

# PC MAGAZINE

**INSIDE USB  
3.1 AND  
USB-C**

**THE GAMING  
HARDWARE  
OF 2015**



# FIGHT OF THE FLAGSHIP PHONES >>>



**COVER STORY**

**THE FIGHT OF THE FLAGSHIP PHONES**

The Samsung Galaxy S6 and HTC One M9 represent the state of the mobile art. But how do they stack up against each other—and Apple's iPhone 6?

**FEATURES**



**GAME ON!**

Diverse, forward-thinking hardware means that 2015 could be an exciting and innovative year in gaming.



# REVIEWS

## CONSUMER ELECTRONICS

Samsung NX1

Sony MDR-1A

## HARDWARE

HP Spectre x360 13t  
(13-4003)

Digital Storm Eclipse

LulzBot Mini 3D Printer

Linksys AC3200 Tri-Band Gigabit Smart Wi-Fi Router EA9200

## SOFTWARE

CrashPlan

Sticky Password  
Premium



Samsung NX1



HP Spectre  
x360 13t

LulzBot Mini  
3D Printer



# WHAT'S NEW NOW



Apple MacBook  
with USB 3.1

## USB 3.1 AND USB-C MEAN MORE POWER IN MORE WAYS

The new USB 3.1 protocol and USB-C plug and cable specification represent a major step forward for computer connectivity.

## FOR SECURITY, BITDEFENDER THINKS OUTSIDE THE BOX

The Bitdefender Box is a new piece of hardware that's designed to protect every Wi-Fi device on your network.

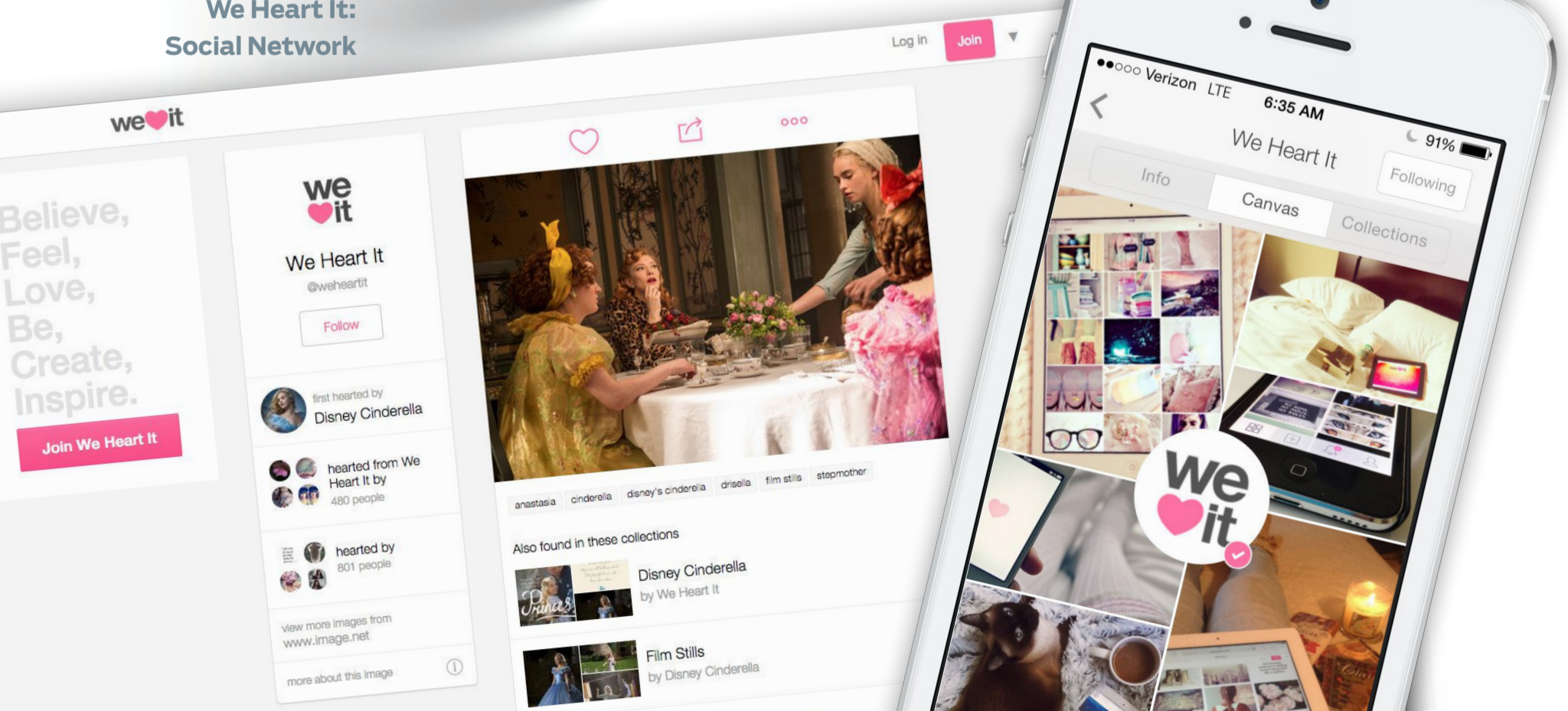
## THE SOCIAL NETWORK THAT TEEN GIRLS LOVE—AND COMPANIES COVET

We Heart It just might be the most popular social network you've never heard of. And major brands are taking it seriously.

### TOP GEAR

### LAUNCH WINDOW

We Heart It:  
Social Network



# OPINIONS

**DAN COSTA**

First Word

**READER INPUT**

**SASCHA SEGAN**

Who Will Buy the \$10,000  
Apple Watch?

**JAMIE LENDINO**

Windows 10 for Phones  
Is Dead Before It Arrives

**DOUG NEWCOMB**

Don't Believe the Car  
Hacking Hype



**Apple is  
very limited  
in what it  
has to offer.**



**JOHN C. DVORAK**  
Last Word

# DIGITAL LIFE



## GET ORGANIZED

Organize Everything You Want  
to Read Online

## TIPS

Master Microsoft OneDrive

## HOW TO

Run Windows 10 in a  
Virtual Machine

## TECH ETIQUETTE

Ask Alex: Self Stick Shaming



## Spring Is New Product Season

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**S**pring is a wonderful time for the technology industry. While the business guys are totaling up their holiday sales, the product guys are busy releasing the things that will shape the industry in 2015. We're only a few months into the year, but there have already been some huge product launches. Two of the most significant provide the basis for our cover story: the Samsung Galaxy S6 and the HTC M9.

Both handsets debuted in Barcelona at Mobile World Congress, the largest technology show in the world outside of CES. The mission for both LG and Samsung is pretty simple: Build a flagship Android phone that can compete against Apple's iPhone 6, as well as against increasingly sophisticated devices from vendors like Xiaomi, ZTE, and Huawei. *PC Magazine* went to Barcelona to spend some time with both devices before they hit U.S. shelves with force soon (not long after you read this, in fact).

We were also able to get our hands on the new Apple Watch. It was announced last year, but Apple's recent press event was the first time anyone had been able to play with one that was fully operational. Apple is betting it can make a smartwatch that people actually want to buy, despite that fact that Sony, Samsung, and pretty much everyone else has already tried and failed. So who exactly is going to buy one of these? Our lead mobile analyst, Sascha Segan, has a few ideas.

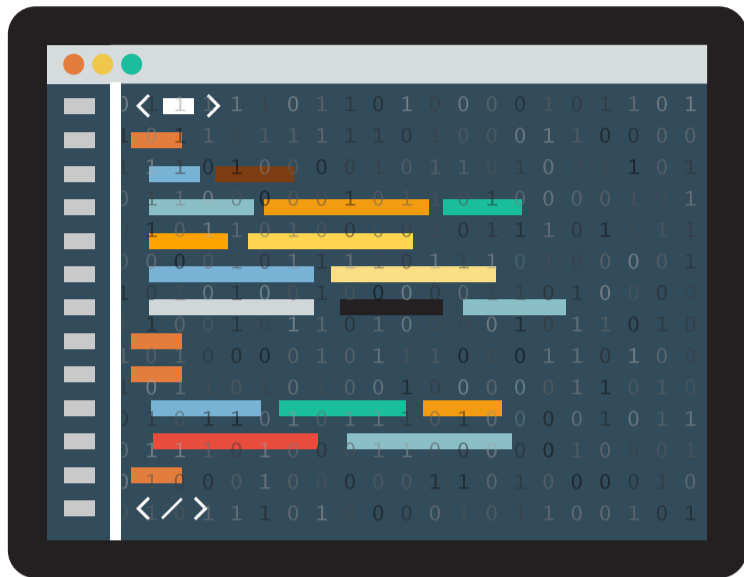
Of course, there have also been some new developments in the traditional PC space. In this issue we benchmark the latest hybrid laptop from

HP, the Spectre 13t. With an all-metal construction and impressive performance scores, the Spectre shows that Windows systems can be just as flashy as their MacBook Air competitors. Although, having devoted some time in Cupertino to Apple's upcoming 12-inch MacBook, the goalposts may be about to move again. (We'll find out for sure when we review that next month.)

Finally, let me take this opportunity to plug *PC Magazine's* social feeds. As a subscriber, you're among our most valuable readers, so you can always email me your questions and concerns about the issue, or really anything else. I try to answer every email I receive, but it's impossible to get to all of them. For a faster response, hit us up on Facebook, Twitter, and Instagram, where you can also connect with other *PC Magazine* subscribers. You are a pretty special group of folks.

A handwritten signature in black ink, appearing to read 'Dan Costa', with a stylized, cursive script.

[dan\\_costa@pcmag.com](mailto:dan_costa@pcmag.com)



## Logic Gates

Hi there. I would like to know the differences between computer science and computer engineering. Can you help me?

—Andres Melendez

### OUR ANSWER:

Thanks for writing, Andres. The two fields differ in a few key ways, though they're both closely related.

Computer science is typically concerned with data: how it's processed, how it's interpreted and communicated, how it's stored, and how it's secured. Think of it more as being based in theory, as it deals a lot with things like architecture, instruction designs, software programming, database organization and modeling, and even artificial intelligence.

On the other hand, computer engineering is, well, engineering. It focuses more on the practical, hardware side, exploring the function and design of processors and other components, how they interface with each other (and with data) electrically, and so on. It essentially puts the theories of computer science into practice using the tools of electrical engineering. That means some familiarity with both is necessary in studying computer engineering (and will probably be required in most university programs).

Computer science and computer engineering overlap in other ways, too. A strong background in calculus, data analysis, and discrete mathematics will help with both, for example, as will the basics of problem solving, programming, and data structures and algorithms. And if you pursue a career in either, the other will almost certainly factor in whatever work you do.



Their most important similarity, though, is that they're both important, and as technology is further integrated into our lives, they will only become more so. Figure out whether you prefer working with the theory and implementation of data or hardware, and you'll know which path is better for you.

—Matthew Murray, *Managing Editor of Digital Editions*

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## HACKER TRACKER BACKER

Regarding your [February 2015] question if any readers of *PC Magazine* have ever seen a good hacker movie: Yes. As you can see, 1999 was a particularly good year—only fitting because it was the eve of “Y2K” fear-mongering: *Tron* (1982, IMDb rating of 6.8), *WarGames* (1983, 7.1), *eXistenZ* (1998, 6.8), *The Matrix* (1999, 8.7), *The Thirteenth Floor* (1999, 7.0), *Pirates of Silicon Valley* (1999, 7.2), *Enigma* (2001, 6.4), *Minority Report* (2002, 7.7), *Transcendence* (2014, 6.3), *The Imitation Game* (2014, 8.2).

—“Anonymous”

### OUR ANSWER:

Terrific list there. I'm ashamed that I forgot *WarGames*—one of my favorite movies of the 1980s, as well as one that helped get me interested in computers. (Aside from the chilliest portions of its Cold War plot, it still holds up well today.) I'm not sure that *The Matrix* really counts as a “hacker movie,” though, at least not in the traditional sense; it's always struck me more as a philosophical action flick, but there's of course room for interpretation.

After *PC Magazine* Editor-in-Chief Dan Costa asked about hacker movies, *Blackhat*, the film that inspired his question, bombed big-time at the box office. But the critical and popular success of the Alan Turing drama *The Imitation Game*—to say nothing of its many nominations and awards (including an Oscar for Best Adapted Screenplay)—has shown that the genre still has plenty of life in it, so we'll all undoubtedly have more opportunities to add to our own lists.

—MM

## Ask us a question!

Have a question about a story in *PC Magazine*, one of the products we cover, or how to better use a tech product you own? Email us at [letters@pcmag.com](mailto:letters@pcmag.com) and we'll respond to your question here. Questions may be edited slightly for content and clarity.



# What's New Now

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**LAUNCH WINDOW**

# USB 3.1 and USB-C Mean More Power in More Ways

BY JOEL HRUSKA AND  
MATTHEW MURRAY



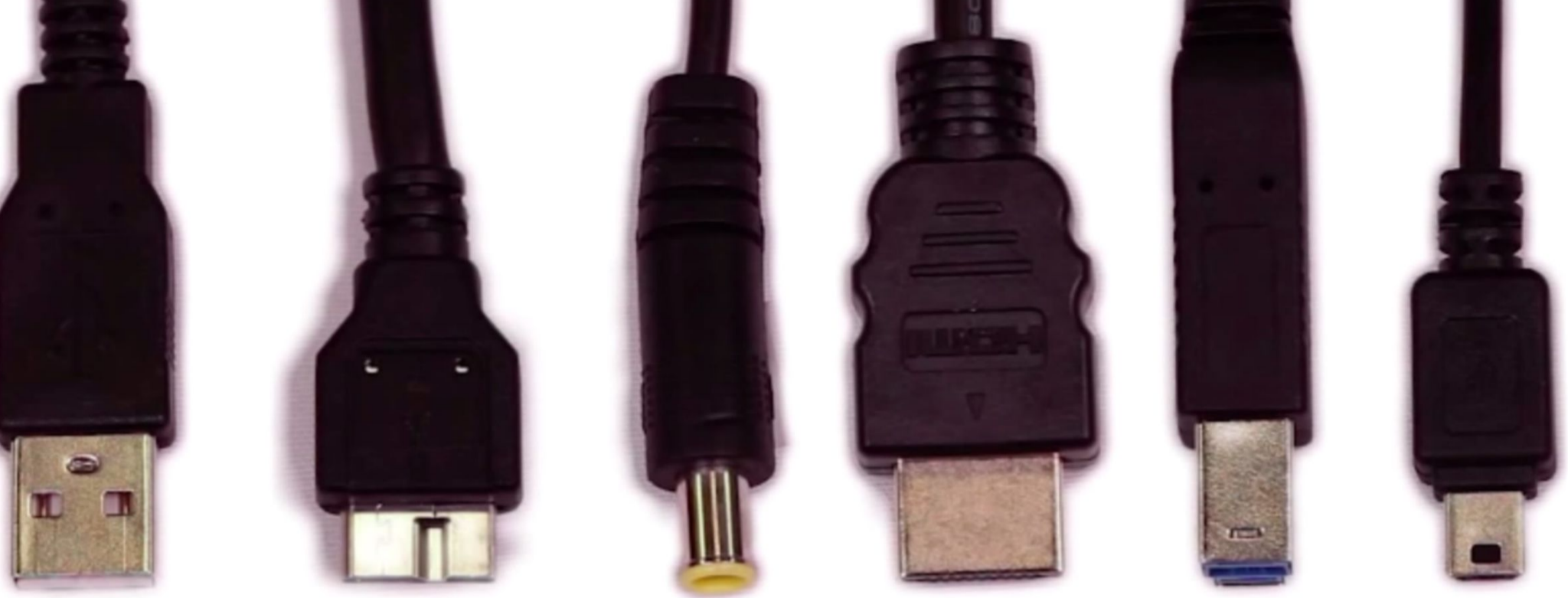
**I**t may seem as if hardly any time has passed since USB 3.0 became the technology industry's interface standard, but its replacement has already arrived. USB 3.1 increases transfer speeds to as high as 10Gbps, comparable with the first-generation Thunderbolt standard (and fully twice that of USB 3.0).

If USB 3.1 is destined to soon become a major force on computers and other devices everywhere, the accompanying USB-C connector and cable specification, which has made its first major public appearances on Apple's recently unveiled MacBook and the Google Chromebook Pixel, could be even more important.

Although it's roughly the same size as the existing micro USB connector used on smartphones, USB-C has one major difference: It's reversible. And new cables with the USB-C connector at both ends finally give users the feeling that they are the ones in charge; you can finally just grab a USB cable and plug it in without wondering which end of the connector is up.

## ONE PROTOCOL TO RULE THEM ALL

Their features and expanded capabilities with throughput, power, convenience, and more make USB 3.1 and the USB-C cable standard ideal for next-gen ultrathin laptops like Apple's upcoming MacBook.



The USB-C connector, which has 18 pins, is essentially two USB 3.1 connectors (which have the standard four pins—if in a different position—plus five more to enable 10Gbps connections). If you plug the connector in one way, the top set of pins is used; if you plug it in the other way, the bottom set of pins is engaged. In addition, the USB-C connector supports the new USB Power Delivery 2.0 spec, which allows for up to 100 watts to be carried over a USB cable—that’s enough to charge a laptop or power most any peripheral, including a monitor.

As you’ve probably worked out, you sadly can’t plug a USB-C plug into an older USB socket—but it is possible to create a converter cable, and adapters (for example, from micro USB to USB-C) are sure to be common. The USB Promoter Group says the USB-C connector is rated to the same 10,000 cycles as micro USB.

The USB-C plug can be used with previous standards of USB, which means manufacturers don’t automatically have to adopt expensive 3.0 hardware if they want to include it in mobile devices. This is going to inevitably cause confusion. One reason the shift from USB 2.0 to 3.0 was relatively painless is because coloring both the cables and plugs bright blue made it impossible to mistake one type of port for the other.

The upside to decoupling USB 3.1 from USB-C, however, is that companies can deploy the technology

### UNIVERSAL USB

USB 3.1’s 10Gbps speed puts it on par with Intel’s Thunderbolt, and the new reversible USB-C plug is easier to use and can be adapted to any previous USB standard.



on mobile devices without needing to opt for interfaces that inevitably consume more power. Then again, some might argue that this would be a moot point; the USB controller can be powered down when it isn't active, and when it is active, the device should be drawing power off the PC or charging port anyway. Heat dissipation could theoretically remain a concern—higher bandwidth inevitably means higher heat, and in devices built to specifications of 3 to 4 watts, every tenth of a watt matters.

We're guessing that USB 3.1's 100-watt power envelope will actually be of more practical value than the 10Gbps bandwidth capability. Although it's true that USB 3.1 will give external SSD enclosures more room to stretch their legs, the existing standard still allows conventional mechanical drives to run at full speed while SSDs can hit about 80 percent of peak performance for desktop workloads. It might not be quite as good, but it's a far cry from the days when using USB 2.0 for an external hard drive was achingly slow compared with SATA.

The ability to provide 100 watts of power also means that nearly every manufacturer may finally be able to ditch clunky power bricks. There could still be concern about ensuring that connect points are sufficiently reinforced, but if that's addressed, the vast majority of laptops could switch over to the new standard, just as the MacBook and Chromebook Pixel already have. Hard drives and other external peripherals could all be powered by single wires, as could USB hubs for multiple devices.

As for competition with Intel's Thunderbolt, USB 3.1 will continue to lag Intel's high-speed standard, but as bandwidth rises this gap becomes increasingly academic. At this point, it's the features that USB doesn't allow, like RAID and TRIM, that matter more than the raw bandwidth does in most cases.



# For Security, Bitdefender Thinks Outside the Box

BY MAX EDDY AND FAHMIDA Y. RASHID



**B**itdefender has made its mark in the security industry with award-winning antivirus software for Windows, Mac, and Android devices. That's why we were surprised when the company's researchers sat us down late last year and told us it was getting into hardware. The result is the Bitdefender Box, a network device that promises to protect every single Wi-Fi-connected device in your home. As the Internet of Things (IoT) looms on the horizon, and our homes slowly fill with more and more smart devices, the Box might just be the future of security.

The Bitdefender Box costs \$199 and comes with one free year of protection. After that, protection costs \$99 per year for an unlimited number of devices. The Box isn't cheap, but it actually works out to be quite a bargain: Bitdefender Total

Security, for example, covers only three computers for \$89—and that doesn't include protection for mobile or IoT devices, either. Once you really start thinking about how many things connect to your Wi-Fi network, the Box looks like a sweet deal.

## HARDWARE

Extremely small and light, the Bitdefender Box measures 1.1 by 3.5 by 3.5 inches (HWD) and weighs a mere 3.25 ounces. Its white finish makes it look like something that would have rolled off Apple's production line, and that comparison is definitely intentional. Bitdefender says the Box is powered by a single-core 400MHz MIPS microprocessor, 16MB flash memory, and 64MB DDR2 RAM. There are two 10/100 Ethernet ports, a power port, and a reset button on the back. The wireless chipset supports 802.11b/g/n. We aren't talking top-of-the-line hardware here; it's just enough for what the Box has to do. The front LED glows teal when operating normally, and flashes teal during configuration, red if there's a problem, and white when the Box is updating.

## SETUP

Bitdefender told us that although the Box can function as a standalone router, its real strength is augmenting an existing Wi-Fi network. That way, you keep your router, and you won't have to update the password information for all of your associated devices. Simply plug the Box into your router via the included Ethernet cable, then plug the included USB cable and converter into any standard power outlet.



The Box requires very little power—we saw one connected to a portable rechargeable battery—so you could conceivably connect it directly to the regular, older USB port on your router or computer.

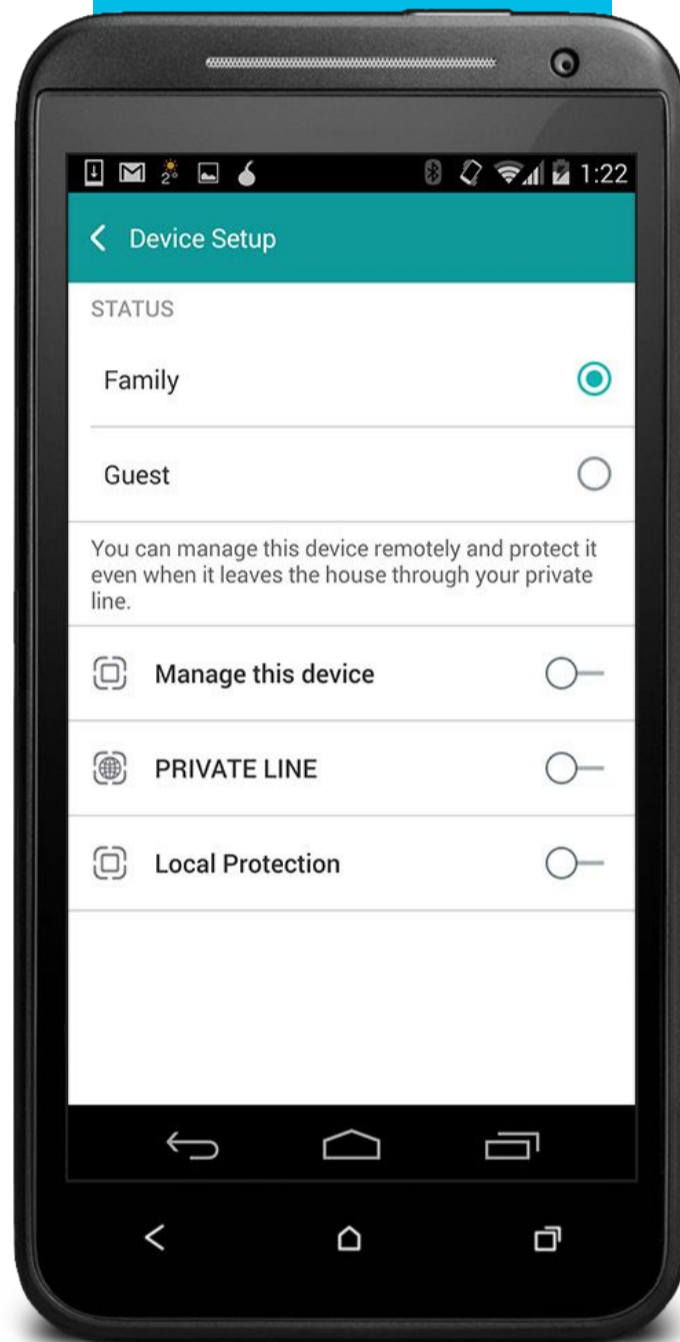
To set up the Box, download either its associated Android or iOS app (sorry Windows Phone owners; you're still protected, but your device can't be used to configure the Box) and create an account. If you already have a MyBitdefender account from one of the company's other products, you can just sign in with that. Bitdefender Box has a long list of supported routers; for those, the app will communicate through your Wi-Fi network and set up the Box automatically. If your router isn't supported, you simply enter your router's control panel and switch off DHCP. The Box should be able to take it from there. The company provides detailed manual setup instructions for different router models on the support page of its website.

Once activated, the Box app will populate with the devices on your network. For the average home with just a handful of devices, this will be a snap. For the super-geeky home with tons of devices, the procedure is a little more challenging.

Our network testing environment is powered by a Netgear Nighthawk router and only has a few devices on it, but even that was confusing. On the network tab of the app (the center one) you'll see your Family devices and your Guest devices. Anything that connects to your network will appear as a Guest in the app, identified by cryptic descriptors like "A smart TV" or "BLACKBERRY-B5D9." You can rename these devices, add images, and even associate them with contacts from your address book, but because Bitdefender doesn't show you the MAC or IP address, figuring out which device is which can be tricky.

## MOBILE SETUP

Use Bitdefender's mobile app to set up the Box, or sign into your preexisting account. You may run into trouble if there are a lot of devices on your network.







## PROTECTING EVERYTHING

The Box uses a tool similar to the super-fast, cloud-based malware detection engine that powers Bitdefender's Android offering to protect every device connected to your Wi-Fi network. This includes friends to whom you've given your Wi-Fi password. If something untoward happens regarding any of the connected devices, Bitdefender will block the threat and send you a message through the app.

For some devices, Box can do more. The app can trigger OS updates, install patches, and even let you perform basic cleanup actions for computers. You can also use the app to install a local agent to provide on-device protection for associated Windows, Mac, and Android devices. Think of it as “antivirus light,” to keep an eye out against infected USB drives or other offline attacks. In our testing, however, we weren't able to trigger the installation of the local agent.

For Mac, Windows, and iOS devices, the Box can provide extended protection through the Private Line feature. Using VPN technology, Private Line extends Box's malware protection to devices that are currently out of range of the Box's Wi-Fi network. No matter where the device is, or how it's connected to the Internet (whether by Wi-Fi or cellular), your traffic is routed through and protected by the Box.

When Bitdefender says that the Box protects every device, the company means *every* device: your printer, your desktop computer, your laptop, your sundry smartphones, your various tablets, your gaming consoles, your Nest smart thermostat, your smart fridge, your Philips hue lights, and so on. Many of these devices are completely closed to the user and can't have antivirus protection installed.



## A SMOOTH BOX WITH ROUGH EDGES

Few of us have fancy IoT devices, and few of us think we're living in smart homes as a result. But that discounts the array of connected devices that are already on your network. You may not have a smart fridge, but you probably have a router and a game system, and those things need protection. Not from hackers trying to burn down your house via your Nest, but to keep all those connected devices from becoming spam-spewing drones or anonymous nodes in a botnet.

The Bitdefender Box is the first product we've seen that actually tries to safeguard everything, including the devices of visiting guests. It's a completely new paradigm for how antivirus protection is packaged, deployed, and priced. Our contacts at Bitdefender hinted that small network devices like the Box, and not downloadable software, might be where security is headed. Given how much careful thought and work the company put into the super-sleek design of the Box, it's clear Bitdefender is betting on just that future.

Despite the polish and the paradigm shifting, however, the Box isn't perfect. We had trouble defining the devices on our network and deploying the local protection. As much as we like the Box app, we think a Web portal would make managing the device much easier. And Bitdefender faces an uphill battle explaining the Box to consumers who are probably only now coming around to the idea of antivirus protection for their phones, let alone their home networks.

Bitdefender impressed upon us that Box will grow and improve as more and more people use it. But given its potential, our expectations are high for it as an important first step toward the future of security.

# The Social Network That Teen Girls Love—and Companies Covet

BY SOPHIA STUART

The outdoor mall at the intersection of Hollywood Boulevard and Highland Avenue in Los Angeles the weekend of February 28 had a line that snaked down the block. Excited teen girls clutched various mobile devices, which they used to pull up the We Heart It iOS or Android app in order to gain entry to a special event.

We Heart It is an image-based social media platform that few over 21 have ever heard of. It has grown almost entirely by word of mouth and now has 30 million registered users.

Founded in 2008, We Heart It is the brainchild of Brazilian user experience designer Fabio Giolito. Frustrated with searching for the right images on his hard drive, Giolito concocted his own tagging, identifying, and image-retrieval recognition service, which formed the basis of the We Heart It platform (and still does today).

This was the first Hollywood Meetup for local members (although some girls had persuaded their mothers to drive 120 miles from San Diego). As they surged into the event space, the girls flocked to the various



vendors that were offering free makeup tutorials, collage decorating display stations, and goodie bags.

It looked like a Sweet Sixteen party, until you saw the people in white lab coats. This was also an important live consumer-testing exercise for the We Heart It marketing team and its developers, who had traveled from San Francisco for the event.

“We have about a dozen engineers supporting 30 million registered members across Web and mobile,” said Juan Baurin, the company’s director of engineering. He explained that the service is built on major open-source technologies including Rails, MySQL, and RabbitMQ messaging, which help handle the heavy traffic demands.

“Billions of images are served every day, and our databases support hundreds of millions of daily writes,” Baurin continued. “We believe we are running one of the largest Rails platforms in the world, so we take our time to think through every change to make sure that it will scale, and when we do make a change the impact is virtually instantaneous.”

Having a robust technology stack that can withstand that much action is the key to We Heart It’s success. But the real challenge is going to be monetizing all

## THEY HEART IT

Pictured (top to bottom): We Heart It CEO Dave Williams, Director of Engineering Juan Baurin, and the full We Heart It team.



Believe,  
Feel,  
Love,  
Be,  
Create,  
Inspire.

Join We Heart It

we♥it

We Heart It

@weheartit

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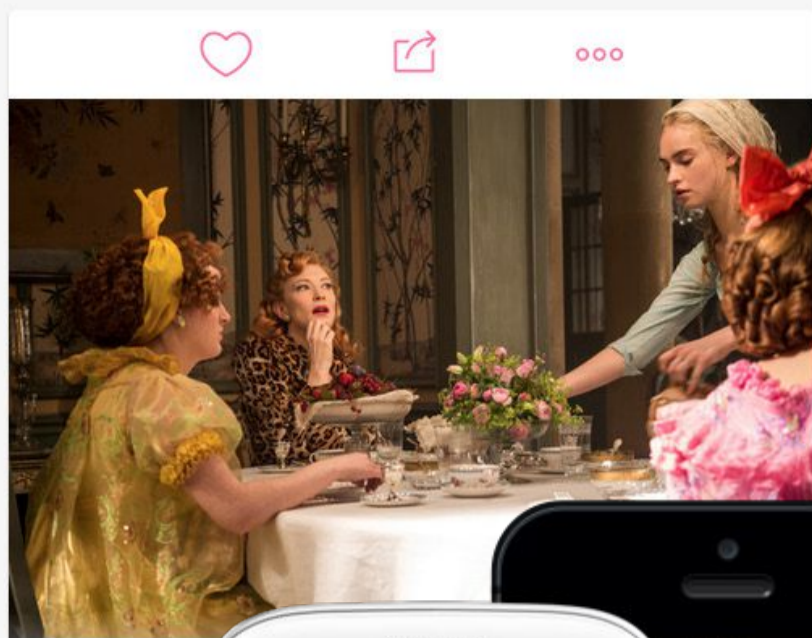
first hearted by  
Disney Cinderella



hearted from We  
Heart It by  
480 people

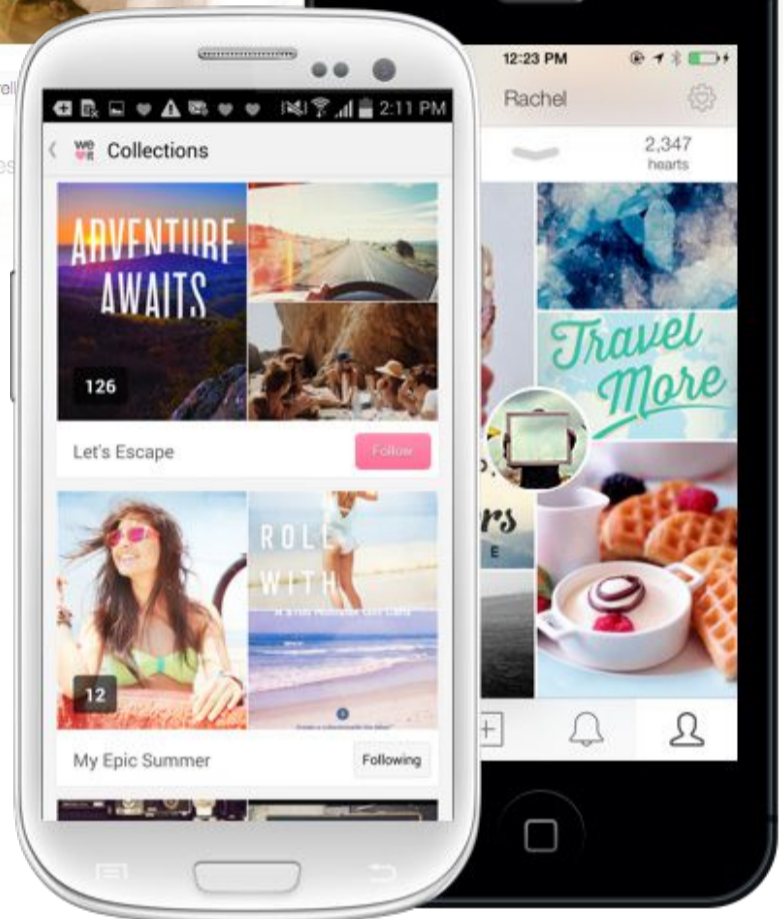


hearted by  
801 people



anastasia cinderella

Also found in these



those budding consumers. It's a coveted demographic for advertisers. "Over 80 percent of our users are under the age of 24, more than 80 percent are female, and more than 80 percent access our service on a mobile device," said CEO Dave Williams, a former SVP and GM of Nickelodeon Kids at Viacom's MTV.

We Heart It is now an extensive repository of teen dreams, and the majority of pictures uploaded, tagged, shared, and "hearted" are carefully stored in personal "Collections" and proudly presented on individuals' "Canvas" start screens. From wistful shots of androgynous boy bands and twilight scenes of Paris cafés to a simmering undercurrent of lust and angst, We Heart It is a scarily accurate pulse of what's hot and what's next, so major consumer brands are watching it closely.

Brands like Hollister and Macy's have already spent native ad dollars, and Maybelline and Starbucks have attracted a significant number of followers through their own organic efforts. Even before the official launch of Starbucks' canvas page, We Heart It members had posted more than 400,000 images tagged with the coffee company's name.

Judging from the hushed whispers from sworn-to-secrecy teen We Heart It members at the Hollywood event, who excitedly tapped on screens during the live consumer testing, the developers back in San Francisco have a few surprises up their sleeves.

# What We Love Most This Month

BY STEPHANIE MLOT 

## POCKETSTRINGS PRACTICE GUITAR

Unless you're a busker, strumming a guitar in an airport or at a café is typically frowned upon. But what's a busy musician to do if not just sling the instrument over their back and practice scales on the go? PocketString's six-fret model lets you take the tunes with you. With customized wood, a raised strum pad, and a durable design, the portable device means never having to give up your dreams of being the next Bob Dylan.

**\$29.95** [pocketstrings.com](http://pocketstrings.com)



# What We Love Most This Month

BY STEPHANIE MLOT 

## CANARY ALL-IN-ONE SECURITY SYSTEM

Smear your face with coal and grab a pickaxe: The Canary all-in-one security system modernizes the bygone days of a canary singing for its life to warn miners of impending danger. It streams real-time video of your home, monitors air quality and temperature, and syncs with an iPhone or Android handset to send instant notifications. We'd like to see a real canary do that.

**\$249** [canary.is](http://canary.is)



# What We Love Most This Month

BY STEPHANIE MLOT 

## VAPORB USB ULTRASONIC HUMIDIFIER

Whether your partner snores all night or your lips dry out during a day of work, you could probably use a donut. (Not the cream-filled kind, unfortunately.) The portable, donut-shaped VapOrb USB Ultrasonic Humidifier floats in a cup of water, moisturizing the air and pampering your sinuses. Plug it into your computer or a wall outlet for hours of steam, or set it to run for 3 or 6 hours while you fall asleep.

**\$14.99** [thinkgeek.com](http://thinkgeek.com)





# What We Love Most This Month

BY STEPHANIE MLOT 

## NYNE TT TRAVEL SPEAKER

Business trips and solo expeditions no longer have to be lonely. The NYNE TT travel companion speaker can accompany you to hotels, motels, or hostels, where you'll get 17 watts of power, up to 10 hours of play time, and Bluetooth 4.0 and NFC compatibility. The wireless device also comes with a built-in power bank to charge your smartphone, and a noise-cancelling microphone for hands-free calls.

**\$129.95** [nyne.com](http://nyne.com)



# Hot Future Tech Releases

Wondering what's coming out in the world of technology, gadgets, and games? This calendar tells you when the best new stuff ships.

BY ANTONIO VILLAS-BOAS

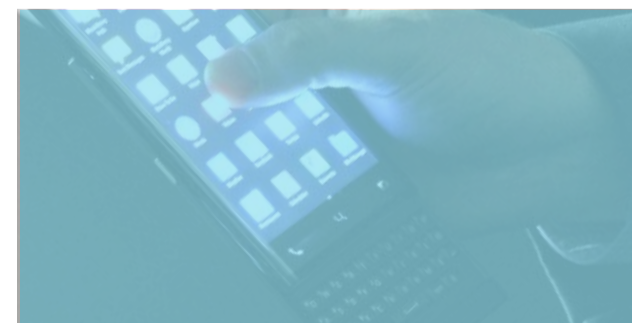
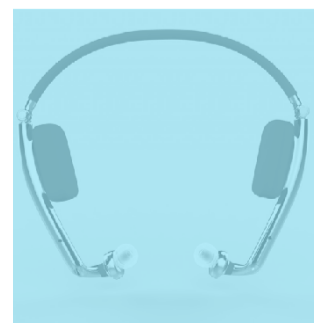
# 1

## TACTUS PHORM

getphorm.com

**Release: Summer 2015**

Typing on a tablet can be a pain, both literally and figuratively, and Tactus is hoping to change that with its Phorm case. When you flip a switch on the back of the Phorm, tactile bumps called Finger Guides appear over the on-screen keys to help you better position your fingers and strike the proper characters. And, oh yeah, the Phorm protects your device's screen from scratches, too.



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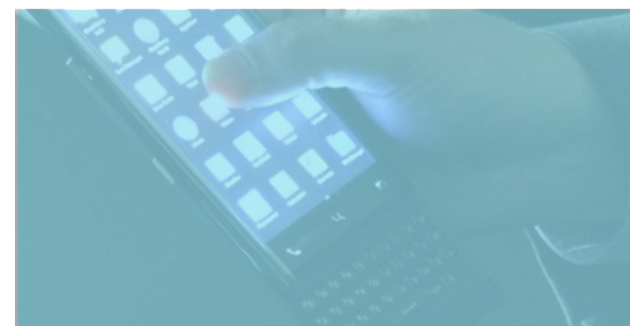
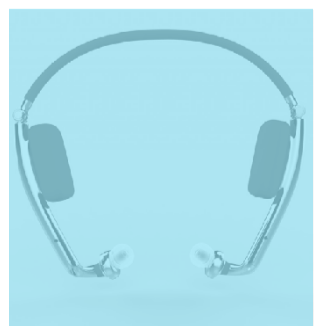
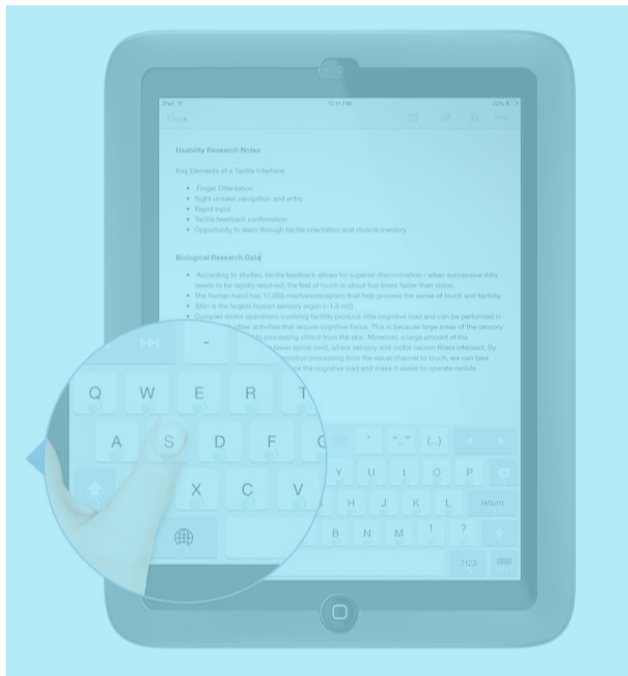
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## LG WATCH URBANE

lg.com

**Release: Q2 2015**

LG's Watch Urbane is slated to be a redesign of the G Watch R, which may not seem exciting, but it's one of the few smartwatches we've seen that actually looks like a watch. Like its predecessor, the Urbane will have a 1.3-inch plastic OLED display and run the Android Wear operating system. The Urbane will be available with black or brown straps made of genuine leather, and you'll have the choice of polished silver or gold finishes for the stainless steel body.



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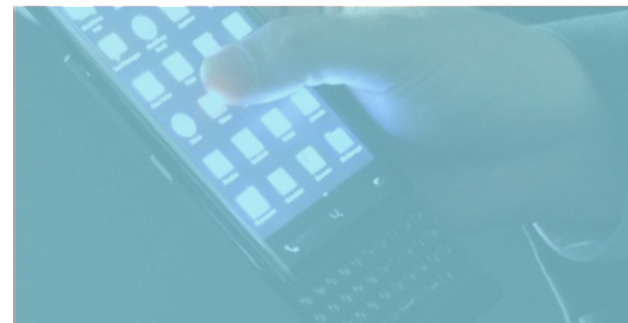
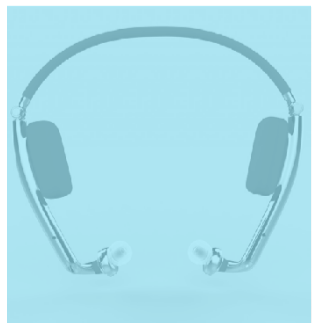
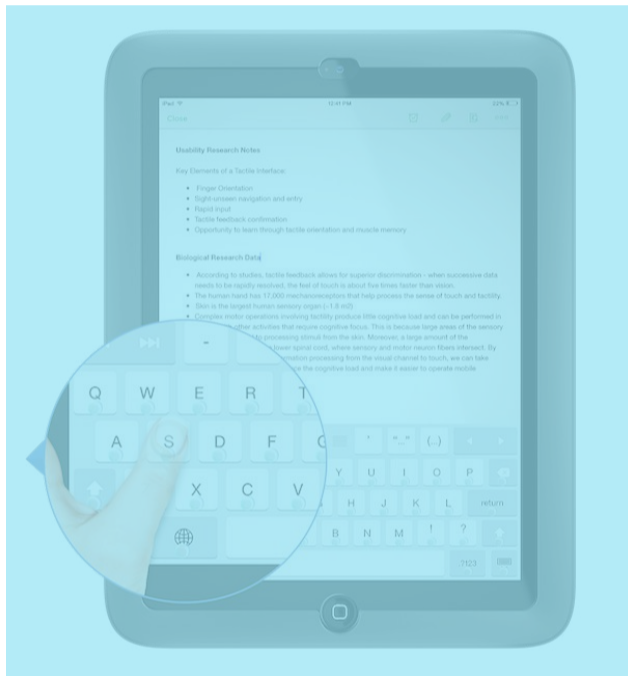
# 3

## SUPERHOT

[superhotgame.com](http://superhotgame.com)

**Release: June 2015**

First-person shooting games typically thrill with their reflex-testing action, but *Superhot* takes a different tack. In it, time only moves forward when you move. (No, walking backward will not send you traveling backward in time.) This makes analyzing where you're pointing your weapon and strategic planning even more important. Think Valve's classic puzzler *Portal* mixed with the slow-mo "bullet time" elements of *Max Payne*.



# Hot Future Tech Releases

Wondering what's coming out in the world of technology, gadgets, and games? This calendar tells you when the best new stuff ships.

BY ANTONIO VILLAS-BOAS

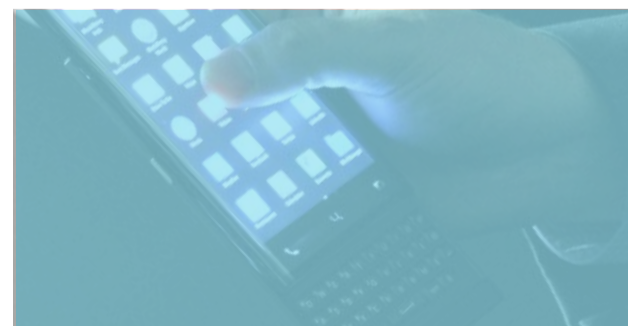
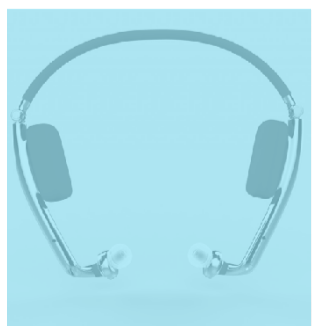
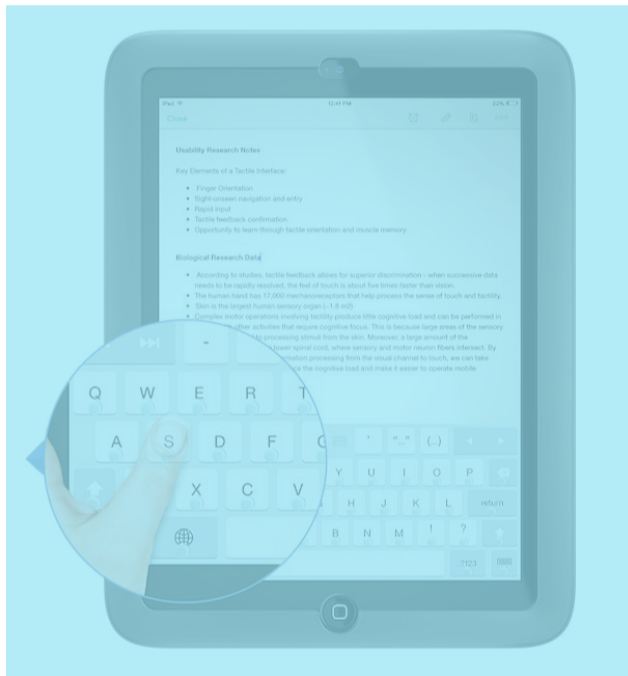
# 4

## VALVE STEAM LINK

[store.steampowered.com](http://store.steampowered.com)

**Release: November 2015**

Valve's Steam Link is a small device that hooks up to your TV and lets you access all of the games in your Steam account's library and Steam's vast catalog. The Link can stream your games from a computer that is running Steam on your home network (802.11ac Wi-Fi is supported), so you won't have to keep a desktop in your living room if you don't want to.



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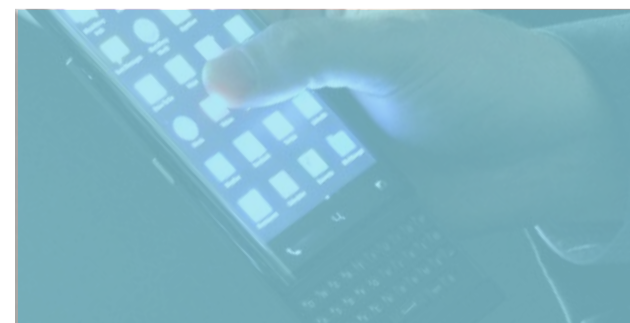
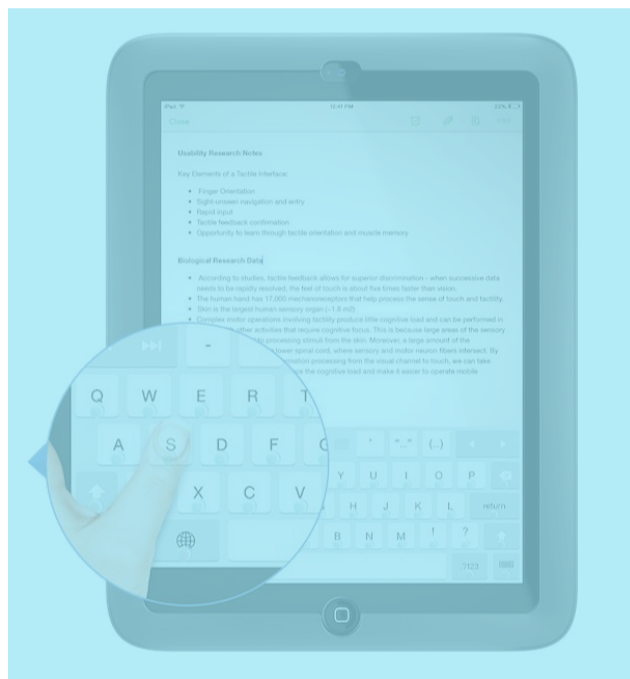
# 5

## SANDISK 200GB MICROSDXC CARD

[sandisk.com](http://sandisk.com)

**Release: Q2 2015**

If you're always running out of storage on your mobile device, you'll love SanDisk's new Ultra microSDXC UHS-I Memory Card. It improves on last year's 128GB model by offering a whopping 200GB of space—enough to store up to 20 hours of 1080p video. SanDisk claims it's fast, too, with read speeds up to 90MBps. It's intended for Android-based smartphones and tablets, though few currently support such high capacity, but it should work on any device with a microSD slot (an SD adapter will also be included).



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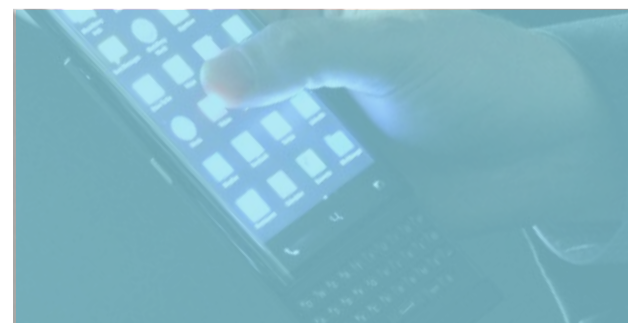
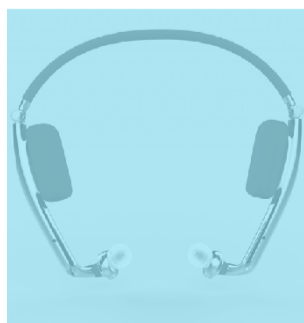
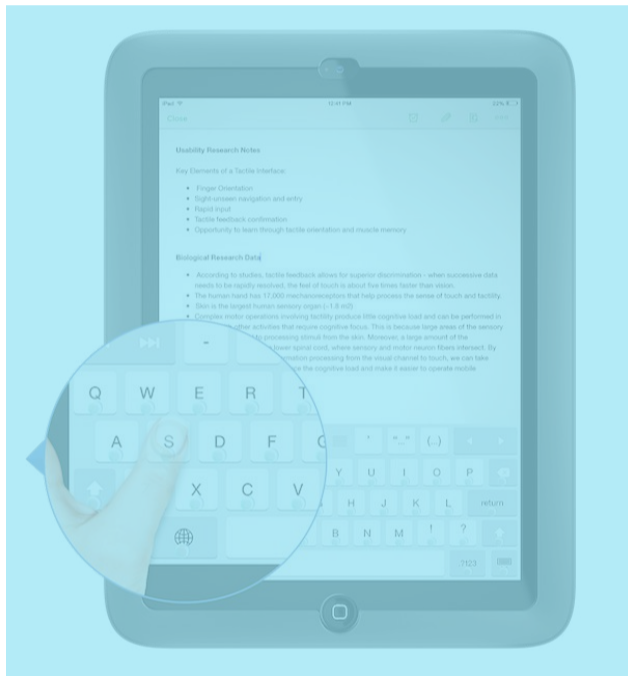
# 6

## SONY XPERIA Z4 TABLET

[sonymobile.com](http://sonymobile.com)

**Release: June 2015**

What will set the Sony Xperia Z4 Tablet apart from the litter, especially when compared with Apple's iPad Air 2? It has a sharp 10.1-inch, 2,560-by-1,600-resolution display, a 6.1mm depth, and a 13.7-ounce weight, all of which make it the sharpest, thinnest, and lightest tablet out there, and ideal for go-anywhere media consumption. What's more, Sony has somehow managed to keep the Z line's signature water- and dust-proofing. If the tablet gets dirty, just run it under the tap to clean it off.



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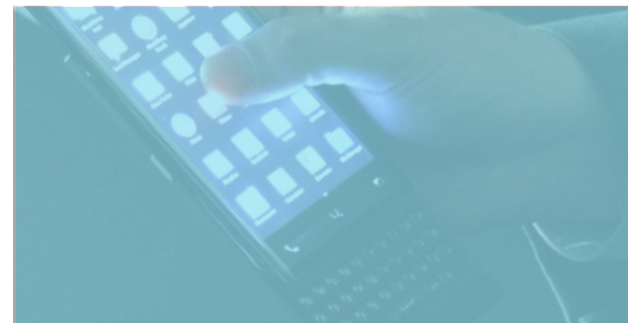
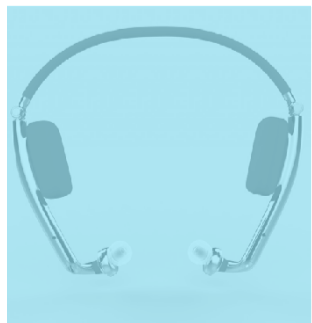
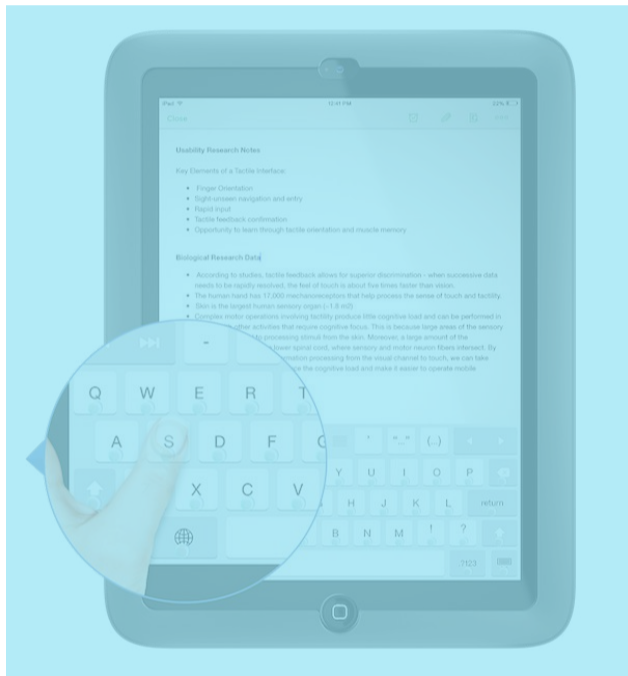
# 7

## YOTAPHONE 2

yotaphone.com

**Release: Summer 2015**

We all love the bright, colorful displays on smartphones, but they're usually also responsible for sucking up your phone's battery. In addition to a standard color display for displaying the Web, photos, and video in all their glory, the YotaPhone 2 will also sport a 4.7-inch e-ink display for when you're texting, reading or writing emails, or just checking the news—in other words, most of the time you're using your phone. The company claims this gives the YotaPhone 2 battery life of up to 100 hours.





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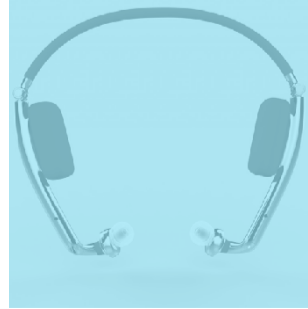
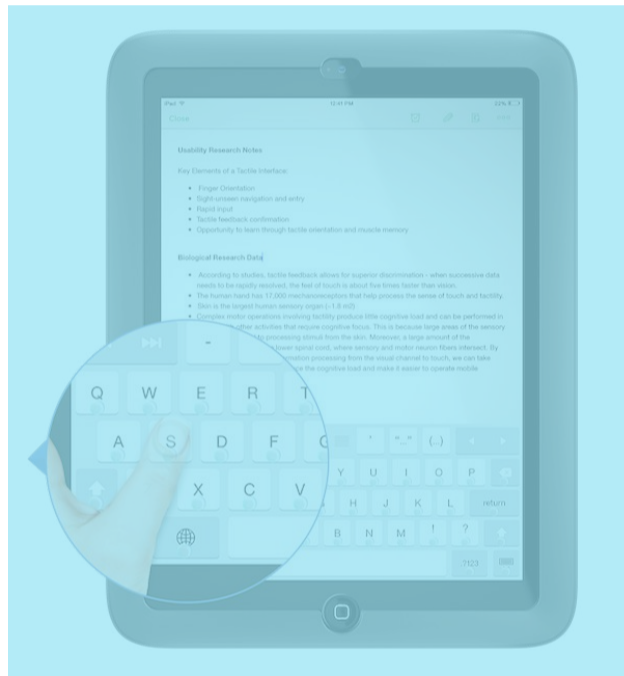
# 8

## CANON EOS REBEL T6i

[usa.canon.com](http://usa.canon.com)

**Release: Spring 2015**

The T6i, the latest update to Canon's ever-popular Rebel series of D-SLRs, employs a fancy new 24.2-megapixel CMOS sensor, 19-point cross-type autofocus, and continuous shooting at speeds up to 5 frames per second (fps). Built-in Wi-Fi makes it easy for you to share your shots in an instant, and integrated NFC makes for painless pairing with a compatible Android smartphone or tablet.



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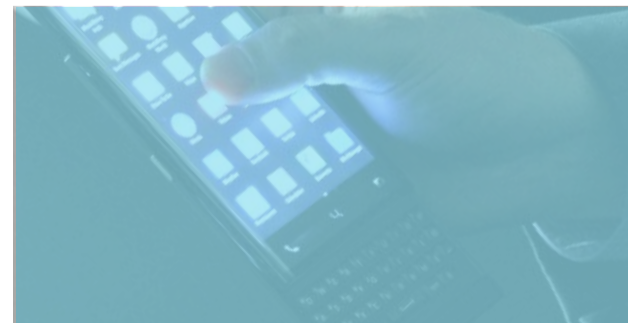
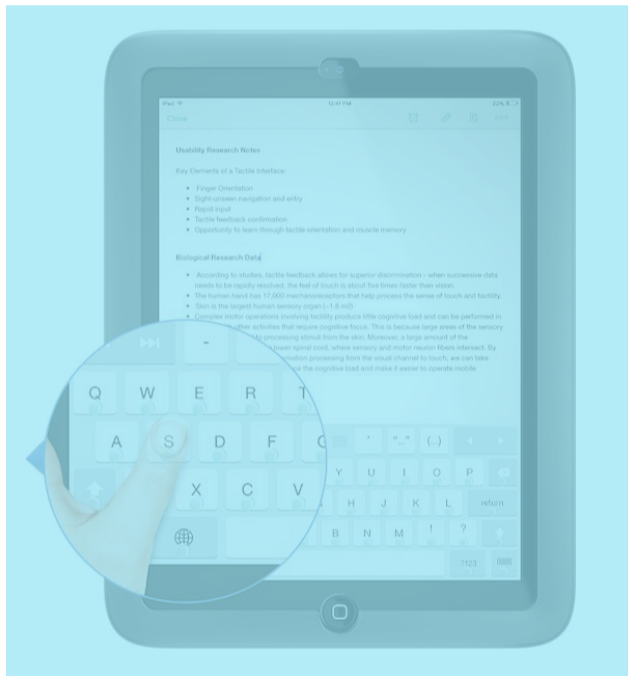
# 9

## PARROT ZIK SPORT

parrot.com

**Release: 2015**

If you've been a fan of Parrot's premium line of Zik headphones, but you've missed the rich sound you get from them while you're out running or at the gym, now you have something to look forward to. The Zik Sport is a lighter, more activity-friendly version of the Zik 2.0, and comes complete with adaptive noise cancellation, advanced DSP, and a "Street Mode" that keeps you safe by playing sounds around you directly into your ear. A new in-ear design will deliver a more secure fit.



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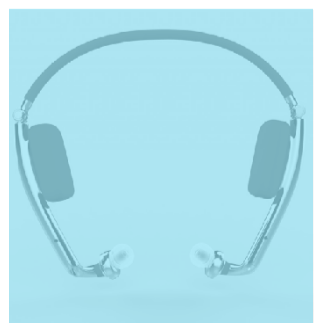
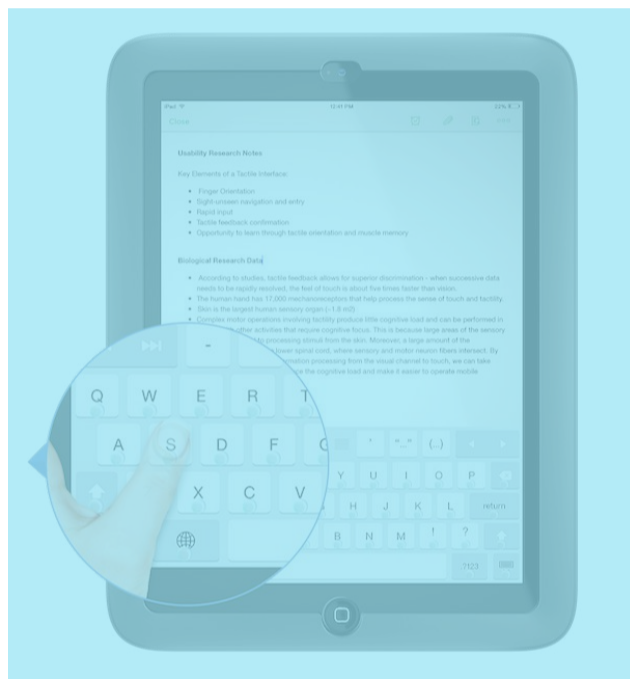
# 10

## BLACKBERRY SLIDER

blackberry.com

**Release: Spring 2015**

There are plenty of people out there who are clinging to their five-year-old slider phones because they can't find new ones with sliding keyboards. For them, and for everyone else who prefers physical controls, BlackBerry is prepping its Slider smartphone. Until you slide out the keyboard, the Slider looks like any other smartphone with a 5-inch touch-screen display. Phones like this are a lot harder to find now than they used to be, but the Slider provides a glimmer of hope for physical keyboard enthusiasts—and BlackBerry itself.



# Opinions

**SASCHA SEGAN**

**JAMIE LENDINO**

**DOUG NEWCOMB**

**The \$10,000  
Apple Watch  
isn't a gold-  
plated gadget;  
it's a gold  
status object.**

**SASCHA SEGAN**

WHO WILL BUY THE \$10,000  
APPLE WATCH?

# Who Will Buy the \$10,000 Apple Watch?

**A**pple is the world's premier smartphone brand, but that isn't a secure spot. To cement it, the company wants to use its Apple Watch—especially the \$10,000 gold one—to become a luxury fashion and lifestyle brand. Apple's director of retail, Angela Ahrendts, has been down this road before, and I wouldn't discount her savvy in making that happen.

The Apple Watch is made of parts found on other smartwatches, and performs some perhaps unnecessary tasks. I don't actually want to make phone calls on my wrist, and although Apple's third-party SDK is the most appealing we've seen yet for wearables, it's all potential. The components aren't there yet for an effortless wearable experience.

Nobody can really solve the technology problems of smartwatches right now, so Apple is attacking the marketing issue from a cultural perspective. The \$10,000 Apple Watch isn't a gold-plated gadget; it's a gold status object that just happens to be a gadget, and an attempt to maintain Apple's status as a luxury brand.

Ahrendts turned Burberry into a fashion status brand. She understands that to be truly aspirational, you need products that not everyone can buy.

"In luxury, ubiquity will kill you—it means you're not really luxury anymore. And we were becoming ubiquitous," she once told the *Harvard*



Sascha Segan is the lead mobile analyst for *PC Magazine*. His commentary has appeared on Fox News, CNBC, CNN, and on radio stations and in newspapers around the world.

*Business Review* about Burberry. The world's number one smartphone balances gently on the fence between luxury and ubiquity, between status object and universally needed tool. The gold Apple Watch helps re-weight those scales.

The idea of a midmarket/luxury technology brand isn't that bizarre. That was Bang & Olufsen's wheelhouse for years. Nokia's Vertu brand spent a happy decade starting in 1998 selling bling-laden feature phones in Russia (and there are more arcane luxury phone brands, too, like Mobiado).

The idea of higher-end luxury pieces creating a brand halo effect for more affordable models is perfectly well known in the auto industry; as Farooq Butt said to me on Twitter, the performance of BMW's M-series tends to sell a lot of cheaper 3-series cars. Apple's been called the BMW of the tech industry more than once.

### **IT'S NOT ABOUT TASTE**

You may raise the question of taste, but it's a fact that taste works differently in different places. There are some key differences between old money and new money, democratic money and oligarchical money.

All of these forms of money have no problem spending \$10,000, or even \$20,000, on a watch. Luxury watches are a time-tested status signifier.

On Twitter, Kevin Taylor posed the question of whether a Breguet or an Apple Watch will maintain value, but he's thinking from the perspective of old money, which wants to be a little quiet and think long-term. The Apple Watch is new money: It says not only that you can spend \$10,000 now, but that you want everyone to see that you can afford \$10,000, and that you'll spend \$10,000 again a few years from now

without much concern. Remember, these are the people who spend \$10,000 for first-class airfare.

How many of these oligarchs are there? Well, if you see a \$349 gadget as a reasonable purchase for someone making \$75,000 per year, the \$10,000 Watch is the same proportion of income for someone who makes a little over \$2 million per year. There are about 100,000 people who make more than that in the U.S. alone. And yes, some of them, probably Kardashians, will buy the gold Apple Watch and wear it everywhere.

You can then go down a rabbit hole and try to figure out how many people in China make more than \$2 million per year, but it's irrelevant, because the Apple Watch there is designed to be about status, not income. It will be given as gifts from officials to their mistresses, and from businessmen to officials. It's designed to be a form of status currency.

It's interesting that the Watch's other most striking feature is also social: touch communication. Insanely intimate (especially with the heartbeat), it's designed to make Apple Watches sell in groups of two, at least.

For the Watch to require an iPhone can also be seen as a plus. The goal is to sell as many Apple products as possible. Especially in China, where Apple is losing some prestige as a phone brand to local rivals like Xiaomi and Huawei, the aspirational watch could now put the aspirational phone back in the hands of taste leaders like China's First Lady, Peng Liyuan, who was recently seen holding a ZTE Nubia.

I'd never buy an Apple Watch, but it isn't for me. It's not my style. But make no mistake: Style is what it's all about.

[sascha\\_segan@pcmag.com](mailto:sascha_segan@pcmag.com)



**If you see a \$349 gadget as a reasonable purchase for someone making \$75,000 per year, the \$10,000 Watch is the same proportion of income for someone who makes a little over \$2 million per year.**



# Windows 10 for Phones Is Dead Before It Arrives

**I**DC recently released its latest numbers for smartphone OS market share, and unfortunately, it means we can likely close the book on Windows Phone.

Windows Phone has a tech journalist problem. A lot of tech journalists, myself included, like it. It's stylish and attractive, and its UI makes sense—at least at the top level, and in a way Windows 8 never did on the desktop. But the way tech journalists get excited about an OS is to have a flagship device, and we haven't had a really good one since the Nokia Lumia Icon, which Verizon never marketed, and the Lumia 1020 and HTC 8X before it.

Microsoft has countered that Windows Phone is the phone for everyone, and as a result, we've seen nothing but low-end and midrange devices, such as the Lumia 830, here in the U.S., and low-end phones in other countries. That strategy hasn't worked either, though. The way consumers get excited about a phone is having the ability to buy it, in stores, with employees who care about selling them, and with tons of apps people want to run that their friends are already running. Microsoft has had the opposite of that experience.

IDC's research data is disturbing if you're a Microsoft fan. Essentially, almost the entire world market (96.3 percent) is stabilizing around Android and iOS. Although global



Jamie Lendino, managing editor of ExtremeTech.com, has also written for *Laptop*, *Sound and Vision*, *Popular Science*, and other publications.



shipments of Windows phones increased 4.2 percent, from 33.5 to 34.9 million units, the platform's market share actually fell back down below 3 percent, which is a horrible sign. (BlackBerry has completely flatlined, but we knew that already, and the company itself is clearly repositioning for the enterprise market.)

## **WHY WE DON'T DO WINDOWS (AT LEAST ON PHONES)**

I've owned, used, and written both positive and critical columns about Windows mobile devices for years. I was a pretty strong proponent of Windows Phone since its inception, both because it was so beautiful and streamlined compared with what came before, and because, although it was fundamentally different than the way iOS and Android are designed, it was equally as useful and valid.

Up until now, Windows Phone has struggled because only its owners love it—not developers, not wireless carriers, and not the device manufacturers necessary to create a robust ecosystem around it. When popular apps finally appear, they're crippled compared with the Android and iOS versions. Microsoft never had a good browser or even a real version of Office for far too long with Windows Phone. And for some reason, Microsoft never figured out how to leverage the awesome Xbox 360 to create some kind of killer mobile gaming experience.

Some people are still bullish that the new Windows 10 for phones will change things. It's finally going to realize the "one state, multiple devices" paradigm. It's Microsoft's first shot at branding a new series of devices on its own, instead of with Nokia's name on them. And the OS certainly looks good on its own, if still

unfinished. I love the new notification bar, and the new photo app and OneDrive integration look terrific. (I'm not big on voice activation, so I'll leave the Cortana analysis to others; for the record, I never use Google Now or Siri, either.)

But if Microsoft is targeting a fall release—and that looks highly optimistic, given that the company will still have to build phones and then get them approved on U.S. carriers—the outlook for Microsoft in the mobile space is dim. It has tremendous cash reserves, so this isn't about Microsoft going out of business or anything sensationalist like that. The desktop is going nowhere, and Windows 10 could be a smash success like Windows 7 was, from what I'm seeing. I can't wait to build a new PC running Windows 10 when the opportunity arrives. (I had less kind things to say about Windows 8.1.) But Windows 10 for phones is a different and much sadder story.

*[jamie\\_lendino@pcmag.com](mailto:jamie_lendino@pcmag.com)*



**The outlook  
for Microsoft  
in the mobile  
space is dim.**



# Don't Believe the Car Hacking Hype

**L**et's face it: Anything that's connected these days can be hacked, including cars. But if more cars are getting connected, it doesn't mean more are getting hacked. And vehicles are still pretty low on the list of hacking targets. But you wouldn't think that if you watched *60 Minutes* in February, or read a report from Senator Ed Markey (D-MA).

The *60 Minutes* segment ostensibly was about the way the Pentagon's Defense Advanced Research Projects Agency (DARPA) is focusing on security as the Internet of Things (IoT) is set to connect millions of consumer devices ranging from thermostats to smartwatches. The head of DARPA's Information Innovation Office, which is tasked with spearheading IoT cybersecurity, pointed out that the military is the target of cyberattacks "every day" and that they are "dramatically increasing." Yet most of the segment centered on car hacking, a threat that has so far been negligible.

To frighten viewers into thinking that hacking is coming soon to connected cars, *60 Minutes* correspondent Lesley Stahl was videoed behind the wheel of a vehicle, while a DARPA representative remotely controlled functions like the windshield washer and horn. And the crescendo came when the White Hat DARPA hacker disabled the car's brakes, causing it to crash through a set of orange cones as Stahl



Car tech expert Doug Newcomb has written for *Popular Mechanics*, *Road & Track*, and other publications, and is the author of *Car Audio for Dummies*.

desperately stabbed the brake pedal.

It was all a perfect setup for the report from Sen. Markey, which arrived the following day—likely not a coincidence. The report said that after probing the practices of 16 automakers, Sen. Markey found “a clear lack of appropriate security measures to protect drivers against hackers who may be able to take control of a vehicle.”

Lost in the hype is that fact that—not counting hacks done for research and publicity purposes—to date there’s been a total of one car hacking incident. And that was performed by a disgruntled former car dealer employee who had access to a system that allows repossessing cars by disabling the ignition system or honking the horn to embarrass owners who are behind on loan payments. No cars, cones, or people were harmed in the hack.

The report also said that automakers don’t have methods in place to detect security breaches and promptly respond to them, which is partly true. Automakers on the cutting edge of connectivity have been caught off guard by vulnerabilities discovered by third parties. For both BMW and Tesla, for example, it was security flaws that could make it possible for hackers to remotely locate a car and unlock the doors (although not start the engine and drive away). And in both cases, an over-the-air software patch was pushed to the affected cars to promptly solve the problem.

This is not to diminish the imminent and pressing need to protect vehicles as they start to become connected, or to let automakers off the hook on securing their connected cars. All the hoopla will certainly help hold automakers’ feet to the fire on security, as it’s clear that connected cars will be hacked at some point, even if the threat is currently overblown.

“The fear mongering gets people to be diligent about this because you don’t want unintended consequences,” said John Ellis, formerly global technologist at Ford and now running the consultancy firm Ellis & Associates. “But it’s nowhere near this cataclysmic event that people keep hearing about, and the car companies are hiring security people and taking this more and more seriously.”

Ellis added that “with enough time and diligence,” hackers could cause a certain amount of havoc by gaining access to a connected car. But he said that “right now it’s really, really hard to do,” and most automakers shield critical systems like braking and steering from features that can be controlled remotely, such as door locking or vehicle location.

In addition, there’s currently little incentive beyond maliciousness for hackers to attack cars. “Given the [monetary] motivation of most hackers, the chance of [car hacking] is very low,” observed Damon McCoy, an assistant professor of computer science at George Mason University and a car security researcher, at an event I coproduced last year during SXSW Interactive in Austin, Texas. For now, only the hype surrounding car hacking is very high.



**There’s currently little incentive beyond maliciousness for hackers to attack cars.**



# Reviews

## **CONSUMER ELECTRONICS**

**Samsung NX1**

**Sony MDR-1A**

## **HARDWARE**

**HP Spectre x360 13t (13-4003)**

**Digital Storm Eclipse**

**LulzBot Mini 3D Printer**

**Linksys AC3200 Tri-Band Gigabit  
Smart Wi-Fi Router EA9200**

## **SOFTWARE & APPS**

**CrashPlan**

**Sticky Password Premium**

**Samsung NX1**

\$1,499.99 (body only)



# Shoot at High Resolutions With This Mirrorless Winner



Mirrorless-system cameras have come a long way since the first using Micro Four Thirds debuted in 2008. Early models were compact and leaders in image quality, but suffered from slow focus and burst rates. Some entry-level models still suffer from slower focus, but premium cameras have come a long way. The Samsung NX1 is the first mirrorless camera we've seen that outpaces D-SLRs in burst shooting, it offers the highest resolution you'll find in any APS-C sensor camera, and it records video at up to 4K resolution. There's a lot of competition at the high end of the mirrorless market, but the NX1 is first among a few near equals.

**DESIGN AND FEATURES**

The NX1 takes its design cues from SLRs, with an EVF that's centered behind the lens mount and a fairly deep handgrip. It measures 4 by 5.5 by 2.6 inches

(HWD) and weighs 1.2 pounds. That's smaller and lighter than the closest SLR in terms of performance, the Canon EOS 7D Mark II (4.4 by 5.9 by 3.1 inches, 2 pounds), and in line with other top-end mirrorless cameras like the Fujifilm X-T1 (3.5 by 5.1 by 1.8 inches, 15.5 ounces). The body is sealed against dust and moisture, but you'll want to pair the camera with a sealed lens to completely protect it.

The control layout isn't that far off from what you'll find on an SLR, either. The front includes a depth-of-field preview button, a button that detaches the lens, and the release button for the pop-up flash. On the top are a dial that controls the drive mode; four buttons that adjust the ISO, white balance, metering pattern, and autofocus mode; a lockable mode dial; a backlit monochrome information LCD; and the AEL button; and the top of the handgrip houses a control wheel, the power switch and shutter release, a movie record button, and an exposure compensation button. Rear controls include an EVF toggle switch (there's an eye sensor if you prefer to automatically switch between the EVF and rear display), a Wi-Fi button, a standard control wheel and a flat command dial (with four directional controls and a center OK button that lets you set the active autofocus area), the AF On button, the Fn button (which launches an on-screen menu control panel for adjusting shooting controls), and standard playback, menu, and delete controls. Many of the control buttons and all of the dials can be customized to suit your shooting style.

The sharp (1,036k-dot) rear AMOLED display is mounted on a hinge and can tilt up or down so you can shoot at waist level or hold the camera above your head to frame a shot. At default brightness it's fine for most outdoor use, and it's possible to increase brightness when you're working under bright sunlight. The EVF is also an OLED; its resolution is

## Samsung NX1

**PROS** Best-in-class sensor resolution. 15fps continuous shooting. Sharp EVF. Tilting touch-screen LCD. 1/8,000-second shutter. Strong high ISO performance. Weather-sealed design. Monochrome information LCD. Great control layout. Dual-band Wi-Fi and Bluetooth connectivity. 4K video recording.

**CONS** Burst shooting limited in Raw mode. 4K footage requires transcoding for editing, computer playback. Bluetooth functionality for Android only. Doesn't include external charger.





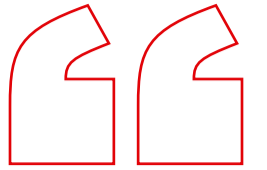
2,360k dots, on par with the best you'll find in this class (such as on the Olympus OM-D E-M1 and Fujifilm X-T1). It's also quite large, with a 1.04x magnification factor. It doesn't articulate, like the one that Samsung includes in its midrange NX30, an engineering decision that was made to make the NX1 as small as possible.

Samsung was one of the first camera makers to really embrace Wi-Fi integration, and the NX1 packs the most refined wireless feature set Samsung has put in a camera to date. It supports dual-band communication, so you can use a 5GHz signal to transfer images or control the NX1 via your smartphone or tablet in environments with heavy 2.4GHz traffic. The camera also features Bluetooth, for automatically setting the date and time, adding GPS coordinates to images, and keeping the connection between the phone and camera alive for quick transfers. But Bluetooth only works if you have an Android phone—it's not available with iOS devices due to security settings in the operating system.

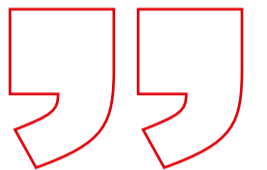
The free Samsung Camera Manager app is used to transfer images and control the NX1 remotely. It gives you complete manual control over camera settings, and the ability to tap on an area of the Live View feed to focus and fire the shutter. Only JPEG images can be copied over to a smartphone or tablet, but the camera does let you develop a Raw image and output a JPEG file via its menu system.

## **PERFORMANCE AND CONCLUSIONS**

The NX1 is built for speed. It starts and shoots in less than 0.8 second, locks focus and fires in about 0.05 second, and can rattle off shots at about 14.7 frames per second (fps). A shutter that can open and close at speeds as quick as 1/8,000 second certainly helps the burst rate,



**The NX1 packs the most refined wireless feature set Samsung has put in a camera to date.**



and makes it possible to shoot at wider apertures in bright light without the aid of a neutral density filter. Focus slows a bit in dim light, to about 1.2 seconds.

If the NX1 has a weakness in burst shooting, it's the buffer size. The camera can capture 12-bit Raw files in continuous drive mode (the bit depth increases to 14 when in capturing single images), but if you shoot Raw or Raw+JPEG you'll only be able to capture 20 photos before the buffer fills—that's just a little more than 1 second of action. If you switch to JPEG mode, the NX1 manages to keep up the pace for 72 shots. Regardless of what format you use, you'll have to wait about 10 seconds for the buffer to fully clear.

Our speed tests are performed with locked autofocus, but the NX1 is also formidable in terms of tracking moving subjects. With continuous focus enabled the camera still fired shots at 11.9fps, and kept them in sharp focus even when we moved the camera toward and away from our test target. The hybrid autofocus system incorporates an absurd number of phase and contrast detection points on its sensor, surpassing the competition when it comes to keeping your subject in sharp focus. There's even a mode designed to capture certain types of sports action, such as the exact moment that a batter hits a ball.

I'm reviewing the NX1 as a body only, but as its 28-megapixel image sensor is the highest resolution you'll find in the APS-C class, I used Imatest to check how it performed in terms of sharpness when paired with a 50-150mm f/2.8 S ED OIS lens. When stopped down to f/8 the lens managed more than 3,000 lines per picture height, better than the 1,800 lines we like to see in a photo. Despite having a high pixel count, the NX1 does quite well in terms of noise control, its sensor's BSI-CMOS design keeping noise under 1.5 percent through ISO 6400 when shooting JPEGs at default settings. When shooting in Raw mode, detail was crisp through ISO 12800, and although there was quite a bit of noise at ISO 25600, our ISO test scene's fine lines were still visible.



The NX1 also packs some serious video chops. It supports 4K (4,096-by-2,160) video at 24fps and UHD (3,840-by-2,160) at 30fps, 24fps, or 23.98fps, as well as 1080p footage at all standard frame rates up to 60fps, and 720p footage at 30 or 60fps. There are a number of features that appeal to pro use, including adjustable gamma, focus speed, and audio levels; black level control; and clean 8-bit 4:2:0 4K output over micro HDMI. There's a microphone input port to connect an external mic, and a headphone jack for monitoring. The video quality is outstanding. The NX1 is quick to focus, and there are options to shoot at very high bit rates. The HEVC (H.265) codec that is used to encode video is fairly new, and you may need to transcode it (using Samsung's included software or a third-party application) in order to edit, or even play back, the footage on a computer.

The NX1's single memory card slot supports SD, SDHC, and SDXC cards. There's a USB 3.0 port to connect to a computer. USB is also used to charge the removable battery in-camera—an AC adapter is included. The battery is rated for 500 shots by CIPA; that's not as good as an SLR, but I got more shots per charge with the NX1 than I did with a full-frame mirrorless model like the Sony Alpha 7 II. An extra battery sells for about \$43 and a charger is \$30.

The Samsung NX1 is a testament to just how far mirrorless cameras have come since their debut, with the best autofocus system and burst rates you'll find in the class, as well as top resolution, 4K video, a weather-sealed design, and a solid lens system. If you can do with a lower burst rate, the Olympus OM-D E-M1 and Fujifilm X-T1 are both excellent; and the full-frame Sony Alpha 7R might be a better fit for landscape photographers. But it's tough to argue with the NX1's all-around capabilities and performance.

**JIM FISHER**



**POWER SHOOTER**  
The Samsung NX1 is an excellent mirrorless camera for people who care about capturing shots at high resolutions, speed for burst shooting, and powerful autofocus capabilities.

**Sony MDR-1A**

\$299.99



## Basic Headphones That Look Good, Sound Great



Sony's latest addition to the MDR lineup is a thoughtfully designed, exceedingly comfortable headphone pair made with luxurious materials. At \$299.99, the MDR-1A isn't cheap, and given the lack of Bluetooth or noise-canceling circuitry, that price could only be reasonable if the audio performance were exceptional. Thankfully, it is. The MDR-1A brings powerful bass and balances it with crisp high-mids. Purists may scoff at the boosted lows and sculpted higher frequencies, but most listeners will find very little to complain about.

### DESIGN

It's clear that Sony put quite a bit of effort into the design of the circumaural (over-the-ear) MDR-1A—it's one of the more simple, beautifully executed headphone frames currently available. The first thing you notice when holding

the good-looking MDR-1A is how exceedingly cushioned the earpads and headband feel. You almost can't wait to put them on, and the fit doesn't disappoint: The MDR-1A is very comfortable, even over long listening sessions.

Offered in black with red metallic highlights or in silver with brown leather, the MDR-1A feels sturdy, but light and seamless, like a sports car. The earpads swivel gracefully to a flat position, and the headband can be precisely adjusted to ensure a proper, symmetrical fit. Inside the earpads, the 40mm drivers are visible through a thin mesh speaker grille cloth.

Two detachable cables ship with the MDR-1A—one with a single-button remote designed for Android devices (it works for basic functions with iPhones, as well). The connection point for the cable on the headphones' frame, located on the left earcup, looks like a mini pipeline, delivering audio through the thick cabling to the drivers. Also included: a drawstring carrying pouch that the headphones fold down flat into for easy stowing.

## PERFORMANCE

On tracks with intense sub-bass content, like The Knife's "Silent Shout," the MDR-1A delivers a thunderous low frequency response. At top, unadvisable listening levels, the headphones don't distort, and at moderate-to-loud volumes, the bass response is still powerful without overpowering the mix. We heard full-bodied, subwoofer-esque bass balanced by plenty of contour and clarity in the high-mids and highs.

Bill Callahan's "Drover," which brings far less deep bass presence, nonetheless sounds like it has plenty of hefty low end. Callahan's baritone vocals, which hardly need boosting in the low-mids to sound full and rich, get plenty of it anyway, and the drums on this track get an added bass boosting as well. This could be a potentially disastrous overindulgence of low frequencies, but Sony saves things by giving the high-mids and highs plenty of

## Sony MDR-1A

**PROS** Fantastic audio performance with deep lows and clear, well-defined highs. Sleek design with luxurious material. Comfortable fit. Ships with two detachable cables, one with an inline remote and microphone for mobile devices.

**CONS** Expensive. Not for purists seeking a flat response sound signature.





sculpting and presence as well. Thus, Callahan's rich voice also gets plenty of treble edge to keep it clear and in the forefront of the mix, while the guitar strumming remains bright and crisp. So yes, there is plenty for purists to gripe about—this is not a flat response sound signature. It is, however, a superbly balanced sound, with round, substantial bass response and wonderfully crisp high-mids and bright highs. Bass lovers seeking a balanced mix will be thrilled.

On Jay-Z and Kanye West's "No Church in the Wild," the kick drum loop's attack gets plenty of sharp high-mid edge to slice through the dense mix, while the sub-bass synth hits that punctuate the loop are delivered with a powerful subwoofer-like presence. The vocals on this track manage to float cleanly and clearly over the aural onslaught.

The opening scene of John Adams' *The Gospel According to the Other Mary* sounds fantastic, with the lower-register strings receiving just enough low-mid and low frequency presence to bring them out of the mix a bit, while the vocals, higher-register strings, and brass remain bright, crisp, and in the spotlight. The sound is dynamic and immersive; we hear the sound of the room in which the music was recorded, implied as much by the lower instrumentation as by the higher-register brass stabs. If you like balance with some added bass presence, the MDR-1A gets it right.

At \$300, with no real extra features, the MDR-1A had better sound phenomenal, and it does. If you like the idea of the MDR-1A's bass-boosted balance, but would prefer to spend less money, the Sennheiser HD 558 delivers excellently for its \$105 price. You might also consider the Master & Dynamic MH40 (\$399), the Blue Microphones Mo-Fi (\$350), or the Shure SRH1540 (\$499) in this elite tier. But there's no denying the MDR-1A is fantastic, worthy of your consideration and our Editors' Choice award for high-end headphones.

**TIM GIDEON**



**HP Spectre x360 13t**  
**(13-4003)**

\$999.99



## HP's Top-Performing Hybrid Is Loaded With Style



When HP wants to impress people, it turns loose its top designers on its Spectre premium model line of laptops and ultrabooks. The latest offering is the HP Spectre x360 13t (13-4003), a touch-screen convertible hybrid that's clearly intended to take on Apple's 13-inch MacBook Air. The best part, however, is how HP has priced the Spectre x360 13t to compete with the likes of the Toshiba Satellite Radius P55W-B5224.

### DESIGN

The Spectre x360 takes some of the best design elements from both the MacBook Air and the Lenovo Yoga 3 Pro and combines them into a premium convertible system. It has the same basic multimode design, with a 360-degree hinge that allows four different usage modes: Notebook, Stand, Tent, and

Tablet. This isn't HP's first convertible hybrid (the Envy x360 15t came out last year), and it's not the first Spectre laptop to closely mimic the look of the MacBook Air (the 13T-3000 did that, too), but it is the best combination of the two I've seen.

The unibody aluminum chassis shares the MacBook's minimalist aesthetic, but it still looks exquisite and feels sturdy. The main surfaces have a soft, matte finish, and the narrow edges of the laptop are jewel-cut with polished metal that glints in the light. The laptop measures just 0.63 by 12.79 by 8.6 inches (HWD), and weighs only 3.26 pounds. Compared with the 15-inch, 5.29-pound Envy x360, it's a featherweight, but the size difference isn't really comparable. Looking at more similar systems, the Spectre x360 is heavier than both the 13-inch MacBook Air (2.91 pounds) and the Yoga 3 Pro (2.6 pounds). For a laptop, that weight is barely an issue—even a full pound is hard to notice when tucked in a laptop bag—but it's a big difference for a tablet.

Instead of using two basic friction hinges, the Spectre x360 uses a geared cam linkage that makes for an extremely sturdy hinge, no noticeable flexing when you open or reposition the display, and fluid motion as you move from one mode to the next. To top it all off, there's less bulk associated with the hinge hardware than you'll see on other multimode laptops, with the possible exception of the Yoga 3 Pro's watchband hinge.

The 13.3-inch display is only available with full HD (1,920-by-1,080) resolution right now, although a Quad HD (3,200-by-1,800) model of the Spectre x360 will begin selling later this spring. That resolution isn't bad at all—and it's higher than the 13-inch MacBook Air's 1,440 by 900—but when compared with what you get from the Quad HD displays on the Yoga 3 Pro and the Dell XPS 13 Touch, it

## **HP Spectre x360 13t (13-4003)**

**PROS** Slim, stylish design. Smooth geared hinge. Good processor. All-day battery life. Extra-wide touchpad. Minimal bloatware.

**CONS** Full HD resolution is relatively low.







still seems low. The display is bonded directly to the glass that covers it, so the color quality and brightness are as good as a full-HD In-Plane Switching (IPS) panel can display. The ten-point capacitive touch sensing on the screen worked well throughout our testing.

Sound is also very good. Whereas past HP products have featured Beats Audio, the Spectre x360 does not, largely due to Apple's purchase of Beats. But the lack of Beats branding doesn't mean the audio is worse off. In fact, as HP's engineering team was doing the actual designing of the speakers in those past Beats-labeled systems, there's no dip in quality at all. The speakers offered clear, crisp sound and a fair amount of bass, and the downward-firing speakers sounded good in every usage mode.

The full-size keyboard has metal keycaps, which feel more luxurious than the plastic kind used on the MacBook Air and the Yoga 3 Pro. More important, the keyboard feels good to type on, with solid feedback, a full 1.5mm of key travel, and backlighting for visibility in dim environments, though the glowing letters can blend into the silver of the keycaps in certain instances.

What really stands out is the touchpad, an extra-wide HP ImagePad sensor that measures 5.6 by 2.6 inches. It's similar to the ControlZone touchpads seen on the HP Envy x360 15t and the HP Spectre 13T-3000, but HP has done away with the textured zones to the right and left sides—used exclusively for edge-swiping gestures in Windows 8—and has instead simply extended the touch surface. One potential pitfall is that a larger sensor means a greater possibility of accidental brushes as you type and adjust your hands on the palm rest. Thankfully, HP has also significantly improved palm rejection.

## FEATURES

The Spectre x360 13t has a full selection of ports including one full-size HDMI, one Mini DisplayPort, three USB 3.0 (all of which offer Sleep-and-Charge), and an SD card slot. For a wider array of port availability, HP also includes two USB adapter dongles: One provides an Ethernet port, the other VGA output. On the right-hand side of the laptop you'll find physical volume controls and a Windows button.

HP has also taken pains to offer a better Wi-Fi experience to customers, and our testing seems to bear this out. The laptop has dual-band 802.11ac with a 2x2 MIMO antenna for better throughput even over longer distances. Using the Wi-Fi in PC Labs, in my apartment, and around Manhattan, the experience was always solid. Other wireless technologies include Bluetooth 4.0 and WiDi.

Our review unit was outfitted with a 256GB solid-state drive (SSD), though 128 and 512GB SSDs are also options. As the drives use a SATA interface, performance may not be quite as fast as you'll see with the PCIe-based storage found in the MacBook Air, but the differences won't be noticeable in everyday use. The SSDs are also a big step up in speed from the traditional hard drives used in the Toshiba P55W-B5224 or the HP Envy x360 15t, though these systems do boast more storage space (1TB and 500GB, respectively).

In order to optimize performance and battery life, HP teamed with Microsoft to tweak several aspects of the system, most notably the software load. The result is one of the cleanest consumer laptops we've seen in that regard. Outside of 12-month trials for Microsoft Office and McAfee LiveSafe, you'll only find apps from Netflix, The Weather Channel, and Skype. HP covers the Spectre x360 13t with a one-year warranty, a free year of online support, and 90 days of phone support.

A close-up photograph of the HP Spectre x360 13t laptop, focusing on the right side of the keyboard and the hinge mechanism. The laptop is silver and shown at an angle, highlighting the gear mechanism of the hinge. The keyboard keys are visible in the foreground, and the hinge area shows the USB ports and the volume controls. The background is a dark blue gradient.

**GET IN GEAR**  
The HP Spectre x360 13t's unique geared hinge makes for exceptionally smooth movement between each of the laptop's four distinct usage modes.



## PERFORMANCE

The Spectre x360 doesn't skimp in processing power. Its Intel Core i5-5200U CPU is a low-voltage processor built for use in ultrabooks, but unlike the power-sipping, passive-cooling Intel Core M line, it doesn't trade power for a better thermal profile. The result, when combined with 8GB of RAM, is a laptop that easily outperforms Core M-equipped systems like the Yoga 3 Pro.

In PCMark 8 Work Conventional, the Spectre x360 13t scored 2,707, well ahead of the Yoga 3 Pro (2,094) and right in line with the P55W-B5224 (2,757) and the Envy x360 15t (2,682). CineBench R15 scores were similar, with the Spectre leading the Yoga 3 Pro by a large margin (258 versus 147), and beating the top-performing Dell XPS 13 Touch (249) and the Envy x360 15t (241).

Graphics are handled with the integrated Intel HD Graphics 5500. The laptop should be fine for most ordinary tasks, but forget about gaming. At Medium quality settings and 1,366-by-768 resolution, it managed only 14 frames per second (fps) in Heaven and 15fps in Valley—far from playable performance.

On our battery rundown test, the Spectre lasted 8 hours, 45 minutes. That's longer than nearly all competitors, including the Toshiba P55W-B5224 (7:51) and the Yoga 3 Pro (8:19). The only comparison system that lasted longer was the 13-inch MacBook Air, which held out a record-setting 15:51.

## CONCLUSION

The HP Spectre x360 13t (13-4003) is a superb mix of design, function, and performance, with premium touches like a versatile convertible design, a unique geared hinge, a spacious touchpad, and enhanced Wi-Fi. That it delivers all of this at a midrange price is just icing on the cake. Offering similar performance, a more compact and portable design, and better battery life when compared with the Toshiba Satellite Radius P55W-B5224, the Spectre x360 is our new Editors' Choice midrange convertible hybrid laptop.

**BRIAN WESTOVER**



## Killer Gaming Chops at a Midrange Price



The Digital Storm Eclipse is a midrange gaming PC with a high-end Nvidia GeForce GTX 970 video card. It's capable of rendering smooth, playable games on an HDTV or other 1080p display right here, right now. Its price is kept low by using an Intel Core i5 CPU instead of a Core i7, but the affordability and good performance it delivers mean you're unlikely to miss the higher-end chip.

### Digital Storm Eclipse

\$1,299



## DESIGN AND FEATURES

The Eclipse uses a compact, small-form-factor (SFF) chassis from Silverstone. It is actually the same chassis as used on the pricier Editors' Choice SFF gaming desktop, the Origin Chronos. But instead of all-black coloring, the Eclipse has a red, plastic-clad metal frame and black side panels (and, of course, the striking, lightning-bolt-shaped Digital Storm logo). The system has several premade configurations; our review unit was a step up from the base configuration, adding a faster CPU and better graphics hardware.

The chassis measures about 14 by 4 by 15 inches (HWD), which is a bit larger than the chassis of the Asus Republic of Gamers G20, but the Asus model uses a pair of external power supply units to keep its dimensions compact. The Cyberpower Zeus Mini, a previous top pick among midrange gaming desktops, is another smaller gaming PC with just enough space inside for a dual-width graphics card. To go smaller, you'll have to forgo upgradeable graphics, as in the tiny Maingear Spark.

The case size limits internal expansion space. There's only one free bay for a 2.5-inch, laptop-style hard drive or solid-state drive (SSD), along with one SATA port. The dual-width GTX 970 occupies the sole PCIe x16 slot, and the DIMM slots are all filled as well, meaning

## Digital Storm Eclipse

**PROS** Nice price. Uses powerful, full-size video card. Smooth frame rates at 1080p. 802.11ac, Bluetooth connectivity. Has dual Ethernet ports. No bloatware.

**CONS** Almost no internal expansion room. Difficult to get into the chassis for maintenance or repairs.





you'll have to remove the existing 8GB of memory to add more. You'll need a screwdriver to access the cramped interior, which is par for the course for an SFF PC.

On the front panel, you'll find a headphone jack, a microphone jack, two USB 3.0 ports, and slot-loading DVD burner. The back panel has several video connectors on the video card: two DVI, one DisplayPort, and one HDMI. Ports from the Gigabyte Z97N-WIFI motherboard include two Ethernet, PS/2 (for a keyboard or mouse), six USB (two 2.0, four 3.0), and Toslink. A DVI port and two HDMI ports output video from the Core i5 CPU's integrated graphics, though with the video card, you won't need these.

The black side panels are vented, with fans on both sides channeling air through the system. The Eclipse's Intel Core i5-4690K processor is air-cooled instead of liquid-cooled, which saves a few bucks. Wireless connectivity comes by way of 802.11ac Wi-Fi and Bluetooth, so you can put the system in your living room or anywhere within range of your wireless router.

The Eclipse comes with a 120GB SSD for booting up, and a 1TB 7,200rpm SATA hard drive for storage. This is the best of both worlds: the speed of the SSD and a lot of storage for video and other space-hogging files on the hard drive. The boot drive is also free of bloatware, just as it should be from a custom gaming PC builder. The Eclipse's warranty is excellent: three years with lifetime technical support.

## **PERFORMANCE**

Gaming tests are where the Eclipse shines. Although the Cyberpower Zeus Mini showed a higher score on the 3DMark Cloud Gate test, the Eclipse overshadowed the older system at the 3DMark Fire Strike Extreme test (with a score of 4,830). The Eclipse also beat the Zeus Mini at the Heaven test at both

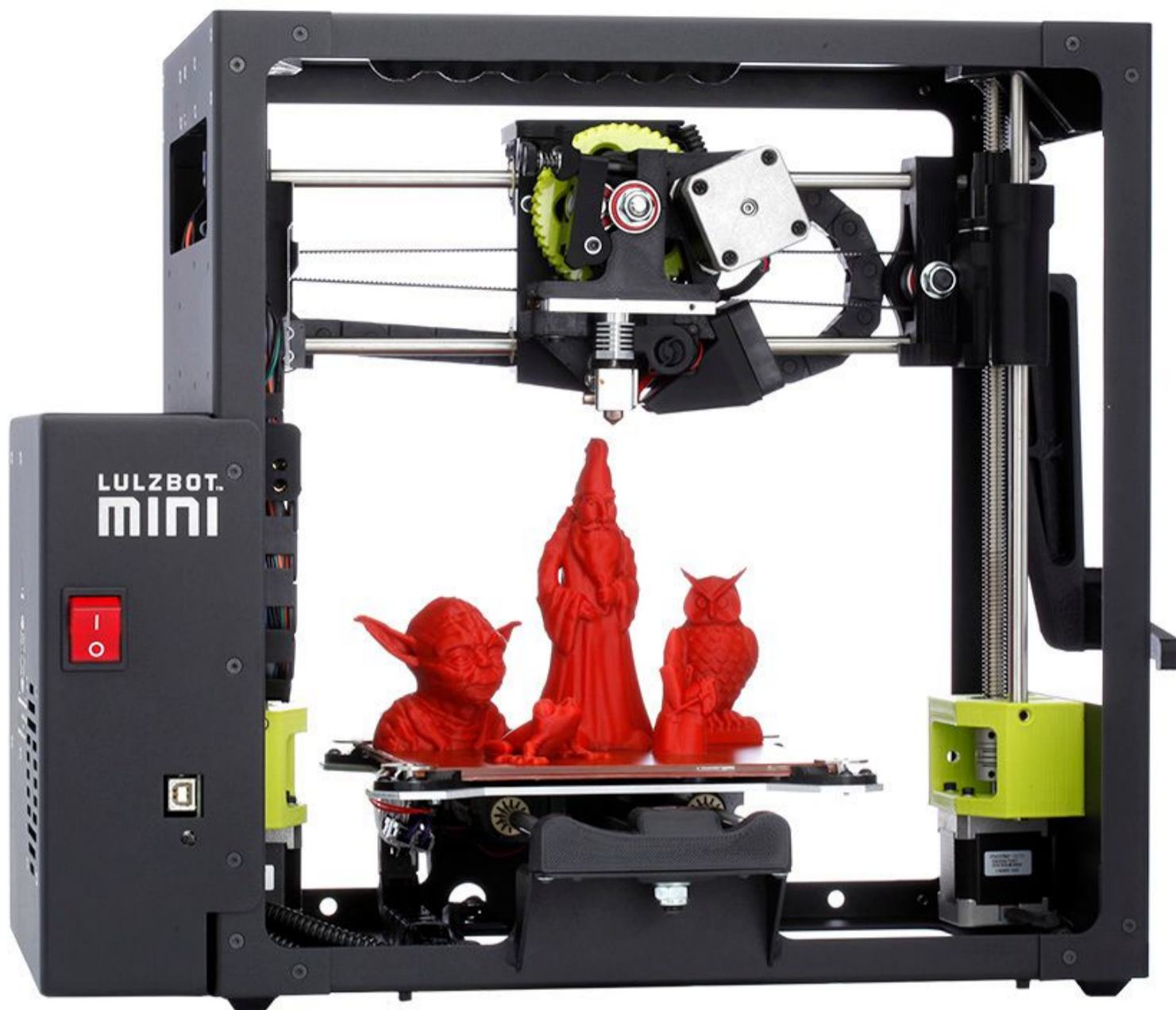
Medium (175 frames per second, or fps) and Ultra (63fps) quality. At the Valley test, the systems tied at the Medium setting (140fps), and the Zeus Mini (73fps) just edged the Eclipse (71fps) at Ultra. That means you can play 3D games on the Eclipse at 1,920-by-1,080 (1080p) resolution with all the eye candy turned on, which is nice if you want to play on an HDTV.

The Eclipse also topped the PCMark 8 Work Conventional (3,809) and Adobe Photoshop CS6 tests (2 minutes, 46 seconds). The Core i7–powered Zeus Mini was faster at the CineBench R15 and Handbrake tests, though the Handbrake win wasn't by a huge margin (1:01 for the Zeus Mini versus 1:09 for the Eclipse). Essentially, you won't be giving up too much performance by going with the cheaper Core i5 in the Eclipse; in fact, you may end up ahead in some respects.

The Digital Storm Eclipse is one of the best performers in the field, and it's chock-full of features. It performs similarly to or better than the Cyberpower Zeus Mini, our previous top pick, though that system has double the memory and storage—and you can use the \$600 you save to get more of both, along with a whole bunch of games to play. The Digital Storm Eclipse is our new Editors' Choice midrange gaming desktop.

**JOEL SANTO DOMINGO**





## Anyone Can Set Up, Use This Simple 3D Printer



The LulzBot Mini 3D Printer, from Aleph Objects, is intended for a wide audience, including home users, schools, and libraries, as well as businesses and institutions looking for a 3D printer for prototyping and production. Aleph Objects describes the LulzBot Mini as a reliable, low-maintenance 3D printer, and that proved to be the case, as it successfully printed out every object we tested it with on the first try. The only other 3D printer we've tested that has done that is the Ultimaker

**LulzBot Mini  
3D Printer**

\$1,350





2, our Editors' Choice high-end 3D printer. Although the LulzBot Mini can't match the Ultimaker 2's resolution and print quality, it lets users print with a variety of filament types and comes in at a much lower price.

## DESIGN AND FEATURES

The black, steel-framed LulzBot Mini measures 15.2 by 17.1 by 13.4 inches (HWD). It has an open frame, meaning that it has no door, sides, or top; because of this, the printer can get loud, and there's increased risk of odors or being burned if you touch the hot extruder. The printer's build area is 6 by 6 by 6.2 inches, smaller than the Ultimaker 2's 8.8 by 8 by 9 inches. Resolution ranges from 500 microns down to 50 microns. For the technically minded, the print bed is made from borosilicate glass covered with polyetherimide (PEI) film. Both the print bed and extruder assembly are positioned on movable, motorized carriages. The print bed moves on the Y axis (in and out), while the extruder moves on the X (side to side) and Z (vertical) axes.

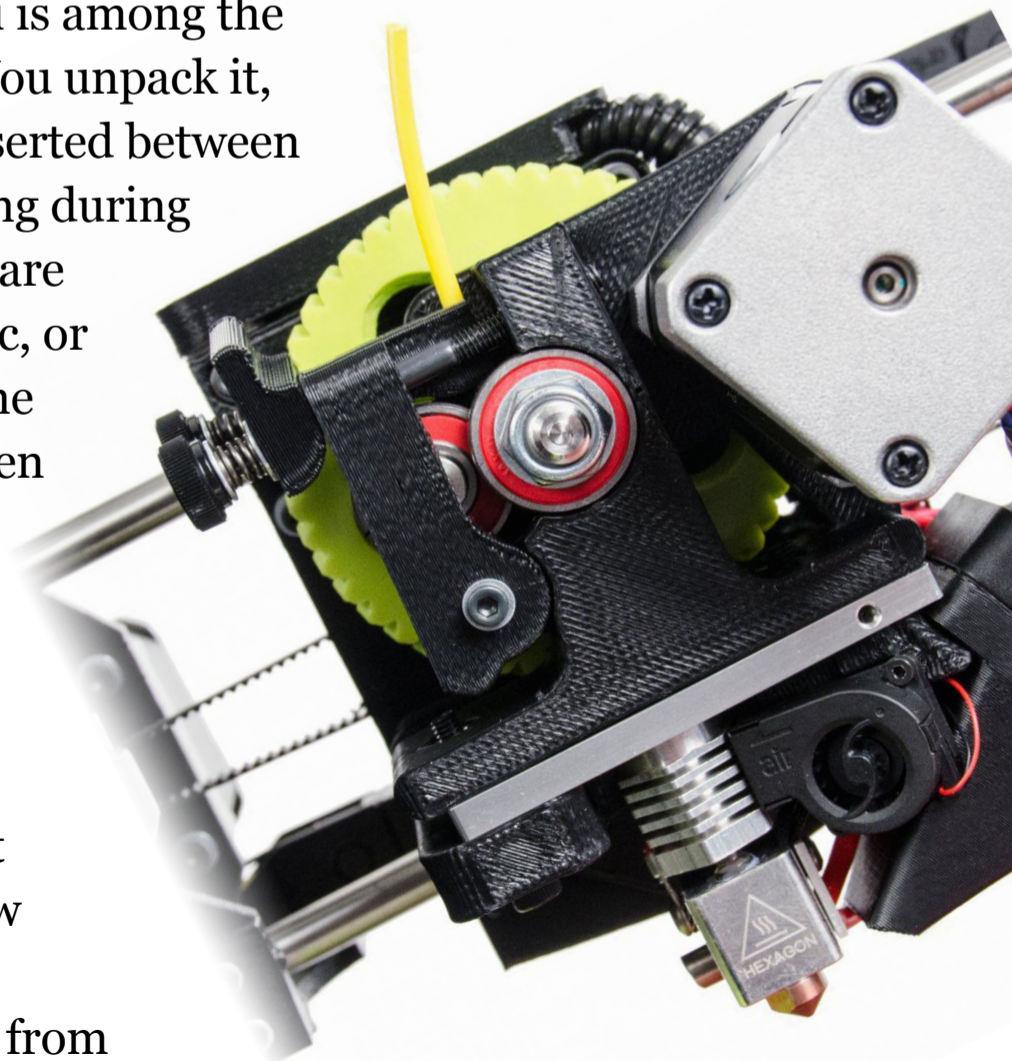
The setup process for the LulzBot Mini is among the easiest for any 3D printer we've tested. You unpack it, remove foam rubber blocks that were inserted between components to prevent them from shifting during shipping, download and install the software (Cura LulzBot Edition, for Windows, Mac, or Linux) on your computer, and connect the included USB cable and power cord. When you open the software, a 3D test file, Rocktopus (an octopus with an upraised front tentacle ending in fingers making the sign of the horns), is visible on your computer's screen.

The next step is to remove old filament from the extruder. (There should be a few inches of filament, left over from when LulzBot printed a test object, protruding from

## LulzBot Mini 3D Printer

**PROS** Easy to set up, use. Capable of high resolutions. Self-leveling print bed. Prints with a variety of filament types, accepts third-party spools. Works with Windows, OS X, Linux. Supports open-source hardware, software. No misprints in our testing. Finished objects are easily removable.

**CONS** Inconsistent print quality. Only includes a small sample length of filament. Open frame increases risk of burns from a hot extruder.



the top of the print head assembly.) You do this by pressing the Control button to call up a dialog that controls the extruder, including letting you heat it by setting a temperature, depending on the filament material. For initial setup, the manual says to set the temperature to 240° C. You can follow its heating progress, and when it's hot enough, you can pull the old filament out, and then insert the new filament through the top.

## **FILAMENT**

The LulzBot Mini takes 3mm filament, the thicker of the two common sizes (the other being 1.75mm). The printer can work with a range of filaments that goes far beyond the acrylonitrile butadiene styrene (ABS) and polylactic acid (PLA) typically used in 3D printing. We printed with high-impact polystyrene (HIPS), the filament that Aleph Objects recommends for this printer, but many others are supported. Although the menu lists just HIPS, ABS, and PLA, LulzBot lists extruder and print-bed temperatures for the more exotic filaments on its website, and provides downloadable software settings for them.

The printer has a spool holder on an arm that extends above the printer. It can fit almost any size filament spool; many 3D printers only fit their company's proprietary spools. Aleph Objects does sell both standard and exotic filament types. The only filament included with the LulzBot Mini is a 1-meter test length of HIPS, whereas most 3D printers include a full spool of filament.

## **SOFTWARE**

The LulzBot Mini supports a variety of open-source 3D printing programs, but we went with the download suggested in the User Guide. Cura LulzBot Edition, a version of the open-source Cura 3D-printing software that's been optimized for use with LulzBot printers, is



### **HAVE YOUR FILAMENT**

**A wide selection of filament types gives you many options for the types of objects you print on the LulzBot Mini, and almost any size of spool is supported.**

very easy to use. When you open it, a representation of the print bed appears on the screen. At the left edge of the screen is the QuickPrint menu, which lets the user set a resolution: High-Quality Print (140 to 180 microns, depending on the filament used; it was 180 microns with HIPS), Normal-Quality Print (250 microns), or Fast Low-Quality Print (380 microns). You can choose between ABS, HIPS, and PLA filaments. You can add print supports to hold overhanging parts of the object in place during printing, or a print brim, a thin extension of plastic around the base to help secure it. Along the top of the screen is a pull-down menu with items named File, Tools, Machine, Expert, and Help.

The easiest way to get printing is to press Load Model, the leftmost of two buttons in the upper-left corner of the screen. This will call up Windows Explorer to let you access any 3D-printable files on your system. Once you've chosen and opened one, it will be shown to scale on the virtual on-screen print bed. You then press the second button, Control, which brings up a dialog box from which you can heat the extruder, and in some cases the build platform, to the desired temperature for the plastic. Once it has reached that temperature, you press the Print button at the top of the dialog screen and, as soon as the build platform is calibrated (as described below), printing will commence. When the job is done, the printer and platform will cool down in a matter of minutes, and you can remove the object from the build platform.

From the Expert tab, you can access Full Settings, which lets you set extrusion speed, resolution (layer height), and a wide range of other settings. The best resolution that the LulzBot Mini offers is just 50 microns, more than three times finer than its best (High-Quality Print) preset resolution.





## DECEPTIVELY SIMPLE

The LulzBot Mini may look complicated, but few of the other 3D printers we've tested have been as hassle-free to set up and operate as this one.

## NO ALIGNMENT REQUIRED

All of the 3D printers that use plastic filament we've tested have required an often arduous procedure to ensure the extruder is set at the proper height above the build platform—this way the first layer of filament is properly applied when printing begins. Not so with the LulzBot Mini, as it automatically sets the extruder height and makes sure the print bed is leveled before each print. The extruder moves to each corner of the print bed in turn, where it descends until it touches a metal disk, and the printer adjusts the corner height as needed.

## PRINTING

I printed about a dozen test objects with the LulzBot Mini, one at the best preset resolution, the rest at Normal quality. The difference between objects printed at Normal and at High print-quality settings is subtle enough that I'd be disinclined to use the latter, which takes somewhat longer to print at than Normal quality.

Impressively, the LulzBot Mini printed out all our test objects without a single misprint. That's not to say that all the prints were perfect, only that none were scuttled, unusable, or terrible. One had a slightly deformed base, but you'd be unlikely to notice it from the front. Overall output quality was decent, though not extraordinary.

In some of the LulzBot Mini's prints, layering was overly obvious, particularly near the top of the object, giving those sections a slightly ropy look. In a few cases, a small gob of excess plastic was extruded on top of the print. The print of



a comb showed tiny notches in its teeth. The prints were relatively smooth, and retained detail nearly as well as those from the more expensive Ultimaker 2. Keep in mind that the LulzBot's finest preset resolution, 180 microns, is not nearly as fine as that of the Ultimaker 2 (50 microns), and the Mini's best resolution using advanced settings (50 microns) is coarser than the Ultimaker's (20 microns).

### **PRINTING IT FOR THE LULZ**

There's a lot to like about the LulzBot Mini, from its easy setup and operation to its support of a variety of filament types. The Mini is even easier to use than the Ultimaker 2, thanks to its self-leveling build platform and the ability to print directly from a computer, though it has lower and less consistent print quality. The Ultimaker 2 remains our top pick as a high-end 3D printer for designers and other professionals, for whom both reliability and print quality are paramount. But the LulzBot Mini 3D Printer, which costs considerably less than the Ultimaker 2, is also award-worthy. Its reliability and ease of operation make it a good choice for secondary schools and colleges—where teachers and students may have limited time to set up and print—as well as libraries, community centers, and similar institutions. It also should appeal to hobbyists, artists, and designers due to its wide range of supported filament types. It's our Editors' Choice midrange 3D printer.

**TONY HOFFMAN**

**Linksys AC3200  
Tri-Band Gigabit  
Smart Wi-Fi  
Router EA9200**

\$299.99



## This 5GHz Speed-Demon Router Doesn't Come Cheap

**T**he Linksys AC3200 Tri-Band Wi-Fi Router EA9200 is made for households that use their bandwidth for smooth gaming and video streaming, as well as fast file transfers to multiple wireless clients. This is a peppy router that provides the fastest 5GHz throughput we've seen to date and delivers very good NAS functionality. Its user interface makes it easy to install and manage, and it offers two 5GHz bands for optimal performance. But this is one pricey router, and its performance at longer ranges could be better.

## DESIGN AND FEATURES

The EA9200 is a tri-band AC3200 router, which means it utilizes three distinctive bands—one at 2.4GHz and two at 5GHz—to deliver combined theoretical speeds of up to 3,200Mbps. Linksys' Smart Connect technology dynamically steers connected devices to a band that will offer the best performance. Beamforming, which is part of the 802.11ac specification, lets the router send a signal in the direction of a wireless client rather than broadcasting, well, broadly, resulting in a stronger Wi-Fi signal to the client, extended coverage, and reduced interference from other devices.

The EA9200 has three external antennas and three internal antennas. It sports a 1GHz dual-core processor, four Gigabit Ethernet ports, an Internet port, a Reset button, a USB 2.0 port, and a USB 3.0 port. The housing has a matte black finish with a brushed silver plate in the center. It measures 8.2 by 9.7 by 3.1 inches (HWD) without the antennas and is supported by a nonremovable 6-inch stand.

There are the usual green and yellow port status lights around back, but the front of the router is devoid of activity indicators, so it's difficult to know at a glance if the router is sending and receiving. A backlit Linksys logo on the silver plate blinks during setup, however. On the right side are buttons for Wi-Fi Protected Setup (WPS) and toggling Wi-Fi functionality.

The EA9200's Smart Wi-Fi management interface is easy to navigate and offers all the usual settings, but not the advanced options you get with the Editors' Choice Asus RT-AC68U, including full VPN-server capabilities.

On the left side of the main page there's a list of Smart Wi-Fi Tools and Router Settings, and on the right a handful of widgets take you directly to specific settings. The Tools include a Network Map, Guest Access and Parental Control settings, Media Prioritization settings, an Internet Speed Test, and External Storage settings. The Network Map illustrates all connected devices and

## Linksys AC3200 Tri-Band Gigabit Smart Wi-Fi Router EA9200

**PROS** Excellent 5GHz 802.11n and 5GHz 802.11ac throughput. Solid 2.4GHz performance. Well-designed user interface.

**CONS** Expensive. No LED indicators. Range performance could be better.



lets you manage them by clicking. The Guest Access tool lets you set up a network for guests that blocks them from accessing other computers and devices connected to your network, and the Parental Control tool lets you block specific sites and place limits on when children can get online. You can also create and manage sharing permissions for USB storage devices, or manage shared folder and FTP access settings and set up a drive as a media server.

The Router Settings menu is where you go to tweak connectivity settings, update firmware, enable DHCP, assign static IP addresses, and assign static routing parameters. You can enable and disable the Smart Connect band steering feature, rename the SSID and password for each band, enable WEP or WPA2 security, and change the network mode, channel width, and channel designation (the 2.4GHz band has a maximum channel width of 20MHz, but the 5GHz bands can be set to Auto, 20MHz, 40MHz, or 80MHz).

Security settings include IPv4 and IPv6 firewall protection, VPN pass-through, and port assignment configuration for games and software programs.

## **INSTALLATION AND PERFORMANCE**

The EA9200 is a breeze to install. Just connect it to your Internet source using the supplied Ethernet cable, connect it to your computer, and power it up. Open a browser and enter 192.168.1.1 into your URL bar, and the Smart Wi-Fi Setup wizard appears and walks you through assigning passwords, naming the router, and configuring security settings. I was up and running within 5 minutes. You can opt to bypass the wizard and configure the router manually.





Throughput performance on the 5GHz band in 802.11ac mode was outstanding. The EA9200 averaged a whopping 443Mbps at close range (5 feet), which is the highest we've seen to date (the Asus RT-AC68U managed only 290.5Mbps). But when measured from a distance of 30 feet, the EA9200's throughput dropped to 255Mbps and the RT-AC68U's increased to 305Mbps.

On the 5GHz band in 802.11n mode, the EA9200 clocked an impressive 207Mbps at 5 feet, compared with the RT-AC68U's speed of 170.5Mbps. At 30 feet, the EA9200 dropped to 122Mbps while the RT-AC68U hit 151.7Mbps. On the 2.4GHz band, both the EA9200 and the RT-AC68U tallied 90Mbps at 5 feet; the RT-AC68U was the winner at 30 feet (81.9Mbps versus 53.2Mbps).

I tested the EA9200's NAS functionality by attaching a USB drive to the router's USB 3.0 port and timing how long it took to read and write a 1.5GB folder. Its average write speed of 30.7MBps was very good, but not as fast as the 66MBps we got from the Editors' Choice Linksys Smart Wi-Fi Router AC1900. With reads, the EA9200 managed 34.9MBps and the WRT1900AC 80MBps.

The Linksys AC3200 Tri-Band Gigabit Smart Wi-Fi Router EA9200 is a solid choice for consumers who need speedy throughput for streaming video and online gaming. It offers the latest in 802.11ac technology and will automatically place wireless clients on a band that will provide optimal performance. This router's 5GHz throughput is phenomenal and its NAS read/write speeds relatively fast, but performance wanes as you move farther away from the router, and it's expensive. The Asus RT-AC68U can't match the EA9200's close-proximity throughput speeds but it offers better all-around range, more advanced settings options, and costs \$100 less.

**JOHN R. DELANEY**



**CrashPlan**

\$59.95 per year



## Online Backup as You've Never Seen It Before



Online backup may seem drab and dry, but CrashPlan makes it cool and innovative. The service's main twist involves where it stores your files. Most online backup services simply offer remote server storage you pay for, but in addition to that option, CrashPlan lets you use any computer hooked up to the Internet or a local drive—in which case the service is free. It also boasts one of the slickest and simplest interfaces we've seen. That, along with unlimited storage space, good security options, and unlimited version saving, makes CrashPlan one of the most flexible online backup solutions around.

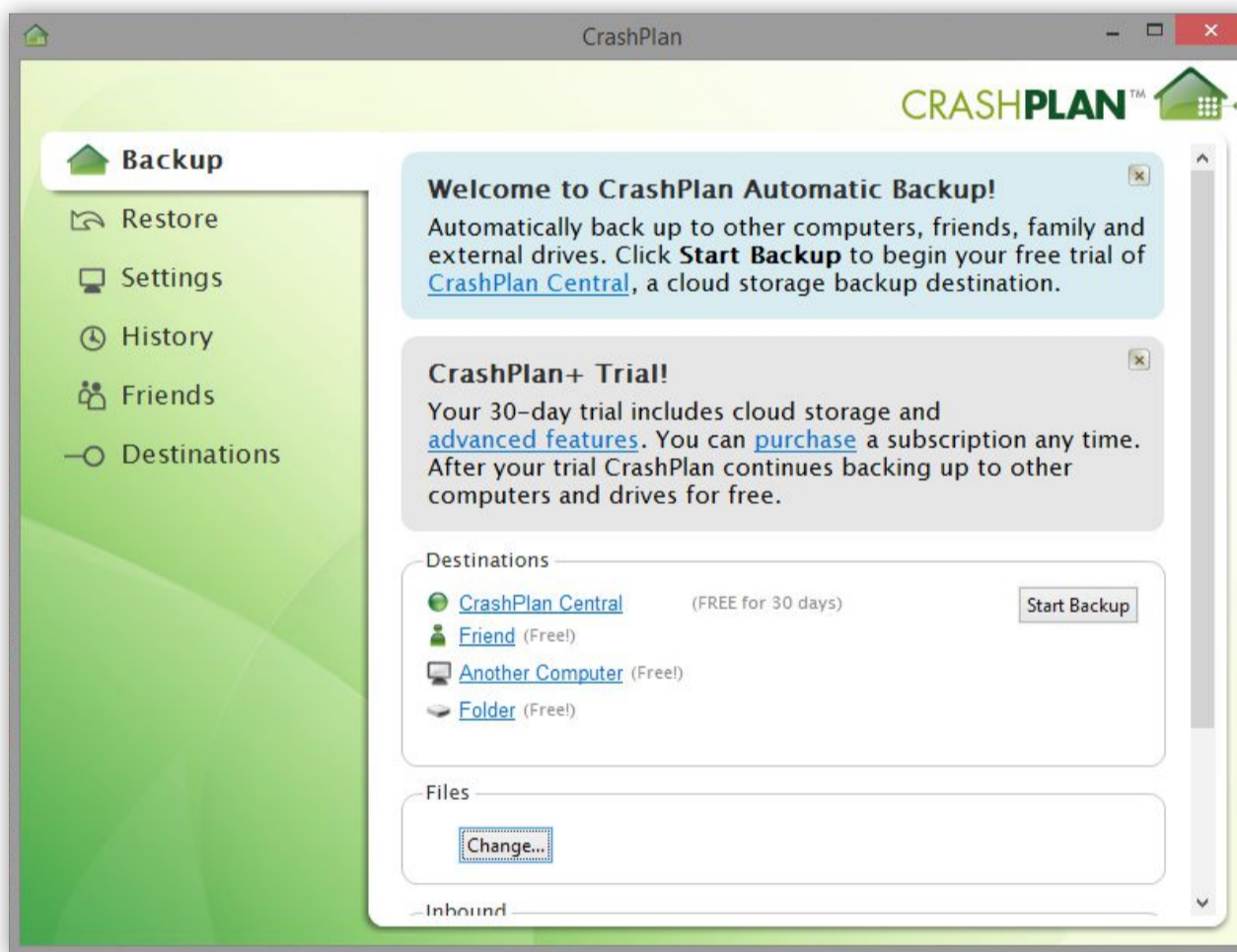
## PRICE PLANS

If you need to buy storage from CrashPlan, a one-computer paid plan costs \$59.99 per year and gets you unlimited storage. As with most services, committing to multiyear plans lowers that cost. The \$149.99 family plan also comes with unlimited storage and increases the number of covered computers to ten. For comparison, Carbonite's unlimited storage for one computer is also \$59.99 per year, IDrive gets you 1TB for unlimited computers at \$59.50 per year, and SOS Online Backup's unlimited storage plan for one computer runs \$79.99 per year. You can try out the full CrashPlan service with a free 30-day trial account, no credit card required.

## CrashPlan

**PROS** Clear, well-designed interface. Backs up to remote computers. Unlimited storage plan. Fast file processing, uploading. Strong security options.

**CONS** No File Explorer integration. Limited Web, mobile access. No file sharing.



### START SCREEN

CrashPlan's interface is as clear as it gets: You can either accept the software's default selection of files to back up or click the "Change" button to select your own.

## GETTING YOUR CRASHPLAN SET UP

The CrashPlan software is available for Windows (XP through 8.1), Mac OS X (10.5 to 10.10), and Linux. The Windows installer is a 47MB download. After running it, you accept the license agreement and enter a name, email address, and password to create your account.

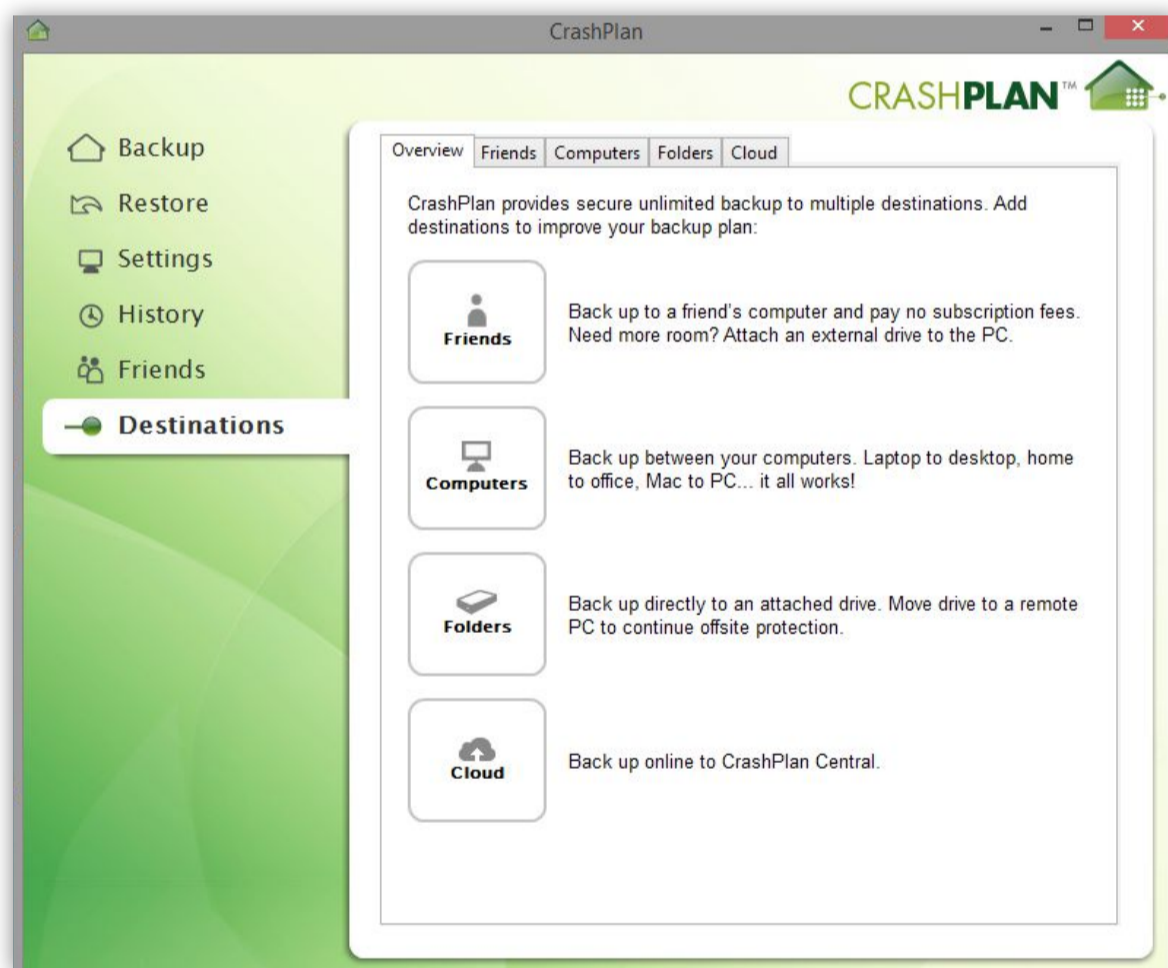
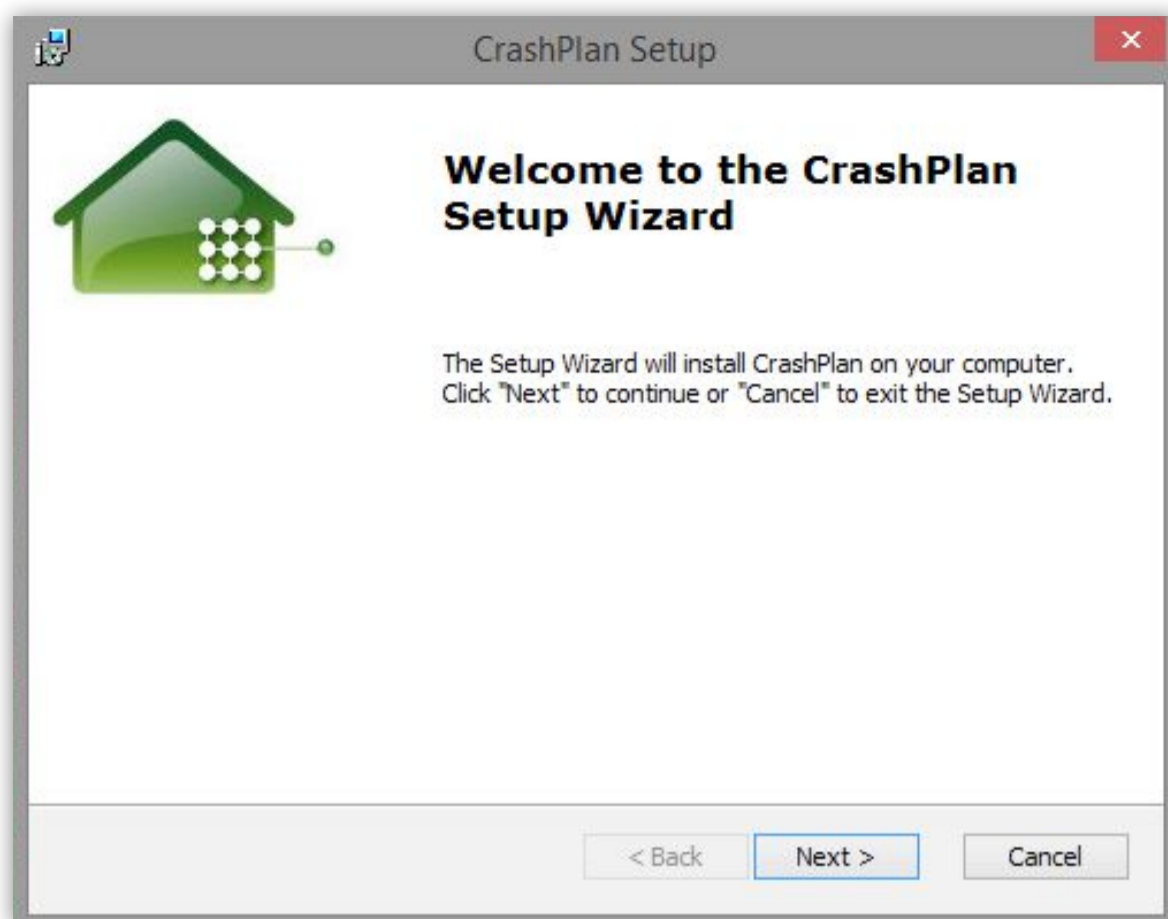
The main program window is an attractive, tab-

organized affair. The setup process also places an icon in the system tray, but it doesn't add right-click options in File Explorer for backing up or restoring files on demand. The tray icon lets you "sleep" backup operations or open the main program window.

CrashPlan automatically selects your user folders (such as Documents and Pictures) for backup. You can change what's backed up by clicking Change under the list of files, which pops up a folder-tree view of your drives where you can check or uncheck anything you like. Local, external, and network drives, or even another

computer, are all fair game for backup. When you use another machine for your backup storage, CrashPlan sends an email to the owner (though you should probably ask first), and, when that person accepts, you get more storage targets in CrashPlan's Destinations tab. You also receive a code to send to friends whose data you want to accept.

As with any other online backup service, once the backup set is created either by you or by the program, you can adjust the upload schedule. By default, the



online backup file set is checked for changes once a day. You can tune it all the way down to once a minute. File versions are checked for every 15 minutes by default. You can specify blackout times and throttle Internet usage to match your needs. Old versions are never deleted.

Backed-up data is encrypted with a 448-bit Blowfish algorithm before being uploaded. By default, the key is based on your user password, but you can strengthen security settings to require a separate password, or improve security still more by specifying a custom key. In this case, not even CrashPlan staff can get access to your data, so be darned sure you don't forget your password.

## BACKUP SPEED

For performance and bandwidth testing, I measured backup speeds by timing how long CrashPlan took to back up a 100MB set of 100 folders and files (188 files in all) of mixed content types and sizes. I used *PC Magazine's* superfast 177Mbps (upload speed) corporate Internet connection so that bandwidth wouldn't be the limiting speed factor.

With a test time of just 47 seconds, CrashPlan was nearly as fast as our speed champ SOS Online Backup's 41 seconds. Along with that service, it handily beat out the still-respectable IDrive and Carbonite, and walloped players like Backblaze, MozyHome, and Livedrive. This could factor into your service decision if you value quick uploads, as the differences among services would be multiplied as the amount of data increases. A faster program also leaves more system resources for the things you really want to do with your computer.

## RESTORING FILES

The CrashPlan control application's Restore tab makes it clear how you can start getting your files back in case there's a mishap. This tab simply shows the folder tree of your backed-up files, which you can expand and collapse. A search box simplifies finding particular files if you don't know their locations. Check boxes let you choose to show files deleted from the PC or hidden system files (both are unchecked by default).

The screenshot displays the CrashPlan web interface. At the top, the 'CRASHPLAN' logo is visible. A navigation sidebar on the left includes links for 'Computers', 'Subscriptions', 'Order History', 'Friends', 'Account', and 'Log Out'. The main content area is titled 'Web Restore - WAYNEPC'. It features a 'Previous Restores' section with a note that ZIP files are available for 24 hours. To the right is a calendar for February 2015, with the 20th selected. Below these is a file tree view showing a folder 'test files 100MB' with a list of files including audio files (m4a), documents (docx), and images (jpg, zip).

Some nice choices at the bottom of the Restore page include choosing earlier file versions from a calendar, changing the landing folder, and renaming or overwriting files that already exist at the restoration location. If a file has multiple backed-up versions, you simply expand them with an arrow in the folder tree. It's clear and incredibly helpful.

## OTHER INTERFACES

You can restore backed-up files from CrashPlan's Web interface after logging in to your account, but it's no-frills. There isn't even a search option. Nor is there any file sharing or video playing capability on the Web. You can also manage computers connected to your account, but that doesn't include things like remote wipe or remote backup configuration, which you get in SOS Online Backup.

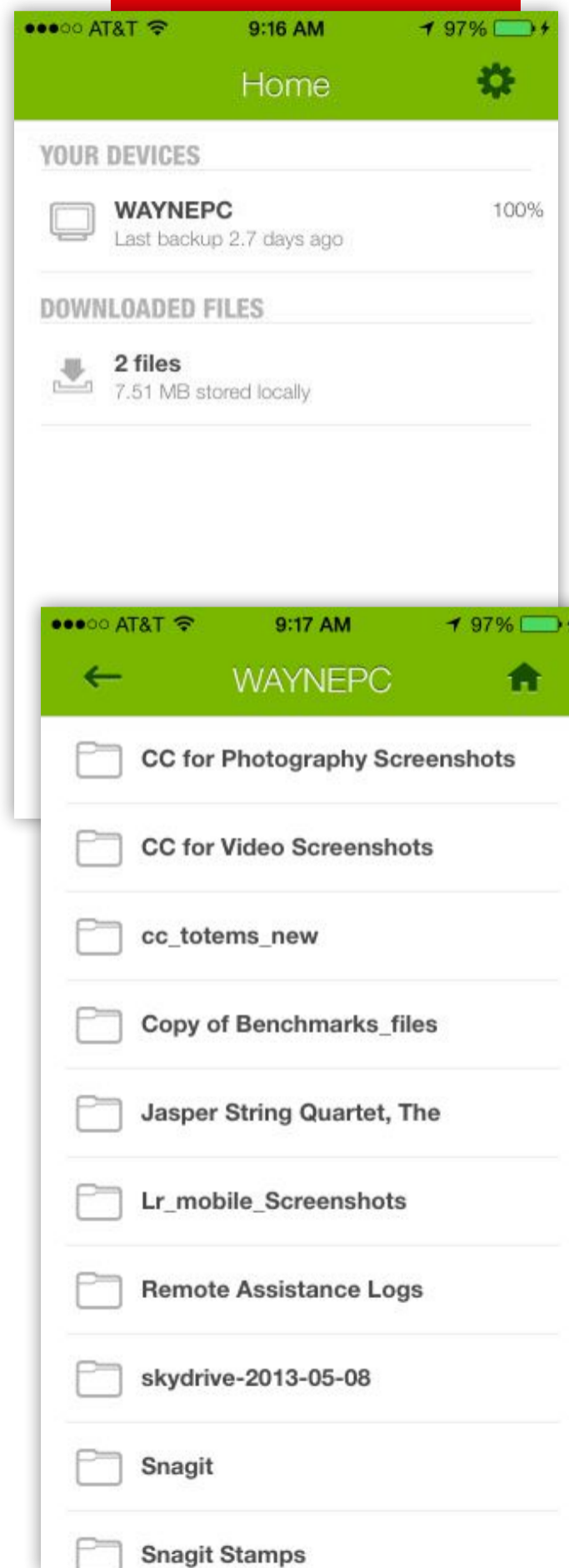
CrashPlan offers mobile apps for iOS, Android, and Windows Phone that give you access to files backed up from your account computers. There's no feature for backing up photos and other data originating on the phone, and no search feature to help you find files. Instead, you have to navigate to the correct folder. But the app can display images and play media files.

## THE BEST PLAN FOR DATA DISASTERS?

Not only does CrashPlan add a new twist to the online backup game with its bring-your-own-storage option, but it's the tops in interface, adjustability, speed, and value. CrashPlan is a new Editors' Choice winner, joining IDrive and SOS Online backup. If you're looking for extras like sharing and collaboration, you'd be better off with one of those. But for straightforward, secure, and flexible online backup, CrashPlan is an excellent choice.

**MICHAEL MUCHMORE**

**MOBILE APP**  
CrashPlan's mobile app is pretty bare-bones; you can download files from any of your backup sets, but you can't even run a search to find them.





# Password Management Worth Sticking With



How many of your software purchases contribute toward saving an endangered species? A portion of the proceeds from each sale of the Sticky Password Premium password manager goes to a fund dedicated to protecting Florida's endangered manatees. Another plus: The product does its job very well.

## GETTING STARTED

You can install Sticky Password Premium on all of your Windows, Android, and iOS devices, and it syncs data between them automatically. (A new Wi-Fi sync option lets your devices sync directly with each other when

## Sticky Password Premium

\$19.99 per year or  
\$49.99 (Lifetime  
edition)



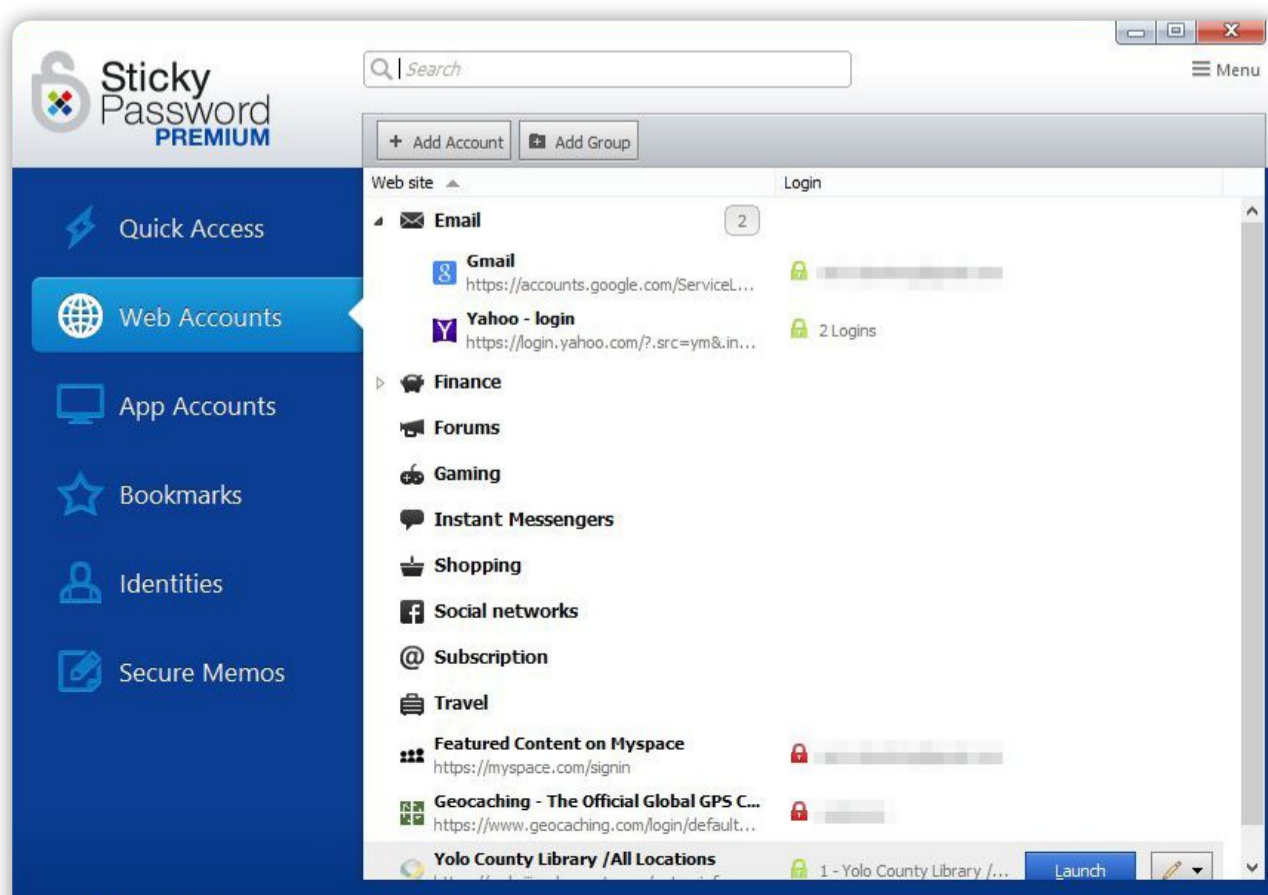
they're connected to the same Wi-Fi network, so your data never even goes to the cloud.) If you can make do without cross-device syncing, you can use it for free. There's also a \$49.99 Lifetime edition for the product's biggest fans, a one-time purchase that gets you all the features of Premium indefinitely.

During the installation process, you'll create a StickyAccount, which is where you can manage your license keys and trusted devices (and wipe out your personal or account data if you want). Enter your email address and create a strong StickyPass—the password you'll use each time you install Sticky Password on a new device. You'll also define a separate master password, which is required each time you log in. Sticky Password can import bookmarks and stored passwords from supported browsers, which includes the usual suspects (Internet Explorer, Firefox, Chrome, and Opera) as well as less-common browsers (such as SeaMonkey, Pale Moon, and Comodo Dragon); these will then work on all your devices. If you're switching to Sticky Password from LastPass 3.0 Premium, RoboForm Everywhere 7, or KeePass 2.28, you can import your existing passwords. You can also import passwords exported by another instance of Sticky Password, which can be handy if you've chosen the no-sync free edition.

## Sticky Password Premium

**PROS** Syncs across devices. No-cloud Wi-Fi sync available. Captures even oddball logins. Manages application passwords. Online console manages trusted devices. Supports biometric authentication via fingerprint.

**CONS** Report lists only the very weakest passwords. No online access to passwords. USB or Bluetooth authentication replaces master password, hence it's not two-factor.



**MAIN WINDOW**  
From the main window in Sticky Password Premium, you can quickly access all your saved passwords, bookmarks and identities.



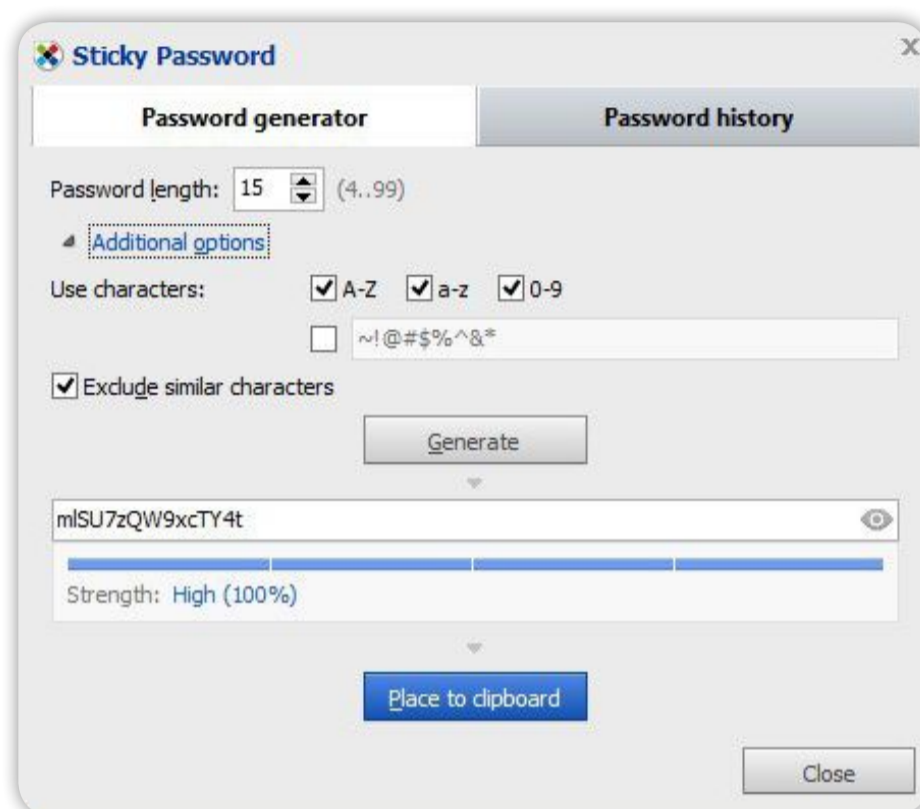
When you click in the password field while setting up a new account, Sticky Password offers to generate a strong password. Choose a length from four to 99 characters, select the character sets you want (uppercase letters, lowercase letters, digits, and punctuation), and click the Generate button. Like LastPass, Sticky Password lets you exclude too-similar characters, such as “O” and “o.”

The password generator flags password strength as Low, Normal, Enhanced, or High. Using the default settings you get punctuation-free 15-character passwords that land in the High strength range, which is an improvement over the previous edition.

To check the strength of your existing passwords, click the Quick Access tab, click Warnings, and click the button titled “Turn warnings on.” You’ll see a list of all saved sites whose password strength is in the Low range. I would prefer a full, actionable report on the strength of all passwords, like what you get with LastPass and Dashlane 3. As it is, a six-character all-alphabetic password like “abCDef” can receive a Normal rating, meaning it won’t show up in the warning list. This is one Sticky Password feature that could still use some improvement.

## USING STICKY PASSWORD

As you visit secure websites, the browser plug-in captures and offers to save your credentials. You can edit the entry’s name at capture time and assign it to a group, though you can’t create a new group at this stage as you can with LastPass. When you revisit the site, Sticky Password automatically fills in the stored credentials. If you’ve saved more than one account for the site, a pop-up window lets you choose. You can also click the product’s browser button and select from a



### PASSWORD GENERATOR

You can control the passwords the built-in generator creates for you by tweaking length, character sets, and more.

menu of all your saved logins.

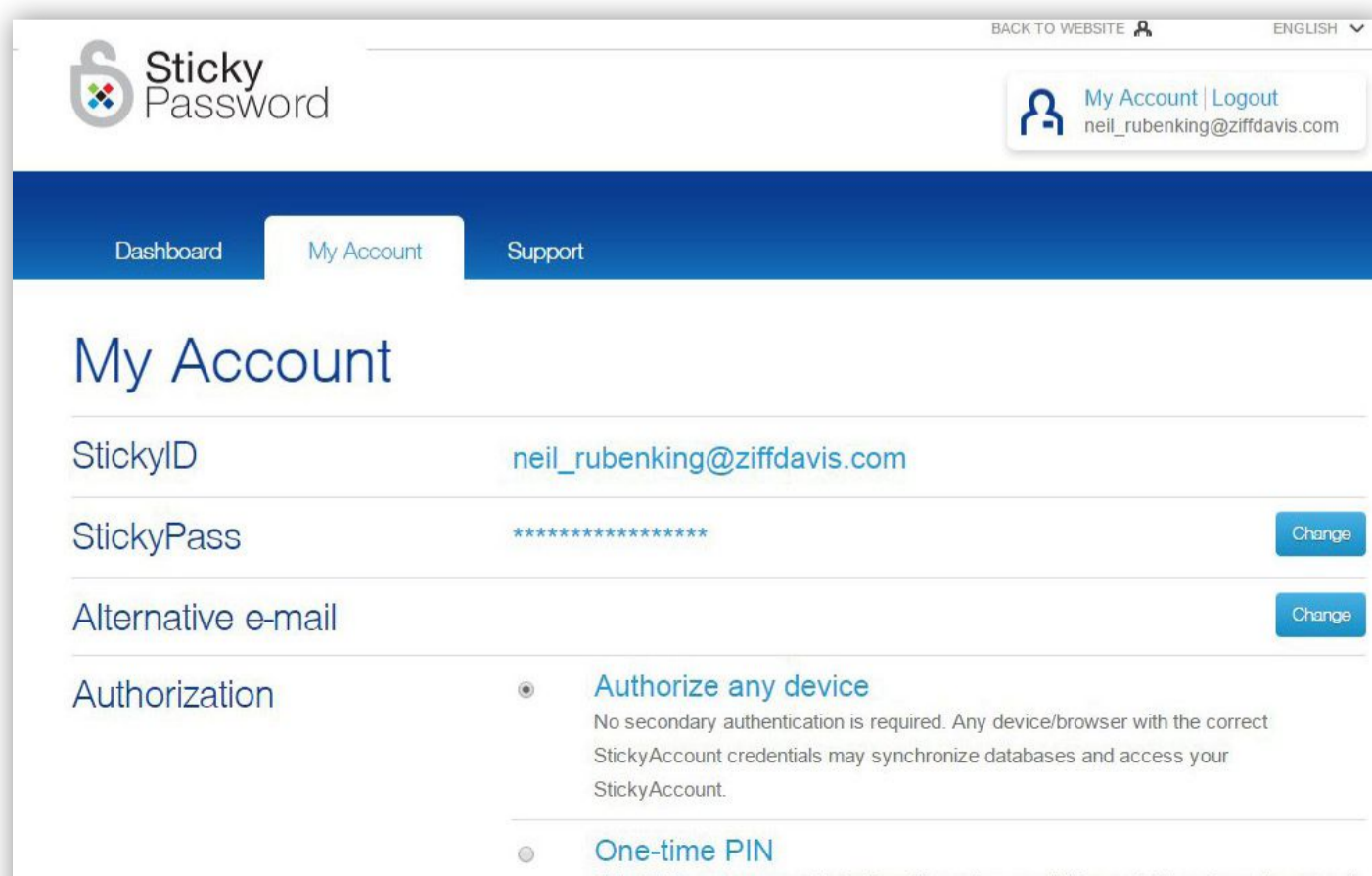
In testing, Sticky Password did an unusually good job of capturing login credentials, even for sites that baffle other password managers. LastPass handles bankofamerica.com's two-page SiteKey login system, but it has to save two separate records. Many competitors simply can't handle a login that doesn't have username and password on the same page. Sticky Password managed this tough login with a single entry. Like LastPass and RoboForm, Sticky Password handles weird login pages by letting you capture all data fields on the page, not just those that look like a username/password pair. Not many password managers are this flexible.

You can also use Sticky Password to enter credentials for applications that require a password. To select the program, you either browse to the filename or drag a crosshairs icon onto the password-entry window. Enter your login credentials and you're done. I found that it worked even with a brand-new password-protected program that I coded myself.

## ADDITIONAL FEATURES

By default, your master password is required every time you log in to Sticky Password. You can configure the product so that instead the presence of a particular USB drive or Bluetooth device authorizes your access. Note that this isn't two-factor authentication, as the USB or Bluetooth authentication replaces the master password.

New in this edition, you can configure Sticky Password to use fingerprint authentication on supported iOS and Android devices. I had a little trouble seeing this feature at work on iOS. It turns out that if you actively click Lock, you must enter the master password to log back in. Touch ID comes into play



### AUTHORIZATION OPTIONS

You can authorize new devices by entering your account password, or ask for an emailed confirmation PIN for added security.

only when you switch away from the app and then return. Sticky Password's designers are still fine-tuning the Touch ID logic; it may change.

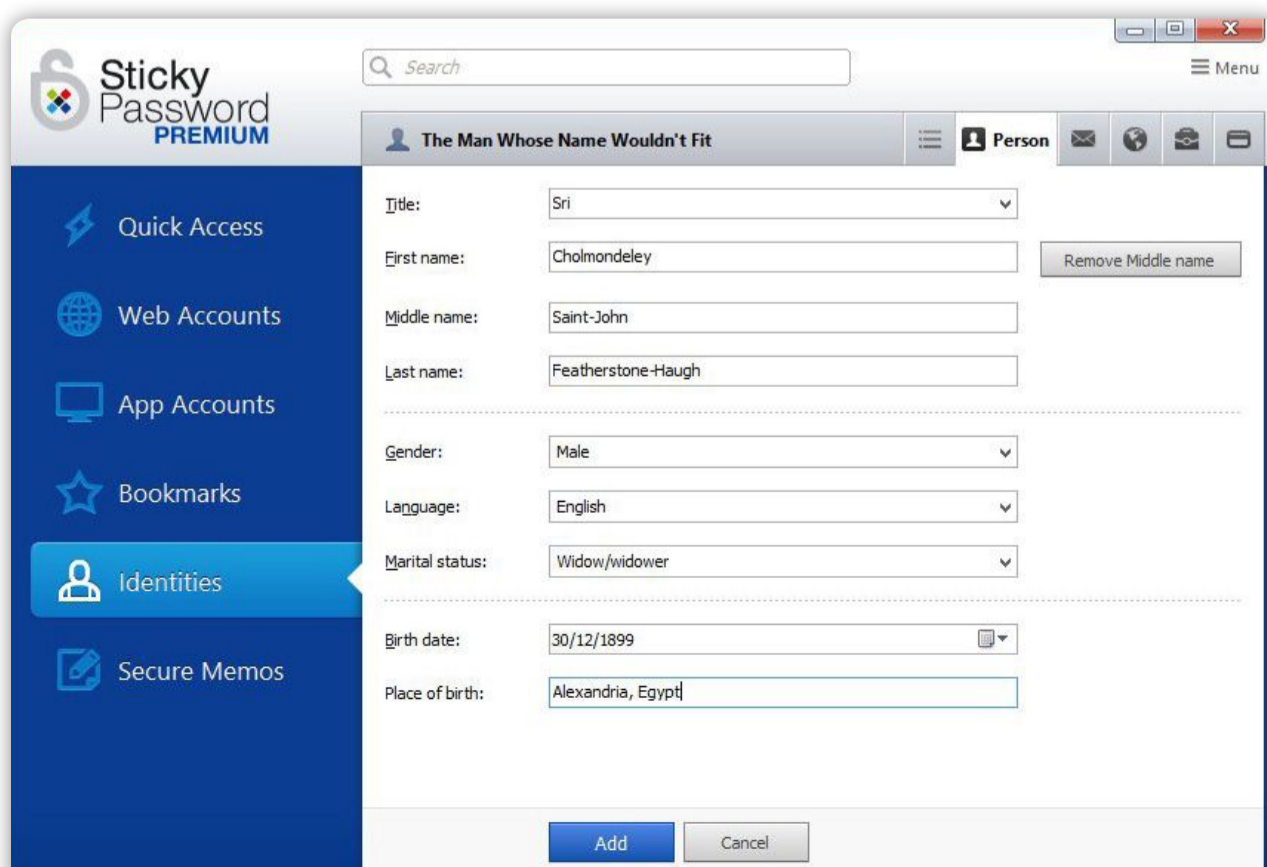
Of course, that doesn't help if you're using a Windows or Mac desktop. Note, though, that Sticky Password powers password management for EyeLock's myris device. LastPass supports the widest range of two-factor authentication options out there, but Sticky Password is the only one associated with iris-recognition biometrics.

Although you can't access your passwords online by logging into your StickyAccount, you can create a portable USB-based edition of the program with all of your current passwords. You can use the USB-based tool to log in to your saved sites just as you would the regular version of Sticky Password. Any new logins you capture will be stored only on the USB drive, however.

You can define any number of identities in Sticky Password. These are collections of personal information for use in filling in Web forms. Available elements include personal details, physical address, online contact information, and business details, as well as a finance page that can store multiple credit cards and bank accounts.

Like LastPass and Dashlane, Sticky Password can also capture data that you've already entered in a Web form. When it detects you're submitting a form, it offers to add the fields it recognizes to an identity entry. When Sticky Password recognizes that you've navigated to a Web form, it puts a red border around the fields that it can fill. Just click the browser button and choose the desired identity. As with most password managers, it won't necessarily fill all the fields, so be sure to double-check any that don't have a red border.

A secure memo is a formatted text document that Sticky Password stores and syncs, along with your passwords and identity data. Ten predefined templates



The screenshot shows the Sticky Password Premium application window. The title bar includes the logo and a search bar. The main interface has a dark blue sidebar on the left with navigation options: Quick Access, Web Accounts, App Accounts, Bookmarks, Identities (highlighted), and Secure Memos. The main content area displays an identity entry form for 'The Man Whose Name Wouldn't Fit'. The form fields are as follows:

Title:	Sri	
First name:	Cholmondeley	Remove Middle name
Middle name:	Saint-John	
Last name:	Featherstone-Haugh	
Gender:	Male	
Language:	English	
Marital status:	Widow/widower	
Birth date:	30/12/1899	
Place of birth:	Alexandria, Egypt	

At the bottom of the form are 'Add' and 'Cancel' buttons.

**IDENTITIES**  
Once you've created one or more identities, Sticky Password can use them to fill in Web forms for you automatically.

list the likely fields you'd want to save for data types including drivers' licenses, passports, and credit cards. You can edit the memo any way you like, or create a new one from scratch.

When you go to launch one of your saved logins, you get a choice: use the Sticky Password browser with AutoFill, or use another browser and copy and paste the credentials. If you browse to a site with saved credentials within this browser, you'll be able to AutoFill just as if you had launched it directly from the program.

### **AN EXCELLENT CHOICE**

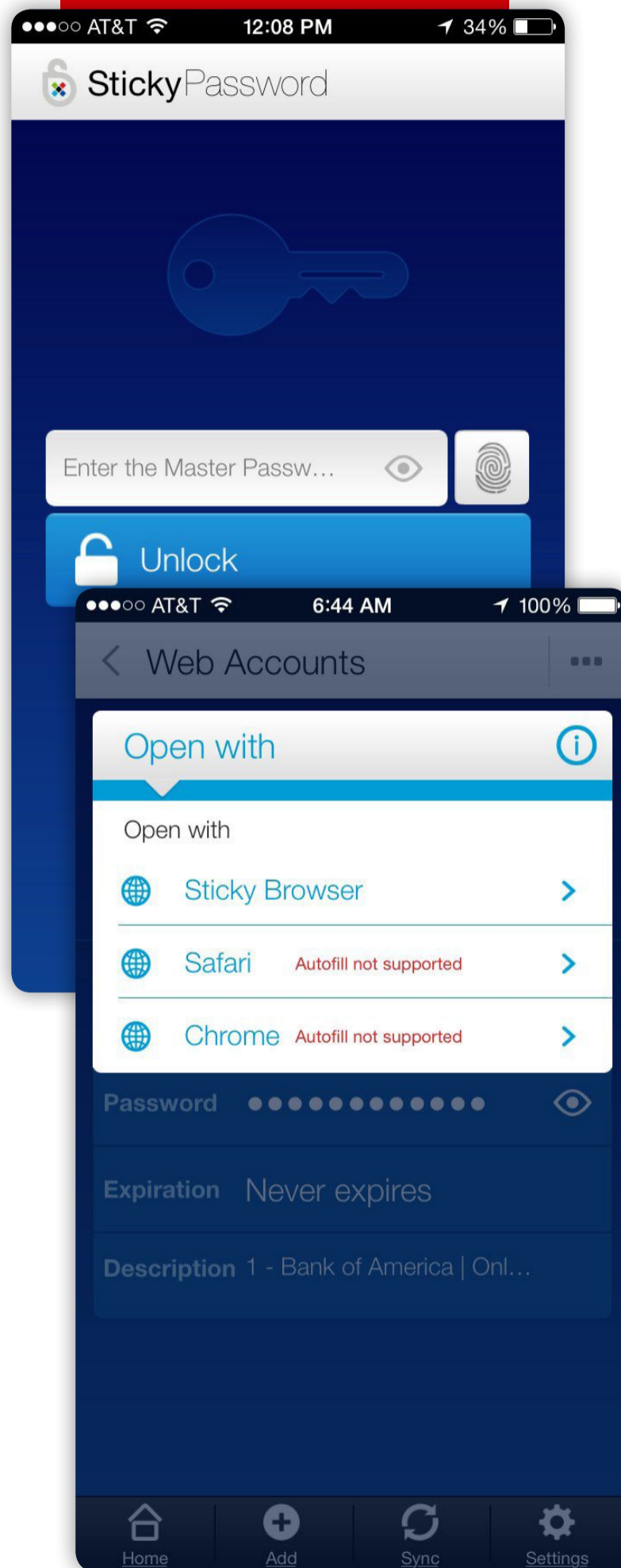
Sticky Password Premium is an effective password manager, and the new biometric authentication options are welcome. It handles oddball logins better than most competitors, offers multiple syncing options, and even manages passwords for applications. I'd still like to see the USB/Bluetooth authentication option revised to work along with, not instead of, the master password. A password strength report that includes more than the very weakest ones would also be nice.

These are just minor quibbles, however, and not enough to prevent the accomplished Sticky Password from joining competing password managers LastPass 3.0 Premium and Dashlane 3 in the Editors' Choice winners' circle.

**NEIL J. RUBENKING**

#### **MOBILE EDITION**

The mobile edition of Sticky Password offers the same features as the desktop version to add extra protection to your Android or iOS device.



# Features

**THE FIGHT OF THE  
FLAGSHIP PHONES**

**GAME ON!**

FEATURES

# THE FIGHT OF THE FLAGSHIP PHONES

BY SASCHA SEGAN



**S**amsung and HTC are looking to bounce back following a down year for high-end Android smartphones. The monolithic Korean company lost momentum thanks to uninspired design choices, while HTC seemed content to iterate rather than innovate. A lot of that changes this year, as both companies square off once again for Android supremacy. Both the Samsung Galaxy S6 and HTC One M9 are landing on all major U.S. carriers this spring, and the battle for dominance—and against Apple’s stalwart iPhone 6—looks to be more exciting than ever.

## **SAMSUNG GALAXY S6**

The Samsung Galaxy S6 is what the Galaxy S5 should have been. After the disappointing, cheap-looking S5, Samsung is roaring back with a gorgeous and powerful phone in two forms: regular and edge. I got some time to try out the Galaxy S6 just before Mobile World Congress and I was deeply moved. I think you will be, too.

Start with the body. Plastic, be gone! The S6 is made of metal and glass, but it’s smarter metal and glass than we’ve seen on iPhones: The glass back is Gorilla Glass 4 rather than Apple’s eminently breakable “ion-tempered” stuff. The phone is basically all glass over a colored inlay with a brushed-metal surround. The basic model comes in white, black, gold, and turquoise. At about 2.75 inches wide and about 4.8 ounces, it’s narrower than the Galaxy S5 and more appropriate for one-handed use.

Then there’s the S6 edge, which, yes, has a screen that slopes down on both sides. I find this even more compelling than the standard model; it really stands out, and it’s still comfortable to hold. The “edge” functionality is pared down from the Galaxy Note 4 Edge. It still works as an alarm clock and offers a news feed when the phone’s main screen is off. When the screen is on, though, the edge doesn’t function as a separate panel, although you can pull out a set of favorite contacts by dragging your thumb over it.



I've been using the Galaxy Note Edge for a while now, and it feels good to hold. The Galaxy S5, not so much. That ridiculous chromed plastic surround ruined it for me, especially when compared with more elegant models like the HTC One M8 and the iPhone 6. The Galaxy S6 is genuinely fun to hold—small enough to feel like a phone, but with curves and edges that pleasantly surprise you. It can hold its own with any other manufacturer's models on design. It puts its competitors on notice.

The Galaxy S6's screen is ridiculously sharp. At 5.1 inches and 2,560 by 1,440, it has 577 pixels per inch. The physical home button, located below the screen, works both as a fingerprint sensor (touch, not swipe) and as a camera launch button if you tap it twice. There's still an IR sensor for heart rate monitoring on the back, and an IR emitter for remote controlling home electronics on the top.

What you won't find are a memory card slot or removable battery. The battery here is smaller than in past Galaxy S phones: 2,550mAh on the normal model and 2,600mAh on the edge, as opposed to 2,800mAh on the Galaxy S5. Samsung says the new phones have better power management, a more efficient processor, and both wireless and quick USB charging built in. But you know that super-dense screen is going to suck a lot of power, so battery life is one of the top questions here. As for storage, there will be 32, 64, and 128GB models.

The S6 will be the first Samsung phone with a Samsung processor in the U.S. Although



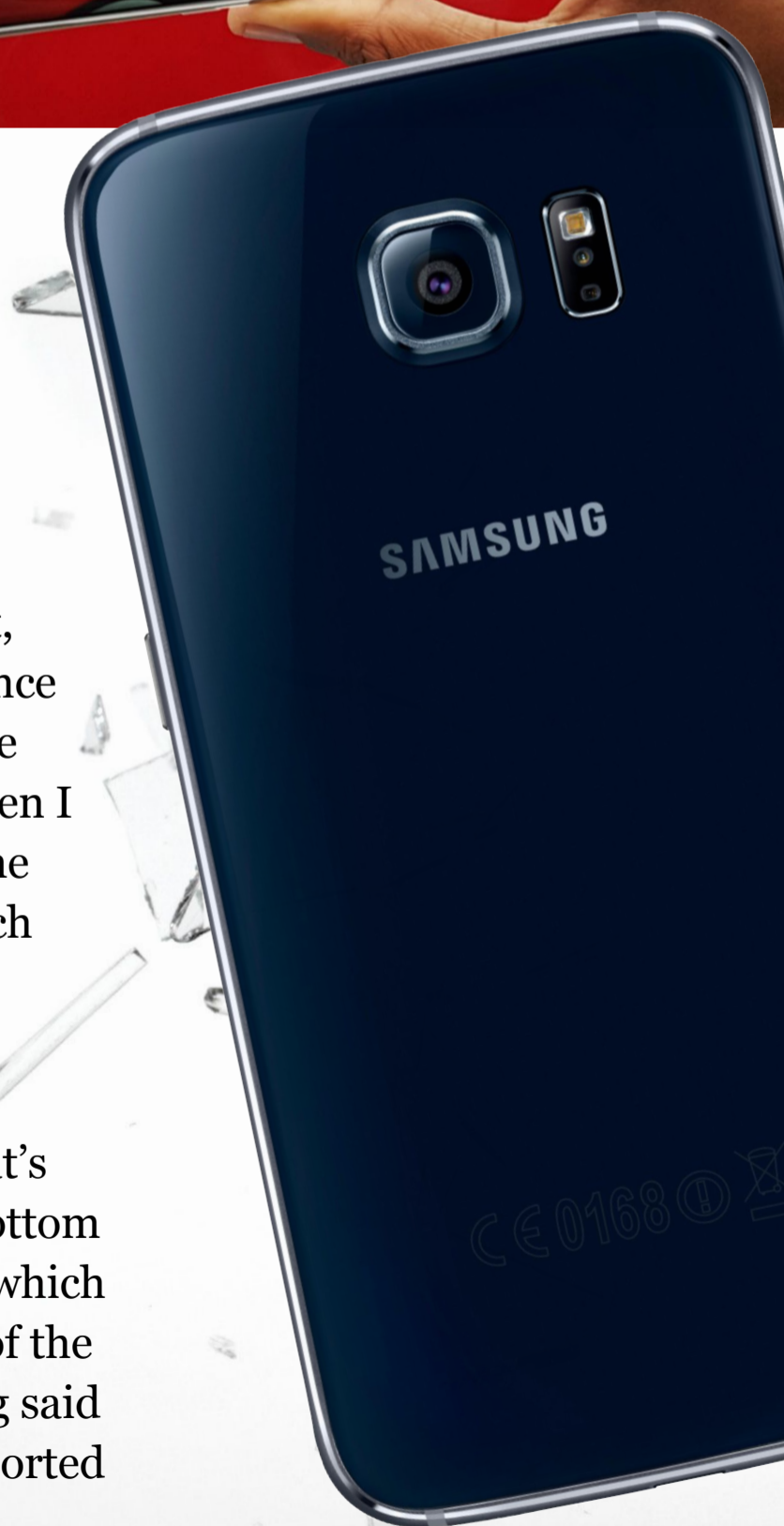




Samsung is officially being very coy about this, I asked people close to development and found that yes, the new Exynos 7 chip (paired with a Qualcomm modem) will be the processor in the U.S. models as well.

The camera has been bumped up to 16 megapixels, and yes, it has a bump. The front camera is 5MP. Both cameras collect a lot of light, with an f/1.9 maximum aperture, and white balance has been enhanced by IR sensing, which helps the phone determine whether it's indoors or out. When I compared a photo taken with the S5 with the same photo taken using the S6, the S6's photo had much better exposure balance, was less blurry, and was much less blown out in bright areas.

The speaker grille is on the bottom, with the headphone jack and a fast-charging USB port that's compatible with Qualcomm QuickCharge. The bottom edge of the phone looks a lot like the iPhone 6's, which will probably cause some talk, although the rest of the phone doesn't look like an iPhone at all. Samsung said the speaker is 1.5 times as loud as the S5's back-ported



speaker, and played some music to prove it. It isn't HTC's BoomSound level of richness, but it'll do.

Samsung pared down its overly complex TouchWiz software from the S4 to the S5, but not enough for many people. The Galaxy Note Edge then added a bit more complexity, with apps that run on its curved edge. The S6, Samsung told me, is yet another move towards simplicity, although the OS isn't the same as stock Android Lollipop 5.0.2.

Samsung showed how it's further trimmed down options (and hopefully, memory footprint) with the S6, with simpler menus and faster load times all around. When I checked on my test S6, I found that Samsung's software used 7GB, down from 7.78GB on the Note 4 Edge. Launching the camera has gotten much faster: I got from button press to image in 0.65 second, as compared with 1.6 seconds on the Galaxy S5. That's a noticeable difference.

The phone also supports the Samsung Pay (formerly LoopPay) mobile payment system, which connects to actual existing magnetic stripe readers rather than needing some exotic NFC-based system to make credit card purchases. It works with MasterCard and Visa, but not American Express (yet). Your credit card information will be stored in an encrypted manner on the phone, Samsung said. To use it, you swipe up from the bottom of the phone and then rest your finger on the fingerprint sensor in the home button.





## HTC ONE M9

Taste is everything at HTC. Where Samsung and LG dream big, HTC is doing the best job so far of delivering a smaller and more tasteful, but still high-end Android phone. The HTC One M9 is a little smaller and cuter than last year's M8, and is a bit more of a fashion phone than its major Android competitors.

Superficially, the M8 and M9 look a lot alike. They're both all metal, with rounded corners and big BoomSound speakers above and below the screen. HTC moved the power button from the top to the side, and put a slightly strange "lip" around the edge of the phone. That doesn't make design sense until you hear that there's going to be a two-tone silver-and-gold model, and the lip marks the place where the color changes.

The M9 is just a few millimeters shorter and a teensy bit thicker than the M8, but not enough to matter. The 5-inch 1080p LCD screen on the M9 is much brighter than the M8's, though, which is very easy to see when the phones are next to each other.

HTC ditched the "ultrapixel" main camera for a more conventional 20MP unit with 4K video recording; because this camera bumps out from the body a little,



HTC covered it with sapphire glass to prevent scratches. I snapped some photos and videos, and the camera was extremely fast, but the video camera mode had serious autofocus problems. It couldn't lock in until I tapped on the screen to focus. (Prototypes are often like that.) Playing back my video, the BoomSound speakers were very loud and extremely rich. The ultrapixels, by the way, are now on the front; the 4MP front-facing camera is just the M8's rear camera turned around.

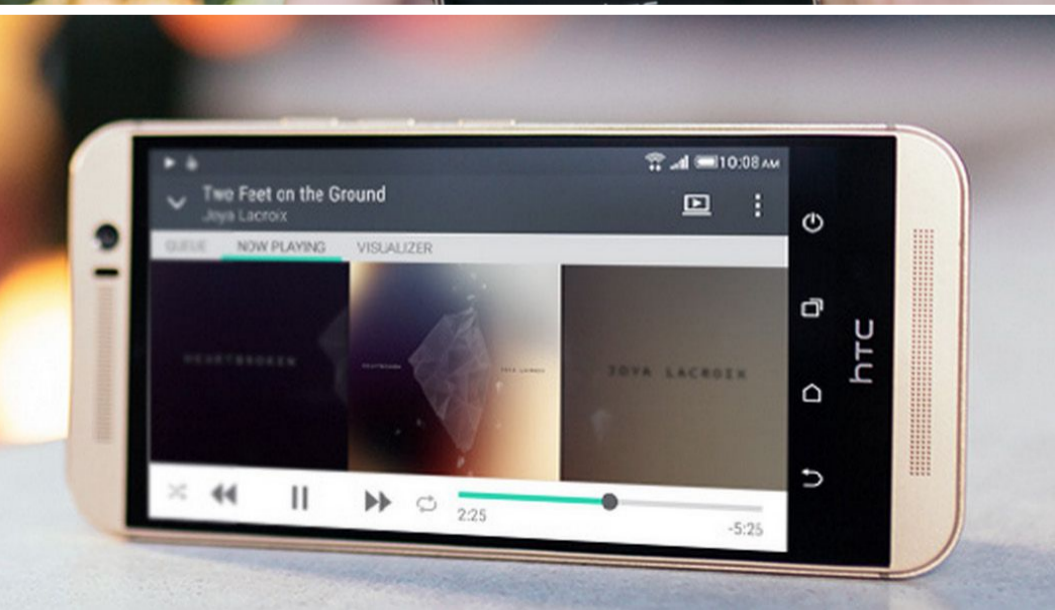
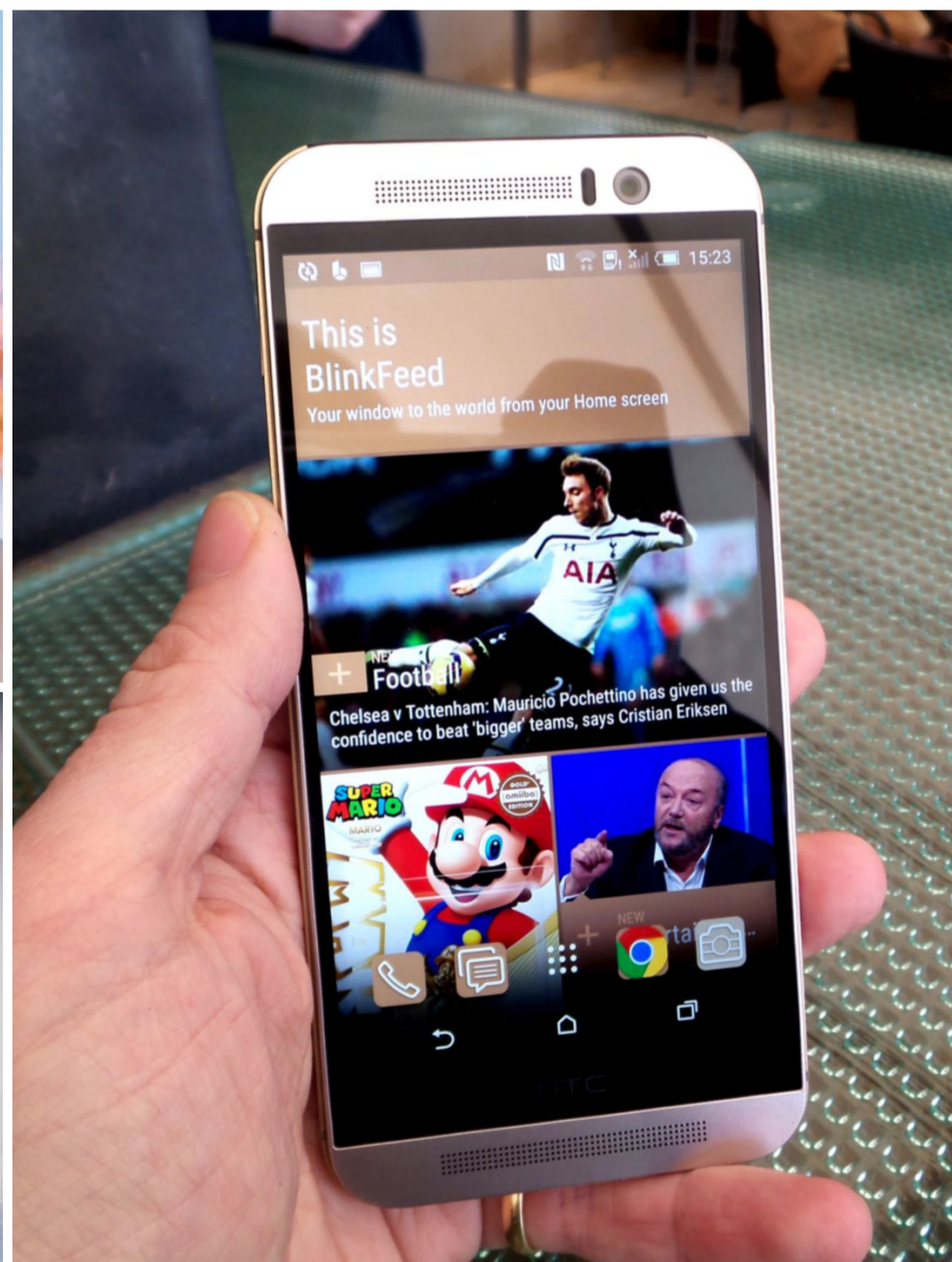
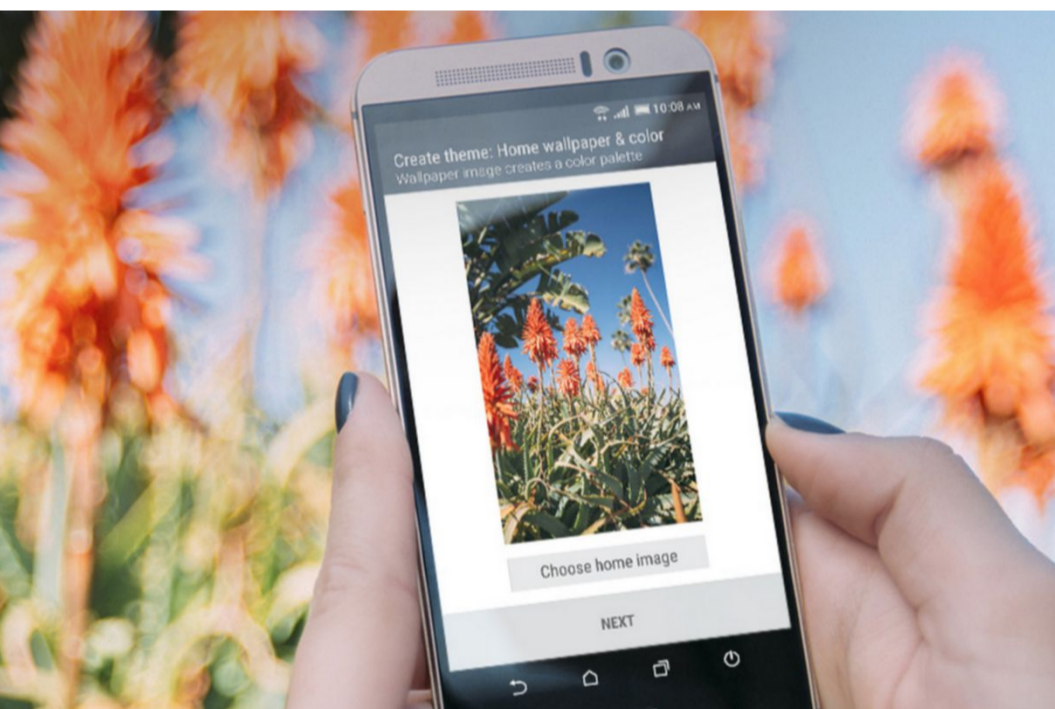
There's still a microSD card slot on the side capable of holding 128GB cards, which supplement the standard 32GB of storage and 3GB of RAM. The M9 uses Qualcomm's Snapdragon 810 processor. I ran a quick SunSpider Web benchmark on the M9 and got the same speed I saw on the LG G Flex 2 at CES, which was half the speed I saw on the production G Flex 2. Software optimization matters a lot, clearly.



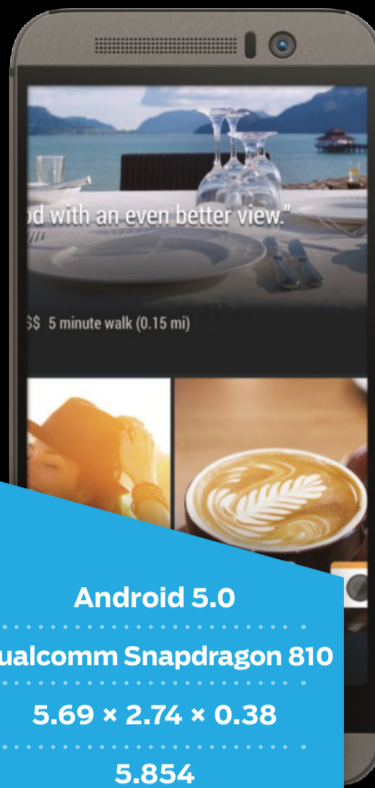
Speaking of software, the new Sense 7, which goes with Android 5.0.1 Lollipop, is a big part of the cute, cuddly experience here. HTC's BlinkFeed app and its lock screen react to your location and the time of day. So at dinner time, you'll see Yelp reviews of tasty meals near you.

When I got my M9 demo unit, it had a theme on it that turned all of the app icons into little circles. There's another theme where, with one touch, you can turn everything into a cartoon-planets-and-stars theme, including the supposedly unchangeable standard Android action buttons. There will be branded themes from the likes of Disney, as well as a theming option to go with your wardrobe: You can take a picture of yourself, and the phone will re-theme itself in colors that match your outfit. It may be a frivolous feature, but it's also fun, stylish, personal, unique, and easy. All of this makes the M9 more customizable (for non-geeks) than most other phones.

More on the productivity side, HTC has a new location-enabled home screen widget that will use your GPS location to pop up the apps you use most commonly at work (productivity), home (entertainment), or on the go. That's a good start. But HTC also intends to tie it into a points-of-interest database, so you'll get tip calculators in a restaurant, train schedules on a platform, and Waze on the road.



# HOW THEY SIZE UP



OPERATING SYSTEM	Android 5.0	Android 5.0	iOS 8
CPU	Samsung Exynos	Qualcomm Snapdragon 810	Apple A8
DIMENSIONS (INCHES, HWD)	5.65 x 2.78 x 0.27	5.69 x 2.74 x 0.38	5.44 x 2.64 x 0.27
WEIGHT (OUNCES)	4.87	5.854	4.55
SCREEN SIZE (INCHES)	5.1	5	4.7
SCREEN TYPE	Super AMOLED HD	Super LCD 3	IPS LCD
SCREEN RESOLUTION (PIXELS)	2,560 x 1,600	1,920 x 1,080	1,334 x 750
SCREEN DENSITY (PPI)	577	441	326
CAMERA RESOLUTION	16MP rear, 5MP front	20.7MP rear, 4MP front	8MP rear, 1.2MP front
VIDEO CAMERA RESOLUTION	4K/1080p	1080p	1080p
BLUETOOTH VERSION	4.1 LE	4.1 LE	4.0 LE
GPS	Yes	Yes	Yes
NFC	Yes	Yes	Yes
TOTAL INTEGRATED STORAGE	32/64/128GB	32GB	32/64/128GB
MICROSD SLOT?	No	Yes	No
<b>SPECS</b>	<b>SAMSUNG GALAXY S6</b>	<b>HTC ONE M9</b>	<b>APPLE IPHONE 6</b>

## CLOSING THE GAP

With the iPhone leading the high-end smartphone market by a country mile in terms of sales, it's clear that Samsung and HTC both identified where they've been falling short and attacked those points with these new phones. That isn't copying the iPhone; it's competition driving everyone forward, the same way Apple saw how Samsung was succeeding with larger phones and followed up with the iPhone 6 Plus.

In Samsung's case, the gap was style. The Galaxy S5 didn't feel like a premium product; although it had a gorgeous screen, its cheap chromed plastic surround gave it a chintzy look. Samsung's user interface software, though pared down from what was used on the Galaxy S4, was still overly complex and had too many options. The S5 was powerful, but it didn't exude taste. The S6, like the S5, tops this year's iPhone on power, but does it with style.



The HTC One M8 had taste in spades. Like Samsung, HTC does its own UI overlay on top of Android, but HTC Sense is generally considered to be good-looking, elegant software. HTC's big mistake (other than its inept, often weird marketing) was its "ultrapixel" camera, which put the M8 significantly behind competitors on this critical application.

So the Galaxy S6 and One M9 hopefully now both match or exceed the best-selling iPhone 6's style, camera prowess, and overall powers. The rest of the story is about execution. Samsung is a marketing juggernaut, but it's spent the past few years trying to convince consumers that features like a removable battery matter; now it needs to pivot and explain why the S6's standout style is more important. HTC has been making tremendously well-reviewed phones for years now, but needs to cut it out with the weird commercials featuring Robert Downey Jr. and trolls.

If you're shopping for a high-end smartphone this year, it's worth waiting until both of these are on the shelves before making your decision. Although LG still needs to weigh in with its G4 (which is probably coming in May), you're sure to find two very strong choices here.

**FEATURES**

**GAMING**

**THE FUTURE OF GAMING IS A LOT MORE VARIED—AND INTERESTING—THAN JUST VR. HERE'S WHAT YOU CAN EXPECT IN 2015 AND BEYOND.**

**BY DAMON POETER**

**ON!**





**T**ake all the gaming news from CES, Mobile World Congress (MWC), and the Game Developers Conference (GDC), mix it up in a bag to get to the most important nuggets, and you start to get a pretty good idea of what fun new stuff gamers are going to get their hands on over the rest of the year.

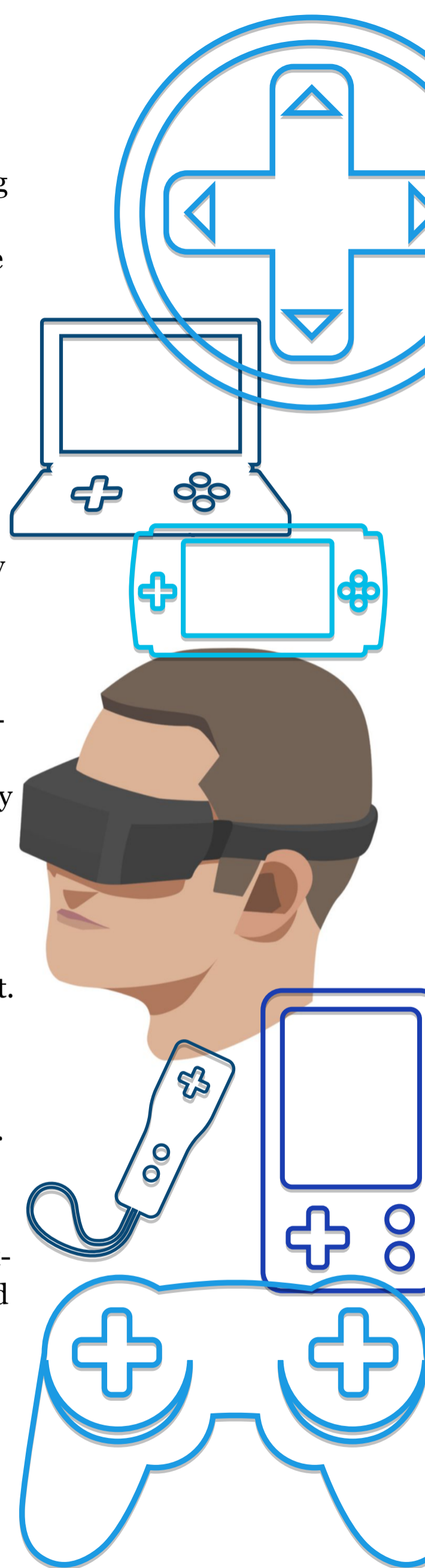
And when you do this, two words leap out: virtual reality. It's been a couple of years since Oculus VR kickstarted the resurgence of interest in VR gaming with its prototype Oculus Rift headset. But these days, just about everybody who's anybody—in video games, mobile, and computer software and hardware—has a strategy for getting in on what's potentially the biggest new growth opportunity in high tech.

Just look at the developments in VR over the past couple of months. Samsung began selling its Gear VR headset in December. At CES, Razer unveiled the open-source OSVR platform. Sony has been hard at work on its PlayStation-integrated "Project Morpheus" accessory for two years now—and debuted a second-generation version at GDC in early March. At MWC in Barcelona, HTC and Valve wowed attendees with Vive, a clunky, chunky face accessory that some reviewers are saying provides the most immersive VR gaming experience yet.

In this space, we're more interested in hitting the brakes on VR Tulipmania, for what it's worth.

Despite what the headlines may say, virtual reality is not the be-all and end-all of gaming in 2015. In fact, far more of us still game the old-fashioned way—on PCs, tablets, phones, and consoles, sans VR headsets—than all of the gamers combined who currently navigate first-person shooters with awkward face computers strapped to their noggins.

As we review recent developments in gaming, let's give credit where credit is due to advances in VR, but let's also remember that there's plenty of other stuff to talk about. People are still working on making PC and console gaming better. More of us play stripped-down



games on our phones than ever before, and the demographics of that market remain the most enticing in the business.

So with no further ado, let's sum up what we've learned in the first few months of 2015 and what it means for video games.

## VIRTUAL INSANITY

Yes, we just said there's a lot more to the future landscape of gaming than VR, but it's still worthwhile to engage in at least a quick review of what's happening in this realm.

Everybody knows that VR hardware is ascendant. There are a number of accessory solutions on the market or in development—many of which are listed above—to get us all hyped up about the prospect of VR gaming going mainstream. And when it does, it's reassuring to note that there will likely be a hardware product available that fits our budget and our needs.

Still, a more important question is, what's happening with content creation for VR? In the first few months of 2015, that question was only marginally answered. Even as Oculus, Sony, HTC, and others gave us carefully controlled demos of their VR accessories at GDC and MWC, another pressing problem loomed large: how to grow a developer ecosystem to build compelling, original content for VR.

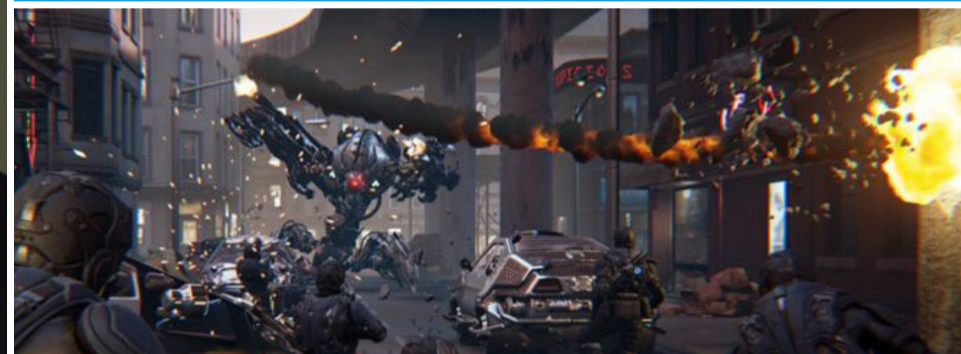


VR headsets from Samsung, Oculus, HTC, Sony, and more can deliver exciting experiences, but the content isn't quite there for them to go mainstream yet.





Unreal Engine 4 gives developers a wide new arsenal of tools for creating both simple and complex VR-based games at 90Hz stereo frame rates and high resolutions. But this frontier remains limited, and high-quality games using VR are still few and far between.



Advanced Micro Devices (AMD), which otherwise had a muted presence at GDC, was one of the few back-end technology providers addressing that issue. AMD announced the availability of its LiquidVR software development kit, which works with nascent VR game engines like Oculus VR 2.0 to reduce latency in head-tracking for virtual reality gaming.

LiquidVR provides a hardware-accelerated solution that better syncs VR engines with AMD Radeon graphics processors, for things like properly timing the lag between user head movement and changes in a virtual environment. If LiquidVR does what AMD says it will, it should help to present a more realistic VR world to gamers—and crucially, one that won't make them sick from disorientation caused by poor latency.

On the broader development front, Epic Games, Weta Digital, and Nvidia teamed up at GDC to showcase Thief in the Shadows, a new VR demo built on Unreal Engine 4 that demonstrates the immersive possibilities of a carefully crafted virtual reality environment. That's a welcome development, but forgive us if we conclude that all this VR Sturm und Drang adds up to a holding pattern. Even as the investment in VR hardware gives us hope for a lively market for immersive gaming taking shape, gamers ought to be concerned that sustainable content-creation paths are not yet being carved out.



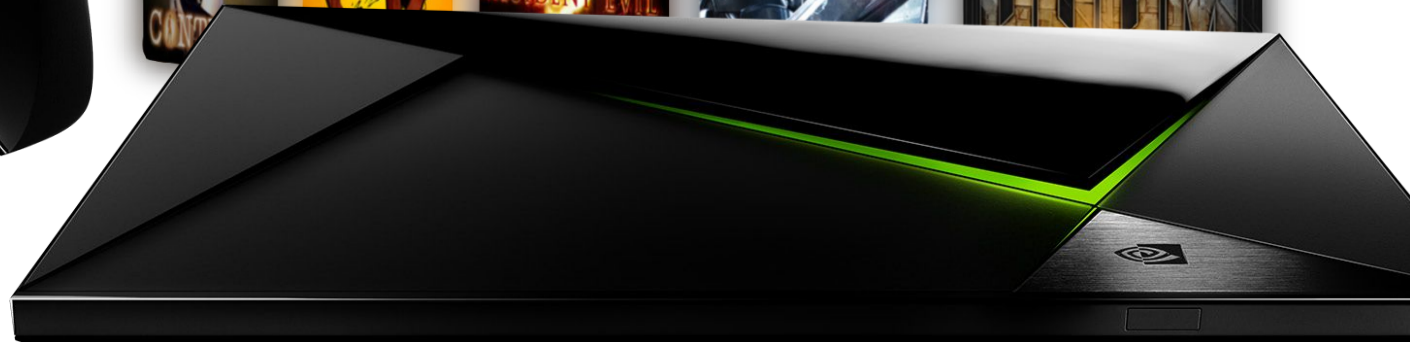
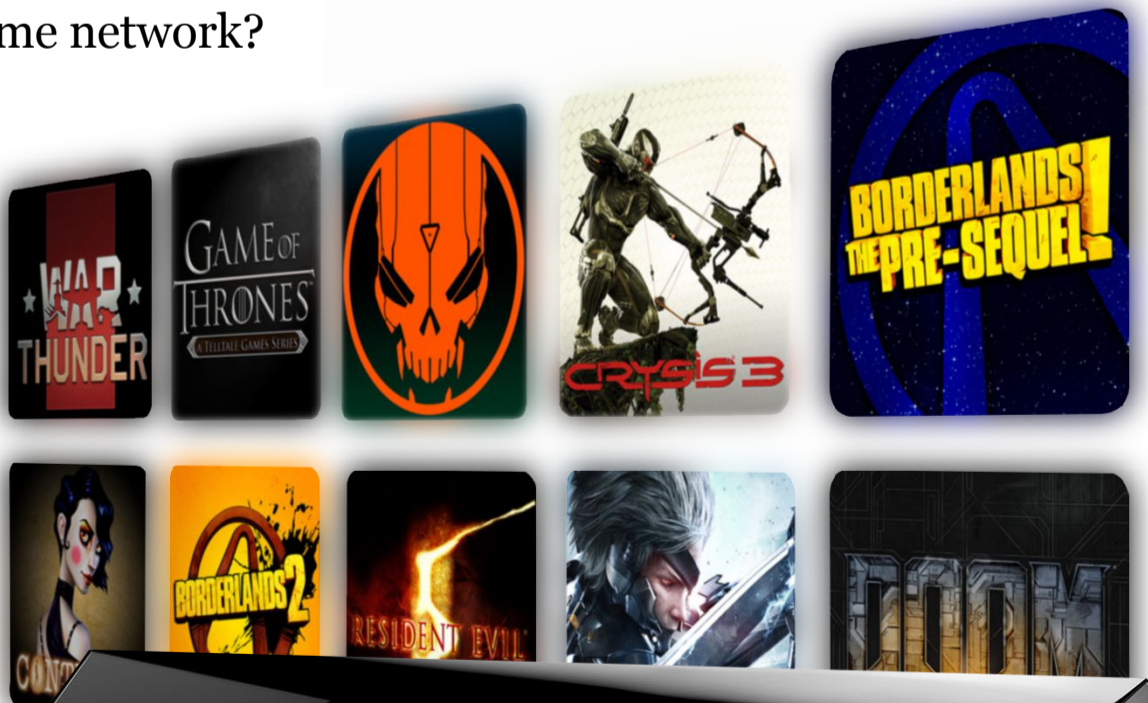
## THE CONSOLE WARS HEAT UP

If you wanted to declare an early winner in the gaming world just a few months into the year, you'd do worse than to name Nvidia. The graphics chip maker put on the splashiest product launch event we saw at GDC, introducing its new Shield microconsole and living room entertainment hub at a gala affair held at the Masonic Center on Nob Hill, the historic enclave of San Francisco's wealthy aristocracy.

But winning the hype game isn't the same as winning the units-sold game. At the bargain price of just \$199, the new Shield can theoretically mount a serious challenge to Microsoft's Xbox One and Sony's PlayStation 4 when Nvidia releases it in May. It's a fantastic all-in-one, Android TV-based entertainment solution that serves up 1080p60 gaming and UltraHD video to your TV—and who doesn't want that?

The caveat is that we haven't yet seen Shield operating in real-world conditions. Sure, it works a treat in the controlled environment Nvidia set up to demonstrate it. But will Shield, which makes its bones on streaming content and cloud-based GRID game acceleration, work as well plugged into the average home network?

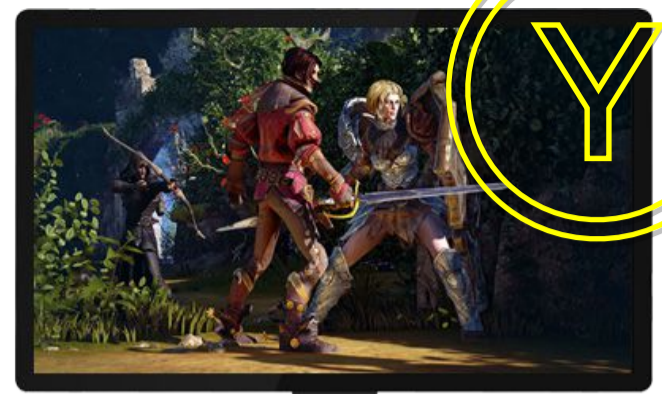
NVIDIA  
SHIELD



If you're more concerned with goings-on in the established console world, it'll be worth it to pay attention to how Microsoft rolls out the merger of its Xbox platform with Windows 10, the next-gen PC operating system that lands later this year.

Redmond has made it very clear that its strategy going forward is to merge its disparate, consumer-facing OS platforms under one umbrella. That means PCs, tablets, phones, and yes, the Xbox One, will all work better together in the near future by virtue of better integration with Windows 10.

To that end, Microsoft announced at GDC the availability of some new software tools to help Xbox developers tailor their games and services to the broader Windows 10 world. The upshot is that it should be easier to build apps that work across the entire vast Windows ecosystem and tie in seamlessly to the Windows Store, Redmond's belated answer to iTunes and Google Play.



**PROJECT  
MORPHEUS**



Meanwhile, Sony and Nintendo have been more quiet. Sony did debut its second-generation Morpheus VR headset at GDC to good reviews, but the PS4 accessory won't even be released until 2016. Nintendo has long been expected to launch a more expansive gaming network to better compete with the PlayStation Network and Xbox Live, but so far, crickets.

## THE NEW MOBILE

Intel has traditionally been in the thick of things when it comes to gaming. But as the PC has surrendered its position as the agenda-setting gaming platform, the chip giant has appeared less confident about what it brings to the table.

The old trickle-down paradigm, where games created for the screamingest, clock-punishing Intel enthusiast boards informed how development happened on less powerful platforms, is gone. And it's not coming back.

To Intel's credit, the very smart folks toiling away in Santa Clara seem to be refocusing their energy on innovating for the new reality. At GDC, Intel talked up its new fifth-gen Core desktop processor with Iris Pro graphics, but spent even more time building up new partnerships with Ubisoft and Funcom to better tailor Intel-based systems to stripped-down, low-power mobile game imprints.

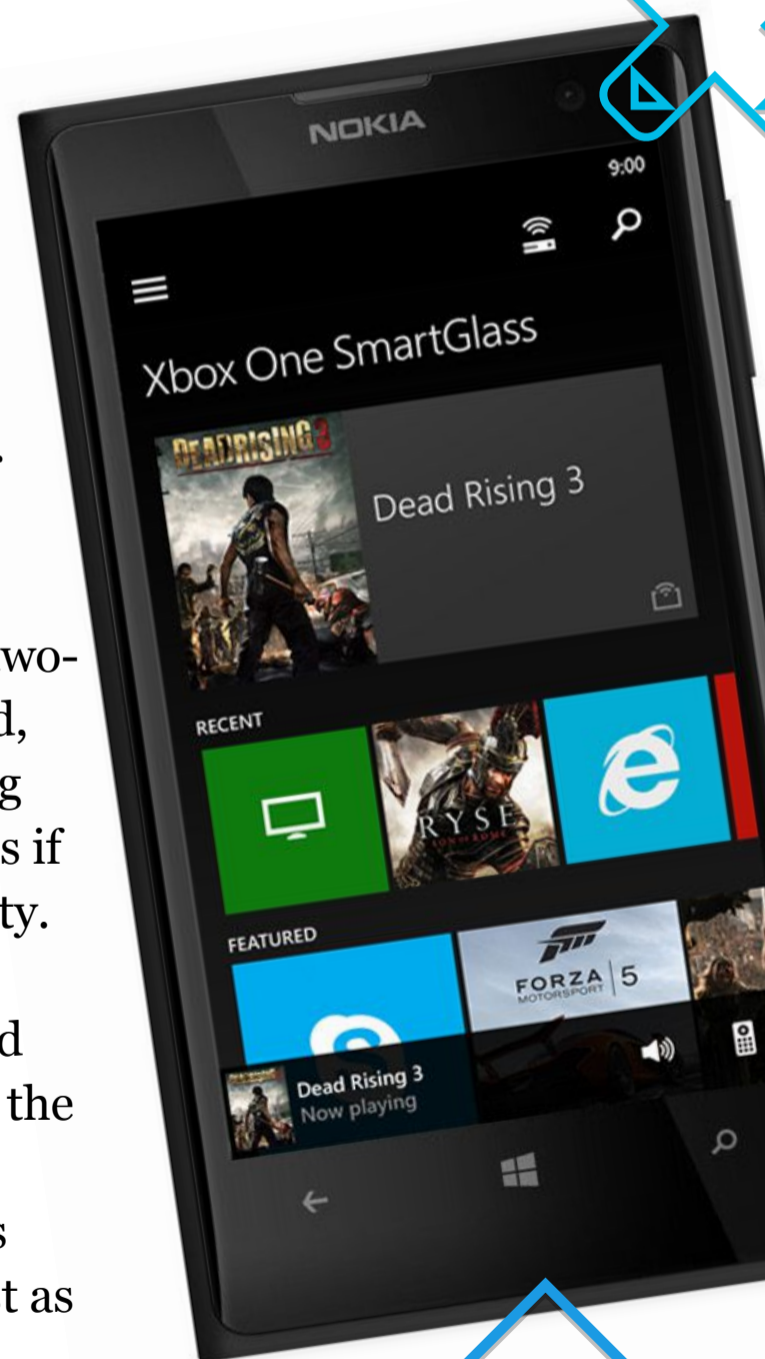
The upshot is that mobile devices like tablets and two-in-ones, powered by Intel chips and running Android, are going to get better at playing games in the coming months. That's not a terrible thing, even if it seems as if Intel and x86 are coming dangerously late to the party.

Ultimately, the dividing lines between PC gaming, console gaming, and mobile gaming are more blurred than they've ever been. Microsoft's big push to bring the Xbox and Windows Phone under the umbrella of Windows 10 probably illustrates that best. But Epic's turning Unreal Engine 4 into freeware is perhaps just as big a deal.

Developers who create games on Unreal Engine will have to give Epic a cut of their revenues, but now they won't have to pay an upfront license fee. This opens the



**WINDOWS PHONE  
GAMES VIA XBOX LIVE**



**XBOX ONE SMARTGLASS  
FOR WINDOWS PHONE**



The capability of Intel's RealSense technology to recognize and respond to facial expressions as well as hand gestures makes it ideal for immersive gaming uses.

door for more small, indie developers to create games on one of the top cross-platform game engines—for the PS4 and Xbox One, as well as Android microconsoles, the Web, Macs, and yes, PCs.

It's also worth keeping an eye on Intel's development of its RealSense technology for incorporating motion and other natural interface inputs into computing. We're seeing the fruits of this investment in desktops and high-end laptops first, but Intel's plan is to bring elements of RealSense into mobile as well and gaming is certainly one area where the technology should have a very big impact.

## THE MORE THINGS CHANGE

What does this all mean? Gaming in 2015 is bigger than ever—and yet the gaming landscape looks far different than it did over the past decade. Led by Microsoft and Sony, consoles remain the dominant force in the industry, but game distribution is changing at a frantic pace, away from sales of physical copies to downloads and streaming services.

PC gaming is now less about a CPU/GPU arms race and more about maximizing gameplay on more humble processing platforms, as well as driving the evolution of VR. New toolkits like Enlighten 3 from ARM's Geomerics and LiquidVR from AMD aim to give developers better means to create amazing games with existing assets.

Social gaming is, well, sort of still with us but not exciting too many people anymore. Android gaming, essentially nonexistent except on smartphones a few years ago, is now a key cog in Nvidia's Shield microconsole play, as well as in Intel's designs on more tablet and two-in-one sales.

So in a sense, gaming as we've known it, is dead. Long live gaming!

## **GET ORGANIZED**

**Organize Everything You  
Want to Read Online**

## **TIPS**

**Master Microsoft  
OneDrive**

## **HOW TO**

**Run Windows 10 in a  
Virtual Machine**

## **TECH ETIQUETTE**

**Ask Alex:  
Selfie Stick Shaming**

# Digital

# Life

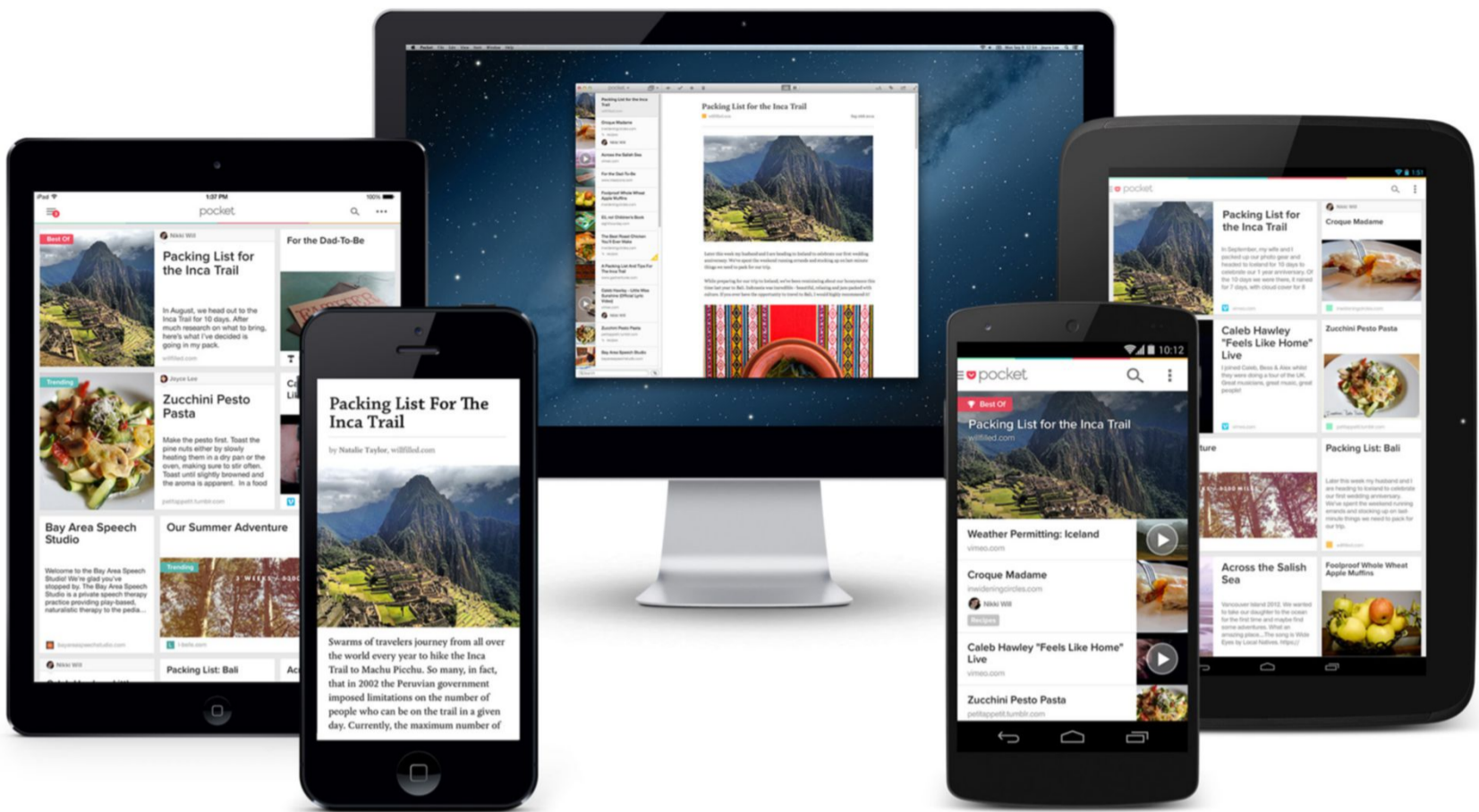


# Organize Everything You Want to Read Online

Want to read more? Use these apps to collect all the interesting material you find online in a single convenient place. BY JILL DUFFY



**A**ren't you always finding interesting long-form articles online when you don't have any time to read them? I am. Wouldn't it make sense, then, to have a way to save and organize those articles so that they'd be in one convenient place to read when you actually did have time? Maybe you've heard of Pocket and Instapaper. Those are two of the best-known apps that help you save Web content for later reading. But there are other apps and services, too, and each does something a little different. If you're committed to reading more, you should commit to one of these apps. Here's what you need to know to decide which is right for you.



## **POCKET** [getpocket.com](http://getpocket.com)

*Available for Web browsers (Firefox, IE, Safari, Opera), Web (app), iPhone and iPad, Android and Kindle Fire, BlackBerry, ereaders, OS X, and more*

With Pocket, saving an interesting article to read later never takes more than a click. When you see an article or webpage you want to save, you just click the Pocket extension in your Web browser or the share button on your mobile device and the piece will be saved to your Pocket account. You can then read the material offline in the Pocket app or Web account. The apps are designed to be easy on your eyes, with ads and extraneous images removed.

In Pocket, you can also add tags to saved articles to categorize them, mark them with a star, and check them off after you've read them. Additional perks and features for subscribers to Pocket Premium (\$44.99 per year) include saving a history of everything you've read and making that library searchable. One thing I don't like about Pocket is that you can't simply drag and drop items to reorder them. You can sort by tag, see all items marked with a star, or order the articles by most recent or least recent.

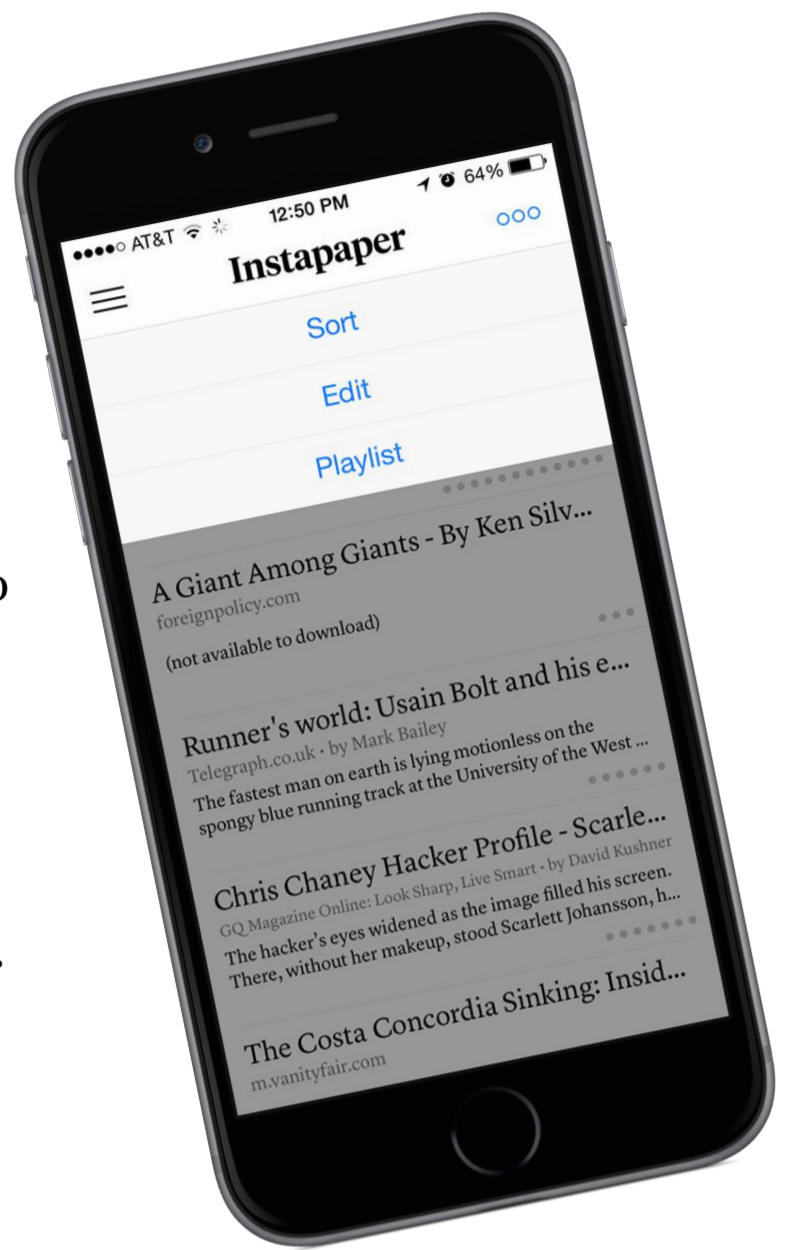
## **INSTAPAPER** [instapaper.com](http://instapaper.com)

*Available for Android, Kindle, iPhone and iPad, Safari, and Chrome*

Instapaper is similar to Pocket in that it lets you save items you want to read offline in its app or Web account at your convenience, and strips away extraneous stuff to help you focus on the content of your reading material. It also includes a highlighting tool, which is handy for people who need to take notes as they read. With a free Instapaper account, there are limits on how much you can highlight, however, and you'll need to pay for a Premium Instapaper account

(\$2.99 per month) for unlimited highlighting and a few other perks.

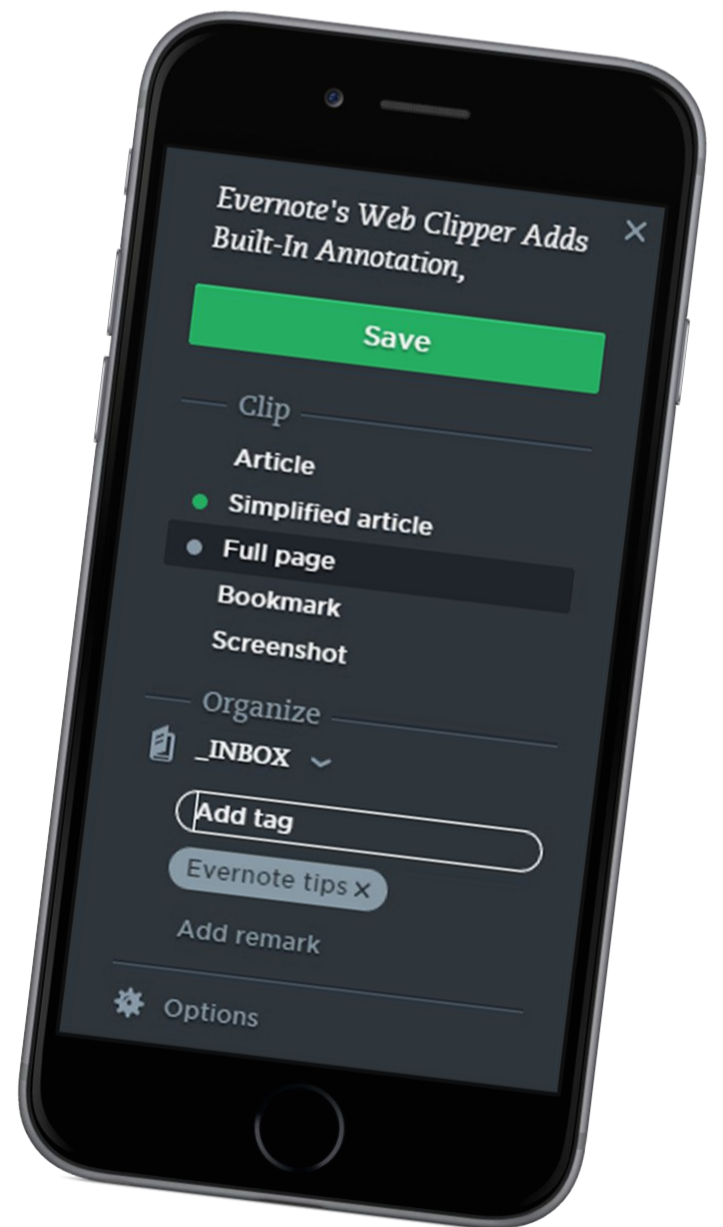
Similar to Pocket, Instapaper doesn't let you drag and drop to reorder your content, but you can sort by many other options, including "read progress," which is essentially a "finish what you started" button. That alone is a compelling reason to choose Instapaper. When you choose to download a file you've saved to Instapaper, you can select the format to be for Kindle, Epub, printable, or RSS feed. In other words, you can essentially convert any webpage to those other formats. Instapaper doesn't have tags, unfortunately, although you can change the name and descriptions of articles you save.

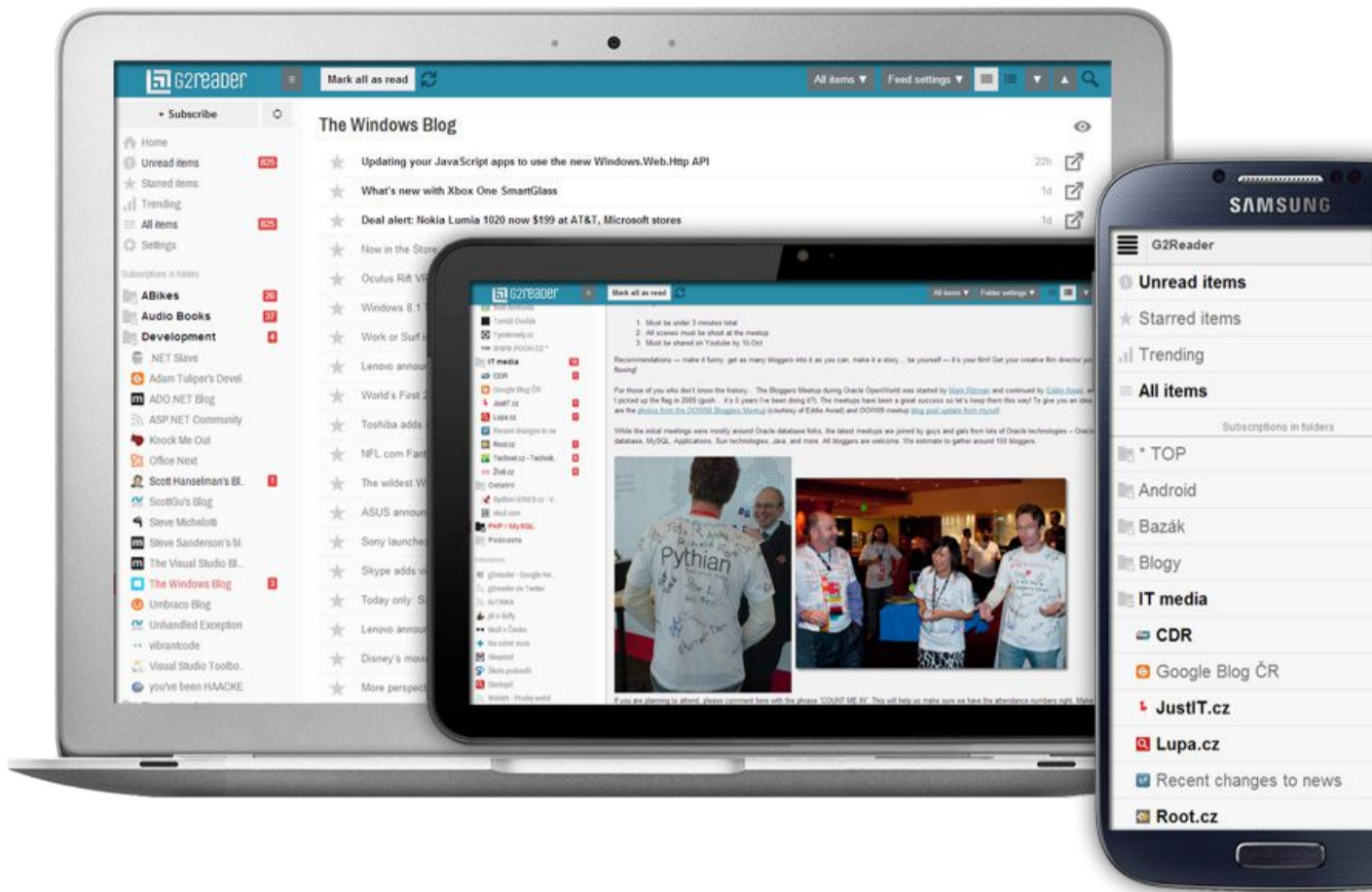


### **EVERNOTE WEB CLIPPER** [evernote.com](http://evernote.com)

*Evernote app available for Windows, Mac, Web, Android, iOS, Windows Phone, BlackBerry; Web clipper available for Chrome, Firefox, Opera, and Safari*

Fans of Evernote, and especially those who pay for Evernote Premium (\$5 per month), should know that they don't need to download a new app to read Web content offline. Evernote has a browser extension called Web Clipper that saves any online material you see to your Evernote account. I've always used the Web Clipper to save recipes, but it works for traditional articles, too. Then, you can read your material whenever and wherever you want, because Evernote has apps for just about every platform. You'll need a Premium account, however, to save those files for offline reading. The Web Clipper does have options for helping you strip out unnecessary images and links, but you also have the option to keep them.





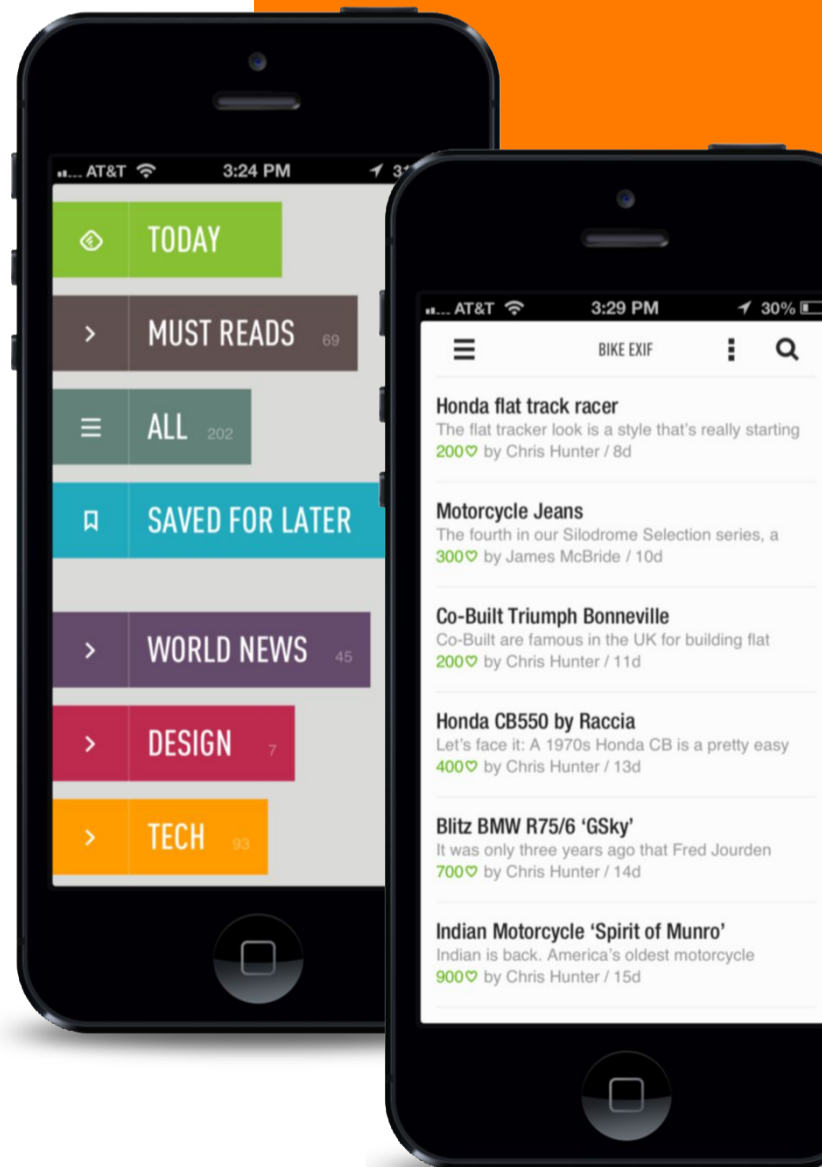
**RSS Feed Readers**  
 Use apps like **G2Reader (left)** or **Feedly (below)** to collect news stories, blog posts, and other content from around the Web and deliver it to you the instant it's published.

## RSS FEED READERS

*Available for Web and Mobile*

All the options I've mentioned so far help you save articles you find online to read later. But there's a different way to approach how to find, organize, and read Web content, and it's to use an RSS feed reader. You use them to follow certain websites, bloggers, or other feeds of content, and the RSS feed reader collects the new material that they churn out. Warning: For the disorganized, RSS feed readers can become overwhelming, especially if you subscribe to too many feeds. It's a very different approach to reading than amassing articles you find online one at a time, although it's great for headline scanning.

Two of my favorite RSS feed readers are G2Reader ([g2reader.com](http://g2reader.com)) and Feedly ([feedly.com](http://feedly.com)). Feedly is an interesting choice in the context of this article because you can save content from it directly to Evernote.

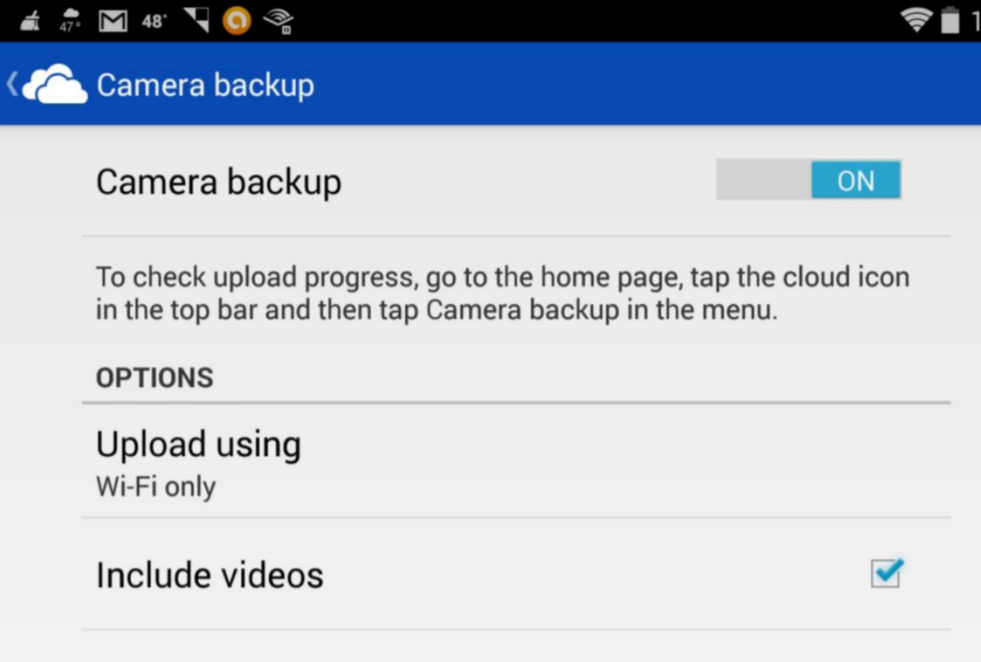


# Master Microsoft OneDrive

BY ERIC GRIFFITH



**T**hough Google Drive is nearly synonymous with cloud syncing and has excellent integration of document and spreadsheet editing, Microsoft's OneDrive has something arguably better: full integration with Office Online, which houses the online versions of Word, Excel, PowerPoint, and OneNote. Plus, OneDrive is integrated directly with Windows 8.1—no utility needed. All it takes to access OneDrive is a Microsoft account. The service will sync files between all your Windows and Mac computers, which you can access online via mobile apps and the Web. And you get 15GB of free storage to boot. But there's a lot more to OneDrive than you may know. Here's how to take advantage of all of it.



## DOUBLE YOUR STORAGE SPACE WITH CAMERA BACKUP

There's a chance you're using OneDrive but are not a subscriber to Office 365. In that case, you get 15GB of online storage for free from Microsoft (if you have 25GB free, you've probably had your Microsoft account since before April 2012). There are ways to increase that free allotment. You can refer new users to OneDrive—that'll nab you a paltry 500MB of new space per person who takes you up on the referral, up to a maximum of 5GB. Microsoft makes it easy to invite people, even via social networks. But that will take forever, and doesn't net much.

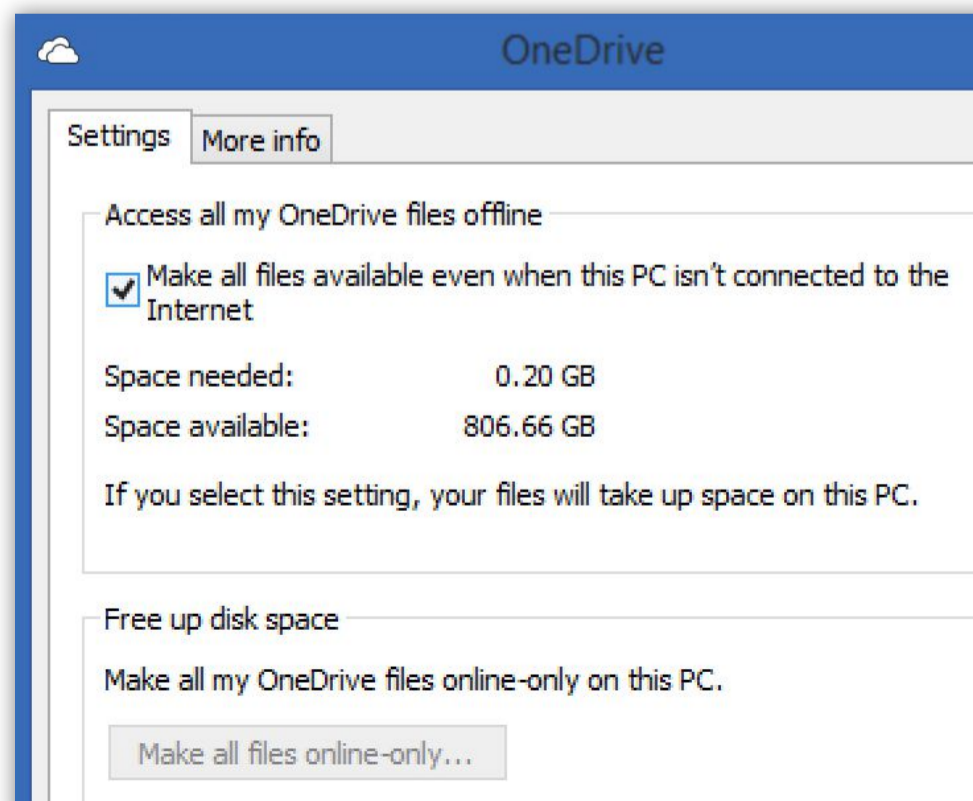
The faster way to double your storage is to activate the "camera roll bonus." To do that, go to the OneDrive mobile app on Windows Phone, iOS, or Android and turn on the camera backup feature. Every picture you take will then get uploaded to OneDrive—and your storage will double from 15GB to 30GB instantly. Windows 7 and 8 will soon have automatic backup of pictures as well, even when you connect a digital camera.

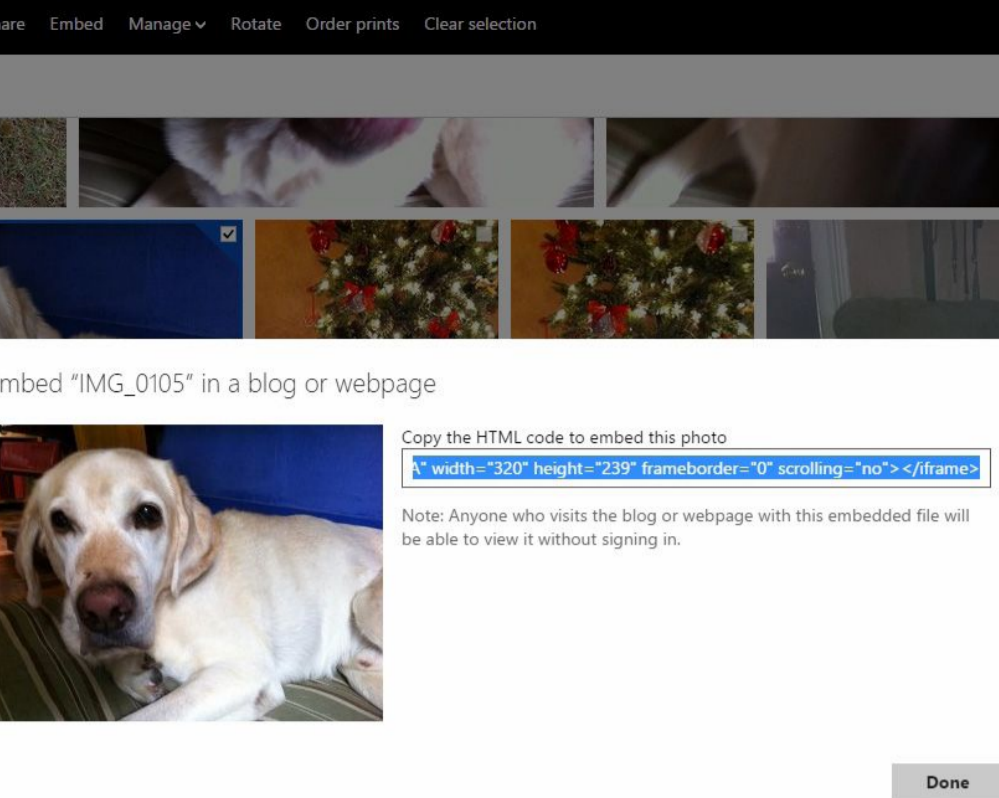
## CHANGE WINDOWS SYNC SETTINGS

OneDrive is part of the sync settings between all your Windows PCs. You can change the settings so you don't always have the same apps (the Windows 8 Start type), wallpapers, start screens, and so on. Just go into OneDrive by right-clicking the icon in the Windows system tray, select OneDrive Storage, and click to "Sync Settings." Or just turn off the PC syncing functions entirely.

## READ ONEDRIVE FILES OFFLINE

In Windows, right-click that OneDrive icon in the system tray. Select Settings. The first tab only has a couple of options, but one you probably should try if you have a big hard drive on that particular PC is "Make all files available even when this PC isn't connected to the Internet." That means even when you're offline, especially with a laptop out of Wi-Fi range, you can still work. Files will sync up again with the online storage when that PC is next attached to the Internet.





## SHARE OR EMBED FOLDERS AND FILES

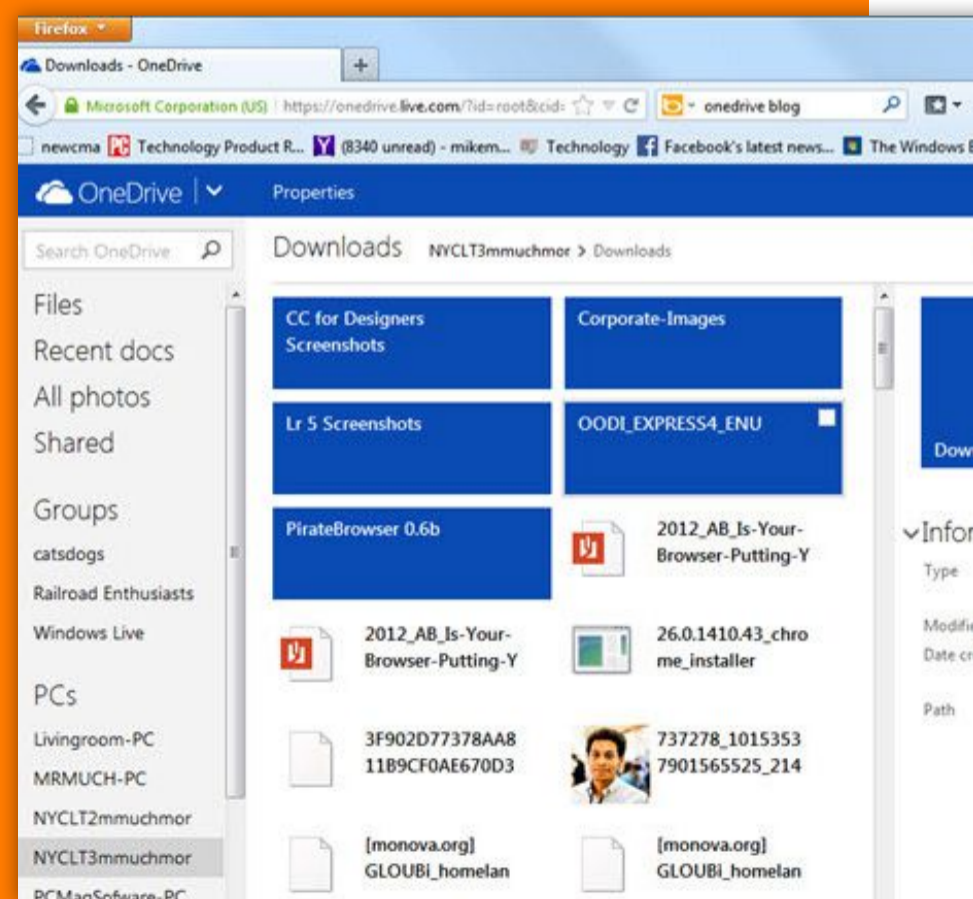
Sharing a file from OneDrive is as easy as you'd expect. From the Web, right-click a file to get a shareable link (it can allow people to view an item only, or you may institute editing privileges), send the link by email, or share directly in Facebook (if that social network is connected to your OneDrive account).

Embedding is more for displaying something, such as when you embed a YouTube video on a webpage. The Embed command will generate HTML code you can then use on a blog or webpage. (The social networks, like Twitter or Facebook, are usually fine with the link you get from the Share option.)

You're not limited to sharing or embedding individual files. You can do either with an entire folder full of files. Sadly, OneDrive doesn't let other people put stuff into the embedded folder, so you can't use it to collect items from your audience. Then again, maybe that's a good thing.

## ACCESS OTHER PCS OVER ONEDRIVE

One amazing thing OneDrive does for you if you're a Windows user is allow access to files on all your PCs—even if the files aren't in your OneDrive folders. In the Web interface you'll see a PCs section, and the name of each PC on the account is listed. If the other PC is turned on, you can click the name and access all the folders on it (assuming the permissions are properly set to do that). It's mainly for access to Office files and photos or videos, so don't expect that you'll be able to find every kind of file, but this is a strong feature even with caveats, and will only get stronger in future versions of OneDrive and Windows. It doesn't exist in the mobile apps, however.





## ONEDRIVE ON XBOX

There's a OneDrive app available on the Xbox 360 and Xbox One (find the latter via a Bing search). It's a perfect way to view personal images or watch videos on the big screen. Any videos stored in MPEG-4, MOV, and M4V formats should be playable without issue—and videos auto-uploaded from an iPhone (even if they were originally shot with an app like Vine, Instagram, or Hyperlapse) will work. In fact, when sharing, OneDrive will actually re-encode video on the fly to suit the player. That means that a big file is sized down to stream better to a phone. Still images play as a slideshow. In March, Microsoft added the capability to play MP3, AAC, and WMA music files, but you're limited to uploading 50,000 songs.

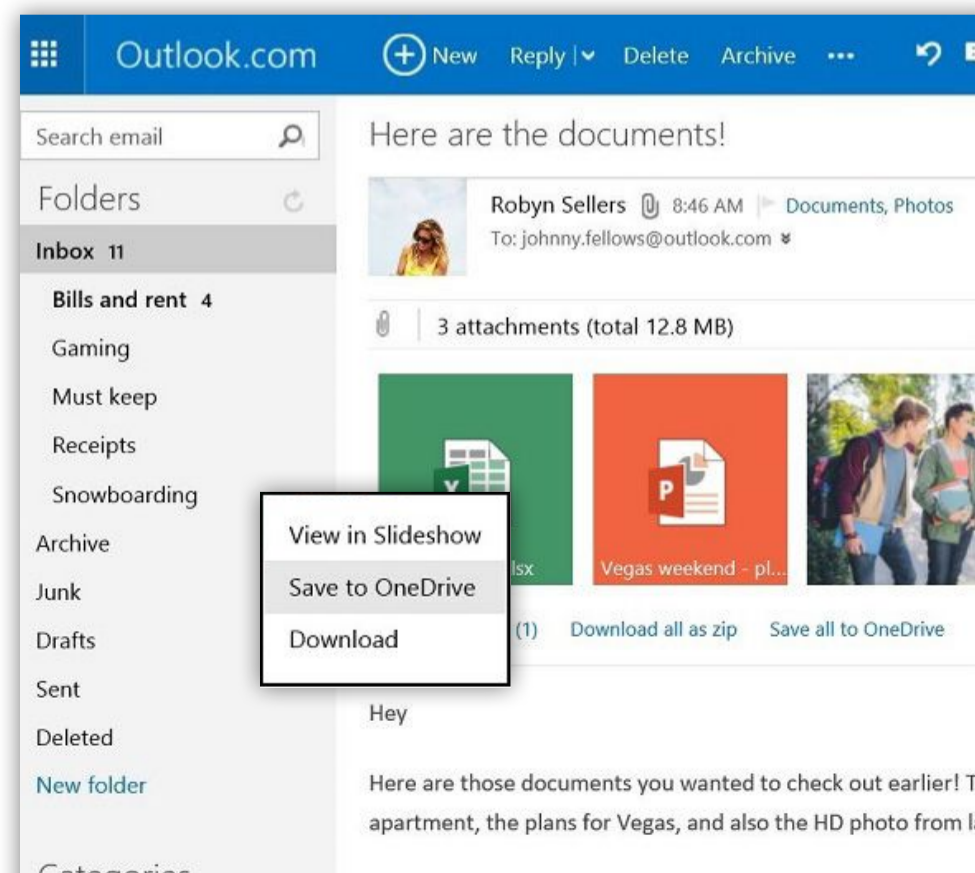
## SAVE ALL OFFICE FILES TO ONEDRIVE

If it's not clear already, OneDrive and Microsoft Office programs like Word and Excel are heavily intertwined, to the point that your OneDrive folder is the default place to save your files from the programs themselves. You can tell you're signed into your Microsoft account while in Word or OneNote, for example, if your name and profile pic are showing in the upper-right corner of a document window. If

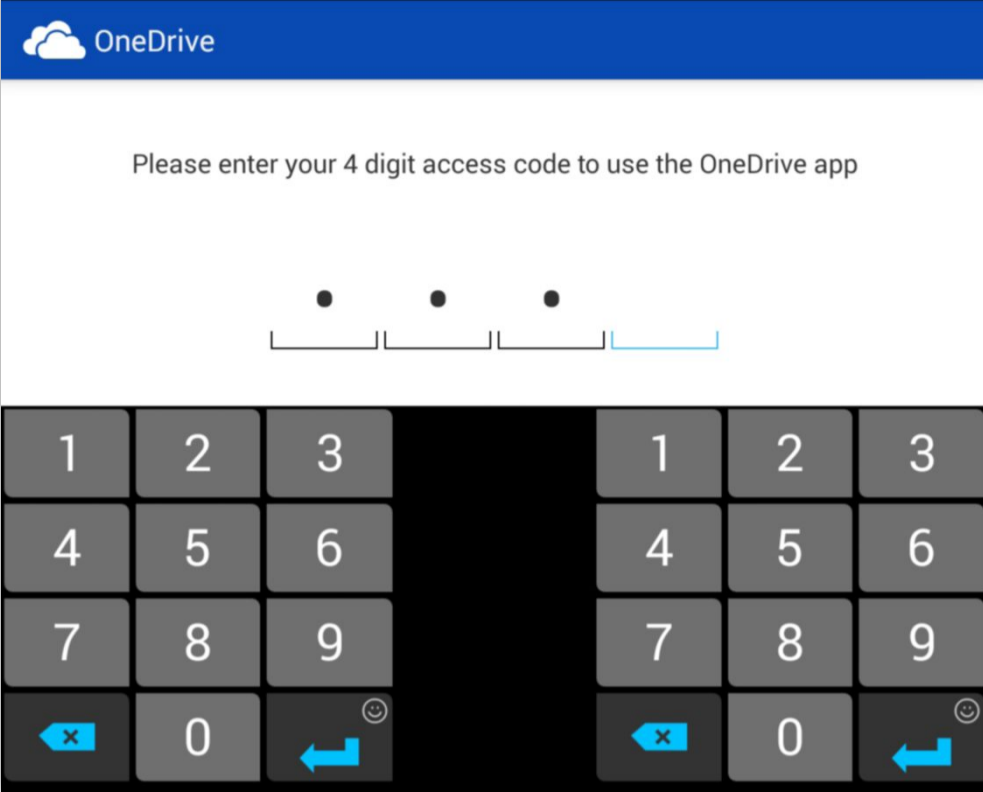
you're not, sign in by going to File > Account. You can click "Add a service" to add OneDrive if it's not already there after you sign into your Microsoft account, but it should be.

After that, whenever you're online and save a new document, the first option that comes up should be "OneDrive – Personal" (as opposed to the "OneDrive – Business" account some offices and schools use). Click "Browse" and you'll get a listing in Windows Explorer of the local OneDrive folders on your hard drive—the folders that are automatically synced with the online service, and then to other computers. Click the Pin icon next to any folder you'll use a lot and it will always be an option.

Naturally, you can save data from any Windows program to those folders and they'll get synced (just as you'd do with the local folders for Dropbox or Google Drive). If you have a secondary OneDrive account, click "Add a Place" and you'll get the option to access that secondary account (or an Office 365 SharePoint volume if your office has one).







## SET UP PIN CODE ON MOBILE

Need an extra smidgen of security? On the mobile OneDrive apps, under settings, activate Require Code and you'll be asked for a four-digit personal identification number (PIN). Thereafter, you'll need to enter it to access OneDrive files online via the app. Apple users with an iPhone 5 or later with a Touch ID fingerprint scanner now have the option to use their fingerprint as access (though the PIN is still required as backup).

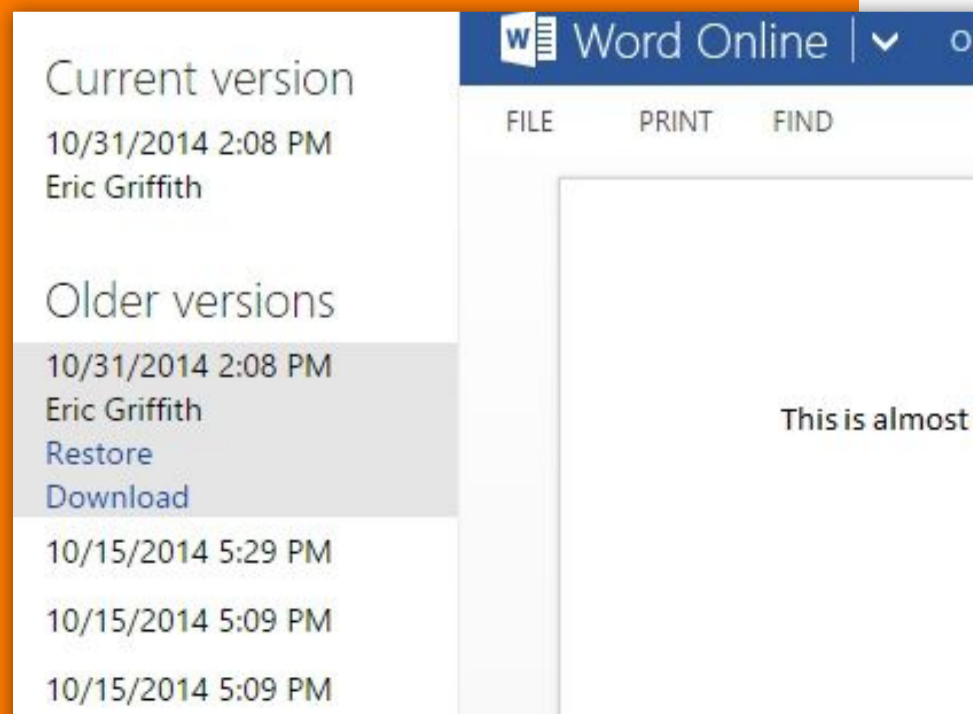
## WATCH FOR APP PASSWORDS WITH 2FA

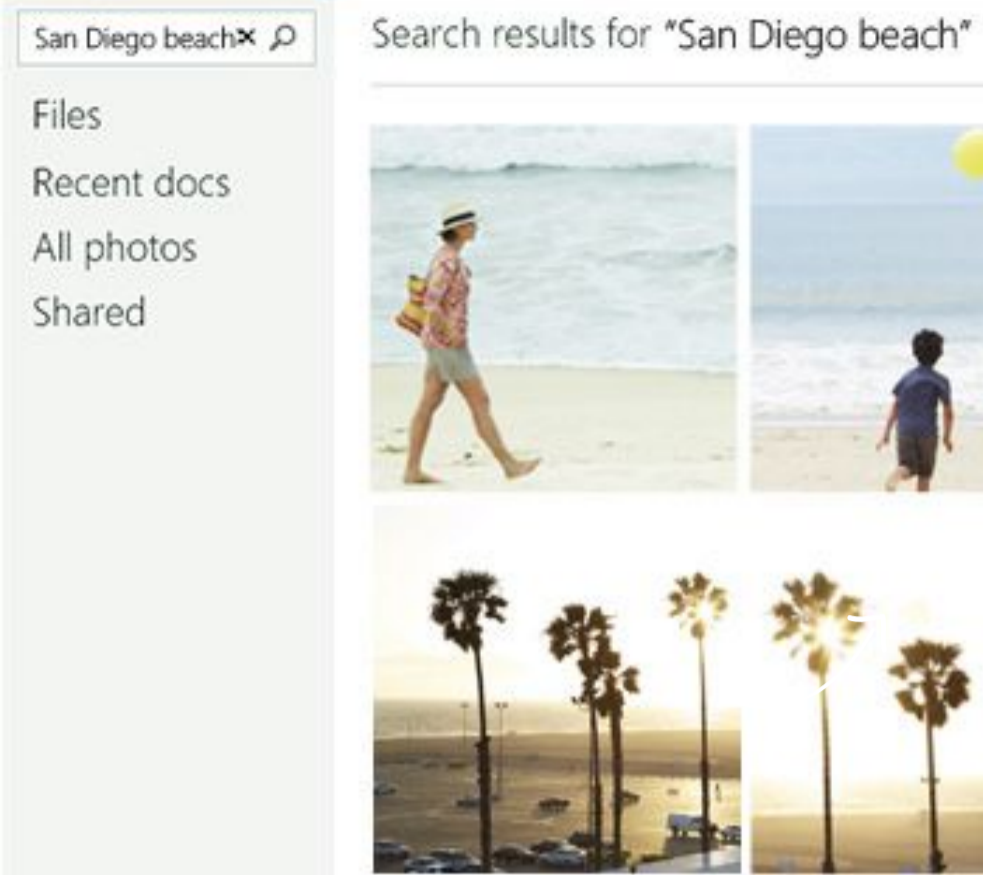
If you're smart, you've signed up your Microsoft account to use two-factor authentication (2FA) for maximum security. One of the options with 2FA from Microsoft is to use an "app password," a one-time-use password used to sign into Microsoft services. You need an app password when the service you want to access is on a platform with no option to enter the secondary code you generally get on your smartphone. I ran into it when signing on to OneDrive on

an Xbox 360—my normal Microsoft account password did not work, because there was no way to enter the extra code Microsoft sends for secondary authentication. If this happens to you, you can gain access by going to the Security & Privacy section of Microsoft's Live account settings and clicking "Create a New App Password."

## ACCESS FILE VERSIONS

When you overwrite a file on the PC, the old version is usually toast. Luckily, sync and backup services like OneNote exist. That might not seem like much help, as if you overwrite a file on the PC, the sync function just grabs the overwritten file. But OneDrive saves every new version change to your documents, especially for Office files from Word, Excel, and PowerPoint. Thus, if you overwrite a file, go to the Web interface, right-click the file to access Version History, and you'll see the full set of clickable options on the left, including one for restoring the older version to make it the current version. Or just download it as a backup. You also get the option to start editing that version in the online app or the full program.





### SEARCH WITH BING

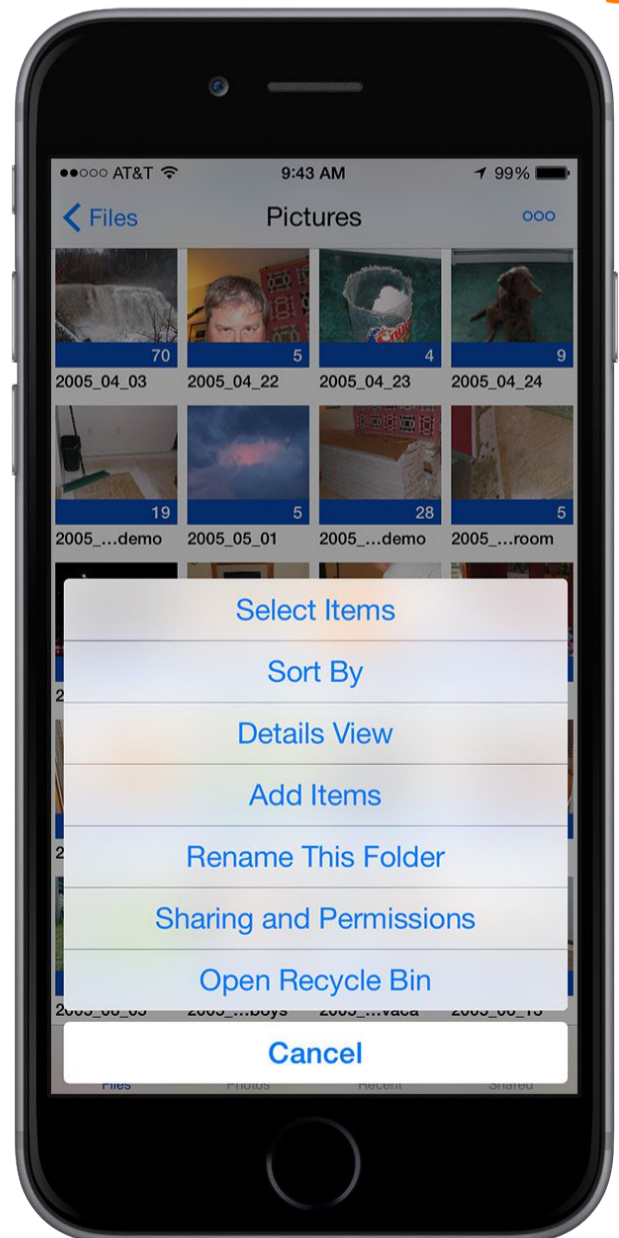
Use the integrated Bing search to find specific OneDrive files. Bing will look at the text inside Office documents, PDF files, and at the tags you assign to images (or the tags OneDrive auto-assigns). In theory, you don't have to do much organization of whatever you put on OneDrive, because you can find it all with a clean search.

### EXAMINE PHOTO STATS

As is true with Flickr, when you look at a photo uploaded to OneDrive, you can see all the photo's EXIF information, the metadata that tells you a lot about the photo. OneDrive will even display a Bing map showing where the image was shot, based on the geographic data in the file, and the camera used to shoot it. Take the extra time to tag the photo and it'll be easier to find in future searches.

### USE MOBILE APPS FOR UPLOADS

Even though OneDrive comes off as pretty PC-centric due to the ties with Microsoft Office products, there are of course mobile apps for your smartphones and tablets. Using the apps to upload files is a breeze, beyond the previously mentioned camera backup. On Android, for example, just go into a folder, click the Upload icon (an upward-pointing arrow) and find the file you want to be stored and synced. On iOS, go into the folder, click the three-dot icon at top, then click "Add Items"—you'll have the option to upload from stored files in any app that iOS can access, such as Photos, but also apps like Instagram.



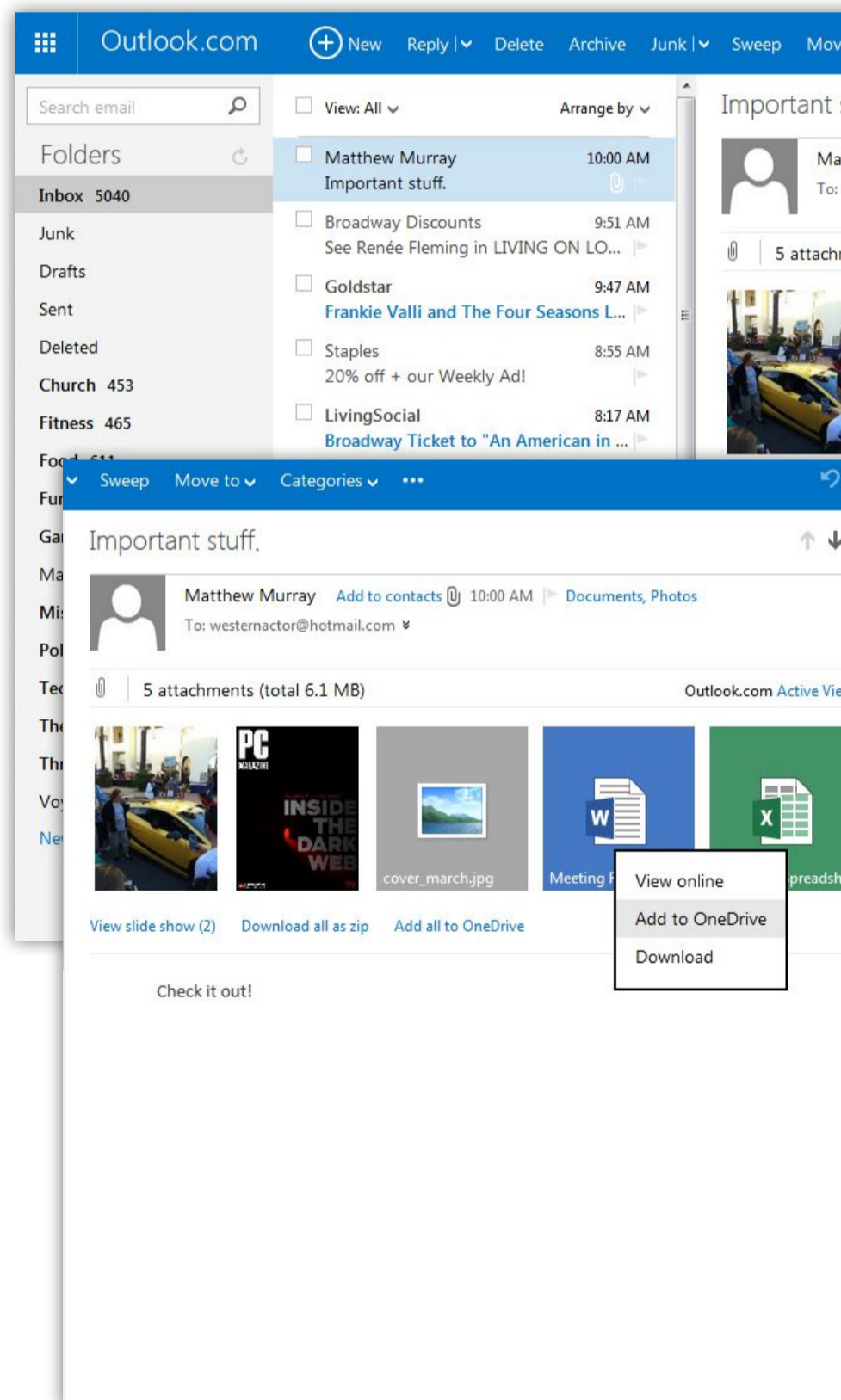


## BETTER PHOTO ORGANIZATION

OneDrive supports folders, of course, but now also has albums. The difference is, folders are more for storage, whereas albums are more for display. You get bigger thumbnail images to search through, and when you view a picture in an album, it takes up the full screen (you can access all the photo info on a pop-up menu). You don't need to move photos into an album—if you have several folders full of vacation images, for example, or if some got stuck in your email attachments, just make one album and pull from all of the folders. You can then share that album with others, and keep changing the album even after that. Albums launched first on the Web and iOS apps, and will soon be on Android and Windows Phone.

## OUTLOOK.COM ATTACHMENTS SAVED

The Save to OneDrive feature makes it possible to instantly back up a file attached to an email message in Outlook.com directly to an “Email Attachments” folder on OneDrive. Send pictures, video, documents, audio, or anything else to OneDrive and access it anywhere. Now you don't have to email it to yourself to access it online later.



# Install Windows 10 in a Virtual Machine

BY GRANT BRUNNER

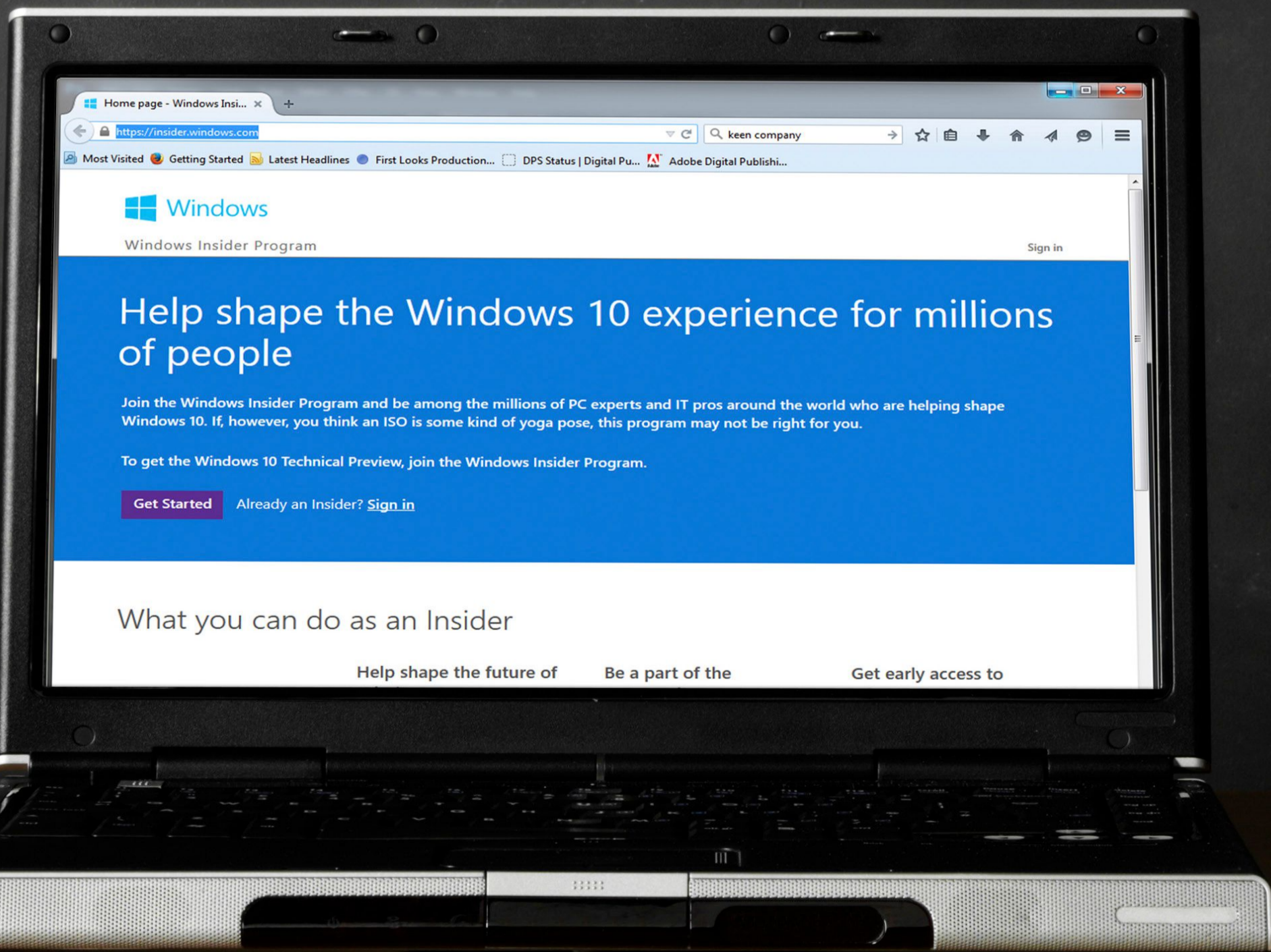
**W**indows 10 is slated for retail release this summer, but anyone can sign up right now for the Windows Insider program, download the Technical Preview build, and get a taste of what the latest version of Microsoft's operating system has to offer. Of course, a prerelease build should never be used as your primary operating system, so to start experiencing Windows 10 while keeping your computer safe, consider installing it in a virtual machine. Note: For this story, we used the free VMware Player (available for Windows and Linux), but other virtual machine applications, such as VirtualBox ([virtualbox.org](http://virtualbox.org)), may be used as well.

WINDOWS 10 PREVIEW



# 1. Download the Windows 10 ISO

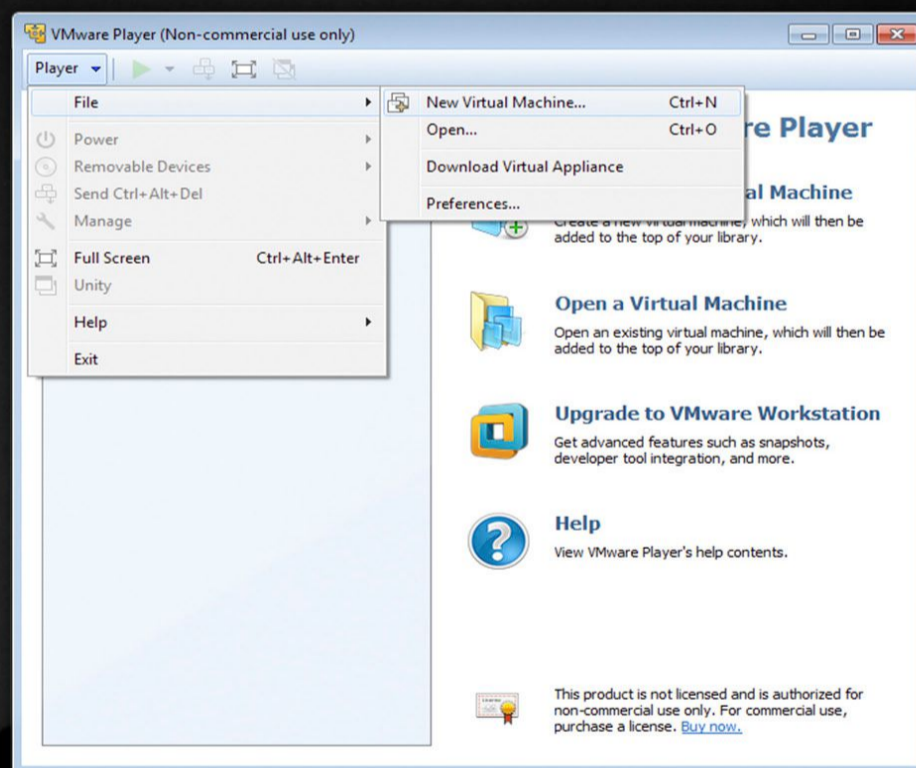
First off, head over to the Windows Insider site ([insider.windows.com](https://insider.windows.com)), and sign up. Once you've agreed to the terms of service, proceed to the download page, and pick which disc image you want to download. For the purposes of this walkthrough, we're using the 64-bit English ISO, but go with whatever works for your setup.



## 2. Create a New Virtual Machine

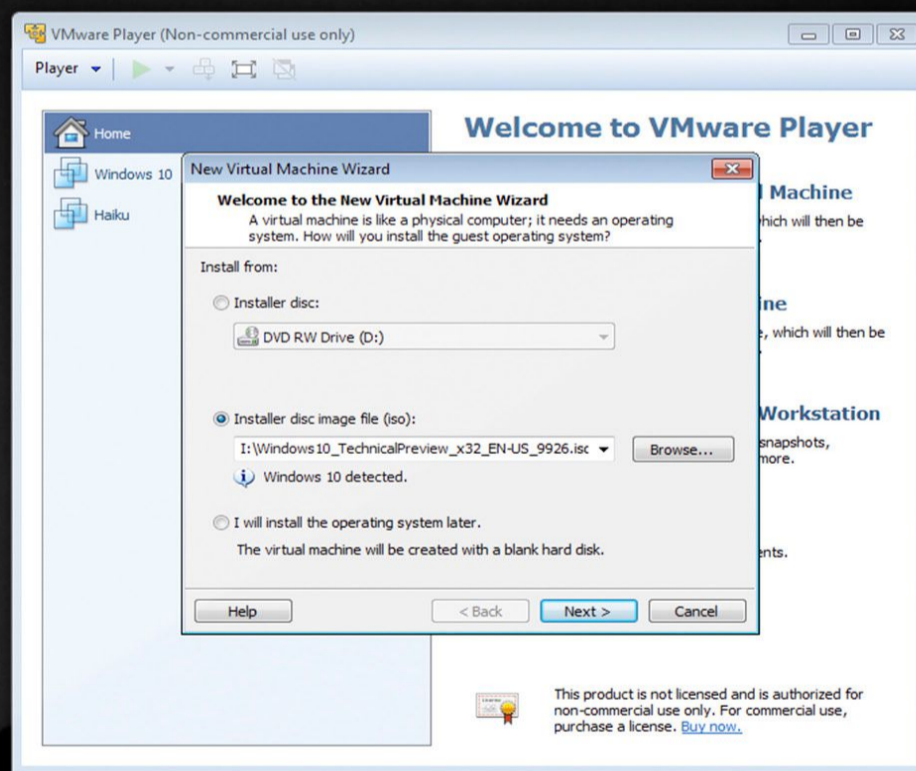
Once you have your Windows 10 ISO ready, you need to install VMware Player. Head to the download page on [my.vmware.com](https://my.vmware.com), pick which platform you want, and complete the installation.

Once the application is installed, launch it, and navigate to Player > File > New Virtual Machine.



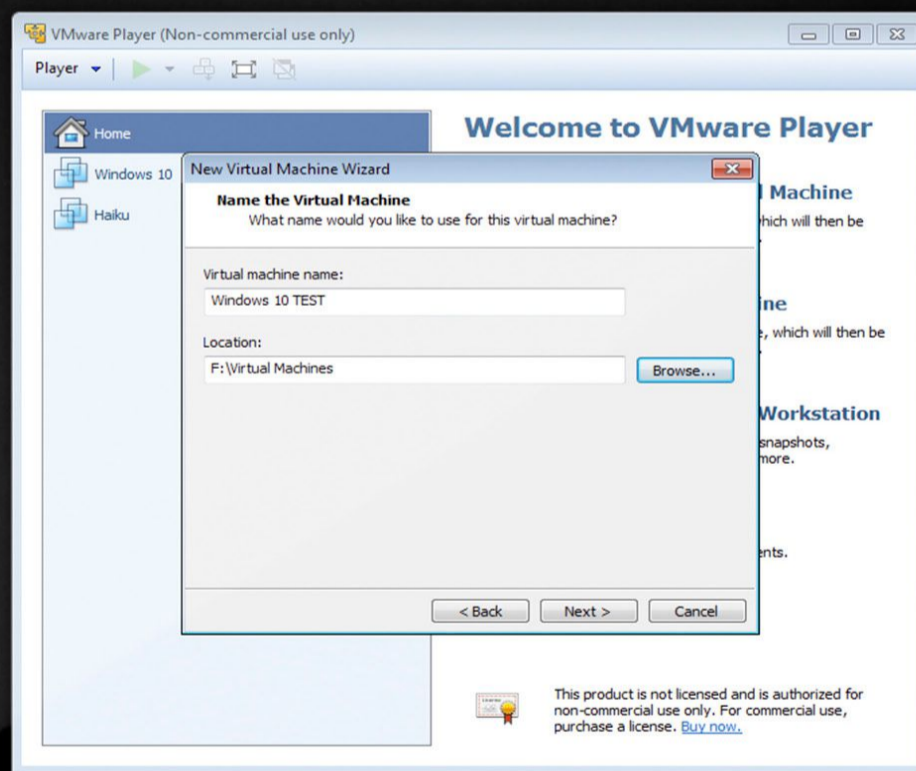
### 3. Find Your Windows 10 ISO

Next, you need to tell VMware Player where to find the Windows 10 ISO you just downloaded. Select the second option labeled “Installer disc image file (ISO),” and then navigate to file’s location.



## 4. Choose Your Save Location

Pick out a name for this virtual machine, and then select where you'd like it to be saved.

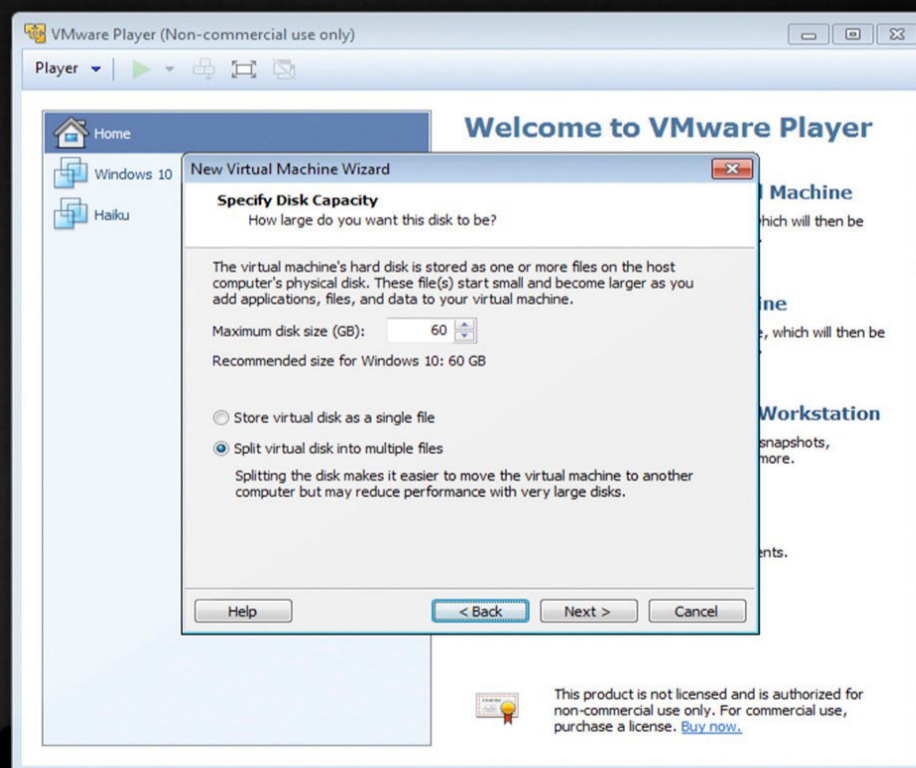




## 5. Configure Your Virtual Drive

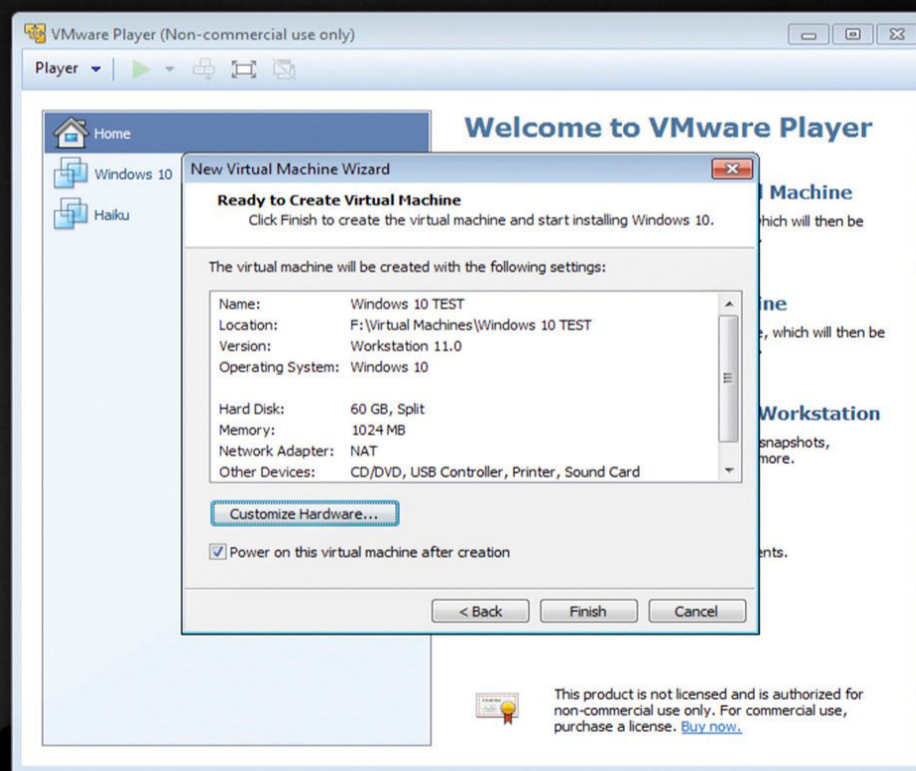
On this screen, you need to choose how big you want your virtual drive to be. The default is 60GB, but you can increase it as needed. Just make sure you have enough free space on your actual hard drive.

By default, VMware Player will split your virtual drive over multiple files, and I recommend leaving it that way unless you have a specific reason to change it.



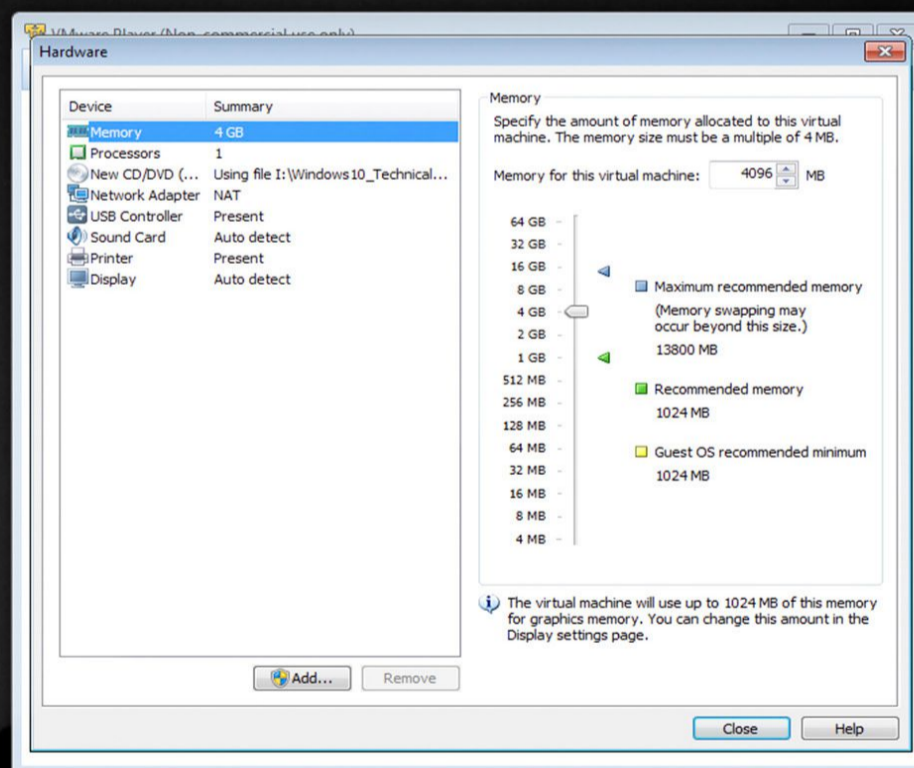
## 6. Customize Your Hardware Configuration

Next, click the “Customize Hardware” button before we finish the initial setup.



## 7. Allocate RAM

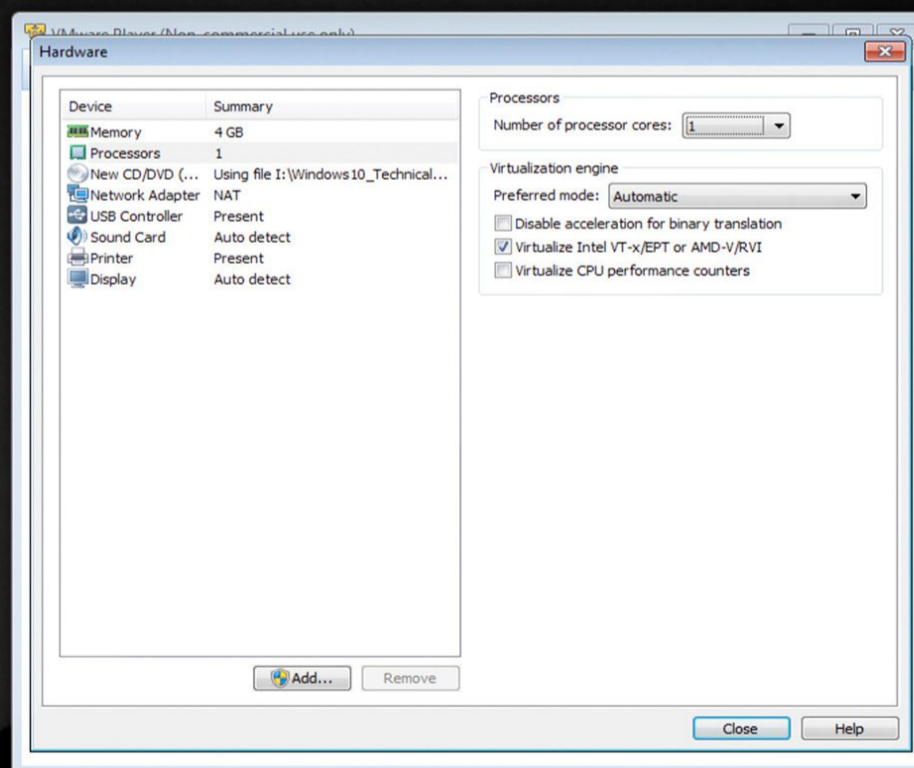
Now, you need to decide how much RAM you want to allocate for this virtual machine. The default here is 1GB, but more would be better. I have 16GB of RAM in my machine, so I decided 4GB was an appropriate allocation. Follow the guide on the right of the screen, and don't go above the maximum recommended memory. If you outstrip what's available, you'll end up paging to the hard drive, and making everything slow to a crawl.



## 8. Configure the CPU

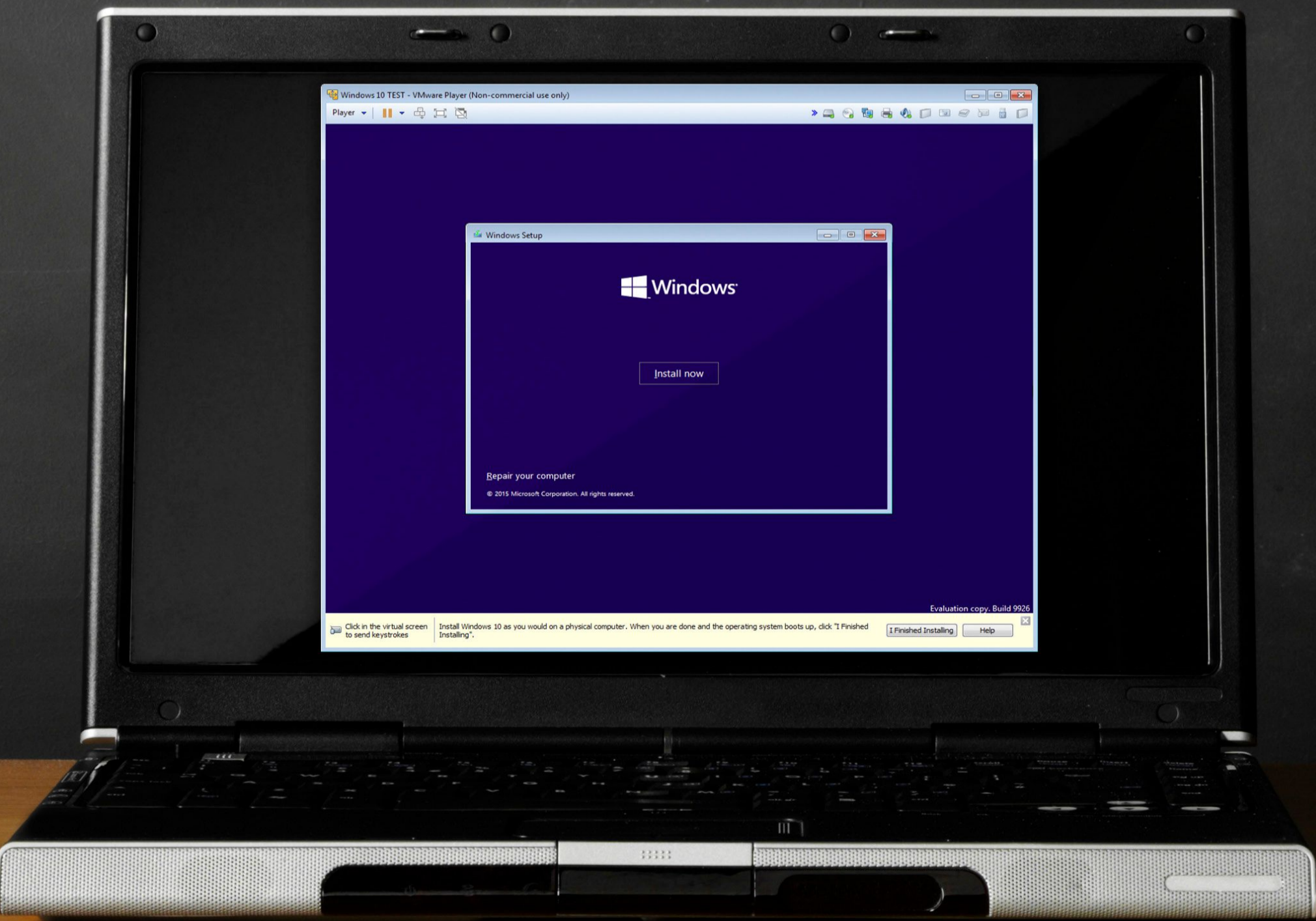
Switch over to the CPU tab, and choose how many cores you want to dedicate to this machine. One is the default, and that's probably a safe starting point. My machine has four cores, so I usually end up bumping it to two cores for virtual machines, but your mileage may vary.

Now take a look at the button labeled "Virtualize Intel VT-x/EPT or AMD-V/RVI." If you're using the 64-bit version of Windows 10, this is mandatory. Of course, your CPU needs to support this functionality, so download the Hardware-Assisted Virtualization Detection Tool from Microsoft's website to verify that it will work with your processor.



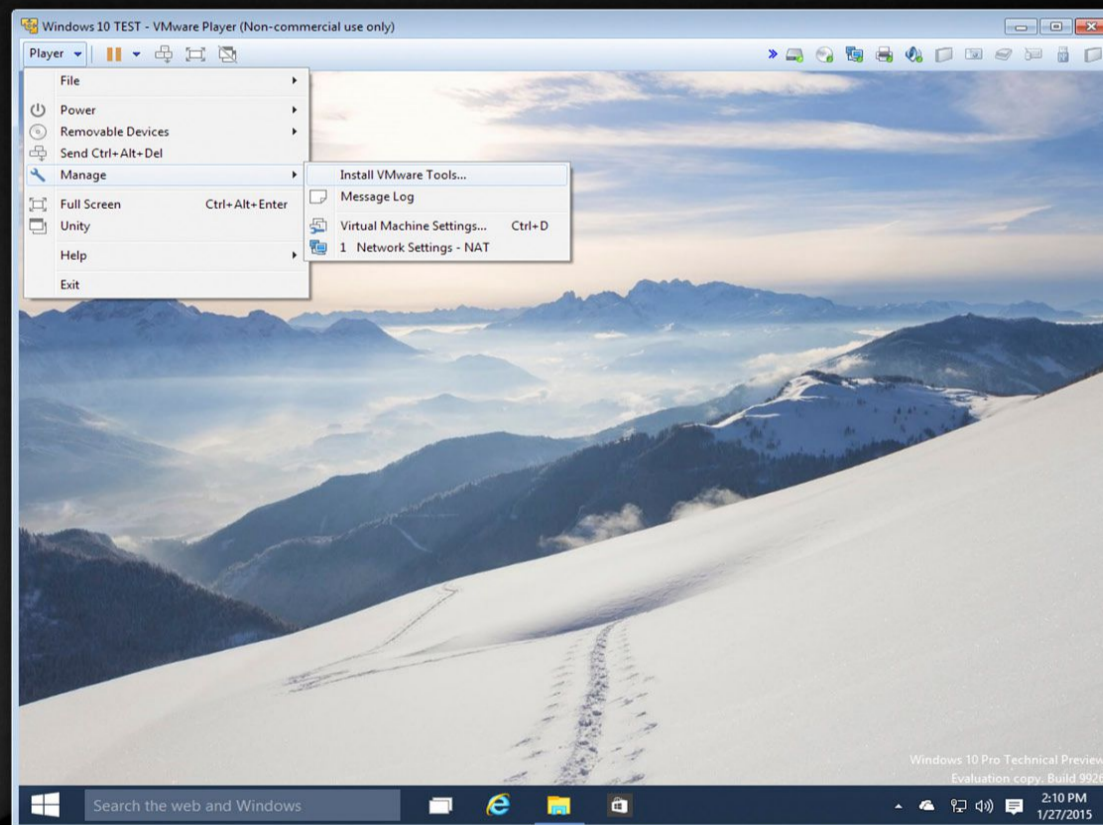
## 9. Begin the Installation

Close out of the hardware configuration screen, and “Finish” the initial setup. Now, boot up your virtual machine, and install Windows 10 just the way you would normally.



## 10. Install the VMware Tools

Once Windows 10 has finally booted up, navigate to Player > Manage > Install VMware Tools. It will mount a virtual DVD, and pop up a notification in the bottom right. Navigate to the disc in Windows Explorer, launch the appropriate executable, and follow the on-screen instructions.



# 11. Reboot Your Virtual Machine

When VMware Tools has finished installing, reboot your virtual machine.



## 12. Start Using Windows 10

Finally, your Windows 10 installation is ready to use—even in full-screen mode. Poke around, download the OS updates, and enjoy the cutting edge of Windows. And when something inevitably breaks, it won't matter. This is just a virtual machine, so toss it and start over.





# Ask Alex

Selfie stick shaming.

BY ALEX COLON



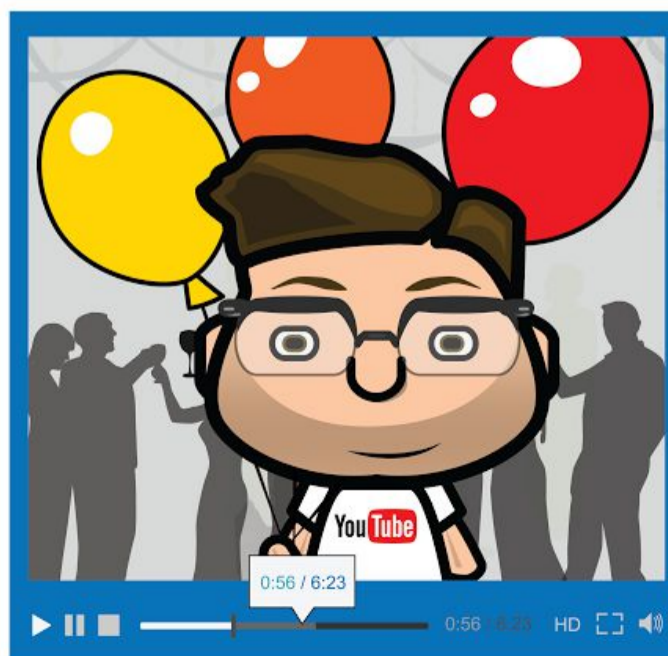
**How do you stop YouTube video sharing from completely taking over a party?**

—Debbie Downstream

**Alex Says:** We've all been there before. You're hanging out with a group of friends, someone wants to show everyone a funny new video, and before you know it, you've spent the last hour eating chips and watching a supercut of dogs looking guilty. I'm actually totally okay with this, but I get that it isn't everyone's idea of a good time.

Here's the thing, though. Unless you're the host of the party, there isn't much you can do to stop this from happening. You're going to look like a major control freak if you say something, and one who hates dogs at that. On the other hand, if it's your party, there are plenty of precautionary measures you can take. Turn off the television. Hide the remote. Close your laptop. Unplug the router if you have to. Without screens and Internet, everyone is much more likely to focus on the gathering at hand.

If that fails, there is still hope for recourse. When it's your turn to pick a video, enthusiastically recommend the most boring one you can think of, and watch how quickly everyone will look for something else to do.



# Ask Alex

Selfie stick shaming.

BY ALEX COLON

# Q

**Is it socially acceptable to use a selfie stick?** —*Selfie-Conscious*

**Alex Says:** Absolutely not. But as strongly as I feel about this (and I do feel strongly), I can still understand the appeal and the utility—yes, utility—of the selfie stick.

When you're traveling solo, or with just one companion, scenic shots are great, but isn't it nice to get some decent-looking photos that show you were actually there? Nothing ruins a picture quite like the bend of someone's outstretched arm, which is tough to avoid when you're trying to get both you and the Eiffel Tower in the frame. My partner and I have occasionally asked strangers to snap a photo of us, but this too has its drawbacks; no one has stolen our cameras, but no one has happened to be a particularly skilled photographer, either. So as dumb as they look (and they look so, so dumb), selfie sticks do a pretty good job of capturing both you and your surroundings in a photo.

That said, here are some rules to follow. Never use a selfie stick in the city or town (and ideally state) you live in. Never use a selfie stick indoors. Never attach a tablet to a selfie stick. Don't accidentally whack anyone when using your selfie stick in public. And finally, be prepared to look dumb.



# Ask Alex

Selfie stick shaming.

BY ALEX COLON



**How do I choose the best photo of myself to use for an online dating profile?**

—Jay Date

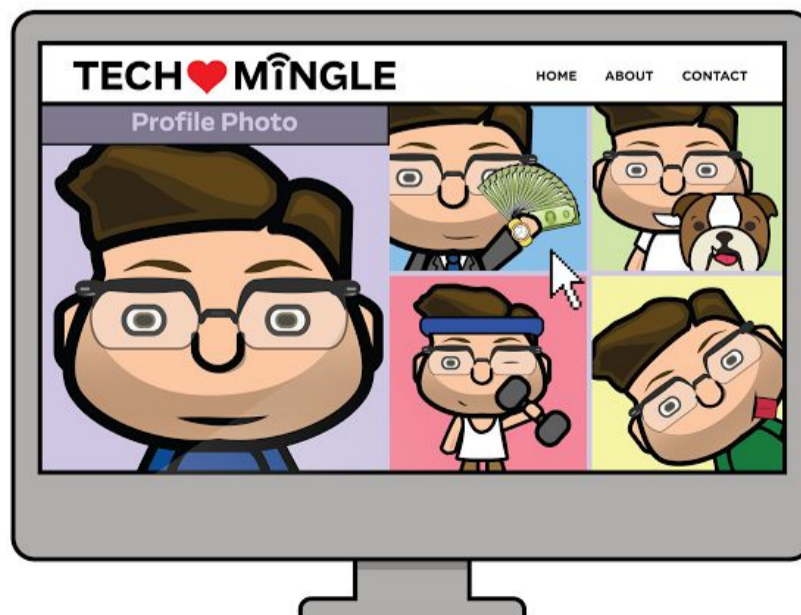
**Alex Says:** You'd think the answer to this question would be pretty simple—after all, who doesn't love sorting through pictures of themselves?—but some of the photos I've seen floating around out there are just plain scary. And I'm not talking about the people in the pictures, but the pictures themselves: blurry, noisy, poorly lit, and red-eyed. So the first step is to completely ignore what you look like and ask yourself: Is this a generally competent work of photography?

The next step is to pick a photo in which you look great, but not too great. Unless you look like that all time, you don't want to choose a picture that shows what you looked like that one time you were paleo dieting and the lighting was just right. Pick one that looks like you on a good day, but not your wedding day.

Speaking of which, don't use an old wedding photo. And don't use photos that are more than a year or two old. Instead, pick a photo that shows you looking happy and doing something you love, which is a good look on anyone.

And if that doesn't work, just take a photo of you with a puppy and watch the responses pile up.

**Have a question for Alex?** Send it to [askalex@pcmag.com](mailto:askalex@pcmag.com)





## The Future of Apple

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**A**pple is a company that makes few mistakes, and people love it for its design and style. But you have to wonder how long the biggest company in the world in terms of value can possibly maintain that position.

When looking at Apple, we always have to consider that Apple is very limited in what it has to offer. It has a few models of mobile phone, an iPad, the iPod, a few desktop computers, and one of the more popular lines of laptop machines. The Watch kind of rounds out the catalog, along with the Apple TV and a Wi-Fi subsystem.

If you compare Apple with a company like Sony, it's laughable. Sony has everything from an array of professional broadcast gear to cameras to video game consoles to microphones to movies offerings and Hollywood production facilities. I'd guess maybe a thousand products and services to Apple's dozen or so.

I've always thought that this lack of diversification hurt Apple when it came to such comparisons and its perceived worth. But, like ExxonMobil, which used to be the long-term most valuable company out there, Apple does quite well—all while Sony languishes.

That's because, like ExxonMobil, Apple would prefer to stick with the projects that are tailored to its strengths rather than overextend itself and risk doing more things poorly. This strategy has a few problems associated with it,

but overall it's a smart one and has served the company well.

True, Apple had failed in some arenas over the years. Thunderbolt and FireWire come to mind; those were heavily promoted I/O subsystems that never caught on the way USB did. And, in the early days, Apple had a floppy disk system that was ill-conceived.

Overall, however, Apple's ability to stay within the confines of its cash cows is unparalleled for a tech company.

The recent rumors about the company's foray into driverless electric cars, for example, undoubtedly stem from its operating systems moving toward the modern electronic dashboard pioneered by Microsoft Sync. We're now even hearing that BlackBerry sees this as a potentially lucrative business. What better interface could there be than one developed by Apple?

Even if Apple thinks it can leapfrog the other enthusiasts in the space—particularly Google, which stole the iPhone idea and developed the Android operating system, which has led phones that use it to become the iPhone's primary competitors—the whole concept of the driverless car is really not that much of a stretch. Apple is still a computer company, and the driverless car is ultimately a computer.

The Watch may or may not qualify as a computer, too. It certainly has the potential. Though I personally see no need for such a device and prefer my timepiece to be the modern equivalent of the pocket watch: the mobile phone. Which, these days, is definitely a computer.

“

**It's been the roller coaster thrill of excitement that has kept Apple flying high for so long.**

”

So, for that matter, are TVs and game consoles, and I wouldn't be surprised to Apple enter those markets, either. If nothing else, these kinds of products would help brighten up the gloomy wall space I see all the time at Apple Stores. (Recent reports suggest Apple may in fact be trying to get its foot in the door by entering the online TV game.)

It's hard to imagine what else Apple can do—and how much further it can go. Apple has pretty much perfected the products it has now. Yes, upgrades come around mostly based on increases in processor speeds, and perhaps that alone can sustain the company forever. But eventually this becomes an unexciting bore. And it's been the roller coaster thrill of excitement that has kept Apple flying high for so long.

We'll know more for sure about the future of the Apple Watch when it ships next month. It could easily morph into a Dick Tracy-style, full-featured communications device. So perhaps taking a flier on it will keep boredom at bay. Let's hope so, for Apple's sake.



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