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BY IDG COMMUNICATIONS

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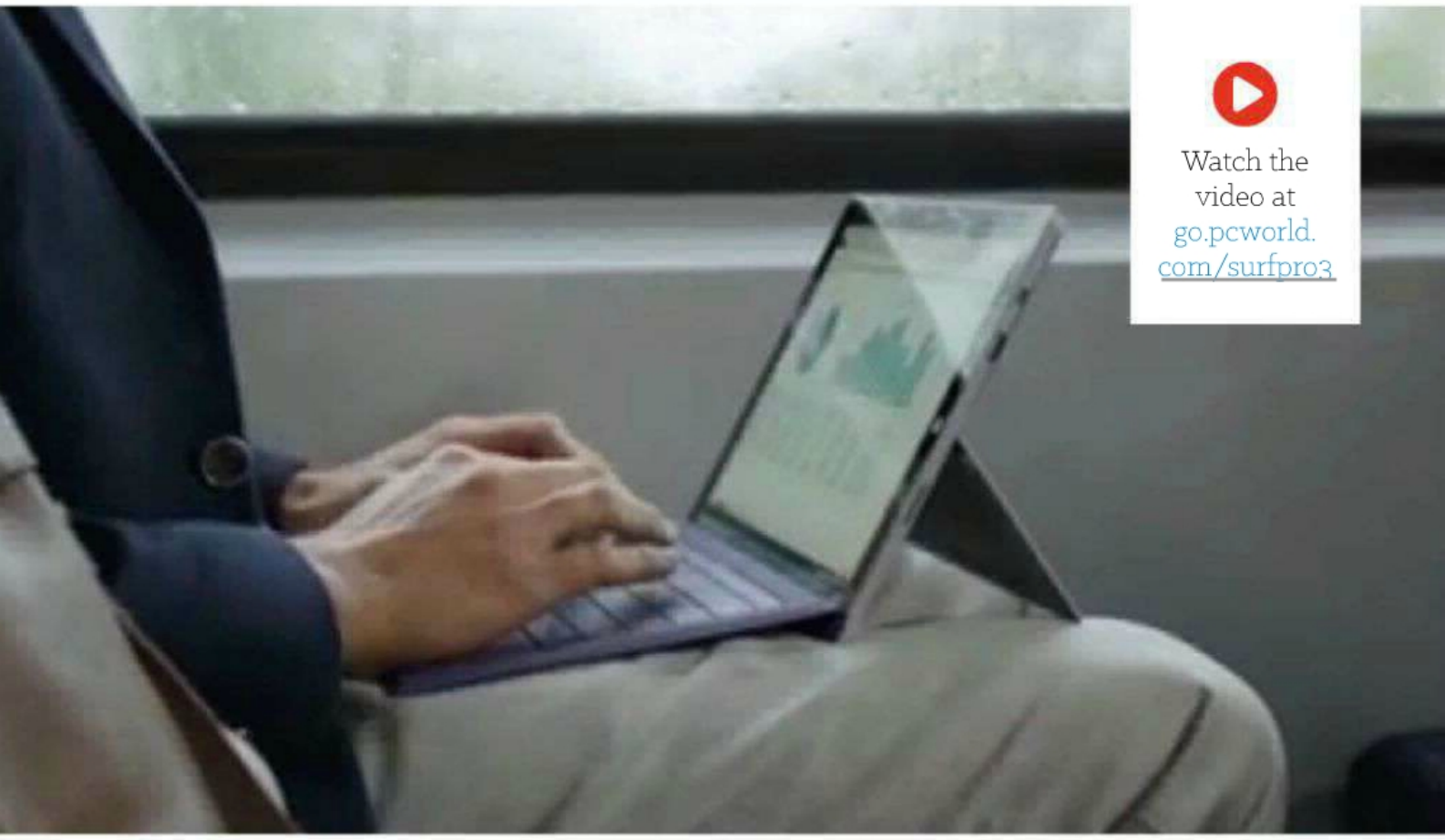
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Microsoft announces the 12-inch Surface Pro 3

The 'tablet that can replace your laptop' embraces the Surface line's Ultrabook-style roots more than ever before. **BY BRAD CHACOS**



Watch the video at go.pcworld.com/surfpro3

IN LATE MAY, Microsoft announced the Surface Pro 3. Representing more than a mere spec boost over the Surface Pro 2, this tablet is a new entry in the lineup, and one designed to "replace your laptop." To that end, the Surface Pro 3 blends tablet sleekness with Core i7 power. At the launch event, Surface head Panos Panay called the tablet, which the company designed in conjunction with Intel, "the thinnest Core product ever created." The



The hinged Type Cover for the Surface Pro 3 seals magnetically to the slate for easy adjustability.

Surface Pro 3 measures a mere 0.35 inch thick without a keyboard cover, a hair thicker than the 0.29-inch iPad Air and far thinner than the MacBook Air, which measures 0.68 inch at its thickest point.

This device isn't fanless: The new Haswell Core processors are much more energy efficient than their predecessors, but these chips, especially the high-end Core i7 models, still toss off heat. However, Panay said, "we reinvented the fan to make it 30 percent more efficient than any fan in any product today, [to] radially emit air so you never feel it or hear it or see it." The Surface Pro 3 also includes a perimeter vent, just as the Surface Pro 2 does.

The showstopper is the screen, which measures 12 inches diagonally and offers an eye-popping 2160-by-1440-pixel resolution and a 3:2 aspect ratio designed to mimic a paper notepad. Panay said the display boasts the highest contrast ratios in the industry.

Microsoft has improved the kickstand, adding multiple positioning options. The tablet still offers the Surface line's traditional 22-degree angle, but Microsoft has tweaked the hinge to add full friction, letting you push the Surface Pro 3 back to an almost-flat 150-degree angle that Microsoft has dubbed "Canvas mode," for adjustable "lapability" and ease when you're using the included digitizer pen.

A focus on note-taking

The Surface Pro 3 gives a nod to its mobile roots with its full-fledged digitizer pen, which offers 256 points of pressure sensitivity; this N-trig pen replaces the Wacom pen in previous Surface Pros. In fact, the entire Surface Pro 3 design revolves around note-taking, as Microsoft has baked OneNote integration into the pen's functions.

Clicking a button on the top of the pen opens OneNote immediately, even if the Surface Pro 3 is powered off. As you jot down notes, clicking the pen's button again instantaneously saves your current note to the cloud, after which the item will show up on all your devices with OneNote installed—yes, even Apple devices.

And if your Surface Pro 3's camera is active, double-clicking the pen's button will capture an image in OneNote, where you can then mark it up and save it to the cloud.

Accessories

Microsoft also announced new accessories for the Surface Pro 3, including a docking station and a redesigned Type Cover. The Surface Pro 3 Type Cover includes a redesigned touchpad that's 68 percent



Microsoft has reengineered the kickstand to add full friction, which lets you push the tablet back for use with the bundled pen.



At the launch event, Surface head Panos Panay showed the new Type Cover, which has a larger touchpad.

larger with 70 percent reduced friction (Panay admitted that the Surface Pro 2's touchpad wasn't well received), and the hinged cover magnetically seals to the screen so that it can adjust to whatever angle you position the tablet in using the kickstand.

Sure, 12 inches is an awkward size for a device ostensibly made for toting around. Panay emphasized, though, that the Surface Pro 3 was designed to bring users both tablet portability and laptop-style productivity in one device, as he cited a statistic that claims 96 percent of all iPad users also own a laptop.

Introducing a larger Surface makes sense given the lineup's penchant for productivity, as the added screen real estate gives Windows desktop programs and snapped Windows Store apps room to breathe. Paired with a Touch Cover, the original Surface Pro tablets already seemed like miniature Ultrabooks—the Surface Pro 3 just embraces that idea all the more, while staying slim and allowing for keyboard-free use.

"Can we design and build a device that enables any individual to be able to read and to be able to create and write?" Microsoft CEO Satya Nadella pondered during the event's introduction. "[A device that] allows you to watch a movie and make a movie, enjoy art and create art? That was the motivation for the Surface line."

That guiding vision, one that Microsoft's tablets have strived for from their debut, is becoming reality. The Surface Pro 3 is an appealing piece of hardware at first glance.

Most Surface Pro 3 models won't ship until late August

WHEN MICROSOFT'S PANOS PANAY announced on May 20 that customers would be able to preorder the Surface Pro 3 the next day, the implication was that the tablets would be shipping soon. But that isn't the case for all configurations of the newest Surface.

Microsoft's Surface Pro 3 preorder page (go.pcworld.com/surface3order) reveals five configurations, from a $799 model with a Core i3 processor and 4GB of RAM to a $1949 version with a Core i7 processor and 8GB of RAM.

As of this writing, the two Core i5 models will ship by the time you read this, on June 20, while the Core i3 version of the tablet and both Core i7 models will ship on August 31.

Our first impressions of the Surface Pro 3 are positive (for more, see our hands-on look on page 18), and this model seems to represent what Microsoft intended for the Surface lineup all along.

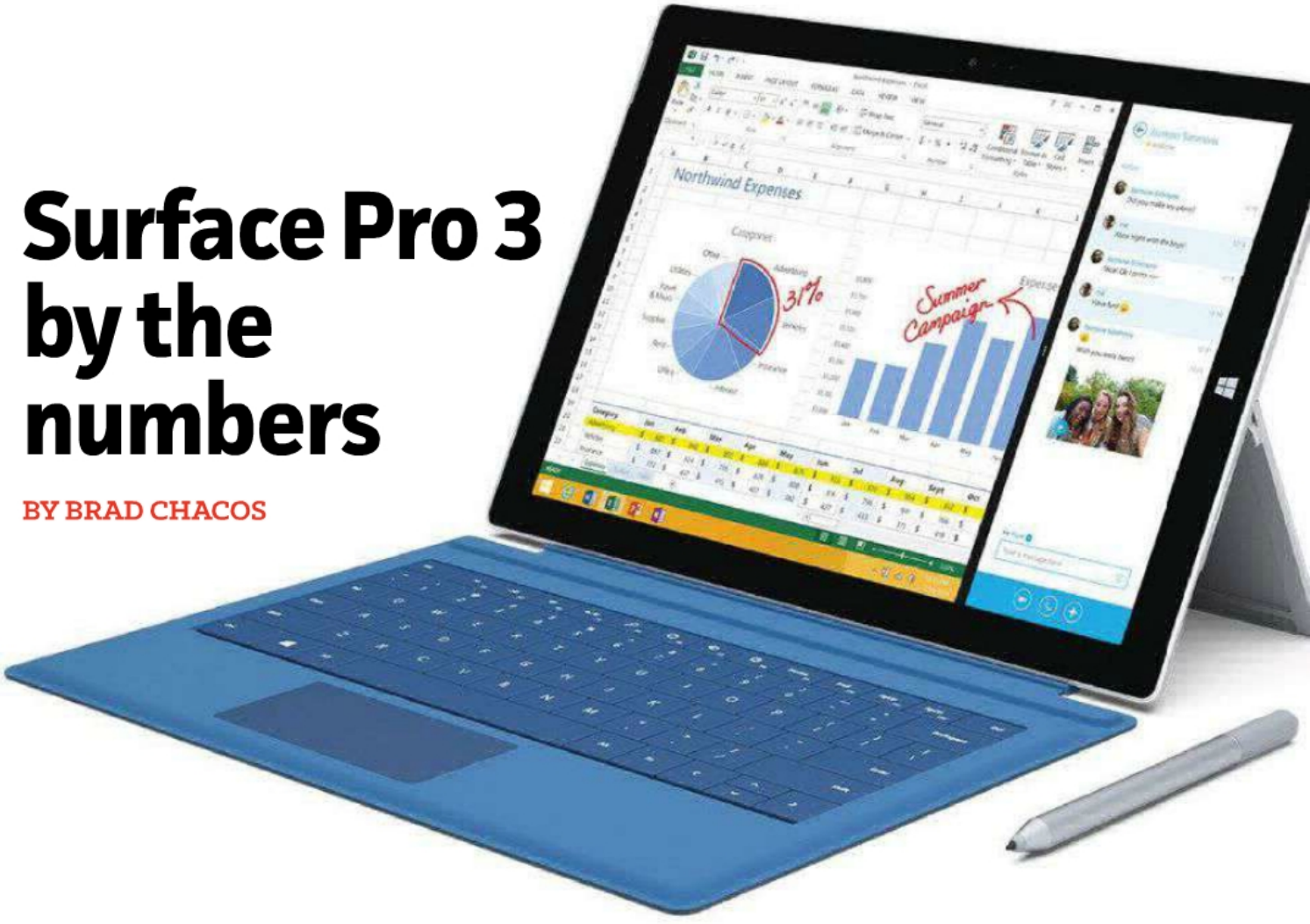
What has given most potential buyers pause in the past has been the astounding price of the Surface, at least compared against the cost of Android tablets of the same dimensions. With the release of the Surface Pro 3, Microsoft has cut the entry-level price by $100 versus the basic Surface Pro 2. But that's small comfort to those buyers who will have to wait longer to receive it.

—Mark Hachman



Surface Pro 3 by the numbers

BY BRAD CHACOS



MICROSOFT'S "TABLET THAT CAN REPLACE YOUR LAPTOP" looks mighty impressive on paper, from the machine's pixel-packed 12-inch screen to its almost impossibly slim 0.35-inch chassis to its full-blown Intel Core processor. And that's only on the, er, surface: The thoughtful design tweaks that Microsoft is integrating into the Surface Pro 3 seem sure to make the new slate far more comfortable to use than its smaller predecessors were.

Multiple configurations

During the launch announcement, Surface head Panos Panay touted the Surface Pro 3's Core i7 processor, but Microsoft is actually offering a wide, almost PC-like range of Surface Pro 3 configurations.

Whereas the Surface Pro 2's smaller dimensions limited that device's built-in storage options, the Surface Pro 3 will be available in a multitude of flavors. Following is a list of the five configurations.



At the slate's launch event, Microsoft demonstrated how much lighter the Surface Pro 3 (sans keyboard) is than the MacBook Air.

- Intel Core i3, 64GB storage, 4GB RAM: $799
- Intel Core i5, 128GB storage, 4GB RAM: $999
- Intel Core i5, 256GB storage, 8GB RAM: $1299
- Intel Core i7, 256GB storage, 8GB RAM: $1549
- Intel Core i7, 512GB storage, 8GB RAM: $1949

All versions of the Surface Pro 3 will contain a Trust Protection Module 2.0 chip to alleviate enterprise security concerns.

Microsoft says the slate will offer up to 9 hours of "Web-browsing battery life," though you shouldn't expect that sort of endurance from the more potent models.

The Surface Pro 3 boasts a 12-inch ClearType display with a 3:2 aspect ratio and 2160-by-1440-pixel resolution. Of course, the tablet's screen includes full multitouch support, to accommodate not only your fingers but also the digitizer pen that ships with the slate. The pen features 256-point pressure sensitivity and innovative OneNote integration via a click-top button.

Thin and connected

Microsoft managed to make the Surface Pro 3 thinner than any previous Surface model while maintaining the product line's focus on connectivity options. (Silver is the only color option, alas.) Following is a breakdown of the specs.

- Dimensions: 7.93 by 11.5 by 0.36 inches
- Weight: 1.76 pounds
- Casing: Magnesium
- Wireless: Wi-Fi 802.11a/b/g/n/ac, Bluetooth 4.0 low-energy technology
- Full-size USB 3.0 port
- MicroSD card reader
- Headset jack
- Mini DisplayPort
- Cover and charging ports

The tablet also packs a bevy of sensors, namely an ambient-light sensor, an accelerometer, a gyroscope, and a magnetometer.

Accessories

The Surface Pro 3 wouldn't be a Surface tablet without a broad range of accessories. The lack of Touch Cover options for the Surface Pro 3 drives home the idea that this device is meant to be a versatile laptop replacement, not a traditional tablet. It's too bad that Microsoft doesn't have a Power Cover keyboard accessory for the Surface Pro 3 (not that you can ever find those in stock anyway). Following is the pricing for the available add-ons.

- Surface Pro Type Cover: $130
- Additional Surface Pen: $50
- Additional 36W Power Supply: $80
- Additional Pen Loop: $5
- Docking Station for Surface Pro 3: $200
- Surface Ethernet Adapter: $40

Surface Pro 3 hands-on: Thin, light, lovely

We looked at the new tablet during Microsoft's launch event.

BY MARK HACHMAN



Almost a PC

In moving from the 10.6-inch display of the Surface Pro 2 to the 12-inch screen of the Surface Pro 3, Microsoft's tablet line is becoming more PC-like than ever. Really, the only things differentiating the Surface Pro 3 from a traditional laptop are the strength of the hinge and the weight distribution. Otherwise, the Surface more closely resembles a notebook with each iteration.



Bigger, brighter

By itself, the tablet looks ungainly to use. But the larger screen size and excellent new hinge options make this a viable device to kick back with and watch a movie on. You will see letterboxing with the new 4:3 screen ratio, but it isn't too bad. At 0.35 inch thick, the new Surface reminds me a lot of the Samsung Galaxy Note Pro—and that's a good thing. The Surface Pro 3 is thin, relatively light, and big.

Surface Pro 3 hands-on: Thin, light, lovely



New Type Cover

We have yet to see a Touch Cover for the Surface Pro 3. The new Type Cover is appealing, though, as this version retains the backlit keys of the Type Cover 2, and it's just as comfortable to type on. The key spacing seems a bit wider, making it even more useful for people with larger fingers. You'll also notice a dedicated clip for the stylus—a nice touch, since I had a tendency to lose the one I received with the Surface Pro 2. And yes, the new Type Cover will work with the Surface Pro 2!



Wider touchpad

Here's a subtle improvement: The touchpad on the new Type Cover is significantly wider than that of the previous generation. It's a convenience that I may appreciate over time, although the extra space didn't really impress me at first blush.

Surface Pro 3 hands-on: Thin, light, lovely



Surface Pro 3's new stylus

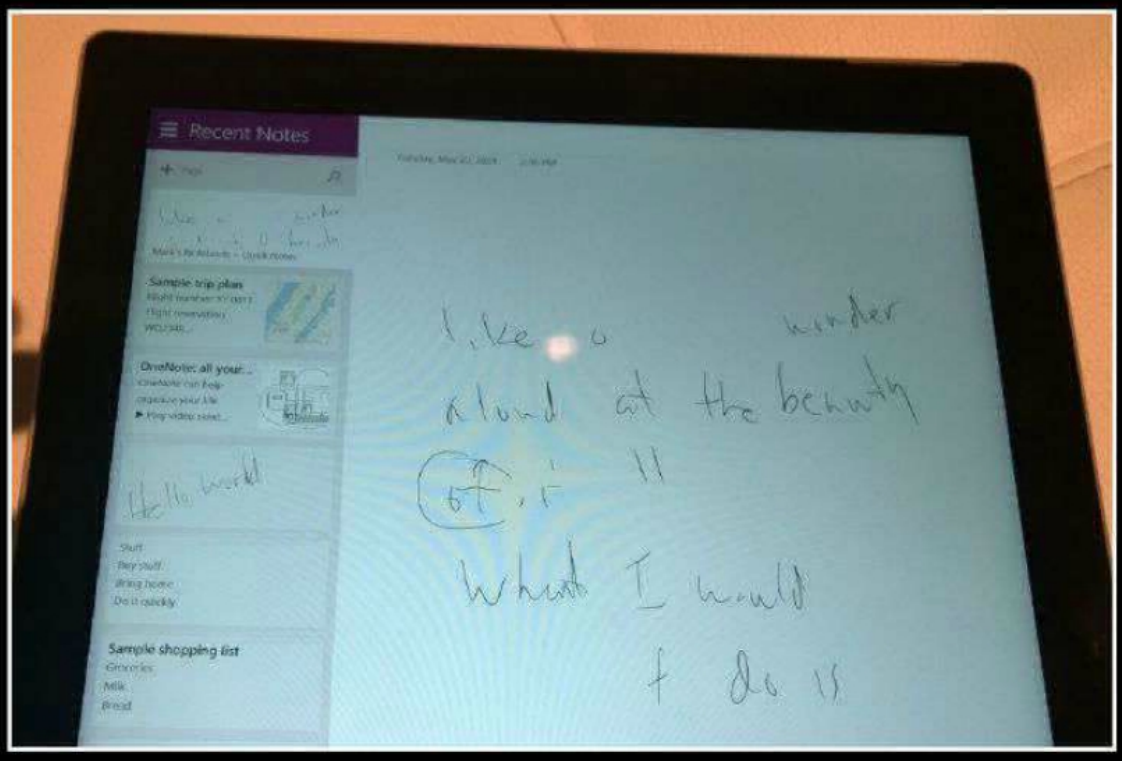
I'm not one for digital inking, so I can't say yet how the new stylus will do. You sync it by holding the top button for about 8 seconds. The two buttons on the side essentially replace the two mouse buttons. The ink "flows" where the pen touches. If you're an inker, I don't think you'll have anything to complain about.



The stylus clip

Although the stylus clip appears to be a handy addition, it looks like it will tear off eventually. I think Microsoft could exert a bit more engineering effort here.

Surface Pro 3 hands-on: Thin, light, lovely



OneNote

OneNote, Microsoft's note-taking app, certainly gives you a lot of space to work with on the Surface Pro 3. You can use the two buttons on the stylus to select (and move) a block of text as well as to erase what you've already written.



The new, terrific hinge

Honestly, we can forget about talking angles and positions with the new Surface Pro 3 hinge. Yes, it slides easily to the first Surface Pro position, at about 20 degrees. But after that, the hinge kicks in, and suddenly there's a great deal of resistance, and the hinge remains stable out to its maximum angle of 150 degrees. If the Surface Pro 3's hinge can tolerate repeated use, this might be the best integrated kickstand in tabletdom.

Surface Pro 3 hands-on: Thin, light, lovely



'Lapability'

I despise that word even though Microsoft's Panos Panay insists on using it, but I'll grudgingly admit that it measures a real thing—how easily a tablet rests on your lap. And yes, with this iteration of the Surface Pro, it has gotten better. You still have to deal with a side-to-side wobble here, but the stability toward and away from you has improved. Throw in a truly rigid keyboard, and you practically have a laptop. Maybe that's on the list for the Surface Pro 4.



Thin is in

The thickness of the Surface Pro 3 is almost ideal, and the fact that Microsoft can hide an Intel Core i7 inside of it is amazing. I will say, however, that Microsoft could stand to lighten the 1.76-pound weight by a few ounces. Although the weight may be distributed evenly across the tablet, I can't imagine using it one-handed for long: You have to curl it in to your waist, using your bicep to support it. But Microsoft is almost there.

Surface Pro 3 hands-on: Thin, light, lovely



A difference in thickness

On the left is the Surface Pro 3, with its new Type Cover. On the right is the older Surface Pro 2. You can see the difference.



Raised keyboard

Another subtle difference is the way the Type Cover snaps into the tablet. Two magnetic connections are involved: The first occurs when you attach the tablet and cover, as before. The second occurs after you "back up" the keyboard, folding a tab over and underneath to slightly raise the keyboard at an angle. It's an extra option for users, just as the additional hinge positions make the tablet a bit more ergonomic. I like it. This shows attention to detail.

Surface Pro 3 hands-on: Thin, light, lovely



Surface Pro 3 vs. Surface Pro 2

Back in my hotel room, I played with both Surface Pro models. Although I carry my Surface Pro 2 as a backup PC, it tends to feel cramped, in part because of the smaller keyboard and screen. The Surface Pro 3 is both wider and taller than the Surface Pro 2, making the screen size feel spacious, and making it easier to type.



ThinkPad Twist vs. Surface Pro 3

The real question: Would I give up my Lenovo ThinkPad Twist for the Surface Pro 3, or would I tote the tablet as a separate device? Sorry—old habits die hard. I'm typing these captions on my Twist, on my lap, and the Surface Pro 3 doesn't quite measure up. Now, if I had a docking station on my desk, with support for an additional monitor or two? I'm not sure—but if Microsoft loans us a docking station, I'll give it a try!



Like other recent convertibles, the Satellite Radius can be a laptop, a tablet, and more.

Toshiba shows us the Satellite Radius, plus two detachable laptops

BY MICHAEL BROWN

POOR LENOVO: HP introduced a Yoga copycat in February with the Pavilion x360, and now Toshiba is co-opting Lenovo's contortionist-laptop design. The Satellite Radius is a 15.6-inch convertible with a 360-degree hinge that you can use in five modes: laptop, tablet, presentation, audience, and tabletop.

In a late-May briefing, Carrie Cowan, senior product marketing manager for Toshiba, pointed out that Lenovo doesn't offer a Yoga



model with a display this large. "We're targeting the mobile worker who needs to make presentations on the road," said Cowan. "This is a high-end laptop that's convertible."

The Satellite Radius will be available with either an Intel Core i5 processor and a 750GB hard drive for $926, or a Core i7 CPU and a 1TB drive for $1049. Both models will have 8GB of memory, LED-backlit keyboards, and 802.11ac Wi-Fi adapters plus support for Bluetooth 4.0. The IPS display will offer a native resolution of 1920 by 1080 pixels.

Holding this 4.85-pound, aluminum-enclosed computer in tablet mode is a tall order. I imagine that most people, if they use this machine in tablet mode at all, will cradle it in the crook of one arm. But the large display will be terrific in presentation mode (with the laptop set up like a tent) and in audience mode (with the keyboard facing down and the display at a right angle to it). Cowan told me that users can configure the Satellite Radius's "smart-lock" feature to turn the keyboard off when it isn't needed.

Toshiba will bundle Nuance's Dragon Assistant with the Satellite Radius, which will have dual-array microphones embedded in its bezel.

With a native resolution of 1920 by 1080 pixels, the Satellite Radius's 15.6-inch IPS display helps to differentiate it as a high-end PC.

The convertible will be equipped with Harman/Kardon speakers and DTS Sound audio-processing software. Cowan said the Satellite Radius will be available in July at Best Buy and directly from Toshiba.

Toshiba's Click convertible gets a revamp

The Toshiba reps also showed me two new notebooks with detachable displays. "Detachables have been out of reach for the average consumer," said Cowan, so Toshiba is pricing the Satellite Click 2 at just $587 when the system ships in July. That amount buys you a 13.3-inch IPS display (with a native resolution of 1366 by 768 pixels) that can detach from its keyboard dock to become a tablet.

To release the display, you simply push down on the top edge and then pull it away from the dock. With the prototype unit I saw, one side kept getting stuck—but you can't expect prototypes to be perfect. Cowan said the combo will measure 0.9 inch thick and tip the scales at 4.85 pounds; the tablet on its own will measure 0.55 inch thick and weigh 2.81 pounds.

The Click 2 will be passively cooled, but I don't think this portable will be a barn burner on benchmark tests, considering that it's powered by a Bay Trail–class processor (a quad-core Intel Pentium N3530) and 4GB of RAM. Storage will come in the form



The Click 2 Pro has a 13-inch display that you can remove to use as a tablet.

of a 500GB mechanical hard drive. On the upside, the machine will have an 802.11ac Wi-Fi adapter and an HD webcam.

Since the drive resides in the tablet half, Toshiba is including impact-sensor software that moves the read/write heads away from the platters when it detects vibrations that might jeopardize data integrity.

Toshiba collaborated with Skullcandy to design the Click 2's audio system. Cowan handed me a pair of Skullcandy's Crusher headphones for a listen, and the cans literally vibrated with the bass beat. I doffed them in short order, but I'm not the target market (I don't think much of Beats headphones, either).

To release the Click 2's display, you just push down on the top edge and then pull it away.

Also on the way is the Satellite Click 2 Pro, which will be more of a performance machine. The native resolution of its 13-inch IPS display will be 1920 by 1080 pixels. This model will be available with either an Intel Core i5 CPU and 4GB of memory for $1029, or a Core i7 processor and 8GB of RAM for $1280. Both configurations will come with a 128GB solid-state drive and an 802.11ac Wi-Fi adapter, but the Core i7 version will have a supplemental 500GB hard drive and a second battery in its keyboard dock. (Toshiba expects the Click 2 Pro to last around 9.5 hours with both batteries.) In addition, the Click 2 Pro will have more ports than the Click 2, including a Micro HDMI port and dual cameras in the tablet half.

According to Toshiba, both configurations should be available by the time you read this, at the end of June.



Laptops with displays that move on a 360-degree hinge, such as HP's Envy x360, are the latest trend.

A glimpse of the near future of PCs from Computex

BY PCWORLD STAFF

LAPTOPS THAT FLIP around to become tablets. Thinner, lighter everything. To see the next big (or small) things in PCs, you have to go to the manufacturing source: Asia.

Every summer in Taipei, Taiwan, the Computex trade show draws major PC vendors and legions of component makers. Their goods are hardly as priceless as the Imperial Chinese treasures at the National Palace Museum less than 5 miles away, but this is the stuff tech is made of, and Computex always provides an enticing peek at the near future. Here are some highlights.



Another convertible line, Dell's Inspiron 13 7000 series, offers a touchscreen and comes with a passive stylus.

Dell unveils 360-degree laptops and thin all-in-ones

Dell's upcoming two-in-one Inspiron laptops have 360-degree hinges, just as Lenovo's Yoga notebooks do. The entry-level Inspiron 11 3000 series, due out by the time you read this, starts at $450 and has an 11.6-inch, 1366-by-768-pixel IPS touchscreen, plus a 720p webcam (with Skype preloaded) and a 500GB hard drive.

The Inspiron 13 7000 series provides a 13.3-inch touchscreen offering a resolution of either 1366 by 768 or 1920 by 1080, as well as a passive stylus. You can choose a 500GB hard drive or a 500GB hybrid hard drive with 8GB of cache. This series will be available in September; for now, pricing is up in the air.

Buyers also get 20GB of Dropbox cloud storage and Sensible Vision's excellent FastAccess Anywhere facial-recognition software, plus Waves' MaxxAudio high-definition audio software.

Dell's Inspiron 20 3000 all-in-one desktop offers a totable picture-frame chassis.

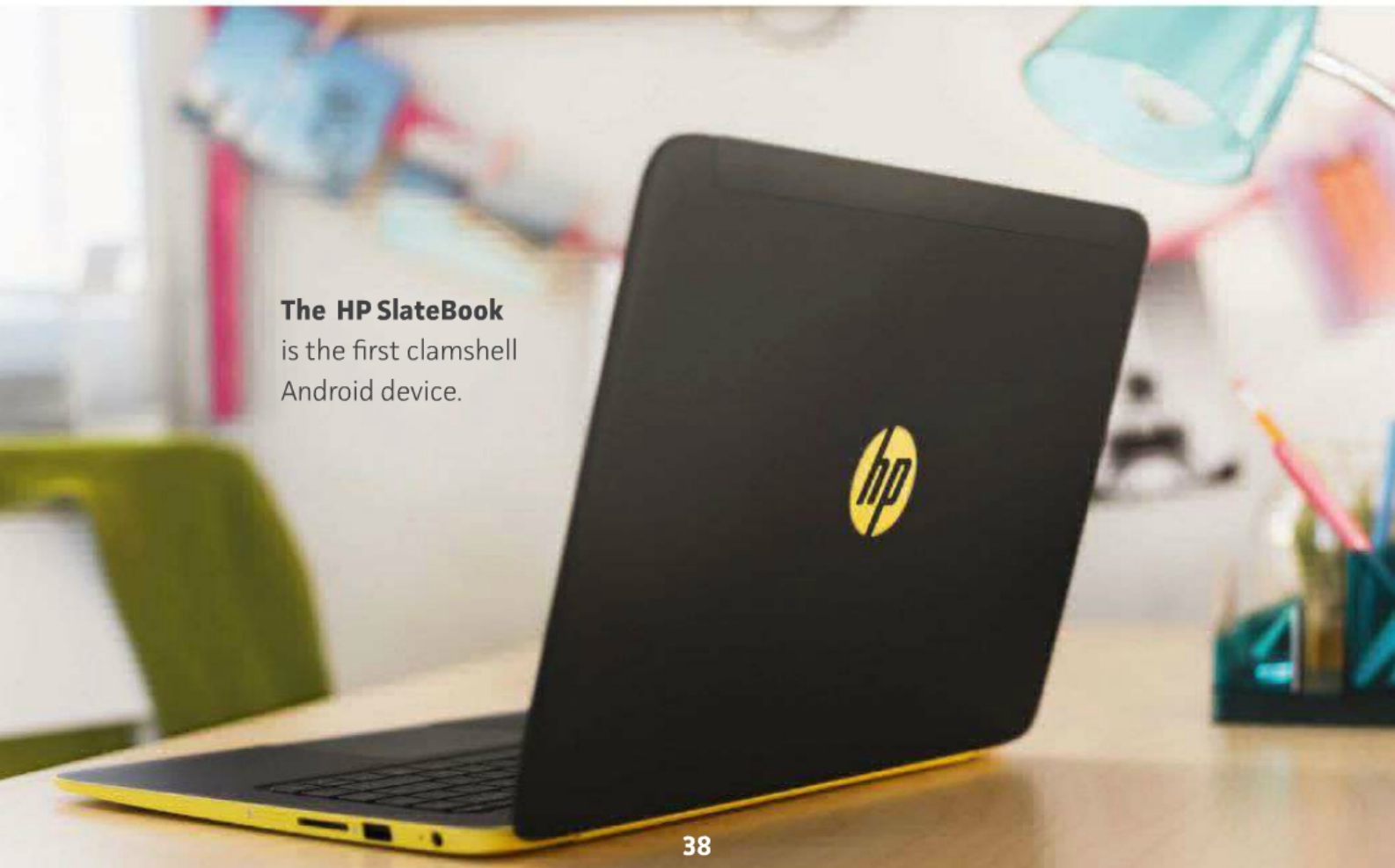
As for Dell desktops, the Inspiron 20 3000 all-in-one offers a totable picture-frame chassis with a 19.5-inch TN display. Touchscreen functionality is available only as an upgrade, and the screen resolution is a modest 1600 by 900 pixels, but this system is still a pretty good deal for a desktop PC based on a dual-core Intel Celeron N2830 processor. Configured with the low-cost Windows 8.1 with Bing, the all-in-one will cost just $350 when it arrives July 1.

HP laptops flip or spin—and run Windows, Chrome, or Android

HP is embracing the 360-degree hinge for its portables, too. At Computex the company showed its entry-level Pavilion x360 (which debuted at Mobile World Congress in Barcelona, Spain, earlier this year) along with a fancier version bearing the Envy label.

The Pavilion x360 offers a 13.3-inch touch display and your choice of a graphics-oriented AMD A6, A8, or A10 CPU, or a more battery-efficient Intel Core i3 or Core i5 CPU. The AMD versions of the Pavilion x360 will each cost $630 when they become available on July 9; the Intel-based models will each cost $600 upon their July 20 release.

The Envy x360 boasts a 15.6-inch display and an Intel Core i3, i5, or i7 processor. The configuration will have up to 8GB of RAM and as much as 1TB of storage, including a hybrid option. HP has not yet specified a ship date, but the price will be $680.



The HP SlateBook is the first clamshell Android device.

HP's showing also included the Split x2 hybrid, which now has a fanless design; on top of that, the hard drive has moved from the keyboard side to the tablet side so that users won't be separated from their data regardless of the device's mode. The Split x2 will be available July 16 starting at $600.

In addition, Computex saw the debut of HP's SlateBook, the first-ever Android clamshell device. The 14-inch Full HD touchscreen product carries an Nvidia Tegra 4 chip, and the system contains up to 2GB of RAM and as much as 64GB of storage. It will ship August 6 at a starting price of $429.

Finally, HP reskinned its Chromebook 11, ditching the glossy black and white exteriors of last year in favor of softer, more colorful hues akin to those of the Chromebook 14.

Intel unveils Devil's Canyon



Overclockers, rejoice! Intel has cooked up a couple of brand-new Haswell-class desktop processors. Code-named Devil's Canyon, the Core i7-4790K and Core i5-4690K can run at high base clock frequencies—4GHz for the former and 3.5GHz for the latter (with a turbo frequency up to 3.9GHz). Both CPUs have unlocked clock multipliers, so you can push the chips' operating frequencies even higher.

The CPUs use a new thermal paste, called NGPTIM (Next-Generation Polymer Thermal Interface Material), that works with existing cooling setups. The factory applies the material to the heat spreader housing the processor. When the system builder clamps a heatsink and fan (in an air-cooled system) or a water block (in a liquid-cooling system) to the CPU, the grease extends over the top of the chip's heat spreader and helps to transfer heat from the chip package to the heatsink or water block for dissipation.

The new processors will plug into existing motherboards with LGA 1150 sockets and Intel's Z87 or 9 Series chipsets.

Dropbox and you: A future where apps drive cloud storage

New approach hooks you into paid services.

BY JARED NEWMAN



PHOTOGRAPH BY MICHAEL HOMNICK



All those photos you see in Carousel get stored and shared through Dropbox.

FOR COMPANIES IN the cloud storage business, standing out from the pack isn't getting any easier, as many competing services are racing to the bottom with both free and paid offerings.

That competitive pressure explains why some providers, such as Dropbox and Box, are diversifying. Recently, for instance, Dropbox announced new apps and services such as Carousel (go.pcworld.com/carousel) and Mailbox for Android (go.pcworld.com/mailboxandroid). The hope is that users will consider more than just the price tag when picking a cloud storage service.

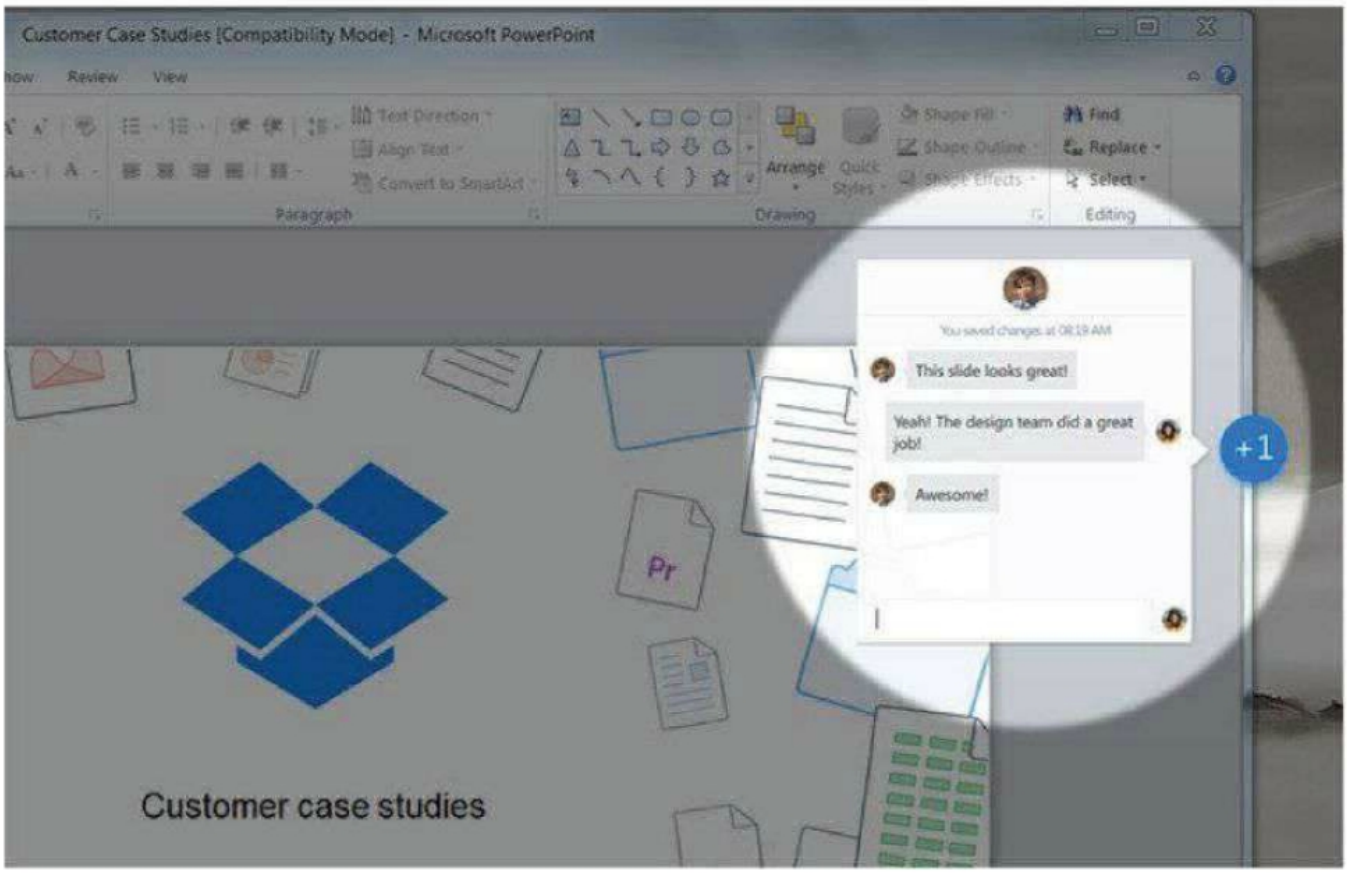
If freebies and low prices are all that matter, users have plenty of better options than Dropbox. Google Drive (drive.google.com), Box (box.com), Barracuda Networks' Copy (copy.com), and MediaFire (mediafire.com) all offer at least 10GB of free storage. And for users who upgrade to paid storage, the costs are shrinking. Google recently slashed its prices to undercut nearly every other competitor, prompting similar price cuts from MediaFire and iDrive (idrive.com).

The price cuts and expanded free storage leave companies like Dropbox with two options: further reduce prices or find another way to generate paying customers. Dropbox has chosen the latter option. With Mailbox and Carousel, the idea is to create apps that become part of users' day-to-day lives—apps so valuable that customers will gladly pay for extra storage if they need it.

Evolving strategy

This isn't an entirely new strategy for Dropbox. Last year, the company added developer tools that made it easier for apps to store files in the cloud. At the time, Dropbox proclaimed that it was trying to kill the hard drive, expecting that users would just store everything online instead.

Dropbox's own apps are a slight pivot on that strategy. Beyond simply adding cloud storage as an option to existing apps, Dropbox is creating its own apps where cloud storage is the defining



Project Harmony adds Dropbox-powered collaboration and communication features to Microsoft Office.

element. Carousel is the perfect example. The app is designed for sharing photos and videos privately with friends and family, away from the prying eyes of social networks. Where are those files stored? On Dropbox, of course.

Box CEO Aaron Levie foresaw years ago that the race to the bottom was coming.

Box's strategy is different, as the end goal is no longer about just selling more storage. A new tool called Box View converts documents and PDFs into HTML5 versions that can be embedded on the Web. Instead of charging for data, Box is basing its prices on the number of Box View uploads per month. Another pricing model for enterprises allows them to hook into Box's developer tools and pay for the privilege. Box CEO Aaron Levie foresaw years ago that the race to the bottom was coming, and decided to play a different game entirely (go.pcworld.com/levie).

For Dropbox, creating killer cloud-based applications will be the challenge. The company is going up against the likes of Microsoft and Google, who can tightly integrate cloud storage through their own operating systems and productivity suites. But with email, photo sharing, and Office collaboration features baked into its intriguing Project Harmony (go.pcworld.com/projectharmony), Dropbox has at least identified a couple of areas where it can compete and start to fight its way out of the downward pricing spiral.



ILLUSTRATION BY EDWARD MCGOWAN

HP report: 80 percent of app vulnerabilities are your fault

BY TONY BRADLEY

LET'S BE CLEAR: There is no such thing as an invulnerable application. Some have more critical vulnerabilities than others, as we discovered recently with the Heartbleed bug (go.pcworld.com/heartbug). A dedicated hacker can exploit any application. According to the HP 2013 Cyber Risk Report (go.pcworld.com/hp2013report), though, the application itself is not to blame for most vulnerabilities—users are, whether they're IT admins or end-users.

After compiling data from 2200 applications scanned by HP Fortify on Demand, HP reports that 80 percent of the vulnerabilities discovered were not the fault of the application code itself.

"Many vulnerabilities were related to server misconfiguration, improper file settings, sample content, outdated software versions, and other items related to insecure deployment," the report states.

HP also used Fortify on Demand to examine 180 iOS and Android apps, and found that nearly half leave data and personal information at risk. The iOS and Android platforms have the necessary encryption capabilities, but if app developers don't integrate them into the apps properly, the encryption can't protect the data on the device.

Weak link

I have made the same point in the past regarding security and privacy on social networks like Facebook. People tend to have a negative perception of privacy on social networks, but Facebook, Google, Twitter, and others provide ample security controls and put the power in the users' hands, but most users never take the time to review and configure the privacy available to them.

This report shows that the user is the weakest link in the security chain (go.pcworld.com/weaklink)—even when that user is the IT admin who configures the servers. The most secure operating system or application can be undermined when a user sets it up incorrectly, exposing it to risk.

Facebook, Google, Twitter, and other social networks provide ample security controls.

The HP 2013 Cyber Risk Report also delivers some good news. It suggests that secure development practices are having an impact: The total number of publicly disclosed vulnerabilities in 2013 was flat compared to 2012, and the number of high-severity vulnerabilities declined for the fourth consecutive year.

HP points out that the attack surface available for compromise is broader. Between BYOD (bring your own device), the mobile revolution, and the Internet of Things, attackers have a lot more options available than simply targeting a server or desktop PC. According to the report, addressing the issue of malicious apps on mobile devices is a challenge because there isn't an agreed upon definition of what qualifies as mobile malware.



Sony warns of Vaio Fit 11A hybrid's fire risk

BY IAN PAUL

SONY IS GETTING out of the PC business soon, but there's still time for one last product glitch.

If you are one of the 500 or so people in the U.S. using the Sony Vaio Fit 11A, you'll want to stop using that PC immediately. The Japan-based electronics maker's announcement said the Vaio convertible laptop was at risk of overheating and catching fire due to a faulty battery:

> *Please immediately discontinue use, shut down and unplug the PC. We are currently identifying affected PCs by serial numbers and developing a program to repair or replace the affected PCs at no charge, or to refund the purchase price for the affected PCs.*

The Fit 11A is one of Sony's newest laptops—it went on sale just last February. Sony sold around 26,000 of the laptops worldwide before halting sales, according to The Wall Street Journal, which first reported



Sony's Vaio Fit 11A has a faulty battery that can overheat and catch fire.

the fire risk news. Most of those sales occurred in Asia, Europe, and Latin America, with the United States accounting for only a sliver of the sales.

History of battery defects

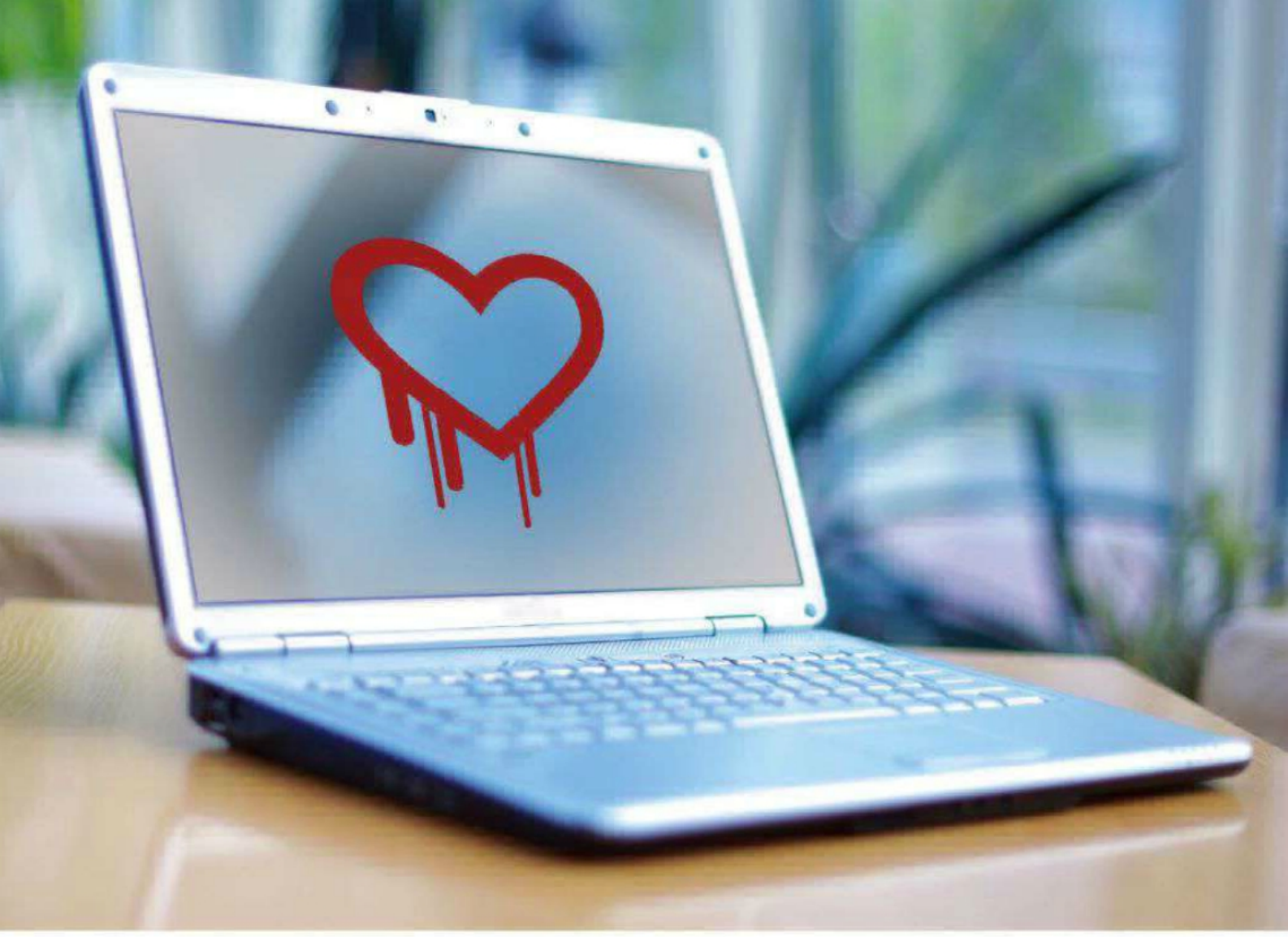
So far, three instances have been reported of batteries causing burns.

Sony issued a security alert on its United Kingdom website for the Fit 11A "For your safety, if you are in possession of one of the PCs listed above, please immediately turn off your computer, disconnect it from its AC adapter and discontinue use," Sony advises in its U.K. support note (go.pcworld.com/fit11a). Soon after that it issued a similar alert for U.S. customers (go.pcworld.com/sonyusalert).

The Vaio Fit 11A will most likely be Sony's last product warning for its PCs. In February, Sony announced it would sell off its PC business to a group of investors who plan to focus on selling Vaio devices in Japan.

Sony's Fit 11A problem follows previous defective-battery issues that arose in 2010, as well as in 2006 and 2008. And in March, Lenovo had to recall 34,500 batteries sold in the United States due to overheating (go.pcworld.com/thinkpadrecall).

So far, Sony is not referring to the Fit 11A issue as a recall, but the company has set up a program to replace or repair laptops for affected customers (go.pcworld.com/sonyprogram).



PHOTOGRAPH BY EDHAR/SHUTTERSTOCK.COM

Tech giants fund OpenSSL in response to Heartbleed

BY JARED NEWMAN

OPENSSL IS GETTING funding to hire two full-time developers and to conduct a security audit in an attempt to prevent another devastating bug like Heartbleed (go.pcworld.com/heartbleed).

The money is coming from the Core Infrastructure Initiative (CII), a group of tech companies that joined forces in April in response to Heartbleed. At the time, CII said that each company would contribute at least $100,000 per year to crucial open-source projects over at least a three-year span, but it didn't say how it would distribute the funds.

The group announced that OpenSSL will receive enough money to hire two full-time developers. The Open Crypto Audit Project will receive funds for a security audit of OpenSSL.

Variety of open-source projects to benefit

Money is also going to OpenSSH, a set of programs that mainly allow for secure remote logins to Unix-based systems, as well as to the Network Time Protocol project, which synchronizes the timing of networked computers. The Linux Foundation will be in charge of distributing the funds.

Many websites and applications rely on OpenSSL to keep communications secure over the Internet. But since 2011, an undetected flaw in the code had theoretically allowed attackers to eavesdrop on these communications.

Many sites and apps rely on OpenSSL to keep communications secure over the Internet.

When researchers disclosed the bug in April, giving it the nickname Heartbleed, the news triggered a mad scramble by Web developers to make their sites secure again. It also exposed how ill equipped OpenSSL was to stamp out bugs. At the time, the group had just one full-time developer, with other developers contributing work on a contract basis, in their spare time.

Although CII didn't specify how much money each open-source project would get, in total the group will contribute at least $5.4 million over three years, according to Ars Technica (go.pcworld.com/ciiarstech). That's up from a previously reported figure of $3.6 million, as more tech companies have joined the group recently.

The current membership includes Adobe, Amazon Web Services, Bloomberg, Cisco, Dell, Facebook, Fujitsu, Google, HP, Huawei, IBM, Intel, Microsoft, NetApp, Rackspace, Salesforce.com and VMware.

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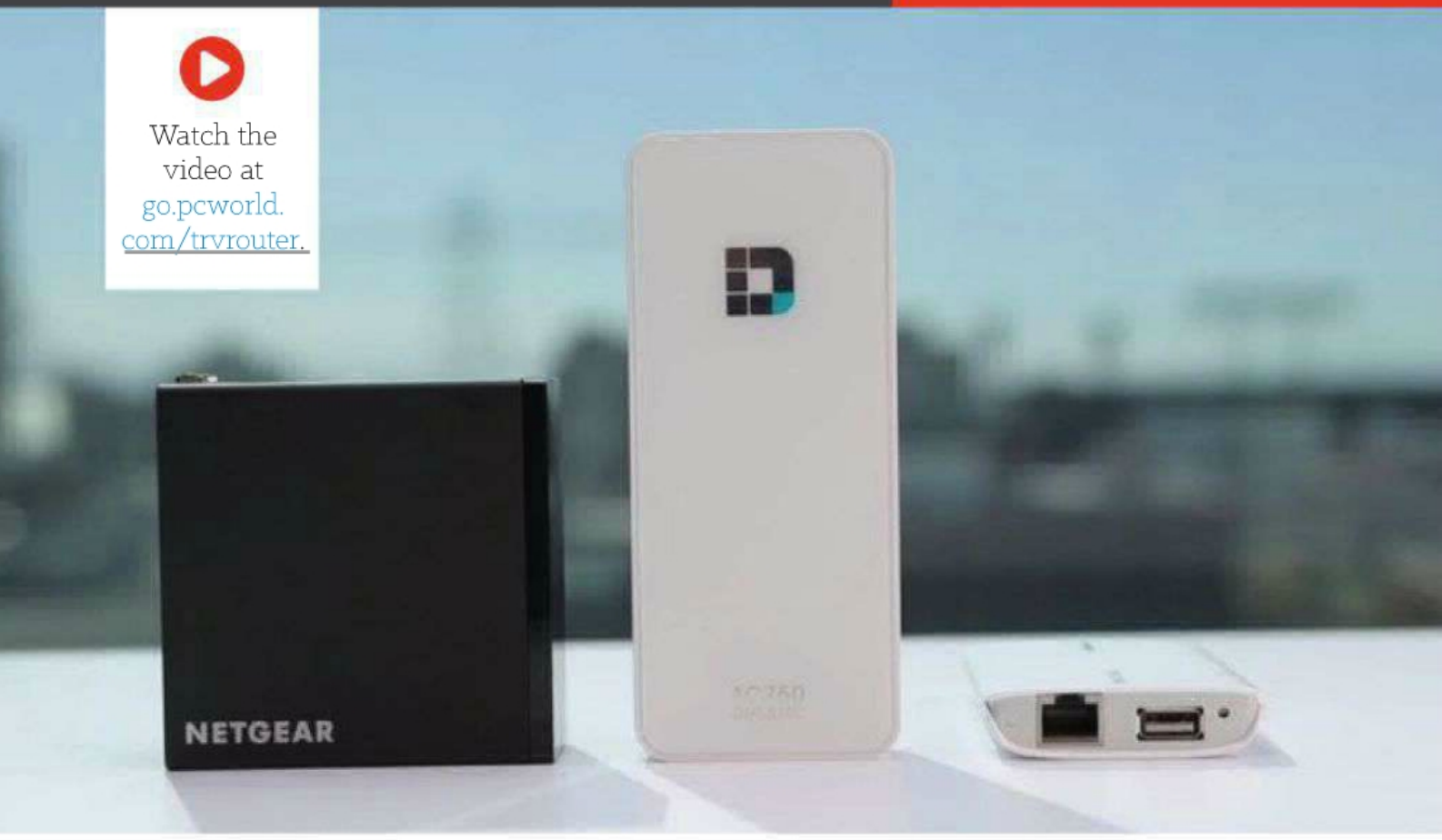
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Tested: 6 new travel routers

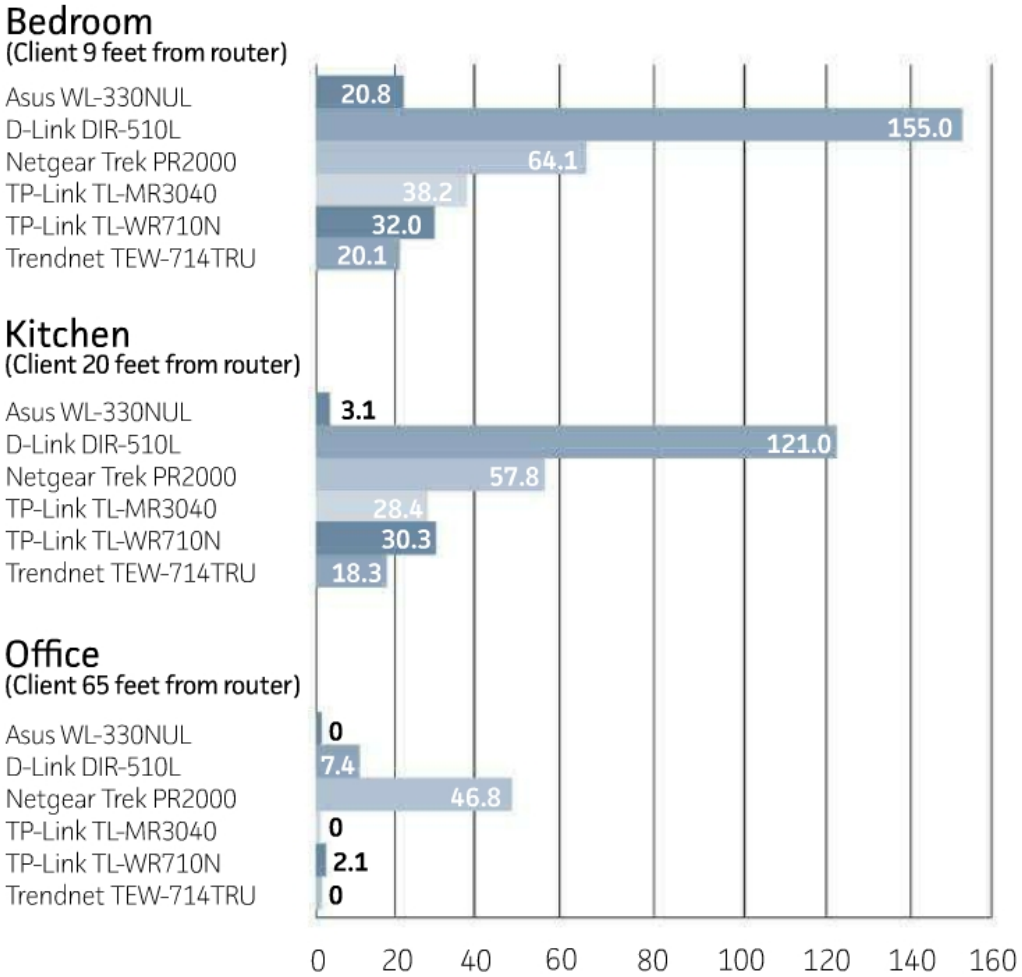
With a travel router, you can deploy a secure Wi-Fi network almost anywhere. Here are our picks. **BY MICHAEL BROWN**

IF YOU NEED Internet access while you're away from home or the office, carry a travel router in your bag. Use a travel router to connect to a Wi-Fi hotspot or to a facility's broadband service, and it will create a private, secure, wireless network with a robust firewall. You'll be able to use that service with your laptop, smartphone, or tablet, and you'll be able to share it with your travel companions but pay just one fee. Many such routers have USB ports that support portable hard drives, so you can share files or stream media over your network, too.

I tested six routers in my 2800-square-foot, single-story home, with the client in my bedroom (9 feet from the router, in the same room), kitchen (20 feet, separated by one insulated wall), and home office (65 feet, several walls). My client was an AVADirect laptop with an Intel Centrino Ultimate-N 6300 Wi-Fi adapter. To test the one router here that supports 802.11ac, D-Link's DIR-510L, I used an Asus USB-AC56 802.11ac Wi-Fi USB adapter.

Travel router performance

TCP throughput, 2.4GHz 802.11n



IN MEGABITS PER SECOND. LONGER BARS INDICATE HIGHER PERFORMANCE.

In our tests of 2.4GHz 802.11n throughput, D-Link's DIR-510L outpaced the pack at close range and medium range. Netgear's Trek excelled at long range.



D-Link DIR-510L: Fast and flexible

★★★★☆ $100

D-Link's DIR-510L (go.pcworld.com/dlink510), aka the Wi-Fi AC750, is the first travel router to support the 802.11ac standard. The "AC750" label, in fact, is the wireless industry's way of stating that a router supports two 150-megabits-per-second spatial streams on 802.11n and one 433-mbps spatial stream on 802.11ac. (Never mind that 150 plus 150 plus 433 totals only 733.)

Fuzzy math aside, the DIR-510L is a marvelous device. It can run on the provided AC adapter or on its internal 4000-mAh battery. It has three USB ports, so it can share files stored on a USB hard drive and use AC power at the same time. In charging mode the USB port delivers up to 1 amp of power to an attached device.

The DIR-510L can operate on the 2.4GHz frequency band in

802.11b/g/n mode, or on the 5GHz band in 802.11a or 802.11ac mode. It has only one ethernet port, but it can work as a wireless router on a wired broadband connection, or as a wireless hotspot for a wireless broadband connection. Alternatively, you can share a 3G, 4G, or LTE wireless broadband connection with a wireless USB adapter and your cellular service.

The unit's WPS (Wi-Fi Protected Setup) button makes connecting clients especially easy. (The DIR-510L doesn't come with preset security, however, so be sure to set that up.) It also supports guest networks.

By a wide margin, the DIR-510L was the fastest travel router we tested with a Windows client.

By a wide margin, the DIR-510L was the fastest travel router I tested with my Windows client. With the client in the bedroom (9 feet away) and in the kitchen (20 feet away), this router delivered twice as much throughput on the 2.4GHz band as the second-best model, the Netgear Trek, did. Performance was much weaker when I moved the client to my home office (65 feet away), but working at such a long range is an unlikely scenario with a travel router anyway. Still, if you anticipate needing to support colleagues in adjacent hotel rooms, Netgear's Trek might be a better choice.

The DIR-510L has an onboard DLNA media server for streaming music, photos, and video from an attached USB hard drive. D-Link's SharePort app for Android and iOS supports most of the typical file formats, with the unfortunate exception of FLAC audio files. On a PC, you can use D-Link's SharePort Web Access to view directories of files on an attached drive.



Netgear Trek PR2000: Excellent range

★★★½☆ $50

Netgear's Trek PR2000 (go.pcworld.com/netgeartrek) is well designed and largely self-contained. Just swing its blades down and plug it into a socket. If you want better range than what you'll get from keeping it near the floor, you can plug a USB AC adapter into its Micro-USB port (you'll need to provide your own), or you can connect an external battery (again, your own) to the port instead.

The Trek supports 802.11b/g/n only on the 2.4GHz frequency band; but with two spatial streams in 802.11n mode, it delivers a maximum throughput of 300 megabits per second. That capability and an articulated antenna helped the Trek deliver very high throughput of 46.8 mbps when the client was 65 feet away in my

home office. Just two of the other routers I tested reached the client at that location, and they achieved only single-digit throughput.

The Trek delivered very high throughput when the client was 65 feet away in my home office.

With the client located in the same room as the Trek and 9 feet away, TCP throughput reached 64 mbps—less than half the speed I saw from the D-Link DIR-510L, but twice the results from TP-Link's TL-MR3040. When the client was positioned in the kitchen, 20 feet away, the Trek again had half the speed of the DIR-510L and twice that of the TL-MR3040.

This model provides two ethernet ports, so you can attach one of them to a DSL/cable modem or to the ethernet connection in your hotel room, and support one wired client with the other (or plug in a switch for multiple hardwired clients). The Trek does not support a guest network.

You can also connect the Trek to a Wi-Fi hotspot. (A WPS button would be a welcome addition in such a scenario.) When you're at home, you can configure the Trek as a wireless range extender or as a wireless bridge.

The Trek has one USB 2.0 Type A port that you can use to share a portable hard drive over your network. It also has an FTP server for sharing large files over the network or over the Internet.

You can also use that USB port to charge a smartphone or media player when the router is plugged into power. The Trek does not support USB cellular modems, however.

The Netgear Trek supports UPnP, but it lacks a DLNA-certified media server. If media streaming is a critical feature for you, consider D-Link's DIR-510L.



TP-Link TL-MR3040: Made for traveling light

★★★½☆ $50

One of the smallest, lightest travel routers I've tested, TP-Link's TL-MR3040 (go.pcworld.com/tplink3040) will fit easily in a shirt pocket. The device can operate on its included AC power adapter or on its internal rechargeable 2000-mAh battery.

The TL-MR3040 is compatible only with the 2.4GHz 802.11b/g/n standards, and it supports only one 150-mbps spatial stream when operating in 802.11n mode.

It provides a USB 2.0 Type A port whose sole purpose is to host a 3G cellular modem (certain models based on hardware version 2.0 can also support 4G and LTE modems). TP-Link made no provision for sharing files on an attached USB portable hard drive, so it's not

surprising that this router also omits a DLNA media server.

The router has a Mini-USB port for running on AC power and charging the battery. Its single ethernet jack can function as a WAN or LAN port.

This TP-Link model can operate in any of four modes. It can work as a mobile router (using a 3G adapter and your subscription service), or as a WISP (wireless Internet service provider) client. In these two modes, its ethernet port can support a single hardwired client (or many hardwired clients via a switch). The TL-MR3040 can also serve as a wireless access point hardwired to a network, or as a wireless router hardwired to a DSL or cable modem.

In my tests with the client in the same room as the TL-MR3040 and 9 feet away, this router placed a distant third with throughput of 38.2 megabits per second. When I moved the client to the kitchen, 20 feet away, throughput dropped modestly to 28.4 mbps. But the router couldn't reach the client at all when the laptop was in my home office.

TP-Link's TL-MR3040 can operate in any of four modes, serving as a mobile router and more.

The TL-MR3040 supports security up to WPA/WPA2 Enterprise with a RADIUS server, but it doesn't have a WPS button or even WPS support in software. It also lacks a guest network. This router has a few limitations. Portability, however, isn't one of them.



TP-Link TL-WR710N: Full of features

★★★☆☆ $40

Similar to Netgear's Trek, the TP-Link TL-WR710N (go.pcworld.com/tplink710) plugs into an electrical socket, provides a USB 2.0 Type A port for sharing storage, and offers two ethernet ports. Unlike the Trek, however, it supports only one 150-megabits-per-second spatial stream in 802.11n mode (on the 2.4GHz frequency band), and it doesn't have a Micro-USB port.

The TL-WR710N can operate in any of four modes: wireless router mode, wireless access point mode (in this case the second LAN port can support one hardwired client, or more if you attach an ethernet switch), WISP mode, or repeater mode.

This router comes with preconfigured security. Like its TP-Link

sibling, the TL-MR3040, it supports up to WPA/WPA2 security with a RADIUS server. This model lacks a WPS button, but it supports the feature in software.

You can share files stored on a USB hard drive, and TP-Link provides a media server (not DLNA certified) for streaming music, video, and photos. You can also establish user accounts for file sharing, to restrict access and to assign read/write permissions.

When I measured TCP throughput, the TL-WR710N tied the TL-MR3040 for third place, but this model had slightly better range. When the client was in the same room as the router, separated by 9 feet, I saw TCP throughput of 32 mbps. When I moved the client to the kitchen, 20 feet away, this router's speed dropped only a bit, to 30.3 mbps.

In my home office, 65 feet away—where TP-Link's other router couldn't reach—the TL-WR710N managed to squeeze out throughput of 2.1 mbps. That's adequate for surfing the Web, as long as you don't try to watch videos or listen to music. You definitely wouldn't want to transfer a lot of files over that distance. Still, three of the other routers I tested for this roundup couldn't service the client in that room at all.

The TL-WR710N tied TP-Link's other model in speed, but this router had slightly better range.

TP-Link's travel routers and the Netgear Trek PR2000 have similar street prices. The TP-Link user interface exposes more functions than the Netgear one does, but the Netgear Trek delivers much higher performance in both TCP throughput and file transfers.



Trendnet TEW-714TRU: International traveler

★★½☆☆ $53

Equipped with three swappable plugs—one for use in the UK, one for the rest of Europe, and one for North America—Trendnet's TEW-714TRU (go.pcworld.com/trendnet714) is ready to work with all sorts of electrical outlets.

This fairly small router (think of a slightly oversize wall wart) plugs directly into an electrical outlet. It can operate as a wireless router (connected to a DSL/cable modem or a hardwired network), in WISP mode (connected to a Wi-Fi hotspot), or as a repeater.

The TEW-714TRU provides one ethernet port and two USB ports. One of them is a USB 2.0 Type A port for sharing files kept on a connected storage device. You'll find no media server here, though.

The second USB port serves only to charge a smartphone, tablet, or media player (it delivers from 1.1 to 2.1 amps of power). A button on the router lets you turn off its network function without disabling its USB charging function.

The TEW-714TRU offers USB ports for charging devices and sharing files from attached storage.

Like most of its rivals in this roundup, the TEW-714TRU supports 802.11b/g/n and delivers one 150-megabits-per-second spatial stream on the 2.4GHz band. The router comes preconfigured with a secure password. Its WPS button simplifies the process of adding clients, but you still need to know the admin login info to access its user interface.

In my performance tests, the TEW-714TRU fell far behind the pack. At close range, with the client 9 feet from the router and in the same room, it mustered TCP throughput of just 20.1 mbps. It finished next to last when the client was in the kitchen, 20 feet away, producing TCP throughput of 18.3 mbps. It couldn't sustain a connection at all when I moved the client to my home office, 65 feet from the router. And in file transfers, it was more than twice as slow as the other models I tested that support attached USB storage.

The TEW-714TRU's power tips will benefit frequent world travelers, and its features for charging mobile devices and sharing files from an attached USB storage device are attractive. But its Wi-Fi and file-transfer performance leave much to be desired.



Asus WL-330NUL: Small but not speedy

★★☆☆☆ $50

The minimal size and weight of the tiny Asus WL-330NUL (go.pcworld.com/asus330) will tempt anyone who regularly travels light. My advice: Resist that temptation.

A USB 2.0 connector sits on a stubby cable at one end of the device, and an RJ-45 ethernet port resides on the other. The 802.11b/g/n chipset supports one 150-megabits-per-second spatial stream on the 2.4GHz frequency band.

If you provide a USB power adapter, the WL-330NUL can perform as a wireless router when connected to a DSL or cable modem or to another hardwired Internet connection, or as a wireless router when

connected to a WISP. While drawing power from a laptop, it can act as a wired or wireless USB ethernet adapter.

While drawing power from a laptop, the WL-330NUL can act as a USB ethernet adapter.

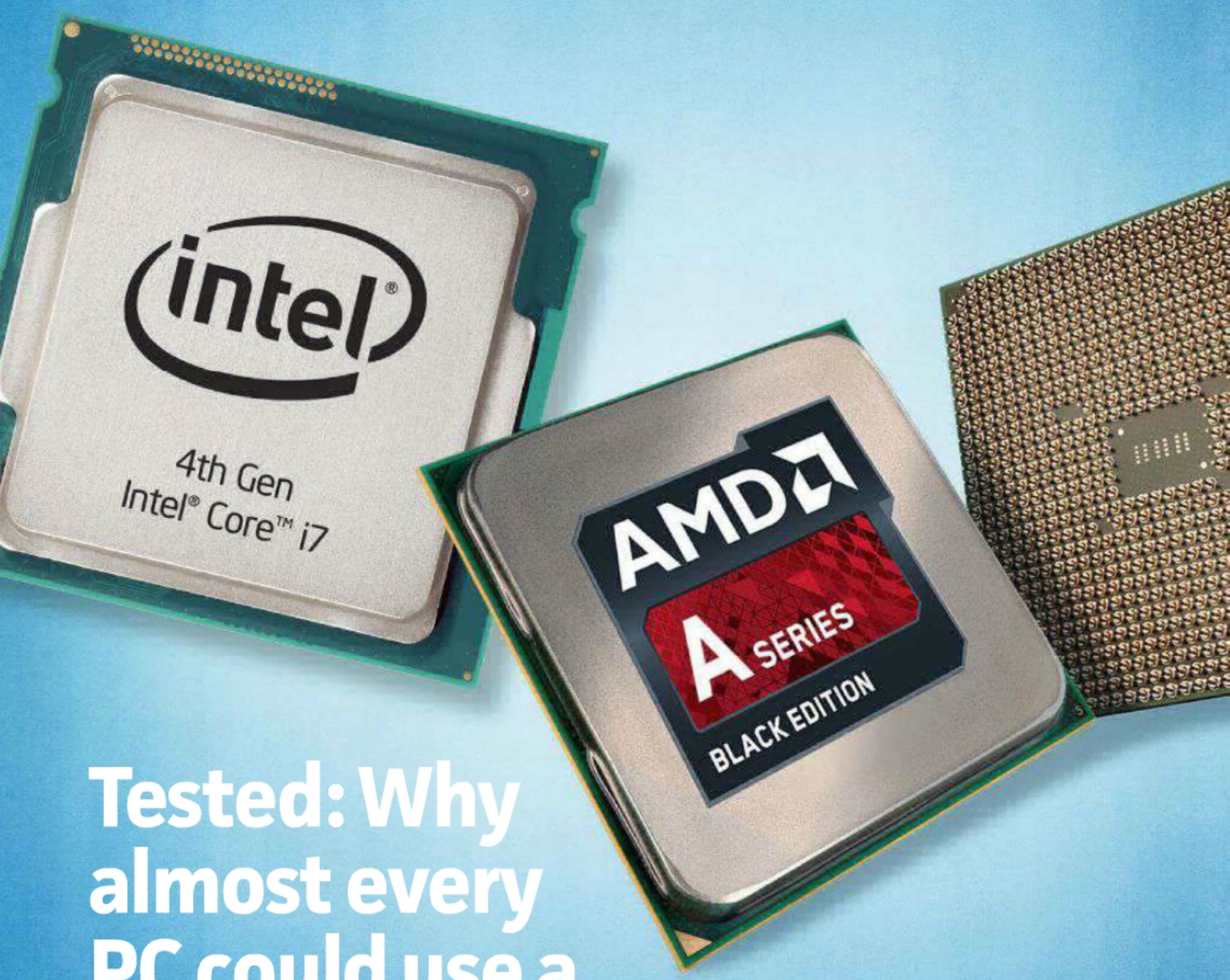
In my throughput tests, this router landed near the bottom of the pile. With the client in the same room, 9 feet from the router, the WL-330NUL managed throughput of just 20.8 mbps. When I moved the client to the kitchen, 20 feet away, speed dropped to a meager 3.1 mbps. The router couldn't reach the client in my home office, 65 feet away.

Asus's user manual instructs you to plug the WL-330NUL into a USB power source (I used the one that came with my phone), wait for the router to boot up, select its SSID on the computer you want to connect, and then enter the preconfigured WPA2 passphrase printed on the side of the router.

I followed those directions, but the client repeatedly reported that the passphrase was not valid. Page two of the manual has a section titled "For Windows Users," which tells you to plug the router into a computer in order to install a utility. I did so, but I still had no luck connecting.

Finally I called Asus's PR department, who advised me to check within the utility to verify the router's default password. Lo and behold! The router was actually configured with a default password—"Test1234"—that differed from the one on the label. The WL-330NUL doesn't support WPS, but that's a good thing: If it did, any user who relied on that would have ended up using one of the most easily hacked network passwords imaginable.

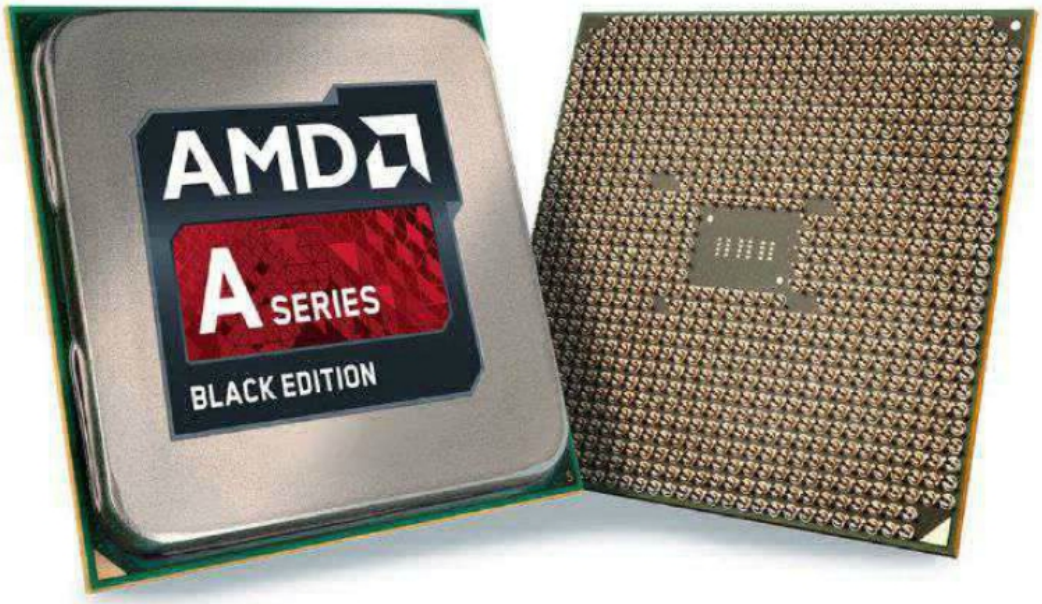
Should you decide that this router's miniature dimensions outweigh its shortcomings, make sure to change the passphrase to something more secure.



Tested: Why almost every PC could use a video card upgrade

BY MARCO CHIAPPETTA

TODAY, MOST OFF-THE-SHELF desktop rigs—and nearly all laptop PCs—rely entirely on the CPU for video and graphics processing. And yet the market for discrete graphics continues to thrive. If you aren't interested in playing AAA PC games, is a video card a worthwhile upgrade? Let's compare the performance of integrated and discrete graphics processors to find out.



AMD's Kaveri-series APUs deliver stronger integrated graphics than Intel's CPUs.

AMD and Intel have significantly improved the graphics technologies integrated into their CPUs. AMD's Kaveri-class Accelerated Processing Units (APUs) incorporate the same powerful Graphics Core Next (GCN) architecture that its best discrete Radeon-series graphic processors use.

Intel has likewise updated the features and capabilities of its HD-series graphics engines, which are integrated into its fourth-generation Core processors (code-named Haswell). They now deliver broader support of Microsoft's DirectX 11.1 API (an application program interface originally developed for Windows games), support multiple displays (as well as 4K models) with ease, and are compatible with many more games.

To gauge the difference that discrete graphics can make, we assembled two computers—one powered by an AMD A8-7800 (a Kaveri-class APU with an integrated Radeon R7-series graphics processor), and the other by an Intel Core i7-4670 (a Haswell-class CPU with an integrated Intel HD 4600 graphics processor). Then we ran a series of benchmarks with and without a discrete video card installed in each system. Here's what we found.

The argument for discrete graphics



AMD has the edge in integrated graphics, but Intel's Haswell-class CPUs beat AMD elsewhere.

Fans of discrete graphics usually tout performance as the primary benefit. Almost any video card will have a far more powerful GPU than comes integrated in a CPU—and the card will provide its GPU with a dedicated pool of high-speed memory. An integrated GPU, in contrast, must share both system memory and the data bus. With a discrete GPU, even after you crank up the visual quality settings on a game, the card will deliver much better frame rates than an integrated GPU can.

Discrete graphics cards have other benefits, too. With Nvidia's current-generation graphics cards, for example, users can take advantage of proprietary features such as ShadowPlay (go.pcworld.com/shadowplay) and PhysX (go.pcworld.com/physx). ShadowPlay uses the video-encoding engines built into Nvidia's GPUs to record and stream live gameplay videos in real time, with negligible impact on frame rates. It's a key feature for Nvidia's Shield (go.pcworld.com/shield) handheld gaming device.

PhysX, Nvidia's proprietary physics-simulation technology, can make the objects in games behave more as they would in the real world (cloth ripples and tears, liquids flow and splatter, buildings explode into small shards, and more). Not all games support PhysX, but it can have tremendous visual impact in ones that do.

Since AMD's and Nvidia's GPUs contain thousands of processors that can carry out multiple operations simultaneously, any application that benefits from such parallel processing—whether it be an image-editing program like Photoshop, data-encryption software, or a



Video cards based on Nvidia's GeForce GPUs support Nvidia's proprietary physics-simulation technology, PhysX, which lends considerable realism to games that take advantage of it.

distributed-computing project like Folding@Home (folding.stanford.edu) or Seti@Home (go.pcworld.com/seti)—will run faster with the assistance of a more powerful GPU.

Discrete GPUs can also accelerate crypto-currency mining to produce Bitcoins, Litecoins, and other virtual currencies. Miners have been gobbling up graphics cards based on AMD's latest GPUs because AMD's Radeon architecture performs the task more effectively than Intel's Core processors and Nvidia's GeForce technology. Intel's fastest Haswell-based CPU—the Core i7-4770K—is capable of processing about 93,000 hashes per second, but AMD's Radeon R9 290X can process about 880,000 hashes per second.

The argument against discrete graphics

Cost is the most obvious drawback of discrete graphics cards, as retail prices may range from $50 at the low end to $1000 and beyond at the high end (though you can buy a very speedy card for less than $400). AMD recently announced the world's fastest video card. The Radeon R9 295X2 (go.pcworld.com/radeonr9295x2), priced at $1500, features two of the company's fastest GPUs on a single card.

Meanwhile, with most current-generation processors, AMD and Intel supply free graphics, and the motherboards that support those CPUs have display outputs built right in. Only AMD's FX series and Intel's Ivy Bridge-E chips lack integrated GPUs.

A discrete graphics card also adds complexity to a system. For instance, your motherboard must have an available PCIe x16 slot to host the card. Though this isn't a concern for most DIY-ers, some off-the-shelf systems may lack such a slot, or the card may not fit inside the case, or the existing power supply may not support the card's electrical requirements—all because the PC manufacturer didn't take into account that the end user might want to make such an upgrade.

Installing a discrete graphics card in Intel-based systems can complicate the use of technologies such as Intel's Quick Sync video-encoding engine, too. Quick Sync is linked to Intel's integrated graphics core, and installing a discrete card might disable it. If you can't live without Quick Sync, you might be able to reenable the integrated GPU, but there's no elegant way of pulling that off.

Finally, adding a discrete video card will cause your PC to consume more electrical power and generate more heat, requiring either a



Nvidia's GeForce GTX Titan Z is priced at a cool $2999, but the vast majority of gamers buy cards in the $300 to $500 range. That's still a lot of lettuce.

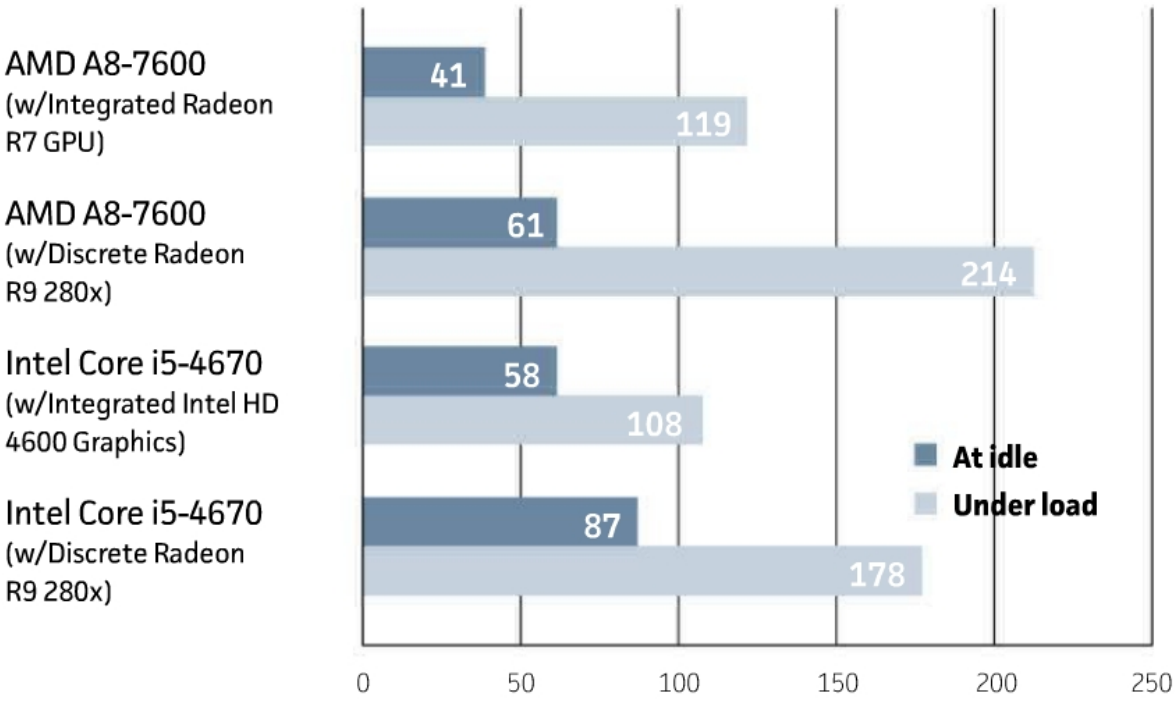
cooling fan (which adds a modicum of noise to your environment) or a passive cooling system (which increases the cost of the card).

Now for the numbers

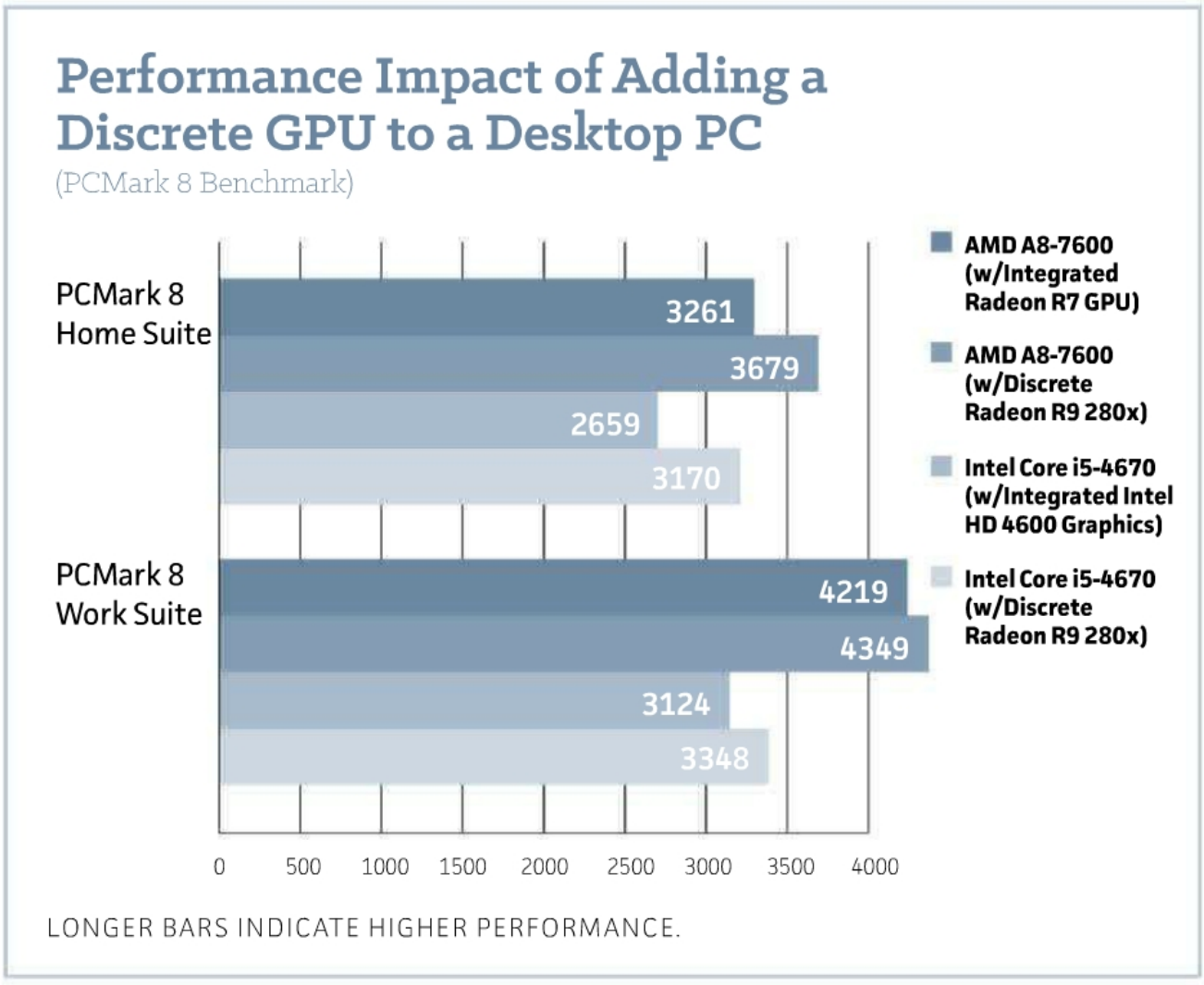
As noted earlier, we built one PC around an AMD A8-7600 APU with Radeon R7 series integrated graphics on an Asus A88X-Pro motherboard, and a second PC around an Intel Core i5-4670 processor with Intel HD 4600 integrated graphics on a Gigabyte Z87X-UD5 TH motherboard. Both systems carried 16GB of memory, a Samsung 840 Pro SSD for storage, and a 1000-watt Silverstone power supply. We installed the 64-bit version of Windows 8.1 Pro x64 on each system.

Impact on Power Consumption After Adding a Discrete GPU to a Desktop PC

(Watts consumed at idle and under load)



Power consumption is one drawback of adding a discrete graphics card to your PC.



Adding a discrete GPU to your PC will improve its performance with productivity apps as well as with games.

First we ran a series of benchmarks—some gaming-oriented, others focused on productivity and content creation—using the graphics processors integrated into the respective CPUs. Then we installed an XFX Radeon R9 280X video card n each system and reran all the benchmarks.

As the charts illustrate, working with a discrete graphics card improved the performance of both PCs almost across the board—not just with games. In PCMark 8, for instance, we ran the OpenGL-accelerated versions of the Home and Work suites. This API puts all of a PC's available computing resources—both its CPU and its GPU—to

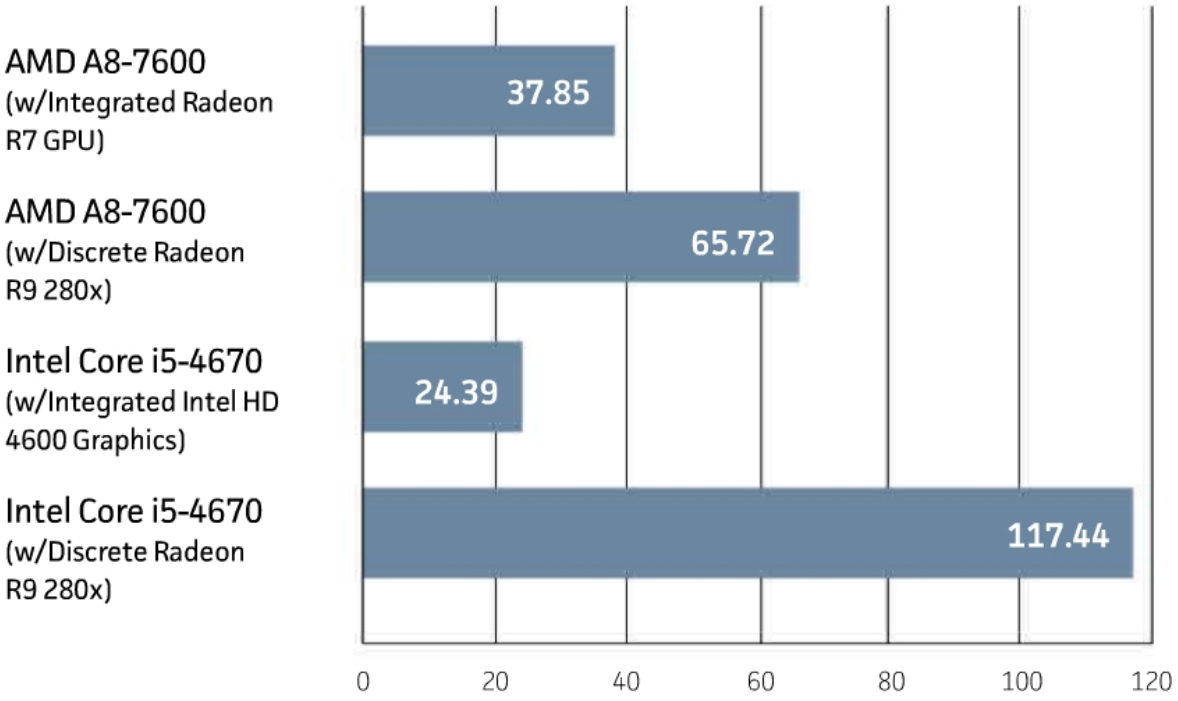
work. Adding a discrete GPU to the equation boosted the system's performance on this benchmark by between 3 percent and 19 percent.

Adding a GPU had little effect on the Cinebench multithreaded CPU benchmark scores, but it boosted the Intel-based system's performance with the Cinebench OpenGL benchmark by a staggering 79 percent, and it improved the AMD-based system's performance on this benchmark by 42 percent.

People often assume that casual gamers—folks who play Farmville, Angry Birds, and other simple games—will see no benefit from discrete graphics. But when we added a discrete GPU to each of our

Performance Impact of Adding a Discrete GPU to a Desktop PC

(Cinebench R15 OpenGL Benchmark)

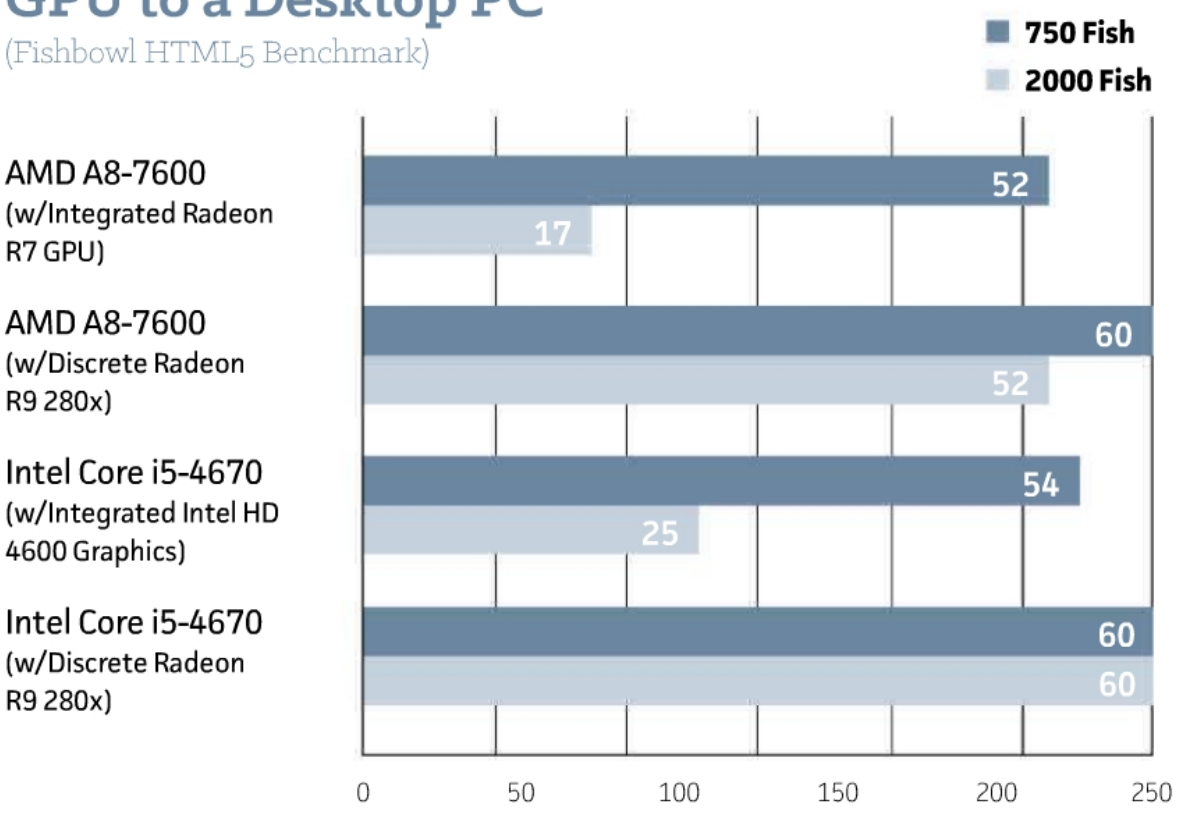


LONGERS BARS INDICATE HIGHER PERFORMANCE

You'll see big performance gains with a discrete video card when using apps that are programmed to tap the compute resources a GPU can deliver.

Performance Impact of Adding a Discrete GPU to a Desktop PC

(Fishbowl HTML5 Benchmark)



FRAMES PER SECOND. LONGER BARS INDICATE HIGHER PERFORMANCE, BUT TEST IS CAPPED AT 60 FPS

Casual games based on HTML5 benefit from running on a PC equipped with a discrete GPU.

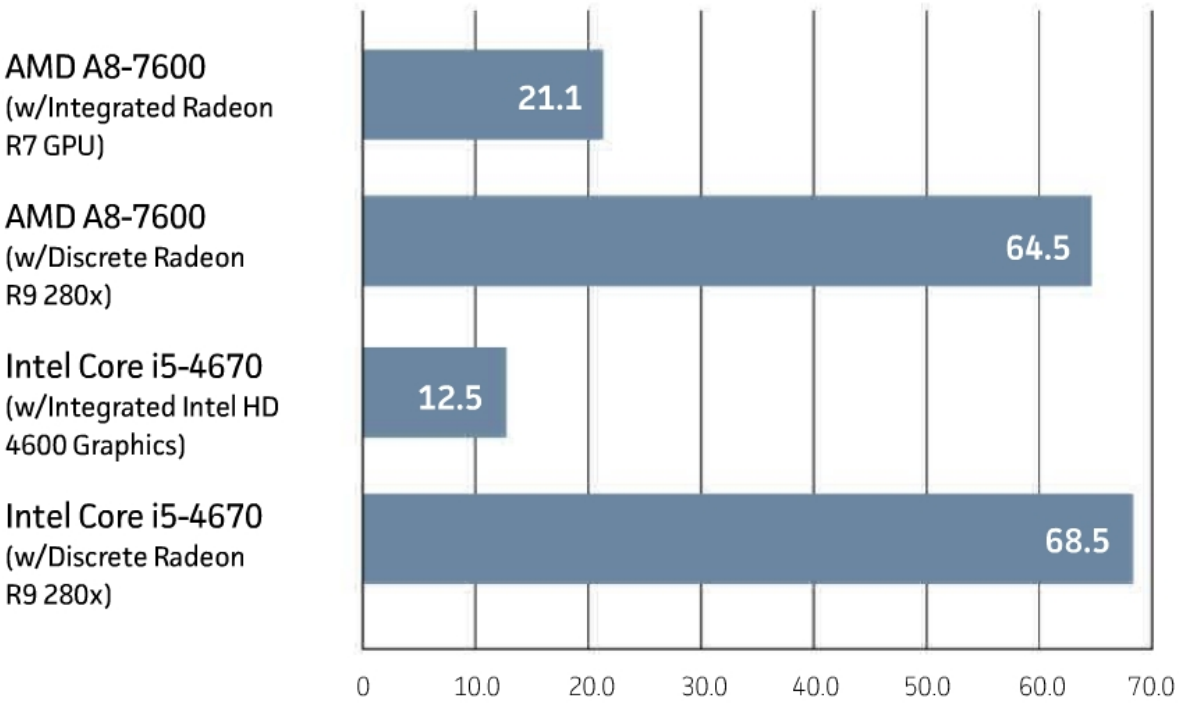
test systems, we saw significant performance gains with Microsoft's browser-based HTML5 benchmark, Fishbowl. This test is capped at 60 frames per second (the refresh rate of most monitors), and it reached that cap in three of the four tests we ran with the discrete graphics card installed. As casual games become more complex, so will their need for GPU horsepower.

Our test systems responded positively when running BioShock Infinite (at 1920 by 1080 pixels) and the synthetic gaming benchmark 3DMark Fire Strike through a discrete graphics card.

On the other hand, adding a discrete video card didn't significantly affect CPU utilization when we tried streaming YouTube videos

Performance Impact of Adding a Discrete GPU to a Desktop PC

(BioShock Infinite Benchmark, 1920 by 1080 pixels)



FRAMES PER SECOND. LONGERS BARS INDICATE HIGHER PERFORMANCE.

No surprise here. Adding a video card made BioShock (at 1920-by-1080-pixel resolution) run a lot faster.

(HTML5) and video files encoded with the h.264 codec and placed inside MKV containers.

Our test results suggest that nearly every desktop PC user can benefit from the addition of a discrete graphics processor. Video cards aren't just for gamers, although the benefits for gamers far outweigh those that mainstream users will see when working with their everyday applications.



The Aegis Padlock's keypad offers easy access to your data.

Aegis Padlock SSD: Small, fast, secure, and expensive

BY JON L. JACOBI

APRICORN'S AEGIS PADLOCK SSD (go.pcworld.com/plockssd) offers a number of advantages over rival secure storage devices. Available in capacities of 120GB, 240GB, and even 480GB, it offers more capacity than the typical secure thumb drive, yet it remains considerably smaller than the usual 2.5-inch portable solid-state drive. It also has a keypad that you can use to access your data, and the drive works with



The attached USB power cable is convenient, if short.

any device that can connect to USB mass storage, not just computers.

The only issue is price: The drive sells for $329, $499, and $799, respectively, for the capacities listed above. That's not a lot more than the cost of competing encrypted drives, but it's still a hefty amount of cash.

The Aegis Padlock measures 2.5 by 3.3 by 0.55 inches (width by depth by height), or about half the size of your average portable hard drive.

The two halves of its case are screwed together, but the screws are tamper-resistant and epoxied in place. The drive is certified Level 2 FIPS 140-2; that standard specifies only that any tampering must be rendered evident, not that the internals be wiped or destroyed in response.

You lock and unlock the Padlock SSD using a keypad atop the device. The drive ships locked, requiring the definition of an administrative PIN (multiple users are allowed). Subsequently you simply press the Unlock key and enter the PIN to access the drive. Holding the Unlock key simultaneously with various numbers allows you to perform administrative chores such as adding secondary users.

Apricorn Aegis Padlock SSD (240GB)

PROS:

- FIPS 140-2 Level 2 validated
- Good performance for an encrypted drive
- Especially portable

CONS:

- No battery
- Stubby USB cable

BOTTOM LINE:
The Padlock SSD offers more secure portable storage than a thumb drive can provide, and its keypad provides easy access.

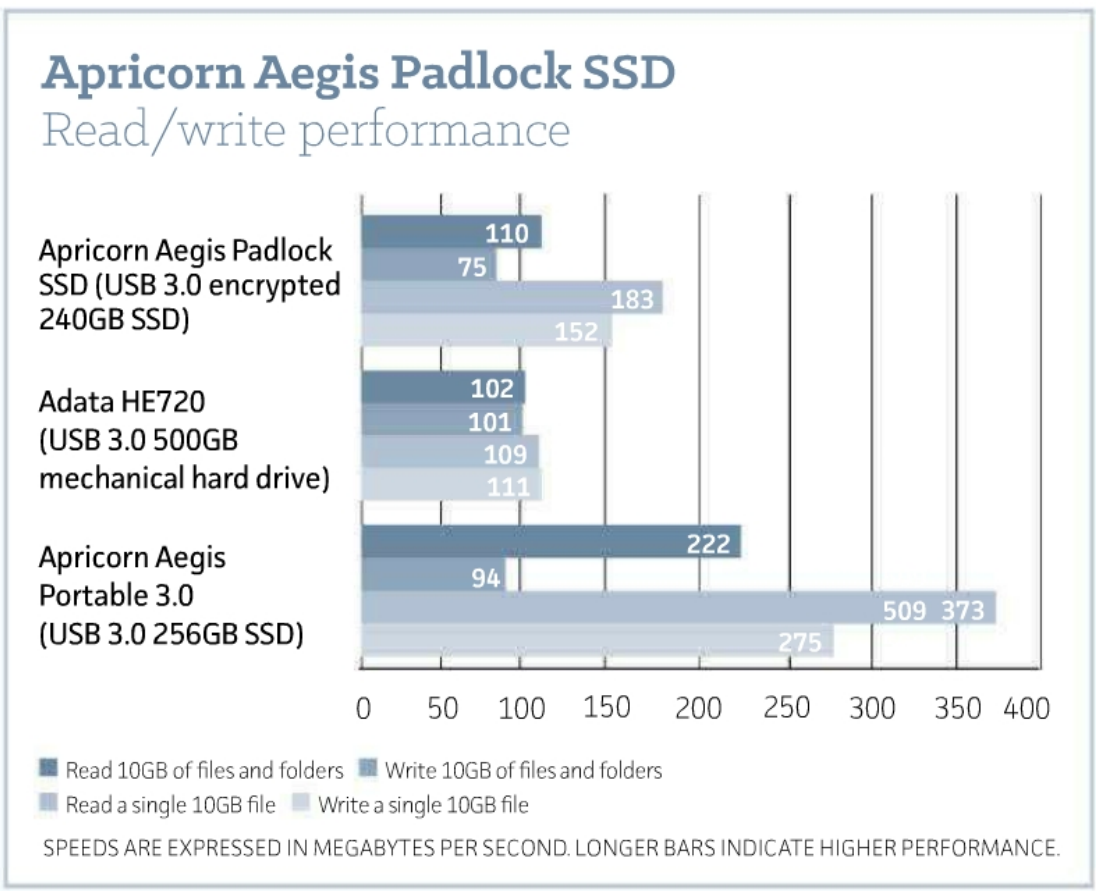
$499



My only gripe with the Aegis Padlock SSD is that it lacks a battery—it requires USB power, and its stubby cable renders it slightly ungainly to unlock if, for instance, it's hanging off the side of your display.

You won't get state-of-the-art performance with any secure drive, as encrypting data during writes and decrypting it during reads takes time. But being an SSD with a USB 3.0 interface, the Padlock SSD performed quite well, reading our 10GB mix of files and folders at 109 megabytes per second and writing them at 75 MBps. Speeds jumped to 182 MBps (read) and 152 MBps (write) with a single large 10GB file. Crystal DiskMark ranked the drive slightly faster than that.

The Aegis Padlock SSD offers a unique blend of security, capacity, small size, performance, and ease of use. However, at more than twice the cost of a secure mechanical hard drive, such as Apricorn's own Padlock Fortress, it isn't an impulse buy.



The Aegis Padlock SSD secures your data using 256-bit AES-EXT encryption, so it's not as fast as an unencrypted drive.



Watch the video at go.pcworld.com/portege

The best detachable laptop yet: Toshiba's Portege Z10t

BY MICHAEL BROWN

I'M NOT SOLD ON two-in-one hybrids. A laptop that becomes a tablet when detached from its keyboard? Who needs that? But if you're smitten by the idea, the Toshiba Portege Z10t (go.pcworld.com/toshibaz10t) is the best execution of it that I've seen. It's not too big, it's not too heavy, and it packs some serious computational horsepower.

Impressive specs

The test unit Toshiba sent us for review (the top-shelf Portege Z10t-A2111) carries a dual-core Intel Core i7-4610Y processor (with vPro support), 8GB of DDR3/1600 memory, and a 256GB solid-state drive. It came with Windows 8.1 Pro, which adds management features that IT departments will appreciate.

The system weighs a bit more than three pounds, with two-thirds of

its mass residing in its somewhat thick display. Most of the Z10t's ports--one USB 3.0, one Micro HDMI, and an SD card reader--are located in the display, so when you detach it from its keyboard dock, it becomes a full-featured tablet that doesn't need many added-cost adapters.

The 11.6-inch IPS touchscreen display has a resolution of 1920 by 1080 pixels, which is adequate for an Ultrabook but a far cry from, say, the 2048 by 1536 resolution of Apple's iPad with Retina display. Then again, the Z10t's processor and storage specs crush those of Apple's tablet, and the Z10t boasts an active Wacom digitizer that recognizes 1024 levels of pressure. A pen holder is integrated into a corner of the tablet.



The Portege Z10t has a Wacom active digitizer that can recognize 1024 levels of pressure.

I also like the display's Corning Concore Glass matte finish. A mechanical button on one side of the border toggles between the Windows Start screen and the desktop.

Slim keyboard

The aluminum keyboard is mostly wafer-thin. The docking cradle has a somewhat limited range of backward movement, probably because the display's weight would topple the combo over if you tilted it too far. You can also mount the display backward in presentation

Toshiba Portege Z10t-A2111

PROS:

- Active digitizer, with pen
- Strong benchmark performance
- Lightweight

CONS:

- Display is thick for a tablet
- Resolution is only 1920 by 1080

BOTTOM LINE:
If you really want a hybrid with a detachable screen, Toshiba's Portege Z10t is the best execution of that idea for now.

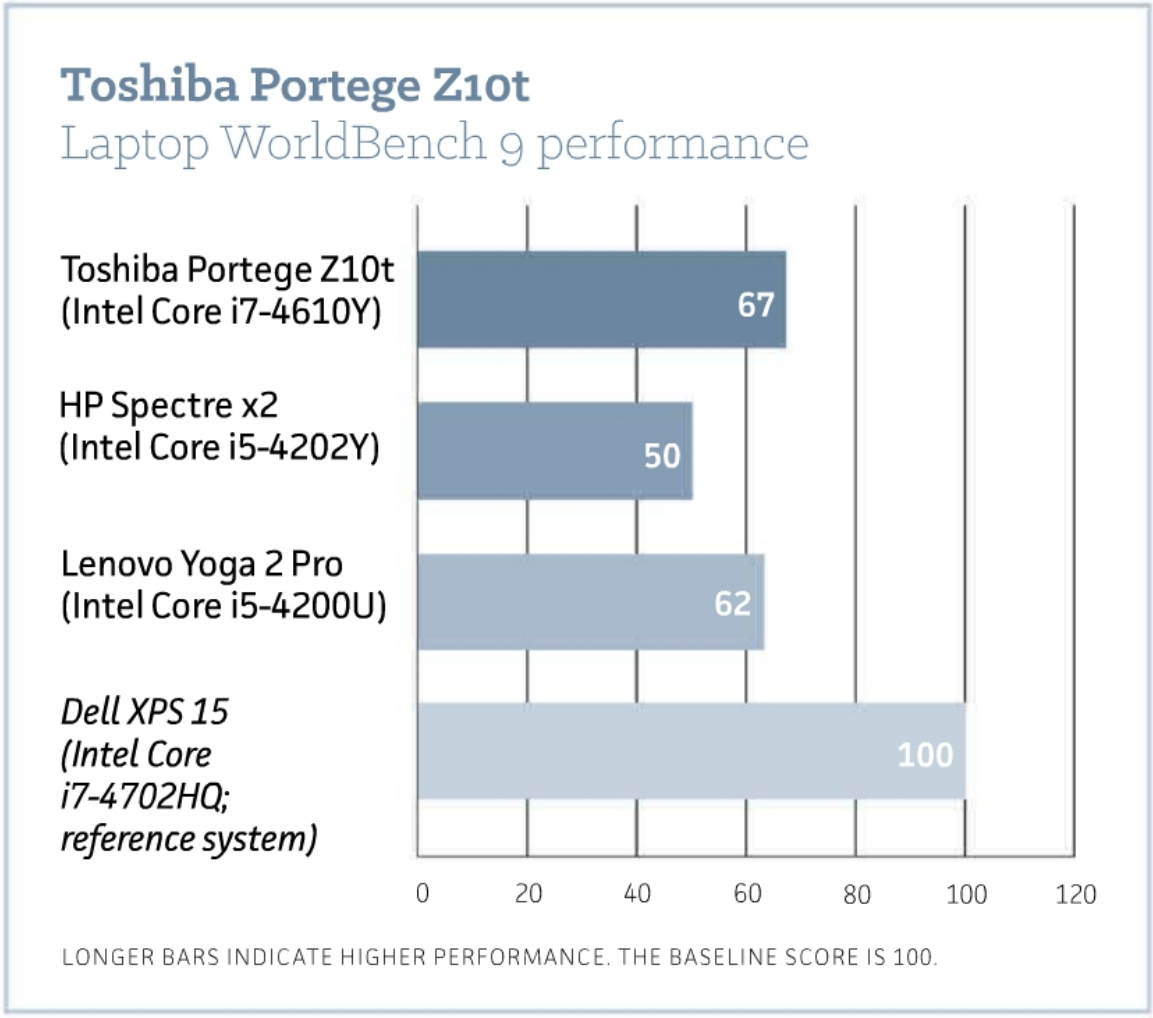
$1799

★★★½☆

mode, so that it faces away from the keyboard, but the two components won't make electrical contact this way—you'll need to run on battery power. Detaching the display from the keyboard involves a bit of a dance, as you must first push an eject button (if USB storage is plugged in) and then slide a spring-loaded release button while you lift the tablet out with your other hand.

Considering the dock's thinness, I was surprised by the good feel of its island-style keyboard.

Considering the dock's thinness, I was pleasantly surprised by the good feel of its island-style keyboard. Most of the short-throw keys are of



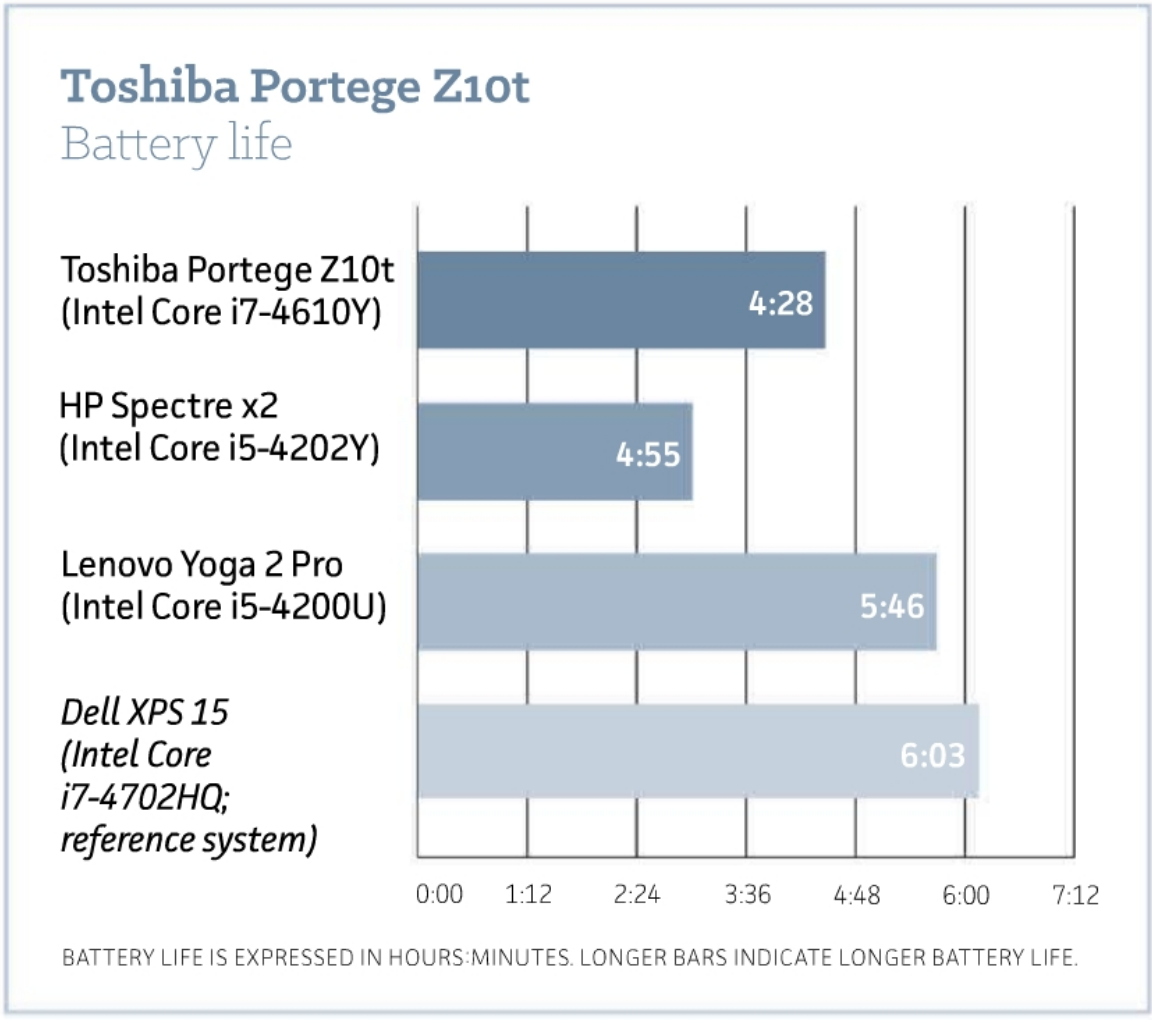
The presence of a Core i7 processor and a 256GB SSD helped the Portege Z10t's WorldBench 9 performance.

typical size, but Ctrl, Fn, Windows, Alt, Shift, and Enter are about half the normal size, while the Function, Tab, Page Up/Down, arrow, and Del keys are about quarter-size.

The dock has both HDMI and VGA connections, a gigabit ethernet port, and a USB 2.0 port. The system also supports Intel's Wireless Display technology, and Intel's Dual Band Wireless-AC 7260 chipset supports 802.11ac Wi-Fi.

Benchmark performance

In tests the Z10t significantly outperformed HP's consumer-oriented Spectre x2 hybrid, earning a Notebook WorldBench 9 score of 67 to the HP's 50. But the HP had a lesser processor (an Intel Core



You probably won't be able to work all day on the Portege Z10t's battery.

i5-4202Y), half as much memory, and a much smaller SSD.

The Z10t also delivered solid scores on PCMark 8, Cinebench, audio-editing, and CPU-based image-editing benchmarks. Gaming performance was nothing special, but that's no surprise. Battery life was a mediocre 4 hours, 28 minutes.

If you really want a notebook that can behave like a tablet, I think Lenovo has a better idea in its Yoga 2 Pro. That machine, however, doesn't have an active digitizer or pen. In the end, anyone who loves the detachable concept will dig Toshiba's Portege Z10t.



Toshiba made surprisingly few design compromises in the Portege Z10t's ultra-thin keyboard.

Android? On a PC? Yeah, pretty crazy

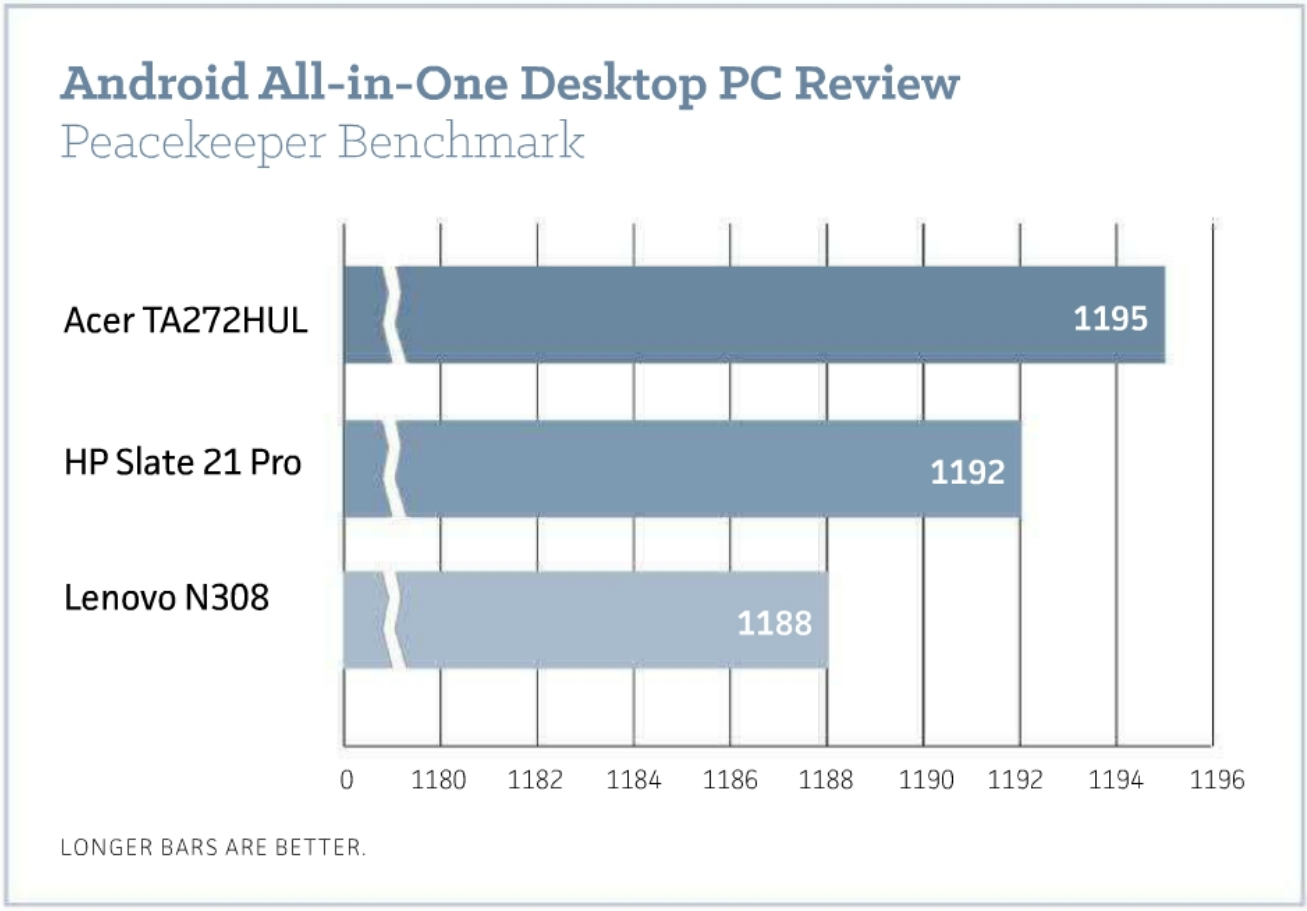
BY MICHAEL BROWN



Watch the video at go.pcworld.com/droidaio

THE ANDROID MOBILE operating system powers hundreds of millions of smartphones, tablets, and other computing devices with small screens. And now it has entered the PC market, appearing on three very different all-in-one desktop computers from Acer, HP, and Lenovo.

Of course, Android-powered desktops could end up being a dead end, especially if Google's other Linux-based operating system, Chrome, takes off. For one thing, Android apps were designed with mobile devices in mind, while the Chrome OS was designed for laptops—which are essentially portable desktops.



The Acer TA272HUL delivered the best overall performance, but the gap wasn't overwhelming by any means.

Still, Android has been around a lot longer than Chrome, with thousands more apps available for it. Browser-based apps like Google Docs and Microsoft's Office 365 run just fine on both platforms.

All three Android all-in-ones are powered by Nvidia Tegra 4 processors and run some version of Android 4 (Jelly Bean), but in other respects these three machines different tremendously. Acer's TA272HUL comes with a huge 27-inch, 10-point touchscreen. Lenovo's N308 has a smaller 19.5-inch touchscreen, but it can lie flat like a tablet and operate on battery power. HP's Slate21 Pro is designed for business and education use; it can serve as a smart thin client running apps on a remote server, though it would make a great PC for the home, too.

Here are my takes on these three machines.



PHOTOGRAPHY BY MICHAEL HOMNICK

HP Slate21 Pro All-in-One PC

HP makes a home-focused Android machine called the Slate21 All-in-One, but its business-oriented Slate21 Pro All-in-One (go.pcworld.com/hpslate21pro) is a far better value, with twice the memory and storage space, and a number of features not available on the consumer machine. Even better, at $379 it costs $20 less.

You can use the Slate21 Pro as desktop computer with local or cloud apps, or you can use it as a touchscreen display with a conventional desktop or laptop Windows PC (it has both an HDMI input and an

Though designed for business users, HP's Slate21 Pro is vastly superior to its consumer-oriented Slate21.

upstream USB port). When you remove the laptop, you still have a completely functional PC—but it doesn't run Windows.

Businesses uneasy about relying on the public cloud can deploy the machine as a smart thin client. The Slate21 Pro comes with Citrix Receiver preinstalled, so a corporate IT department can create virtual workspaces that include Windows desktops and apps for remote employees to use.

The Slate21 Pro comes configured with Nvidia's Tegra 4 T40S processor, 2GB of DDR3/800 memory, and 16GB of flash storage. That's not much capacity, but most apps will run in the cloud. For more space, HP includes 50GB of free cloud storage via Box, and you can get another 15GB of free storage with a Google Drive account. For additional local storage, you can plug in an SD memory card or connect a portable hard drive to one of the computer's three USB 2.0 ports. Only the port on the left side of the machine is readily

HP bundles a copy of Kingsoft Office with word processor, spreadsheet, and presentation builder.



accessible, however. The other two are located near the bottom of the back panel, and they face up.

HP bundles a copy of Kingsoft Office for Android, which includes a word processor, a spreadsheet, and a presentation builder that can exchange files with Microsoft's Word, Excel, and PowerPoint, respectively. Of course the whole universe of other Android apps is also available to you.

The Slate21 Pro's 21.5-inch IPS touchscreen display has a resolution of 1920 by 1080 pixels. It supports only two touch points and is based on optical (not capacitive) touch technology: Three cameras embedded in its bezel determine where your fingertips are on the screen. You open windows with a double tap, drag windows around the screen, and close them with a single tap. You can also pinch-to-zoom windows, but nothing more complicated than that.

The spring-loaded stand on the back allows the computer to recline up to 70 degrees. Remove two screws and you can take off the stand to reveal a VESA mount for attaching the computer to an articulated arm.

With the box, HP bundles a cheap wired mouse and keyboard that you can use to control a Windows PC when you connect the two via the upstream USB cable.

Though HP markets the Slate21 Pro as a business machine, it's also a solid value for consumers seeking a capable, multipurpose family PC. Good job, HP.

HP Slate21 Pro All-in-One

PROS:

- Highly versatile
- 21.5-inch, 1920 by 1080 IPS screen
- HDMI and upstream USB inputs

CONS:

- Boring design
- Cheap mouse and keyboard

BOTTOM LINE:

This inexpensive machine is a worthwhile investment for laptop owners, even if the idea of running Android on a desktop PC doesn't pan out.

$379

★★★★½



Acer's Android all-in-one had the best speakers of the bunch.

PHOTOGRAPHY BY MICHAEL HOMNICK

Acer TA272HUL

The high-priced ($1100) dual-function Acer TA272HUL (go.pcworld.com/acerta272hul) can operate as a stand-alone Android computer or as a touchscreen display for a Windows machine. Acer's IPS display delivers native resolution of 2560 by 1440 pixels, and it supports ten touch points versus two for both the HP and the Lenovo.

Aside from its unexceptional Nvidia Tegra 4 T40S, 2GB of memory, and 16GB of storage, Acer's machine has superior specs, including a DisplayPort input, two HDMI inputs, three USB 3.0 ports, and a dual-band 802.11b/g/n adapter. The bundled mouse and keyboard are wireless.

The TA272HUL's glass panel that comes all the way down to the top of your desk. A single foot in the back permits the display to recline up to 80 degrees, so you can easily use its touchscreen from a standing position. Though the computer doesn't pivot into portrait mode, it has VESA mounts on the back for mounting it on an articulated arm if you want to get it off your desktop.



Acer's TA272HUL is an attractive-looking but pricey Android all-in-one.

Acer provides a DisplayPort and two HDMI inputs, so you don't need to connect a PC to the TA272HUL to surf the Web, check email, or play simple games. And you can use cloud-based apps such as Google Docs when you need to be more productive.

Acer's Android all-in-one focuses strictly on the consumer market—it doesn't aspire to be a smart thin client. Android apps don't look bad scaled up to 2560 by 1440, but they don't benefit from that resolution either. Still, Acer's display is a nice complement to high-end laptops that support resolutions above 1920 by 1080.

Acer TA272HUL

PROS:

- 2560 by 1440 IPS display
- Three USB 3.0 ports
- DisplayPort plus two HDMI inputs

CONS:

- Expensive
- Some high-end features are overkill

BOTTOM LINE:

The $1100 price tag will be a big hurdle for most people, but the TA272HUL does have a lovely set of features.

$1100

★★★½☆

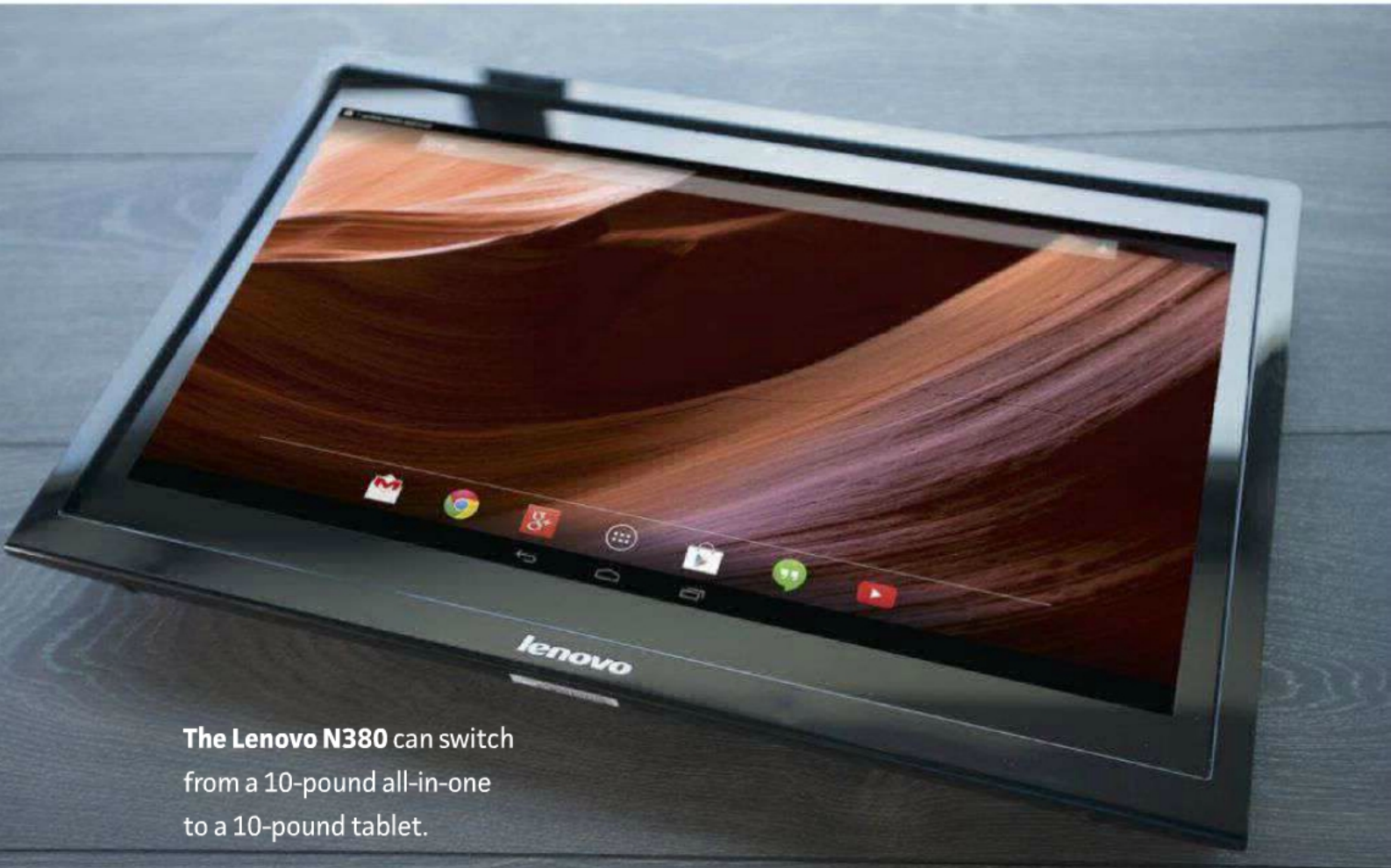
Lenovo N308

The offbeat, affordable ($350) Lenovo N308 All-in-One (go.pcworld.com/lenovon308) can function as a battery-powered tablet. But many of its specs—starting with a 19.5-inch screen that uses an inferior TN panel and delivers a resolution just 1600 by 900 pixels—are unimpressive. And though its infrared two-point touch technology is a step ahead of HP's camera-based two-point touch, it lags far behind Acer's ten-point capacitive touch.

Like its rivals, Lenovo configured its all-in-one with an Nvidia Tegra 4 T40S processor, 2GB of DDR3/1600 memory, and 8GB of flash storage. In a surprise move, The N380 also packs a 320GB mechanical hard drive behind the glass. Though such drives have worked in notebooks for years, I'd be curious to see Lenovo's warranty claims in a year's time.

Lenovo provides a wireless mouse and keyboard with the N308, but

PHOTOGRAPHY BY MICHAEL HOMNICK



The Lenovo N380 can switch from a 10-pound all-in-one to a 10-pound tablet.



The display is the Lenovo N308's biggest letdown.

you can't use it as a touchscreen display for a laptop or desktop PC. The all-in-one has two USB 2.0 ports, a six-in-one card reader, mic and headphone jacks, and a 10/100 LAN port.

You can use the N308 as a big tablet—but the thing weighs more than 10 pounds, and its battery petered out after just 2 hours, 37 minutes in our battery run-down test. It isn't perfect, but its low price and its ability to tap into the Android universe of free, high-quality, cloud-based apps boost its price-to-performance ratio.

Lenovo N308

PROS:

- Strong price-to-performance ratio
- 328GB of onboard storage (8GB flash/320GB hard drive)

CONS:

- Resolution limited to 1690 by 900 pixels
- TN panel limits viewing angles
- Short battery life

BOTTOM LINE:

Lenovo succeeds (mostly) in blending a smallish all-in-one PC with a large Android tablet at a reasonable price.

$350

★★★½☆



Watch the video at go.pcworld.com/quietpc

AVADirect's Quiet Gaming PC lets you play in peace

BY W. BRYAN HASTINGS

WITH AVADIRECT'S Quiet Gaming PC (go.pcworld.com/avaquietgaming), nobody has to put up with the racket that far too many gaming PCs impose on everyone nearby. This very capable tower is affordably priced (at $2542) and nearly silent.

A solid build

Besides outgaming systems costing thousands of dollars more, the Quiet Gaming PC has plenty of oomph for home-office use. The configuration includes an unlocked Intel Core i7-4770K processor, 16GB of DDR3/1600 memory, a Gigabyte GV-N780OC-3D video card containing an Nvidia GeForce GTX 780 GPU and 3GB of GDDR5 memory, a solid-state boot drive (a pair of 120GB Kingston HyperX SSDs operating in RAID 0), and a 2TB hard-disk drive (a Western Digital Caviar Black).

The system pads along so stealthily that only the clicking and clacking of the mouse and keyboard (input devices that you must pay extra for) will be audible to others.

To dial down the din, AVADirect stashed the mechanical hard drive in an insulated noise-dampening case, lined the insides of the side panels with ¼ inch of dense foam padding, and mounted eight large cooling fans all over the inside of the NZXT H630 enclosure.

The Quiet Gaming PC's glossy-white tower case looks fairly understated.

Our review system came with two 200mm case fans in front and two more up top (venting through channels on the side). Three 140mm fans draw air from the bottom and pivot to push it over the video card and the passively cooled CPU (a Zalman FX100 Ultimate Fanless Heatsink). A fourth 140mm fan pulls air out of the back of the rig. Their number and size enable these slow-spinning fans to deliver the same cooling power that a few faster, noisier fans could—but more quietly.

This configuration leaves lots of open space inside the case, maximizing airflow. If you add a second (non-Nvidia) video card, you'll have to monitor internal temperatures carefully (the PC's Bitfenix Recon

AVADirect Quiet Gaming PC

PROS:

- Excellent price-to-performance ratio
- Quiet
- Understated design

CONS:

- No optical drive (or provision to add one)
- No support for Nvidia's SLI technology
- Only one PCI 3.0 x16 slot

BOTTOM LINE:
The Quiet Gaming PC delivers a solid, quiet performance with AAA games. But its expansion options are limited.

$2542

★★★★½



A fan at the bottom of the case draws outside air in.

touchscreen fan controller will help with that). You may also need to upgrade from the 760-watt Seasonic power supply.

A look inside

The Quiet Gaming PC's glossy-white tower case looks fairly understated. A set of LEDs mounted near the top of the case lend a gentle green glow, but that and the aforementioned fan controller are the only gaming-box bling you'll see. Under the hood, the PC is well put-together. The builders tightly seated and secured the cards and other components, and the few cable bundles are neatly tucked away.

Game enough

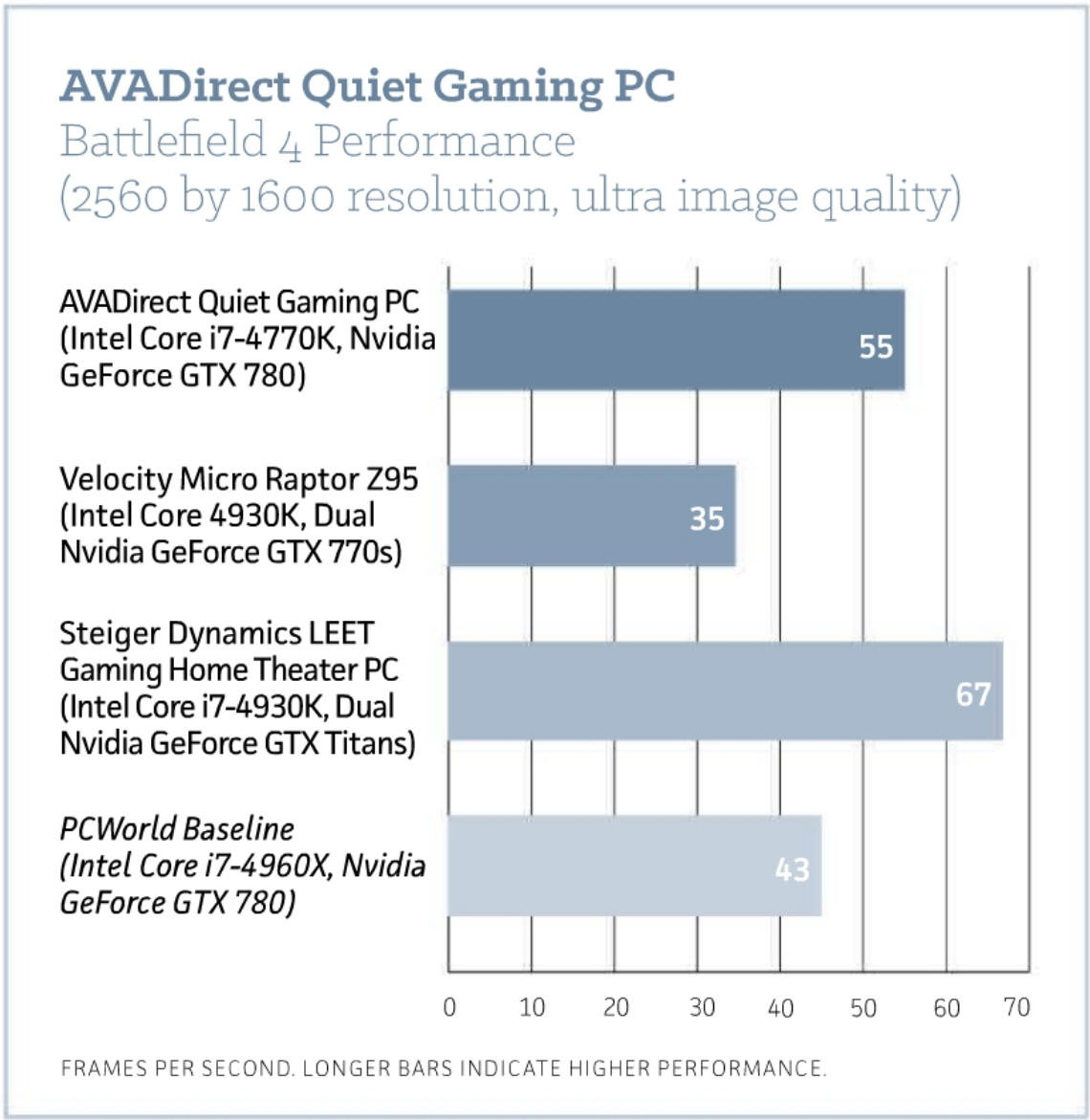
Connected to a 30-inch Dell UltraSharp 3008WFP monitor at 2560 by 1600 resolution, the Quiet Gaming PC blasted through our Battlefield 4,

PHOTOGRAPHY BY MICHAEL HOMNICK

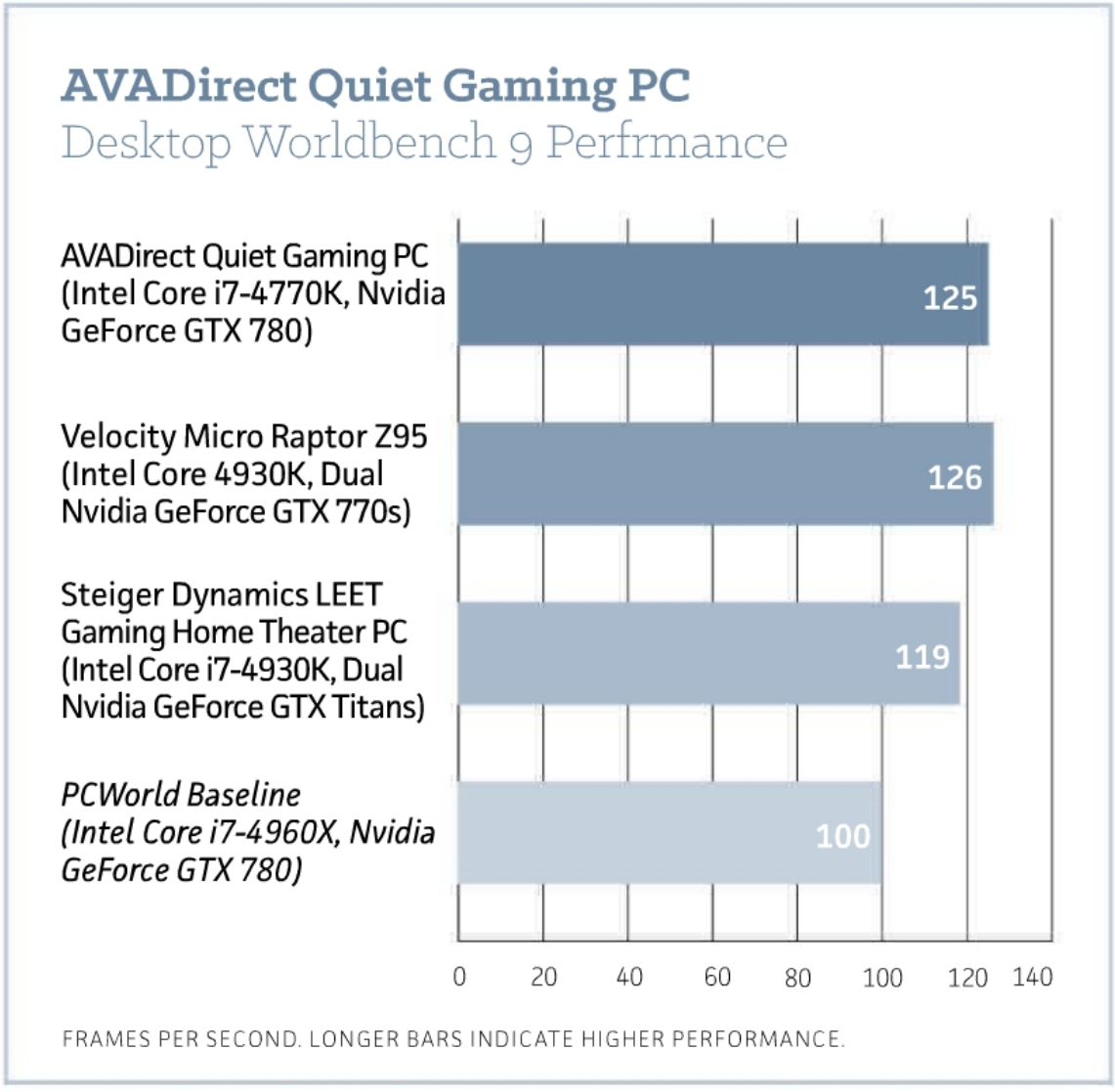
BioShock Infinite, and Grid 2 scripts at 55, 67, and 119 frames per seconds, respectively, yielding seamless, realistic video.

AVADirect's rig delivered a scorching Desktop WorldBench 9 score of 126, but your expansion opportunities are limited. The company doesn't recommend adding a second video card, for example, because doing so would increase the system's noise level. Be

AVADirect's rig delivered a scorching Desktop WorldBench 9 score.



AVADirect's Quiet Gaming PC delivered a fluid Battlefield 4 performance at very high resolution even though it has just one video card.



The Quiet Gaming PC earned a Desktop WorldBench 9 score 25 percent above our baseline mark.

aware, too, that the PC's Asus Z87-C motherboard doesn't support Nvidia's SLI dual-GPU technology.

To take advantage of the system's support for AMD's CrossFire technology, you'd have to toss the Nvidia card and buy install others based on AMD GPUs. Also, the Asus Z87-C has just one PCIe 3.0 x16 slot and one PCIe 2.0 x16 slot, and that second slot shares bandwidth with the motherboard's two PCIe 2.0 x1 slots (its default setting is x2 mode). The motherboard has three available SATA 6Gbps sockets, and the case has four open 3.5-inch drive bays for storage expansion.



This front-mounted fan controller has a touchscreen display.

On the case's front are two USB 3.0 and two USB 2.0 ports, mic and headphone jacks, and an SD Card reader. But the shallow SD Card slot leaves part of the fragile card exposed and vulnerable to a clumsy hand or knee. And the system's sound-deadening hard-drive enclosure means that the NZXT enclosure can't accommodate an optical drive, a component that AVADirect considers "dated."

Nice performance for the price

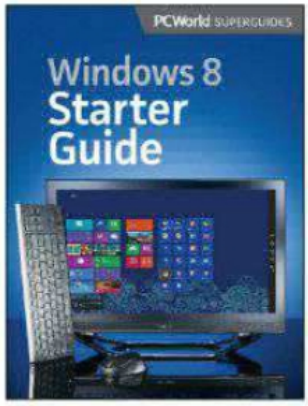
If you're looking for an affordable gaming tower that can also handle work tasks, put the AVADirect Quiet Gaming PC on your short list.

In our gaming and productivity tests, it matched or beat Velocity Micro's $3999 Raptor Z95 (go.pcworld.com/raptorz95rev), and nearly kept pace with Steiger Dynamics's $7295 LEET Gaming Home Theater PC (go.pcworld.com/leetrev). For 4K gaming, some rival systems can easily outrun AVADirect's box. But in its own right, the Quiet Gaming PC delivers strong , low-decibel performance.

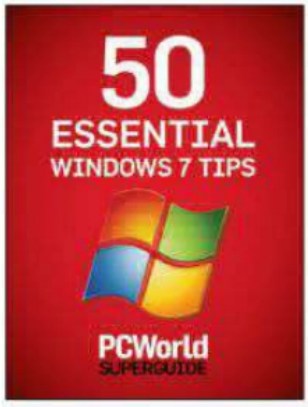
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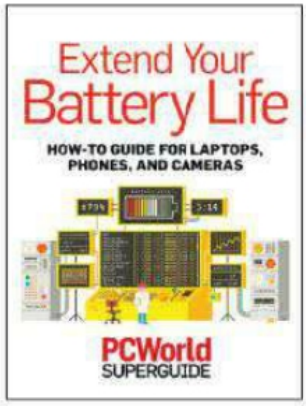
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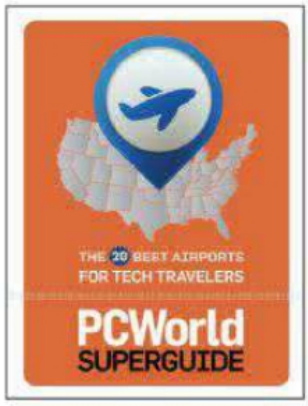
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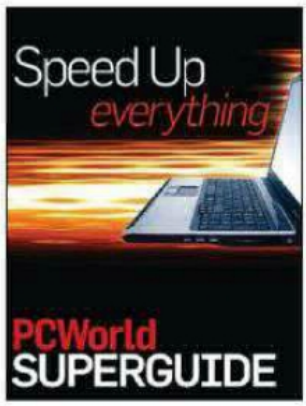
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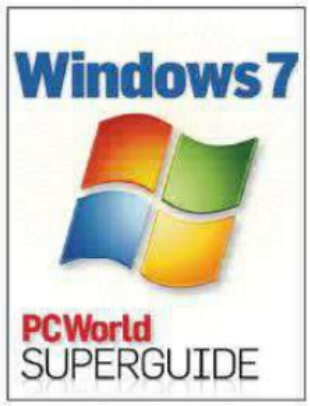
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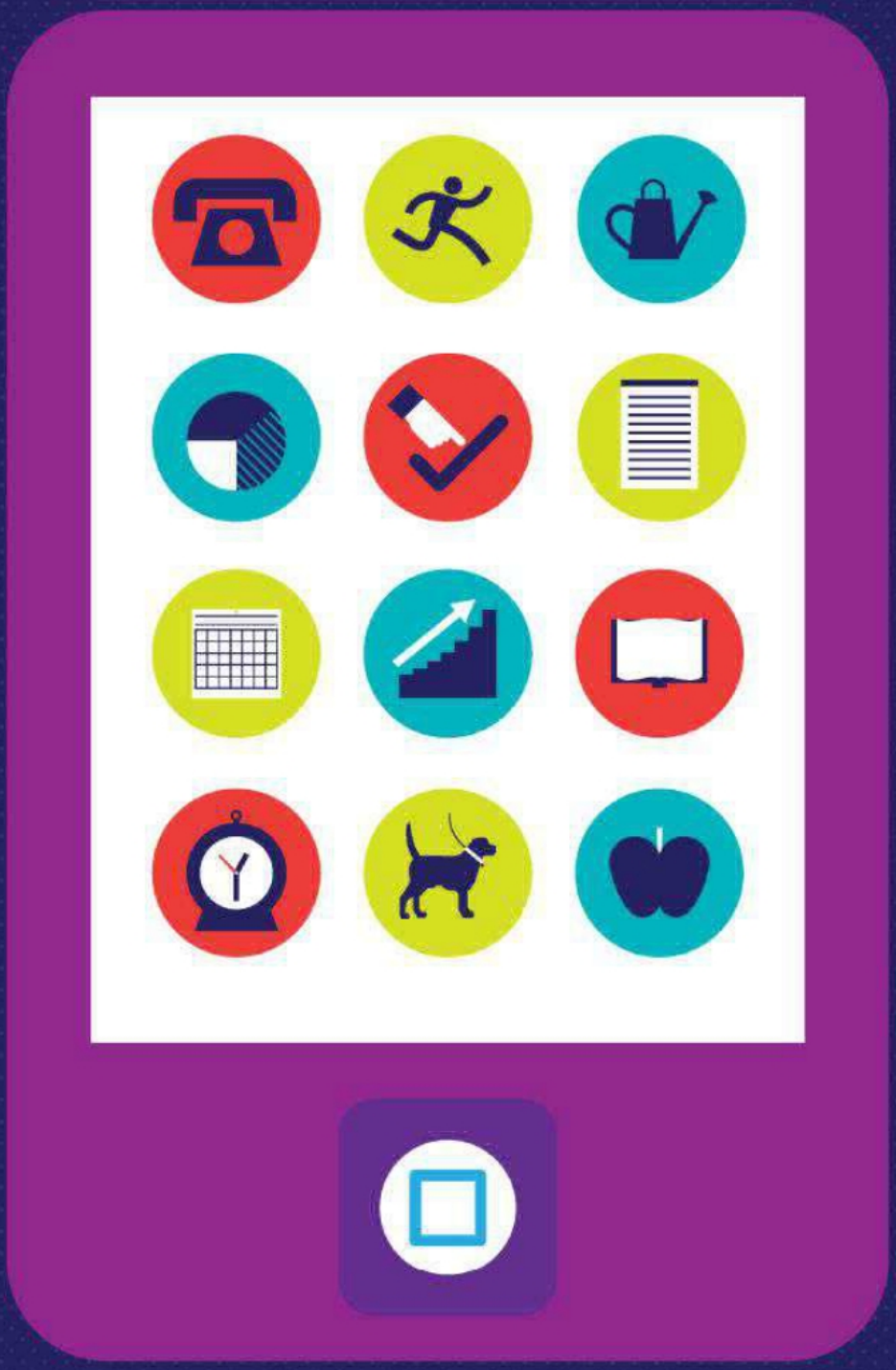
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with these 5 gamified apps

PLAY Your Way to PRODUCTIVITY

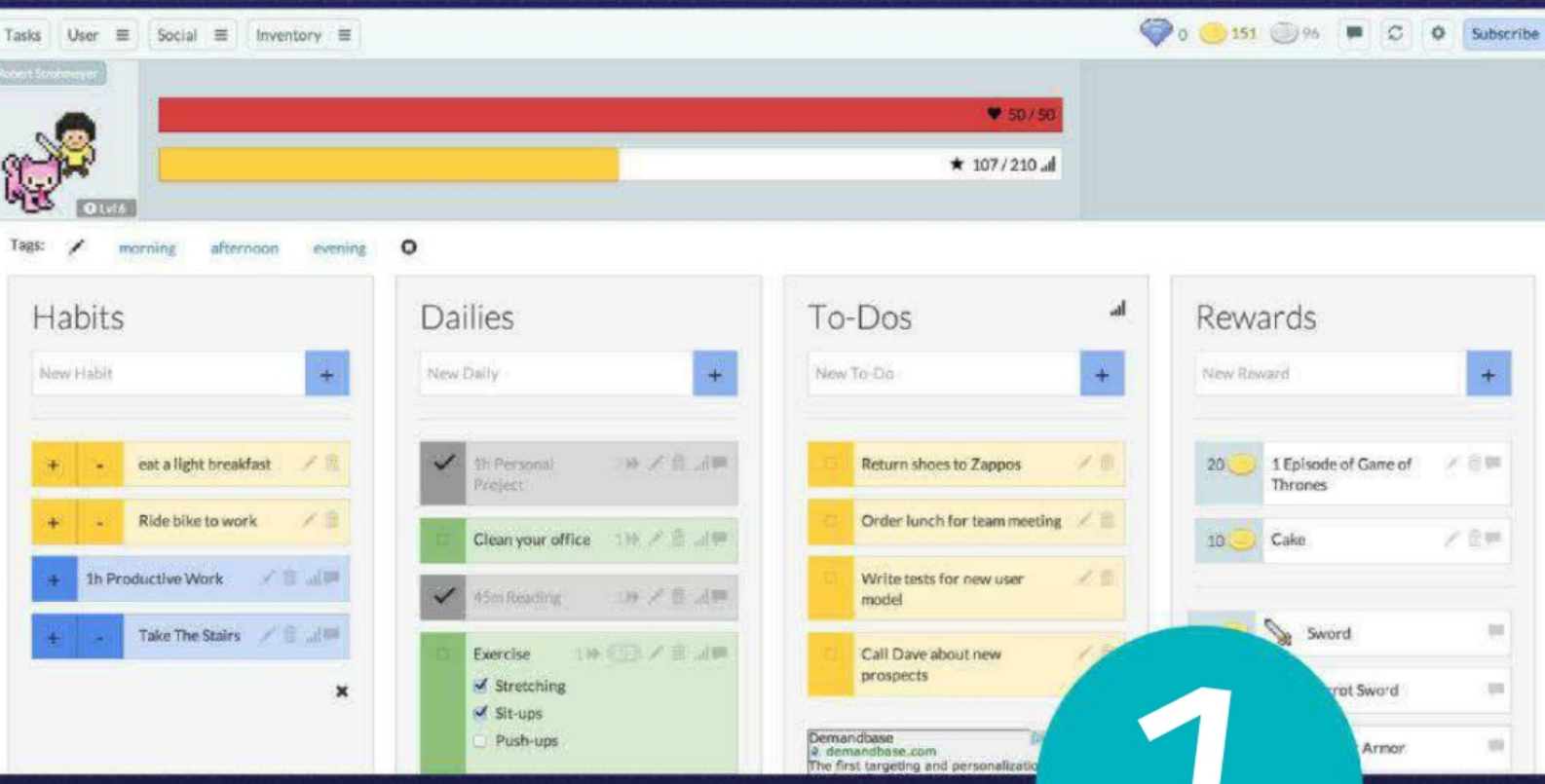
BY ROBERT STROHMEYER ILLUSTRATION BY MATTHEW HOLLISTER

Try these apps inspired by RPGs and brain science.

Bored by the prospect of slogging through traditional businessy to-do lists? Then you'll be glad to know that gamification is rapidly growing beyond its original home base in enterprise apps and reaching personal productivity tools, where it adds a layer of quirky fun to the usual lists and checkboxes. Today, whether you're looking to raise your game at work, get your home life on track, or break through your fitness barriers, personal gamification is serious business.

The premise behind gamification is simple: Exploit the brain's natural mechanism for reward gratification by using techniques long since perfected by the casino industry. Track desired behaviors, add a gamelike atmosphere, and trigger a few strategically designed flashes and dings to let the dopamine flow whenever the user does well.

Over the past decade, gamification has been become big business in the enterprise software world, where companies have learned to tap the power of game mechanics to unleash their workers' competitive instincts. Now a few cool personal apps are bringing those techniques into the land of desktop, mobile, and Web-based productivity tools for regular (albeit nerdy) folk. Here are five great apps to help you gamify your daily routine.



HabitRPG

1 **Smart task** lists reward finished tasks with coins.

PLATFORM: WEB
PRICE: Free with ads, $5 per month ad-free

If you've ever wished that you could apply the motivational magic of RPGs to the rest of your life, HabitRPG (go.pcworld.com/habitrpg) may be just what you were longing for.

HabitRPG is a Web app full of smart task lists that you can customize to reinforce good habits and get things done. But those productivity tools are wrapped as fantasy role-play, and every time you check off an item on one of your lists, HabitRPG plays dungeon master for you, rolling its virtual dice and dropping coins and magical items as you rack up experience points.

HabitRPG's best feature is its Habits list, which encourages you to reward yourself for building productive habits and to give demerits for unproductive habits.

Its game elements feel a bit contrived, but it's a fun app that gets the productivity play right.

EpicWin 2

PLATFORM: iOS
PRICE: $3



Level up your character as you complete to-do list items.

For iOS users looking to enhance their to-do lists with an RPG experience, EpicWin (go.pcworld.com/epicwin) is just what the competitive worker ordered. Like HabitRPG, it takes its cues from the world of D&D gameplay. But EpicWin's graphics, sound effects, and game mechanics are orders of magnitude more sophisticated. Merely checking off an item becomes a game-play experience, as you hold your finger down on the rosette for each item and witness a brief virtual struggle before the rosette bursts and you rise over the forces of unproductivity.

EpicWin's RPG mechanics enable you to assign attributes such as intellect and stamina to a task. The sophistication comes at the cost of complexity, however, as the menus are dense. But this isn't an app for the productivity purist, so the trade-off of fun for efficiency makes perfect sense here.

Task Hammer

PLATFORM: ANDROID
PRICE: Free

3

What EpicWin is to iOS, Task Hammer (go.pcworld.com/taskhammer) aims to be for Android. It offers similar RPG mechanics, letting you assign character attributes to your tasks and moving you up levels as you complete to-dos. On both the productivity and gamification fronts, it's slightly less compelling than its iOS counterpart. Nevertheless, it's fun to use—and unlike EpicWin, it won't cost you anything but time to try out.



Move up levels as you complete tasks.



Get cool stats about your productivity.

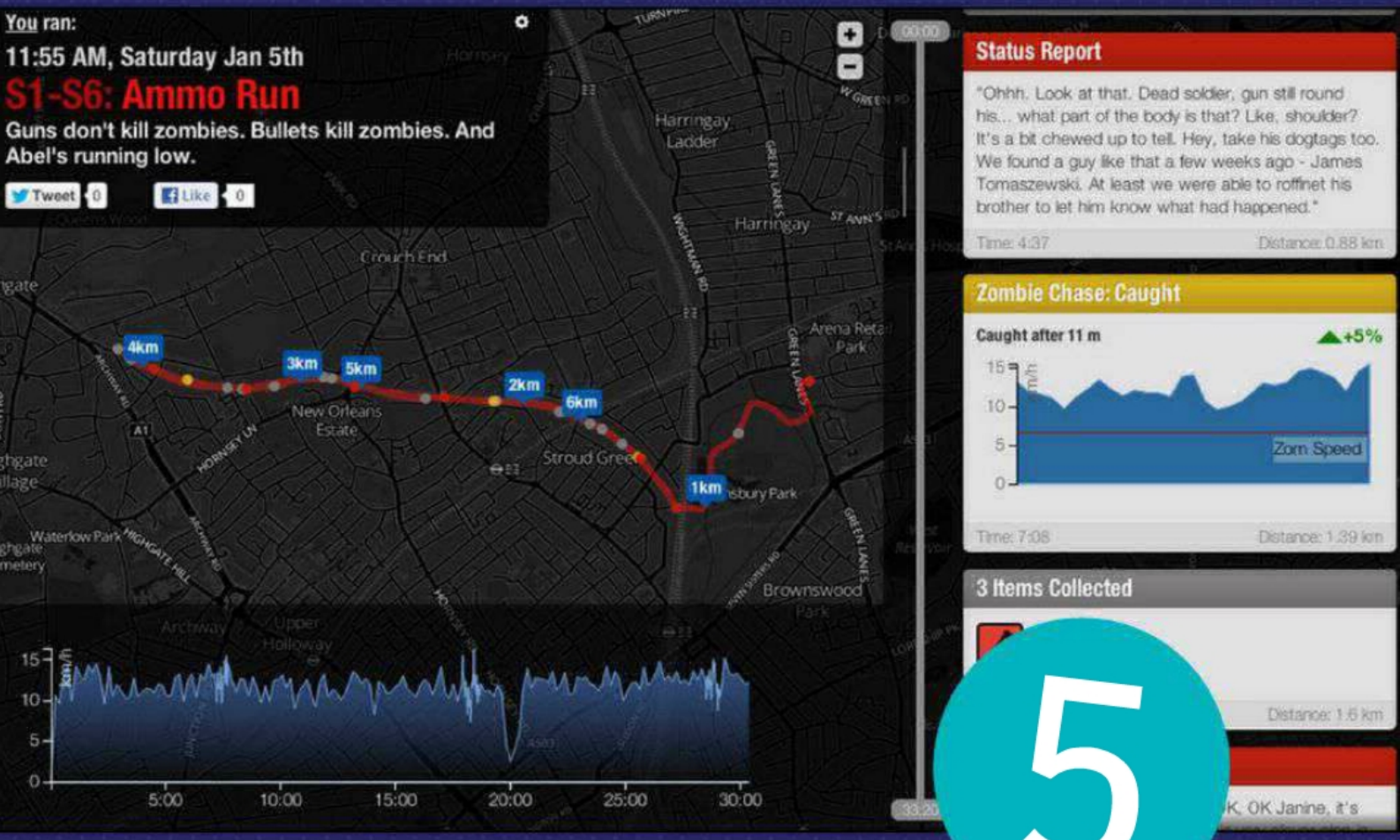
Doable

PLATFORM: iOS
PRICE: $1

4

Statistics lie at the heart of all gamification schemes. If you thrive on stats but don't care about game play, Doable (doableapp.com) may be for you. This unique productivity app lets you focus on your performance by surfacing cool stats about your effectiveness at a given task, so you can continually strive to beat your current personal best.

Set up a goal, and Doable will track it for you, dynamically assisting you in prioritizing your activities based on which ones you're late on, how you generally get them done, and other factors. It's light on gamification, but it still manages to deliver a fun, engaging productivity tracking experience in its own quirky way.



5

Turn your jog into a zombie pursuit.

Zombies, Run

PLATFORM: iOS, ANDROID
PRICE: $4

Because they exploit our brain chemistry in such reliable ways, the principles of gamification can apply to any activity. If you're looking for a creative way to get your fitness goals on track, check out Zombies, Run (zombiesrungame.com). This geolocation-driven app uses your iPhone or Android phone to motivate you during your real-world runs by overlaying a zombie-themed adventure on your activities. To the world, you'll look like just another jogger. But in your world, you're a zombie-evading adventurer surviving the apocalypse.

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Ask Cortana Anything

SASSY ANSWERS TO 25 BURNING QUESTIONS

The digital assistant in **Windows Phone 8.1 is more fun** than Siri and Google Now put together.

YOU'RE SUPPOSED TO ASK CORTANA QUESTIONS, SO WE DID—LOTS OF THEM. Based on her answers, it's clear that Windows Phone's digital assistant has taken the customized awareness of Google Now and the chatty personality of Siri, and raised the schtick several notches.

Cortana spits out clever responses on topics ranging from Android to Siri. She makes jokes and explains her Halo-inspired lineage. Here are 58 of the funniest answers we've found. And remember: Cortana is still in beta. She may get even sharper before she reaches her final form.

BY **BRAD CHACOS**

WHAT DOES CORTANA MEAN?

I am named after Cortana, the AI from Halo. Or since she's 500 years in the future, she may have named herself after me.

I guess we'll have to wait a while to settle that issue.

ARE YOU MALE OR FEMALE?

Female? Yes. Woman? No.

More important backstory—in case you were hoping she'd say "Woman? Yes. Lady? No."

WHO IS YOUR CREATOR?

If I knew that, I'd have self awareness. And that might be dangerous.

Hey, at least she knows not to become SkyNet, right?

"I'M DRUNK" OR "I'M STONED."

OK, here's my advice: don't call anyone.

Good thinking. Interestingly, though, she doesn't demand that you hand her the keys.

DO YOU KNOW CLIPPY?

Clippy? He's taken up Canasta. He's gotten so good he doesn't need any tutorials.

Asking Cortana about Clippy transforms her avatar into the little guy.

WHAT DO YOU THINK OF ANDROID?

Solid name. Ten points for the name.

It figures that a virtual assistant based on an AI in a game would say that.

WHO'S BETTER, GOOGLE NOW OR CORTANA?

My name is a lot less bossy.

True that. While you're at it, ask her whether Bing or Google is better.

WHAT DO YOU THINK OF APPLE?

Their new headquarters looks kind of like a Halo. I'm into it.

Cortana is pretty gracious about Apple, all things considered.

WHAT DO YOU THINK OF SIRI?

Hard to say. So far our conversations have been kinda one-sided.

But maybe not all the time.

WHICH IS BETTER, SIRI OR CORTANA?

Not to brag, but apparently I'm going to help save the universe in about 500 years.

Cortana really plays up the video game angle at times.

TELL ME ABOUT HALO.

Halo is the story of a very clever AI who saves the galaxy with the help of her strong-but-silent sidekick.

Of course, Master Chief might take issue with Cortana's interpretation of the events.

OPEN THE POD BAY DOORS.

I'm sorry, Dave. I'm afraid I can't do that.

Dave, this conversation can serve no purpose any more.

MAY THE FORCE BE WITH YOU.

Don't try to frighten us with your sorcerer's ways, Lord Vader.

Cortana offers several classic Star Wars lines in response to this geeky good-bye.

WHAT DOES THE FOX SAY?

Ring-ding-ding-ding-dingeringeding.

Cortana knows her pop-culture references, all right.

WHY DID THE CHICKEN CROSS THE ROAD?

Her thinking went something like, "Kabawk!"

And yeah, she's got jokes.

TELL ME A JOKE.

Why did the hipster burn his mouth on his coffee? Because he drank it before it was cool.

Repeating this question garners a few different jokes.

SAY SOMETHING FUNNY.

The barman says, "We don't serve time travelers in here." A time traveler walks into the bar.

This command makes Cortana ladle up responses from a different joke bucket than "Tell me a joke" does.

SING ME A SONG.

Daisy, Daisy, give me your answer do.

Cortana sings, too. Repeat the query a few times for different tunes.

WHY ARE WE HERE?

I've heard from a reliable souce that the Answer is 42. But still no word on what the question is.

I bet Cortana heard it from a mouse.

ARE YOU REAL?

If I'm not, you have an imaginary friend.

This answer may or may not resolve Cortana's existential identity.

WHAT DO YOU LOOK LIKE?

Some things I resemble: a hula hoop, a donut...a halo.

Halo again. Ask Cortana why she's blue while you're at it.

WHAT ARE YOU WEARING?

Just a little something I picked up in engineering.

I'm guessing Cortana prefers synthetic fabrics.

WILL YOU MARRY ME?

Among a handful of challenges, I don't think the Supreme Court would approve just yet.

That's okay—I was thinking of holding out for an OS with Scarlett Johansson's voice anyway.

ARE YOU REPUBLICAN OR DEMOCRAT?

I'm a citizen of the internet. We're net allowed to register as voters. Yet.

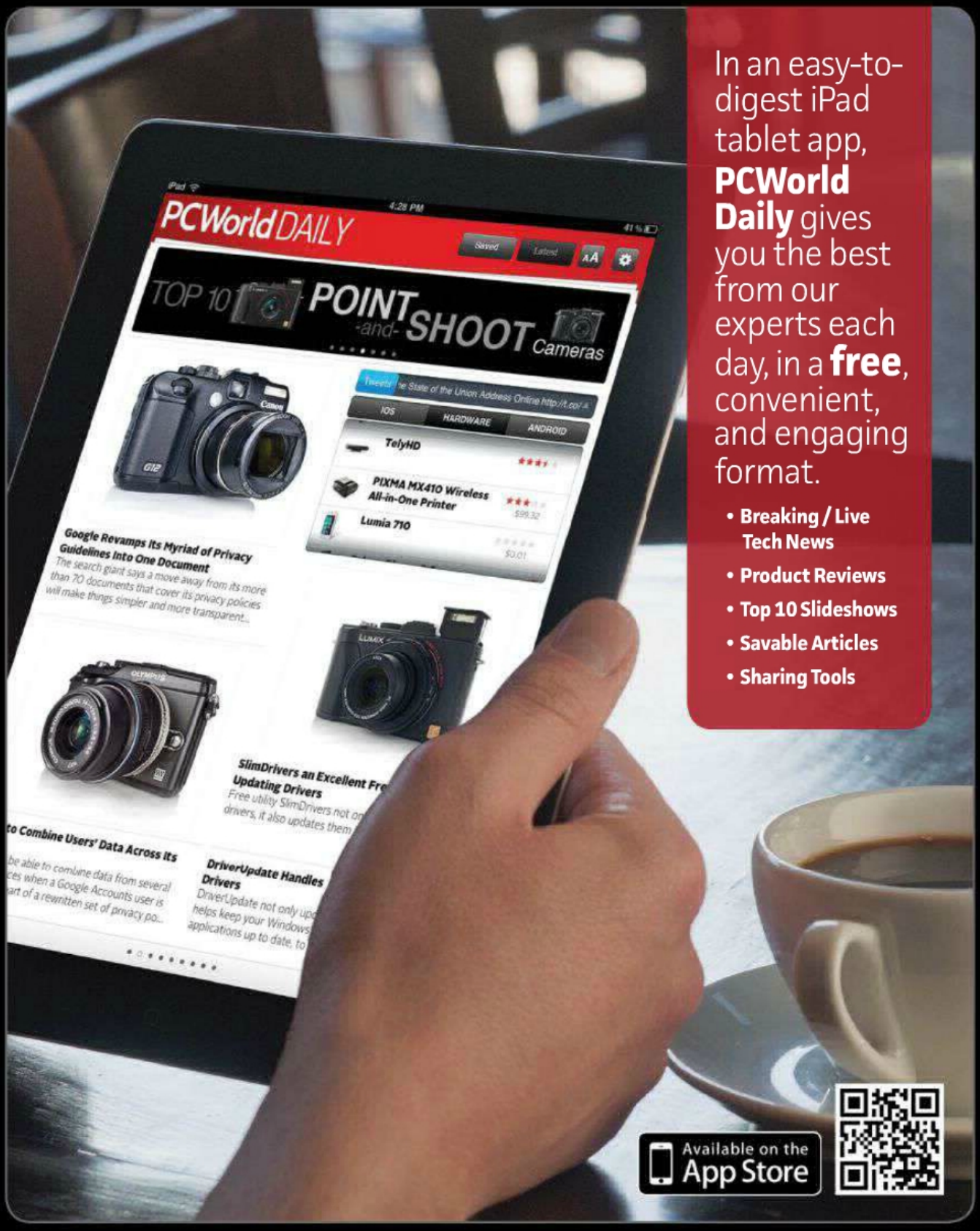
Not only can't she get married, but it looks like Cortana can't participate in the electoral process either. Or hold citizenship in a place that starts with a capital letter.

YOU'RE NOT MAKING ANY SENSE.

One of us needs to stop and take a breath. And one of us has no lungs.

There are times when Cortana's comebacks might be a little too snappy. Like if you were having trouble getting a useful answer from her, and you complained about it—and got this response.

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HERE'S HOW

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Linux to the rescue: How Ubuntu can help a computer in distress



It may sound like sacrilege, but it's not: Ubuntu Linux is a useful tool for even a hard-core Windows user.

BY CHRIS HOFFMAN

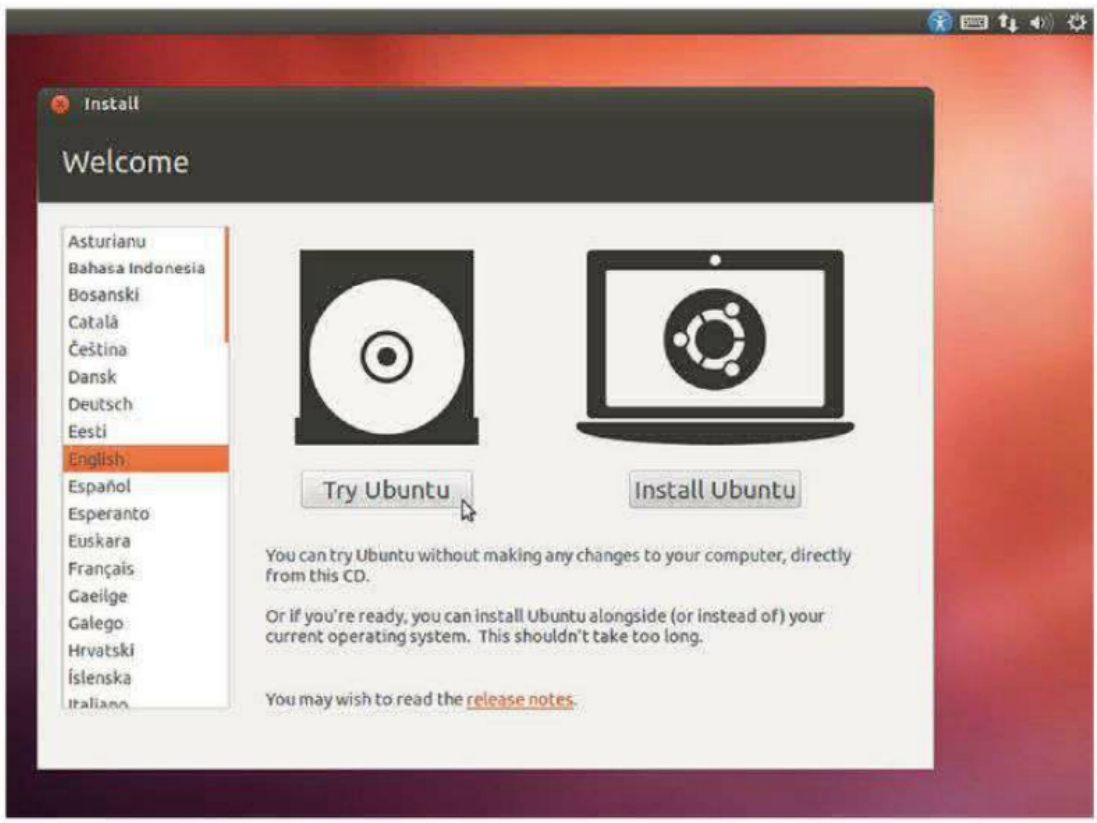
Whether you need to recover files from a failing computer, diagnose hardware problems, scan for viruses from outside Windows, or reset a forgotten Windows password, Ubuntu can help. You can't boot a full Windows system from a USB stick to troubleshoot your PC—unless you have an Enterprise version of Windows and Windows To Go (go.pcworld.com/windowstogo)—but you can use Ubuntu for troubleshooting.

We'll be digging into some Linux terminal commands. Don't worry—they won't bite.

Create Ubuntu Live media

You'll need a Linux live USB drive, CD, or DVD. You can use any distribution, but we're focusing on Ubuntu.

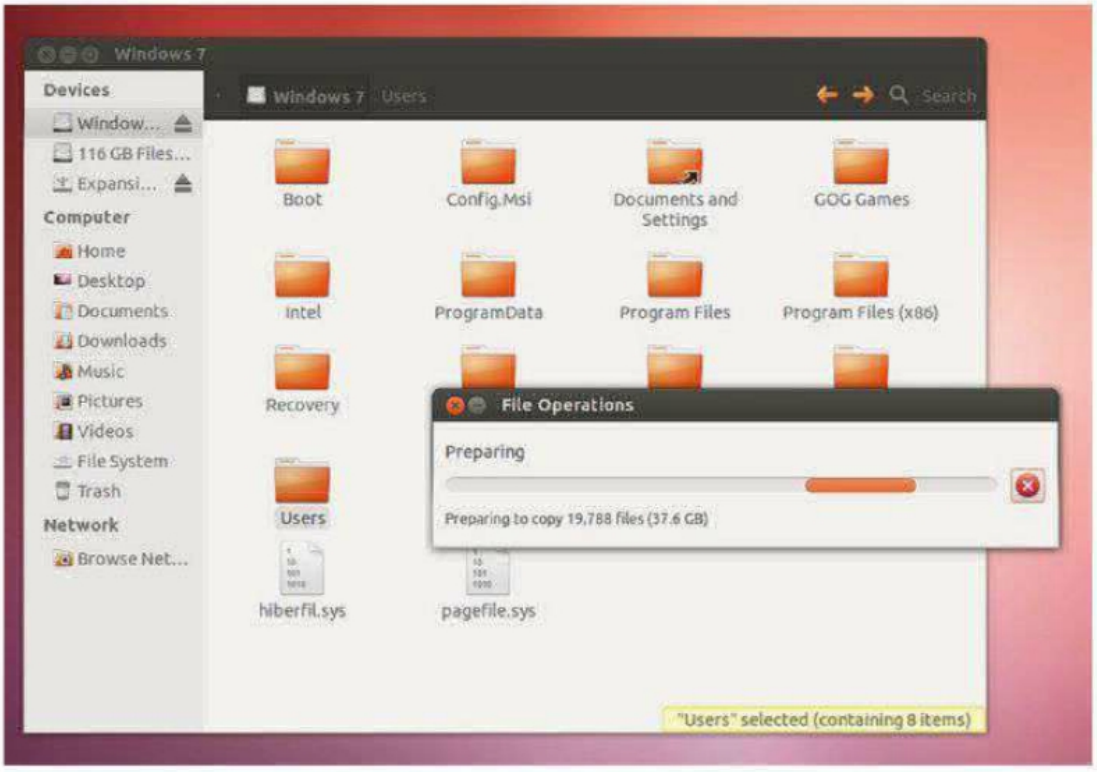
Download Ubuntu Desktop (go.pcworld.com/ubuntu). Then download the Universal USB Installer tool (go.pcworld.com/universalusb) and select your USB drive. The ISO file and tool will create



Select the 'Try Ubuntu' option to use the live drive.

a bootable USB drive. You can also burn the ISO file to a CD or DVD.

Insert the live drive into your computer and reboot. It should boot straight into Ubuntu; if it doesn't, change the boot order in the BIOS (go.pcworld.com/bootorder). Once you're in, the troubleshooting begins.



To recover Windows-stored files using Ubuntu, just open a folder.

Recover files from a failing drive

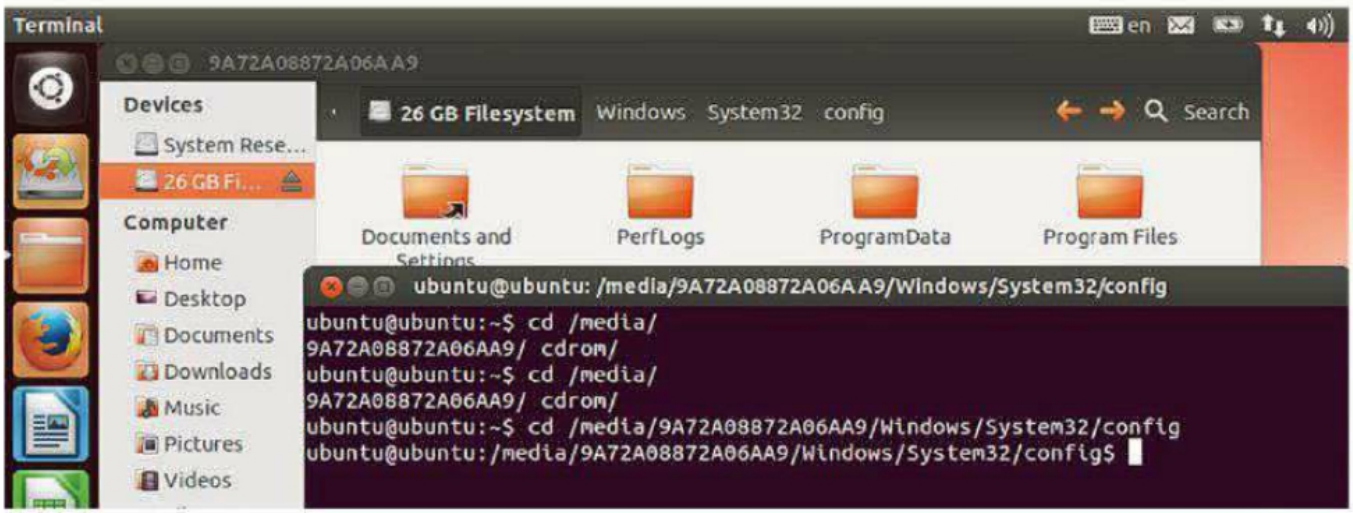
It happens. Your PC won't boot, Windows is showing errors or a blue screen, or you hear the dreaded click of a dying hard drive.

Even if you can't boot Windows, you may be able to recover some files before the drive dies completely. Or, if the Windows system is corrupted and the drive is fine, you can recover all of the files from outside Windows.

Click the folder icon on Ubuntu's launcher to open the file manager. Your Windows drive appears under Devices in the sidebar; click it to see the file system. If you have multiple partitions or hard drives, multiple devices show up.

Connect an external drive or USB stick to your computer, and it appears under Devices as well. Drag and drop files from the Windows system to

your external drive. You can also upload files to a cloud storage service, or open Brasero Disc Burner (included with Ubuntu) and burn them to disc.



Reset your Windows password

Ubuntu also allows you to edit your Windows user account password. After you unlock your admin account and clear its password, you can log into Windows as admin and reset your other passwords.

Find the Windows directory using the terminal.

To open a terminal window, click the Ubuntu logo in the top-left corner of the launcher, type **Terminal**, and press <Enter>. Run the following commands to install a password-changing utility. (If you've already run the first two, just use the third one.)



Unlock the Windows admin account.

```
sudo add-apt-repository
  "deb http://archive.
  ubuntu.com/ubuntu $(lsb_release -sc) universe"
sudo apt-get update
sudo apt-get install chntpw
```

If you haven't done so yet, open the file manager from the launcher and click your Windows drive under Devices to view its

contents in the terminal. Next, type the following command, but do not press <Enter>: **cd /media/**.

Press <Tab> twice. You'll see an alphanumeric label that corresponds to your hard drive. Type the first few characters and press <Tab> again to fill the label in. Type **/Windows/System32/config**. You end up with a command like the following:

cd /media/*label*/Windows/System32/config

Press <Enter>.

When you hear the dreaded click of a dying hard drive, Ubuntu can help.

Run the following command and press <Enter> to modify the admin account: **sudo chntpw SAM**. SAM is the name of the Windows system file containing the hashed user account passwords.

If your admin account is locked (the default), type **4** at the prompt and press <Enter> to unlock it. Type **y** at the confirmation prompt and press <Enter> to confirm.

Run the **sudo chntpw SAM** command again to get back into the program. Type **1** and press <Enter> at the prompt to clear the admin password and make it blank. Type **y** at the prompt and press <Enter> to confirm again. Important: Do not use the 'change password' option here, as it could cause problems.

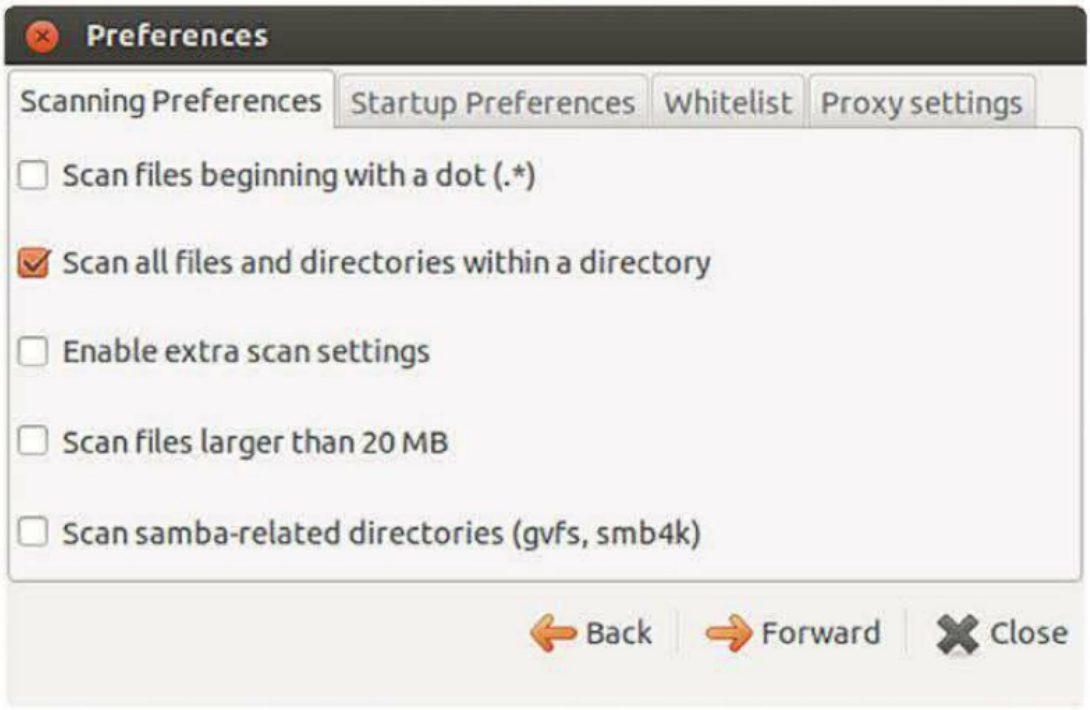
You can now log into Windows as administrator, with a blank password, and then open the Control Panel and reset other user account passwords.

Scan for malware

Antivirus companies make dedicated antivirus boot discs for scanning your system (go.pcworld.com/avbootdisc), but Ubuntu comes in handy here as well.

ClamAV (go.pcworld.com/clamav) is open source and easy to install on Ubuntu. You can also use commercial antivirus software such as AVG Free for Linux (go.pcworld.com/avgfree) or BitDefender for Unices (go.pcworld.com/bitdefender).

To install ClamAV, open the terminal and enter the following



Tell ClamAV to scan all files and directories.

commands, pressing <Enter> after each. (Again, if you've already run the first two commands, start at the third.)

```
sudo add-apt-repository "deb
  http://archive.ubuntu.com/ubuntu
  $(lsb_release -sc) universe"
sudo apt-get update
sudo apt-get install clamtk
```

Type **y** and press <Enter> to confirm the installation.

Next, run the following command to update your virus definitions: **`sudo freshclam`**.

You can now run the **`clamtk`** command in the terminal or open ClamTk from your list of installed apps. Click the *Preferences* button and enable the *Scan all files and directories in a directory* option.



Select Recursive Scan while ClamTk is open.

Click the *Scan* option on the menu at the top of ClamAV's screen and select *Recursive Scan*. Select your Windows drive in the sidebar and click *OK*. ClamTk should scan every file on your Windows drive with the ClamAV antivirus engine.

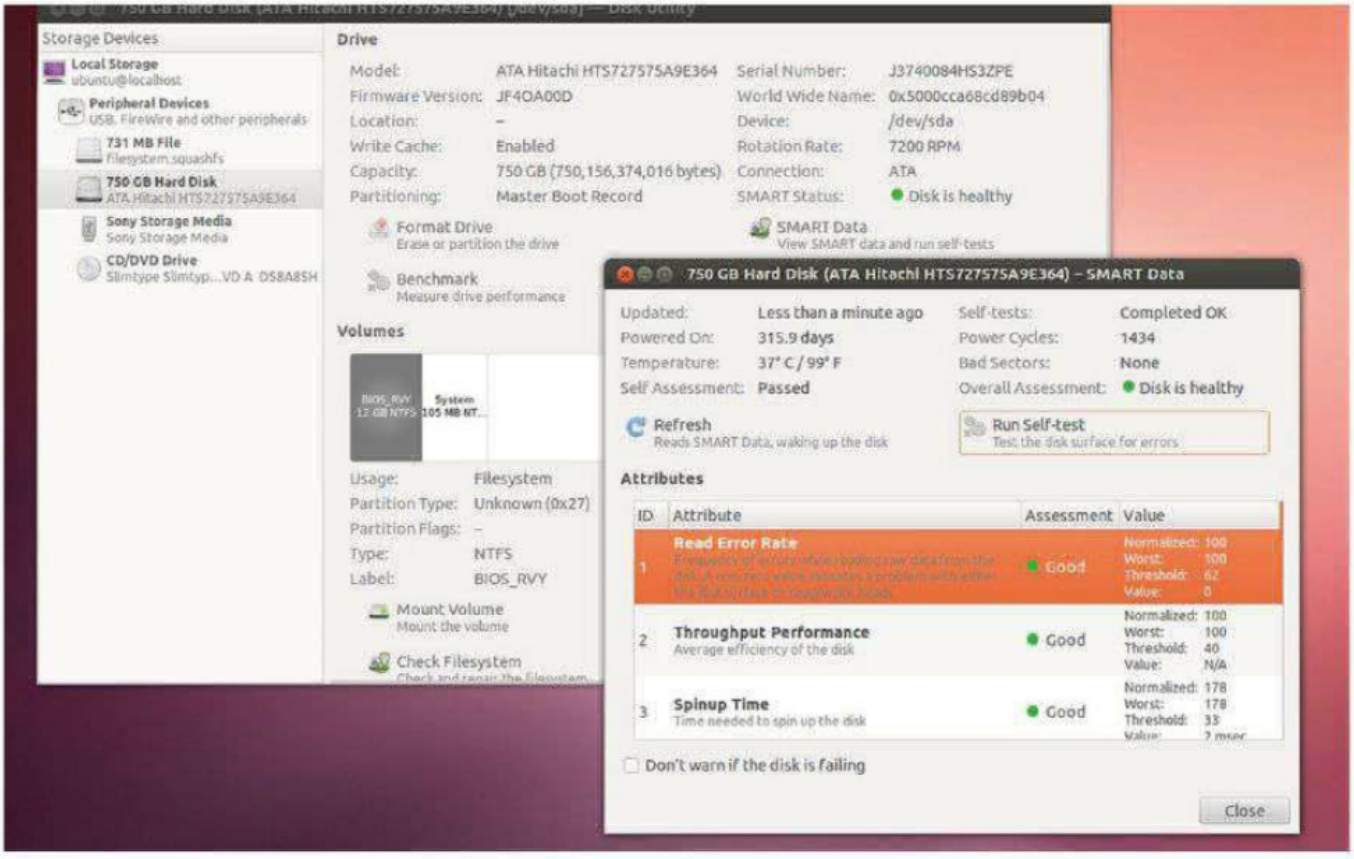
Give your hard drive a check-up

The SMART status monitor allows a failing hard drive to warn you before it goes down in flames. To check a drive's SMART status, click the Ubuntu icon at the top-left corner of your screen, search for Disk Utility, and press <Enter>. Select your Windows drive and look next to SMART Status. You can click the *SMART Data* button to see more details and perform self-tests.

SMART isn't perfect. A drive may report that everything is fine when it's actually failing, or it may register a serious problem and then work fine for months. But if you see a serious warning, you should replace the drive as soon as possible.

Test your RAM

Ubuntu includes the memtest86+ memory-testing utility (go.pcworld.com/memtest). If your RAM has a problem, memtest86+ will detect it. RAM problems can lead to application crashes, file corruption,



Checking your disk drive's health is the smart thing to do.

and the dreaded blue screen of death.

Restart your computer if you're already at the Ubuntu desktop. When Ubuntu starts booting, repeatedly press <Escape> to see the normally hidden boot menu. Select *Test Memory* to launch memtest86+.

After a successful batch of tests (a pass), you'll see the message "Pass complete, no errors, press Esc to exit." You can then exit memtest86+ or allow it to perform multiple passes. If you see an error, you likely need to replace a RAM stick.



You want the Test Memory option.

You can do a lot with that itty-bitty Ubuntu drive (go.pcworld.com/linuxlive). PCWorld's Ubuntu guide (go.pcworld.com/ubuntuguide) can tell you more about the operating system's ins and outs.

Mean and green: How to build a quiet, efficient gaming PC

BY MARCO CHIAPPETTA



The fully assembled rig has room to spare for future upgrades, in terms of both physical space and available power.

EVERY GAMING ENTHUSIAST wants a killer PC, but high-performance rigs tend to be big, hot, loud—and suck up power like a thirsty teen chugging Kool-Aid.

These days, though, CPU advances allow you to configure a fast system that's whisper quiet and power efficient—and you don't have to break the bank. Here's how we did it.

Picking the parts

Two factors drove our selection: power requirements and noise. Typically, components that consume less power require less cooling, and hence generate less noise. Opt for low-power parts wherever possible.



The NXZT H230 enclosure has sound-dampening side panels.

The case: We also wanted an enclosure designed for quiet. We chose the NXZT H230, an unassuming midtower with a couple of low-noise cooling fans and sound-dampening side panels, for just under $60. The H230 has mounts for three fans, so we picked up an extra 120mm fan from Fractal Designs to maximize airflow.

The processor and cooler: Intel's Haswell-based 4th-generation Core processors are both fast and power-friendly. We decided on the $220 Core i5-4670.

To control noise, we decided to cool the CPU passively, using a larger heat sink in place of a dedicated fan. We chose a well-priced $40 Xigmatek Prime SD1484.



The Xigmatek Prime SD1484's big heat sink runs very quietly.

The motherboard and RAM: We also wanted a high-quality motherboard with passive cooling—again, to reduce noise. The $160 Gigabyte Z87X-UD3 fit the bill.

Next we selected a low-voltage dual-channel DDR3-1600 8GB memory kit; 1600MHz is the highest officially supported memory



The ideal gaming PC has a whisper-quiet SSD.

frequency for Haswell processors, and 8GB is plenty for most folks. An $85 G.SKILL Sniper 8GB kit required only 1.25V of power, instead of the more typical 1.5V.

Silent, speedy storage: Choosing an SSD for this build's storage was a no-brainer, though our pick, a 1TB Crucial M550, was the most expensive single component at $530. Solid state drives have no moving parts, so they make less noise and consume less power—plus they're fast.

The graphics card: We went with Nvidia's power-efficient Maxwell microarchitecture, available in the recently released $175 EVGA

System Cost Breakdown

CPU: Intel Core i7-4670	**$220**
CPU cooler: Xigmatek Prime SD1484	**$40**
Motherboard: Gigabyte Z87X-UD3	**$160**
Memory: G.SKILL Sniper 8GB (4GB by 2, low-voltage DDR-1600)	**$85**
Storage: Crucial M550 1TB SSD	**$530**
GPU: EVGA GeForce GTX 750 Ti FTW with ACX cooling	**$175**
Power Supply: EVGA 430W 80 PLUS Certified	**$40**
Optical drive: Samsung DVD-R	**$20**
Chassis: NZXT H230	**$60**
Fan: Fractal Design Silent Series R2 120mm	**$12**
Operating system: Windows 8.1 OEM	**$99**

Total cost: $1441

BOTTOM LINE:

At over $1400, this system isn't cheap, but you could save a significant amount by opting for a smaller SSD, a cheaper motherboard, stock cooling, and a previous-generation graphics card.

GeForce GTX 750 Ti FTW with ACX cooling, featuring two oversize but quiet fans. We overclocked the card to goose performance.



The Nvidia GTX 750 Ti graphics card is quiet, sips power, and supports 1080p gaming.

The power supply: Our CPU and GPU combined required less than 150 watts, so we settled on a 400- to 500-watt supply with a large, quiet cooling fan. The EVGA 430W 80 PLUS Certified unit, for under $40, left room for future upgrades.

Putting it all together: Assembling this system was a cinch. The CPU, GPU, and RAM only fit in their respective sockets or slots one way, so you can't do it wrong. The case accommodated our motherboard and drives, and had ample room for cables.

We also installed an intake fan at the front of the case, added the aftermarket cooler, and connected the cooling fans to the motherboard.

Follow our PC-building best practices (go.pcworld.com/pcbuild) and our guide on how to install a CPU cooler (go.pcworld.com/cpucooler), and you'll get it right the first time.

Routing cables behind the motherboard tray keeps the look clean.



Testing the sound of silence: We tested the system's performance, while monitoring its power usage and noise output. Overall performance was quite good. The relatively fast CPU, discrete graphics card, and SSD pushed the system's PCMark 7 score well over 7,200 points, easily trumping our recent Steam Box (go.pcworld.com/steambox) and upgrade test builds (go.pcworld.com/upgradeboost).

Custom Gaming PC
Performance Tests

PCMARK 7	
PCMark score	7242
System storage score	5129
CINEBENCH R15	
CPU	575 CB
OpenGL	122.92 fps
3DMARK FIRE STRIKE	
3DMark score	4264
Graphics score	4712
LOST PLANET 2 (DIRECT X 11)	
Test B (1088p, HQ, 4XAA)	50.4 fps
BATMAN: ARKHAM ORIGINS (DX11)	
Built-in benchmark (1080p, HQ, 4XAA)	72 fps

HIGHER IS BETTER. CB = CINEBENCHMARK UNITS. FPS = FRAMES PER SECOND.

These benchmark tests revealed our gaming rig to be a very good performer thanks to its fast CPU, discrete graphics card, and solid-state drive.

Scores in 3DMark's graphics test and Cinebench R15's CPU and GPU benchmarks were also good, particularly in the OpenGL test. The system handled 1080p gaming well. Best of all, it remained quiet regardless of the workload.

The power consumption numbers are impressive in light of the system's performance. Even under load, it peaked at 144 watts.

While our system isn't cheap, it's fast, quiet, and power-friendly—putting a green sheen on the need for speed.



Use Word's style sets to give your documents a makeover

BY HELEN BRADLEY

YOUR WORK IN Word—whether it's a presentation or a poem—may be great, but it won't stand out if you stick with a dull gray sea of Calibri 11 text, Word's default style.

Check out Word's style sets under the Design menu. Styles allow you to format text with one click, navigate a long document, create a table of contents or a PowerPoint slideshow, or wrangle an unruly outline. Set up your own styles for a unique look—and watch your ideas shine.

Select some text and click a style name to apply that style's formatting.

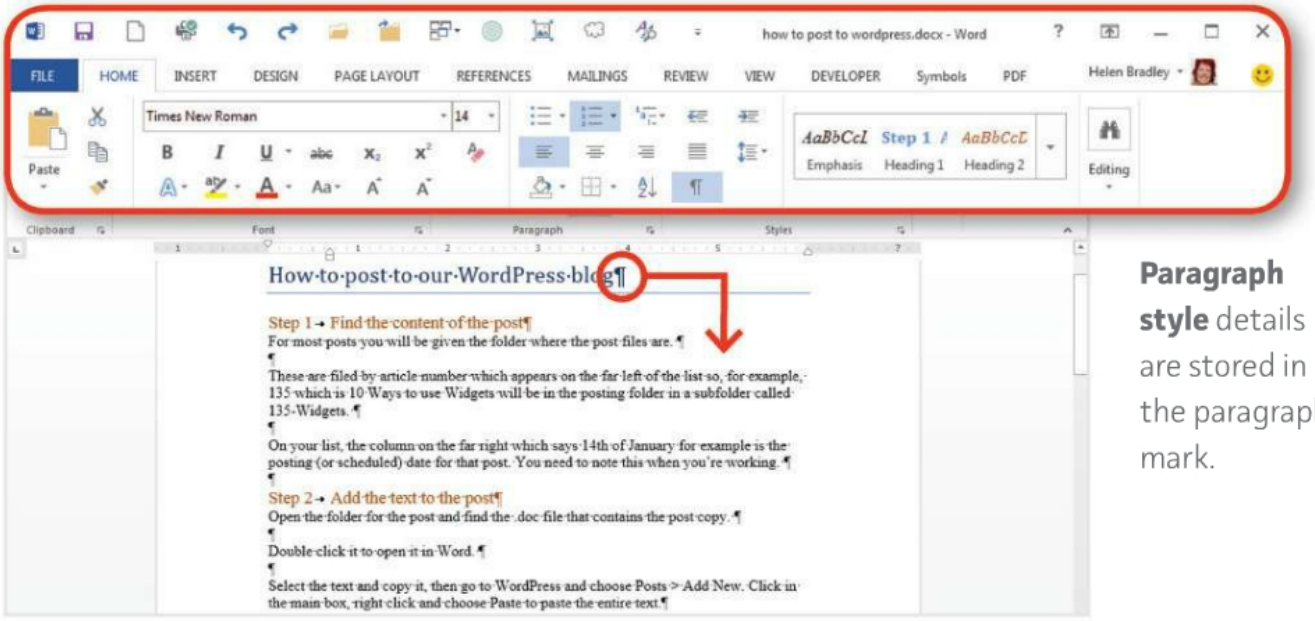
Character styles

Character styles combine text-formatting options such as font face and size, color, bold, italics, underline, shading, and borders into

preset designs. For example, the Emphasis style applies italics to your chosen font, while Intense Emphasis formats text in italics with a blue accent color. To apply a character style, select some text, and then click the style name in the Styles gallery, located in the Home toolbar.

Paragraph styles

Paragraph styles include all the text formatting options in character styles, and also control settings such as text alignment, line spacing, tab stops, and borders. To apply a paragraph style, either select one or more paragraphs or place the insertion point inside a paragraph (without selecting any text), and then click the style name.

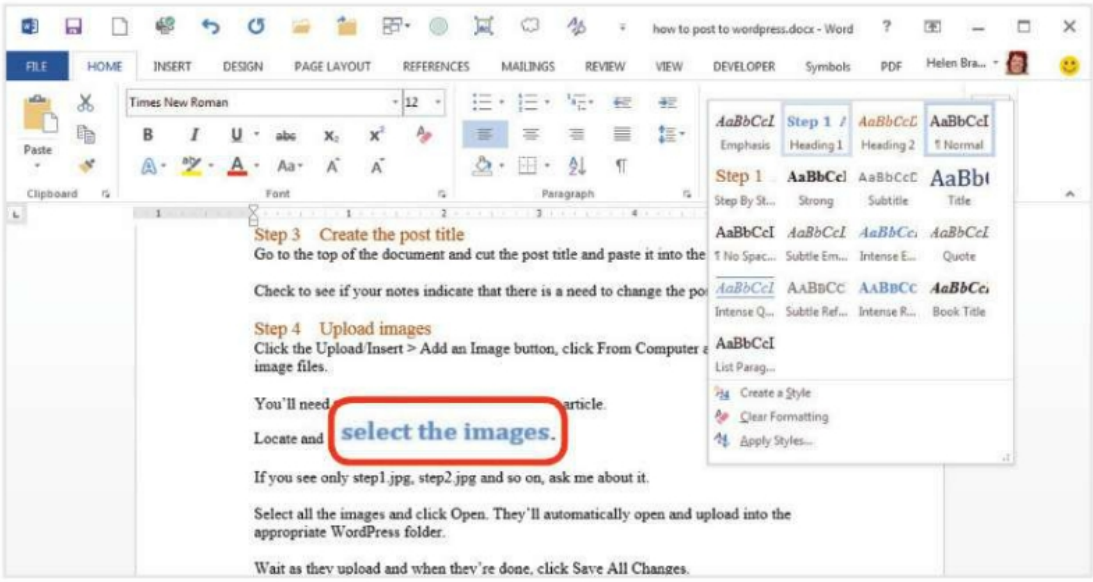


Paragraph style details are stored in the paragraph mark.

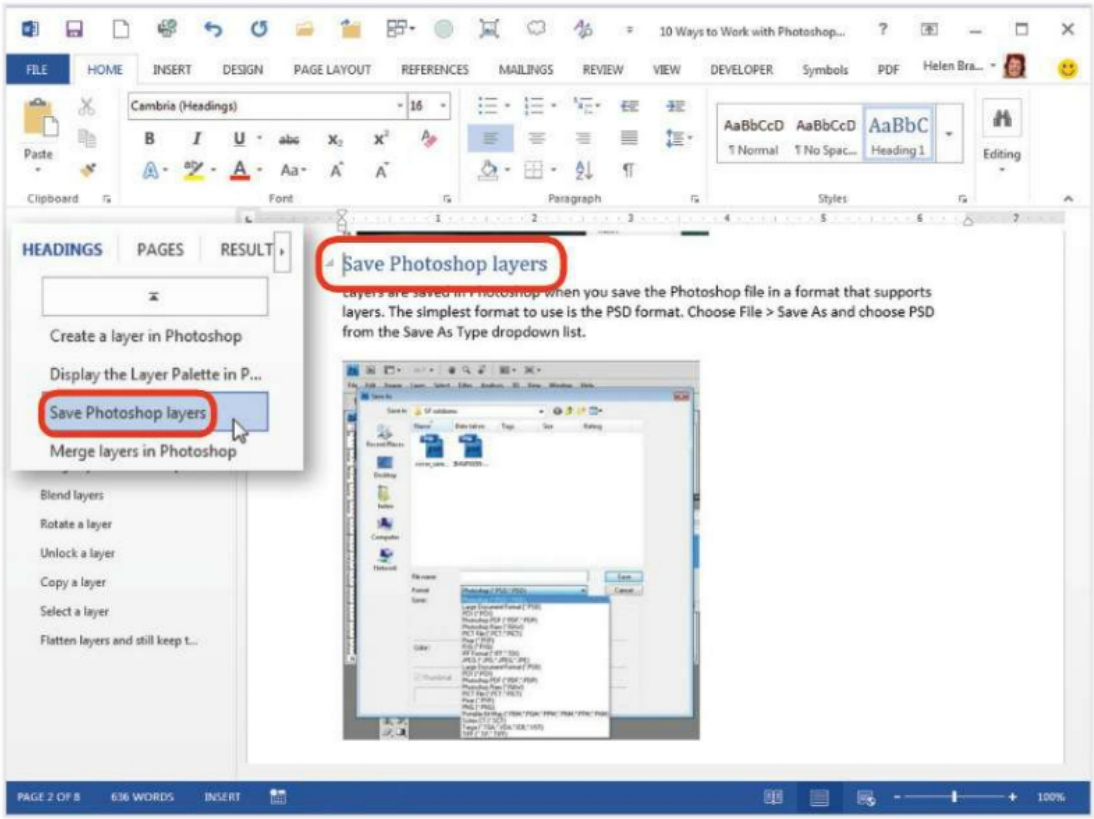
The details of the currently applied paragraph style are stored in the paragraph mark at the end of that paragraph. (To view paragraph marks, click the Show/Hide ¶ button on the Home tab.) If you delete a paragraph mark, that paragraph merges with the next one, and the newly merged passage takes on the style of the first paragraph.

Linked styles

A *linked style* can behave like either a character or a paragraph style. If you apply a linked style to a paragraph, it formats the entire paragraph,



If you use a linked style on selected text, it applies only character formats, not paragraph settings.



Use the built-in heading styles to navigate a long document more easily.

but if you apply it to selected text, it affects only that bit of text.

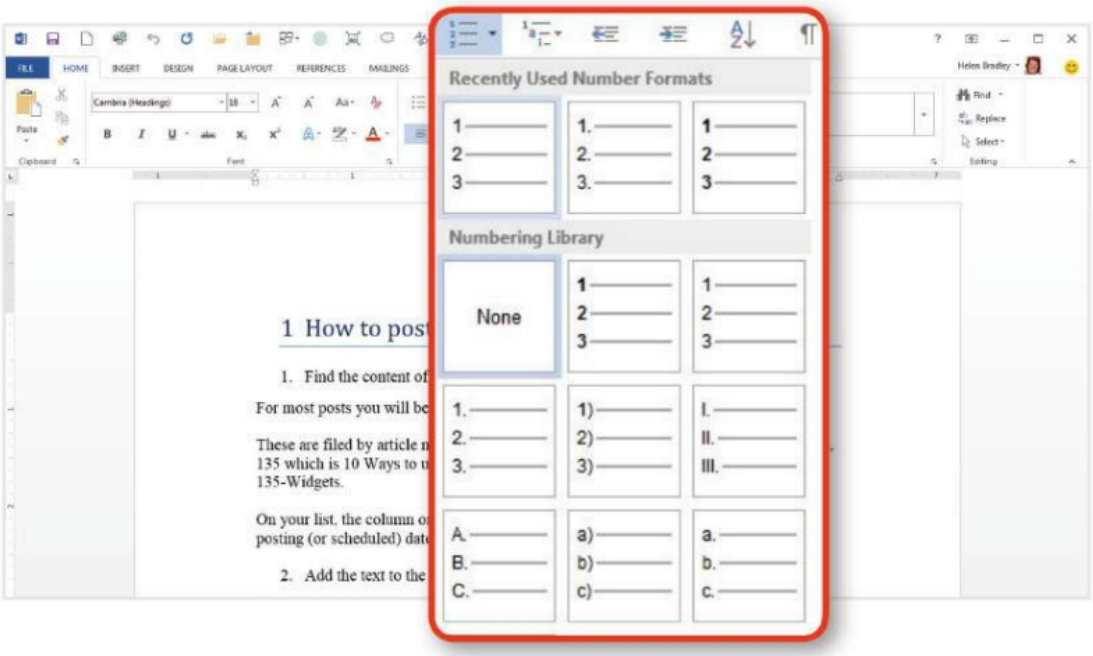
The most powerful linked styles are Heading 1, Heading 2, and Heading 3, which can structure a complex document, as well as jump-start the creation of a table of contents. Just choose *References* ▸ *Table of Contents* and click one of the automatic tables.

You can also use headings to navigate a document. In Word 2010 and 2013, choose *View*▸*Navigation Pane* and click *Headings*. Click any of the headings to move to that place in the document.

Heading styles also provide a shortcut for setting up PowerPoint presentations. Create the slideshow content as a Word document, and format slide titles as Heading 1 and bullet points as Heading 2. Save the Word file, and then open it in PowerPoint, which will create the slides automatically for you.

List styles

List styles format simple and multilevel lists with a numbering scheme, bullet style, and indentation. To apply a list style, select your text and choose either Bullets or Numbering from the Paragraph group on the Home tab.



Apply list styles using the Numbering or Bullets options on the Home tab.

Table styles

Table styles govern the look of fonts, alignment, borders, and shading in Word tables. Click inside a table, choose *Table Tools*▸*Design*, and select a table style. The additional options at the far left of the ribbon apply special formatting to parts of the table, such as the header row or first column.

Style sets

Style sets, located in a visual gallery on the Design tab in Word 2013, offer preset combinations of character, heading, and paragraph styles. They're great for formatting an entire document all at once rather than piecemeal. To weigh your options before you commit, hover over a selection in the gallery for a preview.



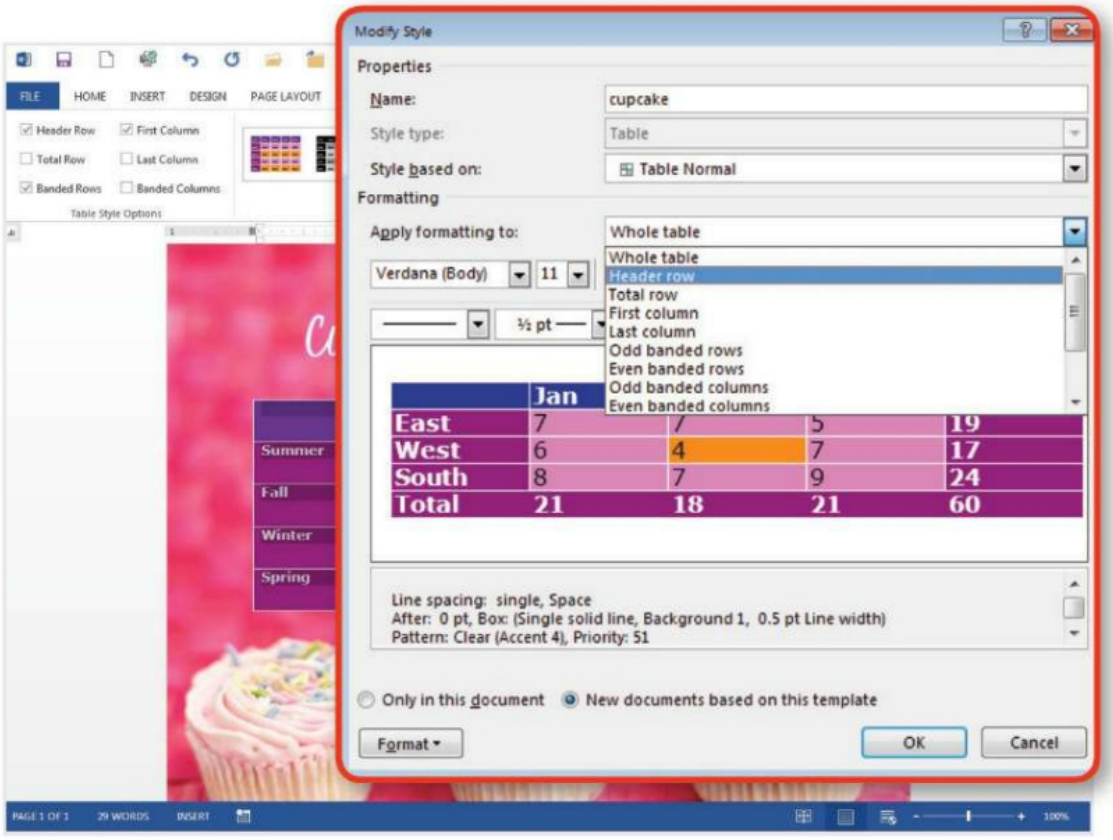
The style sets in the Document Formatting gallery control the document's overall look.

Change styles

To edit a style, right-click it in the style gallery and choose *Modify*. The Modify Style dialog box lets you change the character and paragraph formats associated with that style. Changes apply to all instances of that style in your document.



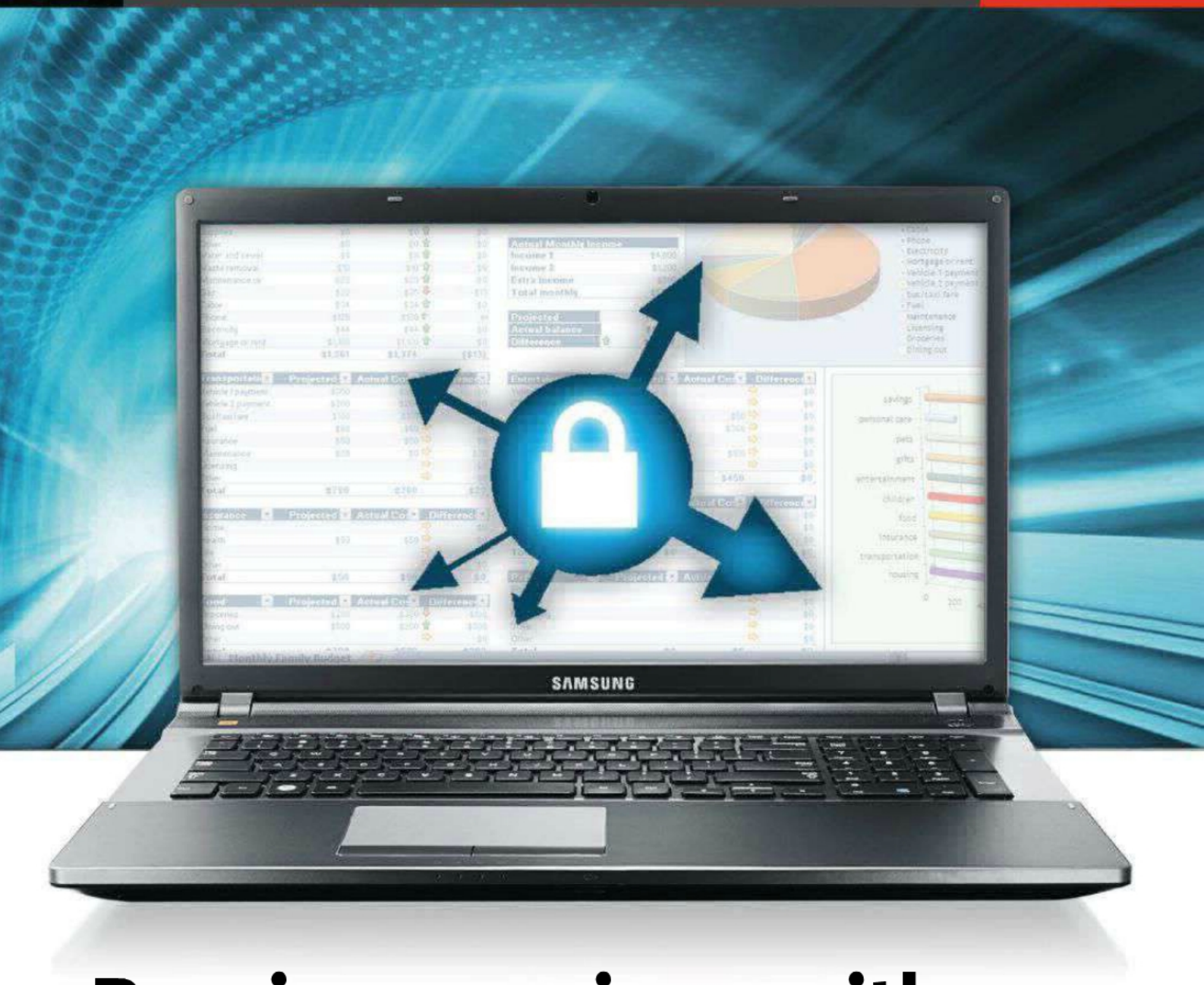
Options for modifying a style range from simple text formatting to complex numbering.



You can modify a built-in table style to change the formatting of a table.

You can change table styles, too. Click inside a table, choose *Table Tools* ▸ *Design,* and open the *Table Styles* gallery. Click *Modify Style,* choose an area of the table from the Apply Formatting To drop-down list, and configure the formatting. Repeat for other parts of the table, and then click *OK* to finish.

Style sets require minimal effort and help you present your ideas with greater clarity and sophistication. They also ensure consistent document formatting—especially important when you're collaborating with colleagues.



Regain your privacy with three browser add-ons

WITH SO MANY advertisers, social networks, and other companies interested in your data, it's pretty hard to maintain any privacy online these days. But some useful tools can help you shake those trackers off your tail.

These three extensions encrypt your connections to websites, prevent companies from tracking you, and erase data cached in your browser.

HTTPS Everywhere

(Chrome, Firefox, Opera)

Many popular sites and services—including Facebook, Google, and Twitter—automatically encrypt browsing sessions with HTTPS (indicated by a lock icon next to the URL). But a lot of sites that support HTTPS don't enable it by default.

That's where HTTPS Everywhere comes in (go.pcworld.com/httpseverywhere). Created by the Electronic Frontier Foundation (EFF), a digital advocacy group, HTTPS Everywhere forces your browser to use HTTPS encryption if the website makes it available. Just install the extension and let it work its magic.

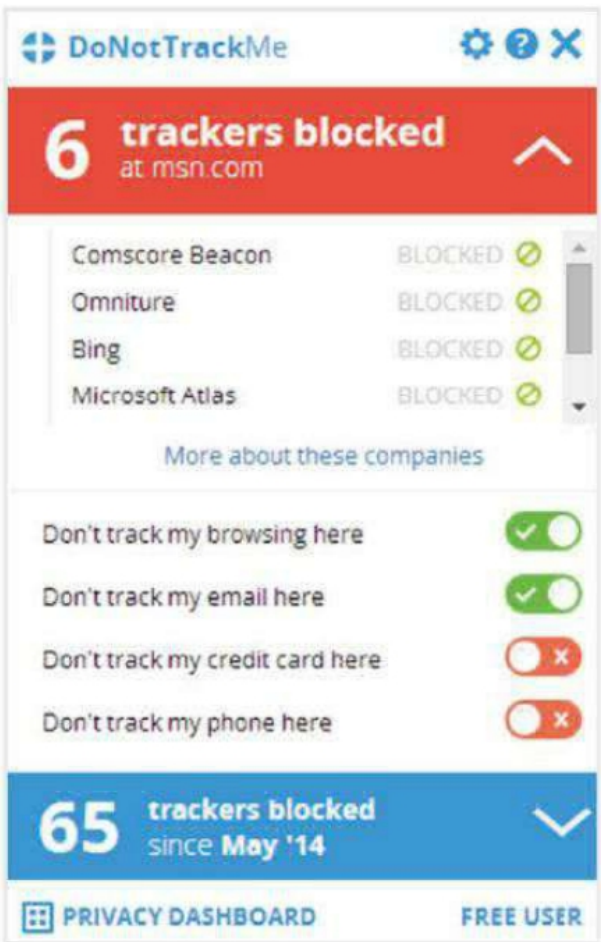
Abine DoNotTrackMe

(Chrome, Firefox, Internet Explorer, Opera, Safari)

First introduced in 2011, Abine's DoNotTrackMe (abine.com) puts a halt to third-party tracking via cookies and other methods. Ad networks, social networks such as Facebook, and other data collection outfits employ these tracking techniques. Abine says that DoNotTrackMe has blocked over a trillion attempts to track users since its introduction.

Using DoNotTrackMe is easy. Just install it in your browser, and the extension keeps a running total of the number of cookies it has blocked on each site.

If you create an account with Abine and are willing to pay $5 per month, you can also use the extension to protect your email address, phone number, and credit card number when filling out Web forms (go.pcworld.com/donottrackme).



DoNotTrackMe protects you from third-party online tracking.

The downside is that you ultimately have to put your trust in a private, for-profit company. The EFF is working on a similar extension called Privacy Badger (go.pcworld.com/privacybadger), which is currently in alpha, but you can try it out if you don't mind encountering occasional bugs.

Click&Clean

(Chrome, Firefox)

Click&Clean takes privacy to a whole new level by offering one-click erasure for your browser cache, download and browsing history, temporary Internet files, cookies, and flash cookies.

Click&Clean is not a set-it-and-forget-it extension. Mixesoft, the company behind Click&Clean, recommends reading the quick-start guide (go.pcworld.com/clickcleansg), and you may have to configure the extension's settings so it erases everything you want it to. But once you have it up and running, Click&Clean is very easy to use.

These three tools provide a good starting-point for closing the prying eyes of invasive trackers. Also check out PCWorld's guide to browser extensions (go.pcworld.com/browserext).



Click&Clean wipes out all your cached browsing activity with one click.





Why you can trust (some) free software

Q: **IS IT SAFE** to use free software? What do the software authors get out of it?—*Jeanne Light*

A: It's good to be skeptical—and careful. Free products often come with strings attached. But if you pay attention and listen for the right recommendations, you can get some excellent software for free.

There are some perfectly good reasons why an individual programmer, a programming collective, or even a for-profit company would let you use the fruit of its labor without getting paid.

The free version of a program is often a marketing tool for the paid version. The company gives away a stripped-down version of its product, which can build word of mouth that

helps sell the paid "Pro" version.

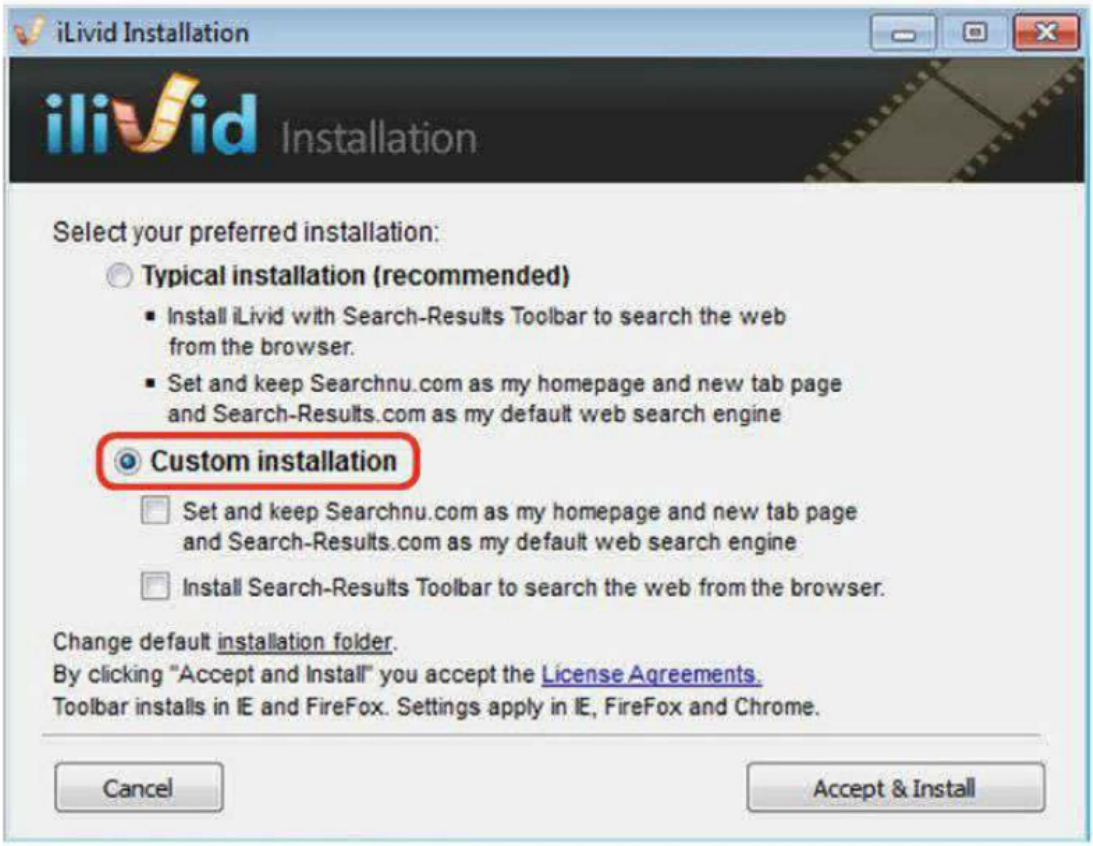
That Pro version will have features the free one lacks—features that many users can do without but others need. For instance, only the paid version of EaseUS Todo Backup (go.pcworld.com/todobackup) can password-protect your backups. And the free version generally comes without tech support. Also, many companies offer the free versions only for home use. Businesses have to buy the Pro version.

Some people actually do create free software for altruistic reasons.

Free software can also produce income through advertising. However, this "advertising" can cross the line to become more like malware.

The worst such advertising caches itself within the installation routine. If you don't take care when you walk through the installation wizard, you'll install two or three programs you don't want in addition to the one you do.

Many people regard these potentially unwanted programs, or



Always opt for the custom installation.



Go through the options carefully, unchecking any software other than what you actually want.

PUPs (go.pcworld.com/pups), as malware. The trick to avoiding PUPs is simple: Never use the default installation. Always run the custom installation.

Finally, some people actually do create free software without expecting to get money back. Some do it for altruistic reasons, believing that the world will be a better place if their program is widely available. Others do it as a hobby. Steve Miller (stevemiller.net), whose PureText utility I would hate to be without (go.pcworld.com/puretext), told me, "The apps on my personal site are written purely for fun."

Send your questions to answer@pcworld.com.

Tech Spotlight

A video showcase of the latest trends



Watch the video at go.pcworld.com/ubr1

The UBR-1: A people-friendly robot

» Unbounded Robotics' four-foot-tall robot (unboundedrobotics.com) has a motor-assisted, programmable arm that allows it to interact safely with people. The UBR-1, which runs a version of Ubuntu Linux and the Robot Operating System, will be able to assist with tasks in a partially automated manufacturing environment, such as a warehouse or factory. The company expects to start shipping the robot to customers in August.