PRODUCT REVIEW

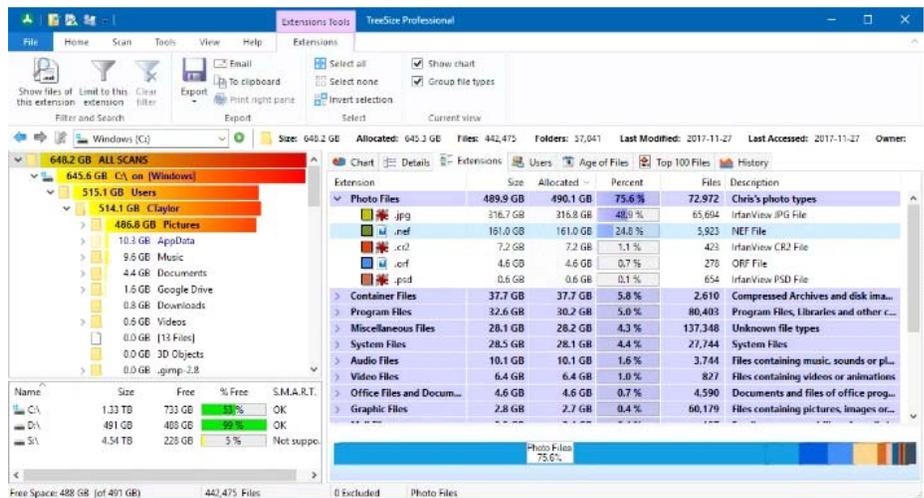# TreeSize Professional   *by Chris Taylor*

I have an issue with my desktop computer's hard drive. I am only using about 665 GB of the 2 TB drive, so I'm not in dire need of free space. What's bugging me are backups. I use a 5 TB external hard drive to store backup images. A backup set (full backup and 30 days of incrementals) takes about 1.2 TB of space, meaning I can only store 3 full month's worth of backups. I want more!

If I could shave the monthly backup set by a couple of hundred gigabytes, I could store 4 months of backups. A file cleanup was clearly in order. I could do it manually, but I knew using a program designed for the task would be a much better approach.

TreeSize Professional from JAM Software is the most powerful program I've seen for analyzing how disk space is being used. Just load the program and specify the areas you want to scan. These can be one or more local partitions or paths, or partitions or paths on networked computers. Hit the *Scan* button and wait a while.

But you don't have to wait long! TreeSize is lightning quick. My local hard drive, which is partitioned as a main C: partition and a supplementary D: partition, has almost 450,000 files using 665 GB. The scan completed in 37 seconds!

There are many ways of looking at the results. The left-hand panel always displays the tree structure and is sorted by size or number of files. Customizable highlighting shows the relative size of folders. In the tree, selecting any line from the combined virtual root of all scans down to a single bottom-level folder shows the details of that section of the tree in the right-hand panel under a series of tabs.

My photographs taking up 490 GB

Chart
Double click any segment of the chart to drill down through a folder structure. The chart updates to show you either the size or number of files at that folder level and below.

Details
A Windows File Explorer-style display …on steroids! Besides the normal *Name*, *Last Modified* date and *Size*, you can display any of 38 attributes collected by TreeSize, including *Creation Date*, *Last Accessed* date, *Owner*, (number of sub)*Folders*, *Link Target*, *Author* (for Microsoft Office documents), and more. Sort on any column by clicking on its header.

Extensions
TreeSize has classified hundreds of different file extensions and displays summary information on 17 groupings such as *Graphics*, *Mail*, *Office*, *Audio*, *Video*, etc. Groups can be expanded to show the details on individual file extensions. You can modify existing groups and add your own. I created a new group called *Photo Files* that included just the file extensions used for my photos.

Inside this issue:

Next Meeting: WEDNESDAY, May 9th, 2018

May Raffle

The May raffle prize is an **Xtreme HD Dashboard Camera**.

Drive with confidence knowing that every mile you drive will be recorded in HD video. The camera has the ability to record sounds in and out of the car and can snap still pictures in camera mode. It has 6 IR LEDs to enable night vision recording.

It features:

- 2.4 in LCD colour display, USB 2.0 interface, supports up to 32 GB SD card (SD card not included)
- Suction cup mount
- Rechargeable lithium battery or 12V power port
- Car Charger

Tickets are $1 for one, $2 for three, or $5 for ten.

April Prize Winner

Our raffle prize at the April meeting, a CaseLogic LoDo Sachel, was won by **Jeff Dubois**!

Coming Up…

➜ **Wednesday, May 9th, 2018**

Topic: Practical Tools for Website Accessibility Testing
Speaker: Toufic Sbeiti, Ottawa-based Web Accessibility professional

There is no single tool that does a full accessibility assessment of a web page. Developers use a variety of tools to help them evaluate websites. This is a practical talk with lots of demos. Toufic will share his favorites, free and easy to use, tools to measure the level of accessibility of web pages.

Toufic Sbeiti has been in the web development field for over 15 years and active in the web accessibility Community since 2010. Toufic is the manager of the web team at Immigration, Refugees and Citizenship Canada and co-organizer of #a11yyow Accessibility Camp Ottawa. Toufic has a Bachelor's degree in Computer Science from Universite du Quebec en Outaouais and a Master in Public Management from Ecole nationale d'administration publique.

Wednesday, June 13th, 2018

Annual Pizza Night & eWaste event, followed by a presentation.

5:30 - 7:00 pm: eWaste Event

Once again, the OPCUG will have its annual eWaste collection on June 13th. If you have electronic items that you no longer need, please bring them to the tent in front of the museum; they will be taken to a processing plant and properly disposed of safely and responsibly with respect to OES guidelines.

6:00 - 7:30 pm: Annual Pizza Night [free for members and their guest(s)]

7:30 pm: Presentation

Speakers: David Smith and Colin Smith (The Surface Smiths)
Topic: Podcasting

The Universal Windows Podcast is a show about the Microsoft Surface and related technologies including Windows, Windows Mobile, Xbox and more. David and Colin, hosts of the Universal Windows Podcast, will speak on podcasting and host a live recording of Episode 77 at the June meeting of the Ottawa PC Users' Group.

For meeting updates and additional details, visit http://opcug.ca/meetings.

2018 CALENDAR

Meetings	Date	Time and Venue
OPCUG General Meeting	Wednesday, May 9th	7:30 p.m. in the main **Mauril Bélanger Theatre** of the **Canada Aviation and Space Museum**, 11 Aviation Parkway. http://casmuseum.techno-science.ca/en/index.php
Q&A Session	Wednesday, May 9th	Immediately following the OPCUG General Meeting.
Beer BOF (Wing SIG East)	Wednesday, May 9th	10:00 p.m. (after the Q&A) at Liam Maguire's, Southeast corner of St. Laurent Blvd. and Innes Rd.

CLUB LIFE

Six Receive Special Recognition *by Jeff Dubois*

Six members of the Ottawa PC Users' Group were awarded Ontario Volunteer Service Awards in a special ceremony held at Ottawa's Tudor Hall on April 15th, 2018. The awards, presented on behalf of the Hon. Laura Albanese, Minister of Citizenship, recognize individuals with long-standing records of volunteerism and service with organizations in the Province of Ontario. Each of the recipients were presented with a stylized trillium service pin and a personalized certificate to acknowledge their respective years of service.

The Hon. Marie-France Lalonde (MPP Ottawa-Orleans) and the Hon. John Fraser (MPP Ottawa-South) attended the ceremony to personally recognize Chris Taylor, Mark Cayer, Robert Walker, Jocelyn Doire, Brigitte Lord and Alan German.

The Ottawa PC Users' Group would like to thank each of the six recipients for their ongoing contributions to the group. We would also like to recognize Bob Gowan, Wayne Houston, Morris Turpin and Gail Eagen, whose names will be advanced .

For those of you interested in statistics, the 6 individuals recognized have a combined total of 127 years of service. How long is 127 years? It's roughly 3X longer than Microsoft have been in existence. It's about 4X longer than Windows has been around. It's about 5X longer than the Internet has been widely available and about 5X longer than Linux has been around. And about 7X longer than Pentium IVs have been around. It's a very, very, very long time.

The recipients thank Jeff Dubois for submitting their names for this much appreciated award. Visit http://opcug.ca to see a picture of the recipients at the ceremony.

Reminder

June will be the last printed issue of our newsletter as we could no longer justify the high printing costs. You can subscribe to receiving the electronic (PDF) format by email. The instructions are on the back cover of this newsletter and on our website (http://opcug.ca/newsletter). You can always download the latest issue from our home page at http://opcug.ca or back issues from http://opcug.ca/newsletter.

We will still print a few copies on a club printer, but these will be limited and we would prefer they be left available to newcomers and visitors at our meetings.

More details were provided in the April newsletter.

Thank you.

Brigitte Lord
Newsletter Editor

OPCUG not moving back to Canada Science & Technology Museum

At the OPCUG March meeting we announced that we may be returning to the Canada Science & Technology Museum in April. This will NOT be the case. We expect to continue at the Canada Aviation & Space Museum for our May and June meetings.

Bob Walker
Facilities Coordinator

Special Event: Laboratory MicroGrid Tour

Saturday, June 9th, 2 pm - 5 pm

The April meeting of the OPCUG featured keynote speaker Art Hunter, who outlined his Energy Freedom Project and the challenges surrounding the underlying technology to manage a sustainable residential microgrid.

Because a number of individuals had expressed an interest in observing the project in action, Art Hunter has kindly offered demonstration tours of his "residential laboratory" and can accommodate small groups of five who may wish to make an on-site visit.

Tours are scheduled for Saturday, June 9th, 2018 beginning at 14:00. Each tour will take approximately 60 minutes. Questions can extend the visit duration. The laboratory is located at 5660 Mahogany Harbour Lane, Manotick, Ontario and there are many coffee shops, eateries and restaurants conveniently located nearby for those wishing to make the event an outing.

If you are interested in participating in this extracurricular event, please send an email to junetour@opcug.ca so we can organize small groups of give to tour Art's energy lab. If you already have a small group, let us know and we'll accommodate your small group.

ARTICLE

Taking Control of My Smartphone (Upsides and Downsides) — *by Alan German*

In the past few articles we have seen some of the challenges to rooting a smartphone. So, after struggling through the process, and spending a little time actually using an unrooted phone, can I say if the benefits outweigh the difficulties?

Of course, the major benefit of rooting the phone was that this provided the ability to flash a custom ROM and upgrade the Android operating system to a newer version than was provided by the phone's manufacturer. So, my Motorola Moto G3 smartphone, which originally came with Android 5.0 (Lollipop), is now running Android 7.1 (Nougat). There is also the possibility to move up to Android 8.0 (Oreo) should the custom ROM for the newest version of Android on the Moto G3 become stable.

Not only does the newer version of Android offer enhanced security over an older system that no longer receives patches, it also provides all of the additional features built-in to the newer software. One seemingly minor change actually has a large effect on the phone's usability. Previously, opening the phone's case would bring up the lock screen but this would turn off, such that the screen went completely black, in just a few seconds, and there didn't seem to be any way to increase the time delay. The problem then was that bringing back the lock screen required pressing the phone's power button and, with the phone in an after-market case, accessing this button was awkward. Nougat solves this issue for me by introducing a much longer time delay, although I still don't see a setting to change this. However, now there is plenty of time to read the notifications, and swipe up on the screen to unlock the phone.

Nougat also provides a much nicer notification shade than was previously available. Swiping down the screen a little way displays an upper bar with the date and time, plus a number of icons indicating such things as the level of connectivity for Wi-Fi, that for the cellular service provider, and the state of charge of the phone's battery. Any notifications are prominently displayed below these icons. Swiping all the way down the screen provides access to further icons that ena-ble toggling services such as Bluetooth and aeroplane mode on and off,. An edit icon (a pencil) allows the display of these icons to be customized.

Having root access means that I have "Developer options" available in the Settings menu. This provides a further feature that I find useful – the ability to set "Advanced restart" that is activated when the power switch is long-pressed. Holding down the power button displays three options: Power off, Restart and Aeroplane Mode. With advanced restart in place, pressing Restart produces a further menu that includes "Recovery". Booting into recovery mode then provides access to the installed backup system (TWRP).

However, having a rooted phone makes this process even easier. I installed the Quick Reboot app which provides a range of boot options including: Reboot (a simple reboot of the system), Recovery (restart in recovery mode), and Power off (shutdown the device). The advantage in using this app is that I don't have to struggle with the power button; I simply tap the app's icon on the homepage, and then tap on one of the boot options.

I experimented previously with a call-blocking app that allowed me to flag spam calls and messages and block the sending numbers from any further communications to my phone. Nougat has this feature built-in so that I don't need to use any third-party software. Not a big deal, but a nice additional feature.

The final (up to now) feature that I find useful is that the Custom ROM software (LineageOS 14.1) provides notifications of system updates that are available on a weekly basis. I had a few problems initially with managing such updates – which brings me to some of the (minor) downsides of a rooted smartphone.

The good, the bad, and the downright ugly with respect to rooted smartphones and Android custom ROM's

First off, I suppose, is the fact that unlocking the bootloader (prior to rooting the phone) voids the warranty. However, if like mine, your phone is outside of the warranty period, this is not a consideration. Some people may find the screen display warning that the bootloader is unlocked to be an annoyance. If so, it is possible to further modify the system to eliminate this warning. On the other hand, some of us consider this to be a "badge of honour", a reward for successfully negotiating the intricacies of the bootloader modification process!

While notification of updates to the LineageOS custom ROM Update are received automatically, the process for downloading and installing any given update package is not very intuitive. Sure, it seems obvious to click the down-arrow next to an update's listing in order to download the file – but then what? It wasn't clear to me that the down-arrow had changed to a down-arrow inside rectangular box, and that this, somehow, indicated that I should click on the down-arrow once again in order to actually install the update.

And, once the update had been installed from recovery mode, and the phone rebooted to the main system, it certainly wasn't obvious why messages were popping up telling me that: "Play Store services keeps stopping" (and a similar message for the Calendar app). The problem here was that without the services running, Google's Play Store refused to download and install any apps. The information posted on the web on this issue was not particularly helpful. My solution was to re-flash the Gapps package. This seemed to restore Google's installed applications to their normal working mode.

Subsequently, I discovered that the updating process had removed some file storage/access permissions, specifically for Firefox, such that the browser could no longer open any local HTML files. This was a problem for me as I use one such file as a menu to all of the web sites that I frequently visit. While the associated error message was not particularly definitive, the required permissions were readily restored by navigating to Apps – Firefox – Permissions – Storage, and toggling this switch to on.
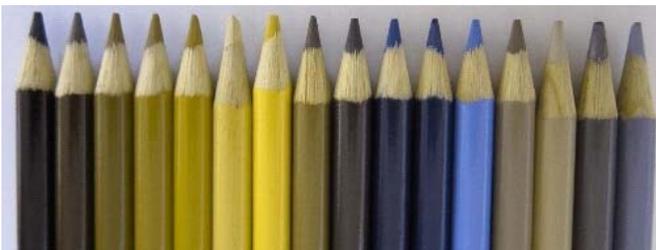
Colour blindness and Windows 10 *by Chris Taylor*

Microsoft does more than any other operating system vendor in helping those with disabilities. They never say, "Okay, we have done enough." In the Fall Creators Update for Windows 10 (version 1709), Microsoft introduced colour filters to help those with any of three types of colour blindness; deuteranopia (reduced sensitivity to green light), protanopia (reduced sensitivity to red light), and tritanopia (reduced sensitivity to blue light).

Deuteranopia and protanopia are collectively know as "red-green colour blindness" and are by far the most common forms of colour blindness. People with either of these can have difficulty distinguishing between reds & greens, and browns & oranges. In the example shown, the lower image shows how the pencils in the top image might be perceived by a person with deuteranopia.

Those with tritanopia, which is quite rare, have difficulty distinguishing between blue & yellow, violet & red, and blue & green.

Colour blindness affects approximately 8% of men and 0.5% of women. Men are much more susceptible due to the fact that it's a defect in the X chromosome that causes colour blindness. Men have one X and one Y chromosome, whereas women have two X chromosomes. Only if both X chromosomes carry the defect will a woman be colour blind.

There are many resources online that can test for colour blindness. Most use a form of the Ishihara colour test plate. Published in 1917 by Dr. Shinobu Ishihara,

they are patterns of coloured dots that show numbers in various colours. People with colour blindness have difficulty in seeing the numbers in the pattern of dots or they see different numbers.

Colourblindawareness.org has lots of great information about colour blindness.

If you want to test yourself for colour blindness, one site is enchroma.com/test/instructions/ . A caution is warranted: given that different monitors can display colours considerably differently, for an accurate colour blindness test, it is recommended you see a doctor who can test with standardized hard copy test plates.

My son, Michael, has deuteranopia. One of his biggest frustrations is battery charger manufacturers that use a single light as a status indicator, switching it from red while charging to green when charged. Michael simply cannot see the difference. Why don't manufacturers help the 4.25% of the population with colour blindness by using 2 status lights, or at least just having 2 states: on and off?

If you are colour blind and are on the Fall Creators Update of Windows 10, go to *Settings | Ease of Access | Colour & high contrast*. Turn on *Apply a colour filter*. From the *Choose a filter* list, select the type of colour blindness you have. The change takes effect immediately.

When Michael used on-line tests with default settings in Windows 10, it showed he had strong deuteranopia. Once he enabled the colour filter for deuteranopia, his colour vision tested as normal. That is not to say he sees all colours the same way as those without deuteranopia. But he can distinguish between different colours. Now he just has to find new wallpaper, given that what looked good for him previously, now looks awful!

A side note: While researching this article, I found a number of apps in the Google Play Store that allow you to take a photo of something and it will report what colour the object is. Such an app could be very useful for someone who has colour blindness. Of course, it could also take away the excuse as to "Why would you *ever* wear that orange shirt with those purple pants?"

◆◆◆

TreeSize *(Continued from page 1)*

Owner

Report by NTFS file owner. Outside of an enterprise environment, this may be of limited use. But if you have multiple user accounts on the computer, this will let you track down who is using a lot of space.

Age of Files

You can create any number of file age groups (e.g. last week, 1 week to 6 months, 7 months to 2 years, & over 2 years). It can be based on creation, last modified, or last accessed date. Data is shown as a bar chart. Double-click a bar to display the files in that age group.

Top 100 Files

Details the largest 100 files.

History

TreeSize keeps track of total size of your scans and displays how the total used space varies over time.
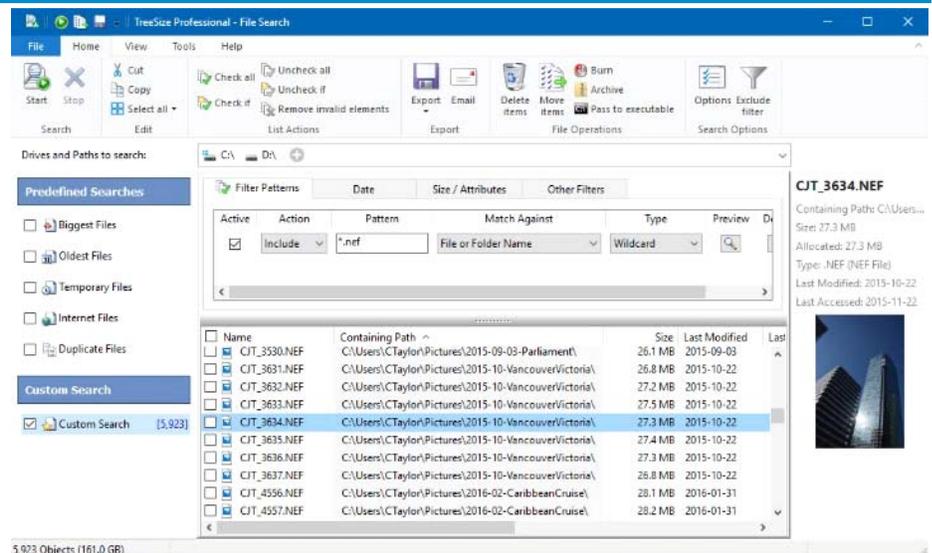
I used a variety of methods to track down files that might be candidates for deletion.

A few quick wins were found in the *Top 100 Files*. I no longer need some videos, a few huge Photoshop images, installation files for programs I haven't used in years, and driver packages for computers I no longer own. That freed up over 10 GB very quickly.

I selected the virtual root and clicked the *Extensions* tab. 76% of in-use disk space was being used by my custom group *Photo Files*. I expanded that group. 25% of *all* in-use space was being used by 5,923 Nikon RAW.nef files. My main camera records both .jpg and .nef files. While RAW files are useful in certain circumstances, they are not always required.

I double-clicked the line for .nef. TreeSize filtered the left-hand tree to show the folders that contain that file type, but I found it better to click on *Show files for this extension.* The companion TreeSize File Search program loaded and showed me all .nef files in a single list that could be sorted by path, size, date, etc. I quickly saw that many were in folders for projects where I don't need the RAW files. I sent about 20 GB of files to oblivion.

TreeSize File Search would have allowed me to play it safe. Clicking on the *Delete items* button gives options to delete files,

File Search for Nikon RAW files

move them to the recycle bin, move them to a ZIP file, or move them to a different location (such as a different drive or computer). When you move items to a different location, you can preserve the path name, leave a shortcut in the original location pointing to the moved file, log the operation, and even create an *undo* script to reverse the action. Very cool!

File Search has some pre-defined search criteria and I used *Temporary Files*, *Oldest Files*, and *Duplicate Files* which turned up a few other candidates for deletion. One powerful capability of File Search is de-duplication. For *Duplicate files*, TreeSize can replace all but one of the files with an NTFS hard link.

TreeSize can export data to a wide variety of formats including Excel, CSV, XML, and PDF for record keeping, later comparison, or further data analysis.

Most people will never run into limits when using TreeSize Professional. I have used it in an enterprise environment to scan several hundred areas on over 50 servers. With 20 GB RAM on the computer doing the scanning, I found that I was hitting the paging file (which slows things dramatically) after scanning about 100 million files, so I broke scans down into separate scanning job and scripted them so I could automate running monthly scans in an easy and repeatable manner. Besides performing the scanning, the scripts export the data in several formats that allow me to analyse the data further.

The included 171-page PDF manual is impressive in its completeness and clari-

ty. It includes an FAQ section that is highly recommended for getting the most out the program, as is the command line section for those who want to automate processes. But rest assured you don't need to read the manual to use TreeSize effectively. As the Managing Director at JAM Software told me "I always try to design software in a way that the manual is not needed, especially for average use cases."

Is TreeSize a cure-all for solving my disk space issues? No. It certainly exposes where the problems lie. But for me, the biggest reclamation moving forward will be going through my remaining 140 GB of RAW photos to see just which ones I need to keep. More cleanup is probably in order to get that fourth monthly backup to fit on my backup drive.

There are three versions of TreeSize.

TreeSize Free is stripped down to the bare essentials, but may be useful for those who only need the *Details* tab or a *TreeMap* (helps you hone in on large folders). TreeSize File Search is not included, although a free program called UltraSearch is available from JAM Software.

TreeSize Personal removes support for Windows Server and automation through scripting. I think this is the version appropriate for users outside of an enterprise environment.

TreeSize Professional is the version I used for this review.

JAM Software: www.jam-software.com
TreeSize Free v4.1: Free
TreeSize Personal v6.3.7: US$24.95

OPCUG Free Software Guide—Part 81 *Compiled by Alan German*

This guide features an annotated list of free computer programs. The software mentioned has not been reviewed (except where noted) nor have any tests necessarily been conducted. Consequently, no guarantees are provided that the individual programs will perform as described. Rather the list of available software is provided for the information of our members who may find one or more of the programs useful.

AOMEI Backupper Standard

To avoid data loss or recover a crashed system, you need to create an image of your PC before the computer breaks down. AOMEI Backupper Standard is all-in-one backup software that will let you back up all your important files and create complete system images to protect your data.

Previously Reviewed: Finding a Backup Program; Chris Taylor; http://opcug.ca/public/Reviews/BackupPrograms.htm

Current Release: Version 4.0.6
Web Site: https://www.aomeitech.com/ab/standard.html

WPS Office 2016 Free
The developer says this is "The perfect free office software". Although small in size, it still offers a full suite of tools including Writer, Presentation, and Spreadsheets, plus PDF tools to fulfill all of your document needs.
Current Release: Version 10.2.0.5978
Web Site: https://www.wps.com/office-free

InfraRecorder
A free CD/DVD burning solution for Windows. Create data, audio, mixed-mode projects, and ISO images and record them to physical disks or disk images. Make copies of disks; add files to multi-session disks; and display disk information.
Current Release: Version 0.53
Web Site: http://infrarecorder.org/

ASTRO File Manager

Find and manage all the files on your Android device no matter where they are located – on the internal storage, an SD card, or even in your Dropbox account in the cloud. Supports file compression and extraction. Play multi-media files such as music or videos, or view your digital images. All this in one app!

Current Release: Version 6.0.5
Web Site: http://tinyurl.com/7u8x77r

Cyberduck
An FTP-client with a difference. Cyberduck uses a browser-like approach to file transfer rather than the more usual two-window display. It's an open-source product and supports FTP, SFTP, WebDAV and Amazon S3 systems.
Current Release: Version 6.3
Web Site: https://cyberduck.io/

SecurityKISS Tunnel
This Virtual Private Network (VPN) redirects your on-line traffic through an impenetrable tunnel to a security gateway where your data is encrypted and secured. SecurityKISS protects you against threats and keeps your privacy intact. The system is based on OpenVPN. The free service provides secure servers in the US, France, Germany, and the UK.
Web Site: https://www.securitykiss.com/

BleachBit

Is your Linux system getting full? BleachBit will quickly free up disk space. You can clear cache, delete cookies, remove Internet history, shred temporary files, delete logs, and discard junk you didn't even know was there! Advanced features include shredding files to prevent recovery, and wiping free space to hide all traces of deleted files.
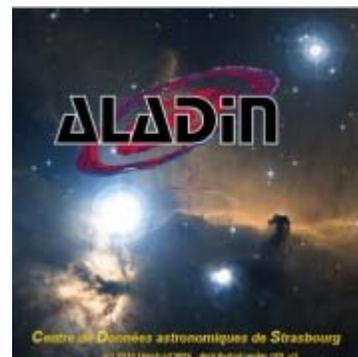Current Release: Version 1.17 beta
Web Site: https://www.bleachbit.org/

Aladin
This interactive sky atlas, from the University of Strasbourg, allows the user to visualize digitized astronomical images, full surveys, superimpose entries from astronomical catalogues or databases, and to interactively access related data and information from the Simbad database, the VizieR service and other archives for all known astronomical objects in the field.
Web Site: http://aladin.u-strasbg.fr/

OTTAWA PC NEWS

Ottawa PC News is the newsletter of the Ottawa PC Users' Group (OPCUG), and is published monthly except in July and August. The opinions expressed in this newsletter may not necessarily represent the views of the club or its members.

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). Deadline for submissions is three Sundays before the next General Meeting.

Group Meetings

OPCUG meets on the second Wednesday in the month, except July and August, in the main **Mauril Bélanger Theatre** of the **Canada Aviation and Space Museum**, 11 Aviation Parkway, Ottawa. http://casmuseum.techno-science.ca/en/index.php
Meetings are 7:30–9:00 p.m. followed by a Q&A Session until 10 p.m.

Parking is available at the museum for a flat fee of $4 after 5pm.
Details at http://opcug.ca/meetings

OPCUG Membership Fees:	$25 per year
Mailing Address:	3 Thatcher St., Nepean, Ontario, K2G 1S6
Web address:	**http://opcug.ca**
Bulletin board—The PUB (BBS)	**http://opcug.ca/default.htm**
Follow us on Facebook:	**https://www.facebook.com/opcug**
Follow us on Twitter:	**https://www.twitter.com/opcug**

President and System Administrator
  Chris Taylor   **chris.taylor@opcug.ca**   613-727-5453
Meeting Coordinator Co-chairs
  Jeff Dubois   **meetings@opcug.ca**
  Bob Herres   **meetings@opcug.ca**
Treasurer
  Alan German   **alan.german@opcug.ca**
Secretary
  Gail Eagen   **gail.eagen@opcug.ca**
Membership Chairman
  Mark Cayer   **mark.cayer@opcug.ca**   613-823-0354
Newsletter
  Brigitte Lord   **brigittelord@opcug.ca**
  (editor/layout/e-distribution)
Public Relations
  Jeff Dubois   **PR@opcug.ca**   613-366-7936
Facilities
  Bob Walker   613-489-2084
Webmaster
  Brigitte Lord   **webmaster3@opcug.ca**
Privacy Director
  Wayne Houston   **privacy2@opcug.ca**
Special Events Coordinator
  (Mr.) Jocelyn Doire **jocelyn.doire@opcug.ca**

© OPCUG 2018.

Smartphone *(Continued from page 4)*

One other even more bizarre error message was encountered when trying to create a new system backup using TWRP: "createTarFork() process ended with ERROR: 255 Backup Failed. Cleaning Backup Folder". Once again, there was a dearth of useful information available on the web in respect of this error. Fortunately, although I have no idea how, the process of installing the system update, and re-flashing Gapps, resulted in TWRP coming back to life and once again making complete system backups.

So, there we have it – the good, the bad, and the downright ugly (as Chris Taylor might say) with respect to rooted smartphones and Android custom ROM's. And, to answer the question that I posed initially – Yes – my phone performs much better under Nougat than it did with Marshmallow, and the difficulties were just challenges to be overcome. Anyway, that's my story!

*This concludes the **Smartphone** series.*

How to get the OTTAWA PC NEWS by e-mail

Want to get the newsletter electronically? The newsletter is available in Adobe Acrobat PDF.

To subscribe, send a message in plain text to **listserve@opcug.ca**. Leave the subject blank and in the body of the message, type:

subscribe NewsletterPDF

To cancel e-mailing, send a message in plain text to **listserve@opcug.ca.** Leave the subject blank and in the body of the message type:

unsubscribe NewsletterPDF