

Bits of Bytes

Newsletter of the Pikes Peak Computer Application Society, Colorado Springs, CO

Volume XL

January 2020

Issue 1



The Prez Sez

by John Pearce,
President,
P*PCompAS

Welcome to the 2020 edition of P*PCompAS. Many thanks to immediate past President Joe Nuvolini for guiding the group this past year. And many thanks, as well, to the other elected officers and volunteers for their efforts in 2019. I also need to thank our anonymous benefactor for paying everyone's dues for this year.

Vice President Cary Quinn is busy organizing presentations for this year. If you have a topic that is near and dear to you, like Greg Lenihan's December presentation on Reddit, please talk with Cary. The January presentation is an update on Acronis Trueimage 2020 and alternative backup solutions presented by Cary Quinn. See you at the meeting, January 4th. ☺



Meeting Minutes

by Cary Quinn,
former
PPCompAS
Secretary

President Joe Nuvolini started the 7 December 2019 meeting at 9:00 am. He mentioned this would be the last month for Starbucks coffee, because to get the club coffee he felt obligated to make a purchase. Minutes from the November meeting were approved.

Next P*PCompAS meeting: Saturday, 4 January 2020

Member Cary Quinn will report on the update to Acronis True Image 2020 and alternative backup solutions.

OFFICER REPORTS

Vice-President Jeff Towne had nothing to report.

Treasurer Chuck Harris said the credit union made a deposit of \$20 into our account. We have \$3605.55 in our savings account and \$107.30 in checking (after Joe paid \$50 for our APCUG renewal).

Membership Chair Ann Titus said she heard from a member that the club roster disappeared from their computer and asked if something like this happened to anyone else.

Newsletter Editor Greg Lenihan announced the next deadline as 21 December.

Librarian Paul Godfrey was not present for a report.

BOD Chairman Joe Nuvolini had nothing to report.

NEW BUSINESS

Election of new officers were voted in by acclamation.

President: John Pearce
VP/Program Chair: Cary Quinn
Secretary: Phyllis Butler
Treasurer: Chuck Harris
BOD member: Jeff Towne

OLD BUSINESS

It was asked if we had made a gift for the church. President Nuvolini asked that we table the discussion for a month so he could call Natalie to see if the church needed anything in particular.

The Volunteers Luncheon will be held on January 25th at Old Chicago on Austin Bluffs

and Academy. Thanks to Ilene Steinkruger for making the arrangements. If you bring a guest, you need to pay the treasurer separately.

The Social Breakfast will be on 21 December.

The April meeting will be on March 28, 2020.

ANNOUNCEMENTS

Editor Greg Lenihan received a participation certificate from the APCUG for the newsletter contest.

Membership Chair Ann Titus offered a shout-out to our anonymous benefactor for paying the 2020 dues for everyone.

Incoming VP Cary Quinn announced he will present the program in January on updates to Acronis True Image 2020, and alternative backup solutions.

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Why Do Spam and Malware Exist?

By Bob Rankin, <http://askbobrankin.com>, published through the APCUG

Computer viruses are everywhere. Spam is abounding. Ransomware, identity theft, denial of service attacks and other cybercrimes are commonplace. Who does this stuff, and what's wrong with them? Let's take a look at what motivates the miscreants who menace millions on the Internet...

Hackers, Spammers and Cybercriminals

Have you ever wondered why there's so much spam, so many computer viruses, rampant identity theft, and other perils of using the Internet? Perhaps it boils down to the ancient philosophical question, "Why is there evil in the world?"

Greed is the most common motivation for cybercrimes, as it is in the real world. There are big bucks to be made in malware that steals credit card, bank account, and identity details, corporate secrets, and other valuable data. The gullible will readily give money in exchange for counterfeit goods

or just the false promise of goods. Some people will pay good money to damage the reputation of business competitors. Ransomware affects the entire spectrum of the online world, from large companies to home users. Most of the online damage is done for money.

Hatred is another ugly motivator. Often, it is disguised as heroism, a noble fight against a perceived evil enemy, which may be an individual, organization, corporation or government. But it's hatred, none the less. Examples of this include those who spread disinformation or maliciously deface the websites of organizations with whom they disagree. Or it could be a "hactivist" group that perpetrates denial of service attacks against their philosophical enemies.

Egotism is a third motivation. The desire to show the world how good your skills are, to do what others have failed to do, to make yourself look smart by making others look stupid, are

Continued on page 5

Meeting Minutes (Cont. from pg 1)

PRESENTATION

Greg Lenihan gave a presentation on Reddit: The Front Page of the Internet. ☺

Charley Hupp, RIP

At the December breakfast, Ilene Steinkruger was asking if anyone had heard from former member Charley Hupp who was last heard from in Kingman, Arizona.

Charley and his wife, Toni, a former P*PCompAS president, were quite active in the communities where they lived, although Toni died some years ago.

Thanks to the Internet, Toni Logan was able to find the answer, but unfortunately in the form of an obituary. Charley passed away on September 19, 2016. You can find more information on Charley at: <https://lietz-frazefuneralhome.com/tribute/details/5231/Charles-Hupp/obituary.html> ☺

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P*PCompAS welcomes any comments, letters, or articles from members and non-members alike. Please send any articles to the editor (see last page for address). The editor reserves the right to reject, postpone, or edit for space, style, grammar, and clarity of any material submitted.

Thunderbolt 3 vs. USB-C: What's the Difference

By Ian Paul, reprinted with permission from [HowToGeek.com](https://www.howtogeek.com)

Original article at: <https://www.howtogeek.com/449991/thunderbolt-3-vs.-usb-c-whats-the-difference/>

Newer laptops often come loaded with a port that accepts a reversible plug and supports very fast transfer speeds. Do you know what it is? If you guessed the Thunderbolt 3 or USB 3.1 port, you're right, and therein lies the problem.

Both data transfer protocols use the same connector, but their potential uses vary. It can be challenging to understand the differences between the two ports and whether your laptop is packing one or the other.

Once you understand the difference, however, it's easy to figure out which port is which and how to use them.

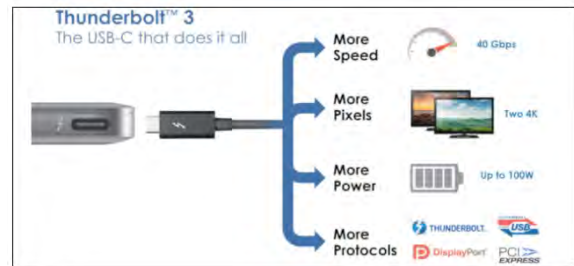
What Is Thunderbolt 3?

Thunderbolt 3 is a proprietary (for now) data and video transfer protocol developed by Intel. To use it, PC makers need to obtain certification from Intel. Not every company wants to do that.

That's too bad because Thunderbolt 3 is incredibly fast. It's much faster than current maximum speeds for USB. The current top version of USB is USB 3.1 Gen 2, which is capable of speeds up to 10 Gigabits per second (Gbps). That is only one-quarter of the maximum speed of Thunderbolt 3, which has a maximum capability of 40 Gbps.

What's the Difference Between Thunderbolt and USB 3.1?

Before we get to what Thunderbolt 3 can do compared to USB 3.1, let's talk about what it looks



like. Both Thunderbolt 3 and USB 3.1 use the USB Type-C connector and port.

To tell the difference, Thunderbolt 3 ports, cables, and gear are typically labeled with an arrow-shaped like a lightning bolt. USB ports can also have lightning bolts, but these signify that the USB port is capable of charging small items such as smartphones even when the laptop is turned off. If it's Thunderbolt 3 the lightning bolt appears as you see above.

Now, here's the critical point about Thunderbolt 3 and USB: A Thunderbolt 3 port can also function as a USB port, but a USB port cannot work as Thunderbolt 3.

Thunderbolt 3 has a "fallback" option, where if it cannot communicate with a connected device as a Thunderbolt unit, then it tries the USB protocol. When using USB, the Thunderbolt 3 port is limited to the USB speeds of the connected device, not the blazing fast speeds of Thunderbolt.

Continued on page 4



Our digerati, who bring so much joy to the world, met at the Golden Corral in December to celebrate another year of our group's existence.

Thunderbolt/USB-C (Cont. from page 3)

Thunderbolt speeds don't just mean you can transfer a two-hour 4K video to an external drive that much faster. You can also connect up to two 4K displays at 60 Hz over [DisplayPort](#). USB 3.1 Gen 2 supports video as well in what's called "Alt Mode" where you can connect directly to a DisplayPort monitor—HDMI is also possible. However, Alt Mode is that it's an optional feature that OEMs have to enable. Thunderbolt 3, by comparison, supports video out of the box.

With Thunderbolt 3, you can also daisy chain up to six additional devices to your source machine. This means you plug device A into the Thunderbolt 3 port on your laptop, and then you connect device A to device B and so on. All devices have to be using Thunderbolt 3. If you use a USB 3.1 device as Device C, for example, then the daisy chain stops at that point.

Also, keep in mind that your laptop will need the computing resources to deal with all those connected Thunderbolt devices. Daisy chaining is typically used to connect multiple displays, but it could also be used to chain up several monitors and external hard drives off of a single port.

[Samsung supports daisy-chaining for monitors with USB 3.1](#), but generally, this feature is not as well supported as it is with Thunderbolt 3.

Finally, Thunderbolt 3 can support [PCIe](#) devices such as external graphics card docks, while USB 3.1 does not. PCIe support allows gamers to turn a laptop without much in the way of graphics support into a pretty good gaming machine. The trick is that computer makers have to support this feature in their laptops as support for PCIe graphics cards is not automatic.

Which Computers Include Thunderbolt 3?



The easiest way to make sure you get Thunderbolt 3 is to buy a Mac. Apple puts the port on [all its current machines](#), including its laptops, desktops, and all-in-ones.

On the Windows side, if you want a Thunderbolt 3 port out of the box, then you're looking for a laptop. Some pre-built desktops support Thunderbolt 3, but typically you need to buy an expansion card to add Thunderbolt 3 to a Windows desktop.

Laptops are a different story with select (and often pricier) models carrying Thunderbolt 3 ports. Some examples include the [Alienware M17](#), [Asus ZenBook S UX391](#), and the [Lenovo ThinkPad X390 Yoga](#).

What's the Future for Thunderbolt?

It's not clear if Intel plans on updating Thunderbolt to version 4, but the future for Thunderbolt 3 is very clear. [Intel's Thunderbolt protocol is merging into USB 4](#). The specification for USB 4 was announced in the summer of 2019, with USB 4 based products rolling out in 2020 or 2021.

USB 4 will have the same maximum transfer speed of 40 Gbps as Thunderbolt 3, as well as the same ability to display video and daisy chain devices. Once USB 4 devices start rolling out, we expect that Thunderbolt 3 will eventually disappear.

Companies can create devices that are just as capable as Thunderbolt 3 without the licensing issues from Intel. Supporting Thunderbolt 3 is an option with USB 4, which is great news for older devices, but there's little reason to create new Thunderbolt 3 devices when USB 4 is available.

Ultimately, we might see a world where only USB 4 with its Type C connector reigns supreme, and pretty much everything can just connect through that port, including storage devices, monitors, security keys, and more.

Of course, that future will probably take years to arrive. Computer makers will likely continue to include standard USB ports on laptops to support legacy equipment of both home and enterprise users without the need for adapters.

With that USB 4-tinged future so far away, it still pays to know the difference between a USB Type C port and Thunderbolt 3. ☺

Malware (Cont. from page 2)

all very satisfying to insecure egos. Some hacking groups have done this by breaking into websites, stealing embarrassing or confidential information, and publishing it online.

Grab That Cash With Both Hands and Make a Stash...

How do cybercrooks make money? The answer has changed over time. But mostly, it's All About the Money. (Hat tips to Pink Floyd and Travis Tritt.)

Sanford Wallace was the original self-styled "Spam King." In the 1990's, he had an ostensibly legitimate advertising business, sending out millions of unsolicited emails that advertise products or services for sale. He got paid a pittance for each email he sent, and a commission for each sale consummated in response to an email. According to "Spamford," he made millions of dollars providing a perfectly legal service to merchants and consumers.

But eventually, spam stopped paying so well. Spam filters improved, and consumers became more wary of unsolicited offers. Spammers increasingly switched from selling things in annoying but legitimate ways to deliberately trying to defraud people. (More on the fate of Spamford below.)

That accounts for the rapid rise of ransomware and high-profile data breaches. By exploiting human error and security vulnerabilities, even low-skilled hackers can lock up the files of a single user or an entire company, and demand that a ransom be paid to restore access. Massive data breaches make the news regularly, compromising millions of usernames, passwords, credit cards, social security numbers, and other private information. These valuable troves of data are sold in the dark corners of the Internet, and the information is used to perpetrate fraud and identity theft.

Then there are the low-volume, high-value cybercrooks. They include so-called Nigerian "419 scammers" who find affluent and gullible victims to milk for thousands of dollars. I wrote about the [419 Scam](#) back in 2006, and it's still going strong today. They also include online bank robbers who hack into financial institutions and steal millions at once, often just skimming a few unnoticed cents off of each customer's account.

One of the boldest cases involved the 2013 [theft of over \\$45 million in 27 countries](#) over the course of a few hours. In that case, hackers broke into the networks of several banks and swiped PINs associated with the banks' own accounts, not those of customers. Debit cards were forged that could use the stolen PINs to withdraw cash from ATMs. Hundreds of co-conspirators drained ATMs dry at approximately the same time, delivering the ringleaders' share of the cash to their bosses and pocketing their wages.

Cybercrime and (occasionally) Punishment

Relatively few online crooks are caught and punished. It's very difficult to investigate and prove such crimes because the criminal activity is hard to trace and often spans international borders. The few successful prosecutions we read about tend to be very large cases that are worth the trouble and expense to prosecutors.

"Spamford" Wallace continued with a string of fraudulent enterprises for a dozen years, was eventually fined several hundred thousand dollars, and sentenced to 20 months in prison. He was released in May 2018. Oleg Nikolaenko was a Russian "spam king" who allegedly ran a botnet that churned out over 10 billion spam emails every day, an estimated one-third of all spam in the late 2000s. He served three years in prison on charges of violating the U.S. CAN-SPAM Act. The FBI is still busy putting online crooks in custody. See the [FBI Cyber Crime news and press releases](#).

There is no end in sight to the war on cybercrime, and sadly, most goes unpunished. The anonymous nature of digital currencies like Bitcoin makes it difficult to "follow the money." The best that YOU can do is try to avoid becoming a victim. Keep your malware and anti-spam defenses up. Be wary of phishing attempts. [Monitor your credit reports](#) and bank accounts for unauthorized transactions. ☺



Fixes for Windows 10 Problems Driving You Crazy

by Kim Komando at Komando.com (tip from 11/30/19)

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Nearly a billion computers around the world run Windows 10. Critics have praised it and some users love it while others hate it. Some estimate Windows 10 dominates nearly 40 percent of the desktop OS market, handily surpassing the popularity of Windows 7. Speaking of, are you still using Windows 7? Microsoft is ending support for the 10-year-old operating system in January.

Using the slogan “upgrade your world,” Microsoft has described Windows 10 as the “final” version. Instead of replacing the operating system every few years, Windows 10 has offered free updates — but it isn’t perfect. Here’s how to improve your Windows 10 experience.

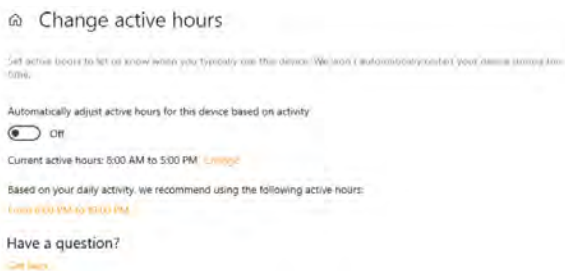
1. Take control

Windows is good at installing updates. This process is straightforward and automatic. The bad news is you usually have to reboot your computer, and you have no idea when a new update will suddenly start downloading.

Be careful. Did you get an email reminding you to update Windows? It’s a scam.

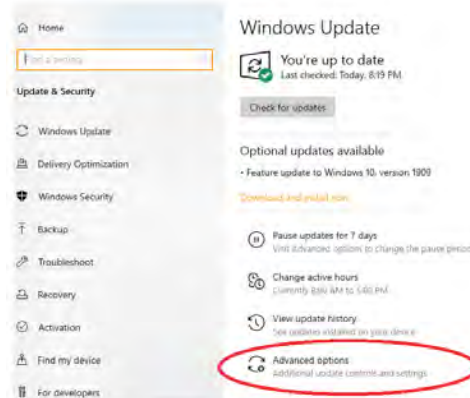
To prevent unscheduled interruptions, go to your **settings menu**, and open **Update & Security**. Here, you can check for updates and stay up to date on your time, or you can set time parameters. This forces your computer to stop itself from updating during “active hours.”

To set time parameters, go to **Settings, Update & Security**, tap **Change active hours** and either choose to have your computer automatically adjust the active hours of your device based on your activity or manually choose your active hours by clicking **Change**.



You can also pause updates altogether. This could impact your security, so you don’t want to wait too long. But if you want a short reprieve,

go to your **Settings** menu, choose **Update & Security** and find **Advanced Options**.



From there, you can use the drop-down menu to adjust the **Pause updates** option up to 35 days.

2. Limit Cortana

Like other virtual assistants, Cortana is always listening for the wake command. Unfortunately, a flaw in the programming may allow hackers to break into a Windows 10 computer using Cortana’s voice commands, even when it’s locked.

Anyone can issue voice commands to Cortana and force it into downloading malicious malware, but you can stop Cortana from putting your data at risk by removing it from your lock screen and teach it to respond to your voice alone.

- Go to **Settings**, then choose **Cortana**.
- Under **Hey Cortana**, turn the **Let Cortana Respond to “Hey Cortana”** switch to on.
- Next, click the link labeled **Learn How I Say “Hey Cortana.”** This allows you to go through the voice recognition training.
- From here, click the **Cortana start button** and repeat the six provided phrases. This will teach Cortana your voice.
- After the training is complete, you can go back to **Cortana** in the **Settings** menu and enable the **Try to Respond Only to Me** option.

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Fixes For Windows (Cont. from page 6)

3. Change search from Bing to Google (or the search engine of your choice)

Bing is set as the default search engine for Microsoft Edge, but that may not sit well with you

Here's how you can change your default browser. We'll use Google as an example:

- Start by searching **Google.com** in Microsoft Edge.
- Click **Settings and more...**, then go to **Settings**.
- Scroll to the bottom and choose **Advanced**.
- Go down the list until you find the **Address bar search** option. Click it and select **Change search provider**.
- Click on **Google** from the list that generates and choose **Set as default**.

4. Use a PIN

You can lock your computer with a long, convoluted password, or you can set it to a simple PIN. Your PIN is only four digits long and doesn't require any complicated parameters such as special characters or mixed case letters. It's less secure, of course, but a PIN makes unlocking faster and easier.

Setting up your PIN is pretty simple. Just do the following:

- Go to **Settings** then **Accounts**.
- Choose **Sign-in options** and click **Windows Hello PIN**, then **Add**.
- Click **Next** and confirm your current password to reach the **Set up a PIN** window.
- Enter any 4-digit PIN you want and click **OK**, then restart your computer.

5. Resize your Start menu like a pro

The start menu acts as the central hub for everything you do on Windows 10. Because of that, its default appearance can seem a little bland. Users have complained about the size of the start menu, never realizing this is customizable.

To customize the size of your menu, do the "Windows drag." Simply click on the Windows icon and move your cursor to the top-right edge of the menu until it turns into a two-sided arrow. Click, hold and drag to resize the menu to your preferred size, then let go.

You can easily resize your desktop icons, too. [Tap or click here for a step-by-step guide](#).

6. Play DVDs the easy and free way

VLC media player

VLC is a free and open source cross-platform multimedia player and framework that plays most multimedia files as well as DVDs, Audio CDs, VCDs, and various streaming protocols.

Download VLC

Version 3.0.8 • Windows 64bit • 40 MB
70,354,743 downloads so far



By now, you've probably noticed that Windows 10 won't play DVDs, and Windows Media Player has been removed. While Microsoft offers an official DVD playback option, this feature costs \$15 and seems to have persistent problems.

Fortunately, there's a better option available that can have you watching DVDs quickly and free of charge: VLC video player. [Tap or click here to learn how to download and install it](#). Just be sure to download the desktop app instead of the Windows Store version, which won't support DVDs or Blu-Ray discs.

7. Silence all the annoying announcements

Depending on your settings, Windows may start announcing everything you touch with an actual voice. Windows will also record and recite any text you type into the Cortana search box, which may feel excessive.

If this starts happening out of the blue, you may have inadvertently turned on the Narrator feature, which is used by visually impaired users to better navigate the system without having to type.

Here's how to turn Narrator off:

- Go to **Settings** and choose **Ease of Access**.
- On the left menu, go to **Narrator**.
- On the right menu, look for **Narrator** and toggle it **off**, then clear **Allow the shortcut key to start Narrator** box to disable the shortcut and keep from accidentally enabling it again.

Hopefully, these tips will come in handy the next time you feel like customizing your Windows 10 experience. ☺

Is Windows 10 Still Free in 2020?

By Leo Notenboom, <https://newsletter.askleo.com>; published under the Creative Commons License

Officially Windows 10 is no longer free, but there remains at least one unofficial scenario that may allow you to upgrade for free.

Officially, no. Anecdotally ... maybe.

There are reports of being able to upgrade existing Windows 7 and Windows 8 installations without needing to purchase a new Windows 10 license. With Windows 7 end of support impending, it might be time to consider trying it.

I'll walk you through the steps, in case they'll work for you.

Back up

Even if this wasn't an unofficial scenario, I'd strongly recommend you take a complete [image backup](#) of your computer before starting. That way, if anything goes wrong, if the activation doesn't take, or if you just don't like the results, you can easily and completely revert to where you were when you started.

Seriously. Back up first.

Prerequisites

In order for this scenario to work, you must have a working, installed, activated copy of Windows 7, 8, or 8.1.

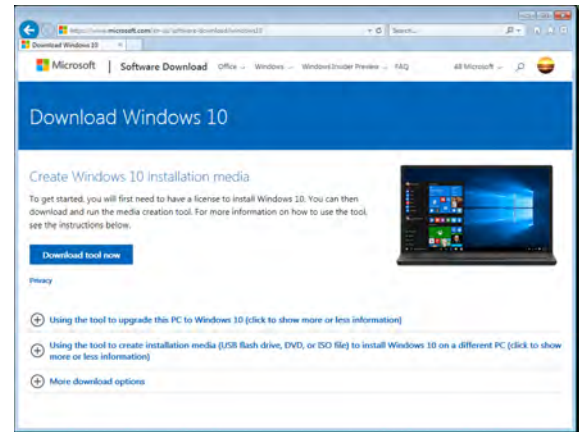
In addition, this process reportedly only works for the Home and Pro editions of Windows, and an upgrade (or downgrade) from one to another is not possible. The upgrade will result in the same edition — Home or Pro — you begin with.

Get Windows 10

The anecdotal information reported by several tech news outlets is that downloading Windows 10 and upgrading your Windows 7 or Windows 8 installation in place will result in a properly

activated Windows 10 with a new digital license for that specific machine.

The steps are pretty straightforward.



- Visit the [Windows 10 Download page](#).
- Click on **Download tool now**.
- Run the downloaded Windows 10 setup tool and follow its instructions.
- When prompted, select **Upgrade this PC now**. (You can, if you like, select **Create installation media** if you're downloading on one machine with plans to upgrade a different or multiple machines.)
- Follow the rest of the instructions.

The result, after some time, should be a working and activated Windows 10 installation. That's it.

The future

It's unclear how long this approach will work, or if it even works in all situations. If not, your only recourse would be to revert to your [backup](#) image or purchase a Windows 10 license key. ☺

Computer History

By Leah Clark, Los Angeles Computer Society, CA, www.lacspsc.org, [leahjc \(at\) sbcbglobal.net](mailto:leahjc@sbcbglobal.net)

Recently I was in Washington D.C. While there, I visited the Smithsonian Museum of American History. They had a special exhibit on computer history. There was a sign that read, "Unless you know the road you've come down, you

cannot know where you are going." I wonder where computer and other technologies are going? Here is some information from the exhibit.

Both corporate researchers and self-trained hobbyists played crucial roles in the invention of

the personal computer. Robert Noyce, Gordon Moore, and Andy Grove used their doctoral training in physics and chemistry to found Intel, a leading manufacturer of integrated circuits. Alan Kay and others at Xerox advanced

Continued on page 9

Free Download: Remove PC Bloatware with Malwarebytes AdwCleaner

By Chris Hoffman, reprinted with permission from [HowToGeek.com](https://www.howtogeek.com)

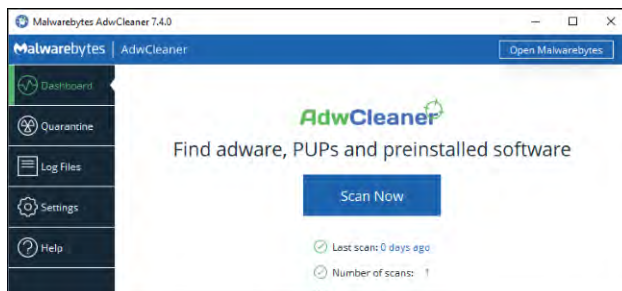
Original article at: <https://www.howtogeek.com/434674/free-download-malwarebytes-adwcleaner-removes-pc-bloatware/>

[AdwCleaner](#) just got better. The latest version of the free Malwarebytes tool can now remove manufacturer-installed [bloatware](#) on Windows PCs. We already loved it for removing [potentially unwanted programs \(PUPs\)](#) like adware and browser hijackers.

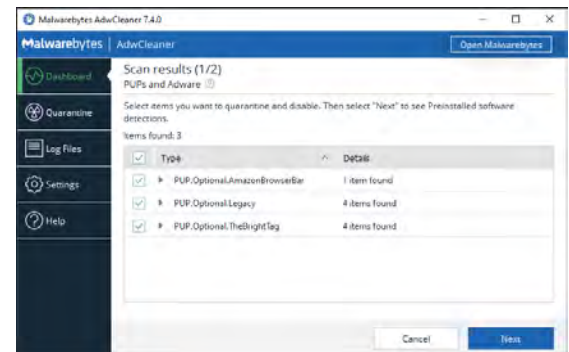
We've loved AdwCleaner for a long time, since before Malwarebytes [acquired](#) it back in 2016. It's a great way to [remove toolbars and other adware from your PC](#). Now, it's even a great way to remove preinstalled junk you probably don't want on a new PC.

We recommend [Malwarebytes](#) as one of the [best antimalware solutions for a Windows PC](#), but this tool is useful even if you already have Malwarebytes installed. It detects additional things that not everyone would want to remove. AdwCleaner is completely free for everyone, too.

To use it, download and run [Malwarebytes AdwCleaner](#) for Windows. The tool will run with no installation required—just click “Scan Now.”



You'll see a list of software you might want to remove. To see more information about a piece of software, right-click it here and select “See Threat Definition” to pull up the definition page on Malwarebytes' website.



As [Bleeping Computer](#) points out, this feature is new in AdwCleaner 7.4, released on July 24, 2019. Before this release, AdwCleaner was focused only on adware and potentially unwanted programs (PUPs), not bloatware.

Finally, if you really want to be rid of bloatware on a new PC, we recommend [Windows 10's Fresh Start feature](#)—it's like [reinstalling Windows 10 from scratch](#), but easier.

RELATED: [What's the Best Antivirus for Windows 10? \(Is Windows Defender Good Enough?\)](#) ☺

Computer History (Cont. from page 8)

computer graphics, networking, and printing. The Homebrew Computer Club in Menlo Park, California, gave hobbyists a place to share knowledge. Homebrew members Steve Jobs and Steve Wozniak founded Apple Computer after demonstrating their Apple I kit at the club.

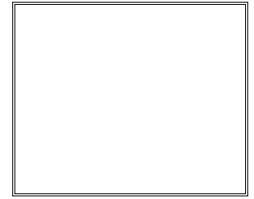
Early computers were big and expensive and required technically trained specialists to run them. Not surprisingly, only universities, big businesses, and government agencies had access to these

behemoths. In the 1970s and '80s, Silicon Valley inventors changed the face of computing with the first “personal computers” small enough to fit on a desk. They created revolutionary features that we take for granted today — a hand-held input device called a mouse, a graphical user interface with overlapping “windows,” and clickable pictures called “icons” — and made computers less expensive and more “user-friendly.”

Douglas Engelbart and his colleagues at the Stanford Research Institute were pioneers in the field

of “human - computer interaction.” In 1964, they built a hand-held pointing device to manipulate images and text on a monitor's screen. The prototype was a simple wooden box with two perpendicular metal wheels, a selection button, and a wire connection to the processor. Engelbart's “mouse” was subsequently refined by researchers at Xerox PARC and made popular with the release of the Apple Macintosh in 1984. Engelbart later noted, “It just looked like a mouse with a tail, and we called it that.” ☺

P*PCompAS Newsletter
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Coming Events:

Next Membership Meeting: 4 Jan, beginning at 9 am (see directions below)

Next Breakfast Meeting: 18 Jan @ 8 am, Golden Corral, 1970 Waynoka Rd.

Newsletter Deadline: 18 Jan

Check out our Web page at: <http://ppcompas.apcug.org>

