MUUGLines

The Manitoba UNIX User Group Newsletter

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Next Meeting: September 9th, 2014

RTFM and presentation:

Sage is a free open-source program that allows (in the style of Mathematica or Maple) various types of symbolic manipulation. It is built out of nearly 100 open-source packages and features a unified interface. Sage can be used to study elementary and advanced, pure and applied mathematics. Michael Doob will be our presenter.

For this month's RTFM topic, Rob Keizer will talk about the **tmux** command.

Where to Find the Meeting

University of Winnipeg Lockhart Hall (marked "L" on the map), on the south-east corner of Spence and Ellice. Parking is available on the surrounding streets. Meetings are normally in room 1L08, but occasionally are relocated to nearby rooms. If there is a change, it should be conveyed via a sign on the door to 1L08.

MUUG Mugs!

Back by popular demand! MUUG now has new coffee mugs, cobalt blue and deep laser-etched with our age old, lovable logo for sale for $15 cash. They are quality mugs, made in the USA, and have a fairly large volume capacity. Want a mug but can't make meetings? Ask on the mailing list and most likely a board member can deliver one within Winnipeg.

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MUUG Mailing List

Did you know MUUG maintains a mailing list open to members and non-members alike? It's called Roundtable. It's usually low traffic, and a great place to ask technical questions between meetings, or just chit-chat about something computer-related. We'd love to see you there!

http://www.muug.mb.ca/maillists.html

PAE: Walking Dead

The PAE kernel may be on its last legs. PAE (Physical Address Extension) is a Linux kernel build option that allows Linux to use more than 4GB system RAM in 32-bit mode. On most x86 systems if you install 4GB or more of RAM, the system will only "see" 3-4GB of it (usually closer to 3).

PAE gives you the main benefit of 64-bit without the pain of switching (wipe/reinstall) to a full 64-bit install. The only limitation (in theory) was that while

your system had greater than 4GB, each process could only address 4GB. For most people not running massive databases, etc, that was not an issue.

PAE works in much the same way that old MS-DOS systems were able to access first the full 640k and then RAM above 640k. It's a type of page-table trick, a kludge.

In the last year, a few rumblings have been leaked regarding PAE. Linus has expressed disgust at it ("PAE is 'make it barely work'") and that it should never be used with 16GB RAM and higher. Besides this obscure web conversation, who would have known? This author recalls reading somewhere that patches against PAE memory bugs would no longer be accepted by Linus, but the link eludes at the moment.

A RedHat spokesman has told this author that RHEL as of version 7 does not even support 32-bit, let alone PAE: only x86_64 is supported. He also said that Fedora heads have been milling over the idea of dropping all 32-bit support from Fedora also. That would be a shock, as it would mean any Intel computer older than June 2004 would not be able to run Fedora. If other distros react similarly, a wide swatch of barely decade-old computers could become useless.

For now, it seems prudent for anyone still using PAE Linux to migrate to x86_64 sooner rather than later. If you are unfortunate enough to have the rare breed of hardware that has >4GB RAM but no 64-bit capable CPU, you may soon be out of luck.

Unless the official support situation for PAE improves, distros should cease installing PAE by default (some do), and the word should go out far and wide PAE is deprecated. Perhaps the distro packages should change the kernel package PAE suffix to PAE-buggy or PAE-unsupported so that unsuspecting users will be enlightened.

In case you were wondering, there appears to be a dearth of "easy" upgrade paths from PAE to x86_64. Whilst, in theory, one can run an x86_64 kernel with a 32-bit userspace, most distros don't make this easy, especially to maintain through updates. The only real solution seems to be a wipe/reinstall/reconfig of the whole system into full x86_64.

http://tinyurl.com/lugfro5

https://bugzilla.redhat.com/show_bug.cgi?id=1075185#c46

ISO9660 Labels

Did you know CDs and DVDs have volume labels, much like most hard disk file systems and floppies? A not-so-easy way to see them on systems that provide no relevant utility is with dd:

dd if=/dev/sr0 bs=1 skip=32808 count=32

Blu-Ray BD-R Finally Cheaper

About a year ago recordable Blu-Ray discs (BD-R) finally passed DVD-R as the cheaper option, per-GB. Today BD-R is approaching half the price per-GB as DVD-R, at 3.5c versus 6.5c in spindles for good quality Verbatim DataLife brand discs.

Prices are for single-layer. Dual-layer discs of both types are still significantly more expensive (more than double the price for double the capacity). DVD-R's provide roughly 4.7GB per disc; Blu-Ray 25GB.

With the cost of BD-R drives having become reasonable, it is now more cost-effective to switch to Blu-Ray for capacity-hungry users of optical media. Optical media still remains the cheapest backup option, and, unlike a hard drive, is not prone to G-force, strong magnet, nor EMP damage.

Blu-Ray XL Gives 4X Capacity

A new variant of BD-R recordable Blu-Ray discs called Blu-Ray XL provides 100GB on one single-sided disc, quadruple the capacity of the standard 25GB BD-R. A special BD-R XL compatible BD-R drive is required, but most recorders should eventually ship with the feature as standard.

Capacity doesn't come cheap though: MSRP is close to $100 **per disk**! Street prices should be sub-$60. If you absolutely need to put 100GB on a single optical disc, at least now you can do it. Interestingly, the price is on par with that of a 128GB USB flash drive.

Cat With File Names

Need to cat a bunch of files but want the file names shown before each file's contents? Turns out cat can't do it (yet). Use tail instead:

tail -c+1 files ...

This is great for snapshotting the output of small files into one big file. For example:

cd /proc; tail -c+1 consoles dma

==> consoles <==

tty0 -WU (EC p) 4:1

==> dma <==

2: floppy

4: cascade

Multipass Disk Erase Overkill

In an interesting discussion on the Linux RAID mailing list, Doug Brown, Fedora packager and past-contributor to Linux Journal says:

> *Even with the full resources of NSA, there is no way to read useful data from a disk that has had a single pass of writing zeros. Multi-pass disk erasure is a case of some companies getting very rich from a myth based on a single academic paper with theories about how /some/ data /might/ be recoverable from overwritten disks. It was never more than an idea at the time, and it applies even less to modern disks.*
>
> *In an experiment, researchers wrote some bits to a sample of hard drive material, overwrote them once, then tried to read the old data. I can't find the reference (I really wish I could), so my figures may be a bit off - but they are in the right ballpark. I believe it was about 32 bits they wrote. They managed to recover 7 bits that they were confident were correct - after spending months with equipment such as electron microscopes.*

http://permalink.gmane.org/gmane.linux.raid/45704

Cute Link of the Month: Mailing List Survival Guide

Worth a chuckle for those who remember using (or still use) terminal-based mail/news readers, like elm, nn and mutt.

http://joeyh.name/blog/entry/thread_patterns/

Thought-provoking Essay: Toward A Better Programming

"How can we make programming better?" is the question. Chris Granger attempts an answer and in the process provides interesting insights into the faults inherent in today's programming methods. Below are some teasers:

> *Think about a line of code like this:*
>
> *person.walk();*
>
> *What does it do? OOP's notion of encapsulation is by definition unobservable. I have no idea what person.walk() does. It probably does something sane, like set isWalking to true, but it could also be setting ateCarrots to true and it may have determined that I passed out from exhaustion [...]*
>
> *While symbols are certainly important and powerful in some cases, they don't have to be this opaque:*
>
> *cards[0][12]*
>
> *Ah yes, when playing cards, I love it when I get the cards[0][12]*
>
> *[...]*
>
> *The other day, I came to the conclusion that the act of writing software is actually antagonistic all on its own. Arcane languages, cryptic errors, mostly missing (or at best, scattered) documentation - it's like someone is deliberately trying to screw with you, sitting in some Truman Show-like control room pointing and laughing behind the scenes*

Check out the full essay here:

http://tinyurl.com/pdn3eew

MUUG Mirroring Requests

As you may know, MUUG mirrors several Linux distributions (such as Fedora and Ubuntu) for the benefit of members and geographically (networkally?) close members of the public. Your Linux install may be using MUUG's server, lisa.muug.mb.ca, without even knowing it, as most package managers now determine the fastest (usually closest) mirrors automatically.

MUUG will be expanding disk capacity in the near future and we are soliciting requests for additional things to mirror. "More distros" is an obvious candidate, but other non-distro ideas have been bandied about, such as Wikipedia. If you have a favourite mirror you would like to see mirrored on lisa, let us know at meetings, on the mailing list, or directly at board@muug.mb.ca. First priority will go to suggestions by members.

Bad Caps Strike Again

Will the world ever be free of substandard capacitors? Apparently not. This author has recently experienced a rash of failing caps, this time in power supplies. While I have seen this before, over the years since the Bad Cap Epoch (circa 2001), it is with disturbing regret that it is showing up in high-quality, higher-end (APFC), non-abused (read: excessive heat) Enermax brand power supplies.

More disturbing still is the method of failure. In numerous systems (including one of my own) I have now witnessed computers running 100% stable for years, that is until the moment the power is cycled. At that moment, when you press the power button to turn on the computer, the power supply acts as though it is completely dead. Fans don't even spin for a nanosecond. Yet if the motherboard has an indicator LED (usually near the RAM slots), it illuminates as normal.

Yet more curiously, hooking the power supply up to a $30 tester shows the supply to be working perfectly, with all voltages within spec.

Upon opening the power supply case (warning: don't try this at home unless you know what you are doing), it is immediately obvious that one or more bad caps are present, with their bulging tops and possibly hints of brown goo. My theory is the supply is capable of maintaining running voltage, but due to the failed cap is incapable of providing the inrush current (which can be around double) required to start everything.

Whilst the symptom of not powering on can also be caused by a dead motherboard, faulty cabling, unhooked power switch wires, etc; suspect a bad power supply first after a cursory glance for motherboard bad caps.

Upon inspection of the faulty capacitors it is obvious all failing capacitors are non-Japanese brands, usually complete no-name Chinese brands. That computer companies of all stripes continue to use such trash to save 10c per capacitor is unconscionable. This author has now switched to mid- and high-end Antec brand power supplies which are one of the few ones that state and guarantee that all of their caps are Japanese-made.

Book Discounts

no starch press

No Starch Press has established a discount for user group members. It's valid for 30% off everything they publish, and it doesn't expire. Use "MUUG" as the discount code when ordering from their website.
http://www.nostarch.com/