



ARTICLE

The Need for Speed by Dunc Petrie

Everyone is familiar with the parallel ATA/IDE (PATA) saga that incrementally increased internal hard drive data transfer rates to 133 MB/sec (megabytes per second). Having reached its zenith it was replaced with a new paradigm: serial ATA (SATA). This interface initially introduced a modest incremental speed increase (to 150 MB/sec); however, unlike PATA this new interface has the potential to offer raw transfer rates up to 600 MB/sec (SATA/600) and possibly beyond. We'll conveniently ignore the parallel discussion of any current system's capability to utilize fully this speed.

There are, of course, alternate protocols for high-bandwidth internal mass storage: for example, serial attached SCSI (SAS) remains an icon in various enterprise configurations but its expense relegates it to a curiosity for hobbyists and small business operators. Various RAID configurations could increase not only transfer rates but also data security; many of these solutions rely upon SATA drives.

These solutions adequately address internal hard drive bandwidth but leave users of externally-attached mass storage at a disadvantage. This discussion will ignore flash drives or "thumb drives"; they are deservedly popular and speedy but their current capacities (8-16 GB) hardly qualify them as mass

storage when they are compared to the 500 GB to 1 TB capacity of their hard drive cousins.

A bit of history:

Early external storage devices relied upon the old parallel (printer) port or SCSI: for example, the ubiquitous Iomega Zip and its assorted competitors. Most were predicated upon floppy drive technology with some tweaks to increase capacity and performance; ultimately, they were doomed by a lack of bandwidth and never-ceasing file size increases. Some attempts were made to increase capacity but that effort ran foul of the rise of optical recordable media - significantly cheaper media that offered several times the capacity. While convenient and adequate for the size of most data files at that time, the parallel port's bandwidth - generously, 2.8 MB/sec - quickly wilted under the strain.

Jury-rigs excepted, PATA never developed an outside-the-box strategy. The current availability of a plethora of external boxes that can interface a hard drive to the desktop workstation has brought external bus bandwidths to the fore. Some are build-it-yourself combinations; others are pre-packaged commercial offerings - frequently with impressive backup strategies that demand little more than hitting a button. Until recently, these units exclusively contained a PATA hard drive and the nec-

essary bridge electronics (this bridge is a source of inefficiencies that detract from the throughput) to adapt that drive to the external bus. With few exceptions that bus would be USB 2.0 although a minority of external cases offered both Firewire (aka Firewire 400, IEEE 1394a or iLink) and USB 2.0.

The usual present

Both these buses offered comparable raw transfer rates but for Windows-based PCs USB 2.0 had the upper hand in sales volume. Firewire-equipped cases were a distinct minority on store shelves since royalties are higher and the hardware is more expensive; practically, few PC-based systems (unlike their erstwhile competitor, the "Mac") integrated it on the motherboard. Newer PC systems - particularly those with multimedia inclinations - are inte-

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# May Raffle

It's déjà vu all over again!

**A**t the May general meeting, thanks to the generosity of McAfee Canada, we will be raffling off *five* – that's right – *five* copies the **McAfee Internet Security Suite with Site Advisor**. This comprehensive, ten-in-one suite of desktop security tools can stop viruses, stop hackers, block spyware, improve the health of your PC, secure your identity, prevent spam & email scams, protect children while online, back up & restores files, rate web sites so you can avoid online dangers, and manage your updates. Valued at \$70. May be installed on three PCs.

We will be drawing five tickets, so for the same inexpensive price, you will quintuple your chance of winning!

Tickets are still *only* \$1 for one, \$2 for three, or \$5 for ten. What a bargain!

# Coming Up...

Members' Presentations, May 14th

Do you have a favourite program you'd like to tell us about? Freeware, shareware, or commercial. Useful utilities or relatively unknown treasures! At our May meeting, several of our members will be doing just that in a series of short (10-15 minute) demos or slideshows. At present, we have room for a few more, so this is your big chance to share your experience with others. To jump in, contact me with your name and topic, but not all at once, please.

Bob Gowan (bob.gowan(at)opcug.ca)

# April Prize Winners

**George Leir** (Flight Simulator 10) and **Ron Darlow** (Halo 2) will be sure to enjoy their new games, courtesy of Microsoft.

# OPCUG Vacuum Flasks

**J**ust in time for the hot summer to come ... or the cold winter to follow, this handsome and durable stainless vacuum flask can help keep your cold drinks cold or your hot drinks hot. Not only that, the stylish OPCUG logo and web address proudly proclaims to all who see you toting it around that you are a member of our august user group!

For only \$15 – yes, for that price you even get the handy carrying case with strap! – you too can be one of the first to own one.

See Mark at the membership table.



## 2008 CALENDAR

Meetings	Date	Time and Venue
OPCUG General Meeting	Wednesday, May 14 <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.science-tech.nmstc.ca/english/index.cfm">http://www.science-tech.nmstc.ca/english/index.cfm</a>
Beginners' SIG	Wednesday, May 14 <sup>th</sup>	Immediately following the OPCUG General Meeting.
Linux/Open Source Software	Wednesday, May 14 <sup>th</sup>	Immediately following the OPCUG General Meeting.
PIG SIG (Wing SIG West)	Wednesday, May 14 <sup>th</sup>	10:00 p.m. (after all other SIGs) at Chances "R" restaurant, Baseline Rd. at Woodroffe Ave. (College Square Shopping Centre)
Beer BOF (Wing SIG East)	Wednesday, May 14 <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).

## CLUB LIFE

### OPCUG Workshops *by Chris Taylor*

Last fall, the OPCUG held its fifth annual fall workshop. These annual events, while a lot of fun to host, are a lot of work. Beyond the need to coordinate presentations from up to four speakers, there are logistics with regards to the room, equipment, lunch, coffee, advertising, and more.

Over the past couple of months I have been arranging a different approach – a partnership of sorts with the Ottawa Public Library. The Library hosts many, many presentations and welcomed the idea of speakers from the Ottawa PC Users' Group broadening the topics for presentations given at the Library.

This is a win-win situation. The Library gets access to some new topics for their program. In return, there are many benefits to the OPCUG. The Library takes care of logistics for the location and equipment such as an LCD projector are available. The Library advertises the events and take care of registration.

We are hoping that this fresh approach, along with the advertising provided by the library will let more in our community know about the Ottawa PC Users' Group and will attract more new members.

So far, we have arranged for three presentations to be given by OPCUG members. All are evening events which will be given at the North Gloucester branch of the Ottawa Public Library, 2036 Ogilvie Road, 613-748-4208. All are welcome to attend.

- Wednesday, May 7, 7:00 p.m. – Keep hackers away and your computer safe by following advice given by Chris Taylor of the Ottawa PC Users Group.
- Wednesday, May 21, 7:00 p.m. - Just what is Linux? Is it really better than Windows? Find out with Alan German from Ottawa PC Users Group.
- Wednesday, June 4, 7:00 p.m. – When buying a digital camera, you are faced with a bewildering array of choices. Chris Taylor from the Ottawa PC Users Group can help you sort them out.

You can find out more about the Ottawa Public Library's events at :

[http://www.bibliottawalibrary.ca/events/todayevent\\_e.cfm](http://www.bibliottawalibrary.ca/events/todayevent_e.cfm)

If you think you might like to give a presentation at the Library on behalf of the Ottawa PC Users' Group, please talk to any member of the Board of directors



## ARTICLE

## Upgrade Envy—Part 8 *by Peter Hawkins*

**W**hen last we met, I quietly mentioned that there was a small Raptor drive that had caught my attention when I was surfing the available computer parts on Ebay, and I just couldn't let it go by without at least making an offer. And I did too, one that I thought would be quite reasonable. And it was enough to win the auction. Could I at least pause here for a moment? Ebay uses the phrase "win the auction" because you are bidding against who knows how many other would-be buyers. But somehow the concept of "winning" doesn't feel right to me. "Winning" implies to me that I have come first in a race of sorts and that there is a "prize". Well, I don't know about you, but I have always felt that a "prize", especially if it was "won", was free to the winner! Here though, you have to pay! At least some of the time, the emails I get from Ebay do tell me that I am the "successful bidder" and that phrase seems at least more honest to me. Enough quibbling on my part for now.

So, being the "successful bidder" of a slightly used 37 gig Raptor drive, I began to watch the mail daily. Thankfully it was not too long before a small package was left for me by the letter carrier. And bundled in lots of bubble-wrap was my latest acquisition. Yes, I hear you reminding me that that the Raptor drive is a SATA drive. Not to worry, mate...the ASRock motherboard was fully equipped to handle not only the older tech IDE drives, but the newer tech SATA drives. See...everything is under control!

It took but a moment in time to open my box, firmly (but not too tightly) snug the mounting screws through the frame and into the drive, plug in the power lead, and the data cable to the SATA 1 terminal on the motherboard. All that was left to do was turn on my computer, and get busy using my new

and very fast drive. Right. Turn on the power, wait, hit F2 to enter the BIOS and find my new drive. Where was it? Power off. Open box. check power lead - Okay. check data cable - OK. Close box. Turn power on. Go into the BIOS - NO RAPTOR. At this point a niggling little fact from many years ago raised its little head: had I initialized the drive? Well, run the install disc and see. Disc, I hear you cry! What disc? NO disc came with it. Not to worry. Western Digital in their infinite wisdom had foreseen such a problem. On their website was a downloadable file for MY drive. All that was required on my part was to download in, then run it. What could be simpler?

That's all it was. I downloaded the file "dlgsetup11\_win.zip" which I got to by telling them I had a model WD360ADFD. Put the file in a temporary directory on my hard drive, unzip the file, and then run the executable install file. Worked like a charm. Set the drive up, formatted the drive (in NTFS), transferred the operating system, and after what seemed like a relatively short time, clicked on finish and was ready to reboot. Of course you all know that the first thing I was going to do was just watch it boot. Right? Of course. And it booted. But it took quite a long time, which I knew should have just not been possible. This was a RAPTOR after all, and it should have been faster than a greased pig! Did it again, same result. Did it one more time, same result. At this point a phrase percolated through my brain to the effect that if you expect to get a different result from running the same experiment over and over again, you are only going to be disappointed.

At this point a 3rd brain cell joined the discussion in my head, casually inquiring as to whether or not I had changed the boot order. Well...I had not. You do know the process by now.

Right...reboot, hit F2, change the order, "Save and Exit" and watch the screen. Well that was harder to watch than before. Windows really booted quickly (that is, especially to you Linux users, an oxymoron!) certainly far faster than I'd ever expected to see it do. And it opened windows on my screen faster than I could ever remember seeing it happen. I couldn't have been happier. This plan was coming together just beautifully.

The last thing to do was to partition my new drive into 3 parts. Part C was the bootable partition, about 9 gigs in size, roughly a quarter of the drive size. Part J was the next part (Do not ask passerby, why...If I have learned anything from observing windows it is that the quite unexpected thing is the most likely to occur...so I have no real idea why it was labeled J.) and I sized it to 10 gigs for pretty much my data, and the most frequently used programs, which I would copy over from the older slower IDE drive. The final partition was labeled K by windows, an obvious choice since it must have been the next available letter, although even then I am sure that windows on its own might have chosen Q or Z if it had wanted to! It occupied the rest of the drive, about 21 gigs, give or take. Please, do not get me started on what the size of 1 gig is. There are 2 clear choices here and I am in a very small minority - not one, but few! Just as a hint, I celebrated the millennium twice, believing quite properly that while Y2K was a correct problem designation, it was not a millennium designation.

Once again, and to nobody's surprise, I have used up all the column inches I am allowed for this part. As a teaser, please remember that when everything is going just fine....



## The Need for Speed *(Continued from page 1)*

grating Firewire 1394a (50 MB/sec) and some offer a convenient front or top panel port on the system case. While raw transfer rates are slightly inferior to USB 2.0 this theoretical disadvantage is offset in certain circumstances by Firewire's strengths: for example, guaranteed bandwidth, less protocol overhead and more electrical power (up to 45 watts versus USB's 2.5 watts). Until recently, Firewire has been relegated to transferring video data from a video camcorder to a computer.

If the time consumed to perform a transfer/backup is not an issue then these approaches are certainly viable. However, due to the bandwidth of most of the interfaces offered, large data transfers become a burden. For example, USB 2.0 in theory can transfer 60 MB/sec; practically, rates hover around 32 MB/sec (discussed at [http://www.tomshardware.com/2008/01/07/sub\\_terabyte\\_external\\_hard\\_drives/page16.html](http://www.tomshardware.com/2008/01/07/sub_terabyte_external_hard_drives/page16.html)). Similarly, Firewire 1394a claims 50 MB/sec but actually delivers about 40 MB/sec. Translating these numbers to reflect real-world data transfer rates yields 15-20 GB/hour (or three to four minutes per gigabyte). In other words, backups of large data resources (for example, large drive partitions, databases or video files) will require considerable patience.

### The "bleeding edge" present

Firewire has offered an update, Firewire 1394b or Firewire 800 or IEEE 1394b (the specification was finalized in 2001-02) that doubles the bandwidth to 100 MB/sec (800 megabits/second, hence the name). To date, this has evidenced little ingress in the PC world although, once again, "Mac" is blazing the trail. There are PC-compatible expansion cards available; however, adding Firewire 800 is not a straightforward upgrade. The "800" series cables and connectors are different (a square, nine-pin connector versus the old four or six pin plug) although adapters will allow connecting legacy 1394a hardware to the new ports. This does not, of course, allow faster transfer rates for legacy hardware. Still, since there are no native Firewire hard drives, expect that raw throughput would be compromised by the essential bridge electronics. While Firewire 400 is readily incorporated in older systems (Windows XP era hardware) Firewire 800 may have problems if the system lacks PCI Express expansion slots. Drivers are included in Windows XP and Vista; bizarrely, Windows XP with Service Pack 2 (SP2) installed may severely restrict the speed - see a workaround at <http://support.microsoft.com/kb/885222>.

### SATA - The new kid on the block

Given the evident speed bump that these bus bandwidths impose on large data transfers an alternate is a necessity. First generation SATA (SATA/150 or unofficially, SATA1), for internal hardware, was originally introduced with a theoretical bandwidth of 150 MB/sec - a modest increase from PATA's last-gasp 133 MB/sec. Due to coding overhead this translated to an actual throughput that makes, in actual operation, SATA/150 and PATA/133 comparable in their theoretical burst-throughput.

Currently, most SATA hard drives (this discussion will ignore optical drives that use this interface) available from retail outlets are SATA/300 and offer a theoretical 300 MB/sec throughput [Aside: SATA/300 is often incorrectly identified as SATAII or SATA2 but the references are so prevalent that the misnomer will probably prevail]. SATA/600 is under development although this capability would significantly exceed current system bandwidth.

### eSATA- Taking SATA outside the box

The true external variant has unique specifications and beefed-up connectors; however, in the short-term most eSATA hardware in the marketplace is simply plain-vanilla SATA gear located "outside the box". With some small compromises (discussed later) this works quite well although the fragility of the connectors demands due diligence from the user.

This latest evolution will place SATA in the ring against two long-standing champions: Hi-Speed USB 2.0 and Firewire 400. Certainly, the potential bandwidth advantage of eSATA - up to three times that of its competitors - is impossible to ignore. Better, it is available now using a cable to connect an on-motherboard SATA port to a backplane adapter. There are also expansion cards - technically called host bus adapters (HBA) - available for both desktop and portable systems. External cases are available with not only the eSATA external connector but also the requisite SATA internal connectors. There is no need for bridge electronics (protocol translation) and that consequent bottleneck should be relegated to history. Theoretically, this bus should allow at least 75 MBps transfers; perversely, some early offerings are bottlenecked at USB 2.0/Firewire 400a throughputs (see [http://www.tomshardware.com/2008/01/07/sub\\_terabyte\\_external\\_hard\\_drives/page9.html](http://www.tomshardware.com/2008/01/07/sub_terabyte_external_hard_drives/page9.html)). Presumably - hopefully - this will improve with time.

Some SATA electrical specifications were tweaked for the external variant - eSATA - to increase data transmission reliability. The need for backwards compatibility ensured that the protocols were respected; this allowed (internal) SATA devices to be installed directly in external enclosures without any data translation. Unlike Firewire or USB connected boxes this avoids the bridge electronics that translate the data between parallel and serial mode as required and permit a PATA drive to work while it is connected through a Firewire or USB cable. These bridges exact a

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## The Need for Speed *(Continued from page 5)*

toll (you never get something for nothing) on data throughput. Thanks, in part, to the tweaks above the cable length specification for eSATA is two meters: double that of SATA itself. However, early offerings - as noted above - that are not true eSATA should be held to tighter requirements to assure reliability. Yes, these distances are significantly less than the competitors - four to five meters for Firewire and USB; however, it should prove adequate in the majority of situations. For comparison, the official PATA specification (internal only, of course) restricted cable length to a mere 18 inches. Yes, there were IDE cables up to 36 inches in length readily available but, theoretically, these could introduce data transmission errors. Remember: a parallel cable's job is to deliver the data bit on each of its conductors to the destination at precisely the same moment in time: the longer the cable the more elusive success. Having personally used longer (to 27 inches) and rounded cables (another specification no-no) I have not experienced data faults - yet (See Scott Mueller's *Upgrading and Repairing PCs*, 18th Ed, page 599).

In theory, both USB 2.0 and Firewire (all flavors) are capable of supplying power to a hard drive contained in an external enclosure. USB 2.0, given its limited wattage, would be marginal, but possibly double, for a portable drive (2.5 inch form factor); I doubt that it could support a high-capacity 3.5 inch drive. Dan's Data (<http://www.dansdata.com/danletters196.htm>) mentions a workaround that I have not observed: a double-header cable with two USB plugs. Plugging these connectors into two separate root ports would supply the usual power and data on one port while the other would supply only power. In theory this could provide enough power to spin up a 2.5 inch form factor drive - 3.5 inch drives would remain "iffy".

Practically, all these enclosures, regardless of interface - at least in my experience - come equipped with an external power supply (aka wall wart or power brick). Against this scenario the essential external power source for eSATA does not loom as a serious impediment. However, a note of caution: due to some technical deficiencies some external enclosures are unable to support hot swapping.

For convenience, early SATA drives offered a choice between a correct SATA power connector (15 pins) and a Molex (the ubiquitous, four pin power connector found on any PATA hard drive) or a Molex-to-SATA adapter. This ad hoc conversion, while convenient, offers only five volt and 12 volt lines; it does not offer the 3.3 volts incorporated into a dedicated SATA power connector.

Some SATA-hard-drive and hardware combinations may perform erratically if the 3.3 volts is not available. To further confuse the reader some early SATA drives simply replaced a PATA drive's data connector with a SATA: the drive's circuit board incorporated the necessary conversion electronics. To most end-users this duplicity was transparent although some high-end features were unavailable. Current hard drive offerings, to my knowledge, are native SATA. I expect that most current hard drives and certainly future offerings (equipped exclusively with a SATA power connector) will demand the dedicated connection that offers the unique 3.3 volts - check your power supply! The ability to hot-plug drives relies, in part, on the presence of this voltage.

Backwards compatibility has been maintained; that is, newer and faster SATA protocols will support legacy SATA hardware but without increasing the bandwidth. As noted earlier, the original SATA/150 bandwidth is not a bottleneck; today's fastest desktop hard drives in most cases cannot saturate this link. Unfortunately, some older motherboard SATA controllers cannot negotiate a fallback protocol. These systems require setting a jumper manually or an updated ROM (for example, VIA VT8237, VIA VT8237R, VIA VT6420 and VIAVT6421L or SiS 760 and SiS 964). Further information is found at: <http://tinyurl.com/39ofqe> (OPT1 Enabled, Western Digital) or <http://tinyurl.com/3bu9cq> (Force 150, Seagate/Maxtor).

**LONG FORMAT URLs** (in case the above "tinyurls" don't work): Please copy and paste the following URLs into your browser:

### Western Digital

[http://wdc.custhelp.com/cgi-bin/wdc.cfg/php/enduser/std\\_adp.php?p\\_faaid=1337&p\\_created=1112379341&p\\_sid=2-p4xEYi&p\\_accessibility=0&p\\_redirect=&p\\_lva=&p\\_sp=cF9zcmNoPTEmcF9zb3J0X2J5PSZwX2dyaWRzb3J0PSZwX3Jvd19jbnQ9MzQ3LDM0NyZwX3Byb2RzPSZwX2NhdHM9JnBfcHY9JnBfy3Y9JnBfc2VhcmNoX3R5cGU9c2VhcmNoX2ZubCZwX3BhZ2U9MSZwX3NIYXJjaF90ZXh0PWp1bXBldiBzZXRoYW5ncw\\*\\*&p\\_li=&p\\_topview=1](http://wdc.custhelp.com/cgi-bin/wdc.cfg/php/enduser/std_adp.php?p_faaid=1337&p_created=1112379341&p_sid=2-p4xEYi&p_accessibility=0&p_redirect=&p_lva=&p_sp=cF9zcmNoPTEmcF9zb3J0X2J5PSZwX2dyaWRzb3J0PSZwX3Jvd19jbnQ9MzQ3LDM0NyZwX3Byb2RzPSZwX2NhdHM9JnBfcHY9JnBfy3Y9JnBfc2VhcmNoX3R5cGU9c2VhcmNoX2ZubCZwX3BhZ2U9MSZwX3NIYXJjaF90ZXh0PWp1bXBldiBzZXRoYW5ncw**&p_li=&p_topview=1)

### Seagate/Maxtor

[http://seagate.custhelp.com/cgi-bin/seagate.cfg/php/enduser/std\\_adp.php?p\\_faaid=2850&p\\_created=1146080290&p\\_sid=q3E8zEYi&p\\_accessibility=0&p\\_redirect=&p\\_lva=&p\\_sp=cF9zcmNoPTEmcF9zb3J0X2J5PSZwX2dyaWRzb3J0PSZwX3Jvd19jbnQ9MjksMjkmcF9wcm9kcz0wJnBfy2F0cz0wJnBfcHY9JnBfy3Y9JnBfc2VhcmNoX3R5cGU9YW5zd2Vycy5zZWZwY2hfbmwmcF9wYWdlPTEmcF9zZWZwY2hfdGV4dD1mb3JjZSAxNTA\\*&p\\_li=&p\\_topview=1](http://seagate.custhelp.com/cgi-bin/seagate.cfg/php/enduser/std_adp.php?p_faaid=2850&p_created=1146080290&p_sid=q3E8zEYi&p_accessibility=0&p_redirect=&p_lva=&p_sp=cF9zcmNoPTEmcF9zb3J0X2J5PSZwX2dyaWRzb3J0PSZwX3Jvd19jbnQ9MjksMjkmcF9wcm9kcz0wJnBfy2F0cz0wJnBfcHY9JnBfy3Y9JnBfc2VhcmNoX3R5cGU9YW5zd2Vycy5zZWZwY2hfbmwmcF9wYWdlPTEmcF9zZWZwY2hfdGV4dD1mb3JjZSAxNTA*&p_li=&p_topview=1)

While actual transfer rates will not increase in the near future (system limitations) SATA will introduce one improvement that has the ability to improve data request response times. SCSI has long-offered support - called native command queuing (NCQ) - for re-ordering multiple requests to improve response time; PATA could adjudicate only one request at a time. SATA will optionally offer this feature: presumably on premium, higher-cost drives.

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## The Need for Speed *(Continued from page 6)*

The SATA power and data connectors and cables are much smaller and are used for both desktops and laptops. The 15-conductor power cable has a polarized connector that prohibits reverse insertion and its physical dimensions prevent cross-connection with the data port. Be careful: the thin shell is prone to break if insertion/removal forces are not aligned along its axis. For example, Anandtech - <http://www.anandtech.com/storage/showdoc.aspx?i=3185> - relates a sad story and offers a useful tip to minimize repeat disasters. Various pins are ganged together to supply adequate power and staggered spin-up (the latter to reduce power demands at system boot); three voltages (3.3, 5 and 12) are required - in part to support hot-plugging. The seven conductor data cable is similar in shape although slightly narrower; it is also polarized and shares the fragility of its power supply companion. Unlike the old PATA scheme one cable connects one device: gone are the jumpers to define master and slave drives on the same data channel (Scott Mueller's *Upgrading and Repairing PCs*, 18th Edition, pages 605-609 and 1256 will fill in the technical specifications). Happily, these cables can be longer (twice the official length of a PATA counterpart) while their reduced cross-section improves case cooling.

### True eSATA - soon to appear on shelves

The external SATA (eSATA) official specifications tweaked some of the original criteria to adapt to the external environment: for example (not a comprehensive listing), increasing the spread of the transmit/receive voltages and the maximum cable length to 2 meters. More robust connectors were adopted that could withstand more vigorous handling; in addition, the deliberate weak link in the chain will become the connector on the cable. Internally, the weakest part was the fixed connector on the drive itself; once broken the hard drive became a paperweight. Presently, an in-specification eSATA connector on most PC motherboard backplanes is infrequent although motherboard manufacturers are beginning to respond. Correct, in-specification eSATA cables remain elusive in the retail market. Early offerings may be a passive SATA connector on a backplane bracket that would attach to an existing, on-motherboard SATA port. While usable, this approach would not be fully compliant with the final eSATA specification; practically, for this interim accommodation the connecting cable should not exceed one meter in length (remaining compliant with its SATA origin). Alternately, true eSATA host bus adapters (HBA) or Cardbus/ExpressCard for notebooks can be installed.

Finally, S.M.A.R.T.(Self-Monitoring, Analysis, and Reporting Technology) is usable with eSATA since the specification does not require bridging technology. PATA to USB and Firewire bridging technologies do not transfer this data.

### The future

USB has announced USB 3.0 Super Speed that would increase speed to 600 MB/sec while retaining backward compatibility (allowing old hardware to run using existing connectors).

Firewire has announced the IEEE 1394c specification (aka Firewire S800T) to use RJ45 connectors and Category 5e network cables. Bandwidth would increase incrementally to 800 MB/sec; eventually, data would travel on optical fibre.

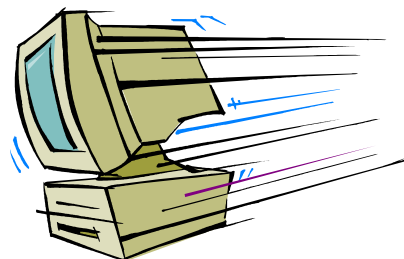
SCSI must be acknowledged in enterprise; however, due to the associated higher costs it is an unlikely candidate for hobbyists or small businesses. Historically, it has claimed not only speed superiority but also reliability. This model seems overdue for a substantial revision. Consider: prices for consumer-level drives have fallen, capacities have increased and warranty periods are extended. Manufacturers must be confident of increased reliability and are prepared to back it. RAID in concert with SATA drives could become an attractive alternate for some SCSI schemes.

Looming on the horizon is the solid state drive (SSD). While current capacities are small and the technology is very expensive the future bodes well: volume manufacturing will reduce costs significantly. The conventional hard drive will meet its match: no mechanical failures; superior seek times, access times and transfer rates; reduced heat and noise; significant power savings; and, high shock resistance.

### What does it all mean?

While eSATA holds top honors for speed USB 2.0 and FireWire are not defeated. USB ports exist in abundance on all mass-market computers to connect a plethora of external hardware devices and FireWire interfaces are a de facto standard for consumer electronics appliances; while they might lose the external mass storage assignment their market presence is assured. For small form-factor devices (such as external 2.5inch/ 70 mm disks), a PC-hosted USB or FireWire link could supply sufficient power to operate the device; in these circumstances, convenience (no power brick) would trump speed.

Not to be outdone, the SATA Organization is proposing a new eSATA specification that would have power provided over the data cable. This would eliminate the need of a separate, external power supply and cable. The revised data cable would retain backwards compatibility with the current, non-powered cable (MaximumPC, Quickstart, April 2008, page 12). An implementation date or strategy was not provided.



# 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 go until 10 p.m.

<b>Fees:</b>	OPCUG membership:	\$25 per year
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And if you decide you do not need the printed version mailed to you anymore, simply let Mark Cayer (membership chairman) know. He can be reached at general meetings, as well as by e-mail at [Mark.Cayer@opcug.ca](mailto:Mark.Cayer@opcug.ca). You might want to wait until you have successfully received at least one issue electronically before opting out from the printed version.

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“Announcements” is a low volume list that the Board of Directors uses to get in touch with the membership. Subscribers can expect at least one message per month – the meeting reminder that goes out a few days in advance of the general meeting. Other than that, the only time it is used is when the Board feels there is some important news that should be brought to the attention of all members.