

FOUNDED MAY 1989

MEETINGS - SECOND

SATURDAY OF THE MONTH

**SOME WEBSITES**

Best MicroSD Cards. Results of a review by Wirecutter of 20 cards. tinyurl.com/yb76p9dw.

Pixelmator Pro compared to Photoshop CC. By TidBITS. tinyurl.com/y2mappwt.

Why Does Restarting Seem to Fix Most Computer Problems? Interesting. tinyurl.com/yyscn9nh.

The 8 Best Universal Remotes of 2019. Lot of information. Big price range. tinyurl.com/y58pe4l4.

Apple TV vs Roku: Which is Better? Apple's easier to set up, but Roku has more choices. tinyurl.com/y4ftvux4.

How to get the Shortcuts app for iOS 12. Apple's new automation app. I've got to try this one. tinyurl.com/y8m59l37.

APRIL LOCATION. We will meet at the Haverford Community Recreation & Environmental Center. You enter Parkview Drive from Darby Road at Williams Road. Go to mlmug.org for maps.

3D PHOTOGRAPHY & PRINTING

NEW APPLE PRODUCTS & SERVICES

Our main speaker will be Dave Comeau. His topic will be The Modern Stereoscope- Easy 3D Photos on the Mac, and Viewing Depth using Modern Technology. Dave will discuss a brief history of stereoscopy, i.e. 3D photography. He'll then demonstrate how to take a 3D photograph with an iPhone, and process it on a Mac using simple, free software. From there, he'll discuss and demonstrate how to view 3D with many of the latest technologies including full color video projection, phone-based VR, and "holographic" displays.

Dave is best known in MLMUG circles as the son of the late Moe Comeau, beloved curmudgeon and prankster. Dave carries on Moe's love of technology, tinkering with home automation, Raspberry Pi, drones, sleep hacking, and 3D. He lives in Brooklyn, NY, and is Secretary of the New York Stereoscopic Association.



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Contributors and Authors

Mark Bazrod
 Glenn Fleishman
 Geoffrey A. Fowler
 Kathy Garges
 Chris Hoffman
 Marziah Karch
 Leif Johnson
 Roman Loyola
 John Martellaro
 Don Mayer
 Daniel Nations
 Tom Nelson
 Scott Orgera
 Cameron Summerson
 Joseph Turow

Newsletter Editor

Mark Bazrod

Graphics Editor

Sally Bazrod

Copy Editor

Deane Lappin

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 Marc Robinson, Steve
 Evans & Bobby Foster

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**President, Program Director &
Vendor Liaison**

Maria O. Arguello

mariarguello@mac.com**Vice President & Multimedia SIG
Co-Chair**

Larry Campbell

lcampbell9@me.com**Treasurer, Membership &
Facilities Coordinator**

Elliott Cobin

eicobin@gmail.com**Secretary & Newsletter Editor**

Mark Bazrod

msb@ipilease.com**Member-at-Large**

Deane Lappin

deanezl@verizon.net**Educational Liaison**

Linda McNeil

mcneil.linda@gmail.com**Multimedia SIG Co-Chair**

Nicholas Iacona

nick@nickiacona.com**Newsletter Copy Editor & Apple
User Group Ambassador**

Deane Lappin

deanezl@verizon.net**Newer Users SIG Co-Chair &
Webmaster**

Bob Barton

barton@bee.net**Newsletter Graphics Editor**

Sally Bazrod

sallybazrod@mac.com**OS/iOS SIG Chair**

Adam Rice

adam@adamrice.org**Picnic Coordinator**

Tony DiPiano

tony@dipiano.net**Raffle Chair**

Susan Czarnecki

sparsefur@yahoo.com**Social Secretary**

Gail Montgomery

gailemontgomery@comcast.net**Membership Information**

Membership dues are \$25 for individuals and \$35 for families. Memberships are based on your anniversary date, which is the month you joined. You will be e-mailed reminders when membership fee is due.

If you're just visiting to check us out, or if you've been visiting for some time, but haven't joined, consider these **BENEFITS OF MEMBERSHIP**:

- **Monthly meetings**, where you can learn, share, and meet everyone from working Mac professionals to new Mac users from all backgrounds.
- **Monthly newsletter**, which is full of interesting Mac news, tips, and information.
- Useful free items at the monthly **Raffles**.
- **Discounts**. Vendors offer special prices to User Group members.
- **Web Site** with 2-3 years of MLMUG newsletters, meeting information, a member directory, directions to our meetings, and much more! Our web site is www.mlmug.org.
- **MLMUG Mailing List**, to post technical questions or comments to each other and the experts within the group.
- **Reviewers** keep items reviewed.

Are you ready to join? Please make a check payable to MLMUG and bring it to a monthly meeting or mail it to:

Treasurer, MLMUG

P.O. Box 1374

Southeastern, PA 19399



Apple
User Group

Typical Meeting Agenda

9:00 - 9:05: Call to order in main meeting room.

9:05 - 10:05: Three Concurrent Special Interest Groups (SIGs) convene in separate rooms. The three current SIGs are:

Newer Users- We cover the most basic questions you may have about your Mac/iDevices and how to use them.

Multimedia - We discuss using your Mac/iDevices and applications for photo, video, audio, and print media.

OS - We go beyond basics to discuss Apple's current operating systems, using your Macs & iDevices, & various applications, & have Q&A.

10:05 - 10:15: Continuation of Q&A for all attendees.

10:15 - 10:30: Welcome and other business.

10:30 - 11:50: Main Presentation (by a member or guest)

11:50 - Noon: Raffles and silent auctions.

Come join some fellow MLMUG members for lunch after the meeting at a nearby restaurant.

MLMUG Email list

The Main Line Macintosh Users Group has its own email list, hosted at [Groups.io](https://groups.io). Compose your letter and email it to MLMUG@groups.io and your message will be sent to everyone on the mailing list. Contact Bob Barton (barton@bee.net) if you are a member and you are not on the list.

Please observe good email etiquette. If your message is humor or not Apple-related (off-topic), please include "Humor" or "OT" in the subject line. The [Groups.io](https://groups.io) Terms of Service are at groups.io/static/tos. Look for the section on "Conditions of Use"

The MLMUG list may be used to post Apple-related items for sale, but any solicitation of members through the list is forbidden without the written consent of a MLMUG officer. Violation of the [Groups.io](https://groups.io) terms of service or good email etiquette may result in removal from the list.

New Users SIG

You don't have to wait a whole month to get answers to your basic Mac questions! Get together with other members on the fourth Saturday (i.e., two weeks after each regular meeting) for the Startup Folder Lite.

Many new users have said that they can learn much more from face-to-face meetings than they do from manuals or other sources. That's what this meeting is all about. Go to www.mlmug.org/nusfl.html for details.



Bookmarks

By Mark Bazrod

Reorganize iPad Apps

I had some iPad apps which I couldn't find on my Home screens, but which I could open by swiping left to do a search. That seemed really weird to me.

iOS 12 can theoretically show over 4,500 app icons by using folders to the maximum. I doubt that anybody does that. I think the limiting factor is the number of Home screens you can have. With 11 the maximum and with 20 icons the maximum per screen, that's 220 icons. Add to that a maximum of 15 icons in the Dock and I arrive at 235 as the maximum number of icons (including icon folders) you can show on your iPad. Through the use of folders holding multiple apps, the number of "seeable" app icons increases, but you don't see more than 235 icons on your Home screens.

I don't know the maximum number of apps that you can download to an iPad, but I suspect it is only limited by the iPad's storage capacity.

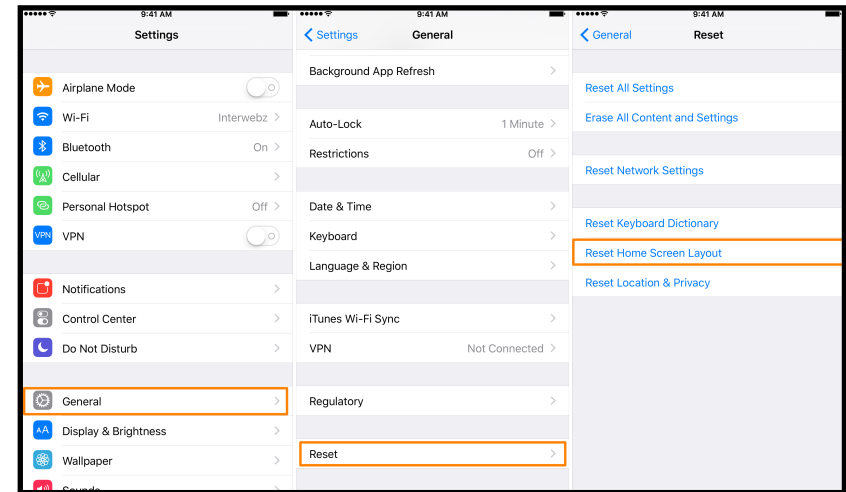
I had more than 500 apps downloaded (more than 300 were games downloaded by my grandchildren). I used some folders, but not enough that the 500 or so apps were seeable on my iPad. My conclusion was that all the apps were still on the iPad and were findable through search, but were just not seeable.

So what was I to do?

After doing some research, I decided to bite the bullet and totally reorganize my iPad's apps, including updating the many apps which required it and deleting the apps I no longer or rarely used.

Of course, deleted apps can always be re-downloaded from the App Store without paying another fee.

The key is to go to Settings-General-Reset-Reset Home Screen Layout. You will be prompted by a pop-up message asking you to confirm the Home screen reset. The Home screen app icons were reset to the factory configuration and all third-party apps replaced on the following pages in alphabetical order. Note - None of the other iPad settings were changed.



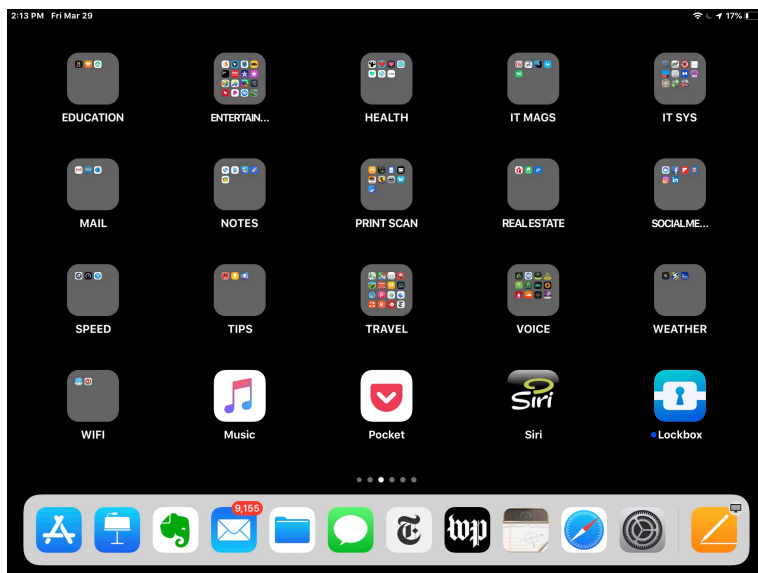
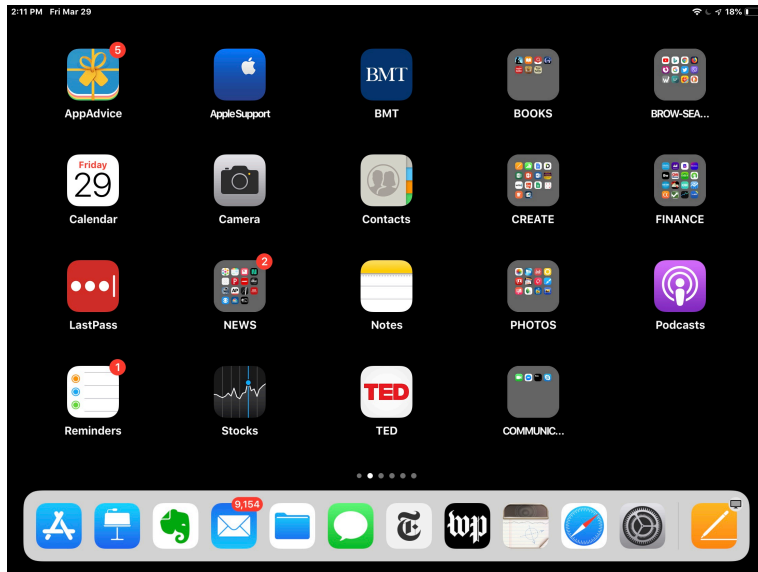
I had already taken a screenshot [Siri interpreted this as *ice cream truck*) of my Home page and Dock so I had an idea of what I generally wanted. I also decided I would use more folders so I could see all the apps and be a bit more organized.

The next step was more time-consuming and I guess will have taken 8 - 10 hours to complete. I'm almost done. I went through the apps one by one, putting them on the Home screens, the Dock, or the appropriate folders which I arranged in alphabetical order if they were not on the first Home screen.

In addition, many apps showed the message: *XXX needs to be updated. The developer of this app needs to be updated to work with iOS 11.* I had to go to the App Store to see if the new version was available. In many cases, it was not. In fact, I was

going to the App Store so often that I temporarily put the App Store icon in the Dock.

To give you a better picture of what I did, you can review the screenshots of my first and second Home screens. The last lines of both pages are not yet completed, but you get the idea.



The third and subsequent Home screens are icons for individual apps which have not been put in a folder.

As a result of these changes, I have reduced the number of Home screens from 11 to 5 and can much more easily access my apps.

Reconfiguring your iPad's home screens certainly takes a fair amount of time, but I have already found that it was well worth it. I recommend you consider the project.

P.S. Apple's new offerings of various services are outlined in the article by Camerson Summerson starting on page 13 of this Newsletter. What is interesting are the links to more than a dozen articles from various websites. The articles are much too numerous to include in this Newsletter, and there is still much to learn about the services, but I suggest you take a look at some of them to get an idea what will be coming.

You might also be able to recover some of your privacy by using the actions indicated in the article on Google starting on page 40.

Leif Johnson posted the following article to macworld.com on March 19, 2019. tinyurl.com/y3lzc8a9. © IDG Consumer & SMB. An Associate Editor at Macworld, he covers IOS, iPhones, iPads and more

The New iPad Air and iPad Mini: What's New and What Isn't

We now effectively have the iPad Air 3 and the iPad mini 5. How do they compare to their predecessors?

By Leif Johnson

SEE ARTICLE FOR VIDEO. Ahead of its March 25 event, Apple announced updated models of the iPad Air and the iPad mini. A lot has changed in the new models, but a lot also remains the same. In this video, Macworld's Leif Johnson shows you the differences.

Surprise! Apple on Monday announced [updated models of the iPad Air and the iPad mini](#). Some of us gave up on seeing new versions of these models, but suddenly they're available for purchase. We should have our hands on the new tablets soon, but we wanted to give you a quick rundown on what's new and what remains the same for both iPads.

iPad Air: What's new

Let's kick off with what's new with the iPad Air, which we thought was effectively replaced with the 10.5-inch iPad Pro in 2017. In essence, this is the iPad Air 3, but much as with the iPad mini, Apple's dropping the numerals. It's now just the iPad Air.

The price sees a welcome change, as Apple now sells it for a starting price of \$499 instead of the \$649 we saw with the iPad Air 2. There's also a change in storage options, as Apple only sells the new iPad Air in 64GB and 256GB configurations. Before, you could buy the iPad Air 2 with 16, 32, 64, and 128GB options. It's a smart move for a more data-hungry age.

The tablet is also bigger—insomuch it has the same 9.8 by 6.8-inch frame as the 2017 10.5-inch iPad Pro. For comparison, the iPad Air 2 measured 9.4 by 6.67 inches. And much like the old iPad Pro, the new iPad Air supports the first-generation Apple Pencil. That could be a big deal if you don't want to pay iPad Pro prices but don't like the smaller screen of the 9.7-inch iPad—or the new 7.9-inch iPad mini.



The iPad Air essentially looks like an older iPad Pro now.

I especially like that the new iPad Air sports the A12 Bionic processor found in the iPhone XS and XR, which marks a massive jump from the A8X chip in the iPad Air 2. Keep in mind, though, that it's not quite as fast as the A12X chips that we find in the 2018 iPad Pros.

The display has changed, too, as the resolution is now 2224 by 1668, up from 2048 by 1536. It's also packed with Apple's TrueTone technology that adapts to ambient light in order to deliver a more natural viewing experience. That display is also laminated, which effectively means the glass sits on top of the display. When you use an Apple Pencil, it makes for an experience that feels slightly more like writing on paper than what you'll get with an unlaminated display. Unfortunately, the iPad Air didn't inherit the iPad Pro's ProMotion 120Hz refresh

rate, which makes everything from Apple Pencil strokes to scrolling through webpages a bit smoother.

The iPad Air is also brighter, as it delivers 500 nits of brightness versus the 415 in the older model. That's great if you often have to use your iPad in the sunlight. And last but certainly not least, the front-facing FaceTime camera got a big boost from 1MP to 7MP.

iPad Air: What isn't new

That's a lot of good stuff, especially when you compare it to the iPad Air 2. When you compare to the 10.5-inch iPad Pro, though, the truth is that we're basically looking at an iPad Pro from 2017 with a better chip. In other words, if you got a 10.5-inch iPad Pro two years ago, you may not need to upgrade.

The A12 Bionic chips allow the new iPads to take better advantage of augmented reality apps.

The new model still has a home button with Touch ID, and I think that's a bit of a bummer as the latest iPad Pros have taught me that Face ID is even better suited for iPads than iPhones. It's still LED backlit, so don't expect the super cool OLED displays you find in the new iPhones. Even the new iPad Pro doesn't have that. While the FaceTime camera got a boost, the rear camera hasn't changed much, as it still has an 8MP rear camera like the iPad Air 2. It's still got a 3.5mm headphone jack, it's still available in space gray, silver, and gold, and it still gives you a battery life of around 10 hours. And it still supports Lightning cables instead of USB-C.

iPad mini: What's new

Let's move on to the new iPad mini. A lot of you have been waiting for this one for a long time, and as you might expect after a four-year wait, it's a massive improvement over the iPad mini 4. What's new?

First off, much as with the iPad Air, this is now simply called iPad mini—even though it's essentially the iPad mini 5. It also sports

the A12 Bionic processor, and that's enough of an upgrade from the A8 chip to give you around three times the graphics processing power of the iPad mini 4.

It's also got a laminated display and first-generation Apple Pencil support like the iPad Air, along with support for Apple's TrueTone technology. It even has a wider P3 color gamut, and Apple says its pixel density of 3 million is the highest of any iPad. The display itself is 25 percent brighter at 500 nits, up from the 450 in the iPad mini 4.



At this point, you're almost using a digital Moleskine notebook.

The camera remains at 8MP, but the newer model reportedly offers better low-light performance and HD video recording. And here again we see the boost to 7MP from 1MP in the front-facing camera.

The iPad mini 4 only sold in a 128GB configuration, but the new iPad mini comes with both 64GB and 256GB storage options. For that matter, it now supports the same Wi-Fi and gigabit-class LTE speeds you'll find in new iPads.

iPad mini: What isn't new

What hasn't changed? For one, there's the starting price, which remains the same as the iPad mini 4 at \$399. I'd be annoyed with that considering that the 9.7-inch iPad supports the Apple Pencil and gives you more screen space for \$329. Nonetheless, this delivers a lot of upgrades for people who want a smaller iPad.

As for the display, it may have that TrueTone tech and the wider P3 color gamut, but the 7.9-inch display itself still has a resolution of 2046 by 1536. Like the iPad Air, it also doesn't support ProMotion.

In fact, I'll probably have a hard time telling the iPad mini 4 apart from the NEW iPad mini when we get ours. It still has the same 8 by 5.3-inch frame, a home button that supports Touch ID, and support for Lightning cables instead of USB-C. And yes, it still comes in space gray, silver, and gold, and it still delivers around 10 hours of battery life.

I know a lot of you have been looking forward to getting your hands on a new iPad mini in particular, so I look forward to seeing if both of these devices live up to expectations.

Roman Loyola posted the following article to macworld.com on March 19, 2019. tinyurl.com/y3y6bxza. © IDG Consumer & SMB. A Senior Editor at Macworld, he has covered technology since the early 1990s.

Apple updates iMac with 8th and 9th generation Intel Core processors

Apple's all-in-one desktop Mac gets a boost in performance.

By Roman Loyola

Following Monday's news of [new iPads](#), Apple on Tuesday revealed upgrades for its [iMac](#) lineup, featuring [eighth-generation](#) Intel Core processors in the standard configurations, with the option to upgrade to a [ninth-generation](#) processor.

The price points of the standard configuration models remain unchanged. Apple is currently taking orders from the new iMac, but it won't ship or be available in the Apple Store until next week.

21.5-inch iMac

Apple has three standard configurations of the 21.5-inch iMac, and Apple is changing two of the three configurations. The [\\$1,099 iMac](#) stays the same, with a seventh-generation 2.3GHz dual-core Intel Core i5 processor, 8GB of memory, a 1TB hard drive, Intel Iris Plus Graphics 640, and a 1920x1080 display.

The new [\\$1,299 iMac](#) features an eighth-generation 3.6GHz quad-core Intel Core i3 processor, 8GB of memory, a 1TB hard drive, 2GB Radeon Pro 555X graphics, and a Retina 4K P3 display.

The new [\\$1,499 iMac](#) also has an eighth-generation 3.0GHz Intel Core i5 processor, but this model supports 6-core processing, a first for the 21.5-inch iMac. This iMac also includes 8GB of memory, a 1TB [Fusion Drive](#), 4GB Radeon Pro 560X graphics, and a Retina 4K P3 display.

A new option for the 21.5-inch iMac is the ability to upgrade the graphics card in the \$1,499 iMac to a 4GB Radeon Pro Vega 20, which the company says is 80 percent faster than the previous graphics card. This upgrade adds \$350 to the price.

While the standard memory configuration remains unchanged at 8GB, Apple is now using faster RAM clocked at 2666MHz, up from 2400MHz. Also, the 21.5-inch iMac can now handle 32GB of memory, up from the previous limit of 16GB. The RAM is still not user-accessible, so if you want more than the standard 8GB,

you either need to customize the RAM at the time of your order, or bring in the iMac to be serviced for a memory upgrade later.

The 21.5-inch iMac comes with four USB 3 ports, two Thunderbolt 3/USB-C ports, a gigabit ethernet connector, a SDXC card slot, and a headphone jack.



27-inch iMac

Apple offers three standard-configuration models of the 27-inch iMac, all of which feature Retina 5K displays. All of the CPUs in the standard configurations are getting two more processing cores, jumping from four cores to six.

The **\$1,799 27-inch iMac** features an eighth-generation 3.0GHz 6-core Core i5 CPU, 8GB of memory (32GB max), a 1TB Fusion Drive, and 4GB Radeon Pro 570X graphics.

The **\$1,999 model** has an eighth-generation 3.1GHz 6-core Core i5 processor, 8GB of memory (64GB max), a 1TB Fusion Drive, and 4GB Radeon Pro 575X graphics.

The **\$2,299 iMac** has a ninth-generation 3.7GHz 6-core Core i5 CPU, 8GB of memory (64GB max), a 2TB Fusion Drive, and 8GB Radeon Pro 580X graphics.

For the \$1,999 and \$2,299 iMacs, Apple has available a CPU upgrade to a ninth-generation 8-core Core i9 processor. The \$2,299 iMac has available a graphics upgrade to an 8GB Radeon Pro Vega 48.

The 27-inch Mac's rear panels sports four USB 3 ports, two Thunderbolt 3/USB-C ports, a headphone jack, an SDXC card slot, and a gigabit ethernet connector.

iMac Pro

Apple didn't announce a major update to the **iMac Pro** (which was released in December 2017), but it did release a couple of new upgrade options.

Apple now has a 256GB RAM upgrade available for the iMac Pro, which adds \$5,200 to the \$4,999 base price.

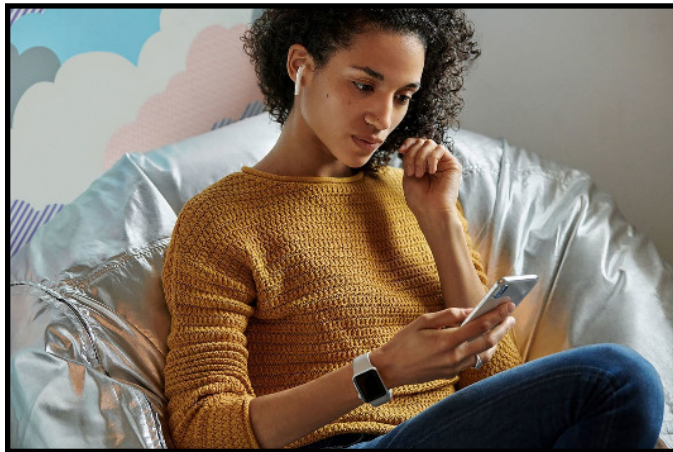
Apple also has a Radeon Pro Vega 64X with 16GB of HBM2 memory graphics upgrade available for an additional \$700.



Geoffrey A. Fowler posted the following article to [washingtonpost.com](https://www.washingtonpost.com) on March 19, 2019. tinyurl.com/y2fw5999. © The Washington Post. He is a technology consultant.

Apple's Big Week of Tiny Product Upgrades: Here's What's Worth Your Money — and Not

The iPad Mini is mighty once again, and updated AirPods give Siri a whole new way to misunderstand what you said.



Apple's new AirPods feature 50 percent more talk time and the ability to summon Siri, but they probably won't do a better job at staying in your ears.

By Geoffrey A. Fowler

Surprise: Apple quietly introduced new [AirPods](#), [iPads](#) and [iMacs](#) this week, just days ahead of a splashy launch event at its headquarters on March 25.

Translation: You can probably hold onto your wallet.

Apple sometimes puts out smaller updates without a big to-do, but usually not for three days in a row before a big scheduled event. Next Monday, Apple is expected to unveil new ways to get

your money: subscription services for news and entertainment. By getting the hardware out of the way in advance, Apple is signaling how important services are becoming to its business in an era when upgrades don't generate much buzz.

[\[Help Desk: Ask our tech columnist a question\]](#)

Apple's newest products are incremental. None of the changes dramatically reinvent the design or capabilities of the products. The biggest happy news is for people who've been holding out on buying an iPad Mini and iMac — they're both getting a welcome speed boost. The updated AirPods headphones will offer better battery life, but disappoint on other fronts.

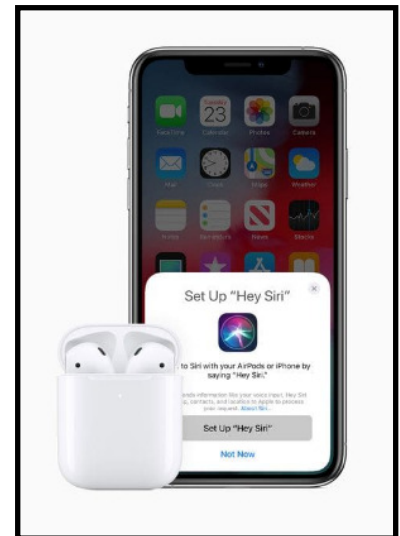
The unsung winners from this week's announcements: People who buy last-generation and used Apple products. Any time there are new Apple products, the older stuff that still works great gets cheaper. Check eBay and sites with refurbished products such as [Backmarket.com](#) for some spectacular deals in the weeks ahead.

So how do you figure out if it's time for an upgrade? Here's a rundown on what's good — and what's still missing — from each of this week's updates.

AirPods

Apple's updated AirPods listen out for "Hey Siri" to summon help from the voice assistant.

Over the past two-and-a-half years, AirPods have grown from the butt of jokes ("Are those Q-Tips hanging out your ears?") to the favorite product of commuters and people who spend all day on the phone. But the



Apple's updated AirPods listen out for "Hey Siri" to summon help from the voice assistant.

2019 update (priced \$159 to \$199) doesn't move the needle much on simplicity — or make them work for more people.

What's good: The battery in the second-generation AirPods promises an hour more of talking time, thanks to a more-efficient processor. This is useful if the primary purpose of your AirPods is making calls, but it probably won't matter much for listening to music. (Even the first-generation AirPods could last up to five hours at a time for streaming music.)

A nice to have: For \$40 more, you can now get AirPods in a case that charges wirelessly. To take advantage of this, you'll need to have access to wireless charging pads — which are still few and far between. You can use first-generation AirPods with the new wireless-charging case, sold separately for \$79.

[\[Are Apple products overpriced?\]](#)

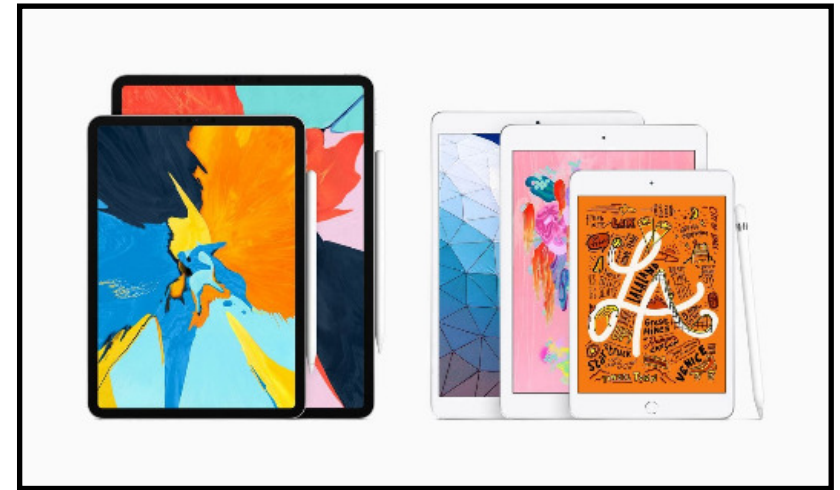
And Apple superfans will like that the new AirPods listen out for the command “Hey Siri” to take your voice commands. The feature is an echo of Scarlett Johansson's in-ear artificial intelligence in the 2013 film “[Her](#).” But it's not clear how much additional utility you get out of talking to Apple's [not-always-so-intelligent](#) AI in your ear, as opposed to through an iPhone, Apple Watch or HomePod.

What's missing: Apple is sticking with its one-size-fits-all design with its second-generation AirPods, but the reality is not all human ears are the same. Would it kill Apple to make small, medium and larger versions? I have no problem keeping AirPods in place while jogging ... or headbanging. But many readers have told me AirPods simply won't stay put. Competitors' products, such as [Samsung's \\$130 Galaxy Buds](#), come with different-size plastic tips, but you'll have to buy those in the aftermarket if you want custom-fit AirPods.

Also missing: noise-canceling capabilities and color options other than white. And if Apple wanted to prove its commitment to the environment, it could have included a replaceable battery.

Products with sealed-in Lithium batteries are built to self-destruct after two to three years — and [pose a significant fire concern for recyclers and trash collectors](#).

Finally, Apple two years ago promised a wireless charger called AirPower that could charge the iPhone, Apple Watch and AirPods at the same time. This product, however, is still MIA.



iPads now come in five sizes, flavors and prices.

iPads

Apple's iPad lineup has never been larger or most confusing.

What's good: A favorite reading device for many, the 7.9-inch iPad Mini is looking strong again. The new \$399 Mini, last updated about two years ago, is now much faster, featuring the A12 processor also found in the iPhone XS and XR. The Mini also works with the Apple Pencil stylus, which you can use to doodle and take notes. The question is: Now that so many people have an iPhone XR or XS Max with a gigantic screen, does the Mini still hold much appeal?

Apple's also bringing back the \$499 iPad Air as a faster, 10.5-inch version of its basic \$329 iPad. The new Air is a good

alternative to the \$799 11-inch iPad Pro, given that the two devices are close in size and have the same processor.

What's missing: None of the new iPads adopted Face ID or the smaller-bezel design of last year's iPad Pro. Most people won't miss those elements, but it does contribute to these new products feeling old right out of the box.

The \$400 price on Mini is also surprisingly high, given that the larger-screen basic iPad is just \$340.

iMacs

Apple's classic desktop computer is getting faster, but not really evolving.

What's good: The iMac, priced \$1,099 and up, is getting Intel's 9th-generation processors and new graphics options, which could help if you need to edit videos and photos. Apple claims that in some circumstances, the new iMacs are twice as fast.

What's missing: Macs have been behind the curve in getting upgrades that come to other Apple products. These new iMacs still don't have TouchID for entering passwords and making payments, even though it now comes on many Mac laptops. In 2019, shouldn't the iMac have FaceID, and the ability to automatically log in to the account of the person it recognizes?

And Apple lags far behind Microsoft (yes, Microsoft!) in reimagining the form of a desktop computer. Microsoft's Surface Studio offers a big screen that's touch and pen enabled, and can also swivel down so you can work on top of it. Who says the desktop computer is dead?

Cameron Summerson posted the following article to howtogeek.com on March 26, 2019. tinyurl.com/y2sbs4y7. © How-To-Geek, LLC. He is the News Editor at How-To Geek and Review Geek, where he's responsible for curating news coverage. Cam joined the team in 2017

The One About Apple Services (and More!)

By Cameron Summerson



The biggest news from the last 24 hours is undoubtedly Apple's new services, but Sony had a thing or two worth talking about in its first State of Play live stream as well. Oh, and there's more AirPower stuff. Heh.

Apple News: Services!

Apple announced a lot of new stuff yesterday, but despite that, it was still pretty light on details. Here's what we know right now.

- First up is News+, the company's buffet-style magazine and newspaper service. It's actually really cool. And available now! [[Engadget](#)]
- Then we have Arcade, which is an interesting take on mobile gaming. You pay one (still currently-unknown) fee, and you play all the games on available on the service. I'm curious. [[Ars Technica](#), [Gizmodo](#)]

- The TV app (not to be confused with Apple TV the product) is getting a makeover to house all of your streaming services in one place. Oh, and it's coming to smart TVs, Roku devices, and Fire TV. That's huge. [[Apple Insider](#), [9to5Mac](#)]
- Then there's TV+ (again, not to be confused with TV the app or TV the product), the home of Apple's new original content. There were a lot of celebrities on tap to announce this one (including Oprah herself), but pricing and availability were nowhere to be found. Cool. [[Engadget](#)]
- Apple also announced a credit card. It's made of titanium, baked into Apple Pay at its core, and is focused on privacy. It sounds really cool and equally as over-the-top. I...kind of want one. [[The Verge](#), [Gizmodo](#)]
- The entire event was about an hour and 50 minutes, but if you want to see the TL;DR version, MacRumors condensed that bad boy down to six action-packed minutes. [[MacRumors on YouTube](#)]
- In not-announced-yesterday-news, AirPower made another surprise appearance. This time on the AirPods 2 packaging. They're just taunting us at this point. [[9to5Mac](#)]
- iOS 12.2, which brings support for News+ (and a bunch of other stuff) started rolling out yesterday. We have the details. [[How-To Geek](#)]
- Hidden deep in the depths of iOS 12.2, Beats' AirPods competitor was uncovered. Does this mean Apple is going to compete with itself? [[Engadget](#)]
- In dramatically different news, Apple confirmed that it will be closing its Frisco and Plano, TX store locations. Weird, man. [[9to5Mac](#)]

The past week(ish) has been surprisingly busy for Apple; last week it announced new iPads and iMacs, as well as updated AirPods. This all lead up to yesterday's event which was focused

on the new services that have been cooking for a while now. While some are already available—like News+—others were simply given the basic “later this year” timetable.

For me, the most surprising announcement was the Apple Card. Sure, it's been making the rounds as a rumor for several weeks now, but to actually see it and get the details is something else altogether. It makes a lot of sense that it's essentially “made” for Apple Pay—getting more people to use the service is the name of the game, after all. Most of the perks, like two percent cash back on everyday purchases and three percent back on Apple purchases, are pretty standard and nothing to really write home about.

The real appeal of the Apple Card is privacy. For starters, the physical card has no number, no CVV code, and no expiration date. It's made of titanium and has your name laser-etched into. It's ultra-clean. Where you use the card, what you buy, and how much you spend won't be tracked at all—all of the financial aspects of the card are handled on-device. Goldman Sachs, the partner bank, and MasterCard have both vowed not to sell your data to advertisers, too.

I could honestly go on about this a lot more, but in the interest of brevity, I'll stop there. This card is fascinating, and I'm sure it will ultimately end up in the hands of many, many Apple users. Good play, Apple.

Geoffrey A. Fowler posted the following article to [washingtonpost.com](https://www.washingtonpost.com) on March 25, 2019. tinyurl.com/y2do46s4.
© The Washington Post. He is a technology consultant.

Apple now wants to be your cable provider, newsstand, credit card and arcade. But will it save you money?

Don't hold your breath



Apple CEO Tim Cook and Oprah Winfrey announced the launch of Apple's video streaming service but left a lot of questions unanswered. (Michael Short/Getty Images)

By Geoffrey A. Fowler

You know Apple as the company that makes your iPhone. On Monday, it said it also wants to be your cable guy, newsstand, credit card and video arcade.

Add up all those new services, and Apple is becoming a kind of online club. The question is: Why should we join?

The Apple club promises to make life a bit simpler, includes some celebrities — exclusive access to Oprah! — and cares a lot about your privacy. But it would be an easier sell if Apple also

demonstrated that Apple TV+, News+, Card and Arcade could [save you money](#). Instead, after a two-hour commercial at its headquarters in Silicon Valley on Monday, Apple didn't even tell us how much some of these services would cost.

Savings is the No. 1 benefit we get from Apple's archival Amazon, with a \$120 [annual Prime membership](#) that packages free shipping, TV shows, music, online storage and other goodies. (Amazon CEO Jeffrey P. Bezos owns The Washington Post.) Yet Apple was short on details about how it might sell its new services together — or, all told, how they would impact your bottom line.

[\[Apple's 'show time' event puts the spotlight on subscription services\]](#)

The biggest news, a [new TV streaming service](#), is coming this fall with shows from Oprah Winfrey, Steven Spielberg and other Hollywood A-listers. But Apple didn't say how much it would charge — or even whether it would charge for it. (Maybe iPhone owners will get it free? We still don't know.) Americans have been stacking up online subscriptions to Netflix, Hulu and others, but at some point, we're going to hit our limit.

Are any of its new shows must-see-TV? Hard to say: Apple, which uncharacteristically offered no hands-on time with its new products, also showed only very brief clips of its shows. During stage presentations, Spielberg said he was reviving his "Amazing Stories" franchise from the 1980s, and Winfrey said she wanted to use Apple's reach to encourage listening and create the world's largest book club. None of the fare seemed as edgy as the blood and gore available from HBO and Netflix, and Apple didn't say how often we'd get new shows.

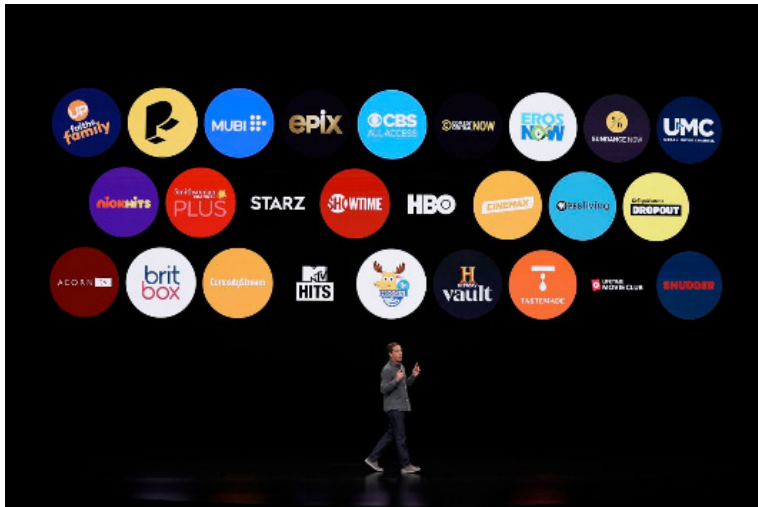
[\[Apple has new AirPods, iPads and iMacs. Here's what's good — and what's still missing — from the updates.\]](#)

Then there's a [new version of Apple's "TV" app](#) that will let you subscribe to other streaming video services such as HBO, CBS and Showtime. But again, Apple didn't say whether it would

discount a bundle of them like cable companies do. Far from killing cable, Apple TV subscriptions might end up costing us more.

Apple was also mum on the price of a streaming game service called Apple Arcade, coming to its App Store later this year. It's supposed to come with over 100 new and exclusive games — but will it have the ones your kids are craving? We don't know.

An Apple credit card from Goldman Sachs sounds like a decent deal but hardly a budget saver. It has no annual fees, offers 2 percent cash back on purchases made through Apple Pay and rates ranging from 13.24 percent to 24.24 percent.



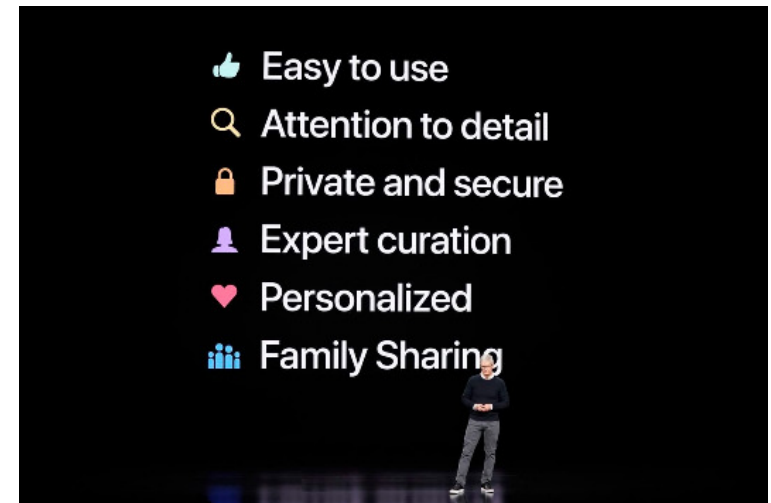
Peter Stern, Apple vice president of services, unveiled a redesign of Apple's TV app, which simplifies subscribing to additional streaming video services.

We got the clearest cost-benefit picture of a new magazine service called Apple News+, which bundles access to more than 300 publications for \$10 per month. Making it easier to pay for news is a win for journalism, but Apple slightly oversold the savings by saying individual subscriptions to all those news sources individually would cost \$8,000 per month. Reality check:

Nobody would actually subscribe to 300 magazines, and some of the publications included, like the Wall Street Journal, are sharing access only to select articles.

Dodging the price discussion, Apple instead played up the simplicity and convenience of its new services. On a first look, its new apps appear slick but aren't a slam dunk.

Streaming services have made watching TV complicated. Can Apple fix that? Apple's "TV" app has actually been around for years, and you've probably never relied on it because it wasn't actually that useful. Apple says the redesigned version will not only make it easier to subscribe to other streaming video services but also offer recommendations on what to watch next, based on editors' picks and what you've watched before. None of this is so different from what we already get from services including Amazon Prime Video. And Apple's new TV app still lacks access to some very important sources of video in our lives, including Netflix, local network TV and many big cable TV operators.



Cook unveiled a mission statement for all of Apple's services that includes personalization and privacy.

One big step in the right direction: Apple is going to bring its TV app (and, presumably, its new original content) to more than just its iPhones and Apple TV box. The app is coming to smart TVs from Samsung, LG and Vizio as well as Roku streaming devices and Amazon's FireTV device. This is good for consumers and an acknowledgment of reality for Apple: While it dominates phone software, it's a distant No. 3 player in streaming with the Apple TV.

I like that Apple said all of its services can be shared by families, at least the ones who are part of the same iCloud family group. That said, sharing a password for a streaming service with a roommate or friend will probably get a lot more difficult with Apple involved because your Apple password also protects photos, email and other sensitive files.

Apple's News app has already made a big impact on how Americans consume information, and adding more content to it is a good thing. The redesign included in the News+ subscription will have beautiful full-screen covers but comes with one important caveat: A subscription doesn't grant you access to the websites of those publications — just their content in the Apple News app on iOS and Mac devices.

The other welcome pillar of Apple's push into services is privacy and security. Apple promised it wouldn't track our purchases with its new credit card, and its bank partner, Goldman Sachs, will "never share or sell your data to third parties for marketing." Apple also said it wouldn't centrally track what we consume with its News and TV apps.

But it was a little more vague about whether it would allow its new third-party partners, including Samsung and Vizio, to surveil our TV-watching habits — a [growing practice for TV manufacturers who have a side business in advertising](#).

Early in his presentation, Apple CEO Tim Cook presented a mission statement for Apple's growing world of services. I can

get behind many of these: simplicity, attention to detail, privacy and security, curation, personalization and family sharing.

But as it enters into service businesses where we have many other choices — including on Apple devices — price has to become a part of how it conveys its value. We're not going to join the Apple club just because we have iPhones.

SPEAKER ROSTER FOR MLMUG'S 2019 MEETINGS

January 12	Nick Iacona - Mojave & iOS 12 Walkthrough
February 9	Jeff Porten - Productivity
March 9	Mark Bazrod - Search Strategies and Resources
April 13	Dave Comeau - 3D Projectors & New Technology
May 11	Dave Hamilton - TBA
June 9	Picnic
July	Recess - Summer
August	Recess - Summer
September 14	Jeff Gorman - TBA
October 12	TBA
November 9	Bob "Dr. Mac" LeVitus - TBA
December 8	Pot Luck Brunch, Members' Show & Tell,

March 9, 2019 Meeting Minutes

By Mark Bazrod, Secretary

Elliott Cobin, our Treasurer, opened the MLMUG meeting at 9:15 AM at the East Whiteland Fire Company in Malvern on 401. There were about **35** attendees.

Q & A Panel - Adam Rice & Nick Iacona.

Q. How safe are Chrome extensions?.

A. There is some malware in there so you can't assume they are safe. Get the extensions from Google, but Chrome was not designed to prevent malware.

Different browsers send different information and differ as to how they view privacy. Also extension writers differ in experience and how much they get into your Mac files. It is best to research the extension before you download it. The number of times the extension is downloaded is of some guidance in determining the extension is safe.

Comment. Freetaxusa. Firefox did not work, but Safari did. Not all sites work for all browsers.

Q. Why is opening the Mac taking longer?

A. Spotlight indexing may have gotten hung up. Command F was the old way to find files. Spotlight is more intelligent. It first does the Mac. Often normal the Mac gets slower. At times Spotlight may stay on. Look at Spotlight preferences. Shut off Spotlight and indexes will be rebuilt. It could take several hours. Also when were your caches last cleaned out? Safe boot will clear out caches. If you keep upgrading operating systems, pieces of software will be left. Onyx will clear out system caches.

Q. When I email pictures from an iPad, I get a message that says picture is too large.

A. You normally get a choice of the size. If not, when you tap the picture, you will get a choice. The problem is strange and probably relates to some settings of the recipient. You can now send large photos - 10mb to 25mb. Note that Large may be smaller than the original. Adam sends the actual size since it is no longer a issue.

You can also could put photos on a cloud based service, such as iCloud, Dropbox or Box and share the photos thru sending a link. Sometimes better if multiple photos. In addition, you can send photos thru Messages by sending a link.

Q. iMac running Sierra boots slowly. David uses CleanMyMac. [Avoid Mackeeper. It is untrustworthy.]

A. Mac operating systems are now designed for SSD so running a hard drive might slow booting a bit. Put Activity Monitor in login items and take a look to see what programs are taking an undue amount of CPU time.. If Safari left on, you get memory leak and Safari will keep taking more memory, slowing down your Mac. [Firefox will do the same]. Shut your Mac down once a month.

Q. I need a USB tutorial.

A. Today's Macs come with USB 3 which is backwards compatible. There is an Apple support article explaining this in detail [Maybe tinyurl.com/yd5aeygc]. There are lots of adapters to connect to whatever you need. There are 2 types of Thunderbolt [USB-C] ports. USB 3 has a blue tongue. Some USB cables have a square end for printers, etc. Thunderbolt is the successor to FireWire. FireWire [and I presume Thunderbolt] has a chip set which offloads work from the CPU.

Q. Would it be a good idea to buy a large disc and partition it for 2 backups, say SuperDuper! and Time Machine.

A. No. If that drive fails you have lost both your backups. It's best to use 2 drives.

Main Speaker Mark Bazrod Search Strategies and Resources.

Most of us know how to search on the Internet, but It may often seem that a search takes too long to get the information we are seeking or we get too many answers.

You need to learn some of the more advanced search methods and then get in the habit of using them. Start using a few and then gradually expand the number.

I started out with about 15. The key ones are red highlighted.

GENERAL STRATEGIES

1. Use DuckDuckGo as your default search engine. It accesses a number of the major search engines, but the main advantage is that the site you go to recognizes DuckDuckGo as the sender and not you. Thus, you don't get emails or pop-up ads from the recipient.

2. At times use Wikipedia and Youtube as your first search engines.

I typically first pick Wikipedia when I want information about a very broad subject or about which I know little. I typically first pick YouTube when I want to view a video about how to do something.

I've now bookmarked Wikipedia and YouTube and put them in the left-hand side of the Bookmarks toolbar. That makes it faster to immediately go to W or YT and search within W or YT without bothering with an overall Internet search.

3. Learn Boolean logic operators of AND, OR, and NOT.

A search will retrieve different files depending upon which operators are used. For example, the search *pie* AND *coffee* will retrieve files which contain both pie and coffee. The search *pie* OR *coffee* will retrieve files which contain either pie or coffee. It will retrieve more files than the first search. The search *pie* NOT

coffee will only retrieve files which contain the word pie, but do not contain the word coffee. This search will yield the smallest number of files.

Google assumes all searches are AND searches so it is not necessary to use the word AND if that is the kind of search you are doing. Not every search engine makes this assumption.

4. Exact Phrase. When you want a phrase and not the individual words in the phrase, enclose the phrase within double quotes, e.g., "free speech".

5. Use at least 3 search terms. The Internet contains millions of files. The more search terms you use, the smaller number of files you will retrieve. I try to use three as a minimum and about seven as a maximum.

6. Capitalization. Most search engines do not distinguish between uppercase and lowercase, even within quotation marks so you can just use lowercase.

7. Use a minus sign to exclude words, e.g., "free speech" - advertising. Same as NOT. This is particularly helpful for words with multiple meanings, such as mustang or caterpillar, where you don't want results for the car or the company, respectively.

8. Use a plus sign and a number after a word to require the word in the results. You probably get the same result with an AND search, but this makes the requirement explicit even for words typically ignored.

9. Synonyms. If you want to include results that contain similar words or synonyms of a word in your search, use the tilde (~) in front of the word, e.g., ~Congress.

10. Truncation. This is helpful to find different forms of a word. employ* will retrieve files which contain the words: employ, employment, employs, employee, and employer.

11. Missing Words or Letters. Use the asterisk. The asterisk wildcard is one of the most useful tips in this list. Some call it

Amnesia Assistance. Very helpful when you can't remember a term or spelling, e.g., my country tis * or pleth*ra.

12. Dates or Numbers. Use two dots and numbers. If you remember one thing from this presentation, remember this! Excellent for narrowing a search for articles between dates, e.g., "apple storage" 2016..2017.

13. Site. To search within a site, type site:the URL, and the search.

14. Use important words only. Google ignores a, an, about, are, how, etc. But it's sometimes easier to type in the word.

15. Spelling doesn't necessarily matter. As long as the spelling is pretty close, Google can usually figure out what it means.

16. Spell checker. If unsure how to spell, type in the word and Google will return the correct spelling.

17. Definitions. Just type define: or definition:, e.g., define:problematic.

18. Whose Phone Number. If all you have is a phone number, use the phonebook feature, e.g., phonebook: 617-555-1212.

19. Area Code Lookup. To look up the area code for a phone number, just enter the general area and the result will be the, e.g., three-digit area code

20. Zip Code Lookup. If you need to look up the zip code for an address, simply search for the street address, city, and state. The results will have the zip code.

Conclusions

The more tips you use, the more you will become a skilled search expert.

1. Use two dots and numbers for dates
2. Make DuckDuckGo your default search engine.

3. Remember Wikipedia & YouTube for some first searches.

4. Use quotes for exact phrase.

5. Use ~ for synonyms.

Organize Your Search Information

Consider keeping a link to every site you visit, keeping on Pages, Evernote, Google Keep, etc.any text, PDFs or images you might need or use; starting broadly, using general terms or Wikipedia and YouTube; checking out some references in Wikipedia articles, and going to specialized search engines (they are coming).

The Three Webs

Surface Web - The "Web". It includes content that is easily indexed by search engines.

Invisible Web - The vast repository of information that search engines don't have direct access to and are not included in their indexes, like databases, libraries and court records. At least 500 times the size of the Surface Web. If you can get to a site, you can drill down into its index.

Dark Web - Very small. Illegal transactions and sites needing to be safely hidden.

The Invisible Web makes up the vast majority of available content on the web. Many invisible web search tools access the information on the Invisible Web. *Italics are my brief comments.*

Some Invisible Web Sites

[Wayback Machine](#) - More than 20 years of web history and webpages. More than 330 billion webpages. *Great for seeing the past.*

[USA.gov](#) - Mammoth guide to government info, databases, & services. Includes Library of Congress & The Smithsonian. *More data than you can imagine.*

[The WWW Virtual Library](#) - Access to hundreds of different categories and databases on a wide variety of subjects. Not updated since 2017. Started by Tim Berners-Lee in 1991. *Had some problems getting to some referred sites.*

[Science.gov](#) - Access over 60 databases and more than 2,200 selected websites from 15 federal agencies, offering 200 million pages of U.S. government science information. *More data than you can imagine.*

[Wolfram Alpha](#) - A computational search engine, implementing every known model, method, and algorithm. Not all features are free. *Will take time to figure out.*

[The National Security Archive](#) - Access to more than 50 years of declassified documents released under the Freedom of Information Act. *More data than you can imagine.*

[Directory of Open Access Journals](#) - Access to more than 10,000 quality open-access, peer-reviewed journals and millions of articles. Results lack a preview. *Need extended search since so many articles.*

[The Online Books Page](#) - Access to more than two million books freely accessible on the Web and to directories and archives of online texts.

[census.gov](#) - If you want data, Census.gov is one of the first places to go. The U.S. Census Bureau conducts demographic, economic, and geographic studies and strengthens statistical development around the world.

[Catalog of U.S. Government Publications](#) - Access to electronic and print publications from all U.S. government branches. More than 500,000 records since July 1976. *Tons of information.*

[FindLaw](#) - A gigantic repository of free legal information, and one of the largest online lawyer directories available. *Lots of lawyers, fair amount of info on selected topics, hard to find answers to a specific question.*

[FreeLunch](#) - Access to free economic, demographic, and financial data. It provides extensive historical and forecast data at the national and subnational-regional levels representing over 93 percent of global GDP. It covers more than 180 countries, over 150 global metro areas, and all U.S. states, metro areas, and counties.

[Bankrate](#) - Around since 1996, it offers a huge library of financial information on current interest rates, mortgage lender reviews, ARMs, articles on CUSIP, and much more. *Very informative.*

Conclusions

For “simple” quick searches (such as questions on Apple products), research on the Surface Web is normally sufficient.

But for more serious or extensive subjects, you need to search on sites on the Invisible Web.

Consider putting the last pages of the minutes on Invisible Web sites in an easily accessible file.

Glenn Fleishman posted the following article to tidbits.com on February 21, 2019. tinyurl.com/y56do8px. © TidBITS Publishing Inc. He is a senior contributor to Macworld and a contributor editor at TidBITS. He appears regularly on public radio to discuss the tech industry.

Stop Renting Your Cable Modem: Buy One Instead

By Glenn Fleishman



Many people continue to pay Comcast and other cable-based ISPs monthly fees to rent cable modems. But with a little research, you can buy your own modem outright and save money in the long run.

The advantages to renting a cable modem are that you can turn to your ISP for hardware support, including Wi-Fi help if the modem includes a wireless gateway, and the company will replace the modem at no cost if the unit fails or can't support higher network speeds as it upgrades its service or you move to a faster tier. However, given the typical monthly rental fees, the premium you'd pay for those benefits is usually high compared to the cost of buying your own modem.

For instance, if you pay your cable company \$13 per month to rent a modem, you'd pay \$468 over 3 years of service, plus any

of the various percentage-based fees cable companies tack on. However, you could instead pay \$350 for the [Netgear C7800](https://www.netgear.com/products/cable-modems/C7800.aspx), a cable modem that includes an advanced Wi-Fi gateway. For the equivalent of 27 months of rental fees, you'd save over \$150 per year.

But you should read your bill carefully before proceeding. Some cable companies have stopped charging a rental fee altogether, effectively bundling it into the monthly service bill. TidBITS Publisher Adam Engst checked his bill and found that his provider, [Spectrum](https://www.spectrum.net), was one of them. (In 2016, Charter Communications acquired Time Warner Cable, his previous ISP, and has now rebranded all services under the Spectrum name.) That means there are no savings for him if he buys his own modem.

Pick the Fastest Model

Cable-based Internet service relies on the DOCSIS (Data Over Cable Service Interface Specification) standard, which was first developed over two decades ago. Version 3.0, released way back in 2006, provided massive increases in maximum downstream and upstream rates, which led cable to outpace improvements in telephone copper-wire DSL service.

DOCSIS 3.0 was in many ways so far ahead of its time that it remains in active and heavy use. Its maximum downstream rate is 1.2 Gbps, and upstream tops out at 200 Mbps. Version 3.1 appeared in 2013 with 10 Gbps downstream and 1 or 2 Gbps upstream maximums. A further improvement in 2017, 3.1 Full Duplex, provides up to 10 Gbps for both upstream and downstream data.

Few DOCSIS 3.0 and later modems offer the maximum possible data rates for their respective supported versions. Performance is based entirely on the kind of modem chips installed, which configure network communications over the coaxial cable wiring into "channels." Each channel is effectively its own separate data stream, and the modem binds all those channels together

invisibly to you. More specifically, each channel has a maximum amount of data it can carry, and overall throughput is based on either how many channels are built into the modem or how many the cable carrier supports for your account. (DOCSIS 3.0 and later have a surprising amount in common with Wi-Fi.) You might have a modem that can outstrip your connection, which is fine, or a connection that offers more channels than your modem can handle, which is bad.

With DOCSIS 3.0, devices could be configured with as few as four downstream channels and one upstream channel, labeled as 4×1, or 171 Mbps downstream and 43 Mbps upstream. In practice, most 3.0 modems started at 4×4, and 8×4 (343 Mbps/171 Mbps) models are more common. By spec, a DOCSIS 3.1 modem can't offer fewer than 24×2 or 1 Gbps/123 Mbps. (DOCSIS 3.1 has more capacity per channel for upstream signals, which is why 3.0 and 3.1 upstream bandwidth-per-channel numbers differ.)

As with Wi-Fi, you won't see maximum throughput rates in the real world, as they describe a state of perfection that never exists. Cable wiring can suffer from transient interference, degradation due to wiring quality, and speed drops due to long distances from the data termination point for your connection to the cable plant. Plus, channels can experience congestion if too many customers around you are connected to the same cable data segment relative to the throughput they require. The modems automatically adjust which channels they use and the throughput within each channel based on continuously changing line and usage conditions.

That means the ISP has to overdeliver on the number of channels it uses to provide you reliable service that's up to the promised service level. If you have a 100 Mbps Internet subscription, the cable ISP doesn't let your modem use only four channels, as "171 Mbps" would likely net out to far less on average. As a result, you need a cable modem that overperforms your current tier of service by a factor of two or three to ensure you have

enough capacity to outpace any of the problems mentioned just above on average. So a DOCSIS 3.0 modem with 8×4 (343 Mbps/171 Mbps) should work fine with a 100 Mbps/20 Mbps broadband plan. But if you're paying for 200 or 300 Mbps, you'll want a much faster model. (ISPs will throttle service in the modem—it's a feature of the DOCSIS spec—or at their network side of things to make sure they don't give you more throughput than you're paying for.)

With gigabit broadband service over cable, you need a DOCSIS 3.1 model, even though some 3.0 versions support 32 downstream channels (about 1.4 Gbps). That's because cable ISPs with gigabit service, like Comcast, have opted to deliver gigabit speeds only using 3.1 technology for greater efficiency and flexibility due to improvements that make a difference in delivering service but are invisible to customers.

Even though DOCSIS 3.1 modems cost a little more than 3.0 models—\$160 to \$180 for well-reviewed 3.1 models versus less than \$100 for 3.0 models—you should, in most cases, purchase a 3.1 model even if your current broadband speed doesn't warrant it. Modems with 3.1 built-in are backward compatible with 3.0 service and thus offer future-proofing against service upgrades without having to swap out your hardware.

While the DOCSIS 3.1 Full Duplex specification has been released, there aren't any consumer-level modems that support it yet, and DOCSIS 3.1 offers more than enough throughput for consumers and most businesses. Ignore it for now.

Buy and Install Your Own Cable Modem

Every cable company has a different list of approved "retail" modems that work on its network, making it impossible to offer a blanket recommendation. Plus, you may want to find a cable modem that includes other features, such as a Wi-Fi router, even if it costs more than a "dumb" unit that only knows how to connect to the cable system.

Pay close attention if you subscribe for both broadband and voice service from your cable ISP. Cable operators typically limit which modems they support for both broadband and voice, and you may have to purchase a modem through a partner or manufacturer's site instead of via an online or brick-and-mortar retailer.

What will you wind up paying?

- **DOCIS 3.0 up to 300 Mbps broadband: around \$60.** The [NetGear CM500-1AZNAS](#) (16×4 or 686 Mbps/171 Mbps) is a good example, scoring solid reviews and working across nearly all cable operators' networks.
- **DOCIS 3.0 up to 600 Mbps broadband: around \$100.** Many people pick the [Arris SB6190](#) (32×8) for the highest data rates below 1 Gbps on DOCSIS 3.0 networks.
- **DOCSIS 3.1 up to 1 Gbps broadband: \$160–\$180:** With a lot of choices for 3.1 models, consider the [Arris SB8200](#) (\$180) and the [Motorola SB8200](#) (\$160), which are solid performers in reviews.

Here's where to check on available modems for the main cable ISPs in the United States:

- **Cox:** A [somewhat technical page](#) that starts with compatibility issues faces you at Cox, but it settles down into a long list of compatible modems. A [self-install page](#) guides you through activating a modem, which requires the serial number and cable MAC address.
- **Optimum and Suddenlink (Altice):** Altice's two cable brands don't provide any public-facing information about purchasing your own modem. Some third-party sites recommend modems for these providers, but I suggest contacting customer service before making a purchase.
- **Spectrum (Charter):** Spectrum's [Authorized Devices on the Spectrum Network](#) page lists modems appropriate to a

visitor's ZIP code. It also offers [a simple page on activation](#), which relies on the device's cable MAC address.

- **Xfinity (Comcast):** Xfinity takes the most encouraging approach with [terrific advice](#) about how and what to buy, and a dedicated [My Device Info](#) site that checks on what service is available for subscribers who log in and non-subscribers who provide their address. It even comes with a promise: "All listed equipment is certified and compatible with Xfinity Internet service." Xfinity also [publishes a clear set of steps](#) for activating your own modem, although it's a bit more complex than other providers.

You can also turn to a reliable third-party for reviews. [Wirecutter assembled a set of recommendations](#) for modems that deliver the performance most people currently need: 24×8 with DOCSIS 3.0 for up to broadband service up to 600 Mbps and a 3.1 option for gigabit subscribers. The reviews dig into compatibility across carriers and other more detailed feature comparisons.

Don't Forget To Get a Receipt!

One of the worst parts of dealing with a cable company is making sure it stops billing you for services and hardware you aren't using and don't possess. I went to a local Comcast office to return my rental modem a few years ago and made sure to obtain a receipt proving that I had handed it over.

And, sure as the sun comes up in the morning, my next bill still showed a rental fee. It took months to convince Comcast to stop charging me, even though in the end, the company refunded all the fees and "believed" me. I had a receipt!

If you need to return your rental modem via the mail or UPS, made sure to take pictures of the unit as you ship it, including the serial number and the packed box, and only ship via a service that provides a tracking number.

Even when you think the cable operators can't get you, they'll try. But in the end, you won't be paying a monthly fee anymore.

Chris Hoffman posted the following article to howtogeek.com on July 11, 2017. tinyurl.com/y3dubuo2. © How-To-Geek, LLC. He is the Editor In Chief at How-To Geek and has written over 2,000 articles since 2011.

Should You Buy a Router If Your ISP Gives You a Combined Router/Modem?

By Chris Hoffman



Many Internet service providers are now giving their customers combined devices that function as both a modem and a wireless router. With these devices, you don't have to buy a router — but you can, if you like.

While separate routers can be more powerful, configurable, and feature-filled, that isn't necessarily a good thing for everyone. Whether you should get a separate router or not depends on what trade-offs you want to make.

Why ISPs Provide Combined Router/Modem Units

For most people, having a combined router/modem unit is just simpler. The Internet service provider can hand their customer a box and that single box handles connecting to the Internet, creating a Wi-Fi network, and sharing the Internet connection between multiple devices. Customers don't have to buy their own router and hook it up, and the ISP doesn't have to field

support calls from confused customers who have problems setting up their routers.

Having a combined router/modem also makes some sense. Why split this functionality into two separate boxes that may have difficulty communicating with each other? This just requires more power outlets and potentially more [troubleshooting](#) — if you have a problem, you may have to troubleshoot the link between the modem and router to ensure they're communicating properly.

RELATED: [Your Home Router May Also Be a Public Hotspot — Don't Panic!](#)

ISPs also gain the ability to do other things with their modems, such as [providing public Wi-Fi access to their customers](#) via these combined modem/router units.

The main advantage to sticking with your combined modem/router unit is that it's simpler. If you already have one, you don't have to buy anything extra or set it up. If the unit was provided by your ISP, you can expect them to troubleshoot it for you. You won't have to deal with problems that can occur if the devices fail to communicate properly.



How You Could Use Your Own Router

RELATED: [How To Troubleshoot Internet Connection Problems](#)

On many of these combined units, you can disable the router functionality. This will cause the modem to simply pass the connection through to the next device in line. Connect a separate router to your modem with an Ethernet cable via its LAN port and the router will get a public IP address from the modem, sending traffic back and forth and functioning as a standard router.

Even if you can't disable the router features, you could plug your own router into the LAN port and create a separate Wi-Fi network. The router would receive a local IP from behind the combined router/modem unit, so you'd be using a local network behind another local network, which will cause problems with port-forwarding — but it should work. This isn't ideal, but it's definitely possible. You can often disable Wi-Fi on the combined modem/router, which will leave you with only single Wi-Fi network. There are many ways to configure these networking settings.

Why You Might Want to Get Your Own Router

The main advantage to bringing your own router is getting additional hardware and features that your ISP's router doesn't provide. For example, let's say you really want the fastest 802.11ac Wi-Fi and your combined router/modem doesn't provide it to you. You can purchase your own wireless router with the feature and connect it to your modem via Ethernet. It will then provide fast Wi-Fi access and communicate over the wired Ethernet line with your modem.

You may also want additional features your combined router/modem doesn't provide. Perhaps you want [dynamic DNS](#) so it's easier to access servers running on your local network from the Internet. Maybe you want [quality of service \(QoS\) features](#) to prioritize your network traffic. Or perhaps you're a geek who wants to install your own [custom router firmware](#), like OpenWrt, and turn your router into an extremely tweakable little device.

OpenWrt is basically a Linux distribution with a package manager for routers, and can be used to run different types of servers and tools on your router — you can't do this with a locked-down router/modem provided by your ISP.

So, Should You Get a Separate Router?

RELATED: [Buy Your Cable Modem Instead of Renting It to Save \\$120 Per Year](#)

The decision is ultimately up to you and depends on what you want. If you're happy with your combined router/modem unit and you don't want any additional features it doesn't provide, you'll probably just want to stick with the box your ISP gave you. It's just easier to set up and use.

On the other hand, if you want the latest wireless hardware or additional features, you can get them by purchasing your own router and connecting it to your modem. You're trading some simplicity for more power and choice.

If you're renting that combined router/modem from a cable Internet provider, there's also another option — you can generally buy [your own router to eliminate the router service fee from your monthly cable Internet bills](#). This doesn't apply to ADSL, fiber, or satellite connections — just cable.

John Martellaro posted the following article to macobserver.com on September 18, 2018. tinyurl.com/y6z5ggum © The Mac Observer, Inc. A scientist and author, he has worked for NASA, the Oak Ridge National Laboratory, & Apple.

What the Surge in Apple Watch Popularity Says About Our Culture

By John Martellaro

The Apple Watch Series 4 appears to have tapped into an emerging cultural theme. And it will accelerate. Series 4 pre-orders are reported to be [better than expected](#). Here's the significance.



Apple Watch Series 4 with new watch faces and complications

When the Apple Watch first shipped in 2015, it was considered a new breed of smartwatch. Apple's early ads tended to show a wide range activities possible with the Apple Watch. It was a veritable smorgasbord of features. The marketing approach was to show how many different things the Apple Watch could do in order to whet the customer's appetite. Third party apps were considered significant. But, in parallel, Apple probably had no

firm idea of which features would endure, become favored: signature elements of the Apple Watch.

That is now changing.

[\[The Apple Watch is Now the Intelligent Guardian of the Galaxy\]](#)

Cultural Pressures

Our current culture is awash with pressures that seem to be accelerating. This may be influencing how people feel about the Apple Watch.

1. Hacking. Not a day goes by without some alarming news about how large chunks of personal information on file, by an internet company, have been compromised.
2. Assaults on our devices. Every new OS update comes complete with a myriad of fixes designed to resist imaginative attempts to outright break into our devices. This is certainly a new way of living compared to, say, 20 years ago.
3. Anti-social media. Nowadays, everyone has a voice. Everyone. Those who are angriest make the most news. It's hard to recover a sense of social peace.
4. An Angry Planet. Our Earth is trying to make adjustments. Increasing average temperatures have nurtured western wildfires all the while melting polar ice. All that now additional liquid water causes widespread flooding. The planet is departing from its idyllic past in more obvious ways.
5. AI threats. Not a day goes by without some frightening story about how AI, in the hands of tech giants, will someday coerce, dupe, and manipulate us. There are few rosy forecasts.

All this, in aggregate, can weigh on people, even subconsciously.

Apple Watch Protection Game

[Rich Mogull](#), a security guru, thinks iOS is the most secure mobile OS in existence. And yet we must remain very careful.

Apps that are carelessly downloaded on a whim and not properly vetted can still compromise our privacy.

The Apple Watch goes one step beyond the iPhone. First, it's simple to operate and maintain. No tiresome backups. (It backs itself up to our iPhone.) Security snafus are even more rare than with the iPhone. Second, it's intimate, always in touch with our skin, unlikely to be misplaced. Because of that, it can perpetually tell us things about ourselves that are helpful and protective. Optical pulse and electrical heart monitoring are upon us. Soon blood glucose and perhaps [blood pressure monitoring](#) may arrive.

In addition, Apple points out clearly how, amongst other data, our health data belongs to just us. [Apple encrypts it and otherwise protects us](#). If ever there were a personal electronic device that gives us warm fuzzies about protecting us, in a world rife with threats, the Apple Watch is it. The psychological comfort factor is palpable.

Companies that compete against the Apple Watch think they're competing in the smartwatch market. They're wrong. It's the protection and well-being market.

When cultural pressures ramp up, I think the tendency is to seek solace in products and services that appear to restore a sense of safety equilibrium. Apple is tapping into a new, perhaps only dimly forecasted notion back in 2014 that a device we wear could become a partner and guardian.

Finally, in the context of AI, all we hear about is that AI will destroy our jobs, dignity and very existence. If Apple extends what it has learned from the Apple Watch to personal robots and AI, maybe there's a New Hope for all of us.



Daniel Nations posted the following article to lifewire.com on November 26, 2018. <http://tinyurl.com/y6e4pjlo>. © About.Inc. He has been writing, programming and following technology since back in the Commodore Vic 20 days.

What is a Podcast? And How Do You Find Them?

Listen at your convenience and be entertained and educated

By Daniel Nations

In its most simple form, a podcast is the Internet's version of talk radio, with added perks such as being able to listen on your own time rather than being forced to tune in at a certain day and time. But while comparing them to talk radio is an easy podcast definition, podcasts are also quite different from what you hear on the radio in the same way that [YouTube videos](#) are different than what you watch on television.

What Exactly Is a Podcast?

A podcast is a series of 'episodes' that are stored in the same type of audio files we use to store music on our laptop or smartphone. Similar to a television or talk radio show, a podcast is generally centered around a theme such as politics, sports, entertainment, gaming, etc. Each 'episode' usually revolves

around a subject within that theme. You can listen to individual episodes or you can subscribe to the podcast, which is usually free.

For example, [Pod Saves America](#) is a popular new podcast with a progressive take on political news. It is hosted by Jon Favreau, Tommy Vietor, Jon Lovett, and Daniel Pfeiffer, and the show frequently has expert guests giving their opinion. Episodes tend to center on something political in nature such as healthcare or tax reform.

On the totally different end of the spectrum is *Critical Role*, a podcast hosted by [Geek and Sundry](#) that features voice actors going through a [Dungeons and Dragons](#) campaign. Each episode is an adventure within that campaign, with longer adventures broken into multiple episodes.

The term "podcast" comes from combining "iPod" and "broadcast". The iPod's ability to store music files (and thus any audio file) led to its use as an audio broadcast (podcast) player in the early days of the podcast. But a podcast is defined by the ability to subscribe to the audio files rather than a particular platform. Podcasts are available on all platforms including Windows, Mac, iPhone, iPad and Android.

What Makes a Podcast Different Than Talk Radio?

The obvious difference between a podcast and a talk radio series is the on-demand availability of the podcasts. However, many popular talk radio shows such as *This American Life* release a podcast version of the show to reach the listeners that miss the regular showing.

So how else is a podcast different?

In many ways, a podcast is the long tail version of radio. The "long tail" concept revolves the grouping of smaller audiences being equal to capturing a single, larger audience. For example, you can have one book that sells ten thousand copies or a thousand books that sell ten copies. The end result is ten

thousand books sold. A physical bookstore will stick to the popular book because it doesn't have room to store a thousand books with such a small audience, but an Internet retailer like Amazon is quite happy to use print-on-demand technology to sell those thousand books.

This same thing occurs with podcasts. There is only so much bandwidth available for radio broadcasts, so talk shows need to appeal to a broad audience. The same restriction doesn't apply to a podcast being distributed over the Internet, so you'll see subjects with more limited appeal and podcasts that don't have the same type of budget.

This is one of the biggest benefits of podcasts. If you have interests, even if those interests are very niche, there's probably a podcast covering it. And better, you can listen at home, in the car or on the go because podcasts can travel with you in your smartphone.

How to Find and Listen to a Podcast

Now that we know what a podcast is, how do we find them? There are thousands of free podcasts online available through various hosting services. These services allow you to subscribe to a particular podcast and download it as each new episode becomes available, even alerting you to new episodes if you have the app on your phone. We'll take a look at some of the most popular platforms.

On the iPhone or iPad... If you own an iPhone or iPad, you already have an app dedicated to podcasts on the device. The Podcasts app, which you can [find easily by using Spotlight Search](#), will let you search for different podcasts, stream specific episodes and subscribe to the podcast. There are also a number of [great Podcast apps available for the iPhone and iPad](#).

On an Android device... [CastBox](#) and [Podcast Go](#) are two of the [leading free podcast apps for Android](#). Podcast Go has a simple interface that will get you up and listening very quickly, while



CastBox is better for discovering new podcasts. Both make a fine first dip into the podcast pond.

On a PC or Mac... [Apple's iTunes software](#) has an entire section devoted to podcasts similar to the sections on music and movies. Even better, it will link up with any podcasts you have subscribed to on your iPad or iPhone, so you can move from device to device with ease.

What's a Vodcast?

A vodcast simply adds video into the mix. Sometimes, this is simply a video of the podcast, while at other times it replaces the podcast. You can subscribe to vodcasts in the same way as a podcast. In the iPhone's podcast app, there is a separate section for vodcasts while Podcast Go on Android lists them side-by-side with podcasts.

Which Podcasts Should You Be Listening To?

The one thing we can't tell you is which podcast is perfect for you. There are thousands of free podcast downloads for almost any interest.

Here's what we recommend if you love [Game of Thrones](#).

ESPN is your source [if you love sports?](#)

Check this out if you are [interested in history](#).

Read all about the [best Podcasts everyone is listening to right now](#).

Scott Orgera posted the following article to [lifewire.com](#) on November 2, 2018. [tinyurl.com/y5mwbsql](#). © About, Inc. He has been as a programmer and quality assurance lead across multiple platforms for 25 years. He has been a technology writer for [about.com](#) and [Lifewire](#) since 2007.

What Is Waze and How Does It Work?

The best free traffic app you're not using yet

By Scott Orgera

Waze is a navigation app you run on a smartphone that helps you find directions and avoid traffic jams.

The Waze app is available for [Android](#), [iOS](#), [Windows Phone](#) and [Windows Mobile](#) platforms. It provides real-time directions that are adjusted on-the-fly to account for various types of potential obstacles.

How Does Waze Work?

There are plenty of GPS-driven apps and software to choose from, including options that may have come pre-installed in your car's dashboard interface or on your mobile device like [Google Maps](#) and [MapQuest](#). Most do a respectable job when it comes to step-by-step navigation, and some even account for congestion and other factors that could affect your overall drive time.

Waze handles things a bit differently, though, relying on the power of the people to steer you down the right roads. With over 100 million users sharing noteworthy information about what they encounter along the way, Waze stays constantly updated about

anything that could slow your progress. Input from your fellow drivers, known as Wazers, lets the app alert you to important items such as construction, police activity, accidents and even minor things to look out for like potholes and disabled cars on the shoulder.

Waze utilizes all of this information seamlessly to predict accurate arrival times and tailor turn-based directions as you drive, helping you traverse both city and rural roads with confidence.

The app is highly customizable, letting you select from a 2D or 3D display and from one of dozens of voices across almost all popular languages. If you aren't satisfied with any of the voices provided, Waze lets you record your own voice for directional playback purposes.

The Social Aspects of Waze

Since Waze is powered by the masses, it's only natural that the app encourages social interaction beyond just warning others of a three-car pileup or hidden speed trap. By integrating with [Facebook](#), you can choose to share your location with friends as well as view their progress if you're heading towards the same destination. This feature also helps you see if anyone you know is nearby.

You can also send a message or a virtual beep of the horn to other drivers in the area, providing the ability to make new friends along the way.

The social nature of Waze can even save you some money, as its compendium of user-shared gas prices allows you to quickly find the cheapest fuel in your neighborhood.

Android Auto and Waze

[Android Auto](#) takes your smartphone's most commonly-used features and integrates them with your car's built-in dashboard screen, allowing you to access key functionality while keeping your eyes on the road. A selection of third-party apps are

supported by this voice and touch-activated platform, and Waze is one of them.

A logical fit for your automobile's dashboard, the combination of Waze and Android Auto makes for the perfect driving companion.

Improving the Urban Landscape with Waze Data

The information gathered by Waze has proven invaluable not only for drivers but also city planners, transportation departments and first responders. Taking into account the sheer volume of data collected on a daily basis, these organizations are able to work with Waze to design new infrastructure while avoiding congestion, plot the most efficient routes for incident response and efficiently reroute traffic during fluid situations.

By using Waze you're not only helping out yourself and other drivers, but you also might be making a difference in improving how your city or town functions.

Tom Nelson posted the following article to [lifewire.com](#) on November 14, 2018. [tinyurl.com/jpxg9sm](#). © About, Inc. He is a consultant and writer providing Macintosh training, advice, and support. He has written hundreds of articles, tutorials, and product reviews.

Hey Siri: Get Your Mac to Activate Siri by Voice

With help from the dictation system, Siri can be voice activated

By Tom Nelson

You know Siri. She's that quirky personal voice assistant that you use on your iPhone and other iOS devices. Well, now's she on the Mac and ready to do her best to be a help and not a hindrance. Now, even though you're familiar with Siri, it's important to keep in mind that Siri on the Mac doesn't work quite like Siri on iOS devices.

Hello Siri

If you have an iPhone, you're probably used to saying "Hey Siri" to start a session with Siri. You may be asking for the weather, or directions, perhaps a really good pizza joint. Regardless of the question, you need to ask, you usually start the conversation by getting the attention of the personal voice assistant by saying, "Hey Siri."



Mac OS Sierra with Siri checking on a baseball game.

Saying Hey Siri will even get the attention of [the miniature assistant stuffed into the Apple Watch](#). But when it comes to the Mac, no amount of voice-based prodding is going to get Siri's attention. Seems the Mac and Apple have turned a deaf ear to the Hey Siri phrase, and instead force you to use keyboard combinations, or [mouse](#) or [trackpad clicks](#), to get Siri to wake up and listen to your requests.

Use Enhanced Dictation to Get Siri on Mac

Apple may have chosen to leave Siri deaf until you manually turn the assistant on, but it doesn't have to be that way. The Mac has been able to take dictation and turn your voice into words since the release of [OS X Mountain Lion](#).

It wasn't the best of dictation apps out there at the time, but it would eventually become a powerful core service of the Mac OS. By the time [OS X Mavericks](#) came about, Dictation had been improved. It not only could be used for converting your spoken voice to words, but you could also [assign certain words and phrases to be used as commands to control various Mac services, features, and apps](#).

It's this feature of Dictation that we're going to use to enable Siri to wake up and respond when she hears the familiar Hey Siri greeting. Actually, you're not stuck with Hey Siri; you can use any word or phrase you want; Hey What's Your Name, or Answer Me This. It's up to you what phrase to use, though I'll demonstrate the process with the old favorite, Hey Siri.

Enable Siri

The first step is to [enable Siri](#). To do this, you need a Mac running macOS Sierra or later, as well as a decent quality internal or external microphone.

Shortcut Keys

The hardest part of this process is coming up with a unique combination of keys that, when pressed, will enable Siri. Apple provides its developers a list of keyboard shortcuts used globally by macOS. It's not a good idea to use any of the keyboard shortcuts listed in the [Keyboard Shortcuts for macOS](#) table.

I decided to use control + period (^.) since Apple uses the period sparingly for keyboard shortcuts. There's still no guarantee that an individual app isn't already using this combination, but so far, it has worked for me.

Assign the Siri Shortcut Keys

1. Launch System Preferences by clicking on its icon in the Dock, or selecting System Preferences from the Apple menu.
2. In the System Preferences window, select the Siri preference pane.

3. In the Siri preference pane, locate the popup menu next to the [keyboard shortcuts](#) text, and then use the menu to select Customize.
4. Press the control + period keys (or whichever keyboard shortcut you wish to use).
5. Return to the full list of preference panes by clicking the back button in the Siri preference pane toolbar.

Enable Dictation

1. In the System Preferences window, select the Keyboard preference pane.
2. Select the Dictation tab in the Keyboard preference pane window.
3. Turn Dictation on.
4. Dictation can be performed either by remote Apple servers, which takes a computational load off your Mac, or it can be performed locally on your Mac. The advantage of selecting Enhanced Dictation is that your Mac will perform the conversion, and no data will be sent to Apple.
5. Click the box labeled Use Enhanced Dictation.
6. Enhanced Dictation requires a download to your Mac of the Dictation Translation system; it may take a few minutes.
7. Once the download is complete, you can return to the main System Preferences window by selecting the back button in the preference pane's toolbar.

Accessibility

To enable voice commands, we're going to use the [accessibility preference](#) pane to associate a phrase with the keyword shortcut we created for Siri.

1. In the System Preferences window, select the Accessibility preference pane.
2. Scroll down through the sidebar to select the Dictation item.
3. Place a checkmark in the box labeled Enable the Dictation Keyword Phrase.

4. In the field just below the checkbox, enter the keyword phrase 'Hey' (without the quotes).
5. The word Hey will be used to activate the Dictation system.
6. Click the Dictation Commands button.
7. Place a checkbox in the box labeled Enable Advanced Commands.
8. Click the plus sign (+) to add a new command.
9. In the field labeled When I say:, enter the word Siri.
10. Use the dropdown menu next to the While using: text to select Any Application.
11. Use the dropdown menu next to the Perform: text to choose the action to be performed when the word Siri is detected. In this case, select Press Keyboard Shortcut.
12. Enter the keyboard shortcut you assigned to enable Siri. In this example, the shortcut is control + . (^.)
13. Click the Done button.
14. You can close System Preferences.

Using Siri With Voice Activation

That's everything you need to do to allow Siri to be voice activated on your Mac. You're now ready to give voice activation a try. Go ahead and say Hey Siri; the Siri window should open, asking, What can I help you with today? Ask Siri about the weather, where to find a good pizza joint, or to open Lifewire.com.

Daniel Nations posted the following article to lifewire.com on February 13, 2019 tinyurl.com/y6rwzvzv. © About.Inc. He has been writing, programming and following technology since back in the Commodore Vic 20 days.

Take Better Notes With the iPad



By Daniel Nations

Who needs a paper and pencil when you have an iPad? One reason why an [iPad](#) makes a great companion to a classroom or to a meeting is the versatility of typing in a quick note, jotting down a handwritten note, adding a photo or sketching your own image. This versatility makes it a great note-taking tool no matter if you are writing down equations on a chalkboard or simply creating a list of to-do items for a project. But if you are going to get serious about note taking, you are going to need some apps.

Notes

The Notes app that comes with the iPad is easy to overlook, but if you need a basic note-taking application that includes the ability to sketch your own notes, add images and perform basic formatting such as bolded text or bulleted lists, it may very well do the trick. The biggest benefit of Notes is that it links notes across devices using [iCloud](#). You can even view your Notes at [iCloud.com](#), which means you can pull up your notes on your Windows-based PC.

Notes can also be password locked, and if you are using an iPad that supports Touch ID, you can unlock the note with your fingerprint. And one of the coolest reasons to use Notes is the ability to use Siri. Simply tell Siri to "Take a Note" and she'll ask you what you want to say.

OneNote

[Microsoft OneNote](#) earns lavish praise for its powerful but easy-to-use interface. OneNote syncs with your Microsoft Account or with an Office365 account, so your notes travel with you by means of your OneDrive storage.

With support for complex notes, images, pencil drawings, and even an Apple Watch app, OneNote's versatility is unmatched. Plus, it's free to use without limit.

Evernote

[Evernote](#) is a cloud-based note-taking app that has a similar easy-to-use feel as the Notes app but with some cool features added on top of it. Evernote includes all of the basic formatting options you would expect. It also includes tools to sketch out a note or attach a photo.

Capture documents by scanning forms or handwritten notes. Similar to [apps that act as a scanner](#), Evernote will automatically focus, snap the photo and crop the picture so that only the document is showing. Evernote also supports voice memos.

Access all of your documents from any device that can connect to the web. Evernote can attach to your calendar so that you can link a meeting with the notes you look at it. You can also use Evernote to leave yourself more advanced reminders than the Reminders app that comes with the iPad is capable of creating.

Penultimate and Paper

What if you need to go heavy on the handwritten notes? [Penultimate](#) may be the ultimate handwriting app on the iPad. It is made by Evernote, which means the notes you write

with Penultimate will sync to your account and show up in the Evernote app. It also has a ton of formats, including graph paper, dotted paper, preformatted to-do lists and shopping lists, and even a hangman game. Penultimate can also search through your handwritten notes and recognize words, which is really cool. Unfortunately, it won't convert that handwriting to text.

If you don't use Evernote, [Paper](#) combines some of the basic features of Evernote with a world-class sketching tool. Paper is at its best when you combine drawings with your handwritten notes, and it really goes hand-in-hand with [Apple's Pencil stylus](#). Paper supports typed notes and performs basic formatting, but this side of the app offers fewer features than even the built-in Notes app. If you don't need all of the advanced features of Evernote and primarily need to sketch out your notes, Paper may be the way to go.

Notability

[Notability](#) may be the best pure note-taking app on the App Store. It doesn't have some of the task-related features of Evernote such as tying into your calendar, but if your killer feature is advanced note-taking, Notability is your top choice.

Notability supports the precise annotation of pictures, shapes, or web clips with handwritten notes. A magnify feature lets you write something in an expanded view and have it show up in a smaller area on the note, which is great if you are using your index finger instead of a stylus.

Save your notes to most popular cloud services like [Dropbox](#) or [Google Drive](#), or let iCloud sync your notes across your devices.

Handwriting to Text With Notes Plus

One thing we haven't covered is converting your handwritten notes into digital text. Skip Evernote and Notability and shoot for [Notes Plus](#) if you value this transcription.

Notes Plus is a very good note-taking tool even if you don't take into account the handwriting-to-text capabilities. It offers a built-

in browser that allows you to search Google for images and then drag-and-drop them into your note, backup of your notes to a cloud-based service like Dropbox and export for your notes to PDF or various other formats.

If you don't need the handwriting-to-text feature, you may be better off with one of the free alternatives, but if you don't mind spending a little bit of money and you think you might want the ability to turn your scribbles into legible text, Notes Plus is a good choice.

To Keyboard or Not To Keyboard

Pairing an iPad with a keyboard can be like turning it into a laptop. Using a keyboard is a personal decision and will depend on how fast you can type using the on-screen keyboard, but if you do go with a keyboard, you may want to go with [Apple's Magic Keyboard](#), or if you have an iPad Pro, one of the new [Smart Keyboards](#), because these keyboards support many of the special shortcut keys that include command-c to copy and command-v paste. When combined with the [virtual touchpad](#), it really is like turning the iPad into a laptop. If you do end up with a non-Apple keyboard, make sure it supports those special shortcut keys.

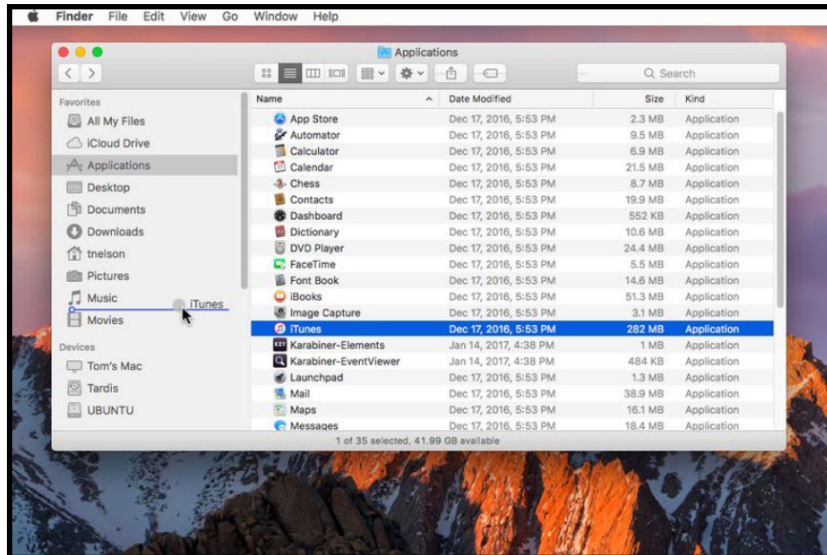
Don't Forget About Voice Dictation!

The iPad is capable of performing voice dictation almost anywhere that the on-screen keyboard appears. A microphone button on the keyboard turns on voice dictation mode, which means you can use your voice to take notes in almost any app, including most apps on this list. This tool is different from a voice memo, which actually leaves a sound file with your voice note in it. Voice dictation takes the words you speak and turns them into digital text.

Tom Nelson posted the following article to lifewire.com on October 29, 2018. tinyurl.com/yyoyk4bk. © About, Inc. He is a consultant and writer providing Macintosh training, advice, and support. He has written hundreds of articles, tutorials, and product reviews.

Modify the Finder Sidebar to Suit Your Preferences

Get more out of the Mac Finder with these easy sidebar tweaks



Besides files and folder, apps can be added to the Finder's sidebar.

By Tom Nelson

The **Finder** sidebar is a handy list of commonly used folders, drives, and network locations. Apple populates it with what it considers to be the most useful items for most users, but there's no reason not to add, remove, or rearrange items. Setting it up just the way you like it is a key to productivity.

Show or Hide the Sidebar

Beginning with OS X 10.6 and in subsequent releases, you can hide the Finder's sidebar, so the window takes up less room, or

display it to give easy access to many locations, files, and apps, all from the Finder's window.

1. Select a Finder window, either by selecting an existing Finder window or by clicking the Finder app in the dock.
2. From the Finder menu bar, select View > Show Sidebar or View > Hide Sidebar. You can also use the [keyboard shortcut](#) Option + Command + S to toggle between the two choices.

Show or Hide the Sidebar's Default Items

1. Open a Finder window by clicking its icon in the Dock.
2. Open [the Finder's](#) preferences by selecting Preferences from the Finder menu bar.
3. Click the Sidebar tab in the Preferences window.
4. Place or remove a check, as appropriate, from each item in the list of items in the sidebar.
5. Close the Preferences window to save your preferences.

Feel free to experiment with the items in the list. You can return to the Finder preferences at any time and modify the show/hide details.

Add a File or Folder

You can add your most often used files or folders to the sidebar to keep them a mouse click away whenever you open a Finder window.

1. Open a Finder window by clicking its icon in the Dock.
2. Click and drag a file or folder to the sidebar. A horizontal line appears, indicating the location the file or folder will occupy when you release the mouse button. With [OS X Yosemite](#), [OS X El Capitan](#), macOS Sierra, and macOS High Sierra you need to [hold down the Command key](#) when you drag a file to the Finder's sidebar. Dragging a folder does not require the use of the Command key.

3. Position the file or folder where you want it to appear and release the mouse button.

Add an Application to the Sidebar

Although this isn't commonly known, the sidebar can hold more than just files and folders; it can also hold the applications you use most often. Follow the same steps as adding a file or folder, but select an application instead of a file or folder. Depending on the version of [OS X](#) or macOS you are using, you may need to hold down the Command key as you drag an application to the sidebar.

To make matters even more interesting, depending on the version of the Mac OS you are using, you may need to set the Finders view setting to List before you can drag an app to the sidebar.

Rearrange the Sidebar

You can rearrange most items in the sidebar as you see fit. Simply click and drag a sidebar item to its new target location. The other items rearrange themselves to make room for the item being moved.

Remove Items

Like the desktop, the sidebar can become cluttered. You can remove a file, folder, or application you added by clicking and dragging its icon out of the sidebar. It disappears in a puff of smoke. Don't worry, though; the item itself is still safe in its original location. Only the sidebar [alias](#) is incinerated.

If you don't mind forgoing the dramatic puff of smoke, you can remove an item from the Finder sidebar by right-clicking on the item and selecting Remove from Sidebar in the pop-up menu.

SOME SPEAKER ROSTER DETAILS

February 9 - Jeff Porten - An author of several Take Control eBooks.

March 9 - Mark Bazrod - Long time MLMUG member, presenter, and Newsletter Editor.

April 13 - Dave Comeau - Long time MLMUG member and entrepreneur.

May 11 - Dave Hamilton - Co-founder of The Mac Observer and publisher and co-host of the Mac Geek Gab Podcast

June 9- Picnic - Valley Creek Park, Route 29, East Whiteland

September 14 - Jeff Gorman - Apple Specialist , PMUG member; and owner of Creative Computing in New Hope, NJ.

November 9 - Bob "Dr. Mac" LeVitus - a leading expert on Apple products and software. Has written or co-written more than 80 popular computer books. Known for his trademark humorous style and unerring ability to translate "techie" jargon into usable and fun advice for regular folks.

December 14 - Pot Luck Buffet, Member's Show and Tell, and Election of Officers for 2020 - An opportunity to enjoy friends, and good food, A "Show and Tell" session.

Don Mayer posted the following article to the Kibbles & Bytes Newsletter #1067 on February 23, 2018. tinyurl.com/y52est3x. © Small Dog Electronics, Inc. He is the CEO of Small Dog Electronics.

Ransomware - What Me Worry?

By Don Mayer

We have not run into too many cases of ransomware on Macs but not only is it common on PCs, it has made it into plot lines of shows like Homeland on Showtime. Once your files are held hostage it is too late so it is best to be informed.



Malware makes headlines regularly these days, and although Macs are targeted far less than Windows PCs, Mac users still need to remain vigilant. A particularly serious type of malware is called “ransomware” because once it infects your computer, it encrypts all your files and holds them for ransom.

Luckily, despite the virulence of ransomware in the Windows world, where there have been major infections of CryptoWall and WannaCry, only a few pieces of ransomware have been directed at Mac users:

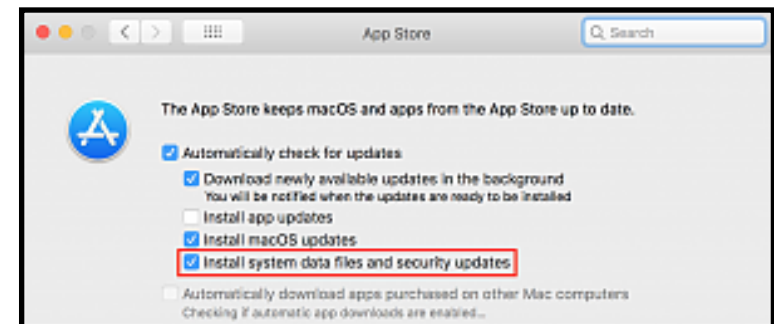
*The first, called FileCoder, was discovered in 2014. When security researchers looked into its code, they discovered that it was incomplete, and posed no threat at the time.

*The first fully functional ransomware for the Mac appeared in 2016, a bit of nastiness called KeRanger. It hid inside an infected version of the open source Transmission BitTorrent client and was properly signed so it could circumvent Apple’s Gatekeeper protections. As many as 6500 people may have been infected by KeRanger before Apple revoked the relevant certificate and updated macOS’s XProtect anti-malware technology to block it.

*In 2017, researchers discovered another piece of ransomware, called Patcher, which purported to help users download pirated copies of Adobe Premiere and Microsoft Office 2016. According to its Bitcoin wallet, no one had paid the ransom, which was good, since it had no way of decrypting the files it had encrypted.

Realistically, don’t worry too much. But it’s likely that malware authors will unleash additional Mac ransomware packages in the future, so we encourage you to be aware, informed, and prepared.

First, let’s explain a few key terms and technologies. Apple’s Gatekeeper technology protects your Mac from malware by letting you launch only apps downloaded from the Mac App Store, or those that are signed by developers who have a Developer ID from Apple. Since malware won’t come from legitimate developers (and Apple can revoke stolen signatures), Gatekeeper protects you from most malware. However, you can override Gatekeeper’s protections to run an unsigned app. Do this only for apps from trusted developers. Even if you never override Gatekeeper, be careful what you download.



Apple's XProtect technology takes a more focused approach, checking every new app against a relatively short list of known malware and preventing apps on that list from launching. Make sure to leave the "Install system data files and security updates" checkbox selected in System Preferences > App Store. That ensures that you'll get XProtect updates. Similarly, install macOS updates and security updates soon after they're released to make sure you're protected against newly discovered vulnerabilities that malware could exploit.

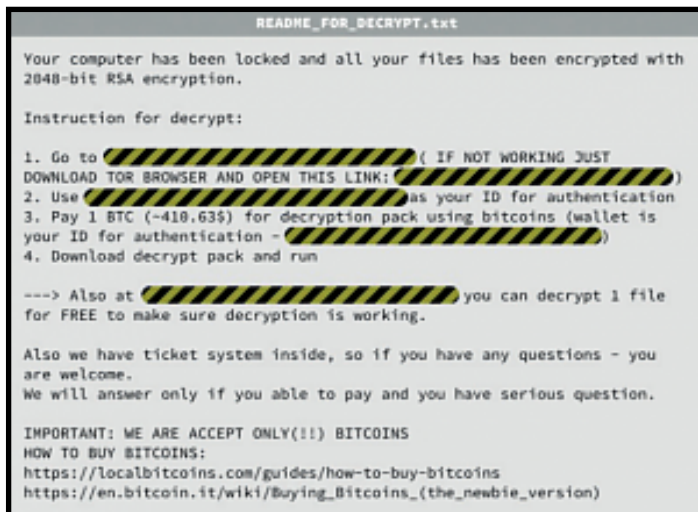
Although regular backups with Time Machine are usually helpful, KeRanger tried to encrypt Time Machine backup files to prevent users from recovering their data that way. Similarly, a bootable duplicate updated automatically by SuperDuper or Carbon Copy Cloner could end up replacing good files with encrypted ones from a ransomware-infected Mac, or a future piece of ransomware could try to encrypt other mounted backup disks as well.

The best protection against ransomware is a versioned backup made to a destination that can be accessed only through the backup app, such as an Internet backup service like Backblaze (home and business) or CrashPlan (business only). The beauty of

such backups is that you can restore files from before the ransomware encrypted them. Of course, that assumes you've been backing up all along.

If you ever are infected with ransomware, don't panic, and don't pay the ransom right away. Contact us so we can help you work through your options, which might entail restoring from a backup or bringing files back from older cloud storage versions. There are even decryptors for some Windows ransomware packages, and such utilities might appear for hypothetical Mac ransomware as well.

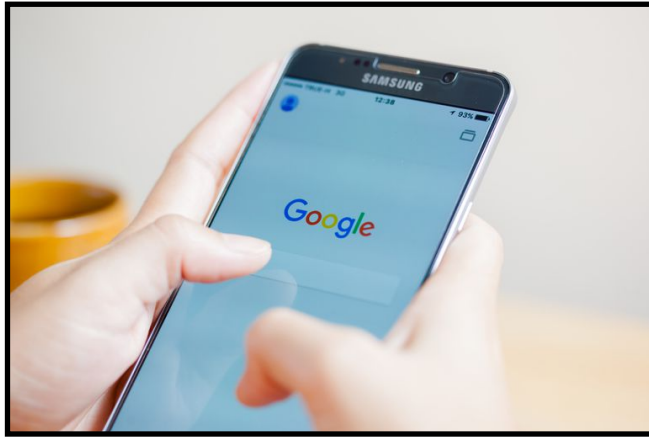
To reiterate, there's no reason to worry too much about ransomware on the Mac, but letting Apple's XProtect keep itself up to date, staying current with macOS updates, and using an Internet backup service will likely protect you from what may come.



Marziah Karch posted the following article to lifewire.com on November 27, 2018. tinyurl.com/y6lx4lef. © About.Inc. She is a former writer for Lifewire, where she wrote on a variety of technology topics. Karch is also the author of several technology books and manuals

How to Explore What Google Knows About You

Find out what Google knows and how to protect your privacy



By Marziah Karch

Like or not, Google knows a lot about you. Let's look at where you can find out what Google knows and some reasons why it may be useful to have Google gathering that information.

Before you begin, it may be helpful to look at the [Google Safety Center](#) to understand how you can control some of that data. Google knows users are wary of trusting them with their private data, so Google has gone out of the way to make the case that it's up to the task. And don't worry, the statements are interactive and user-friendly.

How Is What Google Knows About You Useful?

If you've ever found a great site, video, or image and forgotten where you found it, you can go right back and revisit it, complete with a link. In the case of Google Maps, you can find out where you asked Google for directions (such as from your Android phone) so you can find those places again.

You can even find information inside websites that already require logins, such as pages you may have visited on Facebook.

You can also search against your own history. This is great to drill down results if you remember part of a name or you can find the date you looked something up or visited a location.

This is powerful information, so be sure you secure your Google account [with two-step authentication](#). That's a good idea whether or not you're comfortable with Google's data collection.

Google Shows You What Is Tracked in My Activity

First, you can visit your own history by going to [My Activity](#).

This is a secure area that only you can view, and from here you can see:

YouTube (the videos you've watched while logged into your account).

Chrome activity (if you use the Chrome browser while logged into your profile and not in incognito mode).

Maps (any Google Maps searches while logged in on any device).

Google Searches (both from Chrome or from your Android).

Image Search (same).

Android (which apps you've opened on your Android).

Items are clustered into groups, and you can delete individual or groups of items from your history if you choose.

Google Also Tracks Your YouTube History

Your YouTube activity (YouTube is owned by Google) is divided into two sections. First, there are the YouTube videos you've watched (found on the My Activity page) and then there is your [YouTube search history](#), which is still found on YouTube. In the case of watching YouTube videos, you may not have actually visited YouTube's site to do that. For example, a lot of news sites embed YouTube content directly into articles.

More Activity Reveals Additional Information Google Tracks

Within your Google My Activity information, you can tab to the different areas, but you can also change your view (and bulk delete) by going to the hamburger menu on the upper left corner (that's the three horizontal lines). If you select [More Activity](#), you'll find additional options, such as the location timeline, device history, sound search history, and Google Ads settings.

Even Your Google Maps Timeline Can Be Useful

Your [location history](#), or your Google Maps timeline view, shows you every place you've visited while using an Android with location history on. Remember, this is a privacy-locked page. You should see a lock symbol on every page in this area. If you're [sharing your map location with others](#), they still cannot see this page.

As a personal travel map, this is amazing. You can also explore interactive tabs to see the places you've most frequently visited or the timeline of trips you took. You can also see at a glance if you've specified a work or home location on Google Maps.

If you take a vacation, this is a great way to revisit your trip and see what you explored. You could also use this to estimate your mileage for business reimbursements.

Managing Your Google Play Ad Preferences

If you ever wonder why Google makes those strange choices about what ads to serve you, you can check your [ad preferences](#)

to see what assumptions Google is making about you and what you like or do not like. For example, until I tweaked it, my ad preferences said I liked country music. This is incorrect.

You can also turn targeted ads off if you prefer to just see generic Google ads.

Note: Google doesn't control *all* the internet ads. You will still get some targeted ads even with this toggled off.

What Google Knows About Your Voice and Audio Activities

Beyond your My Activity page, you also have your [Activity Controls](#) page. That's going to show you very similar information from the My Activities page we've been exploring, with one very interesting exception: [Google My Activity: Voice and Audio](#) page.

From here, you can see your Google Assistant voice searches. You see them written out in text form, but you can also play the audio back. Google Assistant typically activates when you say OK Google or tap the microphone icon on your Android or Chrome browser. If you were worried that your devices were secretly spying on you, this may reassure you or confirm your suspicions.

If you click Details you can also see why Google was activated and recorded this snippet. Typically it is *by hot word* meaning you said, OK Google.

You can also see how accurate Google is in interpreting your requests, whether or not you have a lot of false alarms where the voice search is activating without any search requests, or maybe just how much more tired you sound when you ask Google for the weather in the morning vs. when you ask for directions to a restaurant.

If you share your device with someone else (a tablet or laptop, for example) but you were logged into your account, you may also see someone else's voice searches here. Hopefully, they're family. Consider using two accounts and logging out between

sessions if this bothers you. If the idea of having Google recordings at all bothers you, you can also delete them from this screen.

Google uses this history to make Google Assistant better recognize your voice, both to find things and to avoid having voice search pop up when you didn't ask for it.

Tip: Just because Google has this history doesn't mean you have to leave it. You can [erase all or individual Google Assistant voice recordings](#).

Download a Copy of Your Data with Google Takeout

If you ever want to download your data, you can download just about everything Google saves, including from some long-gone products by going to [Google Takeout](#). Downloading a copy of your data does not mean you have to delete it from Google, but please remember to store what you download securely, as it's no longer protected by Google's privacy settings once you download it.

Google Still Doesn't Care About Your Privacy

By Joseph Turow © Fortune Media June 28, 2017

The other morning I looked at the pudgy personal assistant that sits on my kitchen counter and asked, "Hey, Google: Please read me the [Google](#) privacy policy." It responded, "Sorry; I don't understand."

It may sound as if the Google gnome made a mistake. But I suspect the truth is that Google doesn't want us consumers to know how much information it is constantly collecting.

Take the company's decision this week to stop personalizing Gmail ads based on its scanning of words in email messages. It may sound like substantial change, but it's really mostly a smokescreen. First, it's important to note that it came about after [businesses voiced concern](#) that Google would sweep up

sensitive information from their correspondences—not because of consumer outcry.

Second, ads will remain, but "[in line with how we personalize ads for other Google products](#)." That's a cover-up for saying that heavy-duty data gathering will continue on all the Google products you use that are not Gmail. Google Analytics, for example, is one of the ways Google follows virtually everyone everywhere. Google's apps allow it to learn your phone number and physical location, and your searches help it to create sophisticated data profiles about you. This then helps marketers target you with specific advertisements.

All this and much more takes place without your knowledge; some of it isn't even in the privacy policy. But let's say that unlike Google Home, you actually do read Google's privacy policy—which research shows [most of us don't](#). At the very start, the marketing giant hits you with the deal: By giving up information you allow the company "to show you more relevant search results and ads, to help you connect with people or to make sharing with others [quicker and easier](#)."

Yet it's not really a fair trade. [Most people](#) have [little understanding](#) of what they're actually agreeing to [give up](#). A 2015 national survey my colleagues and I conducted showed that Americans [don't buy the tradeoff idea](#). It also revealed that 58% of Americans are resigned to what's taking place. They don't want companies like Google to have control over their data, but they've come to believe they don't have a choice.

The implications of this are profound. Google's activities may affect the ads you get, the deals you are exposed to, the purchases you make, the discounts you receive, the entertainment and news you see, and your very sense that surveillance is natural. Plus, Google is only one of a gaggle of large companies involved in these sorts of activities—all the while seemingly hoping we don't understand and are too resigned to push back.



AI And Humans Electric Touch

By Kathy Garges

The human sense of touch is essential for survival. It is also narrow in scope compared with the other senses. So most of the time we use it in combination with vision. This is illustrated by the classic story of the blind people and the elephant. One blind person feels the elephant's trunk and says an elephant is a thick snake. Another feels the ivory tusk and says an elephant is a spear. Another feels the elephant's huge ear and classifies it as a fan.

The Halloween touch-and-feel game takes advantage of the limited information conveyed by the sense of touch alone. Partygoers stick their hands into a box, feeling creepy objects that the Halloween theme suggests are eyeballs, giant insect legs, and slimy guts. Then they try to guess the true identity of these objects, perhaps peeled grapes, pipe cleaners, and overcooked linguini.

The game also demonstrates how often we use our imaginations to understand our touch perceptions, mentally visualizing objects that we are touching. We also often make useful estimates about how something we are seeing would feel – a rock, we know, will be hard; a pillow will feel soft. Recent research suggests that humans typically integrate visual and touch information in a systematic way that can be modeled mathematically as a “maximal-likelihood” estimation.

Scientists at the University of California, Berkeley have designed and tested a robot system that can match touch sensory information with visual images. When the robot grasps an object, gel sensors on its “fingers” are deformed. This information is coded as a visual data map that looks like a colorful, blurry graph, and then the robot compares this with a regular camera image of the object it previously made. The robot is trained on a large set of data with machine learning artificial intelligence. As the researchers note, prior to their experiment it was not clear that the sense of touch alone, in humans or robots, without accompanying visual information, provides enough data to later identify the same object by vision alone on a reliable basis.

This touch system has several advantages. The robot can grasp an object in any random way. By translating touch sensory information to a visual image, it uses visual machine learning systems that have become sophisticated in recent years. The system does not rely on depth perception and requires little human supervision or interaction. The data from touch training and trials creates a large database of negative identifications as well as positive ones for future use; once an object is correctly identified, other object identifications are ruled out.

One disadvantage is that the research team has tested the system against human touch perception only by asking human research subjects to compare the gel sensor images and camera images. Although the system is better at identifying objects than humans tested using the gel sensor images, it seems unlikely that it is equal to human perception based on actual human touch. That comparison will need to be made in future experiments.

Engineers at Stanford University have approached AI robot touch from a different angle. They are developing an e-skin, an electronic skin that can sense pressure from handling an object in a way similar to human skin.

The e-skin has two layers with an insulation layer in between. The two layers are necessary to allow the skin to have opposite positive and negative electric charges. This allows transmission of electric signals in the same way the human nervous system works. No information can be transmitted in a uniform environment.

The bottom layer has a series of bumps on its top, in between the charged layers, which works to measure the intensity and direction of pressure on the skin at the same time. Human skin works the same way, with a bumpy sublayer called a spinosum. If the robot holds a rock with a strong grip, for example, the bumps will be deformed more deeply and in the opposite direction of greatest pressure (the “shear force”).

The team has tested the design on a glove placed on a robot hand. The objective is to be able to program robots to handle objects in a routine way – for example, packing fresh eggs in a box. The long-term goal is to have the robot handle objects without pre-programming, perhaps using an identification system similar to the one being developed at Berkeley.

Since the human sense of touch relies on the electrical transmissions of the biological nervous system, and robots and AI also operate by using electricity and electronics, one might assume that it would be simple to design robot hardware and artificial intelligence software to mimic human touch. But inventors have only begun the process of designing simple AI robotic touch functions.

To approach the level of human touch function, scientists will have to combine robot identification of objects by touch, sensitive object manipulation, and real-time feedback, all in a broad-range environments. For now, humans have the monopoly on applications that require a highly-developed, sensitive sense

of touch, such as dusting fragile knickknacks, pushing children on swings, and autonomously performing brain surgery.

Sources and additional information:

Wikipedia, “Blind Men and an Elephant,” tinyurl.com/ctxx6lr

Janece Bass, “Halloween Touch & Feel Ideas,” eHow, tinyurl.com/yyshbaht

Ernst, M. O. and M. S. Banks, “Humans Integrate Visual and Haptic Information in a Statistically Optimal Fashion,” *Nature*, January 24, 2002, tinyurl.com/y4jjwb3p

Kyle Wiggers,” AI robotic perception system can recognize objects by touching them,” *VentureBeat*, March 12, 2019, tinyurl.com/y3zgdh86

Justin Lin, Roberto Calandra, and Sergey Levine, “Learning to Identify Object Instances by Touch: Tactile Recognition via Multimodal Matching,” March 8, 2019, tinyurl.com/y2hv25tr

Clementine M. Boutry, Marc Negre, Mikael Jorda, Orestis Vardoulis, Alex Chortos, Oussama Khatib and Zhenan Bao, “A hierarchically patterned, bioinspired e-skin able to detect the direction of applied pressure for robotics,” *Science Robotics*, November 21, 2018, tinyurl.com/y3x3ra8u

“A Hierarchically Patterned, Bioinspired e-skin Able to Detect the Direction of Applied Pressure for Robotics,” *Penelitian*, November 22, 2018, tinyurl.com/y6jaeqjj
