



## ARTICLE

### Updating Microsoft Security Essentials *by Chris Taylor*

**A**ntivirus – one of the oldest forms of computer protection in the PC world – remains one of the cornerstones of making sure your computer does not fall victim to malware. Last fall, I started using the free antimalware program Microsoft Security Essentials (MSE).

Microsoft's *10 Immutable Laws of Security* (<http://preview.tinyurl.com/5xgdof>) states in law number 8, "An out of date virus scanner is only marginally better than no virus scanner at all." So one of the first things I did after installing MSE was load the program so I could schedule updates to be done a couple of times a day.

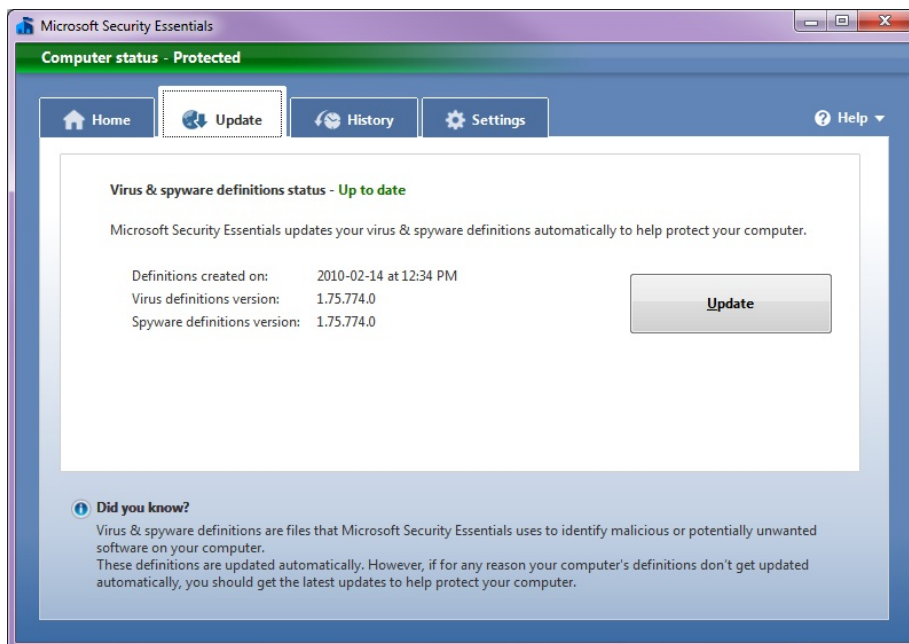
Imagine my dismay when I could not find a scheduler. On the *Update* tab, there is a button to force an immediate update and a note, "These definitions are updated automatically."

It took joining the "perpetual beta" for MSE and reading the on-line forums for the beta to discover how MSE does its updates.

MSE will check for updates 24 hours from the last time it did an update on your computer. If you turn on your computer and it has been more than 24 hours since the last check for updates, MSE will check about 10 minutes after boot-up.

Fortunately, the MSE beta forums were also a help in finding an alternative to this behaviour. It turns out that there is a command line interface to MSE that can be used to force a check for updates. Assuming a standard install of Windows to drive C and a standard install of MSE, the command line to force a check for updates is as follows;  
"C:\Program Files\Microsoft Security Essentials\MpCmdRun.exe" - SignatureUpdate

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After a few days, I could see that the virus definitions were normally no more than a day or two old, so I knew the updates were taking place, but I wanted to know how it was deciding to update itself. And ideally, I wanted to control how often automatic updating took place.

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## May Raffle

**T**hanks to the generosity of Corel, we have a copy of **Paint Shop Pro Photo X2 Ultimate Edition**. This powerful photo editing program allows you to retouch photos with ease. Fix brightness, colour, contrast, and sharpness. Rotate, crop, remove lens distortion and straighten photos. You can even combine exposures to correct for high dynamic range. Includes great makeover tools. Whiten teeth, remove red eye, smooth wrinkles, and remove blemishes.

The Ultimate Edition bonus pack includes a 2GB USB flash drive, a background remover plug-in, special effects filters, and media recovery software to retrieve lost photos and videos from reformatted memory card. Even includes Corel Painter Photo Essentials 4 to turn photos into paintings in 3 easy steps.

Combine this prize, valued at \$130, with all the great tips Bert will be showing you during the main presentation and you will be touching up your photos like a pro!

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

## April Prize Winners

At the April 14th meeting of the OPCUG the winner of our raffle prize (*Corel VideoStudio Pro X2*) was **Jacques Jubinville**.

## Coming Up...

► May 12

**Topic:** Image Editing with Photoshop

**Speaker:** Bert Schopf of *Blackbird Publications, Communication & Design*

<http://www.blackbirdpcd.com/>



**W**ith the proliferation of digital cameras, we take pictures as much (or more) than ever, but now we have the ability to edit and “fix” cherished memories before committing them to prints. Come see Adobe Photoshop in action: commercial image editing techniques that anyone can use to correct, enhance and improve everyday images. Bert will take several poorly shot digital camera images and demonstrate how they can be transformed into great shots!

Learn through demonstrations about the versatility of Photoshop’s layers, selection and painting tools – the key to unlocking the creative potential in assembling artistic imagery. Watch as random photos shot at the meeting get “the treatment” and are brought together into a final layout.

Bert Schopf is a former OPCUG President and Chief Mouse Jockey at Blackbird Publications, Communication & Design.

**June 9** (Pizza night)

**Speaker:** Evelyn Watts (Corel Corporation)

<http://www.corel.com/>

**Topic:** (TBA)

## 2010 CALENDAR

Meetings	Date	Time and Venue
OPCUG General Meeting	Wednesday, May 12 <sup>th</sup>	7:30 p.m. Auditorium of the <b>Canada Museum of Science and Technology</b> , 1867 St. Laurent Blvd. <a href="http://www.sciencetech.technomuses.ca/english/index.cfm">http://www.sciencetech.technomuses.ca/english/index.cfm</a>
Beginners’ SIG	Wednesday, May 12 <sup>th</sup>	Immediately following the OPCUG General Meeting.
Linux SIG	Wednesday, May 12 <sup>th</sup>	Immediately following the OPCUG General Meeting.
Beer BOF (Wing SIG East)	Wednesday, May 12 <sup>th</sup>	10:00 p.m. (after all other SIGs) at Liam Maguire’s, St. Laurent Blvd. at Innes Rd.

Please note that unless otherwise noted, SIGs meet at 9:00 p.m. (immediately following the OPCUG General Meeting).

## ARTICLE

# The Solid State Drive (SSD) by Andrew Petrovic

Vers 1.7 - March 2010

## PART 1

This first part of this report introduces solid state drives and shows their capabilities and how to set up one in your own computer. The second instalment will go into more technical detail, especially considerations concerning the operating system.

### Introduction

There is something that I have been looking forward to for a long time in the computer world. Something that I thought should have happened long ago. Thankfully it is progressing as time goes on. What I am referring to is a computer system with no moving parts. To my mind, mechanical movement is just old hat. Movement means friction, which in turn means wear, which leads to failure; it also means increased noise, heat and power requirements. I want my PC to be as reliable and efficient as possible and that means less movement!

You could say that Solid state drives (SSDs) are a major breakthrough in this respect, as they ideally eliminate the standard hard disk drive. Then again, perhaps they are not so much of a leap forward as they are merely a step up from already existing technology, such as RAM, ROM and flash drives.

Whichever way you look at it, SSDs are here and they're likely here to stay and the demise of the clunky old hard disk drive is inevitable, although I cannot see hard disk drives totally disappearing for some years yet.

### What is a solid state drive?

In the simplest terms, a SSD is a solid-state replacement for a standard spinning hard disk drive. The term 'solid-state' means it uses semi-conductor components in its makeup, rather than

anything mechanical. It is not really any more elaborate than that.

In these notes, I will refer to the new solid state drive as a 'SSD' and the old mechanical drive as a 'hard disk drive'.

As the cost of a SSD is many times more than for a hard disk drive (for the equivalent storage capacity), then it is not really much use using a SSD as a data storage or backup drive at this time. The main advantage of SSD is speed and if we add or replace a drive to our system then it needs to be the boot drive where the operating system also resides. That is where we will see the real benefit. The boot time from a cold start is dramatically improved and the start time and access time for applications stored on the SSD will certainly impress.

Another advantage is, as previously implied, no moving parts, so less wear and with a quieter operation and more resistance to physical abuse. Also less power is consumed and less heat generated, making them especially ideal replacements for laptop hard disk drives.

### Which one shall I buy?

It is a case of cost versus size at the moment. A hard disk drive used as the main (or only) drive in a newer home computer would typically be 1 TB (terabyte), but to replace that with a 1 TB SSD would cost about C\$4000 at today's prices - several times more than the rest of the PC cost to buy.

So to take advantage of SSDs at a reasonable cost, it would likely mean buying a smaller SSD boot drive of around 40 GB up to, say 160 GB, and using a regular hard disk drive as a second drive to hold your larger applications and data, allowing the SSD to look after the operating system and perhaps some smaller applications.

The next section outlines my own tests and benchmarks and may assist further in determining the type and size of drive you may consider for your own system.

One word first about physical size - SSDs normally (there are exceptions) have a 2 ½ inch form factor (the same size as in a typical laptop hard disk drive) and many come with a metal adapter (or you can buy one separately) to fit into a 3 ½ inch drive bay on a desktop PC.

### My SSD experience

To give an idea of what to expect with a SSD, I shall take you through my own experiences and tests, as that may serve a more useful purpose than just quoting manufacturers facts and figures.

I am using a PC with an Intel Core 2 Duo 2.66 GHz cpu with 8 GB of DDR2 memory, so it's a reasonably powerful system, but not top-of-the-range - likely similar to the systems that many are using who are reading these pages.

Also I am testing an Intel X25-V 40 GB SSD. It is obtainable at a reasonable price (currently around C\$140), has the Trim feature that I want and is a good and reliable brand name with excellent support.

A quick word about the Trim function because although I will explain that in detail next time, for now, as a quick explanation, it is basically a SSD function, triggered by the operating system, to enable SSDs to perform write operations with more efficiency.

By far the easiest operating system to install on a SSD is going to be Windows 7. It has been optimized for SSDs in that if it detects the drive as an SSD then it sets up certain adjustments within the operating system in order to benefit from the advantages of this drive type. The

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**SSD** (Continued from page 3)

only other operating systems that cater to SSDs are Windows Server 2008 R2 and some distributions of Linux. Most of the information that follows assumes Windows 7 unless stated otherwise.

A fresh install of the operating system is preferable. I would not recommend trying to copy an existing setup from a hard disk drive to a SSD, even using an image copier such as Ghost or Acronis for example, as it is prone to too many problems that may not be recoverable. The SSD in question is also a SATA 2 drive. Most of them are SATA 2, but be aware of the type you need to buy for your particular PC interface. If you look around, you can find SCSI, IDE, even PCIe interfaced drives.

To give an idea of boot time and how much it is improved, I noted that booting up my PC with Windows 7 on my old hard disk drive takes a total of 2 minutes and 3 seconds. That includes 24 seconds for the BIOS to load, followed by 99 seconds for Windows to load fully. Of course we cannot better the BIOS load time by using a SSD, but with the new drive, my Windows load time is now only 21 seconds.

Looking at my Windows Experience Index (WEI), the hard disk drive transfer rate had a score of 5.9 with my hard disk drive, and 7.7 with the SSD. WEI is a utility in the Control Panel 'System' category. Just take note of the primary hard disk drive score rather than the total score (the scores for other components are unlikely to be affected with the drive upgrade). Typical is a score of 5.9 for a fast hard disk drive. Remember though that the WEI utility is just a performance guide and not a particularly accurate measurement or diagnostic tool, so just use it as a reference between tests.

Now let's see how much space I used on the SSD. With a fresh install of Windows 7 (32-bit), it used 10.7 GB of space. After adding the latest Windows

updates and necessary drivers for my motherboard and graphics card, I am up to 12.4 GB. I then added MS Office 2007 Ultimate with typical features installed, bringing my total up to just below 17 GB. As the formatted size of a 40 GB SSD is actually just over 37 GB, that leaves me with more than 20 GB of free space.

For those that are interested, I tested Windows XP Professional with SP3 (32-bit) and this consumed 4.6 GB of space. An installation of Ubuntu 9.10 Desktop Edition (Linux) with default settings used 2.3 GB of space.

It may be worth remembering that it is advisable, with hard disk drives and with SSDs, to leave 15-20% of the space free, for a smoother trouble free operation.

So it looks like I have space enough left where I can install large applications on a second hard disk drive and have room for any application files that need to fit on to the primary Windows drive. If your requirements are small, you might fit all of your applications on the SSD, but remember to take into account the data you have previously created and collected yourself - My Documents contents; media files; etc. It's also nice to have two drives in a PC so that the second one can look after backup data from the primary drive.

If you are going to install Windows 7 (64-bit) version and you have extra memory, you must consider this too. The 32-bit version can only access something slightly more than 3 GB of RAM, therefore your default paging file will be the same size and your hibernation file will be slightly less. These both take up that exact space on the SSD. With a 64-bit system, with say 8 GB of RAM, your default paging file will be 8 GB and the hibernation file almost that. The basic install of Windows 7 (64-bit) with default settings and 8 GB of RAM will take about 22 GB on the SSD, so more than double the basic 32-bit install with its 3.x GB of RAM.

**How to set it all up**

So now you've just gone and bought a new SSD - how do we get it to dance!

- I am assuming that you are using a late version of Windows as your operating system, such as Windows 7. If you are using Vista, XP or Linux, then some of these steps may be meaningless, though you can still set up your system without too much difficulty.
- The instructions that may accompany your new drive should override anything that I state here, as they are more applicable to the particular drive. Also note that you must be held responsible for any hardware or data loss issues that you may encounter on your systems.
- As always, before any system changes or tests, make sure your system works properly right now and that you have a good backup of all the data that you cannot afford to lose.
- You may first want to do a few diagnostic tests with your old hard disk drive in place, to use as a comparison for after you have installed the new SSD. I would look at the Windows Experience Index (WEI). You might also want to do some speed tests to see how fast (or slow) your system currently boots up from a cold start.
- Check on the web site of your motherboard manufacturer to see if there are any firmware (BIOS) updates or on-board drivers that are relevant to SSDs and apply them if there are. If there are updates but they are not specific to SSDs, then update them sometime later rather than now, for the simple reason that if anything goes wrong during the install, you won't know whether to blame the new firmware / drivers or the SSD or anything else you may have updated at the same time. It's best to change one thing at once.
- One thing that you can change though, if available, is the firmware for the SSD itself. You can use a third-party utility, such as CrystalDiskInfo (free utility from Crystalmark.info), to find the current firmware version. On the Intel SSD I just applied the update even without

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## SSD *(Continued from page 4)*

checking first, because I knew it would not attempt to overwrite firmware that was already at the latest version. The firmware update on the Intel is easy to do - download the latest version from the Intel web site, as an .iso file; burn this .iso file onto a blank CD; boot with that CD and it will search for SSDs to update. To burn an .iso file to disk in Windows 7, just insert a blank CD and in Windows Explorer just double-click the .iso file where you saved it. The Windows Disk Image Burner should start and you can then create the new disk quickly and simply. Alternatively, use your favourite disk burning utility.

While you're downloading any firmware updates, check for any tools or utilities available for your drive and copy them somewhere that will be accessible later after your operating system install, such as to a USB flash drive.

- I would disconnect any other hard disk drive(s), ReadyBoost key; other storage device(s) from your PC. Leave the CD / DVD drive connected if you need to perform the SSD firmware update as outlined above, as well as for installing the new operating system.
- You might not need to make any changes to the BIOS settings on your motherboard. The system should see the new drive as it sees any other drive, though it may be necessary (check your manufacturer's guide) to set the BIOS setting for the SATA interface (SATA AHCI Mode) to AHCI. The choices are usually IDE or AHCI and sometimes RAID. This setting enhances the standard SATA settings and may be necessary to support Trim. One word of warning though - do **not** change this setting after the operating system is installed, otherwise you will almost certainly get a BSOD (Blue Screen Of Death). Only change it before you install anything and be aware of this issue if you are only testing the SSD and going back to your original oper-

ating system on your hard disk drive afterwards.

Also note that if you attempt to install Windows XP as your OS and you get a BSOD (Blue Screen Of Death) it is most likely because you are set to AHCI here and need to change to IDE instead. Try XP with whichever mode you are set to beforehand and only try changing from AHCI to IDE when you need to.

Make sure the optical drive is set as a boot drive in the BIOS as we need to install an operating system from it. The boot order is not as important because the CD is the only drive that is bootable at this stage.

- It is best to connect the new drive to the first SATA port in your system - usually SATA 0 or SATA 1. The data and power connectors are identical to any other SATA disk drive. For other interface types, see your accompanying documentation.
- Physically mount the drive if you want, but for initial testing purposes, as it is so small and lightweight, it can just hang somewhere for now. Please do observe anti-static precautions as with any hardware installs. Your hardware user guides should provide details for safe handling of components.
- Place your operating system install disk into your optical drive and start the system. Optionally, you may want to go into the BIOS during the boot process, just to make sure that the disk drive is recognized at that level. There is unlikely to be any issue here, but if you cannot see the drive in the BIOS then you need to look at those cable connections more thoroughly.
- Install your operating system now, in the same way as you would do with a regular hard disk drive. Many people report a much faster install time to a SSD. To be honest, I didn't see more than a 15% reduction in the total installation time compared to installing to a hard disk drive. If you are using a motherboard with an Intel chipset, it may be preferable

not to load the Intel SATA drivers for the motherboard at this stage. Go ahead and install the other Intel chipset drivers, but note that the Intel SATA drivers have some issues with SSDs and it is better to use the Windows 7 inbuilt SATA driver (they should automatically install). Hopefully Intel will release updated drivers very soon.

- After Windows is installed, you can install any applicable utilities for your drive. The toolbox for Intel drives is downloaded as a .msi file and you install just by double-clicking that file. The tool only installs on Windows XP; Vista; or Windows 7 (32 or 64 bit) systems. It may prompt you to install .NET Framework 2.0 if you don't already have it installed. Note that the toolbox cannot have access to a SSD if it's installed on a virtual machine, just in case anyone is walking that road.
- Install Windows updates and any other drivers and utilities that you normally would install.
- That's basically it. You should at least now have a working system that boots quite fast. Check Device Manager to make sure nothing is amiss there. Run the Windows Experience Index to hopefully see a dramatic improvement for the primary disk drive score, but don't panic if it still only reads 5.9 or so - it may be resolved later after other changes are made. You can re-run the test again afterwards.

In the next part of these notes we will look more deeply into the operating system and how to make it compatible with the SSD, especially if there are any problems.

*PART 2 will appear in the June issue of Ottawa PC News*



## Microsoft Security Essentials

(Continued from page 1)

### Creating an automated task

You can use this with the Windows Task Scheduler to force updates on your schedule. I used it to force an update check every 2 hours. To do this in Windows 7, click on Start | All Programs | Accessories | System Tools | Task Scheduler

When Task Scheduler loads, click on *Create Basic Task* in the *Actions* pane. A wizard will open. In the *Name:* box, type *Update MSE*. In the description, put in some text to remind you what this task does such as *Update MSE on my schedule*.

Click the *Next* button repeatedly until you get to the *Start a Program* screen. Click on the *Browse* button and select the *MpCmdRun.exe* program. See above for the likely location. Click the *Open* button to return you to the wizard. Now click in the *Add arguments (optional):* field and type in *-SignatureUpdate* and click on the *Next* button.

In the final step of the wizard, put a check mark in the box *Open the Properties dialog for this task when I click Finish* and click the *Finish* button. When the Properties dialog box opens, click on the *Triggers* tab. Select the trigger listed and click the *Edit...* button. Here you can choose how often you want the check for updates to take place. You should have *Daily* already selected. Since we want more than once a day, in the *Advanced settings* section, put a check mark in the box *Repeat task every:* and you can choose from the drop-down list. But that only permits frequencies of every hour or less. Personally, I don't think you need to check that often. You can also just type a value into the field, such as *4 hours*. Click the *OK* button to finish things up and close Task Scheduler.

From then on, as long as you are logged into your computer, every 4 hours, Task Scheduler will force a check for signature updates for MSE.

As it turns out, there is an easier way to force more frequent checks for updates to MSE. I leave in the Task Scheduler method because I am hoping you may find some other uses for Task Scheduler and, by following the above steps, you will see it is not all that difficult to work with.

### Modifying the registry

Before I start, I should say that Microsoft has stated that they do not support modification of registry values for Microsoft Security Essentials. If you are not brave, you might want to stick with the *Task Scheduler* approach. Having said that, I have one computer using the registry approach with no difficulties.

Click on *Start* and type in *Regedit* and hit *Enter*. Windows XP users should click on *Start | Run* and then type in *Regedit* and hit *Enter*.

In the left pane, Navigate to the following registry key:

```
HKEY_LOCAL_MACHINE/Software/
Microsoft/Microsoft Antimalware/
Signature Updates
```

First, you have to set permissions on the registry value. In the right pane, select the value named *SignatureUpdateInterval* and choose the menu option *Edit | Permissions*. In the top section, choose *Administrators*. Click the *Advanced* button. Select the *Owner* tab. In the *Change owner to:* section, select *Administrators* and click the *OK* button. Back in the *Permissions* dialog, make sure *Administrators* is selected in the top box and put a check mark in the *Full Control* box in the *Allow* column. Click the *OK* button.

Back in the *Registry Editor*, double-click the value named *SignatureUpdateInterval*, set the base to decimal and type in the update interval in hours that you want (values between 1 and 24 are valid), such as 4 to have the check for updates take place every 4 hours. Click the *OK* button, close the *Registry Editor* and reboot your computer.

### Showing the way

I used Windows 7's Problem Steps Recorder to show how to do both the methods above complete with screen shots. You can download them from The PUB. Look for MSE-Update.ZIP in the *Text* file area, which is file area 23. You can also use the following URL to get the file <http://opcug.ca/file/area23/MSE-Update.ZIP>. Inside the ZIP file there is a copy of this review as well as two separate zip files – MSE-TaskScheduler.zip and MSE-Regedit.zip. Within each of those you will find a single MHT file which, when double-clicked will load into Internet Explorer. An explanation about the structure of the file is included at the top. You can also read my review of Problem Steps Recorder in the March, 2010 issue of the newsletter (<http://opcug.ca/public/Articles/1003.pdf>).



## Review of 2009 OPCUG Accounts

by Richard Aylesworth

I have reviewed in detail the OPCUG accounts for the calendar year 2009. These were given to me by Alan German, the Treasurer. In comparing the detailed item documentation provided, the accounts, the summary income statement and balance sheet, and the bank statements, I found only a couple of minor dating discrepancies which did not seem to affect the integrity of the accounting in any way.

I have every reason to believe, therefore, that the accounts, as delivered to me, accurately reflect OPCUG's revenues and expenses for 2009. I would like to comment that the books were most scrupulously maintained, and to give my congratulations to Alan on a job well done.

# OPCUG Free Software Guide – Part 15 Compiled by Alan German

**T**his 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. If you try one of the listed items, you are encouraged to share your experience, good or bad, by providing a brief review of the program for a future issue of the newsletter.

## Caffeine

If you have problems with your PC going to sleep or the screensaver activating at inopportune times, like when watching a movie, this little utility will keep it awake. It works by simulating a key press every 59 seconds, so your machine thinks you're still working at the keyboard.

Current Release: Version 1.4

Web Site: <http://www.zhornsoftware.co.uk/caffeine>

## HijackThis

This free utility from Trend Micro will generate an in-depth report of registry and file settings from your computer. It makes no separation between safe and unsafe settings in its scan results giving you the ability to selectively remove items from your machine. In addition, HijackThis comes with several tools useful in manually removing malware from a computer.

Current Release: Version 2.0.2

Web Site: <http://free.antivirus.com/hijackthis/>



## GIMP

One reviewer called GIMP (the GNU Image Manipulation Program) “*One of the most powerful general-purpose image editors around... eminently comparable to Photoshop.*” File format support includes JPG, GIF, PNG, and TIFF. Versions of the package are available for several hardware platforms including Windows and Linux.

Current Release: Version 2.6

Web Site: <http://www.gimp.org>

## TrueCrypt

TrueCrypt will let you create and maintain an encrypted data storage volume. Data is automatically encrypted or decrypted before it is loaded or saved, without any user intervention. No data can be read without using the correct password. This free, open-source software is available for Windows 7/Vista/XP, Mac OS X, and Linux.

Current Release: Version 6.3a

Web Site: <http://www.truecrypt.org/>

Previous Reviews: File Encryption Revisited – TrueCrypt, Alan German, <http://opcug.ca/public/Reviews/TrueCrypt.htm>

## WordPress.com

Have a hankering to be a blogger? You can get started with WordPress.com. You'll get your own WordPress.com E-mail address, a selection of customizable designs for your blog, and 3 GB of file storage – all completely free. You can blog as much as you want – to the public – or in a private blog just for your friends.

Web Site: <http://wordpress.com/>



## Advanced SystemCare Free

This utility has a one-click approach to help protect, repair, clean, and optimize your PC. Use the program's fast disk defragmenter, shut down unnecessary background processes, uninstall unused applications, clean the registry, optimize your system, scan and remove spyware and adware, and destroy obsolete files. Supports Windows 7, Vista, XP and 2000 (32bit or 64 bit)

Current Release: Version 3.5.0

Web Site: <http://www.iobit.com/advancedwindowscareper.html>

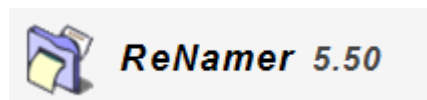
## ReNamer

A powerful and flexible file renaming tool, ReNamer offers all the standard procedures, including the addition of prefixes and suffixes, replacements and case changes, as well as removing contents of brackets, adding number sequences, and changing file extensions. Scripting lets advanced users program their own renaming rule.

Windows 9x/NT/XP/2003/Vista are all supported.

Current Release: Version 5.50

Web Site: <http://www.den4b.com/projects.php>



# 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, at the Canada Museum of Science and Technology, 1867 St. Laurent Blvd, Ottawa. Meetings are 7:30–9:00 p.m. and Special Interest Groups (SIGs) go until 10 p.m.

<b>OPCUG Membership Fees:</b>	\$25 per year	
<b>Mailing Address:</b>	3 Thatcher St., Nepean, Ontario, K2G 1S6	
<b>Web address:</b>	<a href="http://opcug.ca">http://opcug.ca</a>	
<b>Bulletin board</b> — The PUB (BBS)	<a href="http://opcug.ca/default.htm">http://opcug.ca/default.htm</a>	
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Meeting Coordinator		
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<b>Andrew MacLeod</b>	<a href="mailto:andrew.macleod@opcug.ca">andrew.macleod@opcug.ca</a>	
Secretary		
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Membership Chairman		
<b>Mark Cayer</b>	<a href="mailto:mark.cayer@opcug.ca">mark.cayer@opcug.ca</a>	613-823-0354
Newsletter		
<b>Brigitte Lord</b> (editor/layout)	<a href="mailto:brigitte.lord@opcug.ca">brigitte.lord@opcug.ca</a>	
<b>(Mr.) Jocelyn Doire</b> (e-mail distribution)	<a href="mailto:jocelyn.doire@opcug.ca">jocelyn.doire@opcug.ca</a>	
Public Relations		
<b>Morris Turpin</b>	<a href="mailto:PR@opcug.ca">PR@opcug.ca</a>	613-729-6955
Facilities		
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