

# Bits of Bytes

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

Volume XL

June 2020

Issue 6



## The Prez Sez

by John Pearce,  
President,  
P\*PCompAS

The May general meeting and the Social Breakfast via Zoom worked pretty well, in my opinion. It was nice for Judy Tylour and Jay Melnick from APCUG to join us for the breakfast.

Joe Nuvolini has not yet talked with the church about P\*PCompAS continuing to meet there. It may not be until the social distancing recommendation is dropped. My sense is that there are quite a few members who want to wait until this Fall before resuming physical meetings.

I don't know if Cary Quinn is preparing a presentation for June. At the May meeting he talked about doing the presentation on Project Gutenberg. Otherwise, after the Around the Room portion we will talk about whatever topics are of interest to members, like who has dined out at a restaurant after May 24th and how it felt.

Take good care of yourselves. ☺

## Meeting Minutes

by Greg Lenihan,  
for the P\*PompAS Secretary

President John Pearce began the 2 May 2020 Membership Meeting via Zoom at 9:05 am. The meeting started with 18 participants and grew to 20. A motion and vote to approve the minutes from the March meeting passed.

**Next P\*PCompAS meeting: Saturday, 6 June 2020 (via Zoom)**  
A presentation topic has not been announced.



**A Zoom screen from the 2 May 2020 membership meeting**

## OFFICER REPORTS

Vice-President Cary Quinn said he would try to get in touch with his friend Eli for a meeting soon.

Treasurer Chuck Harris said at the end of April we have \$3223.06 in the club account and \$81.29 in checking.

Membership Chair Ann Titus mentioned we were supposed to have a visitor for the meeting but the person did not appear.

Newsletter Editor Greg Lenihan announced the next deadline as 22 May.

Librarian Paul Godfrey had nothing to report.

## OLD BUSINESS:

The treasurer's financial report will be filed when a paper copy is received.

NEW BUSINESS: None

## ANNOUNCEMENTS

Our next membership meeting will be 6 June via Zoom.

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### P\*PCompAS

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## Battery Backup Power—Here's What You Need to Know

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

A concerned reader asks: 'Can you recommend a backup power supply for computers? During the last storm, my PC crashed and we lost power for several hours. If I had a battery backup, I could have saved the document I was typing, and gotten online to check for email and weather updates. I've read about Uninterruptible Power Supply units - is that what I need?'

### What Kind of Backup Power Do You Need?

A sudden loss of electrical power can cause your computer to shut down or reboot. Of course, you will lose anything you were working on at the time of the power glitch. But power failures can also cause head crashes in hard drives, which can damage a disk and the data on it. To guard against power failures, I do recommend that you get an uninterruptible power supply (UPS) to provide a backup power source for your computer.

A UPS, at its core, is a battery backup power supply. It includes circuitry that instantly switches from line power to battery power in the event of a power outage. The simplest and cheapest type of UPS, called a standby UPS, does nothing more. But power outages are not the only hazards your computer faces.

Fluctuations in line power quality are much more common than blackouts. A voltage spike or its opposite, a voltage drop, can adversely affect your equipment's performance and lifespan. If you live in an area where the lights

sometimes flicker, or the power drops for just a second and comes right back, your computer could be damaged. Protections against these types of electrical power hazards should be part of your UPS.

A line-interactive UPS is also relatively inexpensive; it filters and conditions line power as well as providing battery backup. An on-line UPS provides the highest quality line power and the greatest protection against power outages. Most home computer setups require no more than a standby or line-interactive UPS.



### What Features Do You Need in a UPS?

A UPS may include other features as well. Monitoring ports on a UPS can tell attached equipment to shut down gracefully in the event of a power outage, in case no one is around to shut things down manually. Fax and modem telephone-style outlets may be provided on a UPS to give these devices surge protection. Some unprotected power outlets may exist for printers and other devices that do not need backup battery power but should be protected against power fluctuations.

The capacity of a UPS is measured in volt-amperes (VA). How much capacity you need in a UPS is a function of the power needs of all the components you wish to protect and the amount

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## How to Install Windows 10's May 2020 Update

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

Original article at: <https://www.howtogeek.com/675118/how-to-install-windows-10s-may-2020-update/>

[Windows 10's May 2020 Update](#) is finally here. That doesn't mean you'll get it immediately. It may be weeks (or even months!) before Windows Update even offers the update on your system. Here's how you upgrade right now.

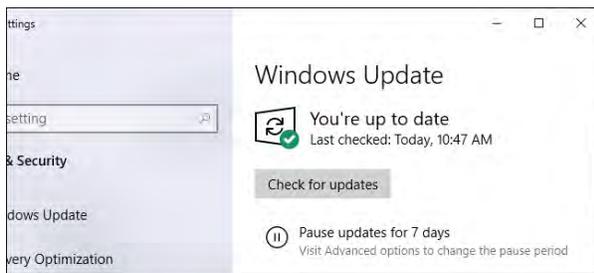
### How to Get the Update from Windows Update

To install this update from Windows Update, head to Settings > Update & Security > Windows Update on your PC. Click "Check for Updates" and you may be offered the update right here, in this window.

Look for the words "Feature update to Windows 10, version 2004" section. Click "Download and install" under it to install the update.



However, there's a good chance you won't see the update in Windows Update. If you just see a "You're up to date" message without any information about the new version of Windows 10, Microsoft hasn't made it available to your PC yet.



**RELATED: [What's New in Windows 10's May 2020 Update, Available Now](#)**

### Why Isn't Windows 10 Offering the Update?

Windows Update slowly rolls out these updates over time. Rather than offering a big update like the May 2020 Update to every Windows 10 PC

in the world at once, Microsoft offers it to a small number of PCs at first.

Microsoft watches how the rollout is going. If there are suddenly blue screens, performance bugs, or other problems, Microsoft can "pause" the rollout and fix the bugs before resuming it. If the update hasn't appeared in Windows Update yet, it's possible Microsoft isn't yet confident that it will work perfectly with your PC.

The rollout will take at least a few weeks. Past updates have taken months to reach everyone. You can just wait and, eventually, Windows Update will offer to install the new software on your PC.

### How to Force an Upgrade to the May 2020 Update

However, if you want the update immediately, you can get it. While Microsoft would prefer to test the update a bit more, it is a stable version of Windows 10 and it should likely work fine on your PC.

To skip the slow rollout process, head to [Microsoft's Download Windows 10](#) web page and click "Update now" to download the Update Assistant. Run the downloaded EXE file.

You'll see a message telling you which version of Windows 10 you're running and informing you that the latest version of Windows is version 2004, which is the May 2020 Update. Click "Update Now" to install it.



Microsoft's tool will automatically download the latest update and install it on your PC. You can keep using your PC while the Update Assistant does its job.

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*Battery Backup (Cont. from page 2)*

of time that you want to be able to run on battery power. APC, a major UPS manufacturer, has a [handy calculator](#) that can help you determine what the capacity of your next UPS should be. Plug in the devices you have (desktop, laptop, monitor, and peripherals) and it will estimate the power needed to keep them running, and give suggestions for APC products that will do the job.

One of the most popular consumer-level UPS models is the [APC Back-UPS 600VA](#) (\$60) which provides battery backup and surge protection for your home computer, router, and peripherals. It has 7 total outlets (5 provide both battery backup and surge protection; 2 offer surge protection only). There's also a USB charging port for your smartphone or tablet. APC says the battery in this model should last 3-5 years, and are replaceable. This model gives you about 25 minutes of battery backup with a 100-watt load. That's enough time to save your work and shutdown, but not a good solution if you want to stay up and running during a longer power outage.

The [APC 1500VA Back-UPS Pro](#) (\$165) is a significant step up. It has 10 outlets, and will keep your gear powered up (100-watt load) for 68 minutes. A display on the unit will tell you how many watts are in use, and the amount of battery time remaining.

Another popular UPS model to consider is the [CyberPower 900VA](#) (\$99). It offers 6 battery backup & surge protected outlets, and 6 surge protected outlets. Data line protection prevents power surges that travel through telephone, coaxial and ethernet lines. CyberPower has a 3-year warranty, including the replaceable battery.

The [Tripp Lite 1500VA](#) (\$171) is also highly rated, and provides up to 90 minutes of runtime for an

entry-level PC system. Includes user-replaceable batteries, software to enable unattended system shutdown, and 3-year warranty. [Amazon Basics](#) also has a lineup of Standby UPS models, ranging from 400VA (\$39.99), to 600VA (\$59.99), to 800VA (\$82.99).

**Don't Forget About Your Internet and Phone and TV**

During a storm or other hazard, it's quite possible that the electrical supply lines might be down, but the telephone, cable or fiber optic lines are just fine. A battery backup unit can power your landline phone's base unit, as well the modem/router for your Internet connection. Some internet service providers install an interface box with a battery backup unit. When I had Verizon FIOS service, that battery would only last about 15 minutes. So during power failures, I plugged the FIOS battery backup into a UPS so I could continue to make phone calls and exchange electrons with the Interwebs. For outages longer than a half-hour or so, a gas-powered generator will be necessary.

**I've found that purchasing a gas-powered generator is a great way to ensure that you'll never need one.** In 2012, Hurricane Sandy heavily damaged the power infrastructure in my area, resulting in outages that lasted for several days. The year before, Hurricane Irene also knocked out power. I assumed that we'd be seeing more of the same, so I purchased a beefy gas-powered generator. But in the past eight years, we've had no outages lasting more than a few minutes. Your mileage may vary. :-)

It's important to conserve every watt of power when running from backup power. So if you have your computer and other gear connected to a UPS, I recommend turning off the printer, speakers, external hard drives and other non-essential items unless you're actually using

them. I have a dual-monitor setup, so I power one of them down, too. Laptops and tablets use a lot less power than desktop rigs, so consider moving to a smaller screen when running on auxiliary power.

**But I Already Have a UPS...**

I had a Tripp-Lite TE-600 UPS for many years, and there were many times when the lights flickered in the house, causing televisions and alarm clocks to shut off or reset. My computer never even flinched. Even during power outages, my trusty computer plugged away, while the rest of the house was dark. But during the winds that Hurricane Irene brought to my area, we lost power and my UPS failed when the internal batteries died of old age. Fortunately, I only lost the document I was working on, and I've since replaced that unit with a beefier model that'll run my desktop appliances for at least 30 minutes.

A UPS contains a battery, of course; typically, a lead-acid battery much like the one in your car. Such batteries are generally good for several years, but eventually they do need to be replaced. UPS units and replacement batteries are available online, but pay close attention to shipping charges; these things are heavy and expensive to ship! I found a good deal on a \$12 battery from BatterySharks <https://www.batterysharks.com/> but the shipping cost added another \$10. You might want to shop locally when purchasing a UPS or replacement batteries. ☺

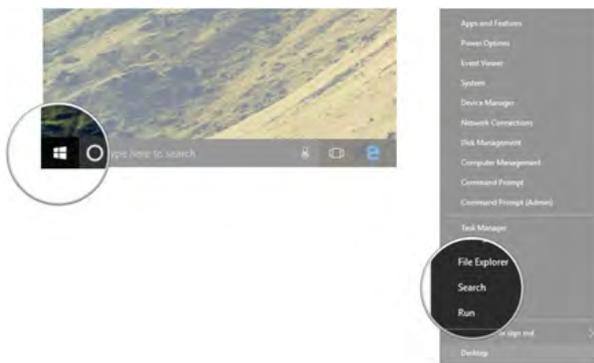
# How to Use Windows 10 Quick Assist to Remotely Troubleshoot PC Problems

By Ann Titus, P\*PCompAS

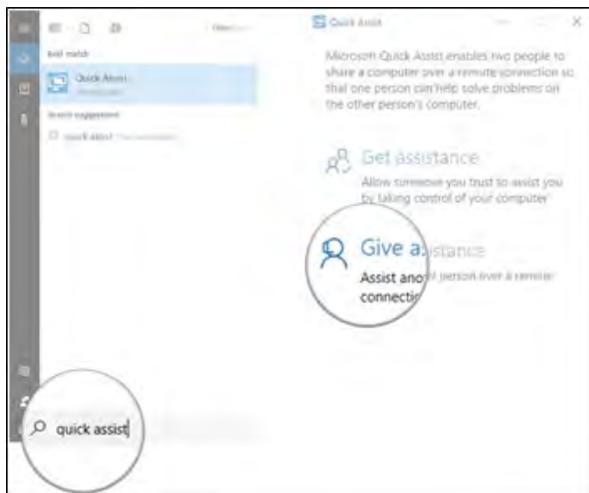
## How to set up Windows 10 Quick Assist

### If You're Helping Out

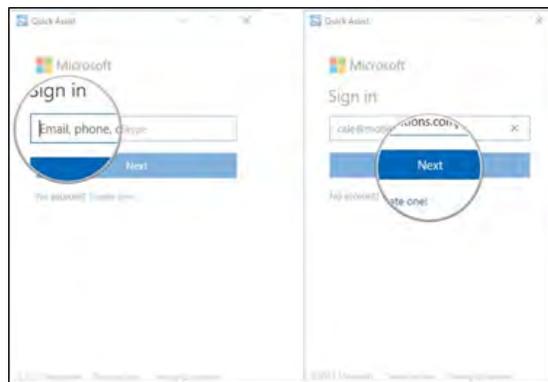
1. Right-click the **Start** button.
2. Click **Search**.



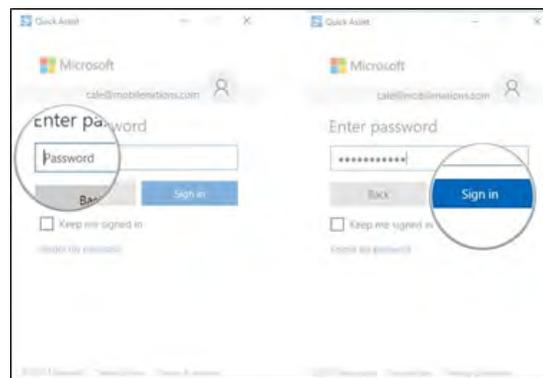
3. Type **Quick Assist** and press **Enter** on your keyboard.
4. Click **Give Assistance**.



5. Type your Microsoft Account user name.
6. Click **Next**.



7. Type your password.
8. Click **Sign in**.



You are then shown a six-digit code that must be shared with the person receiving assistance. There are a couple of options you can click right in the Window (like email), but you can relay the code any way you want.

### If You're Getting Help

1. Right-click the **Start** button.
2. Click **Search**.
3. Type **Quick Assist** and press **Enter** on your keyboard.

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### Meeting Minutes (Cont. from page 1)

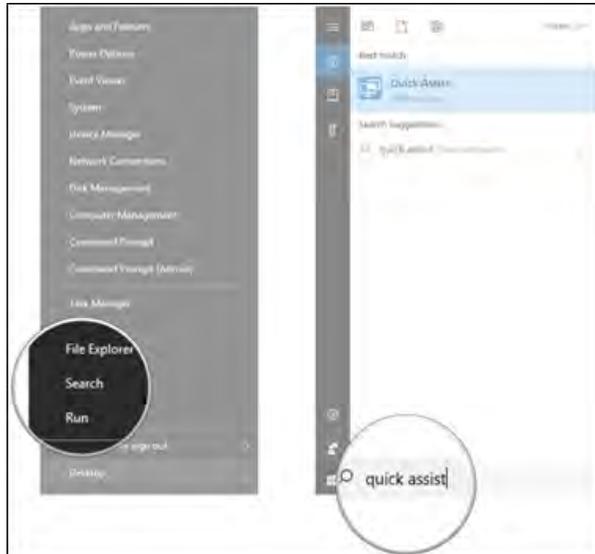
The next social breakfast Zoom meeting will be 16 May at 9 am.

### PRESENTATION

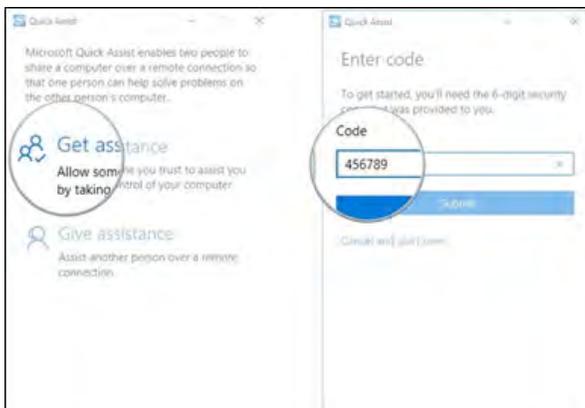
Ann Titus showed a video "Photo Album to Google Photos in 13 Minutes" using a smart phone and another video "Colorize Photos." Cary Quinn showed the

videos "How the Internet Archive is Preserving the World One Web Page at a Time," and "Where to Get Books for Free." ☺

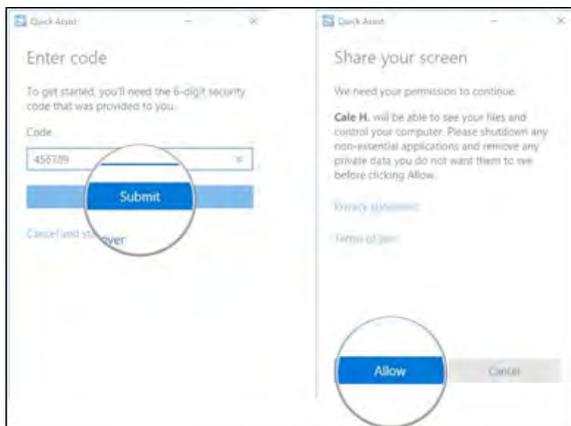
Quick Assist (Cont. from page 5)



4. Click **Get Assistance**.
5. Type the six-digit code you received from the person giving assistance



6. Click **Submit**.
7. Click **Allow** as long as the name matches the person giving assistance.

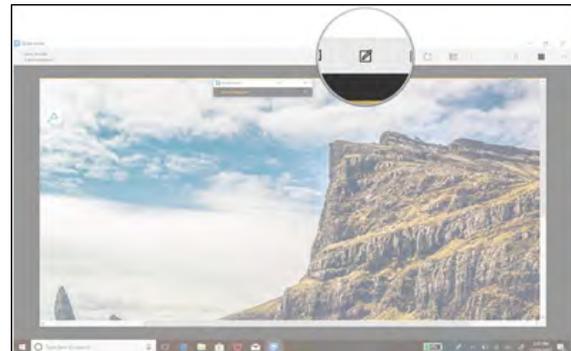


The person giving assistance will now have a window open that shows the other person's desktop.

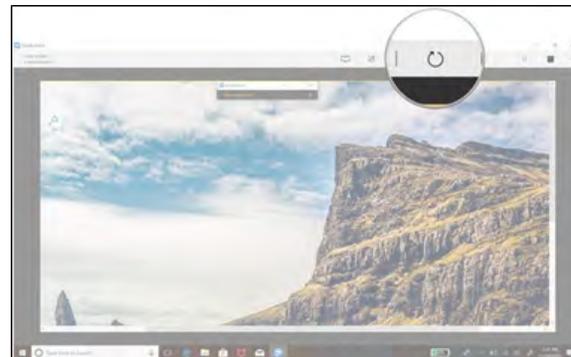
How to Use Windows 10 Quick Assist

Once you have a working connection, the person offering assistance has a number of tools at their disposal.

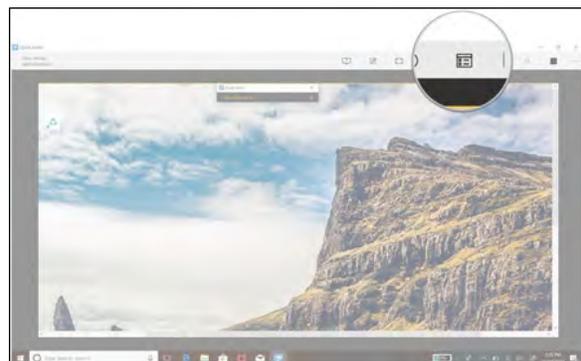
- To annotate both screens, click the **Annotate** button. This allows the person giving assistance to draw directly on both screens using their mouse cursor.



- To restart the other PC, click the **Restart** button. The Quick Assist connection will pause, but will automatically re-open when the PC restarts and boots Windows.



- To open the Task Manager on the other PC, click the **Task Manager** button.



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## Intel's 10th Gen CPUs: What's New, and Why It Matters

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

Original article at: <https://www.howtogeek.com/672037/intels-10th-gen-cpus-whats-new-and-why-it-matters/>

Intel rose to [AMD's Ryzen 3000 challenge](#) with its recent announcement of new 10th generation desktop processors. Dubbed Comet Lake-S, these CPUs bring a slew of improvements and a few surprising new features. Here's what's so great about them, and why PC builders, or anyone looking at prebuilt desktops, should consider one for their next rig.

Intel announced the new Comet Lake desktop chips on April 30. Earlier that month, it introduced new Comet Lake mobile processors for laptops and other smaller PCs. We won't delve into the laptop side of things here. However, Intel said more than 100 laptops are slated to come out with the new 10th generation processors this year. As for the desktop processors, those should start rolling out in May 2020.

### Lots of Cores

Comet Lake CPUs have a lot of [cores](#). The Core i9-10900K is the top chip, with 10 cores and 20 threads. CPU cores process instructions from the system and make your PC work its magic. The

more cores there are, the more instructions a system can process simultaneously. The system will also perform better.

The one snag is software developers have to take advantage of all those wonderful cores. Many don't, either because they don't need that much power, or their software isn't optimized for mega-core machines.

Still, if your workload involves heavy apps, like photo- or video-editing, or games, then all those cores can help.

**RELATED:** [CPU Basics: Multiple CPUs, Cores, and Hyper-Threading Explained](#)

### Hyper-Threading (Almost) All the Way Down

Hyper-Threading is Intel's name for splitting one core into two virtual ones. As far as the operating system is concerned, you get two cores for the price of one. This means your machine can process instructions faster. In the past, Intel has been stingy with Hyper-Threading on desktops, restricting it to Core i7 and Core i9 processors.

For Comet Lake, however, you'll find Hyper-Threading all the way down to Core i3 and Pentium parts. Generally, with Comet Lake-S, Core i3 parts have four cores and eight threads, Core i5 have six and 12, Core i7 have eight and 16, and Core i9s have 10 and 20.

That much Hyper-Threading is tremendous and means there could be surprising deals on lower-tier CPUs for budget gaming. When desktop Comet Lake reviews are in, bargain hunters will want to read them carefully for performance and pricing details, and the trade-offs with Core i3 processors.

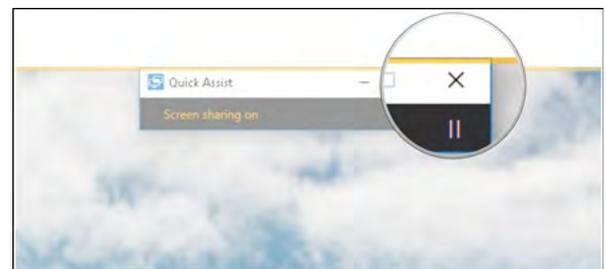
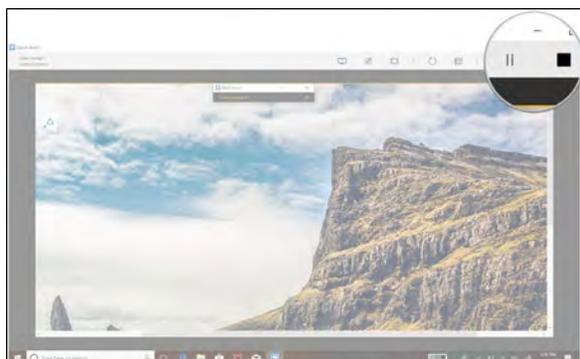
### New Motherboards

CPU makers generally try to make CPUs backward-compatible with older motherboards for a few generations, but that doesn't last forever. At some point, the demands of new processors require new motherboard CPU sockets, and thus, new motherboards. That time has come with Intel Comet Lake.

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### Quick Assist (Cont. from page 6)

- To pause or stop the connection, click the **Pause** or **Stop** button. The connection can be resumed by hitting the **Play** button in the same spot.
- If the person receiving assistance would like to stop the Quick Assist, they can click the X in the top-right corner of the small window on their screen. 😊



*Intel CPUs (Cont. from page 7)*

Comet Lake-S uses a new LGA1200 socket. The new motherboards will be easy to spot, as they'll have specific designations, including Z490, B460, H470, and H410.

**Improvements to Heat Transfer Efficiency**

The biggest problem any computer system must solve is [how to cool](#). When computer parts get too hot, their safety mechanisms start ratcheting down performance. In other words, they get slower to prevent physical damage. The key, then, is for these components to transfer heat as efficiently as possible so fans or liquid cooling devices can expel the heat before it goes too far.

Intel's new 10th generation CPUs are supposed to be better at transferring heat. Intel made some internal adjustments on it to increase the size of the integrated heat spreader (IHS). The IHS is the part that transfers the heat away from the CPU. The bigger size should keep the heat away from the CPU's innards more efficiently, and result in better performance.

**Turn Off the Threads for Less Heat**

As we discussed earlier, the upside of Intel's Hyper-Threading is it allows the CPU to work faster. As usual with PC hardware, the downside is higher performance

comes at the cost of generating more heat.

With Comet Lake, Intel makes it possible to shut off Hyper-Threading on a per-core basis. So, instead of one core operating like two, one will operate like one. With fewer cores working, the CPU generates less heat. With less heat, the cores that are working can perform at higher levels for longer periods.

It's a bit unclear how this will all work in practice. However, it appears that turning off Hyper-Threading will require a dip into the motherboard BIOS instead of a simple switch in Windows 10.

**Thermals Through the Roof**

It's a good thing Intel did all that work on heat-transfer efficiency because some of these CPUs are capable of getting really warm. The top-tier Comet Lake processors—the Core i9-10900K, the Core i7-10700K, and the Core i5-10600K—can generate up to 125 watts of heat under an intense workload. The measurement of this is called thermal design power, or TDP.

All of this just means PCs need a capable cooler to keep the higher-tier Comet Lake monsters from getting too hot.

**RELATED:** [What Is TDP for CPUs and GPUs?](#)

**Breaking Through 5.0 GHz**

CPU speeds are measured in

gigahertz. Generally, the higher the clock speed, the better a CPU performs. [There are some big caveats to that statement](#), but we won't get into those here.

Consumer CPUs usually haven't surpassed 5 GHz, but Intel has found a way. Comet Lake CPUs use a new technology called Thermal Velocity Boost (TVB). This will push a single core up to 5.3 GHz when the processor's temperature is below 70 degrees Celsius. That single core will be able to perform at a higher level for short bursts, which can help for gaming and other demanding applications.

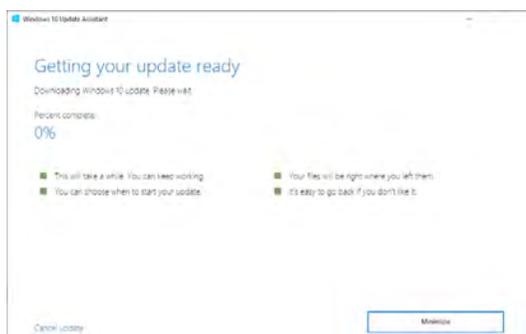
The Core i9 Comet Lake desktop CPUs will also have a feature called Turbo Boost 3.0 Max. This finds the two top-performing cores (not all perform equally well) on a processor and pushes their speeds a little higher for certain uses, such as gaming. Again, the result is a faster processor under certain workloads.

**RELATED:** [Why You Can't Use CPU Clock Speed to Compare Computer Performance](#)

**PCIe Overclocking, But No PCIe 4.0**

Some Comet Lake motherboards will be capable of overclocking PCIe lanes to eke out more performance from components, like graphics cards. This capability will vary

*Continued on page 9*

*Install Win 10 May 2020 Update (Cont. from page 3)*

Eventually, you'll be prompted to restart your PC to install the update. That's it!

If you run into a bug or another problem with the update, you can [roll back to your old version of Windows 10](#) from Settings > Update & security > Recovery. You must do this within the first ten days after upgrading or Windows 10 will remove the requires files to free up disk space on your PC.

**RELATED:** [How to Roll Back Builds and Uninstall Updates on Windows 10](#) ☺

## ICYDK: Windows 10 Remembers Your Copy-Paste History (Even If You Don't)

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

Original article at: <https://www.reviewgeek.com/41259/icydk-windows-10-remembers-your-copy-paste-history-even-when-you-dont/>



This weekend I wrote a review for the OnePlus 8 smartphone, [which you can read here](#). It's about 2100 words, 1500 of which temporarily disappeared as I copied them from Google Docs (where I do all of my writing) into WordPress. I didn't notice the missing section of my review immediately, and Google Docs uncharacteristically failed to save about three hours of edits.

Welcome to ICYDK (*In Case You Didn't Know*), a series where we offer tips and tricks that aren't necessarily new but may have gone under the radar or otherwise not be well known.

And, I'd already copied another small bit of text for another part of the review.

Well, crap.

I checked through the Docs history and the WordPress window, just in case several hours of my life were hiding behind a stray tab. No dice. It seemed as if I'd just blown my entire afternoon. But then I recalled: Windows 10 can remember your clipboard history, as of about a year and a half ago!

I did a quick search on our sister site, How-To Geek, and [found the guide](#). It turns out that opening a history of your copied text and images is super easy, barely an inconvenience: press Win+V on your keyboard. Any text or image under 4MB is saved to the history, back to the point at which you rebooted your computer. Just click the item to paste it again.

This is a wonderful little tool that Microsoft has built into Windows 10, no extra apps necessary. You'll need to be running the October 2018 version of the operating system or later to access the tool. Be sure to [check out the full guide on How-To Geek](#) if you want to see how to clear your clipboard history, or even sync it across multiple machines. ☺

### Intel CPUs (Cont. from page 8)

| PROCESSOR NUMBER  | BASE CLOCK SPEED (GHZ) | INTEL® TURBO BOOST TECHNOLOGY 2.0 MAXIMUM SINGLE CORE TURBO FREQUENCY (GHZ) | INTEL® TURBO BOOST MAX TECHNOLOGY 3.0 FREQUENCY (GHZ) | INTEL® THERMAL VELOCITY BOOST TECHNOLOGY SINGLE / ALL CORE TURBO FREQUENCY (GHZ)* | INTEL® ALL CORE TURBO FREQUENCY (GHZ) | CORES/ THREADS | THERMAL DESIGN POWER | UNLOCKED† | PLATFORM PCIE 3.0 LANES | MEMORY SUPPORT‡        | PROCESSOR GRAPHICS      | INTEL® OPTANE™ MEMORY | RCP PRICING (USD 1K) |
|-------------------|------------------------|---|---|---|---------------------------------------|----------------|----------------------|-----------|-------------------------|------------------------|-------------------------|-----------------------|----------------------|
| <b>i9-10900K</b>  | Up to 3.7              | Up to 5.1   | Up to 5.2   | Up to 5.3 / 4.9   | Up to 4.8                             | 10/20          | 125                  | ✓         | Up to 40                | Two Channels DDR4-2933 | Intel® UHD Graphics 630 | ✓                     | \$488                |
| <b>i9-10900KF</b> | Up to 3.7              | Up to 5.1   | Up to 5.2   | Up to 5.3 / 4.9   | Up to 4.8                             | 10/20          | 125                  | ✓         | Up to 40                | Two Channels DDR4-2933 | Intel® UHD Graphics 630 | ✓                     | \$472                |
| <b>i9-10900</b>   | Up to 2.8              | Up to 5.0   | Up to 5.1   | Up to 5.2 / 4.6   | Up to 4.5                             | 10/20          | 65                   | ✓         | Up to 40                | Two Channels DDR4-2933 | Intel® UHD Graphics 630 | ✓                     | \$439                |
| <b>i9-10900F</b>  | Up to 2.8              | Up to 5.0   | Up to 5.1   | Up to 5.2 / 4.6   | Up to 4.5                             | 10/20          | 65                   | ✓         | Up to 40                | Two Channels DDR4-2933 | Intel® UHD Graphics 630 | ✓                     | \$422                |
| <b>i7-10700K</b>  | Up to 3.8              | Up to 5.0   | Up to 5.1   | NA  | Up to 4.7                             | 8/16           | 125                  | ✓         | Up to 40                | Two Channels DDR4-2933 | Intel® UHD Graphics 630 | ✓                     | \$374                |
| <b>i7-10700KF</b> | Up to 3.8              | Up to 5.0   | Up to 5.1   | NA  | Up to 4.7                             | 8/16           | 125                  | ✓         | Up to 40                | Two Channels DDR4-2933 | Intel® UHD Graphics 630 | ✓                     | \$349                |
| <b>i7-10700</b>   | Up to 2.9              | Up to 4.7   | Up to 4.8   | NA  | Up to 4.6                             | 8/16           | 65                   | ✓         | Up to 40                | Two Channels DDR4-2933 | Intel® UHD Graphics 630 | ✓                     | \$323                |

by motherboard, as it's up to the manufacturer to make this feature a reality. This feature is mostly for extreme overclockers—the hot-rodders of the PC universe.

Something the new Intel CPUs won't have is PCIe 4.0 capability—they'll stick with PCIe 3.0, instead. PCIe 4.0 helps components like

graphics cards and storage drives perform at double the speed they currently do. However, all the components—from the graphics card, to the motherboard and processor—must support PCIe 4.0.

AMD already supports PCIe 4.0 in its Ryzen 3000 processors and X570 motherboards, but Intel chose

not to follow that path just yet. This isn't unreasonable, as AMD's X570 boards require extra cooling to deal with this new version of PCIe.

### RELATED: [PCIe 4.0: What's New and Why It Matters](#)

Still, some high-end, Comet Lake-compatible motherboards are anticipating the upgrade and [will have PCIe 4.0 built-in](#). This allows for a bit of future-proofing, but they won't perform at PCIe 4.0 levels until Intel supports the new standard.

Those are the major features of the upcoming Comet Lake CPUs. There'll be other goodies baked in, like firmware for faster Ethernet and RAM, and Wi-Fi 6 integration.

It will be interesting to see how this line of CPUs compete with AMD's Ryzen 3000 processors. ☺

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**Coming Events:**

**Next Membership Meeting: 6 June @ 9 am, via Zoom**

**Next Breakfast Meeting: To be announced**

**Newsletter Deadline: 20 June**

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

