software\Microsoft\Windows\CurrentVersion\P
120 User	Control Panel\Personalization	HKCU\Software\Microsoft\Windows\CurrentVersion\P
121 User	Control Panel\Personalization	HKCU\Software\Microsoft\Windows\CurrentVersion\P
122 User	Control Panel\Personalization	HKCU\Software\Microsoft\Windows\CurrentVersion\P
123 Machine	Control Panel\User Accounts	HKLM\Software\Microsoft\Windows\CurrentVersion\P
124 Machine	Login	HKLM\Software\Microsoft\Windows\CurrentVersion\P
125 Machine	Login	HKLM\Software\Microsoft\Windows\CurrentVersion\P
126 Machine	System\Credentials\Delegation	HKLM\Software\Microsoft\Windows\CurrentVersion\P
127 Machine	System\Credentials\Delegation	HKLM\Software\Microsoft\Windows\CurrentVersion\P
128 Machine	System\Credentials\Delegation	HKLM\Software\Microsoft\Windows\CurrentVersion\P
129 Machine	System\Credentials\Delegation	HKLM\Software\Microsoft\Windows\CurrentVersion\P
130 Machine	System\Credentials\Delegation	HKLM\Software\Microsoft\Windows\CurrentVersion\P
131 Machine	System\Credentials\Delegation	HKLM\Software\Microsoft\Windows\CurrentVersion\P
132 Machine	System\Credentials\Delegation	HKLM\Software\Microsoft\Windows\CurrentVersion\P
133 Machine	System\Credentials\Delegation	HKLM\Software\Microsoft\Windows\CurrentVersion\P
134 Machine	System\Credentials\Delegation	HKLM\Software\Microsoft\Windows\CurrentVersion\P
135 Machine	Windows Components\Credential User Interface	HKLM\Software\Microsoft\Windows\CurrentVersion\P
136 Machine	Windows Components\Credential User Interface	HKLM\Software\Microsoft\Windows\CurrentVersion\P
137 User	System\CSA\Alt-Del Options	HKCU\Software\Microsoft\Windows\CurrentVersion\P
138 User	System\CSA\Alt-Del Options	HKCU\Software\Microsoft\Windows\CurrentVersion\P

Although less convenient and informative than the GPE, this Microsoft guide to all of the GPE settings shows the ambitious tweaker where in the Registry to find the keys that control the same functions.

As you can see, the GPE gives you tremendous control over the user experience. For instance, if you are an IT administrator, you can prevent workers from tweaking their office systems via the Control Panel. In this same branch of the GPE tree, double-click Prohibit Access To The Control Panel and toggle Enable. The CP is no longer visible on the Start menu, and even if a user types control panel in the Start menu, attempting to launch the program will trigger a warning message that the feature has been restricted by the system administrator. Now you're playing with power.

If you want to prevent a user from changing the wallpaper or specify a wallpaper that cannot be changed, go to the User Configuration\Administrative Templates\Desktop\Desktop branch and double-click the Desktop Wallpaper item. Enable this setting to set a wallpaper image and prevent users from changing it. In the left pane, type the complete pathname to your target image and use the drop-down menu to set the style.

Addition By Addition

Of course, the GPE isn't only about restrictions. It can enhance productivity in a number of ways. For instance, you can expand the number of recent documents displayed in the Start menu. Go to User Configuration\Administrative Templates\Windows Components\Windows Explorer. Double-click the setting for Maximum Number Of Recent Documents. When enabled, you can set

the number of documents in the counter in the left pane.

The Windows Security screen that pops up when you press CTRL-ALT-DEL is cluttered with functions you often don't need or don't want another user to access. To winnow down the selections, go to the User Configuration\Administrative Templates\System\Ctrl+Alt+Del Options. In the right

pane are the following controls: Remove Change Password, Remove Lock Computer, Remove Task Manager, and Remove Logoff; hide whichever you like.

Home Premium Users Can Tweak, Too

Veteran tweakers may notice that GPE's structure and adjustments seem a lot like the settings also available in the Registry. In fact, the GPE really is a convenient front end for the Windows Registry. As we mentioned, you can perform the same tweaks via the Registry Editor, provided you know each key's location.

Thankfully, Microsoft has provided a guide in the form of a downloadable spreadsheet titled "Group Policy Reference for Windows and Windows Server." The easiest way to find it is to do a search with that title at the company's Download Center (www.microsoft.com/downloads). The link will appear among the top results. There are four Excel files available for downloading, but the one for Win7 is titled "WindowsServer 2008R2andWindows7GroupPolicy Settings.xlsx."

The Policy Path column corresponds to the item names in the Administrative Templates branch of the GPE, but you won't find them in the same order as the GPE. You can, however, do an Excel search for item names or even features you may want to tweak. For instance, a Find All search of "Control Panel" on this file will show all of the items in the GPE that you can change directly in the Registry. Go to one of them,

and the Registry Information column will show you the specific place in the Registry to make a change. The Help Text column presents the same descriptive information for the setting you found in the GPE.

Obviously, this method is more cumbersome, and the spreadsheet doesn't provide explicit instructions for editing the Registry setting. In many cases, the policy change requires simply changing a Registry value from the default of "0" to "1." But the best way to discover how to edit the designated Registry value is to Google the Value name.

So, regardless of which version of Win7 you're using, there are plenty of tweaking options available to customize your OS. ■

BY STEVE SMITH

INFINITE LOOP

Auctioneering Made Easy, Really Easy

Some people spend a lot of time with their good friend eBay; entire businesses exist exclusively within the boundaries of the online auction service provider. Conversely, there are just as many people who want to get their Chad Ochocinco bobblehead and get out. New Zealander Paul Hunkin's eBay activity is a little bit of both. Hunkin, taking a page from Web comic xkcd, wrote a script that would automatically buy him cheap, random knickknacks on a regular basis. Bonus: Hunkin's creation has its own Twitter feed, which alerts the world when his stockpile of "treasures" expands. (story via Gawker)



Source: bieh.net/2011/01/08/xkcd-576

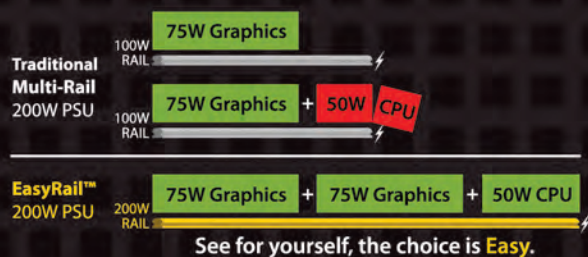


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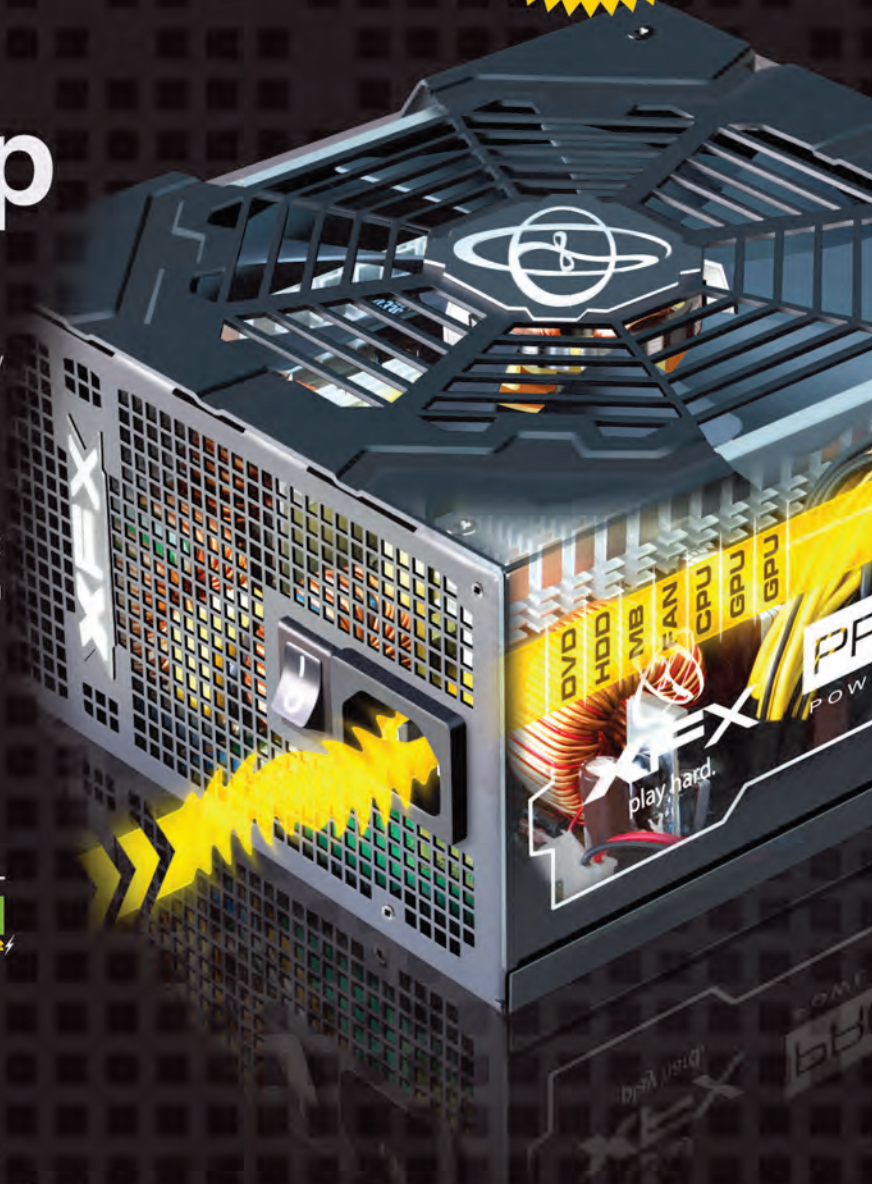
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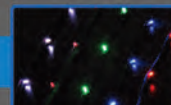
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An Interview With Sezmi CMO David Allred

David Allred is chief marketing officer at Sezmi. Before that, he was vice president of marketing and products at Clearwire Wireless Broadband, and prior to that, was responsible for worldwide leadership of HP's direct-to-customer business across the consumer and small-business market segments.

BY BARRY BRENESAL

CPU: Let's begin by going over the basics of the entertainment package Sezmi offers to U.S. consumers.

Allred: We have a complete television service that consists of live local and cable TV, and on-demand video—that's movies, as well as cable content and Web video, such as YouTube and podcasts. All of that is delivered as a personalized TV service, with a DVR.

CPU: Watching Internet video on television alongside movies and network content is a distinctive feature.

Allred: Today, we have full access to YouTube, and it's fully integrated into the television service. It literally feels just as though it were another channel: a common UI, and a common experience with the rest of the Sezmi system. We also have a very large podcast library that includes both user-generated podcasts and many of the top media brands, such as Disney, Discovery, and ESPN.

CPU: The ability to view real-time Internet video streams adequately (without endless pausing for caching) is going to be based on the connection speed that a customer already gets from his Internet provider, correct?

Allred: That's correct. The system itself detects what the consumer's bandwidth is, and manages that situation. Anything above



a 1.5 connection will be adequate. If a consumer has a lower bandwidth speed, then it does take a moment or two longer before the video will start. But once it's started, it's a very stable, pretty high-quality experience.

CPU: How much do on-demand movies cost, and what sort of library does Sezmi provide?

Allred: Our movie service is an on-demand library that includes more than 10,000 films. Prices vary, anywhere from less than a dollar up to \$4.99 for new-release HD content. Most are \$3.99. You can watch one anytime during a 30-day window, though once you start watching, you have 24 hours to see it complete. You can also purchase the movie, but the more common mode is rental.

CPU: Do you include any cable networks at this time that are predominantly movie-based?

Allred: Such as Cinemax or HBO? Not today. That's something that we hope to add in the future.

CPU: The cable content that you mentioned earlier isn't part of the basic \$5 per month package, is it?

Allred: That's correct. We have two services: our entry-level product, which we call Sezmi Select, and our higher-tier, Sezmi Select Plus. With Select, you have your local TV channels—as many as 80 in some markets—plus access to our Web video and VOD service. When you step up to Sezmi Select Plus, that adds a collection of top-rated cable networks.

CPU: This brings to mind an almost causal insult that Time Warner's spokesperson, Travis Reynolds, made a while back: "Sezmi has launched in other Time Warner markets and made little impact because of the limitations of their products and service." Is there a possibility here that if you're not competing on the numbers and variety of cable stations, you'll be viewed by prospective shoppers as a second-tier add-on, rather than as basic competition?

Allred: It's important to understand the state of the TV market as many consumers view it. The No. 1 complaint they have is that they're paying way too much for

television and watching way too little. It's not a secret of the industry that although consumers may buy 300 or 400 channels, the majority of households watch anywhere between 10 and 15.

What we've done, rather than focus on the number of channels, is look at the content that is watched the most. To break that down a little bit, over 50% of all TV shows come directly off local broadcast channels: ABC, CBS, etc. By the time you add about 35 channels through cable networks, you're at 90% of all shows watched in the U.S. today. We're in the process of expanding that list of 23 cable networks, but even with what we currently have, it's an attractive offer.

CPU: How do you respond if somebody in one of the major metro markets you cover says to you, "I already have several hundred cable stations available, and I'm happy with that. I can go rent a video when I want one from a store around the corner, or find them on movie networks. What can you offer me that goes beyond all this?"

Allred: The first thing I would ask is are they really watching all that content? Do they like that they're paying \$75 per month for that all-in model? They can very likely acquire the same content for a lot less cost by subscribing to Sezmi Select Plus to cover 90% of what they watch and then selectively adding their favorite shows.

Beyond that, Sezmi is designed around the concept of having a personalized television service. When you turn on the Sezmi system, the first thing it asks you to do is hit a button on the remote that indicates who is watching TV. From that point on, all the material that shows up on the television screen is organized and prioritized for you, the person watching. The second thing is that the television service is really optimized around on-demand viewing, with a terabyte DVR as the basic platform. It will store up to

roughly 1,000 hours of a user's favorite shows—all automatically.

CPU: Once you've had something recorded on that DVR, can you later transfer it, either to watch elsewhere, or to store for later viewing?

Allred: No, at the moment it needs to reside on the Sezmi System because of rights management issues.

CPU: Is there any possibility of the programs that are not bound by any kind of rights issues being provided in the future without the device restrictions?

Allred: Yes. In fact, we're working on a version of our service that actually makes accessible all of the consumer content across a number of additional devices, including a phone, a PC, or a tablet. But it has not yet been released to the market.

CPU: Neither has "targeted advertising with sophisticated metrics," but that sounds interesting.

Allred: The biggest challenge faces is the fact that advertisers, or even television service providers, don't actually know who's watching TV. They can target a ZIP code. They may even target a household. But until you actually know that it's Dad watching TV vs. a teenage son, it's very difficult to get a lot of productivity or efficiency out of that advertising. Because Sezmi's system is personalized around the individual viewer—and we know who's watching, because they log into their Sezmi—we will have the ability to deliver targeted advertising that is also interactive, right down to the set-top box.

CPU: Let's say you're a consumer, and you don't want to be

on the receiving end of targeted advertising. You may feel that kind of information is too personal. Can you opt out of logging into Sezmi, losing the ability to structure content, yet still enjoy its benefits?

Allred: Certainly. It's entirely up to them, and we won't force that in any manner.

CPU: Your first and primary market has been in the U.S.—after all, there's a lot of venture capital here. Now, according to a recent press release, you have moved into the Malaysian marketplace.

Allred: We just announced that Sezmi and YTL Communications are launching home-based television, video, and broadband services, as well as mobile broadband and video. We're delivering that over a combined digital television broadcast, and their 4G WiMAX network.

CPU: What prompted Sezmi to seek partnerships specifically in Malaysia?

Allred: There are many countries that frankly lack the money to invest in laying fiber or land line-based video delivery mechanisms. As a result, most nations outside of industrial powerhouses are looking to wireless content distribution. In Malaysia, we're doing that through over-the-air television and 4G wireless. A combination of a hybrid broadcast, a digital television network, plus broadband (the 4G wireless) is incredibly powerful. We see a lot of opportunities in places such as Latin America and Eastern Europe. The Malaysian deployment is not just about Malaysia; our approach has been to build the core operating center in Malaysia, then use that to service other countries in that region.

CPU: Then, it's onto the world?

Allred: I like your aspiration! ■

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www.lanpartymap.com/tennessee-lan-party/1554-Completely-Reborn.html

12.03.10

Maryland LAN Gamers - Maryland
www.marylandlangamers.net

12.04.10

Intel LANFest InfernaLAN Winter 2010 - Dupont, WA
lanfest.intel.com

Rapid Response LAN party - Trenton, NJ
www.lanaddict.com/lan/view.php?LANID=2237
www.lanpartylist.com/list.php?cat_id=34

12.11.10

Hiram LAN 2.0 - Hiram, OH
hiramlan.webs.com

LAN Lordz - Wichita, KS
lanlordz.net

Marietta LAN - Marietta, OH
mariettalan.wsoc.edu

12.17.10

Intel LANFest Atlanta - Atlanta, GA
lanfest.intel.com

12.18.10

Oklahoma Gamers Group - Oklahoma City, OK
www.okgg.org

NGC's LAN-A-GEDDON - Greenville, TX
www.networkgamingclub.com

SLAGG - Bradenton, FL
www.slagg.org

South Princeton LAN II - Princeton, IL
southprincetonlan.wordpress.com

01.01.11

MagFest - Charlottesville, VA
magfest.org/index.php

01.08.11

LAN Lordz - Wichita, KS
lanlordz.net

01.15.11

Gaming Northwest LAN - Vancouver, WA
www.gamingnw.com

NGC's LAN-A-GEDDON - Greenville, TX
www.networkgamingclub.com

Oklahoma Gamers Group - Oklahoma City, OK
www.okgg.org

WV Gamers - Eugene, OR
www.wvgamers.com

01.21.11

Kansas LAN - Lyons, KS
www.kansaslan.com

01.28.11

JANLAN 2011 - Eugene, OR
www.euglan.com/janlan-2011

02.05.11

Carolina Games Summit - North Carolina
www.CarolinaGamesSummit.com

02.12.11

LAN Lordz - Wichita, KS
lanlordz.net

WV Gamers - Eugene, OR
www.wvgamers.com

02.19.11

NGC's LAN-A-GEDDON - Greenville, TX
www.networkgamingclub.com
Oklahoma Gamers Group - Oklahoma City, OK
www.okgg.org

02.25.11

FITES Frag Infinity Tournament - York, PA
www.fites.net

03.04.11

Pittco's IRON STORM XII LAN Party - Pittsburgh, PA
www.pittco.org

03.12.11

LAN Lordz - Wichita, KS
lanlordz.net

WV Gamers - Eugene, OR
www.wvgamers.com

03.19.11

NGC's LAN-A-GEDDON - Greenville, TX
www.networkgamingclub.com
Oklahoma Gamers Group - Oklahoma City, OK
www.okgg.org
RIT Gaming Society Expo - Rochester, NY

04.02.11

Bring Your Own Computer 12-hour LAN Party - Penn College

04.09.11

LAN Lordz - Wichita, KS
lanlordz.net

04.16.11

LAN OC V8.0 - Ohio City, OH
lanoc.org

NGC's LAN-A-GEDDON - Greenville, TX
www.networkgamingclub.com

Oklahoma Gamers Group - Oklahoma City, OK
www.okgg.org

04.23.11

WV Gamers - Eugene, OR
www.wvgamers.com

05.13.11

Project X: Redemption - Calgary, AB, Canada
www.ProjectxLAN.com

05.14.11

LAN Lordz - Wichita, KS
lanlordz.net

05.21.11

NGC's LAN-A-GEDDON - Greenville, TX
www.networkgamingclub.com
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www.okgg.org

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06.01.11

HAM LAN - Hamilton, OH
www.ham-lan.com

06.11.11

LAN Lordz - Wichita, KS
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06.18.11

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resistance. Other components that give this PSU an edge over others include durable Japanese capacitors, a double-ball-bearing fan, gold-plated connectors, a DC-to-DC VRM, and a PWM fan controller for low acoustic noise and optimal cooling under load. This PSU also features a high-quality EMI filter, which eliminates noise from other nearby electronic devices.

Antec's advanced hybrid cable management system gives you the best of both worlds, combining a modular PSU's ease of cable routing and improved airflow with a traditional non-modular PSU's low wire-transmission loss. If you have any doubt about this unit's hardware capabilities, consider that **FOUR** of those 2V rails, supporting

up to 30A each (up to 99A total), are dedicated to graphics cards; there are eight 6+2-pin PCI-E connectors capable of supplying juice to your choice of up to quad graphics subsystems. And this unit is both Nvidia SLI and AMD CrossFireX certified. Here you'll also find two 8-pin CPU connectors for supporting dual processor workstations or servers. Antec's latest PSU also ensures your hardware is protected against short circuits, under-voltage scenarios, and surges in voltage, power, and current.

Antec has made a name for itself by delivering a top-of-the-line, no-holds-barred high-performance family of power supplies, and the HCP-1200 is no exception. ■

Q&A With Jack Wang

Shuttle USA's President Thinks Inside The Box

Shuttle pioneered and popularized SFF (small form factor) PCs almost a decade ago, but the tech market has changed radically in that time. With Intel's Atom and other increasingly capable tiny computing devices, Shuttle faces increasing pressure in an arena it once ruled. Jack Wang became president of Shuttle's U.S. arm back in 2004. He keeps a remarkably low public profile, but hardly anything you see with Shuttle's name now fails to bear his direct input.

Q The SFF has a lot of pressure on it. Where do you see this space going?

JW Actually, I see it thriving. It wasn't until just two to three years ago that other manufacturers noticed an opportunity in small form factor and decided to start offering SFF solutions of their own. Now, you see many major names involved. Many of these companies have yet to master SFF PC design, though, which is why they're focused on entry-level solutions.

Q To the untrained eye, there wouldn't seem to be much secret sauce to a performance SFF apart from an optimized, compact cooling system. Why aren't other vendors hammering Shuttle at the high-end?

JW They're just following the trend. Consumers haven't forced them to push performance that much yet, although they're starting to. The computing intensity level, if you will, of the average consumer has really gone up in the last couple of years, with higher gaming and productivity demands. More people want machines that can do these tasks, but they want them in smaller designs.

Q Within SFF, Shuttle has several form factors, and I've seen even more in your concept designs. I don't sense as much enthusiasm for the old shoebox designs. What's the rising trend in size and shape?

JW Entry level is hot now, nothing mid level. The mainstream PC seems to be dying off. The shoebox is still alive and in demand, but do you remember our three-liter, the X27? We actually have people wanting that over the one-liter XS35. For some reason, people prefer the slightly larger size, even though the specs are almost the same.

Q Sony's new panel with an integrated Atom CPU and Google TV seems like a harbinger of the living room computer to come. The "SFF" is actually built into the devices and set-tops. Does this mean that Shuttle will start pushing into the CE market?

JW We have been. The XS35 is actually a "consumer electronics product." Several partners sell it with their software preloaded, turning it into basically a DVR. Also consider that a "smart TV" is not meant for multitasking like a PC is. When you want to juggle a kid's show, a game, a spreadsheet, some photo editing, all in the same space, a solid PC can do this. You won't have that experience on a set-top or smart device.

Q Are notebooks and ultramobiles clobbering SFF?

JW Mobile PCs have made progress into the SFF space, sure, but keep in mind that the line between these two form factors is blurring. We introduced



our open SPA (Shuttle PCB Assembly) form factor for notebooks at CES 2010. We don't brand it as Shuttle, but we do build for other notebook vendors. Intel tried to do a standardized notebook form factor a few years ago, but the notebook frame kept changing, so there was no way to have a consistent parts ecosystem.

With SPA, everything is standardized. We hope that soon you'll be able to have a true DIY notebook and buy upgrade parts right off the shelf. Intel allowed for maybe three configurations. We're enabling up to 180 right now. Globally, we're already selling 160,000+ units per month. But the cool thing is that the XS35 is based on the SPA standard. In future designs, you'll see mobile Core i3s and Core i5s going into both [notebooks and desktops].

Q Are you worried that the cloud will kill the need for most SFF PCs?

JW And everyone will use cheap thin clients? No. Think about how many computing devices homes have now, and all of them need lots of bandwidth. Our pipes aren't that big yet. The cloud cannot deliver rich data and streams throughout a high-end home. No, the performance SFF is safe for now. ■

BUILDING A PC

JUST GOT INTERESTING



TOP VENTILATION
Pre-Installed 2 X 120mm Fan



FRONT VENTILATION
Pre-Installed 1 X 120mm Fan



BACK VENTILATION
Pre-Installed 1 X 120mm Fan



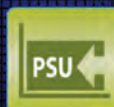
SIDE VENTILATION
Optional 2 X 80/90/120mm Fan



SSD PLANK
Bracket SSD & 2.5" HDD Support



DUST FILTER
Prevent Dust Buildup



SERVER STYLE
Bottom Mounted Power Supply Design

EVO

ATX MID TOWER

The EVO is not just mere case, it is an extension of your inner gamer. Its design and form factor lives and breathes gaming – designed for the longest gaming sessions without strain or overheating of your PC.

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Send Eurocom your working laptops, servers, and/or desktop computers (with monitors) and get up to 20% off new Eurocom notebooks or portable LCD PCs.* The company's Trade In Program is open to any brand. And if you currently own Eurocom systems, you can get up to 30% off new models via the Trade Up Program.

Think about that; not only will you save on IT equipment disposal fees for getting rid of your old PCs and monitors, but you'll also realize significant

discounts on top technology. We're talking about systems powered by Intel's Core i7 processor family, ATI and NVIDIA graphics, and more.

Eurocom builds systems not just for power and reliability, but also for easy upgrading. Thanks to modular designs that make parts upgrades easy, Eurocom's notebooks and other systems are capable of longer life spans than less future-proof models from its competitors.

Of course, you don't have to be a business owner to get in on this deal. It's open to individual users, educators, government agencies, the healthcare industry . . . you name it.

** Some restrictions apply.*



Featured Product: X7200 Panther 2.0

Available with a 17.3" Full HD 1920x1080 backlit LED display, powered by Intel® Core™ i7-980X Extreme Edition and Intel® Xeon® 5600 series processor; 6 core . Supports the following NVIDIA® and ATI® VGA cards: GeForce® GTX 480M with SLI®, Quadro FX 2800M, 3800M and 5000M , and Radeon™ Mobility HD 5870 with CrossFireX™.



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