MUUGLines

The Manitoba UNIX User Group Newsletter

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Editor: Katherine Scrupa

Next Meeting: September 12, 2017 7:30pm

RTFM: RCS Redux

Adam Thompson will be hosting this month's RTFM segment about Revision Control System. Like other version control systems, RCS automates the storing, retrieval, logging, identification, and merging of revisions. This primer will help you manage your frequently-revised text, source code, programs, documentation, graphics, papers, and form letters.

Presentation: NTP

Wyatt Zacharias will be presenting NTP, with a bit of theory and practical information on setting up NTPD.

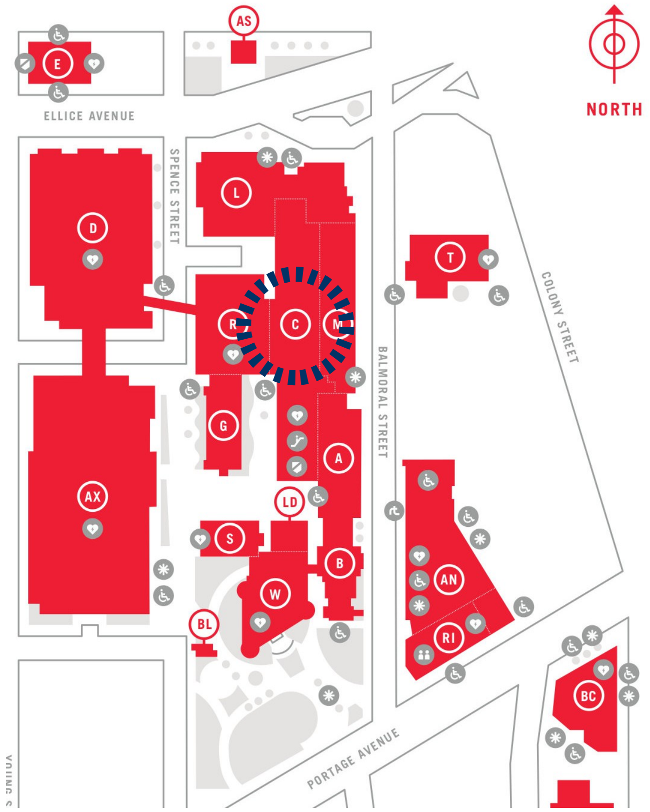
Door Prizes:

We will be giving away a couple of e-books and the usual assortment of magazines and miscellanea. Come to the meeting for your chance to win!

This Month's Meeting 1C16A Centennial Hall

This month's meeting is in Centennial Hall. Look for a sign on the door. There are elevators and escalators scattered around the buildings. A convenient one might be the elevator located right at the Ellice Ave entrance. Doors are usually open by 7:00 pm with the meeting starting at 7:30 pm. Parking is available on the surrounding streets. Please see `http://www.uwinnipeg.ca/maps` for further information about parking and access to the campus.

The latest meeting details are always at:
https://www.muug.mb.ca/meetings



Where to Find the Meeting

Hardened BSD Now Available on the MUUG Mirror

The latest Hardened BSD 11 version as of August 20 is 48.2. You can find it (and others) at

`https://muug.ca/mirror/hardendbsd-stable-pub`

Python is Bananas

“She’s using bananas to advance her slides. I’m not kidding.”

“Bananas go brown really quickly, especially when you run current through them.” (Video in link:)

https://twitter.com/glasnt/status/894059763993952257

From the MUUG Math Department

Thanks to Michael Doob:

A little summer problem

Consider all numbers of the form $a+b\sqrt{2}$ where a and b are integers. We want to show that numbers of this form can be positive and as close to 0 as we like. More precisely, for any positive real number r, we can alway find some $x = a+b\sqrt{2}$ so that $0 < x < r$. For example, if $r = 0.001$ then $x = 577 - 408\sqrt{2}$ is between 0 and $r = 0.001$.

1. Show that no matter how small a positive r is, there is some choice of a and b so that $0 < a + b\sqrt{2} < r$.
2. Write a program that will find an appropriate a and b once r has been chosen. It should be efficient (say, if you cut r in half, the program should have no more than double the steps).
3. Show that if 0 is replaced by any fixed number, then the result is still true.

As an example of item 3, if 0 is replaced by π and once again $r = .001$, then

$$\pi < 2092202 - 1479408\sqrt{2} < \pi + .001$$

(All of these require nothing more than high school algebra).

Solutions

1. Let S be all real numbers of the form $a+b\sqrt{2}$ (the ones we’re looking for).

   If we square one such number, say $x = a+b\sqrt{2}$, we get $x^2 = (a^2+2b^2)+2ab\sqrt{2}$, that is, $x^2 = c+d\sqrt{2}$ where $c = a^2+2b^2$ and $d = 2ab$, This means that if x is in S, then x^2 is also in S.

   Consider the special case: $a = -1$ and $b = 1$. In this case

   $$0 < x = -1+\sqrt{2} \approx 0.414 < \frac{1}{2}$$

   Now we apply the squaring result repeatedly:

   $$\begin{aligned} x &< \frac{1}{2} \\ x^2 &< \frac{1}{4} \\ x^4 &< \frac{1}{16} \\ x^8 &< \frac{1}{256} \\ x^{16} &< \frac{1}{65536}, \text{ etc.} \end{aligned}$$

   After k iterations, we have

   $$0 < x^{2^k} < \frac{1}{2^{2^k}}.$$

   That upper bound goes to 0 really, really fast.

2. The squaring result holds the key. After initializing the variables $a \leftarrow -1$, $b \leftarrow 1$ and $c \leftarrow a+b\sqrt{2}$, a loop of the type

```
while $(c > r)$
        $(a, b) = (a^2 + 2b^2, 2ab)$
        $c = a + b\sqrt{2}$
print $a, b, c$
```

   will print out the answer almost instantly.

3. Suppose we have our value of x (using 1.) so that $0 < x < r$, and L replaces 0 as the number we want to approximate with a number in S. We need only consider all integral multiples of x: $0, \pm x, \pm 2x, \pm 3x, \ldots$. These are all in S, and for some k we have $kx \leq L < (k+1)x$ (in fact $k = \lfloor \frac{L}{x} \rfloor$). Since $(k+1)x - kx = x < r$, we know that $0 \leq L - kx < r$.

Microsoft Porting SQL Server and .NET Core 2.0 to RHEL

Not only is Microsoft is porting SQL Server to Red Hat Enterprise Linux (RHEL), but Red Hat will also support Microsoft’s open-source .NET Core 2.0 on RHEL, Red Hat OpenShift Container Platform, and other Red Hat platforms.

It will soon be available through various Red Hat products as RPMs for traditional yum installations or as Linux container images.

The 2.0 release supports C#, F#, and Visual Basic and is use to create applications in a container framework.

.NET Core 2.0 was release August 14, 2017 and has 32,000 APIs. Most of the new APIs are .NET Framework APIs which should help programmers port their .NET Framework Code to .NET Standard.

http://www.zdnet.com/article/red-hat-adds-microsofts-net-core-2-0-to-its-linux-and-cloud-offerings/

Solving the Mystery of Linux Load Averages During Uninterruptible Sleep State

Consider that in addition to the 1, 5, and 10-minute load averages, other system resource metrics help you determine what's really happening.

The author notes,

> "Adding the uninterruptible state means that Linux load averages can increase due to a disk (or NFS) I/O workload, not just CPU demand. For everyone familiar with other operating systems and their CPU load averages, including this state is at first deeply confusing.
>
> Why? Why, exactly, did Linux do this?"

The author then dives into Indiana Jones archeological pursuit into the old kernel mailing list archives to determine where the uninterruptable states came from. In 1993, he finds these notes in a change:

> The kernel only counts "runnable" processes when computing the load average.
>
> I don't like that; the problem is that processes which are swapping or waiting on "fast", i.e. noninterruptible, I/O, also consume resources.
>
> It seems somewhat nonintuitive that the load average goes down when you replace your fast swap disk with a slow swap disk...
>
> Anyway, the following patch seems to make the load average much more consistent WRT the subjective speed of the system. And, most important, the load is still zero when nobody is doing anything. ;-)

Check out the link for a very comprehensive writeup.

http://www.brendangregg.com/blog/2017-08-08/linux-load-averages.html

How About Windows Defender Ported to... Linux?

https://github.com/taviso/loadlibrary

Native Encryption on ZFS for Linux

You can now replicate encrypted data to another site using the original encryption scheme and keys (you don't need to manage keys on each device.)

The zfsonlinux team notes:

> The last addition *is* the ability to do raw, encrypted sends and receives. The idea here is to send raw encrypted and compressed data and receive it exactly as is on a backup system. This means that the dataset on the receiving system is protected using the same user key that is in use on the sending side. By doing so, datasets can be efficiently backed up to an untrusted system without fear of data being compromised.

https://github.com/zfsonlinux/zfs/commit/b52563034230b35f0562b6f40ad1a00f02bd9a05

Happy 26th Birthday Linux!

On August 25, the Linux kernel reached its 26th anniversary!

A nostalgic writeup of installing 1993's Softlanding Linux System, including a text-based version of Tetris:

https://opensource.com/article/17/8/linux-anniversary

Pdf-bot for Headless Chrome

pdf-bot is installed on a server and will receive URLs to turn into PDFs through its API or CLI. The microservice generates PDFs using headless Chrome, and will manage a queue of PDF jobs. Once a PDF job has run it will notify you.

https://github.com/esbenp/pdf-bot

Open Source House

The plans for this 1,200 sq ft structure is free of charge from Studiolada Architects.

https://uncrate.com/article/open-source-house/

http://www.studiolada.fr/docs/telechargement/maison/dossier-synthese.pdf

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Book & User Group Discounts

O'Reilly, No Starch Press and Les.Net continue to offer discounts to MUUG members. Remember to take advantage when you're buying anything from them!

http://www.oreilly.com/
https://www.nostarch.com/

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