THE GIGABYTE GAZETTE

The Monthly Newsletter
of the

SUN CITY SUMMERLIN COMPUTER CLUB

https://www.scscc.club

November, 2021

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Issue Contributors

Tom Burt	*Peggy Cushman*
Kathy Kirby	*David Kretchmar*
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President's Message

## Inkjet Printer Ink Cartridges

by Jeff Wilkinson

There are two methods of ink deposition that are widely used in household inkjet printers: thermal bubble and piezoelectric.

Thermal Bubble Printing

Inkjet printing technology was proposed as early as 1960 and became commercially available in the early 1980s in the form of the Canon Bubblejet and the HP Digital Printer. In March 1993, Epson entered the inkjet printer market with Micro Piezo inkjet technology using a piezoelectric crystal in each ink nozzle.

With the bubblejet technology, current is passed through a resistor in the nozzle path heating the ink, vaporizing it and depositing a small amount of ink on the media. A slight vacuum is created drawing more ink into the nozzle for the next cycle. This happens as often as 36,000 times per second.
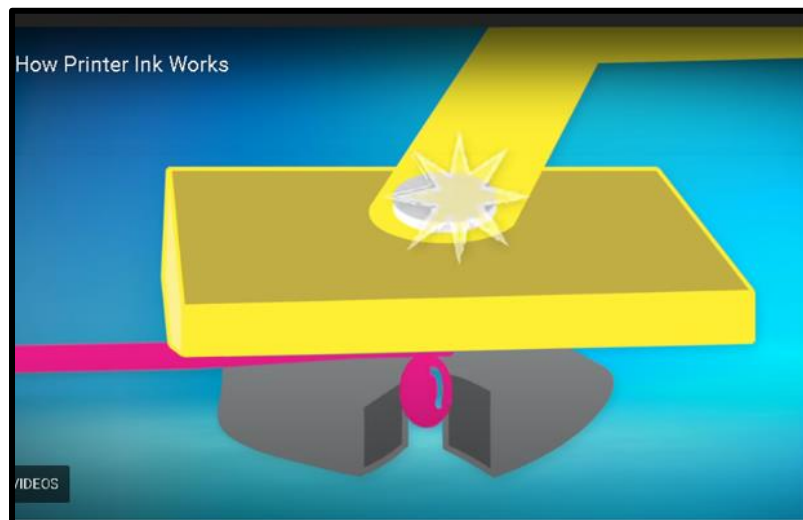

The typical ink cartridge using "bubblejet" technology has hundreds of tiny holes or nozzles, about 15 microns in size. The precision digital manufacturing process ensures the nozzles are properly sized and placed on the printhead for correct placement of the ejected drops. The tiny ink drops, as small as 4-picoliters, are launched through these precision nozzles. A picolitre is a millionth of a millionth of a liter! As many as 32 drops of ink are used to produce each color dot and images may contain thousands upon thousands of dots. The chemical formulation of the ink is very important and poorly formulated inks may cause clogging or oxidation on the printhead nozzle.

Partially because of the complexity and development costs and a somewhat captive market, the price of inkjet cartridges was initially quite high. This spawned a compatible cartridge market in which vendors, big and small, qualified and not so qualified, began offering replacement inkjet cartridges. With the existing patents, their only option was to refill inkjet cartridges since a replacement could not be legally manufactured. This created a secondary market for empty inkjet cartridges with various recycling and collection schemes used to get cartridges to refill.

As the compatible market matured, the OEM manufacturers added protection in the form of a semiconductor chip used to prohibit the use of non-OEM cartridges. Of course, workarounds appeared almost immediately and the back and forth battle has been going on for many years. There is no question the best quality comes from OEM ink cartridges, but many users feel for everyday printing the cost/quality ratio is too high and opt for compatible cartridges. Since the printing functionality comes almost entirely from the cartridge, a faulty cartridge can be replaced and renew the entire imaging system.

Piezoelectric Printing

Epson inkjet printers use the piezoelectric process in their printers. With this process the printer contains the printheads rather than the printheads being part of the cartridge. In the printer, printheads contain a piezoelectric element that contracts when a voltage is applied. The element and vibration plate move, much like the cone of a loudspeaker, and force out a precise amount of ink out of the nozzle.
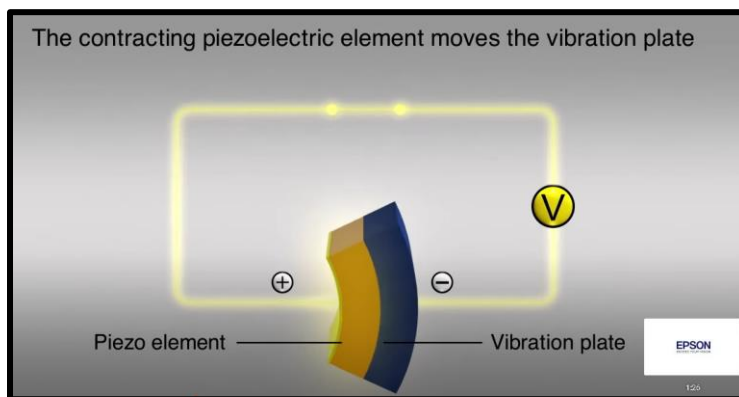
This eliminates the need to heat the ink to create a bubble, reducing the complexity of the ink formulation. Printheads with 128 black nozzles and 192 color nozzles (64 for each color) produce a resolution of 720 dpi, for example.
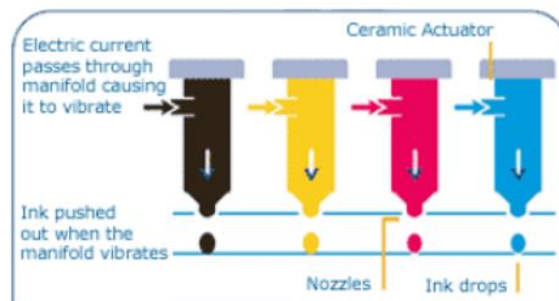
Since the ink does not need to be heated, it can be tailored to the media to which it is applied, in many cases giving more flexibility to the ink formulation.
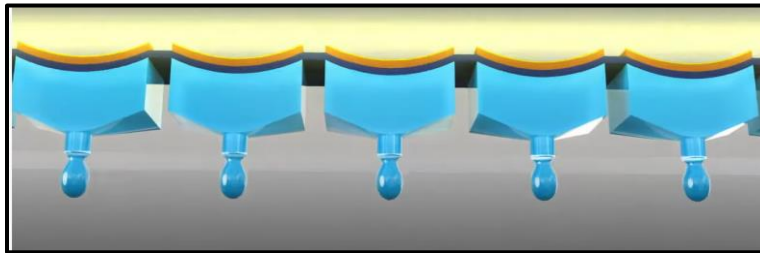
The internal printheads contain rows of these elements which fire at precisely the right time releasing the correct amount of ink as many as 40,000 times per second!

Since the ink cartridges for these printers do not contain the printhead, they are easier to duplicate, and many compatible cartridges are available. Once again, the manufacturer has countered these efforts with onboard chips which warn you about the use of third-party inks.

There have been numerous attempts by printer manufacturers to use firmware and onboard chips that won't allow the use of third-party inks and numerous corresponding class action lawsuits against these actions.

Each user has to make their own choice of which ink cartridges to use but armed with some understanding of the printer ink systems you can add make a more informed decision.

Jeff Wilkinson, President
(702) 527-4056 pres.scscc@gmail.com

General Membership Meeting

Our next General Meeting will be held at **2 PM on Thursday, November 4th in the Computer Club class and simulcast via Zoom**. The meeting's Zoom link can be found on the Computer Club home page at **https://www.scscc.club**. Our presentation will be a video seminar by Ron Brown.

For Club information: go to www.scscc.club, contact Jeff Wilkinson, President at (702) 527-4056 or email him at pres.scscc@gmail.com.

SCSCC Board of Directors Actions

The Computer Club Board of Directors took the
following actions on October 13, 2021

Chuck Wolff made a motion that the **minutes of the September 8, 2021 Board Meeting be approved as submitted.** The motion was seconded by George Lobue and unanimously approved by the Board.

Tom Burt made a **motion** that the meeting adjourn. Chuck Hagen **seconded** the motion, and it was unanimously **approved** by the Board. The meeting was adjourned at 10:20 AM.

November 2021 Printable Calendars

To view this month's classroom and lab calendars, click the following hyperlink:

http://www.scscc.club/Calendars/scscc_calendar_2021-11Nov.pdf

Submissions Welcome

We are always looking for new information to share with our club members. If you have computer or technical information you would like to share with members of the club, send your articles to editor **Tom Burt** at tomburt89134@cox.net. Thank you to everyone for your contributions.

Welcome New Members

The following new members have joined the Computer Club
from September 29th to October 28th.

Steve Cunningham	**Dick Nielsen**
Monina Exconde	**John Wolosz**
Gladys London	

As of October 29th, the club has 587 paid memberships for 2021
and 15 paid memberships for 2022.

As of December 31, 2020, the club had 614 paid memberships.

Special Interest Groups and Kaffee Klatches

Special Interest Groups (SIGs) provide a forum for general discussion on a specific computer related subject. Admission to all SIGs is on a first-come, first-seated basis and is subject to the maximum allowed by fire code regulations. <W>, <L>, <M> or <H> indicate whether a SIG would be of interest to a Windows, Linux, MacOS or Hand-held Device user.

Apple Q&A One on One Help <M/H> *Live in the Classroom*
Advance Reservations Required!

Gail Weiss (702-355-6220)
Third Monday, 10 a.m. DARK in November

Bring your Apple iPhone, iPad, Watch or MacBook to get one on one help with your questions about how to use any Apple device and popular iOS or MacOS apps.

Repair SIG <W/L/M> *Live in the Classroom*

Chuck Wolff (702-233-6634) and Chuck Hagen (702-418-2614)
Every Tuesday, 12:30 p.m. to 3:30 p.m.

The Repair Lab provides **CLUB MEMBERS ONLY** with no-cost assistance for those having upgrades and / or hardware and software problems with their computers. Bring in only your PC tower, your Mac or your laptop and your problems. Our TECH team will give you our best effort. ***Be sure to mark your cables so you can re-connect when you get home***.

Internet Investing <W/M/H> *via Zoom*

Tom Burt (702-341-7095
3rd Thursday, 9:00 a.m. in even months
Next meeting: December 16th

The Internet Investing SIG provides a forum for members interested in using Internet resources for researching and managing investments to meet, discuss, and learn more about the topic. The SIG's target audience is members with intermediate computer skills and investment experience, but all members are welcome.

Kaffee Klatch <W/M/H> *via Zoom*

Jeff Wilkinson (702-527-4056)
Every Tuesday, 8:30 a.m.

This Kaffee Klatch is an open, free-form discussion group for all users, from beginning to advanced. KK discussions are not restricted to any one subject, computer platform or computer-knowledge level but should be computer or technology related. We will try to answer your questions, help you keep your systems updated and provide some useful "tips and tricks."

Windows 10 SIG *Live in the Classroom*

Bill Wilkinson (702-233-4977)
First and Third Saturdays at 9:30 a.m.
Suspended (DARK) in November due to COVID restrictions.

If you are a novice or near-beginner computer user, or if you just want some refresher information together with a refreshing cup of coffee, then jump-start or recharge your computing knowledge by attending these Win 10 SIG / Q&A sessions. At each session, attendees will explore several topics of interest to beginners and near-beginners. The topics are always announced a couple of days in advance via e-mail to SCSCC members who have subscribed to the club's SCSCCNews mailing list. Each topic is presented in a step-by-step manner and is supported by "how to" notes that can be easily and conveniently downloaded from the SCSCCBKK.org web page. Following each "up front" presentation of one or more topics (approximately 60 minutes in duration), an informal open-ended Question and Answer period takes place for those who wish to participate, listen, reflect, or inquire.

Seminar Offerings

The club's Seminars, SIGs, Q&As and Kaffee Klatches are being conducted either as Zoom webcasts, live in-person or a hybrid of the two. Check the weekly calendar on the website to see which mode the session is using. Unless explicitly stated, advance registration is not required for Seminar sessions.

"Cutting the Cord" - 2021

Thursday, November 18th 9:30 AM – 11:00 AM *via Zoom*
Presenter: Tom Burt
Location: Zoom Webcast

Due to recurring price hikes, many of our members have become disenchanted with TV service from Cox, DirecTV, Dish and Prism. The array of alternatives can seem dauntingly complex and confusing. This seminar will review and compare all the TV and Internet services available to Sun City Summerlin residents in 2021/2022.

We'll summarize broadcast "over the air" digital TV technology and how to set up a HDTV antenna, including some tips for getting the best reception.

We'll compare the commercial cable and satellite TV services' features and prices so you can be an informed shopper. For prospective cord cutters, we'll also include some discussion of the various Internet streaming TV services like Sling, DirecTV Now, Amazon's Prime TV, NetFlix, Hulu and YouTube TV. We'll also touch on media center software you can use to stream music, photos and videos directly from your PC or laptop to your smart device or HDTV.

We'll also touch on some upcoming new options for getting high-speed Internet service. And we'll include a generous amount of time for questions and discussion.

The presentation notes will be available about November 20th at:
http://www.scs-cc.com/smnr

Tom's Tech-Notes

Windows 11 Compatibility – Things to Know

On October 5, 2021 Microsoft officially released its newest incarnation of the Windows operating system, Windows 11. Based on Windows 10, Windows 11 is a free upgrade to existing Windows 10 users. But there's a caveat; Windows 11 has some demanding hardware requirements that many older Windows 10 PCs are unable to meet. This month, we'll look at what those requirements are, what options you have if your PC doesn't meet the requirements and how to manage the timing of your own upgrade to Windows 11.

Windows 11 System Requirements

Here's a link to Microsoft's Windows 11 Minimum System Requirements:
Windows 11 Specs and System Requirements | Microsoft.

Key among these are: TPM (Trusted Platform Module - a special security chip) 2.0, UEFI BIOS, Secure Boot, 4GB of RAM, DirectX 12 video and having a compatible dual core CPU. The main requirements page above contains links to lists of supported AMD and Intel CPUs.

How Urgent is the Upgrade to Windows 11?

In the first release of Windows 11, the user-visible differences are modest. For details, check out my recent Windows 11 presentation notes at:
https://www.scscc.club/smnr/Windows11EarlyLook.pdf.

Microsoft will continue to support Windows 10 until October of 2025. So, there's no need to worry about your Windows PC suddenly being an orphan. Further, Microsoft says there are over 1.3 billion existing Windows 10 devices, so I believe it's highly likely that the October, 2025 end-of-life date will be extended.
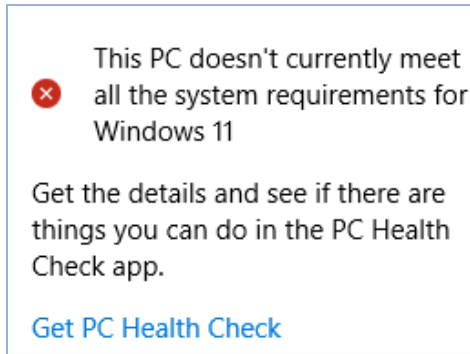
If you buy a new Windows PC, it will have Windows 11 preinstalled or will be able to perform an in-place update to Windows 11, retaining all data, settings and installed programs. If you bought your current Windows 10 PC within the past three years, it will very like already be compatible with Windows 11. But run the PC Health Check to be sure. You may have to turn on TPM 2.0 and Secure Boot in the UEFI BIOS.

My PC *IS* Compatible – How Do I Upgrade?

If your Windows 10 PC is compatible with Windows 11, Windows Update will eventually offer Windows 11 as a feature update to Windows 10. Once it's available, you click "Download and Install" to install it.

If you **don't want to upgrade to Windows 11**, you can ignore the upgrade offer until you're ready.

My PC *IS NOT* Compatible – Can I Upgrade Anyway?

This PC doesn't currently meet all the system requirements for Windows 11

Get the details and see if there are things you can do in the PC Health Check app.
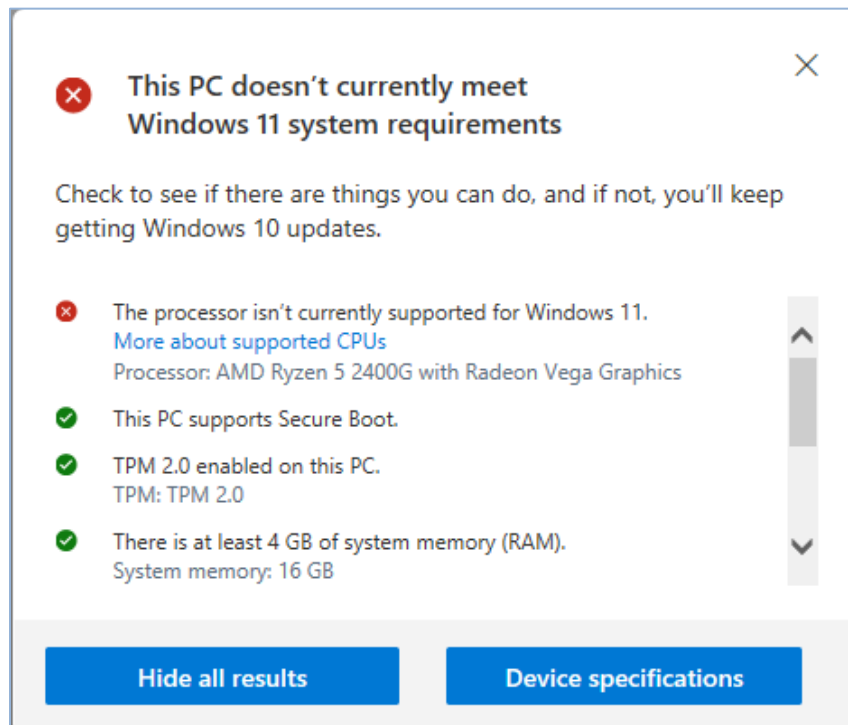
Get PC Health Check

If you've run Windows Update since October 5th, you may have seen a message like the one at left, indicating your PC doesn't meet all Windows 11 system requirements.

You can download and run the **PC Health Check** tool to learn the details. Click this link to download the Windows PC Health Check installer.

On my desktop PC, there were originally two problems: My AMD Ryzen 5 2400G CPU was not supported and my CPU/motherboard did not support either TPM 2.0 (Intel) or PSP 11.0 (AMD).

This PC doesn't currently meet Windows 11 system requirements

Check to see if there are things you can do, and if not, you'll keep getting Windows 10 updates.

❌ The processor isn't currently supported for Windows 11.
More about supported CPUs
Processor: AMD Ryzen 5 2400G with Radeon Vega Graphics

✅ This PC supports Secure Boot.

✅ TPM 2.0 enabled on this PC.
TPM: TPM 2.0

✅ There is at least 4 GB of system memory (RAM).
System memory: 16 GB

Hide all results   Device specifications

Here's a screen shot of the final report from the PC Health Check. I was able to resolve the TPM 2.0 issue by changing a setting in my motherboard's UEFI BIOS to enable a software version of TPM 2.0.

However, my CPU remains incompatible. For now, if I stick with "official" ways of updating to Windows 11, my current PC is out of luck.

There are a variety of things you can do to try to make your PC compliant. There are also some registry edits that may allow you to bypass Microsoft's official requirements when running the Windows 11 setup.

Resolving Compatibility Issues

If your PC is incompatible, but you really want to upgrade to Windows 11 as soon as you can, and you don't want to plunk for a new PC, you can try to make your current PC compatible. Some compatibility issues may be resolved relatively easily and inexpensively, especially on a desktop PC where you have easy access to the motherboard.

Add Memory

Even if your PC has the required 4 GB of RAM, you may want to upgrade it to 8GB for Windows 11. The tricky part is you will have to determine what type and speed of dynamic RAM is

currently installed on your PC motherboard and order one or more matching RAM sticks. If your PC is more than 5 years old, it may not be easy to find compatible RAM for sale. Most of the websites of online vendors of PC memory now offer a memory checker that can tell you exactly how much and what type of memory is currently installed.

Ensure Your Boot Drive is Larger Than 64 GB

On desktop and laptop PCs, this is almost a given unless the boot drive is a small solid-state drive. On some tablets and 2 in 1 PCs, the on-board solid-state drive may be smaller than 64GB. Also, to install Windows 11 as an in-place upgrade over Windows 10, the boot drive will require about 40 GB of free space. This may be a show-stopper.

Convert Your Boot Drive's Partition Table from Master Boot Record to GUID Partition Table

For commercial PCs, this is almost certainly already the case. If your PC's boot drive is formatted using the older Master Boot Record (MBR) partition table, it needs to be converted to the GUID Partition Table format before upgrading to Windows 11. This is a precursor to enabling UEFI mode and Secure Boot in the BIOS. Here's a link to an article with the details of how to do this conversion while preserving your programs, data, settings and operating system:

https://www.windowscentral.com/how-convert-mbr-disk-gpt-move-bios-uefi-windows-10 .

Ensure Your BIOS is UEFI and Enable Secure Boot

For commercially sold PCs, these settings are almost certainly already in place. If the PC Health Check is citing either of these as issues, you must change the BIOS settings.

In Windows 10, the best way to boot into the BIOS settings is to go to **Settings > Update and Security > Recovery > Advanced startup** and click the **Restart Now** button. This will take you to an options screen that includes an option to boot into the BIOS settings. Select that and the PC will reboot into the BIOS settings. Each PC maker's BIOS settings interface is a bit different, so look around.

First, make sure your BIOS is in **UEFI mode** (as opposed to Legacy mode). Then enable Secure Boot. Exit and save your BIOS changes. When the PC has restarted, run the PC Health Check again to see if your PC is now compliant.

Check Your UEFI BIOS to Enable TPM 2.0

Follow the directions above to enter your BIOS setup. Look for a checkbox or dropdown to enable TPM or a setting for FTPM (firmware TPM). If the option is present, select the setting to enable TPM and then exit and save the changes. After the PC reboots, re-run the PC Health check to see if the TPM requirement is now satisfied.

Buy a TPM 2.0 Add-on Module

Many motherboards that do not already support TPM 2.0 (Intel) or PSP 11.0 (AMD) have a jack that will accept an add-on plug-in module that will implement TPM 2.0. Each motherboard vendor may have its own version of the add-on module. Typical pricing is $15 to $20. Order the correct module, plug it into the jack on the motherboard and reboot. Run the PC Health Check again to see if your PC now passes.

Registry Edits and Other Ways to Bypass Support Checks

Microsoft's Official Registry Edit

Microsoft has provided an "official" registry edit that will allow you to install Windows 11 on a PC with an unsupported CPU or with only TPM 1.2. After making the registry edits to your current Windows 10, you will need to run the setup.exe from a downloaded ISO image or flash drive of the Windows 11 setup. Details and examples are provided in the following articles:

https://www.theverge.com/22715331/how-to-install-windows-11-unsupported-cpu-intel-amd-registry-regedit

https://www.tomsguide.com/news/windows-11s-system-requirements-can-be-bypassed-with-this-official-microsoft-workaround

Article on Other Ways to Install Windows 11 on Unsupported Systems

The following article details a number of registry edits and other work-arounds to install Windows 11 on unsupported PC hardware configurations.

https://appuals.com/bypass-windows-11-installation-requirements/

These may be challenging for non-technical users and may not work if your current PC is more than about 3 years old. Our Computer Club's Tuesday Repair SIG may be able to help you if you want to try.

Conclusion

As noted earlier, there's no reason to hurry to upgrade to Windows 11. For most, if your current PC is not compatible, your best bet is to stand pat until you're ready to purchase a new PC and you will get Windows 11 already installed.

Kretchmar's Korner

And the Scams Just Keep Coming

David Kretchmar, Computer Technician

If some nice, polite person asks you to download some software onto your computer that will allow them to remotely fix something that has been a problem, please think twice about it. Then do not do it. The chances are high that you are dealing with a scammer who is trying to get financial and personal data about you.

It is probably generally a very bad idea to give a stranger access to your computer. Yes, there are exceptions; I have allowed a Microsoft Tech to access my computer remotely to fix an Operating System installation problem. But anything short of that, such as reactivating a permanent version of Microsoft Office after a hard drive failure, did not require me to relinquish control of my computer to a stranger. It is extremely unlikely that any issue you might be having would require you to give a stranger remote access to your computer.

My Experience

I was having problems installing AOL Gold on a client's new computer. A Google search led me to what appeared to be a legitimate AOL site, or at least it fooled me. I called the number and spoke to a nice polite young lady, who might have been on the other side of the world. She explained that in order to fix the problem that was preventing AOL Gold to load I would have to give her access to my computer.

She asked me to download and install a program that would allow her to access my computer, which I foolishly did. She then sent me a code, by text or email, which I had to enter to activate a remote session.

Then for the first time I wondered, why does she need to do that? I told her I was a computer tech who could probably follow her instructions and she gave me an unsatisfactory answer. I terminated the call and uninstalled the remote access software.

Remote access programs such as TeamViewer, AnyDesk, LogMein and dozens of others are legitimate programs, but they can be used for nefarious purposes

Scammers expertly reproduce the logos of legitimate software providers, such as AOL and McAfee. They can even spoof their email address, so an email appears to be coming from a legitimate company.

Fake antivirus email scam

Scammers might come at you via your email. One message I have seen purports to be from
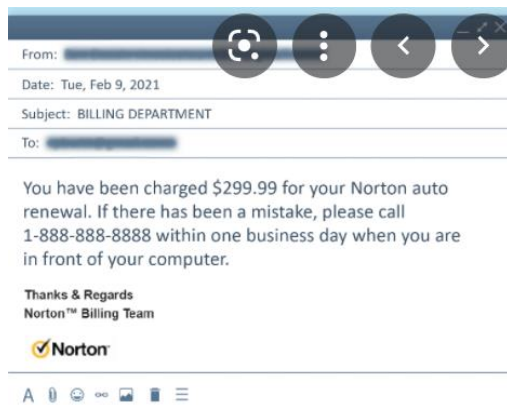
McAfee or Norton, stating that your credit card will be charged for another year's subscription unless you contact them via a phone number or hotlink in the email. This message sounds authentic to many users, who might have had McAfee or Norton in the past, or who got a free trial that comes with many new computers.

When contacted, the scammer will state that in order for you to avoid additional charges the scammer must remotely access your system. They will try to get you to download remote access software that will give the scammer access to your computer. Just say no. There is no legitimate reason someone needs to access your computer to remove a program.

As we approach the holidays, computer scammers and hackers seem to step up their attacks on computer systems. Users are especially vulnerable to messages from vendors such as Amazon stating there is a problem with their order since many of us do order gifts from online venders this time of the year. Don't let your guard down!

APCUG Guest Article

Understanding Internet Speed

By Joe Callison,
Author, GEEK FREE & FOR~GO (For Geeks Only) blogs;
Convener, Senior Techies SIG
Seniors Computer Club of Greater Kansas City
https://kcsenior.net/ sencommember00 (at) gmail.com

How fast is my internet connection? Am I getting what I am paying for? These are typical concerns for consumers, especially if they think their internet connection is too slow. We will look at this from the top-down, starting with the service from the internet provider to the residence or business, then the modem/router that provides the local network over wire and Wi-Fi, and finally the adapters in the computing devices connected to the local network.

Internet service is characterized with language like "speeds up to" many megabits per second (Mbps). This is the maximum speed that will be delivered with the lightest load on the providers' distribution system. Suppose many consumers happen to be streaming movies simultaneously on the same network branch that you are connected to. In that case, you may only experience 80 or 90 percent of the maximum speed. This possibility should be considered before you decide on what speed of service you need. Do you know what speed you need? I doubt that most people do. Let's look at some of the requirements.

Netflix recommends 3 Mbps for standard quality video (SD), 5 Mbps for high-definition video (HD), and 25 Mbps for ultra-high-definition video (UHD). Hulu recommends 3 Mbps for content from their streaming library, 8 Mbps for live streaming, and 16 Mbps for 4K content. Remember that if you have two people in the household or business who may be streaming videos simultaneously, these requirements will double, and four people would quadruple. To ensure that you always receive at least these speeds from your provider, you should increase the total simultaneous requirements by 25%. Suppose you don't stream high-definition movies (or games) over the internet at all. In that case, you can use a rule of thumb of 5 Mbps for each simultaneous connection to the internet, which is plenty adequate for email, internet browsing, standard quality video or video conferencing, and such.

The modem/router, which may be leased from your internet service provider or provided by you, must be capable of handling the total simultaneous network requirements, in addition to providing each connected device with its needed speed. Old "G" routers (802.11g) generally have either 10 or 100 Mbps for each wired connection and a maximum of 54 Mbps for Wi-Fi connections. The Wi-Fi speed will drop off dramatically as the distance from the router increases.

The "N" routers (802.11n) may have a single 2.4 GHz radio like the "G" routers or may have both a 2.4 GHz and a 5 GHz radio (dual band). The single band generally provides up to 300 Mbps, and the dual band up to 600 Mbps (total for both bands). The wired connections maybe 100 or 1000 Mbps. Newer "AC" routers (802.11ac) are all dual-band and are often identified by

a total combined Wi-Fi speed such as AC1200 for one with a 300 Mbps 2.4 GHz radio and 900 Mbps for a 5 GHz radio, or AC1900 for one with a 600 Mbps 2.4 GHz radio and 1300 Mbps for a 5 GHz radio. Wired ports are generally rated for 1000 Mbps.

A modem and or router may have a total bandwidth limitation that is less than the sum of the ratings of all individual connections. In other words, a router with four wired ports rated 1000 Mbps each may only be capable of delivering a fraction of that if all ports are active simultaneously. Unfortunately, the bandwidth rating is often a very difficult specification number to find.

The wired Ethernet adapter or Wi-Fi adapter in your computer or other internet-connected devices may also be a G, N, or AC capable type with its own specifications for speed. For the last several years, computers have included wired adapters rated 1000 Mbps. The ratings for Wi-Fi adapters vary greatly, as does their antenna's capability to send and receive signals over distance. For example, the 5 GHz adapter in the laptop I am using connects to the router at 390 Mbps at a distance of about 20 feet. An external USB 3.0 Wi-Fi adapter I recently tested connects at over 700 Mbps from the same distance. For those with 1000 Mbps internet service, the Ethernet cable used for wired connections can limit achievable speeds. It will generally be necessary for cables over a few feet in length to use CAT 5e or CAT 6 cables to obtain maximum speeds.

Ultimately, the most interesting number is the speed we can actually get at our computer or device. The speedtest.net (www.speedtest.net) website is often used to test the speed between your device and a selected server on the internet. For the most accurate test, other background tasks that could be connecting to the internet should be temporarily halted. Also, note that the site recommends using their app for testing connections rated 100 Mbps or more instead of the browser version. I have tested both ways on my 1000 Mbps capable internet service, and the browser version showed 394 Mbps compared to over 900 Mbps with the app. Real-world connections can be much slower than the test speeds because of the load on the servers for a particular website you are connecting to. Using a VPN service also generally results in slower speeds.

Lab Monitor Schedule

The Open Lab session is held once per week: 9 am to noon on Saturdays.

November	Monitor Schedule
Jeff Southwell Linda McMullin	Saturday 11/6/2021
Fred Cohen Ann Warhaftig	Saturday 11/13/2021
John Zuzich	Saturday 11/20/2021
Marilyn Gramms	Saturday 11/27/2021