



OTTAWA

PC NEWS



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& Computer User Groups

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MERRY CHRISTMAS!
SUPER JUMBO HOLIDAY EDITION



Run a Chatbot on Your PC by Alan German

We have heard a lot about artificial intelligence (AI) and large language models (LLM) recently and most of us will have tried one of the available web-based chatbots such as ChatGPT or Perplexity AI. Some chatbots require a subscription while others are free, but who knows how long free chatbots will remain free? The other issue is the massive amounts of electrical power that AI is using globally to answer everyone's questions. So, is there any viable alternative to big-AI?

One thing that stands out in my mind is that most chatbots know "everything". I can ask just about any question and the chatbot will have an answer (good or perhaps not so good!) But, suppose all I want is access to a specialized knowledge base. Is there a small bot that could provide relevant information on a single topic?

For example, I'm interested in programming in Python but don't know much about the specifics of that language. Currently, I conduct searches on Google to locate code snippets and then string these together with coding elements that I do know in order to create a working program. I can often improve on this technique by asking ChatGPT to write some code for me. But, wouldn't it be nice if I could find a small bot that speaks fluent Python

and, even better, would run locally on my PC?

I had seen a video on the *Gary Explains* YouTube channel on running LLM's on a PC and even on a Raspberry Pi (<https://www.youtube.com/watch?v=pevdZpHD9F8>) so thought it would be worth trying this on my laptop equipped with a fourth-generation, 2 GHz, Core i7 CPU, 16 GB of RAM, and a 250 GB SSD.

One of the engines used by Gary Sims was Ollama (<https://ollama.com>), an open-source project designed to run LLM's locally. I downloaded and installed the Windows (Preview) version as OllamaSetup.exe. The installation completed with no obvious evidence that anything had happened. A note in the developer's blog indicated that "Ollama's API automatically runs in the background". And, sure enough, a small llama icon was hiding in "Show hidden items" on the Windows task bar confirming that the software was active.

The next task was to identify a LLM to run using Ollama. A query to Perplexity AI for an open-source LLM that was specific to programming in Python provided several suggestions from which I selected the python-specific version of codellama (<https://ollama.com/library/codellama:python>).

This is the smallest of the available models, being based on seven billion parameters, and so is perhaps best suited for a PC.

A further note in the Ollama blog indicated "...open your favourite terminal and run ollama run llama2 to run a model." And, indeed, the listing for codellama-python on Ollama's website provide the command `ollama run codellama:python` to run the python-specific model selected. Processing this command took approximately 15 minutes and ended with a message indicating success (Figure 1).

(Continued on page 5)

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Next Meeting: **WEDNESDAY, December 11th, 2024**

Next Meeting

Wednesday, December 11th, 2024

Topic: [Encryption Software](#)

Speaker: Mark Schulman, IT manager

How can you prevent your private data from leaking out into the world? Losing a flash drive, having your laptop stolen, or having someone spy on your email doesn't have to mean that the bad guys see your private information. Learn how to use encryption software to protect your private data on PCs, laptops, external hard drives, USB flash drives, and even smartphones. Topics include:

- single-file encryption
- encrypted containers
- whole-drive encryption
- smartphone encryption

The presentation demonstrates several free software apps that make encryption easy to use for anyone.

Mark Schulman has spent his career as a computer instructor, software designer, and small business owner. He has taught a wide range of programming courses for major corporations and worked on large software development projects. He is currently the IT manager for a group of family practice physicians. His major geek interest these days is the computer technology that brought about the moon landings in the 1960s. He lives near Orlando, Florida.

This meeting will be via Zoom video conference.

Join us at <https://tinyurl.com/opcug-meeting>. The Zoom link will be live at 7:15 pm. The meeting will begin at 7:30 pm.

The above link includes the meeting ID and password. However, if you are prompted for the information, use:

Meeting ID: **924 9556 0898**

Password: **opcug**

Coming Up...

November 27

[Weekly Q&A Session](#)

December 11

Topic: [AI Showdown](#)

Speaker: Bob Herres, OPCUG

January 8

Topic: [How to buy a PC](#)

Speaker: Chris Taylor, OPCUG



Visit <https://opcug.ca/#upcoming> to see all scheduled events.

OPCUG presentations at the OPL:

Monday, 25 Nov, 6:00 pm - 7:30 pm

Quick PC Tips: Enhancing Capabilities and Performance with Free Tools (Chris Taylor)

Carlingwood Branch

Thursday, 28 Nov, 6:00 pm - 8:00 pm

How to buy a PC (Chris Taylor)

Rosemount Branch

Monday, 02 Dec, 6:00 pm - 8:00 pm

How to Secure a home wireless network (Chris Taylor)

Centennial Branch

Saturday, 07 Dec, 2:00 pm - 4:00 pm

Whoa, backup! Effective strategies for keeping your computer files safe (Chris Taylor)

Cumberland Branch

Tuesday, 17 Dec, 6:00 pm - 7:00 pm

Armchair travel: Newfoundland (Lynda Buske)

Orleans Branch

Visit <https://opcug.ca/mec-category/opl-presentations/> for the full list of OPL presentations.

2024 CALENDAR

Event	Date	Time and Venue
Next Monthly Meeting	Wednesday, December 11 th	7:30 pm via Zoom video conference: https://tinyurl.com/opcug-meeting To see all scheduled events, visit https://opcug.ca/#upcoming
Next Q&A Session	Wednesday, November 27th	Until further notice, Q&A sessions are no longer held after regular monthly meetings. Join us on all other Wednesdays at 7:30 pm for weekly Q&A .
Next OPL Presentation	(see Upcoming Events)	Visit https://opcug.ca/mec-category/opl-presentations/ for the full list of OPCUG presentations at the OPL.

CLUB LIFE

OPCUG wins 1st and 3rd places in APCUG contests

In August, the APCUG launched their annual eBulletin, Newsletter, and Website contests. Contestants from the USA, Canada, and Australia were eligible to participate. Winners were announced at their AGM on November 9.

Our club entered all three contests and won 1st place in the Website category. Our Q&A poster won 3rd place in the eBulletin category. Our newsletter did not place, but we intend to participate again next year.



Winner, Best Website 2024



3rd place (eBulletin)

We thank Lawrence Patterson whose idea it was to upgrade our old website to a shiny new WordPress site. It was launched in March 2020, maintained by Brigitte Lord with help from Alan German who maintains the Q&A section and Chris Taylor who posts the OPL presentations in our Events calendar.

Our Q&A poster was created with content provided by Alan German.

The APCUG posted all contest entries [here](#) and all winners [here](#).

Nominations for OPCUG Board for 2025

Once a year, the OPCUG holds elections for the 9-member Board of Directors. We are once again coming up to this annual event.

We encourage all members to consider running for a board position or getting involved in some other manner in the operations of the OPCUG.

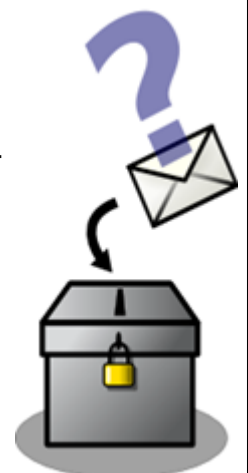
If you want more information about what is involved, please talk to me or any current or past Board member. Names are listed on the back page of the Newsletter and on the [website](#).

Nominations can be submitted via email to Lynda Buske, Election Chair, at nominations@opcug.ca.

Nominations must be received by midnight, December 31, 2024.

Please get involved. Please help the OPCUG continue in its role of *Users Helping Users!*

Lynda Buske
Election Chair



CLUB LIFE

Quick Tip 68: OPCUG's Q&A sessions

by Chris Taylor

While the OPCUG hosts a general meeting on the second Wednesday of the month (except July and August), on every other Wednesday at 7:30 PM, we host an hour-long Q&A session.

OPCUG's motto is *Users helping users*. Q&A is arguably the most comprehensive way we all can fulfill both sides of the motto.

Did you ever come across something you think others in the OPCUG can benefit from such as a program, a configuration setting, an interesting website, a service, etc.? Conversely, have you struggled with a problem on your computer that you think another OPCUG member might be able to help with? Or maybe you don't know what you don't know and are interested in hearing both sides of the equation—problems and solutions—others have encountered.

Come on out on Wednesday evenings and be part of it all. It might just be the most valuable way you can spend the hour. Join using the link <https://tinyurl.com/opcug-meeting>. For details, see <https://opcug.ca/qa/>.

OPCUG



Users helping users
for over 40 years

One editor's filler for the dreaded white space

by Brigitte Lord

Below is how Henry Winokur, editor of PATACS Posts (newsletter of patacs.org), took care of a problem he encountered in reprinting one of Alan German's articles (as seen on page 10 in their [October issue](#)). Thank you, Mr. Winokur, for the laugh (beautiful tree notwithstanding) and Alan for bringing this to my attention.

account on the system or login using an established Google account. Once logged in, one enters a request as a string into a text box. My request was "Write a program in LibreOffice Basic to add a string to the end of an odt file."



Sorry for the interruption, but this gigantic white space needed filling and the article is formatted in such a way as to be impossible to arrange things otherwise.

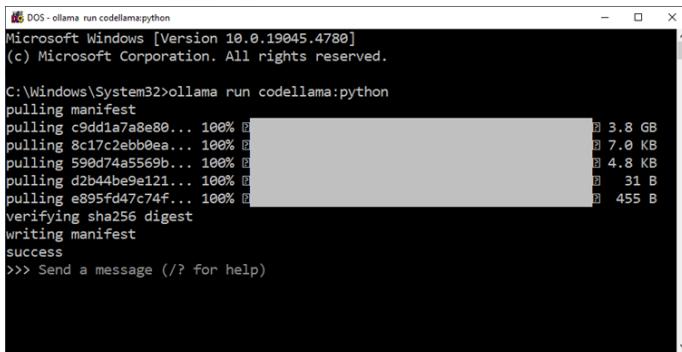
The article continues on the next page...

Image exposure info:
Canon R5: ISO 200,
1/160ths, f/5.6
Canon RF24 -105 f/4
L IS USM: 72mm



I've placed a few white space fillers myself in this issue. Christmas definitely lets you do this more subtly (and my white spaces weren't quite as big).

BL

Chatbot *(Continued from page 1)*


```

Microsoft Windows [Version 10.0.19045.4780]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\System32>ollama run codellama:python
pulling manifest
pulling c9dd1a7a8e80... 100% 3.8 GB
pulling 8c17c2ebb0ea... 100% 7.0 KB
pulling 590d74a5569b... 100% 4.8 KB
pulling d2b44be9e121... 100% 31 B
pulling e895fd47c74f... 100% 455 B
verifying sha256 digest
writing manifest
success
>>> Send a message (/? for help)

```

Figure 1. Installation of the codellama:python model in Ollama

To initially test the capabilities of the local LLM, a simple programming task was selected to compare the lines of text in two files. The contents of the two text files were as follows:

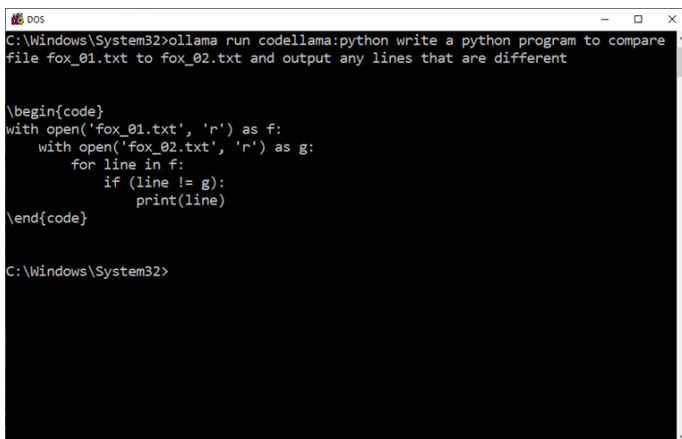
fox_01.txt

The quick brown fox
jumped over the lazy dog

fox_02.txt

The quick brown fox
jumped over the extremely lazy dog

Specifically, the command entered into the terminal was:
ollama run codellama:python write a python program to compare file fox_01.txt to fox_02.txt and output any lines that are different. Processing this command took only two minutes and resulted in the Python code shown in Figure 2.



```

\begin{code}
with open('fox_01.txt', 'r') as f1:
    with open('fox_02.txt', 'r') as f2:
        for line in f1:
            if line != f2.readline():
                print(line)
\end{code}
C:\Windows\System32>

```

Figure 2. Python code generated by the local LLM

Copying and pasting the Python code generated into a text file named fox.py allowed this file to be opened and run in the PyCharm integrated development environment. The results are displayed in Figure 3.



```

Run Difffox x
C:\Users\toaster\PycharmProjects\FoxDiff\.venv\Scripts\python.exe D:\Difffox.py
jumped over the lazy dog

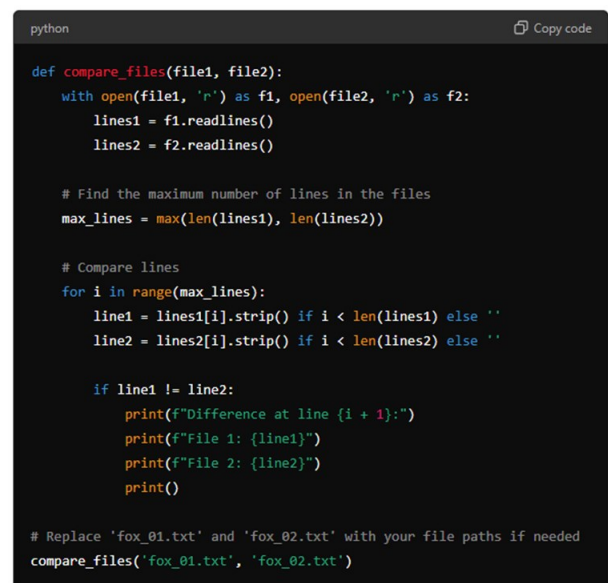
Process finished with exit code 0

```

Figure 3. Output from the Python program generated by the LLM

The results were totally consistent with the Python code that had been generated although not entirely so with the precise nature of the task set for the LLM model. The code specifies that if a line in file_01.txt is not present in file_02.txt then this line is to be displayed. Hence we see “jumped over the lazy dog”, the line in the first file that is different to the line “jumped over the extremely lazy dog” that is contained in the second text file. However, the command to generate the code was “...output any lines that are different” [note the plural “lines”], implying that any lines in either file that are different should be output.

Indeed, when the same programming task was repeated in ChatGPT, a much more comprehensive program was returned (see Figure 4). This code opens both files and copies their contents into arrays. The program then loops through the lines of the two files, using the maximum number of lines in either array as a boundary condition. If a line in one file is identified as being different from that in the other file then both associated lines are displayed. So, for this program, both of the lines “jumped over the lazy dog” and “jumped over the extremely lazy dog” are included in the output (Figure 5).



```

python
def compare_files(file1, file2):
    with open(file1, 'r') as f1, open(file2, 'r') as f2:
        lines1 = f1.readlines()
        lines2 = f2.readlines()

    # Find the maximum number of lines in the files
    max_lines = max(len(lines1), len(lines2))

    # Compare lines
    for i in range(max_lines):
        line1 = lines1[i].strip() if i < len(lines1) else ''
        line2 = lines2[i].strip() if i < len(lines2) else ''

        if line1 != line2:
            print(f"Difference at line {i + 1}:")
            print(f"File 1: {line1}")
            print(f"File 2: {line2}")
            print()

# Replace 'fox_01.txt' and 'fox_02.txt' with your file paths if needed
compare_files('fox_01.txt', 'fox_02.txt')

```

Figure 4. Python program generated by ChatGPT

(Continued on page 7)

THROUGH THE LENS

A guide to digital photography for computer enthusiasts. After the click of your camera, you're only half done!

Shooting the Northern Lights

by Lynda Buske

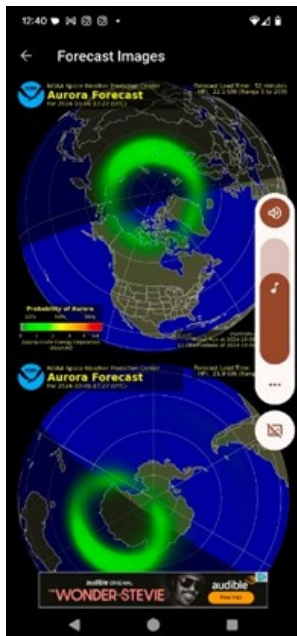
While not an everyday event, the aurora borealis (northern lights) do appear every now and then in the Ottawa area, typically in late summer or fall/winter season. But it certainly can vary from year to year. This article contains a few tips based on my rather limited experience of how to shoot this wonderful phenomenon if you get a chance.

So how do you know when the northern lights are going to appear? Well, sometimes you will hear it on the news or from photography groups via social media but there are free apps that you can download onto your phone to see what chance there is for seeing the northern lights in your area. For example, I use one called **My Aurora Forecast & Alerts** and it can be downloaded from either the Google Play store or the Apple store:

https://play.google.com/store/apps/details?id=com.jrustonapps.myaauroraforecast&hl=en_CA

<https://apps.apple.com/us/app/my-aurora-forecast-alerts/id1073082439>

Below is a screenshot from the app:



Or you can check out websites such as the one below:

<https://www.swpc.noaa.gov/products/aurora-30-minute-forecast>

You may wish to use the app in conjunction with a comprehensive weather app since the appearance of the northern lights doesn't guarantee good photo ops if there are clouds obliterating your view.

To set up your shot, leave the city limits and find a place with a dark star-filled sky. I would suggest setting up at least 15-20 minutes past the city limits in a lowly populated area. [Light pollution filters are available which may help].

To include a lot of sky, use a wide-angle lens or set your zoom lens to its shortest focal length. If possible, include interesting foreground and background such as trees, mountains or a shoreline to add interest just as you would with a sunrise/sunset photo. Make sure these objects of interest are not moving since you will probably be using a long exposure to shoot such a dim scene. If you want to include a person, ask them to stay still for the duration of the exposure.

If you are shooting with a traditional camera (DSLR, mirrorless, or bridge) and the northern lights are bright, you probably only need 5 seconds but if they are slow moving or faint you may wish to expose anywhere from 10 to 25 seconds. Beware though that super long exposures may cause the stars to show trails. Make sure your EV adjust is set to -2 or -3. You can adjust your aperture to get the exposure time you desire. You do not need to set your ISO low to get long exposure times but you may want to keep it fairly low to reduce noise in your image. Either of these adjustments tells your camera that you do not want a bright sky.

Unfortunately, this year, I have not been lucky enough to catch the northern lights locally but our club president, Chris Taylor, did at Shirley's Bay (see below).



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Read all of Lynda's articles [here](#). See her [presentations](#) at the Ottawa Public Library (select **Lynda Buske as Organizer**).

Northern Lights *(Continued from previous page)*

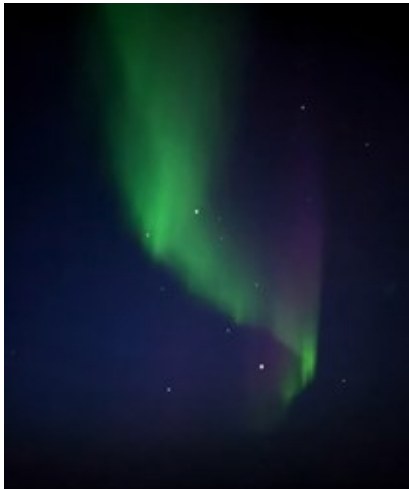
I did, however, have the opportunity to shoot some in Norway in September. They are not guaranteed at that time of year but certainly in the winter months you would definitely have the opportunity to see them providing you have clear skies.

Even though the northern lights did appear for me in Norway, the conditions for traditional photography were not ideal. Since I was unable to go ashore, I was limited to shooting

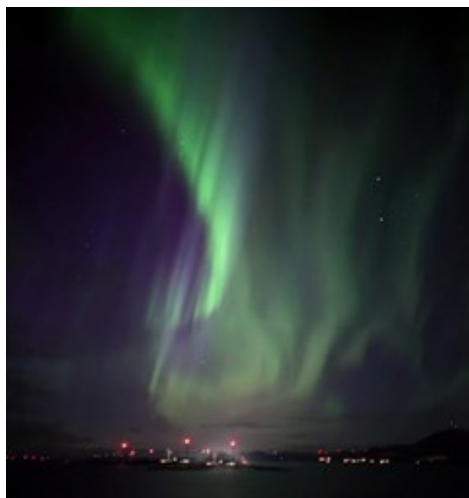


onboard a moving ship with winds strong enough to shove the camera around. Not only were we underway, the sea swells were causing a noticeable up and down motion as well. This meant the camera was in constant motion so a tripod was neither practical nor used!

Instead, I used the *Night sight* setting on my Google Pixel 6 cell phone and just hand held it. The computational creations the phone made from taking multiple images over a period of about 5 seconds resulted in some lovely souvenir images.



I made sure to include fellow passengers in a few shots to remind me of the excitement we all felt in experiencing these breathtaking skies!



Chatbot *(Continued from page 5)*

```
Run DiffFox_ChatGPT x
C:\Users\toaster\PycharmProjects\FoxDiff\venv\Scripts\python.exe 0:\DiffFox_ChatGPT.py
Difference at line 2:
File 1: jumped over the lazy dog
File 2: jumped over the extremely lazy dog
Process finished with exit code 0
```

Figure 5. Output from the ChatGPT Python program

So, what are my conclusions from this test of a Python-specific large language model running on a PC? Firstly, Ollama is really easy to install and similarly is easy to use once the terminal commands are understood. Typing *ollama help* in the terminal produces a list of the available commands but there are also many how-to tutorials and on-line videos available as additional resources. In addition, running a LLM locally is slower than using the web-based counterparts but even the small 7B model is capable of producing useful code.

Further testing of the model identified some instances of “semi-hallucination” where the module suggested importing a Python library but failed to provide any code to support its use, and also indicated the alternative use of the “diff” command that is only available for Linux and not for Windows.

I didn’t attempt to produce a complicated Python program that would likely require a very detailed and complex set of instructions. In fact, this might be better accomplished by generating specific code snippets using the local LLM and subsequently combining these into a complete program. Nevertheless, the current generation of local LLM’s shows promise and is most probably the precursor to a much faster and more powerful system at some point in the future.

Bottom Line:

Ollama (Open Source)
Version 0.3.9
<https://ollama.com>



(read all OPCUG reviews [here](#))

(back to [Table of Contents](#))

ARTICLE

Trading Up To Linux – Part 3 by Alan German

We have now arrived at that scary moment when it's time to install Linux onto our computer's hard drive. However, there is absolutely no need to be anxious about this process. I have performed such installations many times without incident. Furthermore, our method for installing Linux will maintain the option to use Windows and is easily reversible if at any point in the future you decide that Linux isn't right for you after all. We will go through the installation process step-by-step, and for those who may need even more comprehensive instructions, a complete, fully-illustrated guide is available at <https://linuxnorth.wordpress.com/installing-linux-mint-as-a-dual-boot-system/>

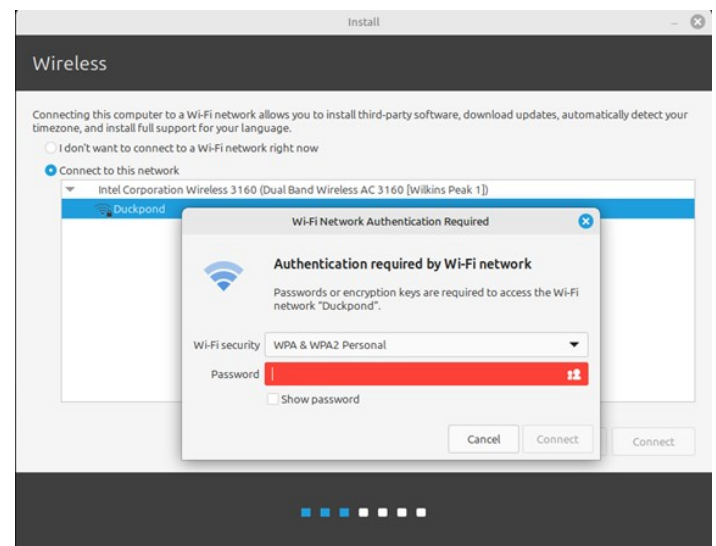
Notwithstanding the above reassurance of the ease and safety of installing Linux, we will be making significant changes to the hard drive, notably by modifying the partition structure. Consequently, our first step should be to make a full disk image backup of our system so that we can restore the disk to our starting point in the unlikely event that the installation process goes south. In any case, it's always a good idea to have a recent system backup so the process of installing Linux provides a good excuse for doing so now.

If you are not employing a specific backup strategy and want to use a conventional Windows-based backup system, take a leaf out of Chris Taylor's playbook and use *Easeus Todo Backup* (see: [Finding a Backup Program](#).) An alternative, since we now have some experience using live-USB's and the Linux OS, might be *Foxclone* (see: [Exploring Linux – Part 33 – A Backup Solution for Linux Systems](#).) Either of these programs will readily create a disk image of the entire system as a backup.

So, with our backup in hand, our first step in the installation process is to reboot the computer into the Linux desktop using our Linux Mint live-USB. But, this time, instead of exploring the menu options and trying the available applications, we will focus our attention on the top-left corner of the desktop where we will find an icon labelled *Install Linux Mint*. Not surprisingly, we are going to double-click on this icon and launch the installation process.

What follows is a series of screens in the form of an installation wizard that will guide us through the process. Most of the inputs required by the dialogue boxes will be self-explanatory. Where this might not be the case, you should find detailed explanations and screenshots in the following text. So, take a deep breath, and let's get started.

The very first screen is straightforward. It is seeking the language that is to be used by the wizard. The default selection is *English* and to accept this option it is merely necessary to press the *Continue* button in the lower-right corner of the window. The next screen is similarly easy to deal with. It presents the default option for the keyboard layout as *English (US)* which is the most likely scenario for users across North America. So, once again, we can simply press *Continue*.



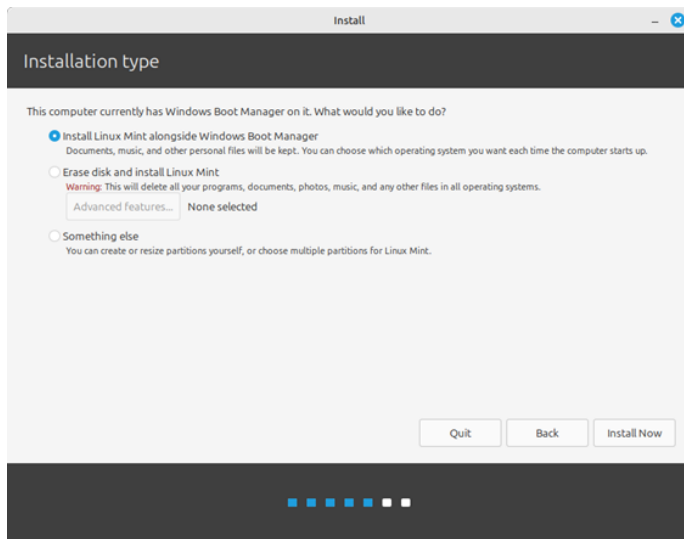
Now, we come to our first real choice. The screen entitled *Wireless* gives us an option to connect to our local W-Fi network. My strong recommendation is to select the entry for your specific network (as I have done for *Duckpond*). Click on the radio button labelled *Connect to this network*, and press the button labelled *Connect*. A pop-up dialogue box now requests your Wi-Fi password and activates a second *Connect* button. Pressing this button returns us to the initial screen where we can finally press the *Continue* button. This process establishes Wi-Fi connectivity that can be accessed as part of the installation process but, more importantly, provides the information that enables the installed version of Linux to automatically connect to the local Wi-Fi network on each subsequent bootup.

Now that we have established Wi-Fi access, we can select the option on the next screen to *Install multimedia codecs*. This will allow our Linux system to play audio and video files that require encoding systems that are not in open formats. Most of us will not have any reservations about using software that is not solely open-source (we have been Windows users after all!) and will be happy to simply press *Continue*.

(Continued on next page)

Linux *(Continued from previous page)*

Now, an information screen pops up that asks if we want the Linux installer to try to unmount disk partitions that are in use and will probably indicate that the disk is something like `/dev/sdc`. It won't be obvious to those currently unfamiliar with Linux that this is actually referring to our live-USB drive. On my system, the devices (dev) in use are `sda` (my main hard drive), `sdb` (an SDcard used for backup), and `sdc` (the USB flash drive with the Linux software). The displayed text is noting that, if the USB drive is left mounted we may be able to create additional partitions on the drive. Since we have no need to do this, the simple option is to press the **Yes** button and have the installer unmount the drive. The software required to complete the installation has already been read into memory so we have no need for the live-USB drive to remain mounted.



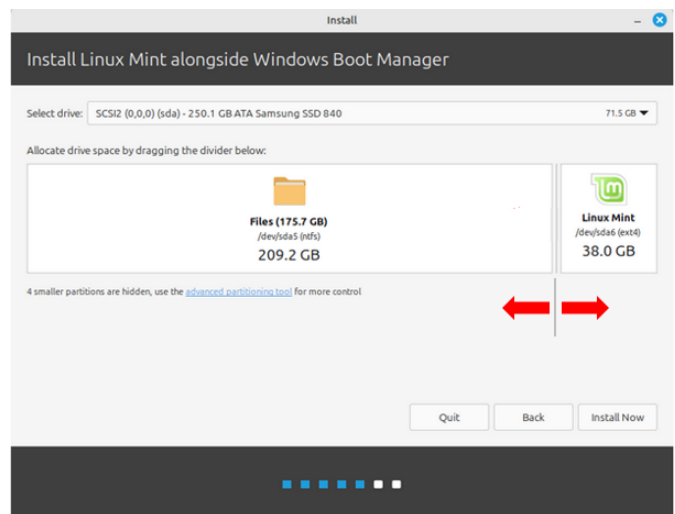
The next screen determines how Linux will be installed on our hard drive. The default entry is to *Install Linux Mint alongside Windows Boot Manager*. This is the option that we wish to use as it will automatically shrink the Windows partition, create a new partition in the free space, and install Linux in this new partition.

*As a note of caution, **do not select the second option** to Erase disk and install Linux Mint since, as the warning note indicates, this will delete Windows and all your files on the hard drive. You definitely do not want to do this!*

So, press the **Install Now** button. This will result in a new screen with a graphical representation of how the Windows and Linux disk partitions are going to be sized. The installer will make a choice of how to split the existing Windows partition but this may be changed by simply sliding the divider between the two partitions, to the left to create a larger Linux partition, or to the right to maintain more space for Windows.

Note that if the partitioning scheme on your hard drive is more complex than that for a simple installation of Windows, you may not have the option to split the partitions as shown. In this case you may need to partition the drive manually. See [Manual partitioning revisited](#) for a description of this process.

Linux Mint will run easily in a 20 GB partition and, in my case, the installer has chosen to make the new partition almost twice as large at 38 GB. Note also that the Windows partition will be shrunk to about 210 GB. The used space on this partition is currently about 176 GB so there will still be 34 GB of free space available for use in Windows. As a first option this all sounds quite reasonable and, in any case, the partition sizes can always be adjusted should this become necessary at some point in the future.



Next, we see two further warnings. Firstly, the installer reminds us that the changes to the disk partitions must be made and that this cannot be undone. Clearly we need to allow the new partition scheme to be established in order to create our dual-boot, Windows-Linux system. This process cannot be undone by the installer but we have our disk image backup that we can use to restore our original setup should anything go wrong (which it won't!) Pressing the **Continue** button pops-up a second reminder informing us that changes will be written to the disk. In this case, the bottom line will be something to the effect that "The following partitions are going to be formatted: partition#6 of `SCSI2 (0,0,0)(sda)` as `ext4`" This is simply telling us that the new Linux partition (Partition No. 6) on our hard drive (designated as `sda`) will be formatted using the Linux `ext4` file system. Once again, this is something that needs to happen, so press **Continue** to allow the changes to the partitions to take place.

(Continued on next page)

Linux (Continued from previous page)

A map of the world is now displayed asking *Where are you?* The highlighted zone is likely to be labelled *Toronto* but there is no need to change this (and there is no option to select Ottawa!) The installer doesn't want to know the geographical location; it's actually going to set the appropriate time zone. The highlighted area of the world is the Eastern Time Zone which, for us, is correct. So, no changes are necessary, we can simply press *Continue*.

The next screen, labelled *Who are you?*, has several blank text boxes that we need to complete. Enter your name (first name, full name, or a pseudonym is perfectly fine) and the installer will populate the next field with a suggested computer name. The entries to all of the data fields are totally flexible so make these names whatever you prefer.

Next, we need to enter a username and password to use as our login credentials. Note that the username must begin with a lower-case letter, otherwise an error message will pop up indicating "*Must start with a lower-case letter.*" Choose a username and password that make sense to you, and make a note of the parameters selected. The password, in particular, will be required both for logging in to Linux and also for any command that needs authorization (in much the same way as required by the Account User Control system in Windows).

The final options on this screen are radio buttons for the login method and a checkbox to encrypt the home folder in the Linux filesystem. My recommendation, and my practice, is to accept the default entry to *Require my password to login* and to leave the box labelled *Encrypt my home folder* unchecked.

That completes the data entry process. Press the final *Continue* button and a series of information screens is displayed as the installation proceeds. There are also a series

of messages and a progress bar displayed along the bottom of the window. You can scroll through the information screens, using the left and right arrows at the edges of the window, or simply let the installer run to completion.

On my computer, this part of the installation process took about ten minutes. I was then presented with a pop-up dialogue box indicating that the installation had finished with control buttons to either *Continue Testing* or *Restart Now*.

We have already used the live-USB to test Linux on our computer so, now it's time to take the final step and press *Restart Now*. The computer will reboot, but now will display the GRUB (GRand Unified Bootloader) menu, essentially offering the choice to boot into either Linux or Windows. The default boot sequence is Linux; however, there is a 10-second delay before the computer boots into the default OS. At any time during the countdown, the arrow keys can be used to select another menu option. The other option of choice is likely to be to boot into Windows which, for my computer, means selecting the option for *Windows Boot Manager (on /dev/sda1)*.



We have now installed Linux in a new partition on the hard drive of our computer, while maintaining the Windows operating system and its associated files in the original partition albeit with a somewhat reduced size. The grub menu allows us to easily boot into either of the two operating systems so we have successfully created a dual-boot environment. The next step will be to update the Linux software and start to customize the OS to suit our requirements. But, that will have to wait for the next installment in the present series of articles.



APCUG

Starlink – It may be in your future

By Phil Sorrentino
Secretary & Newsletter Contributor
Sun City Center Computer Club
<https://sccccomputerclub.org/>

Starlink is a satellite constellation built and operated by SpaceX, currently providing satellite internet access coverage to over 53 countries. Starlink is the world's first and largest satellite constellation using a Low Earth Orbit to deliver broadband internet capable of supporting streaming, online gaming, and video calls. Starlink will become a critical element in the client-server technology used by the internet in many areas worldwide.

Client-server technology is the network architecture that connects our devices to powerful Servers at the far ends of the country and, in some cases, the world. The internet provides this connection, so the devices and servers appear close in adjoining rooms. To make this a reality, the internet connection must be high-speed. This type of internet connection is called a low-latency connection. A connection that is so fast that a message might go from New York to Los Angeles and back in less than .1 seconds (100 ms). Starlink can deliver high-speed, low-latency internet to users worldwide, though it may be a little expensive now.

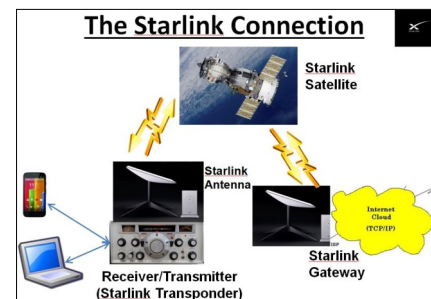
To take advantage of the Servers on the internet, our devices (computers, smartphones, tablets) must be able to connect. Ei-

ther of the two mechanisms traditionally does this. If you are stationary, typically in a building, you can connect to the internet through your Internet Service Provider and more than likely connect via a wireless wi-fi network. If you are moving in a vehicle, you can connect through your Wireless Internet Provider via the Cell Towers in all major populated areas and along most major highways in the US. Access to the internet is excellent in the US. Ninety percent of the people in the US have an internet connection available to them. New Jersey and Connecticut have the best broadband coverage at about 99%. As expected, the major cities, Washington DC, Philadelphia, San Francisco, and New York, have the highest internet participation. But the rest of the world is not covered very well. Europe has a participation rate of about 90%, but the numbers are much lower for underdeveloped countries like India at about 48% and China at about 70%. With all things considered, worldwide internet participation is reported to be about 60%, which leaves a large population without access to the internet.

The Starlink satellite constellation currently has around 4,500 satellites and will eventually have around 12,000. They will cover most of the earth, providing an internet connection to any site with a direct view of the satellites as they pass overhead. Think of the satellites as Cell Towers in the Sky.



The Starlink satellites are in Low Earth Orbit (LEO), about 340 miles above the earth, and have a speed that creates a 90-minute orbit around the planet, about 17,000 mph. When the constellation is entirely built out, a satellite will be accessible by almost every place on the earth. A device will send/receive data to/from the internet via the Starlink Transponder, overhead satellite, other satellites, and finally, the Starlink Gateway (Ground Station). The connection of the Starlink transponder to the overhead satellite will continue until the satellite moves out of view and another satellite comes into view. At this time, the connection from the transponder will switch to the new satellite, and the data flow will continue.



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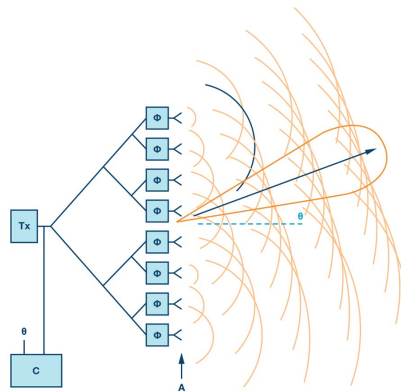
Starlink *(Continued from previous page)*

The Starlink Transponder controls tracking the satellites when they are in view and switching the data stream to a new satellite. The heart of the transponder is a sophisticated computer-controlled phased array antenna system.

Phased array antennas are a key component of the Cell Tower Communications systems we use as we travel on the Interstate highway. The phased array antenna was invented by Karl Ferdinand Braun in 1905. The initial experimental antenna was a three-element array that transmitted a beam whose direction could be aimed electronically in 3 specific directions, 120 degrees apart. The military experimented with phased arrays in the 1970s, the first industrial phased array systems were introduced in the 1980s, and Cell Tower antennas appeared in the 1990s. Today's phased array antennas have large numbers of elements and can form several very narrow beams and steer them independently in very small angle increments. The technology behind phased array systems is steeped in the propagation of electrical energy from Gauss's laws for static electric and magnetic fields to Maxwell's equations that relate electric and magnetic fields to each other. It is a collection of technology concepts that would make Nikola Tesla proud.

Just a little technical talk. A phased array antenna is a collection of antenna elements assembled such that the radiation pat-

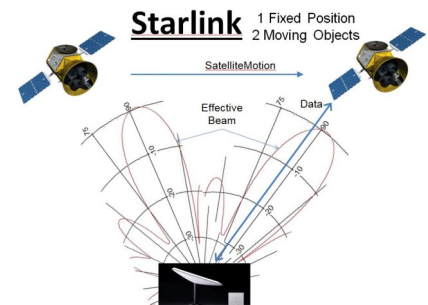
tern of each element constructively combines with neighboring antennas to form an effective radiation pattern called the main lobe. The main lobe transmits radiated energy in the desired direction, while the antenna is designed to destructively interfere with signals in undesired directions, forming nulls and side lobes. The antenna array is designed to maximize the energy radiated in the main lobe while reducing the energy radiated in the side lobes to an acceptable level. The radiation direction can be manipulated by changing the amplitude and phase of the signal fed into each antenna element.



Phased Array pattern showing antenna elements creating a central lobe.

As we travel down the highway, the closest cell tower tracks us with a phased array antenna that allows us to connect to the internet. The tracking allows the Cell Tower System to transition a vehicle to the next Cell Tower in the direction the vehicle is moving, thus allowing the communications to continue uninterrupted as the vehicle is handed off from cell tower to cell tower. This is all coordinated

using the phased array antennas on the Cell Towers.



This cell tower hand-off is similar to the hand-off used to transition from one satellite to another as the satellites move in the sky. The phased array antenna in the Starlink Transponder tracks the satellites and coordinates the hand-off when needed so that the communications continue without interruption.

Starlink is an enormous project that combines many technologies to hopefully provide global access to the internet so that we all can take advantage of the Servers at the other end of the internet, just as if they were in the adjoining room. It may just be in your future.



APCUG

Does the Control Panel still exist?

By Phil Sorrentino
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Good question. When Settings appeared in Windows 8 in 2012, it looked like Microsoft may have been laying the groundwork for moving most of the Control Panel features over to Settings. That may be true, but here we are, eleven years later, and the Control Panel still exists. The control panel exists along with the settings in Windows 10 and 11, though the organization of each changes slightly compared to Windows 10 and 11.



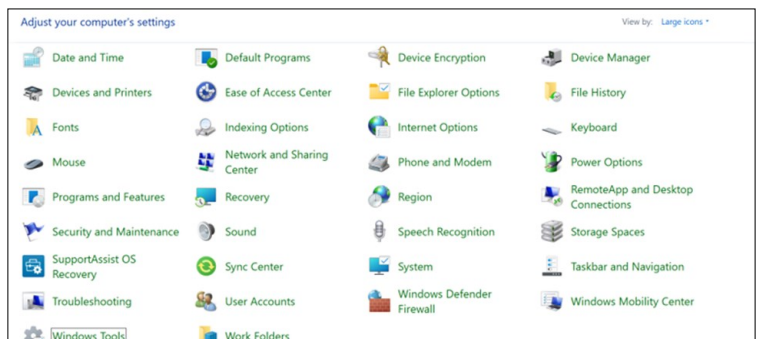
So, how did we get here? Just a little history. Our very old friend Control Panel has been part of Microsoft Windows since version 1.0. Each of the early versions introduced new Applets (small software applications). Being much younger, the Settings App was first released with Windows 8. In Windows 8, the “PC Settings” App was designed as a simplified area optimized for touchscreen devices. It included a small portion of Control Panel functionality on a two-panel full-screen interface. Windows 8.1 improved the Settings App by including capabilities previously part of the Control Panel and providing a redesigned organization. It also added a small “Control Panel” link at the bottom of the left panel to allow users to open the Control Panel. Unfortunately, that helpful link did not remain in later generations of Settings. (However, you can always get to the Control Panel by typing “Control” into the search bar in the taskbar.) Settings categories change with each generation released. In the first generation Settings App, the categories were: PC and Devices, Accounts, OneDrive, Search and Apps, Privacy, Network, Time and Language, Ease of Access, Update and Recovery, and finally Activate Windows (which shows up only if Windows isn’t activated).

The second generation of the Settings App was included with all releases of Windows 10, 2016, 2019, and 2022. It included more capabilities that were previously parts of the Control Panel. Windows Update, part of the Control Panel before Windows 10, was now exclusively a part of Settings. This second version brought some changes to the categories. It contained the following: System, Devices, Phone, Network & Internet, Personalization, Apps, Accounts, Time & Language, Gaming, Ease of Access, Search, Cortana, Privacy, Update & Security

and finally Mixed Reality (but only if a connected device meets HoloLens requirements).

The third generation of the Settings App is found in Windows 11. This version has been significantly redesigned with a new layout and updated icons. (A persistent navigation sidebar has also been added, providing links to various settings capabilities within the App.) The Windows 11 Settings App now contains the following categories: System, Bluetooth & Devices, Network & Internet, Personalization, Apps, Accounts, Time & Language, Gaming, Accessibility, Privacy & Security, and Windows Update.

The control panel is not apparent or easily found on Windows 10 or 11. If you don’t have the Control Panel icon on your desktop, you can use the Search bar on the taskbar to find it. (Though it doesn’t seem obvious or intuitive, in either Windows 10 & 11, if you want to put the Control Panel icon on your desktop, go to Settings-Personalization-Themes, select “Desktop icon settings,” and then check the box next to Control Panel and click Apply.) Control Panel seems to be relegated to the background in Windows 10 and 11. Though there are some differences, once you get to the Control Panel in either version, it seems to work just about the same.



Windows 11 Control Panel

“Settings” is much more prominent than Control Panel on Windows 10 and 11. On Windows 10, Settings is immediately available after the Start button is left-clicked. (See the gear icon?) If you right-click the start button, you will also see an entry for “Settings” in the menu. Either method gets you to the same Settings App. On Windows 11, the Settings (gear) icon is probably in the Pinned area of the start menu. If you don’t see it there after you left-click the start button, it might be on a second-level display of the Pinned icons. If there are two dots on the right side of the display of icons, click the smaller one (or the arrow that appears when you hover over the dot). That will reveal another group of “Pinned” icons. If it is there, you are set. If it is not present, click “All apps >” and you will see it in the “All apps” alphabetical list. Right-click Settings and click “Pin to start,” it will be easier to find the next time you need it. You can also click

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APCUG

To Charge or Not to Charge? (That's Only One of Many Questions)

President's Corner
by Greg Skalka, President
Under the Computer Hood User Group
<https://www.uchug.org/>

We have many batteries in our lives because we use a lot of battery-powered technology. Of all those devices, big and small, the one battery-powered device that almost every person has at this point in human civilization is the smartphone. Even in developing countries where water distribution and sanitation systems are woefully lacking, cell phone infrastructure is often very robust and advanced.

Over 8 billion people live on the planet today. Around 7 billion smartphones and approximately 16 billion mobile devices make these devices a shared human experience. From the migrant or homeless person to the CEO, from whatever ideology, religion, political tribe, gender, or gender identity we may be part of, we are all the same in one way: we are all out there looking for a place to charge our phones.

I've written a few columns recently about the wide range of battery-powered devices we use and how to care for them: small battery devices (like electric toothbrushes and earbuds) and medium-sized battery devices (like laptops, hand tools, and smartphones). Being a near-universal device, the smartphone needs a bit more elaboration on its charging. It is unique in that it is almost always on; I doubt anyone turns their phone off (entirely powered down) at night. Nothing else we use is depended on for so much.

I used to think that charging battery-powered devices was fairly straightforward. All you had to do was pick an inactive time, plug the device into a wall-powered charger until it was fully charged, and you were ready to go

again. Most devices weren't run so much that you regularly ran out of power when using them. A spare battery could keep you going for those devices where that could be an issue. I bought two extra batteries for my Panasonic Lumix digital camera to make sure photo-taking could last all day on my vacation trips. I have two battery packs for my DeWALT cordless drill, so I don't run out of power in the middle of a day of home improvement.

Some devices are designed to be on continuous charge when not being used. Our Roomba floor vacuum stays parked on its charging base when not cleaning. My Braun electric toothbrush and hair trimmer are stored in their charging cradles. It may not be the best for its battery, but I always keep my HP laptop plugged in (I use it like a desktop computer and only occasionally run it on the battery).

Our phones are not like these devices; we need them to be on all the time. We use them a lot, and we take them everywhere. Tethered operation won't work; we generally can't swap batteries, and though we can power and charge from a USB battery pack if needed, this typically limits our mobility.

When my wife and I had ordinary cell phones, we usually charged them overnight every night. After I got my first smartphone, a Samsung Galaxy J3, in 2017, I did the same. I believe I always used the AC charger (with USB output) and cable that came with the phone. I used this phone for five years (and still have it); the battery seemed to work pretty well during that time. Ultimately, it may have been down about 20% in usable capacity, but that was not the primary reason I looked for a replacement. My old phone could no longer run all the apps I needed, so in mid-2022, I got a Samsung Galaxy S22. Its battery seemed to last longer,

but it was probably larger and more advanced. I initially charged it overnight with the charger and cable that came with it.

The battery management system (BMS) of the S22 is undoubtedly more sophisticated than the one in the J3. The S22 displays time and battery capacity remaining (as a percentage of full charge) with a single screen tap (though it is dimmed in intensity, making it harder for old eyes to read). It can also operate in fast charge mode. When charged from a typical USB source (charger or battery pack), it displays "Charging," along with the charge level and an estimated time remaining to full charge. At 64% full, it might indicate it would take 1 hour and 15 minutes to full level. When charged from a charger or battery pack capable of fast charging, the phone displays "Fast charging," the equivalent fill time estimate might be shown as 37 minutes.

My ideas about charging overnight changed after reading the article "Recharging your Battery" by Kurt Jefferson, editor of the newsletter for the Central Kentucky Computer Society (<https://ckcs.org>), which was republished in our group's November 2022 newsletter. The thrust of this APCUG PUSH article is that the batteries in smarter products should only be charged to between 40% and 80% of capacity, not left to be charged to 100% overnight, as many folks do. The main reason stated was the problem of additional heat from being on the charger all night. I have read other articles and heard from others who are adamant about the need to charge 40-80% to prolong battery life.

One problem with the 40-80% method is that it is much less convenient. It is easy to plug your phone in at bedtime and unplug it in the morning, knowing

(Continued on next page)

To Charge or Not? *(Continued from previous page)*

you now have a full charge for the day. Charging to a specified charge level means watching the phone while charging; I'm unaware of how to set the phone to shut off charging at 80% full.

Charging to 80% also means giving up 20% of the phone's operating time compared to a full charge. I typically use only 30-40% of my phone's battery capacity daily, which varies with usage. A day of driving with Google Maps and handling my navigation can drain my battery by late afternoon.

The most challenging part for me in switching to the 40-80% plan was finding a consistent charge time. I settled on early in the morning as, at that time, I would spend around an hour at my desk at work, allowing the charging to be (sort of) monitored. This worked for a while, as the fast charging mode meant I only had to be around the phone for about 30 minutes. Unfortunately, the only power outlet in my cubicle was under the work surface, so I had to crawl under it to plug in and unplug it.

Last holiday, I learned about USB battery packs that can charge phones using fast charging modes. In the 2022 Black Friday sales, I bought myself a Baseus 65W, 20,000 mAh power bank. It can fast charge a Samsung S22, so I can take it to work and charge my phone there each morning without crawling under my desk. Its capacity allows me to charge my phone daily for about a week under normal usage. It is supposed to be the largest-capacity lithium-type battery that can be taken on a plane. It has a digital display that can show its capacity, charging voltage, and current when providing power to another device. I liked it so much that I got a second one and bought a third in this year's Black Friday sales.

Now, I charge my phone almost exclusively from these battery packs. I've partially bought into the 40-80% charging philosophy; I seldom let my phone go below 40%, but I'll usually charge to around 90% rather than 80%. To me, to have that extra 10% capacity is worth a little lower battery lifespan. Of course, I'll occasionally not pay attention to it as much as I should, and I find it has charged 100%. To me, it is kind of like being on a diet; you can follow it most of the time, but cheating on occasion is not fatal.

I've read many articles on battery charging, but the most useful source of information is Battery University, a free educational website (<https://batteryuniversity.com>) sponsored by Cadex Electronics, a battery-oriented company in Canada. This site has a lot of information on all types of batteries. It has many articles about how Li-ion batteries work, how they should be charged, and how to get the most life out of them. There are several rules to maximize battery life, some easier to follow than others.

I follow many Battery University recommendations in taking care of my phone battery, but I sometimes feel it is impractical to follow them all fervently. The battery that lives the longest is the one that is seldom used, but where is the fun and usefulness in that?



Control Panel *(Continued from page 13)*

"More" and then "Pin to taskbar" to pin it to the taskbar if you expect to use it often. (You will also notice "App settings" next to a gear icon. This will take you to the "Apps – Installed Apps – Settings" screen, which provides some general control over apps.)

On Windows 11, no matter how you get to the Settings App, the persistent navigation sidebar controls the action. The left panel is the Navigation panel, and the right panel presents the capabilities selected in the navigation panel. Initially, "Settings" starts with "System" in the navigation panel, and the System capabilities are shown in the right panel. Choosing a capability by clicking on a capability in the right panel gets you to the capabilities presented on the next screen. After you reach a capabilities screen, clicking the <- arrow next to "Settings" at the top left corner will get you back to the Settings screen. (This "back arrow" is used throughout the Settings App to get you back to the previous screen.)

So, for now, at least, the Control Panel is still an integral part of Windows 10 and 11, though it seems that without the Search bar, it might not be easy to find. Maybe, as time passes and we get updates, more Control Panel capabilities will be moved into Settings. Control Panel may eventually disappear, but only Microsoft knows what the future holds for Control Panel.



OTTAWA PC NEWS

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Member participation is encouraged. If you would like to contribute an article to Ottawa PC News, please submit it to the newsletter editor (contact info below).

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Group Meetings

OPCUG meets on the second Wednesday in the month, except July and August, at the Riverside United Church, 3191 Riverside Drive, Ottawa. Parking is free at the church. OCTranspo bus #90 stops nearby. Details at <https://opcug.ca/venue/>.

NOTE: Until further notice, all our events are via video conference.

Details at <https://opcug.ca/venue/>

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Q&A IS ON-LINE! Weekly!

Since the pandemic, the OPCUG has been holding weekly Q&A sessions in Zoom video-conferences.

Join us every Wednesday (except on regular monthly meeting nights) at 7:30 pm to discuss computer issues. Questions (and answers) on any computer-related issue are welcome. Or, do you have a favourite computer program or topic that you would like to share with the group? Send your questions, answers, or the details of what you would like to share to:

SuggestionBox@opcug.ca

Everyone is welcome to attend Q&A sessions and to ask questions about their specific computer-related problems. Join us at: <https://tinyurl.com/opcug-meeting> (if you use the Zoom client, the meeting ID is **924 9556 0898** and the password is **opcug**).

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