

# MUUGLines

The Manitoba UNIX User Group Newsletter

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Editor: Michael Doob

## Next Meeting: June 11th, 2013

### Mini-Presentations and RTFM:

The June RTFM will feature Gilbert Detillieux talking about the `dpkg(1)`, `apt-get(8)`, `apt-cache(8)` and `aptitude(8)` commands, used for package management in Debian and similar Linux distributions.

After the round table and break, we will have three quick (5-10 minutes) presentations/demonstrations of some new software followed by questions (see the meeting topic for details).



## Where to Find the Meeting

1L06 Lockhart Hall (marked “L” on the map), University of Winnipeg

## Important: MUUG Has Moved

Our new home is at the University of Winnipeg and, for the rest of this term, is in room 1L06 Lockhart Hall; it is indicated on the map with the L. Lockhart hall is on the south-east corner of Spence and Ellice. Parking is available on the surrounding streets. Look for signage once you’re at the building, or ask a security guard.

## Upcoming Meeting Topics

### June 11, 2013

Topic: Three of my favourite things

This month we have three presenters giving short demonstrations of some new software that they have found interesting.

- **LyX with Adam Thompson**  
Adam will demonstrate LyX, a WYSIVRT WYG [What You See Is Vaguely Related To What You Get] document creation and editing system that (sort-of) puts a GUI and yet another layer on top of the excellent  $\text{T}_{\text{E}}\text{X}$  and  $\text{L}_{\text{A}}\text{T}_{\text{E}}\text{X}$  document preparation systems.
- **Meld with Trevor Cordes**  
Trevor will demonstrate Meld, a graphical diff viewer. It’s designed for those of us who will never be comfortable with text-based diff output syntax.
- **Asymptote with Michael Doob**  
Michael will demonstrate Asymptote, a markup language for producing high-quality graphics. Like  $\text{T}_{\text{E}}\text{X}$ , it separates the concepts of markup from presentation, and this allows graphics drawn with very high precision.

## Take That, Patent Trolls!

The Electronic Frontier Foundation has sent out a release concerning the US state of Vermont and patent trolls. “There is exciting news out of the Green Mountain State this week: folks in Vermont are so fed up with patent troll abuse that they are taking matters into their own hands. With trolls filing thousands of lawsuits every year and blanketing the country in threat letters, states are looking for ways to protect victims—especially small entities that lack the resources to defend against a patent suit. Vermont is tackling trolls on two separate fronts.”

More details are here (and what a great URL):  
<https://www.eff.org/deeplinks/2013/05/vermont-mad-hell-about-patent-trolls-and-not-going-take-it-anymore>



## What's New

- **Fedora Remix for the Raspberry Pi**  
This recompilation of Fedora 18 was released on May 22. and is available from <http://www.pidora.ca/>. In addition, there is a wiki site with complete installation instructions at [http://zenit.senecac.on.ca/wiki/index.php/Raspberry\\_Pi\\_Fedora\\_Remix](http://zenit.senecac.on.ca/wiki/index.php/Raspberry_Pi_Fedora_Remix)
- **Ubuntu 13.04** (Raring Ringtail)  
This release from April 25 includes the Linux kernel version 3.8.3, Python 3.3, Gnome 3.6 and LibreOffice 4.0. Also available in the usual {K,Ed,X}ubuntu for other window managers. No surprise as to where to go: <http://www.ubuntu.com/download>
- **Linux Mint 15** release candidate appears as of May 16 with Ubuntu 13.04 package base, Linux 3.8 kernel, MATE 1.6 and Cinnamon 1.8.  
<http://www.linuxmint.com/release.php?id=20>

- **OpenBSD 5.3** has been released as of May 1. Downloads are at <http://www.openbsd.org/53.html>
- **OpenIKED**  
OpenIKED is a FREE implementation of the Internet Key Exchange (IKEv2) protocol which performs mutual authentication and which establishes and maintains IPsec VPN security policies and associations (SAs) between peers. The IKEv2 protocol is defined in RFC 5996, which combines and updates the previous standards: ISAKMP/Oakley (RFC 2408), IKE (RFC 2409), and the Internet DOI (RFC 2407). OpenIKED only supports the IKEv2 protocol; support for ISAKMP/Oakley and IKEv1 is provided by OpenBSD's isakmpd(8) or other implementations on non-OpenBSD platforms.

It is intended to be a lean, clean, secure, better configurable and interoperable implementation that focuses on supporting the main standards and most important features of IKEv2. OpenIKED was written by Reyk Floeter and is primarily developed with Mike Belopuhov and various contributing OpenBSD hackers.  
<http://www.openiked.org/>

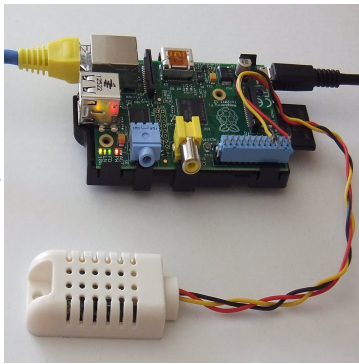
## Temperature and Humidity Monitoring on the Raspberry Pi

*By Gilbert Detillieux, University of Manitoba*

For a while now, I've been looking for a cheap solution to monitoring temperature and humidity in our server rooms. While dedicated devices such as those offered by IT Watchdogs have come down in price, it occurred to me that the Raspberry Pi might be able to offer a cheaper and more flexible solution (while at the same time giving me a good pet project to learn more about the Pi)!

There appear to be several projects on the go to run the Pi as a full-blown weather station, using multiple sensors and either an Arduino or some kind of A/D chip to read these. This too seemed like overkill for my purposes.

A tutorial on the Adafruit web site gave me a great starting point, showing how to interface a very inexpensive device called the DHT22, or the slightly more expensive, wired version of the sensor, called the AM2302 ([adafru.it/393](http://adafru.it/393)).



For my application, the wired version was preferable, since it didn't need an external pull-up resistor, and could easily be mounted outside of the Pi's enclosure, where it would give more accurate readings.

The tutorial included a sample C "driver" program that read the data from the sensor, which transmits using a proprietary serial protocol with pulse-width modulation. The tutorial also showed how the collected data could be transmitted to a Google Docs spreadsheet. For me, a more useful goal was to read the data remotely, via SNMP, so that I could plot it using MRTG, just as I do for network traffic, CPU usage and system load averages.

One problem I encountered with the sensor and the sample driver program from the tutorial is that the data weren't always reliably transmitted. So I used a shell script to repeatedly call the driver program until I got good results to put into a log file. A crontab entry was used to call this script every minute.

The Net-SNMP agent (snmpd) provides an extension mechanism that allows for scripts to be called when particular MIB values are requested. I was able to add the following lines to the snmpd.conf file to call a script to extract the last results from the log file, and return them as simple integers, for MRTG to use:

```
# Temperature/Humidity readings from DHT2302
extend hum /home/pi/DHT/Get_Logged_DHT hum
extend temp /home/pi/DHT/Get_Logged_DHT temp
```

The script pulls the last results from the log file that's updated by the crontab entry, rather than directly from the sensor, to avoid the very real chance of an SNMP timeout and no data being returned to the client. With a more reliable sensor or driver program, it might be feasible to take a more direct approach.

Once I was able to remotely poll the data via SNMP, I was ready to configure MRTG to collect and plot the results. It would be nice if a statement like this would have worked in the MRTG configuration file:

```
Target[raspberrypi.dht]:
nsExtendOutputLine."hum"&nsExtendOutputLine
."temp":public@raspberrypi.local
```

However, MRTG didn't seem to like the string-index syntax that the snmpget and snmpwalk commands were happy with. Instead, I needed to find out the numeric MIB for each and use those...

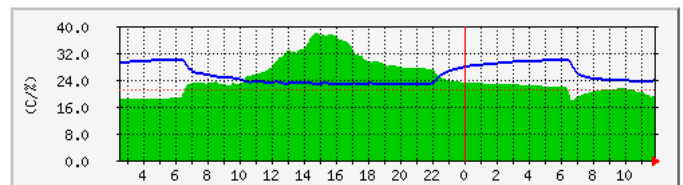
```
# snmpwalk -v1 -cpublic raspberrypi.local -On
'nsExtendOutputLine."hum"'
.1.3.6.1.4.1.8072.1.3.2.3.1.1.3.104.117.109 =
STRING: 191
# snmpwalk -v1 -cpublic raspberrypi.local -On
'nsExtendOutputLine."temp"'
.1.3.6.1.4.1.8072.1.3.2.3.1.1.4.116.101.109.1
12 = STRING: 259
```

These numeric MIB values could then be put into the MRTG configuration:

```
Target[raspberrypi.dht]: .
1.3.6.1.4.1.8072.1.3.2.3.1.1.3.104.117.109&.1
.3.6.1.4.1.8072.1.3.2.3.1.1.4.116.101.109.112
:public@raspberrypi.local
```

A bit ugly, but it worked... With that and a few other configuration tweaks, MRTG was able to collect and plot the results.

'Daily' Graph (5 Minute Average)



	Max	Average	Current
Humt %	37.9	24.5	19.0
Temp °C	30.0	25.6	23.7

For those interested in trying this at home (or work), I've prepared an archive with my scripts, configuration files, and more detailed installation instructions. You should also read the Adafruit tutorial before attempting this for yourself.

<http://www.muug.mb.ca/~gedetil/DHT.zip>

<http://learn.adafruit.com/dht-humidity-sensing-on-raspberry-pi-with-gdocs-logging>

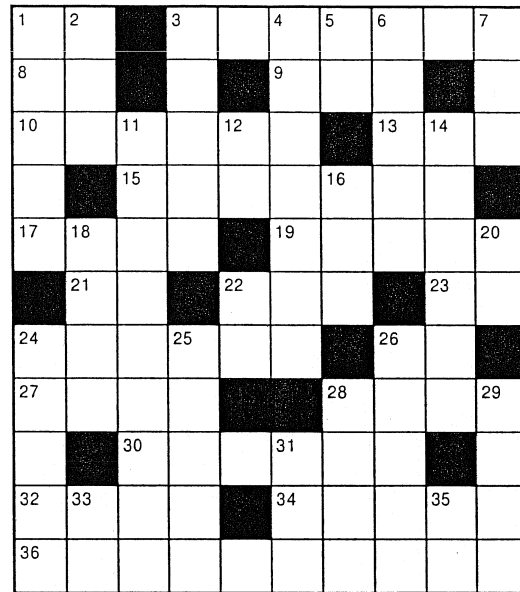
## Summer Homework

Here is a crossword (or, cross-natural-number, perhaps) puzzle to be solved over the summer. The solution has been verified (by me) to be unique. In fact, it has a bit more information than the minimum necessary to deduce the solution.

This puzzle first appeared in *The Listener* in England in 1933. Yes, it is 80 years old!

The solution will appear in September. Want to solve it? As the Beatles said, "All you need is love bc."

## Listener Crossword No 111: Mathematical



No number can begin with 0.

[The unchecked digit in 29 Down is 0; 11 Down requires some licence.]

### ACROSS

- 1 4th power
- 3 20th power
- 8 Prime number
- 9 Multiple of 13
- 10 Square
- 13 Sum of number of possible moves of a knight from all squares of a chess board
- 15 Square
- 17 Square
- 19 Square
- 21 Product of two prime numbers
- 22 Square
- 23 Prime number
- 24 Square
- 26 Square
- 27 One less than a square
- 28 Cube
- 30 Cube
- 32 Twice a prime number
- 34 A factorial (*i.e.*, product of all numbers from 1 to a given number inclusive)
- 36 Number of seconds in the nineteenth century

### DOWN

- 1 5th power
- 2 Square
- 3 Square
- 4 Square
- 5 Prime number
- 6 Square
- 7 Square
- 11 Generally denoted by a Greek letter
- 12 Product of two consecutive even numbers
- 14 Square
- 16 Multiple of 37
- 18 Product of four consecutive numbers
- 20 Prime number
- 22 Multiple of 3
- 24 Multiple of three consecutive odd numbers
- 25 Square
- 26 Multiple of 64
- 28 Multiple of 3
- 29 Telephone number familiar to listeners
- 31 Prime number
- 33 Prime number greater than 70
- 35 Product of two consecutive numbers