Full Circle

THE INDEPENDENT MAGAZINE FOR THE UBUNTU LINUX COMMUNITY

ISSUE #94 - February 2015

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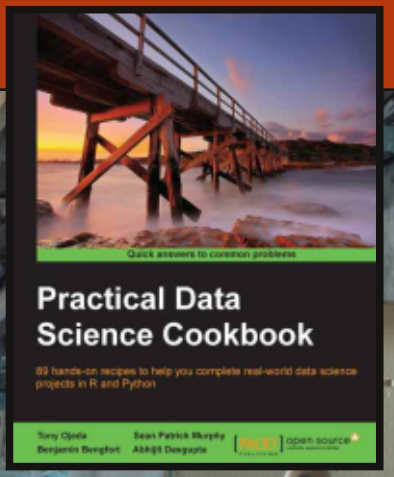

Photo: [AndreasS] (Flickr.com)

USING i2P

SECURE YOUR INTERNET CONNECTION

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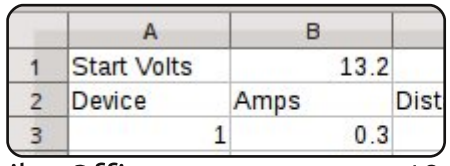

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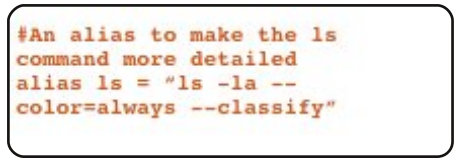

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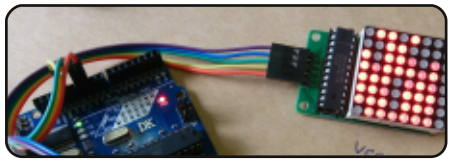
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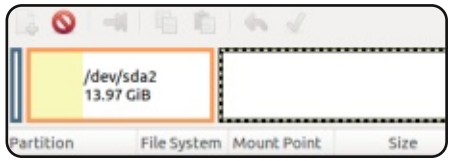

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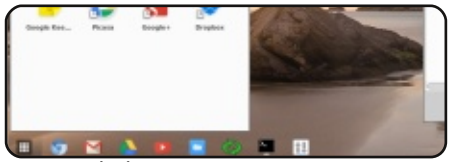
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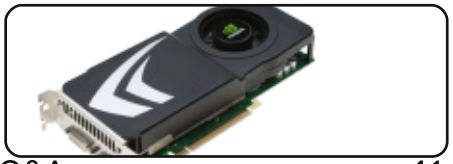
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EDITORIAL

Welcome to another issue of Full Circle.

We've still no Python this month I'm afraid. In place of Python we have an interesting article on a two modem solution. A solution to what? I'll let you read it and find out. There's the usual LibreOffice article, and I've written a quick article on how to set up, and use, i2P which is fast becoming the goto for former Tor users. If online anonymity is your thing then that piece should be of interest.

The BIG piece of news this month is, of course, the Ubuntu Phone. The **BQ Aquaris E4.5** (as it's officially known) is only being sold in Europe through 'flash sales'. The latest reports (as we go to virtual press) is that BQ are getting hammered with over 12,000 requests per minute to buy the E4.5. So much so that their servers are finding it difficult to cope with the demand. I just hope they have enough stock. Several people have already written to me saying they've found it incredibly difficult to go through the buying process on the site, and when they did finally get their confirmation it seems they need to wait over a month for a unit. The word from the VP of mobile at Canonical is that it shouldn't take that long to get the units shipped. Here's hoping!

Elsewhere, Kevin O' Brien gives us an historical look at encryption from early Greece through to modern-day PGP encryption. Alan Ward (in Linux Labs) has an interesting look at the BTRFS file system.

All the best, and keep in touch!
Ronnie
ronnie@fullcirclemagazine.org

This magazine was created using :

Full Circle Podcast

Released monthly, each episode covers all the latest Ubuntu news, opinions, reviews, interviews and listener feedback. The Side-Pod is a new addition, it's an extra (irregular) short-form podcast which is intended to be a branch of the main podcast. It's somewhere to put all the general technology and non-Ubuntu stuff that doesn't fit in the main podcast.

Hosts:
- Les Pounder
- Tony Hughes
- Jon Chamberlain
- Oliver Clark

http://fullcirclemagazine.org

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Dell to offer Ubuntu Linux for XPS 13 and Precision M3800 laptops

Dell has been offering Ubuntu Linux as an alternative to Windows on some of its laptops for the past few years. Now Dell is adding two of its most interesting new laptops to its line of computers that are available with Linux.

The Dell Precision M3800 Mobile Workstation is now available with Ubuntu, and there will soon be an Ubuntu-powered developer edition of the new Dell XPS 13 ultrabook as well.

Configuring the Dell Precision M3800 with Ubuntu instead of Windows will knock $101.50 off the price tag.

That brings the starting price down to $1533.50, which is still pretty expensive. But what you get for your money is a laptop with a 15.6 inch display which weighs just 4.2 pounds, measures 0.7 inches thick, and which features a full HD display, 8GB of RAM, a 500GB hard drive, an Intel Core i7 Haswell processor, and NVIDIA Quadro K1100M graphics.

There are also options for up to 16GB of RAM, a bigger battery, additional storage (and solid state storage), and a 3840 x 2160 pixel touchscreen display.

If you choose Ubuntu as your operating system, the computer will come with Ubuntu 14.04 LTS pre-loaded. At launch, this means the operating system won't support the notebook's Thunderbolt port. But the upcoming Ubuntu 14.04.2 maintenance release will add initial support for that feature.

Source:
http://liliputing.com/2015/02/dells-offer-ubuntu-linux-xps-13-precision-m3800-laptops.html
Submitted by: Arnfried Walbrecht

HummingBoard-i2eX review, dual-core SBC which runs Android and Linux

The attraction of Single Board Computers (SBCs) for both hobbyists and developers (as a prototyping platform) is clear, and their lure has been rising steadily for many years. Probably the most famous SBC is the Raspberry Pi; however there are lots of companies that make these nimble little boards. I recently reviewed the MIPS Creator CI20, a SBC designed around a MIPS-based CPU rather than an ARM-based one. However, the Pi and the CI20 aren't the only SBCs out there. SolidRun has several different products that use Freescale's i.MX 6 series of processors. The i.MX 6 range is based on ARM's Cortex-A9 design, and scales from single- to quad-core.

I recently got my hands on a HummingBoard-i2eX from SolidRun. It uses a dual-core i.MX 6 processor, comes with 1GB of RAM, has the same form factor as a Raspberry Pi 1, and can run both Android and Linux. Let's take a deeper look, shall we?

Source:
http://www.androidauthority.com/hummingboard-i2ex-review-584446/
Submitted by: Arnfried Walbrecht

BackBox Linux 4.1 Keeps Security Researchers

There are many options available today for users looking at Linux distributions tailored for security research, and among them is BackBox Linux, which was updated to version 4.1 on Jan. 29. Backbox Linux 4.1 is based on the Ubuntu 14.04 LTS (Long Term Support) distribution, and uses the Xfce desktop environment. BackBox Linux is not intended to primarily be a user-focused privacy distribution, as is the case with Tails, but rather is more aligned with Pentoo, CAINE and Kali Linux, all of which focus on providing tools for security

analysis. Though BackBox is not primarily a privacy distribution, it does have tools that enable security researchers to stay anonymous while conducting research. For example, a RAM wiping tool will erase the memory on the system that Backbox is running when the operating system shuts down. Plus, BackBox includes a command line interface wizard that provides users with options for enabling anonymous network traffic over Tor (The Onion Router), as well as masking a user's hostname.

Source:
http://www.eweek.com/enterprise-apps/slideshows/backbox-linux-4.1keeps-security-researchers-anonymous.html
Submitted by: Arnfried Walbrecht

Upgraded Raspberry Pi offers Windows and Linux – the best of both worlds

The Raspberry Pi has been a great success, selling millions since launch in 2012 and igniting hobbyists' imagination everywhere. The Pi is a tiny computer at a tiny price, but now the arrival of a seriously upgraded Raspberry Pi 2 has brought the performance that the first lacked, in a package the same size at the same cost of US$35.

The Raspberry Pi 2 Model B, to give its full name, bumps the memory (RAM) from 512Mb to 1Gb, and introduces a 900MHz quad-core ARM Cortex-A7 processor. The new board also requires less power and is pin-compatible with previous boards so it will be backwards-compatible with existing projects.

Source:
http://theconversation.com/upgraded-raspberry-pi-offers-windows-and-linux-the-best-of-both-worlds-37135
Submitted by: Arnfried Walbrecht

DDoS malware for Linux systems comes with sophisticated custom-built rootkit

A malware program designed for Linux systems, including embedded devices with ARM architecture, uses a sophisticated kernel rootkit that's custom built for each infection.

The malware, known as XOR.DDoS, was first spotted in September by security research outfit Malware Must Die. However, it has since evolved and new versions were seen in the wild as recently as Jan. 20, according to a new report Thursday from security firm FireEye, which analyzed the threat in detail.

XOR.DDoS is installed on targeted systems via SSH (Secure Shell) brute-force attacks launched primarily from Internet Protocol (IP) addresses registered to a Hong Kong-based company called Hee Thai Limited.

Source:
http://www.cio.com/article/2881154/ddos-malware-for-linux-systems-comes-with-sophisticated-custombuilt-rootkit.html
Submitted by: Arnfried Walbrecht

Ubuntu Linux smartphones to go on sale, expected to be ultra-rare

The first smartphones running Ubuntu Linux are poised to go on sale next week with the expectation that they will be an exceedingly rare handset to find and purchase.

In order to create buzz, Ubuntu has decided to use Twitter to announce flash sales starting next week. Canonical, the main commercial sponsor behind the open source operating system, says that it hopes early adopters of the new Ubuntu phones will do the majority of the marketing for it, building the kind of following that is common in the incredibly crowded Chinese smartphone marketplace.

Canonical VP for mobile and online services, Cristian Parrino, says that aiming for retail shelves and volume from day one isn't going to be the way Ubuntu phones are going to conquer the marketplace. Instead, the company plans to get to the mass market in an intelligent manner over time, with Parrino claiming that an Ubuntu phone isn't simply a run-of-the-mill Android or iOS device with a grid layout on the screen.

Source:
http://www.smnweekly.com/ubuntu-linux-smartphones-to-go-on-sale-expected-to-be-ultra-rare/14122/
Submitted by: Arnfried Walbrecht

Best Linux Software of All Time

Over the years, there have been a number of claims that the Linux desktop is lacking in terms of good, highly useful, software. Today, I'm aiming to put this myth to bed once and for all. Continue reading for my list of the top ten best applications for Linux.

1. Sublime Text – It's been said that not all text editors are created equal. This is certainly the case with Sublime Text. It's designed to provide a distraction-free experience for coding, markup and more.

It should be noted that yes, it's available for Windows and OS X users. But the biggest takeaway is that Linux users can use it without losing out on any features.

2. LibreOffice – Obviously the number one draw to using LibreOffice is its price – free. The added bonus of it being pre-installed with popular Linux distros has put it ahead of its competitors for years. With the realization that even today, Microsoft provides only a free web-based office suite to their users, LibreOffice continues to have an advantage.

Source:
http://www.datamation.com/open-source/best-linux-software-of-all-time-1.html
Submitted by: Arnfried Walbrecht

Getting Started with Linux: Another Look at UberStudent

Time flies. It's hard to believe it, but it's been four years since I first took a look at a Linux distribution called UberStudent. Back then, it was in its 1.0 release, called "Cicero." The latest release, "Epicurus," came out in mid-January, with a version number of 4.1.

There are a lot of Linux distributions out there. What makes this one worth checking out?

As with previous releases, what makes UberStudent unique is its target audience, and the software and little added touches it has as a result.

Installing UberStudent is as easy as installing any other Linux distribution: download the .iso file, burn it to a DVD or install it to a bootable USB, boot from it, and follow the directions. Once it's installed and you've restarted the computer and logged in, you'll see the welcome screen pictured at the top of this post.

UberStudent uses the XFCE desktop. There are two panel styles to choose from, but for those who aren't fond of XFCE, it's possible to install other desktop environments.

Source:
http://chronicle.com/blogs/profhacker/getting-started-with-linux-another-look-at-uberstudent/59139
Submitted by: Arnfried Walbrecht

End of a Lightweight Distro: CrunchBang Linux is Officially Dead

Philip Newborough, the developer behind lightweight CrunchBang distro, decides to end his involvement in the project. Originally developed in 2009, CrunchBang was quite popular among NetBook users of that time, who wanted a lightweight and fast distro to power their machines. Based on Debian, CrunchBang made use of Openbox desktop environment and other light software to make the user experience smoother on relatively low-end machines. However, lack of active interest among the masses, paired with delay in planned releases, has caused the end of the once-awaited project.

Newborough, CrunchBang's creator, argues that the picture may not be so bad, in the long run. CrunchBang's appeal was the fact that, it used to be a distro specifically targeting netbook users, at a time when they had very few alternatives to choose from.

The last stable version of

CrunchBang, codenamed Waldorf, was released in May, 2013.

Source:
http://www.theregister.co.uk/2015/02/09/brit_linux_distro_crunchbang_calls_it_quits/
Submitted by: Anirban Chatterjee

KDE Plasma 5 most popular DE: Ubuntu tops charts in LinuxQuestions' annual survey

Linuxquestions.org, one of the most visited Linux forums on the web, has published the results of its latest annual survey, featuring user responses from the year 2014. Unsurprisingly, KDE Plasma 5 received over 34% of total vote share to become the most popular desktop environment, with Xfce and GNOME 3 coming a distant second and third respectively. Part of this preference for Plasma 5 is due to the system being lighter and faster, noticeably, together with the superb visual excellence and astounding customizability that KDE offers its users.

Parallely, Ubuntu has emerged as the leading distro in the eyes of the masses, although it was closely tied with Linux Mint and Slackware respectively. Ubuntu's appeal, as Swapnil Bhartiya of ITWorld observes, stems from its massive official support from Canonical, ease of use and actively helpful user community in the forums.

Alongside the main surveys, Dolphin has emerged as the most choice file manager among the users, beating its Mac and Windows alternatives alongside the usual Linux-based file managers.

Source:
http://www.itworld.com/article/2881172/survey-says-kde-plasma-is-the-most-popular-desktop-linux-environment.html
Submitted by: Anirban Chatterjee

World's smallest chess game application released for Linux, Windows and Mac

As time passes by, gradual sophistication of storage devices with ever higher capacities is a common sight. Inevitably, software makers and programmers around the world choose to employ this to their advantage, by building smarter and more versatile applications, at the cost of higher RAM consumption and filesizes. However, a recently release chess game application has raised interest among those who believe "Small is beautiful".

Sized at only 487 bytes, BootChess was released last month for Linux, Windows and a number of other platforms. It has beaten ZX chess, which held the title of the smallest chess game for more than 33 years, at 1 kb filesize. Currently, BootChess is being actively developed, and holds the world record in its genre.

Obviously, there is no graphical interface to the game. Chess pieces are, instead, represented by ASCII letters, upper cases representing white pieces and lower cases representing the blacks.

Source:
http://www.gizmodo.in/software/The-Smallest-Game-of-Chess-Takes-Up-Just-487-Bytes/articleshow/46042234.cms
Submitted by: Anirban Chatterjee

It ain't dead! LibreOffice 4.4 released, features major UI revamp, added tweaks

LibreOffice, arguably the most common office productivity suite on Ubuntu and other Linux desktops, has seen a major UI redesign in its latest 4.4 release. Originally derived from OpenOffice in 2010, LibreOffice is a software that needs no special introduction to anyone using Linux, but in each of its releases, it has always packed something new for thousands of its users.

In the new release, changes can be seen and experienced almost everywhere, ranging from the addition of the flashy Sifr Monochrome icon set by default, to the revamped ruler and sidebar with enhanced usability. A full changelog, along with a beautiful infographic designed by The Document Foundation, can be read on the official 4.4 version release notes, at

https://wiki.documentfoundation.org/ReleaseNotes/4.4

Ubuntu 15.04 is expected to ship with LibreOffice 4.4 preinstalled.

Source:
http://www.omgubuntu.co.uk/2015/01/libreoffice-4-4-released-ui-revamp
Submitted by: Anirban Chatterjee

Distro Astro, a distro aimed specifically at astronomers, released

Domain-specific Linux distributions, such as UberStudent and Ubuntu Ultimate Edition, are quite popular in these days. And to make things more interesting, a first-of-its-kind distro has been released for astronomers, both professionals and amateurs.

Cleverly named Distro Astro, the OS is packaged with bundles of applications useful for collecting, analyzing and researching data, in the field of astronomy. Inbuilt software library includes the usual faces, such as KStars, Stellarium and Carte du Ciel, but new and interesting additions, such as Where is M13? (a tool for visualizing deep sky objects in 3D) and wxAstroCapture (written specifically for telescopic image capture) have been packed inside.

Distro Astro comes with native INDI library, for interfacing with hardware such as external telescopes and even commercial domes. The IRAF (Image Reduction and Analysis Facility) is also natively included. Overall, the distro is powerful enough to be used in planetariums and astronomical observatories.

It also comes with a special and interesting Night Vision mode, which is a special colour theme that makes full use of red-on-black colours, for easier use during nighttime observations. Wallpapers too have been selected from the images captured by Hubble space telescope.

Source:
http://www.linuxjournal.com/content/linux-astronomers
Submitted by: Anirban Chatterjee

The Open-Source Question

You'd be forgiven for thinking that the tech world is a loathsome hotbed of rapacious venture capitalists, airheaded trend-riders, and publicity hounds. That's the image presented by much of the tech press, which prizes stories about the Montgomery Burnses of the tech world over ones about its more idealistic denizens.

Last week, however, brought a story about one of the better angels of our software. ProPublica's Julia Angwin reported on developer Werner Koch, the German creator of the email encryption software suite GNU Privacy Guard, known as GPG. Popular and free, GPG has achieved wide usage across Linux, MacOS, and Windows, and it is the software Edward Snowden taught journalists such as Glenn Greenwald so that they could communicate without fear of detection. Koch single-handedly started the project in 1997 and has worked with only minimal help. Since 2013, he's been the only person working on GPG.

Source:
http://www.slate.com/articles/technology/bitwise/2015/02/werner_koch_and_gpg_how_can_we_preserve_important_barely_funded_open_source.html
Submitted by: Arnfried Walbrecht

Elementary OS 'Freya' Beta 2 gets released

One of the greatest features of open-source philosophy is that, any theoretical philosophy, assuming that it has merit, can be embodied into a software. An the famous Elementary OS remains a shinning testament to the validity of this statement.

Following the first beta that was released back in April 2014, February 8 saw the release of the eagerly awaited second beta. Freya is based on Ubuntu 14.04 LTS. The latest beta packs in quite a number of improvements, such as the inclusion of UEFI/SecureBoot support, settings panes for modifying the frequency and behaviour of notifications, standard bug fixes and revamped versions of calendar and video software. Pantheon continues to

be the primary UI for Elementary OS.

Proposed in 2013 by project leader Daniel Foré, the initial name of the 0.3 version of Elementary OS was ISIS. But it was later renamed to Freya, to avoid conflict with the militant group of the similar name.

Source:
http://www.webupd8.org/2015/02/elementary-os-freya-beta-2-available.html
Submitted by: Anirban Chatterjee

Google plans to push into Android cars rather robot cars

Google has announced it's planning to move forward into in-car infotainment systems with an upcoming version of Android. Google made its first advances toward the automotive world at its I/O developer conference earlier this year, when it unveiled its Android Auto software. The first Android Auto compatible cars are expected to appear early next year.

"Android M" – the version to come after the current Android 5.0 "Lollipop" – will be available in a formulation designed specifically to run cars' built-in screens, Reuters reports, citing anonymous insiders with knowledge of the plan.

But much like Apple's CarPlay, Android Auto is an add-on system that lets you use your phone to control your car's screens and stereo. No phone, no Android in your car.

The forthcoming system, industry blabbermouths claim, is designed to be built into vehicles and to power their infotainment systems directly. The Android OS would be available every time the driver turns on the ignition.

Such an embedded version of Android could potentially have access to a variety of in-car systems, such as dashboard gauges, sensors, cameras, and environmental controls, making for a much richer experience for the driver.

Source:
http://customstoday.com.pk/google-plans-to-push-into-android-cars-rather-robot-cars/
Submitted by: Arnfried Walbrecht

End of the m0n0wall project

Manuel Casper the creator of m0n0wall project officially announce on 15 February 2014 that the project has officially ended and no development will be done anymore, and there will be no further releases. Here is his announcement:

"Dear m0n0wall enthusiasts, on this day 12 years ago, I have released the first version of m0n0wall to the public. In theory, one could still run that version - pb1 it was called - on a suitably old PC and use it to control the Internet access of a small LAN (not that it would be recommended security-wise). However, the world keeps turning, and while m0n0wall has made an effort to keep up, there are now better solutions available and under active development."

Source:
http://m0n0.ch/wall/end_announcement.php
Submitted by:Manuel Kasper

Microsoft Reportedly Uses Patent Blackmail Against Android to Force Samsung to Spread Microsoft Spyware (Incorporated Into Android) (Updated)

Microsoft is reportedly pressuring Samsung, by means of expensive patent lawsuits, to turn Android into "Microsoft Android" (Microsoft spyware installed by default).

The clown called Microsoft, which claims to "love Linux", is still attacking Linux in a big way. Usually this is done more or less covertly, so enough"useful idiots" won't see it and even defend Microsoft.

The other day we saw Steven J. Vaughan-Nichols addressing Microsoft's attack on Android through Cyanogen. Microsoft wants the world to believe that it 'owns' part of Android as it even claims to be 'licensing' Android, despite having nothing to do with Android development.

Microsoft actively attacks Android from multiple directions and as Vaughan-Nichols put it:

"The only thing that makes me take Cyanogen's plans seriously is that Amazon and Microsoft appear to be looking into investing in Cyanogen to help create an Android software eco-system that's not under Google's control. But, honestly, even if Amazon and Microsoft backed Cyanogen to the hilt, would that really matter?"

Source:
http://techrights.org/2015/02/14/patent-blackmail-tactic/
Submitted by: Roy Schestowitz

Vivaldi Web Browser Now Has 32-bit Builds for Linux

Vivaldi, a new web browser based on Chromium, built by an Opera founder and his team, has just received an upgrade and 32-bit versions for the application, among other things.

One of the most important requests of the community regarding Vivaldi was a 32-bit version of the application. It looks like there are a lot of users out there with 32-bit processors that would love to give Vivaldi a try, but they couldn't do that in the absence of a special build. Now that build has been made available, along with a host of fixes and various improvements.

This is a stable app, which makes things very easy, but in fact it's still pretty much a technical preview. That means that it's not even an Alpha release. This is built for testing purposes only, but it has most of the functions you would expect to find.

Source:
http://news.softpedia.com/news/Vivaldi-Web-Browser-Now-Has-32-bit-Builds-for-Linux-473416.shtml
Submitted by: Silviu Stahie

Unofficial Ubuntu Store for Phones Now Available on PCs

Ubuntu for phones doesn't have an official online store for the applications accessible from the PC, but that doesn't mean someone didn't manage to put one together. It's not official, but it works very well.

Now that there is an Ubuntu phone in the wild, users have started paying much more attention to the applications available in store. There are a lot of them, but you can't see them unless you are booting an Ubuntu OS on a phone, like Aquaris E4.5 Ubuntu Edition or Nexus 4. Now that has been changed because an unofficial store is available.

Source:
http://linux.softpedia.com/blog/Unofficial-Ubuntu-Store-for-Phones-Now-Available-on-PCs-473334.shtml
Submitted by: Silviu Stahie

Fed up with systemd and Linux? Why not try PC-BSD?

With the growing adoption of systemd, dissatisfaction with Linux has reached proportions not seen in recent years, to the extent that people have started talking of switching to FreeBSD.

Talk is all very well as a means of making a threat, but how difficult is it to actually make the move? Has Linux moved so far ahead that switching systems will mean one has to do without many applications that one has gotten used to?

iTWire spoke to Kris Moore, one of those deeply involved with the PC-BSD project. Moore also works with iXsystems, a company that sells hardware loaded with FreeBSD and PC-BSD.

Source:
http://www.itwire.com/business-it-news/open-source/66900-fed-up-with-systemd-and-linux?-why-not-try-pc-bsd?
Submitted by: Sam Varghese

Facebook, Stripe pledge funds for GnuPG development

Two companies, Stripe and Facebook, have pledged an annual donation of $US100,000 to aid in the development of GNU Privacy Guard, the encryption software that has been created by a single German developer.

Stripe, which provides a way for

individuals and businesses to accept payments over the internet, made the announcement on Twitter on behalf of itself and Facebook.

The Linux Foundation's Core Infrastructure Initiative made a one-time donation of $US60,000. Other donations by individuals have also come in.

Source:
http://www.itwire.com/business-it-news/open-source/66886-facebook-stripe-pledge-funds-for-gnupg-development
Submitted by: Sam Varghese

Cut the Rope Is the First Major Game Ported for Ubuntu Phones

ZeptoLab, the studio that made the famous "Cut the Rope" game a couple of years back, has officially ported the title for the Ubuntu platform and is now available in the store.

Cut the Rope is a game that reached peak fame a couple of years ago and it was all the rage, but now it's the first major title to be ported for the Ubuntu platform. To be fair, a few other games have been made available until now, including 2048 and Flappy Bird.

Cut the Rope is the first big caliber game to land in the Store and even if it's an old one, it's still an important milestone.

Source:
http://linux.softpedia.com/blog/Cut-the-Rope-Is-the-First-Major-Game-Ported-for-Ubuntu-Phones-473303.shtml
Submitted by: Silviu Stahie

Bodhi Linux 3.0.0 gets released, spiced up with complete overhaul

Bodhi Linux, one of the most famous lightweight distributions based on Ubuntu, saw a major release in the fully revamped and reworked 3.0.0 version on February 17. This release is based on Ubuntu 14.04 LTS, and is being considered a major milestone for users and developers of the OS alike.

Enlightenment, the celebrated lightweight window manager that makes Bodhi Linux stand out of the masses, has been upgraded to version E19.3, which improves speed and functionality, especially on older hardware. Other changes include revamped and upgraded versions of Bodhi Linux's standard offerings, such as ePad 0.9.0 and Terminology 0.8.0.

For those unfamiliar with the distro, Bodhi Linux focuses on flexibility and ease of use, alongside stability, which is partly due to the fact that major releases are based on Ubuntu LTS releases, and partly due to the active involvement of developments in Bodhi-specific apps and code. Enlightenment, for example, aims to provide high-end visual effects even on older hardware, while still keeping performance intact.

Alongside the general 32-bit and 64-bit ISOs for installation, Bodhi Linux also releases installers for Chromebooks and Chromeboxes, in the form of SeaBios. If you are disheartened by the recent death of CrunchBang Linux, Bodhi might be just the distro for your netbook.

Source:
http://betanews.com/2015/02/17/bodhi-linux-3-0-0-is-here-download-the-ubuntu-based-distribution-now/
Submitted by: Anirban Chatterjee

Linux has 2,000 new developers and gets 10,000 patches for each version

Nearly 2,000 developers started contributing to Linux in the past 15 months, making up nearly half of all developers writing code for the open source operating system kernel.

"The rate of Linux development is unmatched," the foundation said in an announcement accompanying the report. "In fact, Linux kernel 3.15 was the busiest development cycle in the kernel's history. This rate of change continues to increase, as does the number of developers and companies involved in the process. The average number of changes accepted into the kernel per hour is 7.71, which translates to 185 changes every day and nearly

1,300 per week. The average days of development per release decreased from 70 days to 66 days."

Source:
http://arstechnica.com/information-technology/2015/02/linux-has-2000-new-developers-and-gets-10000-patches-for-each-version/
Submitted by: Arnfried Walbrecht

Microsoft embraces free software, employs python and Linux on its Azure platform

Microsoft Azure, the software giant's premiere cloud computing platform, saw the implementation of Azure HDInsight, a Hadoop-based cloud tool powered by Linux. Alongside this development, Azure's native Azure ML (machine learning) service now fully supports Python, thereby making Azure HDInsight the first truly Linux-based cloud computing solution for big data.

In addition, a recent development revealed that nearly 20% of all VMs powering the Azure infrastructure, are running Linux.

The Microsoft, that was once hailed as the archnemesis of the proponents of FOSS enthusiasts, has indeed become a thing of the past. Instead, people can now see the software company in a new Avatar, which openly and freely uses open source solutions to cater its services. In the opinion of many, language agnosticism, coupled with this liberalisation of services, has partly contributed to this change.

Source:
https://gigaom.com/2015/02/18/microsoft-embraces-python-linux-in-new-big-data-tools/
Submitted by: Anirban Chatterjee

Linux clockpocalypse in 2038 is looming and there's no 'serious plan'

The year 2038 is still more than two decades away, but LWN.net editor and longtime Linux kernel chronicler Jon Corbet believes software developers should be thinking about that date now, particularly in the Linux world.

Corbet raised the issue at his annual "Kernel Report" talk at the Linux Foundation Collaboration Summit in Santa Rosa, California this week. "Time to start worrying," he said.

The issue is similar to the dreaded Y2K bug, in that a longstanding deficiency in the way some computers record time values is due to wreak havoc in all manner of software, this time in 2038.

This latest problem comes down to the "time_t" time codes used by Linux and other Unix-compatible operating systems. Because they were specified as 32-bit values – back in the early days of Unix, when 2038 was almost a century away – they're eventually going to run out of bits with which to tick off seconds. Specifically, that's going to happen at exactly 03:14:07 GMT on January 19, 2038.

So why worry now, when we still have decades to fix the problem?

Source:
http://www.theregister.co.uk/2015/02/20/linux_year_2038_problem/
Submitted by: Arnfried Walbrecht

Atom Editor from GitHub

Written by Lucas Westermann

The last few issues of Command & Conquer have focused on programming aspects. However, I realized that I haven't talked about development environments. For a long while, I generally used a terminal and Vim, but for a few months now, I've been using Atom. In this article, I'll focus on what Atom is, how you can install it, and what the benefits are to using it.

What is Atom?

Atom is a text editor created by GitHub. It's hackable (meaning you can configure it however you like), and is based on web technologies. This means you can adjust the look and feel of Atom by editing CSS files and adding features with HTML and JavaScript. If anyone has used Brackets or Adobe Edge CC, Atom should be familiar to you.

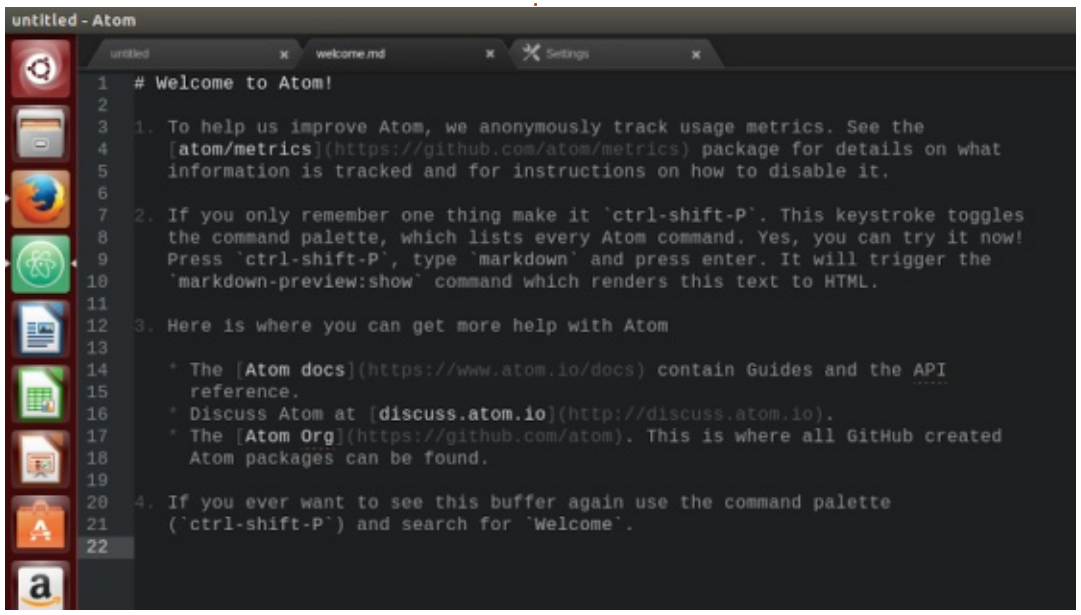
Install Atom?

Homepage: https://atom.io/

Atom has a precompiled debian package for Ubuntu (as well as an rpm package). It can also be built from source, but it's easiest to just download the .deb file from the homepage, and install it in Ubuntu. Unfortunately, as it's not in a PPA, it will not update automatically. You will need to re-run these steps to update it, or use an unofficial PPA such as https://launchpad.net/~webupd8team/+archive/ubuntu/atom.

Why should I try it?

Atom offers a large collection of plugins - ranging from themes, to syntax highlighting, to plugins that will compile and execute code directly from Atom. Due to its hackable nature, you can install exactly what you want, and configure it to run however suits you best.



The features integrated into its core (a file tree, tabbing, file management directly from within Atom, etc) are features almost every heavy-duty IDE has. However, not every text editor offers these same features out of the box while remaining relatively lightweight. Furthermore, support for things such as Emmet (a plugin for generating HTML using css-like selectors) can simplify your workflow.

A small list of plugins I use:

- Stylus - syntax highlighting and snippets for Stylus files
- web-browser - a browser that opens and runs directly in atom
- atom-terminal - opens a terminal in the current directory
- build - build your current project from within Atom
- script - runs your code in Atom
- color - css color viewer
- color-picker - allows you to select a color from a pallet.
- emmet
- project-manager - allows you to save open folders/paths into a project for easy access later.

Of course, there are many, many more to choose from. Depending on what languages you program in, or your personal workflow, you may find packages I have never heard of.

Lastly, Atom also offers some

IDE-like features (such as collapsing code, or auto-indenting the lines in a file).

One thing to note

One item that you might notice when you first open Atom is a vertical line running down the side of the editor area. This is intended as a visual guide for line wrapping (as most style guides recommend limiting a line to 80 characters, and then breaking it manually). If, however, you don't want/need the visual indicator, you can hide it by disabling the wrap-guide package. This can be found under Edit -> Preferences -> Packages -> wrap-guide. Then simply press the "Disable" button. It will not be necessary to restart the editor for changes to take effect, unless you uninstall the package. It can also be hidden in CSS, but as the package supplies only the visual guide, disabling it is easier.

Hopefully this has enthused some readers to give Atom a shot the next time they want a development environment. If you know of any useful packages, cool themes, or helpful tips/tricks, feel free to send me an email at the following address. Also, if anyone has any questions, suggestions, or requests, feel free to email me at lswest34+fcm@gmail.com.

Further Reading

- http://atom.io - official homepage

- https://github.com/atom/atom - GitHub repository

https://launchpad.net/~webupd8team/+archive/ubuntu/atom - Unofficial PPA for Ubuntu

Lucas has learned all he knows from repeatedly breaking his system, then having no other option but to discover how to fix it. You can email Lucas at: lswest34@gmail.com.

EXTRA! EXTRA! READ ALL ABOUT IT!

Our glorious news reporters are now posting regular news updates to the main Full Circle site.

Click the NEWS link, in the site menu at the top of the page, and you'll see the news headlines.

Alternatively, look on the right side of any page on the site, and you'll see the five latest news posts.

Feel free to discuss the news items. It's maybe something that can spill back from the site into the magazine. **Enjoy!**

ubuntu uk podcast

The Ubuntu Podcast covers all the latest news and issues facing Ubuntu Linux users and Free Software fans in general. The show appeals to the newest user and the oldest coder. Our discussions cover the development of Ubuntu but aren't overly technical. We are lucky enough to have some great guests on the show, telling us first hand about the latest exciting developments they are working on, in a way that we can all understand! We also talk about the Ubuntu community and what it gets up to.

The show is presented by members of the UK's Ubuntu Linux community. Because it is covered by the Ubuntu Code of Conduct it is suitable for all.

The show is broadcast live every fortnight on a Tuesday evening (British time) and is available for download the following day.

podcast.ubuntu-uk.org

Block Calls - A Two Modem Solution

Written by Kirby

I haven't heard from him, so I have to assume Greg is still feeling a bit under the weather this month. Feel free to email him some get well soon messages: greg.gregwa@gmail.com

Solution to what, you may ask. Why, nuisance telephone calls, of course. Politicians, telemarketers, charities, and too many others have my telephone number. They're not paying my phone bill, so it costs them next to nothing for their auto-dialers to ring my phone to ask for money.

For several years, I toyed with the idea of answering such calls with a modem pretending to be a fax machine. I figured that the squeals would alert their software to remove my number from their vast databases.

This year (sadly after the flurry of pre-election calls), I managed to partially complete such a toy. Since current computers no longer have DB-25 serial connections, I hastily bought a USB modem on eBay.

Having mistakenly believed that all modems have both a "line" and an extension RJ-11 jack, back I went to eBay for another modem. This time what the Chinese vendor called a "two-port" model cost only a bit more than the one I had. When it arrived, the experiments began.

Weeks went by as I tried various Linux programs to monitor our landline, read the caller ID (CID), check it against a blacklist to blast the modem synch tones to the unwary, if hopeful, scavenger on the other end.

I finally settled on picocom for the monitor function, minicom for setup, and modem-cmd to do the auto-answer and blast job. After many hours of writing bash scripts, testing and rewriting, I learned that:

1. Picocom does not like running in the background.
2. Picocom has no logging feature, necessary for passing events by file.
3. Modem answer and hang up commands interfere with the modem's monitoring.
4. The Expect language was mysterious for me.
5. Even bash has some squirrely comparison rules.
6. The embedded USB modem code does not fully implement the Hayes command set. (But it's adequate for my purposes.)

Lesson one: Picocom wants its own tty for starting/running. Dedicate a terminal just for it.

Lesson two: A patch (diff) to implement logging is available for picocom and it's easy to apply, even for a noob like me. My picocom log file is named CID.log, but it can be any file spec.

Lesson three: The port-capturing nature of serial I/O forced me either to suspend monitoring or to use a second line attachment. I thought I could switch between monitoring and answering in a script, but picocom would not function for me when started by a script.

So here's where the second modem comes in. (I have two now, you know.) The one-port modem connects to the extension port of the two-port modem. The two-port modem's "line" port connects to the phone line. Picocom monitors the two-port, while modem-cmd answers and hangs up the "extension" using the second modem. Of course, both modems are really on an "extension" but they neither know nor care.

These modems appear in my (Debian) /dev directory as ttyACM0 (the two-port) and ttyACM1 (the one-port). The command lines I use for the modems are:

Set up

```
minicom -s -D /dev/ttyACMx
```

Monitor

```
picocom -ilr --logfile
/root/phone/CID.log
/dev/ttyACM0
```

Pick up the phone

```
modemcmd=`/usr/bin/modem-cmd
/dev/ttyACM1 ~~ATA`
```

Now hang up.

```
modemcmd=`/usr/bin/modem-cmd
/dev/ttyACM1 ~~ATH`
```

Reset the modem

```
modemcmd=`/usr/bin/modem-cmd
/dev/ttyACM1 ~~ATZ`
```

These three modem commands are issued within a bash script after starting Picocom manually in a dedicated terminal window. The first, ATA, is used because the fax machine dream came to an end – it was too much trouble. Also, the modem was unwilling to dial without a dial tone. (Remember, it's answering a ringing phone.)

Here's a sample of Picocom's output, including the CID block (four values) which arrive just before the second ring. That first call is a candidate for blacklisting.

```
RING
DATE = 1117
TIME = 1848
NMBR = 8009421970
NAME = TOLL FREE    (The CID
says that it's not
blacklisted; let it ring.)
RING
RING
DATE = 1118
TIME = 0931
NMBR = 8009421970
NAME = TOLL FREE
RING
```

Sample from /root.Phone/Namesub.txt

```
2027650882,Political Call
2028005670,Stop Hillary PA
```

Sample from /root.Phone/Namesub.txt

```
2028005670,Stop Hillary PA
2028005696,Political Call
```

Sample from my /var/log/caller.log:

```
     Seq   Date  Time  Phone       Formatted     Caller, Blacklist flag
     2021,1207,1838,8552067186,(855) 206-7186,American Legacy PA,1
     2036,1208,1349,8009421970,(800) 942-1970,Presidential Coali,1
```

Sample from /var/log/blackmaint.log:

```
     1205 TIME = 1433 Blacklist was sorted
       5. 1231 at TIME = 1340 7207639906 blacklisted
     caller.log rebuilt 1231 TIME = 1412
     Blackballed call from 8552067186 added to caller.log 0101 at TIME = 1057
```

Here's the maintenance screen:

```
     ************************************************************
     *         Executing /root/phone/scripts/Blackmaint         *
     ************************************************************
              1.  View TODAY's logged CALLS
              2.  View ALL CALLS in log
              3.  View ALL CALLS in log sorted by date, time
              4.  View all phone numbers in the BLACKLIST
                  ---------------------------------------
              5.  ADD the LAST caller to the blacklist
              6.  ADD a RECENT caller to the blacklist
              7.  ADD a 10-digit phone no. to the blacklist
              8.  REMOVE a number from blacklist.txt
              9.  MATCH blacklisted numbers with Name Substitutes
                  ---------------------------------------
              10. STOP MONITORING calls (Kills picocom)
              11. Kill Picocom, start Minicom on ACM0
              12. Start Minicom on ACM1
              13. Clean temporary CID files from /root/phone


      > Enter number of your choice or enter 'q' to quit.
```

Ringmon, the program which issues the one-port modem commands (see above) is kicked off by incron. Incron is watching the CID.log file for the updates picocom makes. Ringmon starts Caller with a parameter "1" (Caller 1). Caller checks blacklist.srt to see whether it needs to intercept the call or just let the humans answer it. If the CALLERID is found in blacklist.srt, it calls Blackball. Blackball uses modem-cmd to function the modem to dial out. This stops the ring by answering the phone, producing a modem error because there's no ring tone. But that doesn't cause a problem. The modem is told to hang up after a few seconds, then it's reset.

The remaining tasks (blacklist maintenance, call logging, etc.) are divided among several bash scripts and files. These programs make liberal use of cat, grep and tr, which simplify the code. To avoid permission problems, the whole system resides in /root/phone and /var/log.

You may want to do something similar. The code is available here: https://www.dropbox.com/sh/yvbilaxpqoho57g/AACYRMwYhy9SM8NXpKVAQGHPa?dl=0.

List of programs

File spec.	Function
/root/phone/Ringmon	Initiated by inchron, reads CID.log, waits for CID, starts Caller
/root/phone/maint-scripts/Caller	Builds caller.log record, calls Blackball. Also rebuilds entire caller.log from CID.log and Namesub.txt.
/root/phone/maint-scripts/Blackmaint	Adds numbers to blacklist, sorts it, etc.
/root/phone/Blackball	Commands second modem to answer and hang up.

Available from repositories:

minicom	Modem setup
modem-cmd	Output simple commands to second modem
inchron	Program (Ringmon) initiation
nano	Misc. file edits
picocom	Monitor phone line
sed	Phone number formatting to (XXX) xxx-xxxx
tr, grep	File editing

List of files

File spec.	Function
/root/phone/CID.log	Picocom's log file; monitored by inchron
/root/phone/CID1.sav	Backup of CID.log
/root/phone/blacklist.txt	Blacklisted phone numbers, manual name substitutions
/root/phone/blacklist.srt	Sorted (by phone #) version of above
/root/phone/Namesub.txt	Aliases for phone numbers (from Internet); maintained manually
/root/phone/CID.grep, CID.tr1, etc.	temp files re-created at each phone call
/var/log/caller.log	Logs all calls with date, time, substitute name, etc.
/var/log/blackmaint.log	Logs activities of Caller, Blackmaint and Blackball

LibreOffice Pt.46 - Entering Functions

Written by Elmer Perry

In past articles, I have discussed and used functions to illustrate other functionality in Calc, but today, I am going to show you three different ways to enter functions. I'll show you the structure of a function; we will create data for a spreadsheet; then I will apply each of the input methods: Function Wizard, Function List, and manual entry.

Structure of a Function

It helps to understand the structure of functions if you plan to use them. I will use the following function for my discussion of function structure:

```
=PRODUCT(B5, A1:A6, 0.25)
```

Functions are always a part of a formula. When you use any formula or function, it must begin with an equals sign (=). If you use multiple functions, the equals sign is required only at the beginning.

The start of a function is the function name. By tradition, function names are entered in all upper-case letters, but Calc will recognize them in lower or mixed case letters. Keeping with the tradition, I usually enter function names in all capitals. The name of our function in the example is PRODUCT. PRODUCT is to multiplication what SUM is to addition, it multiplies all its arguments into a final total.

After the function name is the argument list, separated by commas, and surrounded by parenthesis. This is the (B5, A1:A6, 0.25) part of our sample function. Arguments can come in several forms, and the function will usually expect a certain type in each position of the arguments. Arguments can take the form of numbers (9), "Quoted text", cell reference (C3), cell range (C3:C10), comparisons (C3 > C1), or another function. Note that quotes around a number, "9", defines the argument as text – and not a number.

Setting Up the Sheet

I work with installers of controlled access systems. When setting up a new system, it is necessary to calculate how many power supplies are needed in order to power the equipment for the site. We use a formula for calculating the voltage drop at each device. The calculation involves the input voltage, the current draw of the device plus the current draw of any devices after it, multiplied by the resistance of the length of wire to the device. The basic formula is

```
Vout = Vin – I(DR)
```

where Vin is the input voltage, I is the current draw of the device and any devices after it, D is the length of wire (in feet), and R is the resistance of the wire per foot. Let's set up a sheet to help us calculate the voltage at each device.

Start with the label "Start Volts" in cell A1. In cells A2:E2 put the following column headings: Device, Amps, Distance, Ohms/Foot, and Voltage. In cell B1 put 13.2 for your starting voltage. In A3:A5 put 1, 2, 3 for the devices. B3:B5 are the current draw for each device. Use 0.3, 0.25, and 0.5. The three distances for the wire are 75, 110, and 120. For the Ohms/Foot, use 0.00639 for all three. This is the approximate Ohms per foot for 16 AWG (US). Leave the Voltage column blank. This is where we will enter our formulas.

Function Wizard

The function wizard is the most complete method for entering formulas with functions. It is also the slowest because of the many options. The wizard is a great way

	A	B	C	D	E
1	Start Volts	13.2			
2	Device	Amps	Distance	Ohms/Foot	Voltage
3	1	0.3	75	0.00639	
4	2	0.25	110	0.00639	
5	3	0.5	120	0.00639	

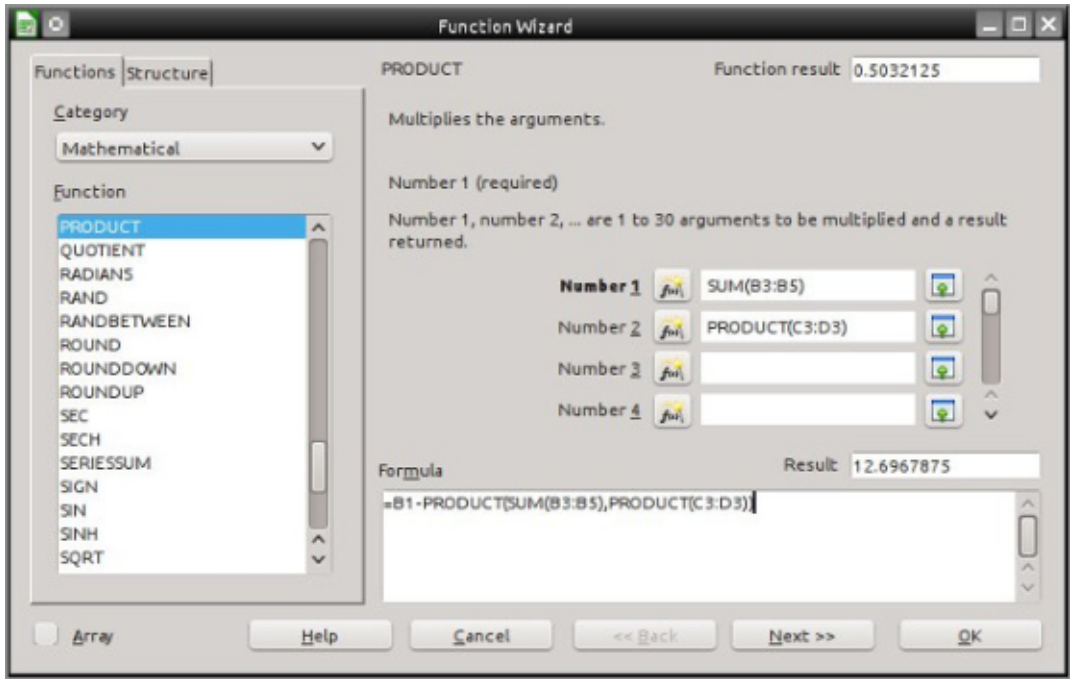
to work through the set up of a complicated formula by allowing you to deal with individual pieces of information one at a time. We will use the wizard to create the voltage formula for the first device.

There are three ways to access the Function Wizard. Select cell E3 and do one of the following:

- Click the Function Wizard button on the formula toolbar.

- Insert > Function...
- CTRL + F2

The Function Wizard displays a function list box to the left. The Category drop-down list allows you to narrow the functions in the list to the selected category. There is also a Last Used category for selecting recently used functions. If you single-click on a function name, it displays a short description of the function to the right. When you double-click on a function, it inserts the function into the formula text box on the bottom right. Notice that the wizard has already inserted the equals sign for you. The right center displays text boxes for entering the arguments for the function. Above the argument boxes, it displays the short description and a list of the arguments and their type. The top right shows the results of the current formula and the formula result is displayed above the formula edit box.



Our formula starts with the voltage coming into the device. For the first device this is 13.2 from cell B1, so click into the formula text box at the bottom and type "B1-". From the category drop down list select Mathematical. Scroll down the list and double-click PRODUCT. The PRODUCT function is added to the formula.

Click into the Number 1 text box. The first argument is the sum of all the amps for all the devices. Click on the Function Wizard button to the left of the Number 1 text box. This gives you a blank function wizard screen. Note that you now have Back and Next buttons at the bottom. Select Mathematical from the category list, but this time double-click the SUM function. Click into the Number 1 text box. Use your mouse to select cells B3:B5. The range is added to the Number 1 text box for SUM.

Click Back twice to return to the PRODUCT function we started with. Notice that the SUM function is now in the Number 1 text box. Select the Number 2 text box. Double-click on PRODUCT again. In the Number 1 text box for the second PRODUCT function, enter or select the range C3:D3.

We are now finished with our formula. The final formula should look like

```
=B1-
PRODUCT(SUM(B3:B5),PRODUCT(C3
:D3))
```

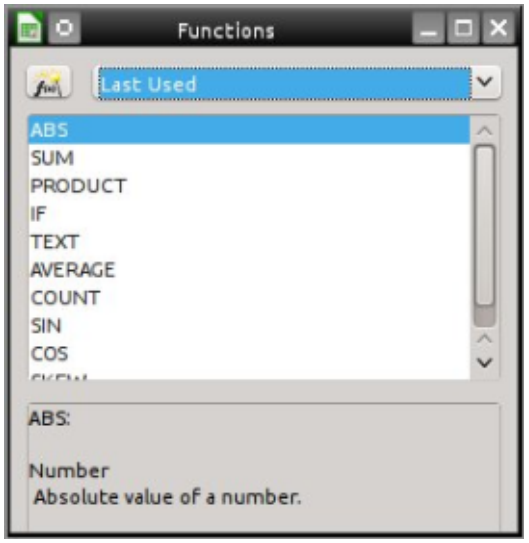
Click OK to finish the wizard.

NOTE: I could have used the multiplication operator (*) to accomplish the same thing in the PRODUCT function, but I used the function in order to illustrate the ability to use functions as arguments to other functions.

Function List

The Function List is the wizard without the bells and whistles. In fact, it is just the function list portion of the wizard. The idea behind it is to help you in adding functions directly into the cells.

You can bring up the Function List by using the menus, Insert > Function List, or by clicking the Functions icon in the sidebar. When you select a function name in the list, a short description appears at the bottom of the list. The Function List also has a category item called Last Used, containing a list of the functions you have used



recently.

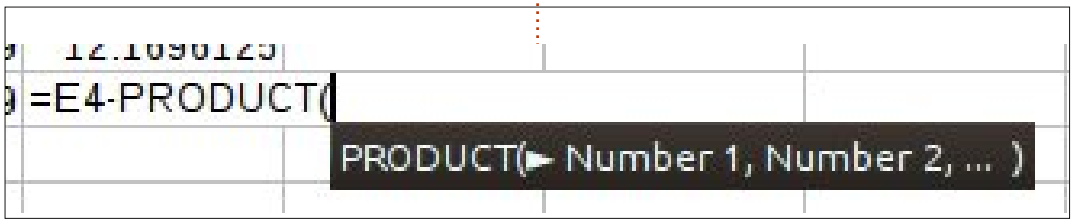
Let's use it to create the formula for the second device. Select the cell E4. Select the Input Line text box on the function toolbar. This is the best place to enter functions using the function list. For this device, we need the ending voltage of the previous one, so start the formula with "=E3-". You should see PRODUCT listed on your Last Used list. Double-click PRODUCT to add it to the formula. With the cursor between the parenthesis, double-click SUM, which should also show in the Last Used list. Select cell range B4:B5. Click into the formula and use the arrow keys to move the cursor outside SUM's parenthesis. Type a comma then double-click PRODUCT again. Type in or select the range C4:D4. Press Enter.

The final result should look like

```
=E3-
PRODUCT(SUM(B4:B5),PRODUCT(C4
:D4))
```

Manual Entry

Manual entry is just that, typing the formula directly into the cell from memory. The formula for the last device is the easiest because you no longer need the sum of device currents because it is the only one left. Select cell E5 and type in




```
=E4-PRODUCT(B5,
PRODUCT(C5:D5))
```

and press Enter. While you are typing in the functions, Calc will show you a hint balloon of the function and its arguments.

Calc gives you three different methods for entering functions into a cell. Use the Function Wizard when you need as much guidance as possible, or when entering a complicated formula for the first time. The Function List gives you a list and short descriptions to aid you in using the correct arguments and functions in your formula. The manual method is great for entering short formulas, using functions you are familiar with, or repeating a formula you have used before.

Elmer Perry's history of working, and programming, computers involves an Apple][E, adding some Amiga, a generous helping of DOS and Windows, a dash of Unix, and blend well with Linux and Ubuntu. He blogs at http://eeperry.wordpress.com

Just as everyone got nice and comfy with Tor, and being private, the world comes crumbling down when news got out that Tor wasn't, in fact, secure at all. Down went Tor, up went the red flags. Luckily, there is an alternative that does seem (for now) to actually be secure. For now; the Invisible Internet Project, or i2P for short.

Installation

Installing i2P is pretty simple since there's a Debian repo and Ubuntu PPA available. To start with, open a terminal and enter:

```
sudo apt-add-repository ppa:i2p-maintainers/i2p

sudo apt-get update

sudo apt-get install i2p
```

That will add the PPA, update your list of software and then install i2P.

Starting

To start i2P you need to keep that terminal open and enter:

```
i2prouter start
```

That will display something like:

```
Starting I2P Service...
Waiting for I2P Service.......
running: PID:17372
```

The PID will not be the same on your machine, but you get the idea.

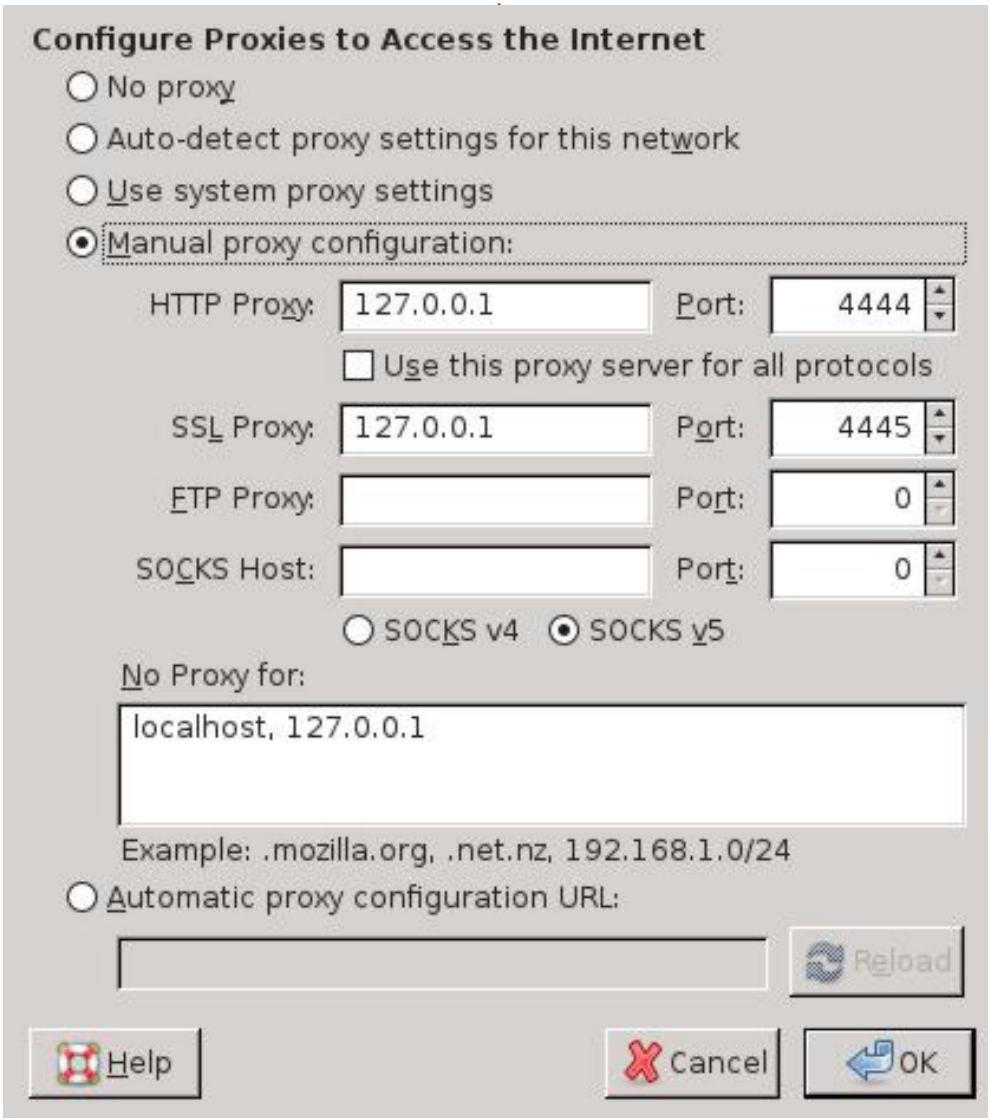
Now that the i2P server is running, we need to configure the browser. Please note that once you configure the browser to use i2P it won't load normal http pages, so it's probably best to install another browser just for i2P. I normally use Chrome, so I configured Firefox for i2P to try it out for this tutorial.

Proxy

Before you can use i2P properly, you need to edit the proxy settings of the browser you're going to use with i2P. I won't go through the settings for all the different browsers as all the steps are well written at:

https://geti2p.net/en/about/browser-config.

In short: you're setting your http (and ftp) proxy to 127.0.0.1:4444 and your SSL proxy to 127.0.0.1:4445.



Browsing

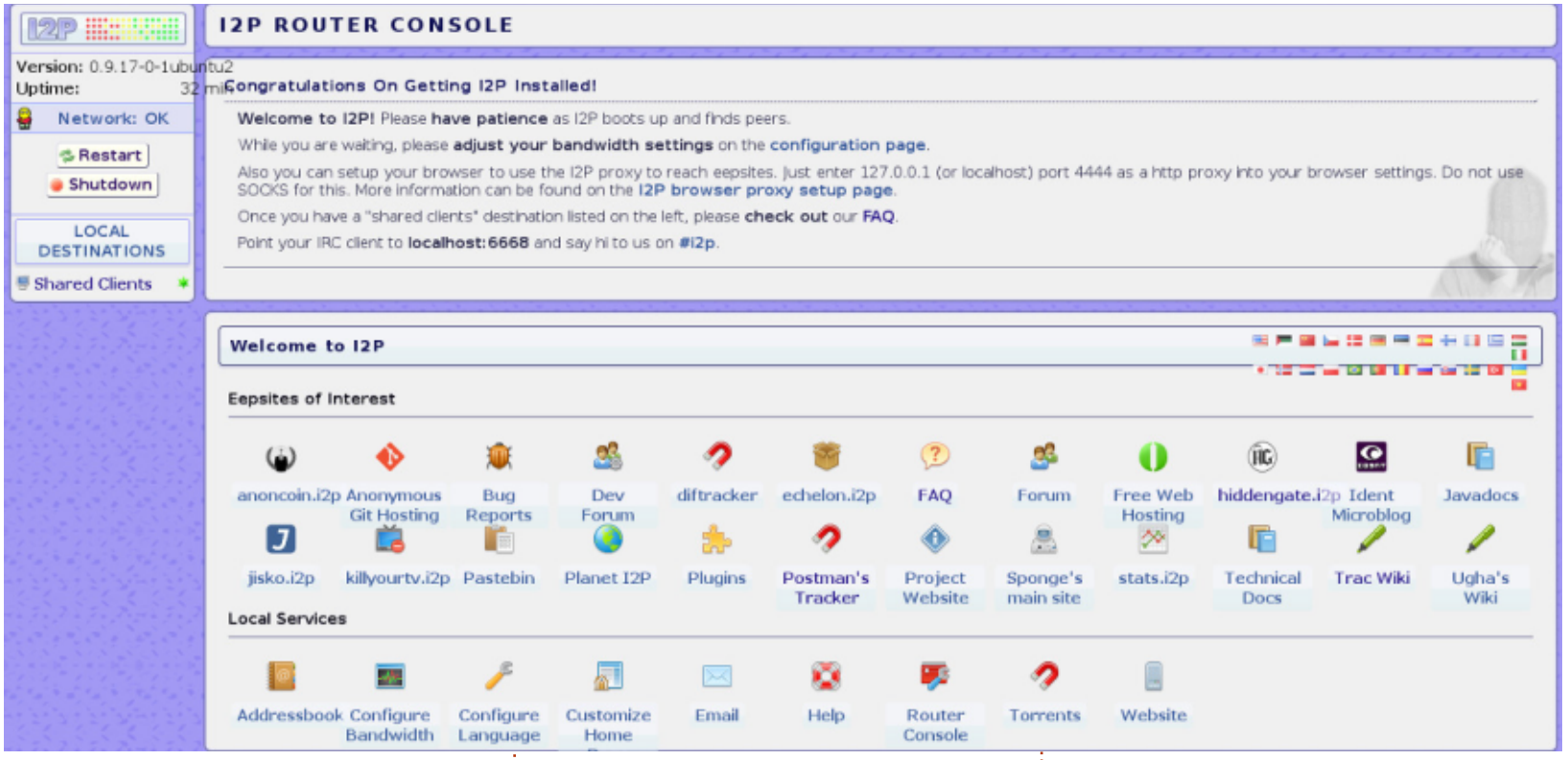
To gain access to the i2P settings, open your i2P browser and enter:

http://127.0.0.1:7657/home

You'll see a page something like the one shown right.

This is where you can gain access to the i2P configuration page (as a link near the top of the homepage) or go straight to recommended i2P sites.

You're now using i2P. Just to prove this, try going to a regular http page. If you're really on i2P it should not load. Here's an i2P site to get you started: http://i2p-projekt.i2p/how. It's some technical documentation on the i2P project on their own i2P site.



Email

Obviously, there's no point in signing up to an anonymous site using your real-world email address, so i2P comes with a built in email client called susimail. In your i2P home page, click the email link (bottom of the page, under Local Services).

Here, shown above, you can login (if you already have an @mail.i2p address) or click to create a new email. This new page (Postman HQ) will, at the bottom of the page, let you create a new email address. This email address is valid only on i2P, so don't bother trying to send from your regular email to @mail.i2p. It won't work. You'll get a bounce back. Don't email from @mail.i2p to the outside world. That would obliterate any, and all, privacy.

The i2P server also comes with built-in web hosting and bittorrent clients as standard. That's not even getting into the plugins that are available.

There's a lot to i2P. Sure, it's not as fast as the regular internet, but it's something new to check out.

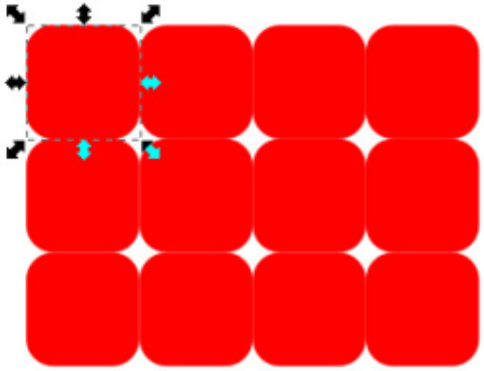
Obviously, and it should go without saying, be careful what you do on i2P as I do not guarantee its anonymity. Remember when everyone was sure Tor was secure?

Inkscape - Part 32

Breaking News: Since the previous instalment of this series, the long awaited 0.91 version of Inkscape has finally been released. Whilst it has some exciting new features, there's nothing that radically affects any of the subjects I've covered so far, so all the previous articles still apply. I'll delve into some of the 0.91 additions in future tutorials, but, for now, let's carry on with the Tiled Clones dialog, which hasn't really changed with the new release…

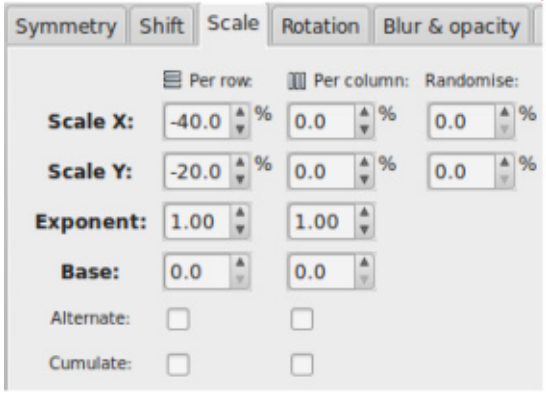
Last time, we quickly skipped over the first tab of the Tiled Clones dialog, leaving the pop-up menu on the "P1" setting, then spent the rest of the article looking at the Shift tab. The key thing is understanding how each column of controls applies to the rows and columns of clones that you define at the bottom of the dialog. If you're not entirely clear about that, now's the time to go back and revise because the next four tabs are all based on the same type of arrangement.

Before we move on to the Scale tab, once again you'll need an object or group to clone, and once again I'll be using a simple rounded rectangle. You should also click on the Reset button in the dialog to ensure that you haven't got any odd values hanging around in the Shift tab that will confuse the results. Click the Create button at this point and you should see the same simple array of objects that we started with last time, which will confirm that all the controls are set to sensible base values.

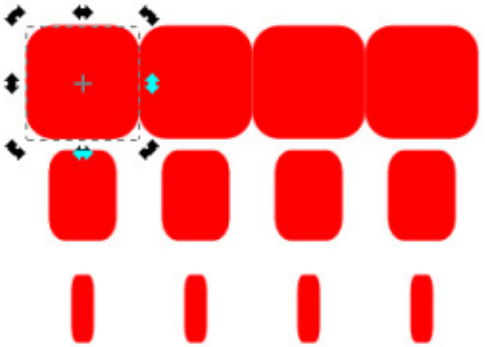


Now let's take a first foray into the Scale tab (shown right). The layout is almost identical to the Shift tab, so you should be able to work out what most of the fields are for. The Shift X and Y rows have been replaced with Scale X and Scale Y, allowing you to set the amount by which the width and height of your clones are changed for each row and column – plus a random amount if you choose. Clones that have been scaled in this way are exactly the same as if you had manually scaled them using the normal resize handles. As usual, the values are percentages that are relative to the parent's bounding box dimensions. In this example, I've set the values to reduce the width of the rectangle by 40% and the height by 20% for each row.

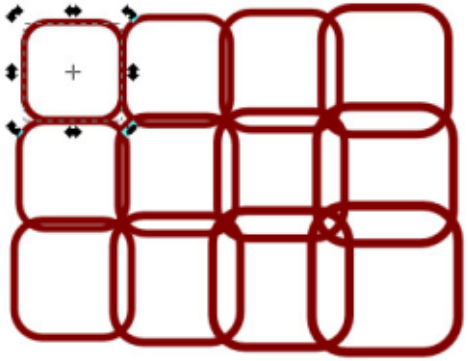
The Exponent field lets you determine whether the amount of X and Y scale should be the same for each row or column, or whether it should increase or decrease exponentially. The Base fields are used in conjunction with the Rotation tab to create logarithmic spirals, but I've never really had much luck with the technique. Finally, the Alternate and Cumulate checkboxes work the same way as for the Shift tab. The former allows the Scale factor to be applied as alternating positive and negative values for each row or column, whereas the latter causes the scale factor to be repeatedly added for each row or column, rather than just using the same value for every one.



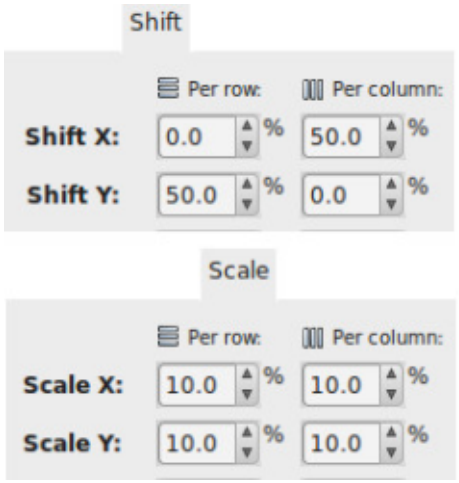
You can, of course, scale up as well as down using this dialog simply by setting positive values for the Scale X and Scale Y fields. If

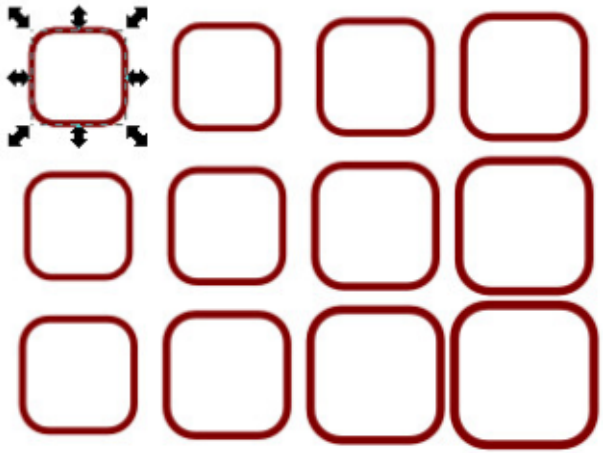


you do this you'll see that the clones immediately start to overlap each other. Here I've set both the X and Y scale factors to +10% for both the rows and columns (in other words, I've put 10 into the four boxes at the top left of the dialog). I've used a shape with stroke and no fill to make it a little clearer what's happening.



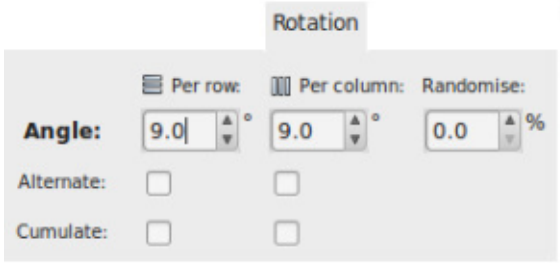
If you don't want your scaled clones to overlap like this, you simply have to give them a little more breathing room using the Shift tab. This is a key point of the Tiled Clones dialog: you can combine options from multiple tabs in order to create the arrangement you want – although it's also easy to create arrangements that quite literally spiral out of control! If your experiments take you too far off



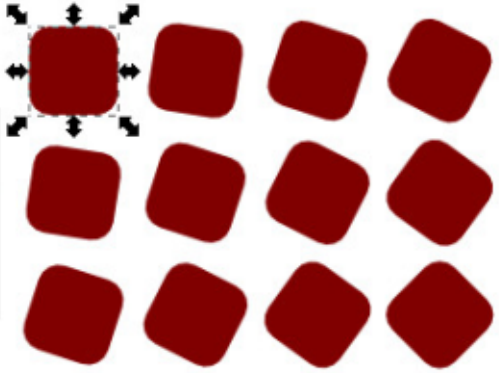


the beaten track, don't forget the Reset button.

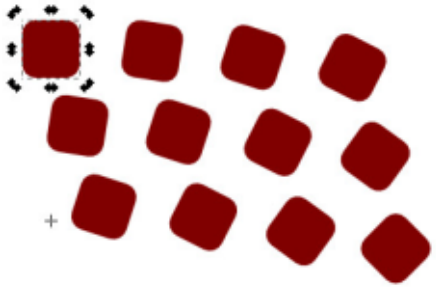
Moving onto the Rotation tab, I'm not even going to describe each field because, by now, you should be seeing a common theme across the dialog. Instead I'll just present the following screenshot, and ask you to think about how those values of 9° for each row and column have accumulated into a 45° rotation of the bottom-right rectangle.



At first the rotate tab seems fairly plain and innocuous. It does what it suggests, rotating each clone according to its row and column position, and that's about it. But there's one vital parameter required for rotating that doesn't even get a mention in that dialog: the center of rotation.



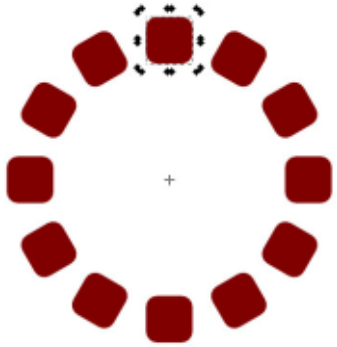
In the previous example I used the parent's default center of rotation, at the middle of the bounding box. But you can move it, as described way back in part 1 of this series: just select an object then click it a second time to bring up the rotate and skew handles, then drag the small cross that marks the center of rotation to some other position. If you want to return it to the default position, just SHIFT-click on it. With the center of rotation moved outside our parent object, the previous rotations become a little more interesting.



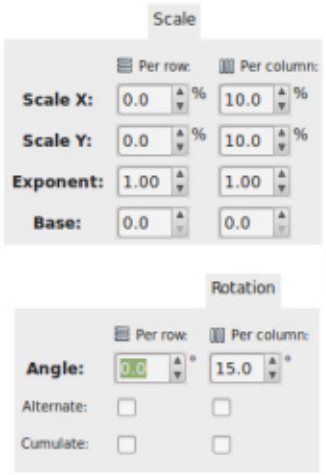
Notice how the arrangement as a whole is starting to curve? We can take advantage of this to create circles and arcs, even though the first tab still claims we're performing a “simple translation”. By changing the parameters at the bottom of the dialog to just produce a single row of clones, with a center of rotation outside the parent object, you can

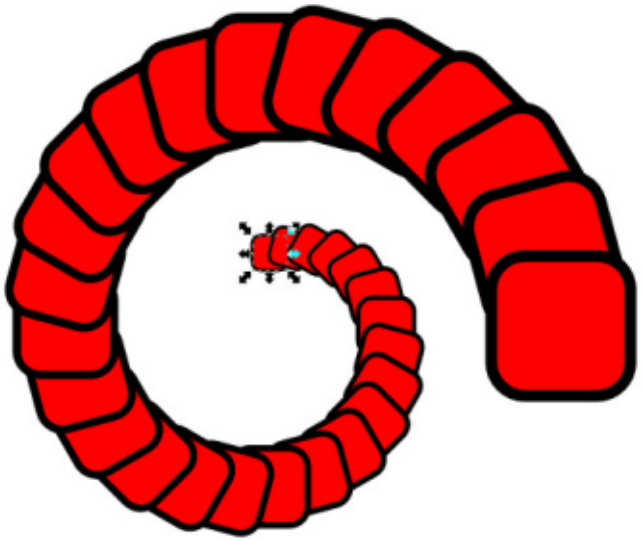
contents

create a circular array. Let's give it a try: set the “Rows, columns” fields to 1x12; adjust the center of rotation to drag it down below your object; set the rotation per column to 30°; finally either check the Per column “Exclude tile” box in the Shift tab, or set the Per column Shift X amount to -100%, in order to counteract the default behaviour of placing each column further along the X axis. Click the Create button and you should have a circular arrangement of clones.



By also putting values into the Scale X and Scale Y fields, it's possible to create spirals in this way. Unfortunately the use of these fields will, of course, alter the size of the clones – I've yet to find a method for creating spirals of identically sized objects using this dialog. This is where the Base fields should allow you to create logarithmic spirals that grow (or



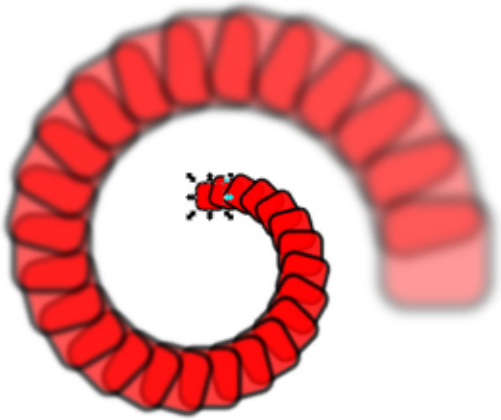


shrink) exponentially, but all they seem to do for me is to distort the clones as they progress around the spiral, so I tend to leave them as 0. Feel free to experiment on your own, though, to see if you can make them perform their magic.

Finally for this instalment, the Blur and Opacity tab should be fairly easy to understand. Tweaking the values in here is the equivalent of setting the Blur and Opacity sliders in the Fill and Stroke dialog for each clone. It's worth noting that any transparency in an object can cause Inkscape and other SVG renderers to slow down a little, as they have to calculate the effect that the pixels behind the object will have on the overall image. Blur has an even more significant effect on rendering speed, with larger values requiring ever more intense calculations. It's easy to add too much blur via this dialog, especially when creating a lot of clones, so you should probably start with very small values and work your way up, rather than just going straight for multi-digit numbers.

Be aware that adding blur to clones in this way will actually create a new Gaussian Blur filter for each clone. Filters are a subject for another article, but suffice to say that it's easy to bloat your file with numerous redundant filters, especially when you're experimenting with several different values in this dialog. Using File > Vacuum Defs (renamed as File > Clean Up Document in 0.91) can often remove any obsolete filters, but it's not always 100% successful.

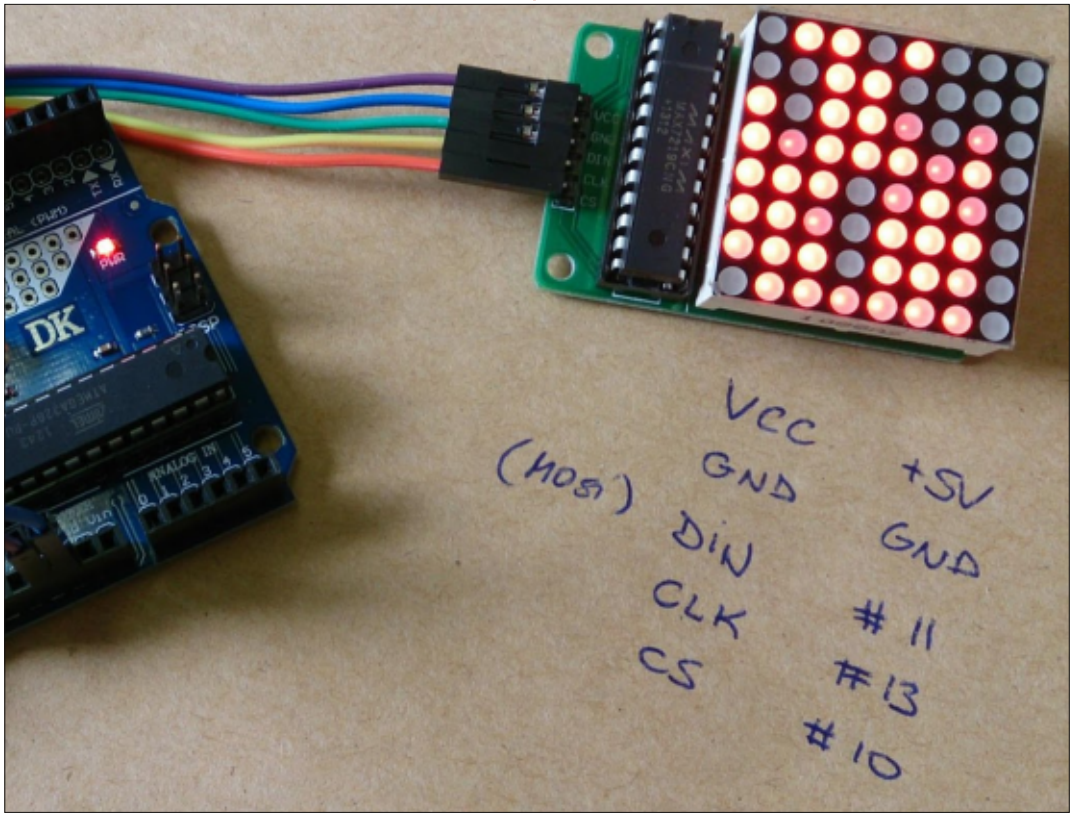
There are no “Cumulative” checkboxes on this tab because these values always add up: if you put 5.0 into the Per row Fade out field, the first row will be completely opaque, the second row will have 5% transparency applied, the third will have 10%, and so on. Applying a little blur and fade to our previous spiral gives this result.



Next time we'll continue our investigation of the Tiled Clones dialog by looking at the last two tabs: Colour and Trace.

The aim of this mounting is to simulate the flame observed in a fire.

An 8x8 LED matrix using the MAX7219 driver is lit with SPI protocol. DataIn, Clock and Chip Select pins are connected to the Arduino board using pin 11, 13 and 10 respectively. VCC (+5V) and GND pins are also used to power the LED matrix.

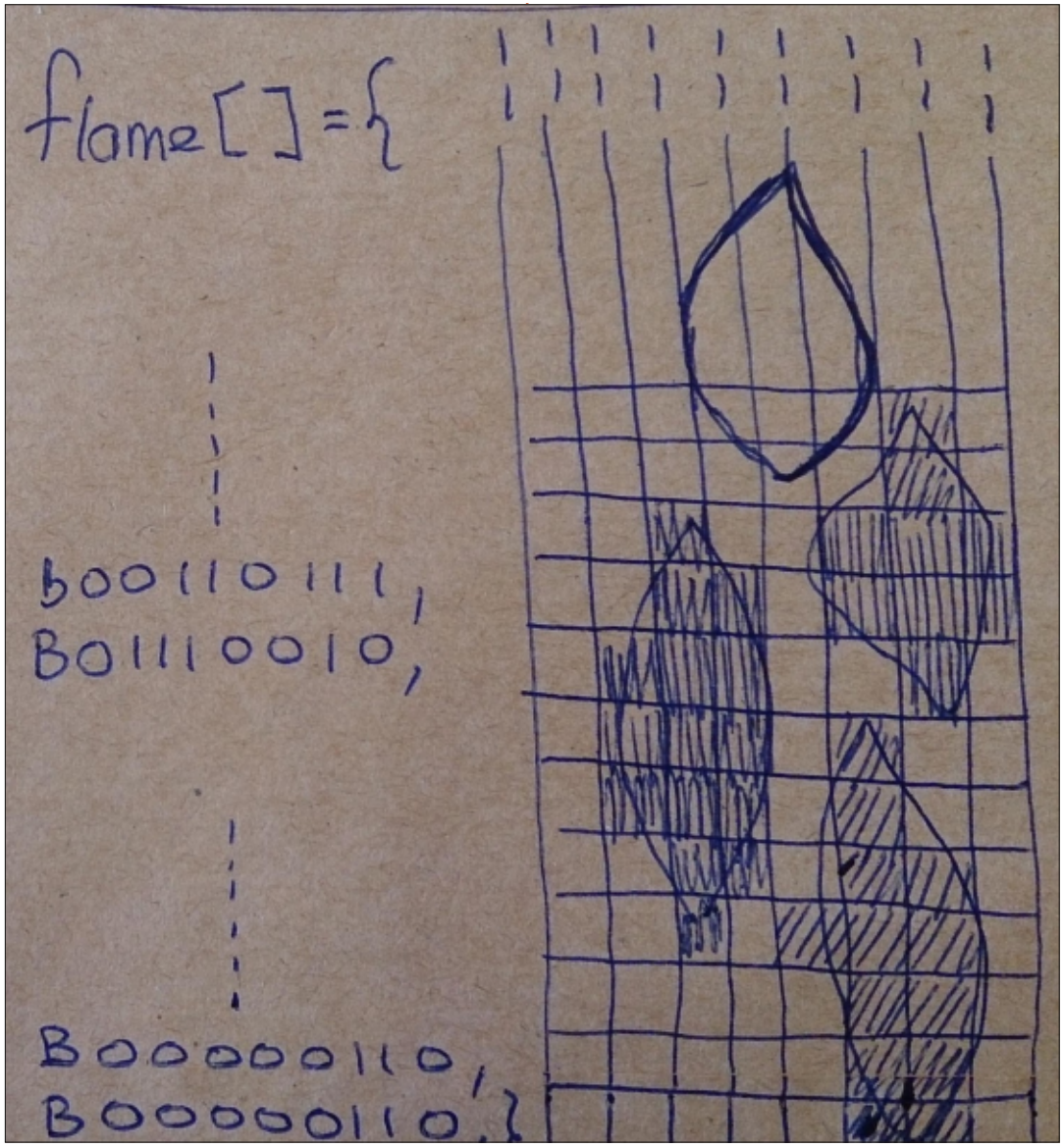


Drawing a flame on squared paper

We have plotted the flames on a 'digital ribbon' as shown right.

In the void loop, the flame array is written in the MAX7219 using a moving window governed by variable j. A delay of 25ms is used to render the flame dynamics.

Arduino code:
http://pastebin.com/DmABRLHs



Write For Full Circle Magazine

Guidelines

The single rule for an article is that **it must somehow be linked to Ubuntu or one of the many derivatives of Ubuntu (Kubuntu, Xubuntu, Lubuntu, etc).**

Rules

• There is no word limit for articles, but be advised that long articles may be split across several issues.

• For advice, please refer to the **Official Full Circle Style Guide**: http://url.fullcirclemagazine.org/75d471

• Write your article in whichever software you choose, I would recommend LibreOffice, but most importantly - **PLEASE SPELL AND GRAMMAR CHECK IT!**

• In your article, please indicate where you would like a particular image to be placed by indicating the image name in a new paragraph or by embedding the image in the ODT (Open Office) document.

• Images should be JPG, no wider than 800 pixels, and use low compression.

• Do not use tables or any type of **bold** or *italic* formatting.

If you are writing a review, please follow these guidelines :

When you are ready to submit your article please email it to: articles@fullcirclemagazine.org

Translations

If you would like to translate Full Circle into your native language please send an email to ronnie@fullcirclemagazine.org and we will either put you in touch with an existing team, or give you access to the raw text to translate from. With a completed PDF, you will be able to upload your file to the main Full Circle site.

REVIEWS

Games/Applications

When reviewing games/applications please state clearly:

- title of the game
- who makes the game
- is it free, or a paid download?
- where to get it from (give download/homepage URL)
- is it Linux native, or did you use Wine?
- your marks out of five
- a summary with positive and negative points

Hardware

When reviewing hardware please state clearly:

- make and model of the hardware
- what category would you put this hardware into?
- any glitches that you may have had while using the hardware?
- easy to get the hardware working in Linux?
- did you have to use Windows drivers?
- marks out of five
- a summary with positive and negative points

You don't need to be an expert to write an article - write about the games, applications and hardware that you use every day.

BTRFS is a new-ish filesystem that is available to GNU/Linux systems, among them Ubuntu distributions and their derivatives. Pronounced in various ways (my favorite is “Better FS”), it has been under active development for at least the last five years, though the developers have granted it stable status only since 2013. It aims to replace the venerable ext* series of filesystems as the default choice for Linux systems, sometime in the short-to-medium term.

This filesystem rose above the radar of many systems administrators even before it was claimed to be stable, since the brief was impressive. It has a features list that contains not only RAID 0 and 1 capacities - within the filesystem itself, not having to mess around with mdadm any more - but also subvolumes, snapshots and copy-on-write. In practice, this means that previously, GNU/Linux systems administrators who needed to administer large, complex file-systems while ensuring no data could ever be lost, either cobbled together various techniques to achieve what they needed, or looked towards more exotic offerings from large server vendors. Sun Microsystems’ ZFS is one such, and probably stands as one of the sources of inspiration for BTRFS. However, licensing concerns mean that ZFS may never get into the Linux kernel code base. Its use on Linux systems has been achieved only through the FUSE userland-based mechanism, which effectively curtails its use for a system’s root disk.

However, BTRFS has not yet been much in view of the normal desktop user, perhaps because it has been seen as a bit of a guru’s plaything, as well as a tad complicated to figure out. In this piece I will try to convince you, the reader, of its use for, let us say, at the very least the “power users” (whatever that may mean).

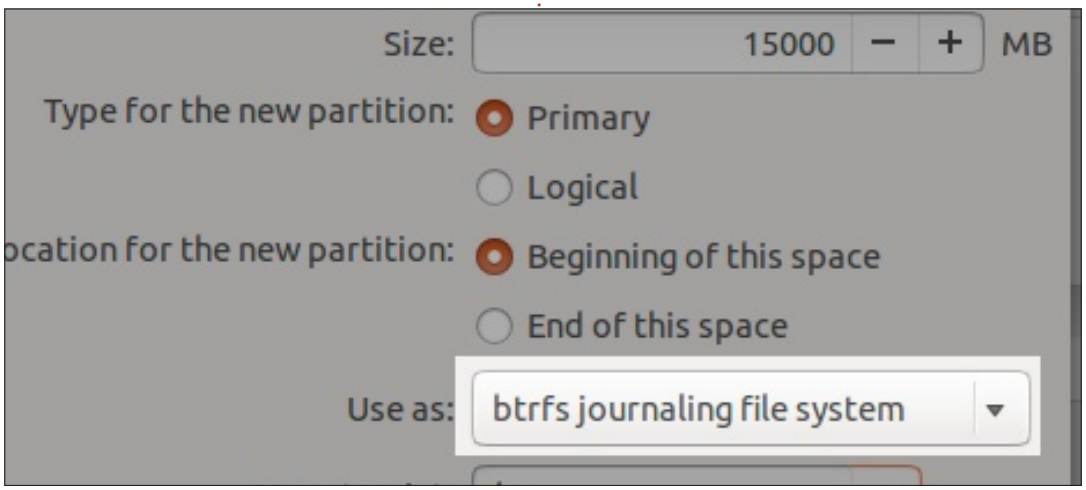
INSTALLATION

Installing a system with a recent version of Ubuntu is a breeze, since they already have the appropriate drivers built into the kernel, and helper libraries and tools are available in the btrfs-tools package. I will be using Ubuntu 14.10 version compiled for i386, but any version of 14.10, 14.04 or Linux Mint 17 will work just as well. If using a distribution that lacks them, you may need to boot into the Live CD environment, connect to the Internet and install the required package.

Start up the Live CD, and in the "Installation type" screen choose "Something else". This gets you into manual partition management. The approved way to install a Linux system on a BTRFS filesystem is create at least two partitions:

- A first partition for /boot. This needed to be of the ext* family, so why not ext4. This partition needs to be at least 200-300 MBytes in size, though 512 MBytes was probably wise to leave some extra space if you will be upgrading your kernel at some point in the future.
- A second partition for the root (/) and the rest of your system. For a simple install, there is no need to create a separate /home partition, but more on that later.

When creating a new partition, simply choose “btrfs” instead of “ext4”. The other options work in the usual way. In this case, I will be



creating a 15 GByte partition - though it will get resized up further on.

A simple partition scheme would be as follows. Please note (regarding the image below) /dev/sda was the USB pendrive I was booting from, while /dev/sdb was the (external) hard drive I was installing the system on.

The need for the separate /boot partition was because, until recently, GRUB did not know about BTRFS partitions, and complained if the /boot directory has been placed on such a file system - although the system did actually boot correctly anyway. Just to make it cease nagging, people used to create this separate partition.

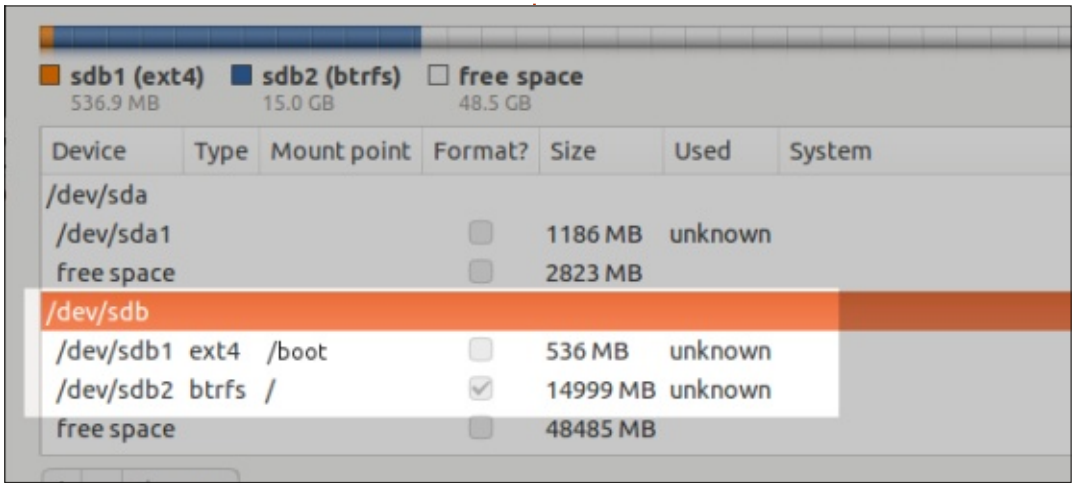
In more recent versions of Ubuntu, this is no longer necessary, and a single root BTRFS partition is altogether sufficient.

That's it, the rest of the installation should go in the usual way.

SUBVOLUMES

Now, reboot your system and open a terminal. If you issue the "mount" or "df" commands, you should see something a little bit weird (shown top right).

That's right, beside the /dev/sda1 boot partition that seems to be correctly mounted, we see the root /dev/sda2 partition mounted not once, but twice! But, it we take a closer look at the output from "mount", we can see it is indicating "subvol=@" on one mount, and "subvol=@home".




```
$ mount
/dev/sda2 on / type btrfs (rw,subvol=@)
/dev/sda2 on /home type btrfs (rw,subvol=@home)
/dev/sda1 on /boot type ext4 (rw)
$ df -h
Filesystem          Size  Used Avail Use% Mounted on
/dev/sda2    14G  4,0G  8,4G  33% /
/dev/sda2    14G  4,0G  8,4G  33% /home
/dev/sda1           488M   42M  411M  10% /boot
```

Subvolumes are one of the new features of BTRFS, compared to more traditional filesystems. With this system, different spaces can share available disk space within the BTRFS partition. However, subvolume contents are somehow separate, and can be mounted in different locations on our directory tree.

OpenSUSE takes this principle a way further, creating subvolumes for many other directories. Naturally, we can create further subvolumes manually and set them up if needed.

For example, in a server it would be usual practice to keep the contents of /var separate from the rest of the system. Let us create a subvolume for that. We will need to create it inside the parent partition /dev/sda2, and not the subvolume @. As root, let us mount /dev/sda2 on /mnt, and create the @var subvolume on it:

```
$ sudo bash
# mount /dev/sda2 /mnt
# btrfs sub create /mnt/@var
Create subvolume '/mnt/@var'
# umount /dev/sda2
```

We can now list all available subvolumes:

```
# btrfs sub list /
ID 257 gen 208 top level 5
path @
ID 258 gen 208 top level 5
path @home
ID 264 gen 207 top level 5
path @var
```

We can mount the new subvolume temporarily on /mnt to move over the contents of /var:

```
# mount -o subvol=@var
/dev/sda2 /mnt
# mv /var/* /mnt/
```

Now, unmount the subvolume from its temporary position on /mnt and mount it on /var:

```
# umount /mnt
# mount -o subvol=@var
/dev/sda2 /var
```

Let us check we have everything mounted correctly:

```
# mount
/dev/sda2 on / type btrfs
(rw,subvol=@)
/dev/sda2 on /home type btrfs
(rw,subvol=@home)
/dev/sda1 on /boot type ext4
(rw)
/dev/sda2 on /var type btrfs
(rw,subvol=@var)
```

That looks good. Just to make sure this partition is also mounted on reboot, add it to /etc/fstab. For example:

```
# echo "/dev/sda2  /var
btrfs  defaults,subvol=@var
0  3" >> /etc/fstab
```

(Please do make sure you use *two* >> symbols - or you will end up overwriting the whole file!)

Of course, it is even better to use volume UUIDs when editing the /etc/fstab. If your disc is on an external connector, what appears as /dev/sda on one system may very well become /dev/sdb or /dev/sdc on another, with more internal units installed - while UUIDs remain the same. A complete /etc/fstab with our current configuration could be that shown below.

Note that the very same UUID is used for all three subvolumes of the BTRFS partition. They also have individual subvolume UUIDs, but these are less often used.

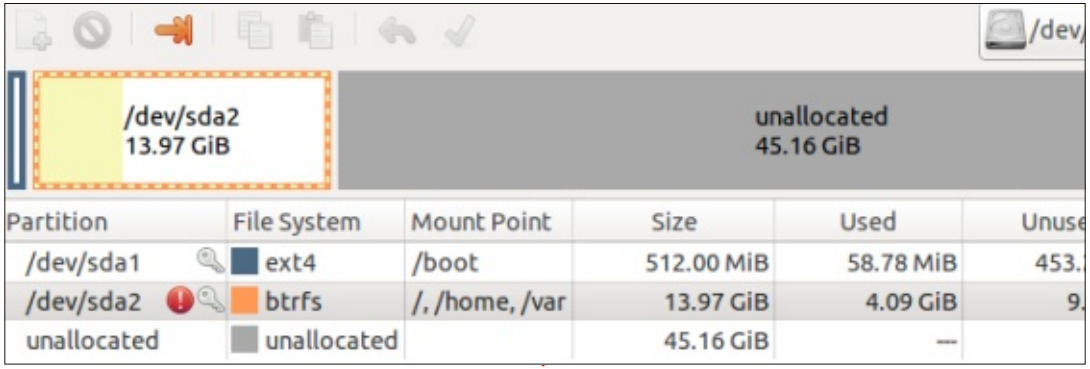
It is important to note that the contents of subvolumes do share space within the same filesystem. Subvolumes may be a practical way of separating data structures, and they can also be used to make separate backups (of the system itself, and of user's data). But if our partition gets nuked for whatever reason, all subvolumes go with it. This is why I still prefer different partitions, if at all possible on different physical disks, for the root / system and for the /home directory.

ADDING PARTITIONS TO INCREASE AVAILABLE SPACE

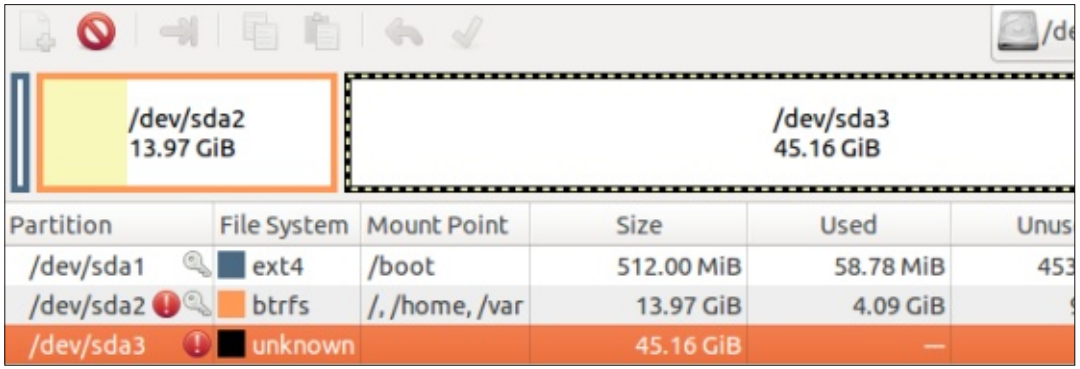
When we installed the system, we chose to create a rather small partition for use as our BTRFS root filesystem. A rather large amount of space is still unused, and available should we wish to increase our disk space.

Our root filesystem is mounted, and in fact our computer's operating system is running from it. This is why gparted cannot resize it on the fly, and instead displays the key icon next to the partition name.

However, we can use the free space to create a new partition, in this case /dev/sda3. We will not need to create it with a specific filesystem for our use, so it can be left just as a new, but unformatted partition.




```
# cat /etc/fstab
# <file system> <mount point>   <type>  <options>           <dump>  <pass>
# /dev/sda1 is the /boot partition
UUID="3975aff8-408f-46c0-8c30-197dbb939b00"      /boot     ext4     defaults     02
# /dev/sda2 is the btrfs partition, containing @,@home, and @var
UUID="cc619f9e-5e46-4e77-9051-8733670fed4d"     /     btrfs     defaults,subvol=@     0     1
UUID="cc619f9e-5e46-4e77-9051-8733670fed4d"      /home     btrfs     defaults,subvol=@home     0     3
UUID="cc619f9e-5e46-4e77-9051-8733670fed4d"     /var     btrfs     defaults,subvol=@var     0     4
```



Now, we can add this new partition to /dev/sda2, to extend available space. This is as simple as adding the new partition to the existing device, and re-balancing data across partitions. Interestingly enough, adding the device is almost instantaneous, while balancing may take some time depending on partition sizes:

```
# btrfs dev add /dev/sda3 /
Performing full device TRIM
(45.16GiB) ...
root@alan-crucial:~# btrfs
bal start /
Done, had to relocate 10 out
of 10 chunks
```

As a side note, it can be observed that the BTRFS subsystem has correctly recognized the physical disk as an SSD unit, and has accordingly activated TRIM.

When we investigate the BTRFS file system, we find available space has increased to take up both /dev/sda2 and /dev/sda3:

```
# btrfs fil show
Label: none  uuid: cc619f9e-
5e46-4e77-9051-8733670fed4d
    Total devices 2 FS bytes
used 3.91GiB
    devid        1 size
13.97GiB used 1.03GiB path
/dev/sda2
    devid        2 size
45.16GiB used 5.03GiB path
/dev/sda3

Btrfs v3.14.1
```

SETTING UP RAID

Another useful feature of BTRFS is that both RAID 0 and RAID 1 are baked into the filesystem itself. RAID 0, or "striping", means that data is written across more than one hard drive or partition. This is what has been applied in the section above.

On the other hand, RAID 1 or "mirroring" allows the filesystem to hold multiple copies of both our files and file-system metadata.

By default, BTRFS makes multiple (actually, just two) copies of only the metadata. This is the information referring to the actual placing of files on the disk sectors that used to be contained in a File Allocation Table (FAT) on some early file-systems. In modern systems, this information is spread all over the disk or partition, to reduce localized wear. Making two copies of metadata means the chance of getting corrupted file positions is reduced. Currently active options may be examined with the following command:

```
# btrfs fil df /
Data, single: total=4.00GiB,
used=3.72GiB
System, RAID1:
total=32.00MiB, used=16.00KiB
Metadata, RAID1:
total=1.00GiB, used=192.17MiB
```

Here, we see that System and Metadata elements are duplicated - with, by default, one copy on each device. User data (files) are held as only a single copy, however. This can be changed, by simply re-balancing the file-system with the appropriate options set:

```
# btrfs bal start /
-dconvert=raid1
```

Done, had to relocate 4 out of 6 chunks

If we check, we can see that both metadata (System, Metadata) and our files (Data) are now mirrored across the two units - even though they are of different sizes.

```
# btrfs fil df /
Data, RAID1: total=4.00GiB,
used=3.72GiB
System, RAID1:
total=32.00MiB, used=16.00KiB
Metadata, RAID1:
total=1.00GiB, used=192.39MiB
```

REMOVING PARTITIONS

Adding new partitions and more space to our system is fine, but at times we need to remove partitions. Perhaps a physical disc has gone bad, or perhaps we wish to use one of the underlying partitions for some other purpose.

In this test, we will remove /dev/sda2 from our BTRFS file system, leaving only /dev/sda1 used for /boot, formatted as ext4, and the 45 GiByte /dev/sda3 for

our system and user data.

Trying to simply remove /dev/sda2 does not work:

```
# btrfs dev delete /dev/sda2
/
ERROR: error removing the
device '/dev/sda2' - unable
to go below two devices on
raid1
```

This is quite logical, as we will no longer be able to have 2 copies of each data block on different partitions when we reduce the partition count to just one. So, let us re-balance our system in order to use a single copy of each data block (-dconvert=single), and also to reduce the metadata copy count to one (-mconvert=single). This is not a risk-less situation, so if we were to perform this operation on a production system this would be a good time to make sure our backups are in order. This is why we will be required to append the -f parameter to force execution.

So, re-balance the system and then remove /dev/sda2:

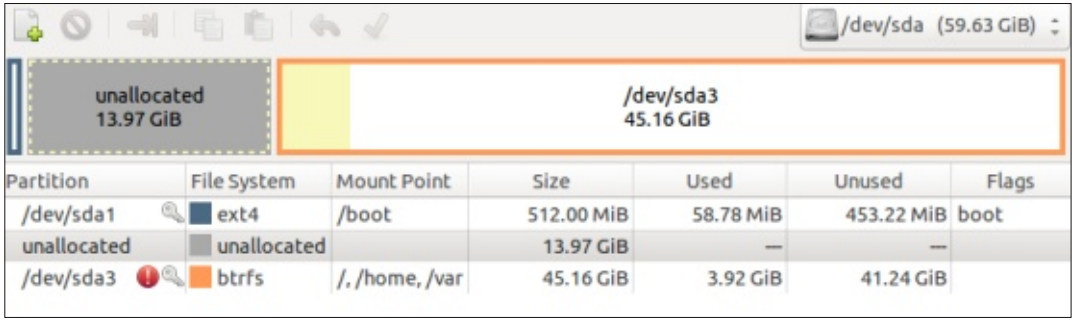
```
# btrfs bal start
-dconvert=single
-mconvert=single -f /

Done, had to relocate 6 out
of 6 chunks
# btrfs dev delete /dev/sda2
/
```

Let us check the filesystem status:

```
# btrfs fil sho
Label: none  uuid: cc619f9e-
5e46-4e77-9051-8733670fed4d
    Total devices 1 FS bytes
used 3.92GiB
    devid        2 size
45.16GiB used 5.03GiB path
/dev/sda3
```

We can now destroy /dev/sda2 if necessary:

```
# dd if=/dev/zero
of=/dev/sda2 bs=10M count=1
1+0 records in
1+0 records out
10485760 bytes (10 MB)
copied, 0,720581 s, 14,6 MB/s
```



The next time we reboot the system, /dev/sda2 will no longer be mounted. We should take care, if the /dev/sda names are given in /etc/fstab, to update this file before reboot. Otherwise, if the UUID nomenclature is used, this step will not be necessary.

Then gparted or a similar tool can be used to remove the old partition and repartition if so desired:

USING SNAPSHOTS

If you are like me, you will have, at some point in time, done Bad Things to your system, by way of testing extra programs, fiddling with system configuration, or, in general, learning the hard way how not to do things. In case of a really serious snafu, re-installing the system may be just about your only way out. OK, so it can take as little as 5 minutes on a modern machine - but not all of us use a modern machine and specially not for testing purposes, right?

Wouldn't it be nice if we had a safe-net at our disposal, that let us just roll back any changes to the system disk? Going back to a known point would simply be a question of rebooting the machine, and voilà!

This is just one of the capabilities of the BTRFS snapshot mechanism. In essence, a snapshot is a means of taking an image of a volume. This snapshot will, in essence, remain unaltered, while we do our meddling with the live volume. BTRFS's implementation of this feature is actually quite efficient, since only differential information is recorded about changes to files that have taken place since the snapshot was taken. Reverting to the snapshot simply consists of rolling back these changes, leaving the file system in its original state.

Just one point needs to be made before starting testing: snapshots may be made only of subvolumes. This is a further reason why forward planning of system subvolumes is important.

Let us start with a simple example. Suppose we wish to make a snapshot of the /home subvolume. Let us call it home_snap. Start by mounting the parent partition on /mnt:

```
# mount /dev/sda2 /mnt
# btrfs sub snapshot /home
/mnt/@home-snap
Create a snapshot of '/home'
in '//mnt/@home-snap'
```

That's it. If we consult the number of subvolumes in the BTRFS system, we can see both the mounted system, /home, and the new snapshot:

```
# btrfs sub list /
ID 257 gen 878 top level 5
path @
ID 258 gen 878 top level 5
path @home
ID 264 gen 851 top level 5
path @var
ID 279 gen 873 top level 5
path @home-snap
```

Now, let us do something really stupid, such as:

```
# rm -r /home/alan/*
# ls /home/alan
```

So it's time to roll back our snapshot. Since a snapshot can be seen as just another subvolume, perhaps the easiest way to do so is simply by modifying the corresponding entry in /etc/fstab (as shown below).

Now, reboot the system and the original /home directory should come up correctly:

```
# mount
/dev/sda3 on / type btrfs
(rw,subvol=@)
/dev/sda3 on /home type btrfs
(rw,subvol=@home-snap)
/dev/sda3 on /var type btrfs
(rw,subvol=@var)
/dev/sda1 on /boot type ext4
(rw)
```

The very same technique can be used with any snapshot on your system. So if you wish to roll back modifications to the system configuration or installed programs, subvolumes @ and @var are the ones to snapshot. Just remember to create new snapshots *before* making the alterations! Snapshots cost very little space...

SOME FINAL WORDS

Everything we have done so far could just as well have been performed with other file systems. Perhaps the most impressive is that many tasks have been done without rebooting the system and on "live" (mounted) partitions. This is what really makes BTRFS magic for server administrators, since system downtime is a bad thing. But it may also help us mere mortals in a tricky situation.

A second point that needs to be made is that, with these techniques, you can very easily mess up your system - I certainly did. So please be careful, and start out by playing with a computer and hard drive of which you don't care very much about the contents.

Finally, some tools are starting to become available to manage snapshots in the Ubuntu repositories – snapper and apt-btrfs-snapshot both may be worth some investigation… I may report on them later on in these columns, so stay tuned.

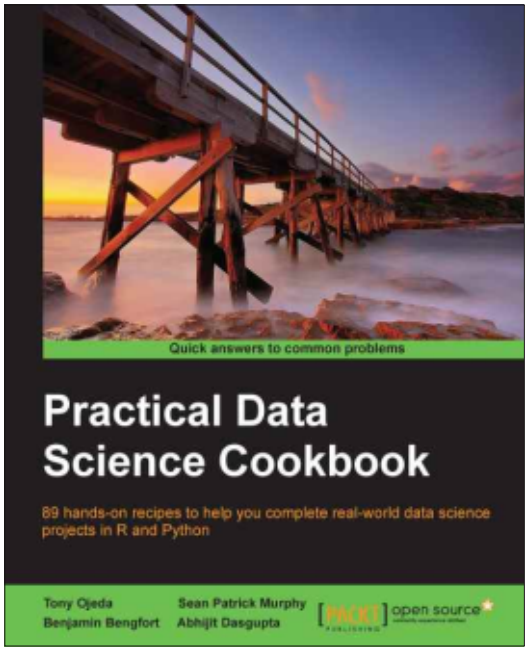
Alan teaches computer science at Escola Andorrana de Batxillerat (high-school). He has previously given GNU/Linux courses at the University of Andorra and GNU/Linux systems administration at the Open University of Catalunya (UOC).

```
# cat /etc/fstab
# <file system> <mount point>   <type>  <options>           <dump>  <pass>
# /dev/sda1 is the /boot partition
UUID="3975aff8-408f-46c0-8c30-197dbb939b00"     /boot    ext4    defaults    02
# /dev/sda2 is the btrfs partition, containing @,@home, and @var
UUID="cc619f9e-5e46-4e77-9051-8733670fed4d"    /    btrfs    defaults,subvol=@    0    1
UUID="cc619f9e-5e46-4e77-9051-8733670fed4d"     /home    btrfs    defaults,subvol=@home-snap    0    3
UUID="cc619f9e-5e46-4e77-9051-8733670fed4d"    /var    btrfs    defaults,subvol=@var    0    4
```

BOOK REVIEW

Written by Greg D. Walters

Practical Data Science Cookbook



When I see the phrase 'Cookbook' in a title, I'm immediately attracted to it, and, once I thumb through the book, I'm more times than not disappointed. The reason for this is that the recipes presented are usually either so basic or so obscure that I would never use them. So when I volunteered to review this book, I was expecting to experience this once again. However, once I got into the book, I was very pleasantly surprised.

As promised, this book provides source code examples in R and Python. The R projects are limited to chapters 2 through 5, but give enough information to whet the appetite of anyone interested in data analysis. Chapters 6 through 11 are focused on Python solutions and I must say, the code is very clean and the presentation is very good.

While the subjects of some of the chapters aren't really my cup of tea (Recommending Movies or Harvesting and geolocating twitter data), the authors presented the information in such a way that the examples could be extrapolated to cover many forms of data, not just movies or twitter.

Chapter 1 is dedicated to preparing the data evaluation environment on your computer for both R and Python. It is done in a very clear and easy-to-follow manner – without spurious packages that tend to obfuscate not only the intent of the project, but also make the reasoning behind the need for those packages questionable. Their choice of the free Anaconda Python distribution actually flies in the face of my above statement; however it is the correct tool (in my humble opinion) for the data analysis that is to follow, and will follow if you are going to continue in a serious data analysis role. In the same vein, the section on setting up a R environment is very straightforward and allows the reader to choose the best tool for the particular job. Enough information is given about the usage of R vs Python for even the greenest programmer to make a reasonable decision of which one to use.

The four authors, Tony Ojeda, Sean Patrick Murphy, Benjamin Bengtort and Abhijit Dasgupta all have extremely impressive credits and have done a tremendous job on this book. Their roles in the 'real world' include work at Johns Hopkins University to Masters Degrees and PhDs. I doubt anyone could have come up with a more impressive group to discuss this very complex subject.

The bottom line here is that if you are looking for a book to learn about data analysis and get snippets to help you along, then this is the book for you. You will want to pay close attention to Chapter One when setting up your analysis workstation, since the reasoning behind the packages used is clearly explained and the examples are well done. I would suggest that you install both R and Python as described in the book, since not all jobs are best handled by only one package.

Greg Walters is owner of RainyDay Solutions, LLC, a consulting company in Aurora, Colorado, and has been programming since 1972. He enjoys cooking, hiking, music, and spending time with his family. His website is www.thedesignatedgeek.net.

MY OPINION

Written by Knightwise.com

I run operating system X, I prefer distribution Y, I like desktop interface Y better..." I've heard the discussions over and over again. Sometimes people stick to their guns and defend their choice, other times people hop around from OS to OS or from Linux distro to Linux distro – just because they want thingie X that isn't available in Distro Y.

The question is: Why do we still need to choose? If we can train our digital workflows to be operating system independant, why can't we take it one step further and instead of 'choosing' our operating system… why not design it ourselves?

The question came up when I got back from a visit to Fossdem this week (Belgium's largest open source conference with attendees and speakers from all over the world). Seeing all these pretty Linux distributions and the powerful stuff you can do with them made me all eager to take the plunge once again and go "Full Linux" for a while. I slide from OS to OS (my main workhorse is a Mac; my traveling companion is a Chromebook that has Ubuntu on the side; my desktop runs Linux Mint; and I have a Surface Pro running Windows 10). Lately I have been having hours of fun playing around with the Chromebook. Its simple operating system charms me into using it quite often. It is clutter free, not a lot of distractions, and I like its simple elegance. However, it is limited. Some things just don't work on Chrome, but, luckily for the Chromebook, I can just 'sidestep' into the Ubuntu version I've installed via Crouton.

Hopping from OS to OS at the press of a button is a joy. However, since Ubuntu uses the same Root kernel as Chrome OS, some features are missing (no iPTables means no way to use Sshuttle, my favorite vpn client). The other downsides from working on the Chromebook are its limited storage (16 gigs divided between Ubuntu and Chrome OS), and the low quality screen. I love working with the little machine when I'm on the road, but it has its limits.

Meanwhile, my super powerful Macbook Pro sits by the wayside, waiting patiently until I have a new task for it to do (I do most of my audio and video production on my Mac, and it IS the main machine for my business, so tinkering with it is just not done). A bit of a shame really.

As I was once again working on both machines side-by-side this week, I wistfully thought: how cool would it be to have the power and screen size of the mac, the simplicity of the Chrome OS, and the power of linux – all rolled into one machine – while still having the option to "slide" back and forth between the operating systems at a whim.

Sure, I could dual boot my Macbook pro with some flavour of Linux, but that would violate one of my basic principles: my Mac is my work machine, and my livelihood, so excessive tinkering that might harm the OS or the data on the machine is NOT done. Furthermore, since the latest upgrade to OSX Yosemite, dual booting has become a lot more complicated. So the alternative was easy: use a virtual machine. With plenty of Ram, and an SSD drive, I would have no trouble throwing some gigs and a few cores at my Linux distro of choice and run one on top of the other.

So what to choose? Choosing your distro is always hard. And, in my case, I wanted something very specific. I wanted the distro to have a light graphical user interface (I don't like clutter + I wanted it to be sharp and snappy so I didn't get the feeling I was running a VM). On the other hand, I also wanted it to look like Chrome OS. So what to choose?

Chromixium : A great distro, that I found that does just that, is Chromixium. Basically it's a re-build of Chrome OS, but using the open source version of the Chrome browser: Chromium. The Chrome-OS look and feel is done by heavily modifying an E17 interface and adding a plank dock. The operating system is light, elegant and well

done. The great thing is: where Chrome OS stops, Chromixium goes on. Instead of running on a shared Linux Kernel (like the Ubuntu installs in Chrome OS via Crouton), Chromixium is pure Ubuntu under the hood. That means a terminal and access to the software center. Install whatever you please!

Looks like Chrome, Feels like Linux, Runs on a Mac.

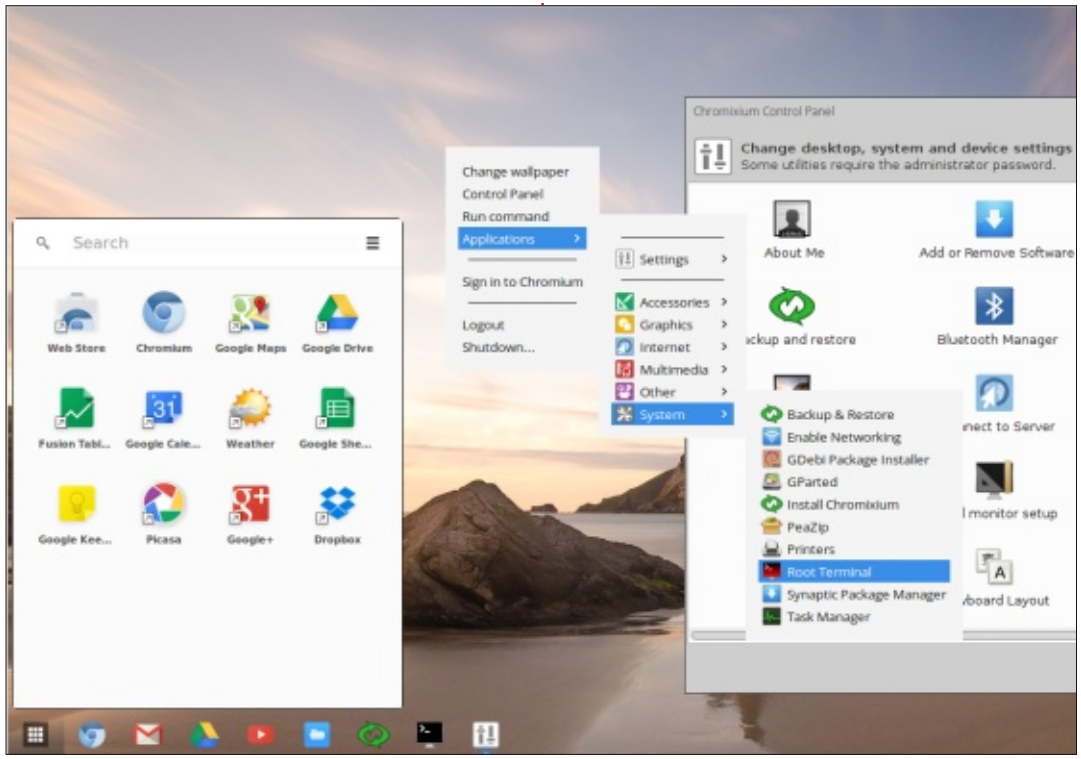
So, after I installed my favorite Linux applications (both Command line versions and actual apps), I have "morphed" my Chromixium into something that looks like Chrome OS but has the full power (and applications) of Ubuntu available at my fingertips. So now to get it to play nicely with my Mac. In order for the Chromixium VM to be able to use the full resolution of my Retina display, I made sure to assign it at least 32 meg of video memory in the Virtualbox control panel. I also assigned 2 cores and 4 gigs of ram. Next up, it was time to install the Virtualbox add-ons into the guest operating system (Chromixium) to let it use the full resolution.

Retina Schmetina

The actual resolution of a 15 inc Retina Macbook Pro is 2650 by 1600, and I was puzzled why, no matter how I tried, I could not get my Chromixium VM up to that exact resolution when I put it in full-screen mode. Turns out that this is actually impossible. The retina resolution is no longer tied to the actual resolution of your display. So you can "scale" the actual resolution of your desktop to 'appear' a certain resolution that is actually being 'mapped' on the actual resolution of your display. To make a long story short, I went into my Mac's system preferences and set the host resolution of my system to a setting that "looked" like XXX XXX, and, when I set my VM to full-screen, I saw that THAT was the actual 'physical' resolution the VM recognised.

So, in the end, I'm running an OS that is a mutated version of Chrome OS and that I have pimped out with a lot of "standard" Ubuntu applications ON TOP of my Yosemite install on my Macbook pro. It gives me the best of both worlds. The look and feel of Chrome OS, the power of the cloud – both Chrome and Chromium can sync with my Google account and all settings, plugins and extensions are carried over between my Chromixium OS, my Mac, and my Chromebook. To power it all, I have my Retina-display I7 Macbook pro, and, due to the fact this is a VM , I can easily make snapshots I can roll back to should something go wrong. I've already cloned the Virtual machine to my home server so I can access it remotely (via RDP) should I need to.

Tie in a couple of SSH connections and applications running on some of my other (remote) virtual machines, and pretty soon I am having a hard time keeping track of what OS I'm actually using. And that is the whole point. The operating system needs to become abstract – a software layer that provides you with the means to get things done. It is not there to be adored, it is not there to be fought over, it's not there to make you choose. It's there to help you get stuff done regardless of what OS you choose.



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LETTERS

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PLEASE NOTE: some letters may be edited for space.

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Full Circle Needs You!

Without reader input **Full Circle** would be an empty PDF file (which I don't think many people would find particularly interesting). We are always looking for articles, reviews, anything! Even small things like letters and desktop screens help fill the magazine.

See the article **Writing for Full Circle** in this issue to read our basic guidelines.

Have a look at the last page of any issue to get the details of where to send your contributions.

Q&A

Compiled by Gord Campbell

If you have a Linux question, email it to: misc@fullcirclemagazine.org, and Gord will answer them in a future issue. Please include as much information as you can about your query.

Q My graphics card is a Geforce 250. Will I need to upgrade for an Acer B286HK "4k"-resolution display?

A According to this page: http://www.geforce.com/hardware/desktop-gpus/geforce-gts250/specifications your graphics card can not produce 384x2160 output.

Q Is there a way to delete shortcuts on the Xubuntu desktop?

A (Thanks to ***PaulW2U*** in the Ubuntu Forums) You'll find an Icon tab in the Desktop settings. Just untick the icons that you don't want displayed on your desktop. If you decide you want them back, just tick the checkboxes again.

Q A member of my family runs Ubuntu 12.10 and cannot update, upgrade or install anything because his version is not supported any more. Is there a way to upgrade to a LTS?

A (Thanks to ***slickymaster*** in the Ubuntu Forums) Please see this thorough tutorial in AskUbuntu: How to install software or upgrade from an old unsupported release?

Q Is there a working OCR program for Ubuntu?

A (Thanks to ***ajgreeny*** in the Ubuntu Forums) Instal tesseract. Scan your material at 600dpi for best accuracy, and preferably in lineart or greyscale. Open a command line and CD to the location of your image, then enter this command:

```
tesseract infile.png outfile
```

Q All the computers in my household run Linux. There are several users. I want to set up an external hard drive so anyone can use it with no permissions issues.

A (Thanks to ***weatherman2*** in the Ubuntu Forums) Create an ext4 partition which uses the whole external drive. Enter these commands:

```
ls /media/ubuntu

sudo chmod -R 777
/media/ubuntu/partition-name
```

Q I have a 1 TB Silicon Power external hdd. It is formatted with gparted, using ext4 and gpt. Everything was working fine till today. I unmounted it with: sudo umount /media/directory

Since then, I cannot mount it by any means.

A The solution was:

```
fsck.ext4 /dev/sdb1
```

This cleaned up the corrupt file system.

Top questions at Askubuntu

* How do > and >> work?
http://goo.gl/WBLXRJ

* Is there a `Locate pointer` helper in Lubuntu (for visually impaired)
http://goo.gl/VCVSP6

* Can I stop wget creating duplicates?
http://goo.gl/84Cm48

* Why do I not see my /bin, /var, (etc.) directories in my root partition?
http://goo.gl/Xb7amm

* Is uninstalling via software center the equivalent of apt-get purge
http://goo.gl/yDbr2D

* Will Windows 10 "upgrade" affect GRUB2 and screw up my dual boot with Ubuntu?
http://goo.gl/ERzIKQ

* What are the icons on the top bar called?
http://goo.gl/WtJJI4

* How can I take a screenshot from a window, with customizable margins
http://goo.gl/Ch8Knv

* Command-line presentation tool for Linux?
http://goo.gl/S2Od3t

Tips and Techniques

The first branch office

My client is opening its first (one-person, for now) branch office this month. For me, that means a shopping spree: computer, monitor, keyboard and mouse, printer, network cable, jacks, faceplates, switch. (The ISP will provide the router.) Plus, we will set up a fake receptionist's workstation, with surplus computer equipment. Lots of fun, but no Linux.

I just hope someone is thinking about furniture; I don't see that as part of "IT Support."

Gord had a long career in the computer industry, then retired for several years. More recently, he somehow found himself "The IT Guy" at a 15-person accounting firm in downtown Toronto.

Security

Written by Kevin O'Brien

If you have security-related questions, email them to: misc@fullcirclemagazine.org, and Michael will answer them in a future issue. Please include as much information as you can about your query.

We know that the issue of securely sending information without it being read by others has been with us for a long time. Herodotus tells us about incidents in the 5th c. BC when Persia was at war with the Greeks. Two techniques were mentioned. One was writing the message on a writing tablet then adding a wax layer on top to hide it. Since writing tablets normally had a wax layer, that looked OK, and a message got through. This is really more of an example of steganography, which comes from the Greek steganos (covered) and graphei (writing). Steganography is hiding a message in such a way the observer does not know there is a message at all. Later examples include microdots (minute film hidden in the period of a sentence), and in the digital age, hiding a message in the code of a picture like a JPEG.

The problem is that once the observer knows about it, it is easy to defeat the secrecy and grab the message. WWII intelligence agencies learned all about microdots and how to find them, and once you know where to look there is no secrecy at all.

What you want is a way to stop someone from reading your message even if they physically have it in their possession, and that is known as encryption, from the greek kryptos (hidden). Encryption uses a cipher to turn your message from one that is read by anyone to a message that should, ideally, be unreadable to anyone who does not know how to decrypt the message. An early example was in Julius Caesar's Gallic Wars, and is therefore known as a Caesar cipher. This cipher moved each letter of the alphabet a fixed number of spaces. So if you moved everything one letter, "HAL" becomes "IBM". ROT13 is a common Caesar cipher. This is of course very easy to decrypt since you need to test only a handful of variations once you know the method. To make a more secure system of encryption, people next moved to a more random and less systematic method, creating the so-called substitution ciphers. Here, there is no pattern for how the letters are substituted for each other. In the U.S. we see these often in newspapers as "brain teaser" puzzles, and they are not too hard. The Arab scholar Al-Kindi showed the way in the 9th. century by showing that language is subject to statistical analysis. In English, for example, the most common letter is "e", the second most common letter is "t", and so on. The top of this list is "e,t,a,o,i,n,s,h,r,d,l,u". And you take the enciphered text, look for the most common letter, assume it "e", and you are off to the races.

The next step was taken by the Italian Bellaso, and later rediscovered by the Frenchman Vigenerewho – who now gets all of the credit, so it is called the Vigenere square. (Sic transit gloria mundi, poor Bellaso). This uses a key word or phrase to essentially change the substitution cipher for each letter, which initially was very hard to break, but Charles Babbage (yes, the same Babbage of Difference Engine fame) showed that even this could be defeated by statistical analysis. But then Joseph Mauborgne showed that you could make a completely secure cipher using a one-time pad. This is a pad on which each sheet has a completely random key for creating your Vigenere square. You make two copies, one for encoding, and a duplicate for decoding. Done properly, there is no known way to defeat this type of encryption, but there are problems. First, you have to create all of these pads and ship them to all of the people who need to communicate with you. Second, if even one of these pads is ever intercepted in any way, you no longer have any security. Third, it is very laborious, particularly if you need to send a lot of messages. For these reasons, no nation has ever adopted one-time pads for the bulk of its security needs.

The next step involves mechanical systems of encryption. The first ones were just simple pairs of disks with different diameters. You could rotate one disk to align up the A with a different letter on the second disk,

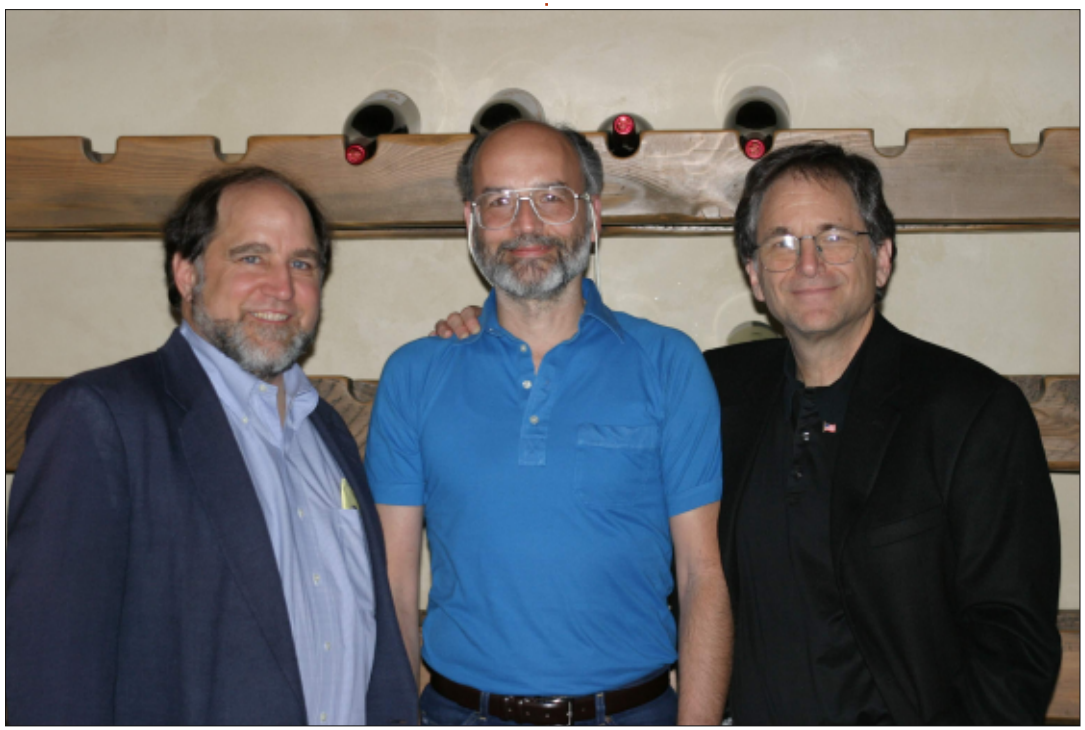
and then begin encrypting. An example known to old timers in the U.S. is the Captain Midnight Secret Decoder Ring. If you think about it, this is just a simple Caesar Cipher, although more efficient than doing it all with pencil and paper. But just after WWI, a German inventor named Arthur Scherbius took the basic idea and solved a lot of the problems to create the Enigma machine. This machine changed the settings after each letter was encrypted, making it all a lot more complicated and hence more secure. The German government adopted this, and believed it to be completely unbreakable. But in fact Polish cryptanalysts figured out how to crack the encryption, and passed their results on to Britain and France, and Britain created a mammoth operation at Bletchley Park that decrypted German messages all through the war. While there was sloppiness in the German implementation, even if this had been eliminated they still could have decrypted the messages (though with more difficulty) because a mechanical system like the Enigma machine has a built-in flaw: no mechanical system can be truly random, and if it isn't random, there will be a crack in the wall that a skillful cryptanalyst can exploit. The Poles, and then the British, realized that the key lay in mathematics, and recruited a large number of mathematicians to work on the cryptanalysis of these messages.

While the Enigma machine was the main one used by the Nazis, there was an even more secure encryption called the Lorenz Cipher, and, to decrypt these messages, the British created what was the first modern computer, beating Eniac by several years. Colossus could attempt to find the key by checking many possible combinations at once. This was the beginning of computerized decryption, and shortly thereafter computerized encryption was also attempted by several people. But this faced very active opposition by the NSA in the U.S., which, after WWII, was the dominant country in both computers and cryptanalysis. And this is an important point. If the NSA could simply throw computing power at any encryption and break it, they would never have behaved the way they did, and still do to this day. It is the very fact that they cannot do so that leads them to weaken the standards and oppose research.

By the 1960s, it was clear that computers could create encryption schemes that could not be broken so long as the users did not make a mistake. But the big problem was distributing the keys. The key used to create the cipher is essential, and getting it to the people who need to use it without anyone else getting it is a big problem. Whitfield Diffie and Martin Hellman, working with Ralph Merkle, created what Hellman has suggested should be called the Diffie-Hellman-Merkle key exchange algorithm which showed that it was possible to securely exchange keys even through a public medium, and Diffie later had the insight that the key could be asymmetric, meaning that the key used to encrypt the message could be different from the key used to decrypt the message. This would enable Alice to encrypt a message and send it to Bob (in discussion of crypto it is always Alice and Bob who are communicating; see Wikipedia) using Bob's public encrypting key, and Bob could then decrypt it using his private decrypting key which only he knows. Diffie thought this was

theoretically possible, and then a team at MIT actually found a mathematical function to do this. The team was Ronald Rivest, Adi Shamior, and Leonard Adleman, and by their initials this became known as RSA encryption, and it is still basically the standard in use today. The way it works, without going into extremely deep mathematics, is by using a one-way function, which is a mathematical function that can operate on a number, but, when you get the result, there is no way to go back and see what the initial number is. So using a public key with a one-way function, Alice can post this key on a public site, print it in a newspaper, put it on handbills, and tack it up all over town, or whatever. Anyone can use it to encrypt a message, but this key can never decrypt the message. Only her private key can decrypt. These two keys are generated together as a key pair, based on taking two very large prime numbers, a dash of randomness, and some interesting mathematics. If you really want to look at the math, start with the Wikipedia page for the RSA Algorithm.

So the key to modern encryption is that it is an example of applied mathematics. Every message you write can be encoded using ASCII or some similar encoding scheme into a series of binary digits (zeros and ones). So that means that any message is equivalent to a number, and any number can be operated on using mathematics. And using mathematics we can determine just how secure it is, and that is why we can have confidence that encryption can be made secure even from government decryption. They may threaten you with jail if you don't reveal the key (in civilized countries), or even threaten you and your family with torture (in totalitarian dictatorships), but they cannot break the encryption if you don't help them at some point.



Again, the bottom line that everyone needs to understand is that if you use this properly, it cannot be decrypted using brute force in any reasonable time. It is not hard to encrypt data using a key strong enough that it would take every computer known in the entire world a billion years working day and night to crack the cipher and decrypt the message. And the NSA knows this, which is why they tried very hard to stop this technology getting out, and even indicted Phil Zimmerman, author of PGP, for "exporting munitions" when his code got out of the U.S. (BTW, he was never successfully prosecuted). And to this day, the NSA rarely tries to brute force any encrypted data, since it is hopeless. What they try to do is get the keys (often by legal compulsion), or find a way to weaken the keys, as they did with the Elliptical Curve Cipher.

War Thunder

World War II aficionados, rejoice! This month's video game review is on War Thunder, a combat, strategy & simulation, F2P, WWII, MMO – that'll blast you away. War Thunder was developed by Gaijin Entertainment and released for Linux November 2014, 2 years after its original release for Microsoft Windows. War Thunder is also available for Mac OS X and Playstation 4. As the name implies, War Thunder is a war game in which you battle it out against players from all over the world in various vehicles. In War Thunder, you have the option to play with a diverse array of aircraft or armored tanks. The game recreates (to a certain extent) battles from the period beginning with the Spanish Civil War (1936-1939) up until the Korean War (1950-1953), which naturally includes WWII. As such, there are over 500 vehicles currently available from this time period, as well as maps from places which were the unfortunate hosts of many of these historic battles. Being a massively-multiplayer-online battle game, you will fight it out against players from all corners of the planet.

Installation and First Steps

The game is available for download on the WarThunder website as well as through Steam; as a beta, it is still being developed and new features continue to be added. War Thunder is a Free-to-Play game, and, although there is the option for micro-transactions throughout, there is no need to make any purchase unless you really want to. Without making any purchases, it will take you longer to get certain aircraft/vehicles, but the pay-to-win scenario doesn't apply to this game. After you register (with Gaijin Entertainment), you then have to choose from one out of five available countries to play the game. The countries available are: USA, Germany, USSR, Great Britain and Japan. Since the game is still considered to be in beta, new content is being added constantly. Besides the five countries already mentioned, planes have been added from other countries such as France, Italy and Australia.

However, these countries are not available to be selected on their own, but are rather tied in to one of the main five countries. I imagine that, eventually, these newly added countries will continue to grow and be available as legitimate choices on their own. Assuming you are planning on playing with tanks, then you must be careful at the very beginning of the game and choose either USSR, Germany or (as of recently) USA, as other countries don't yet offer the option of playing with tanks. If you are like me and make the mistake of choosing a country that doesn't have tanks, don't worry, after playing 10 matches you are free to choose another country in addition to your original choice. When I started playing, I chose USA since that's where I'm from, but unbeknownst to me, at the time there was no option to choose tanks. In the middle of January 2015, tanks were added to the USA's arsenal. Supposedly Gaijin Entertainment is planning on adding more tanks, more countries, naval battles (including ships), and lots of other options to

the game.

Playing the game

There are three modes to play in War Thunder: Arcade Battles, Realistic (Historic) Battles and Simulator Battles. The Arcade mode is the best suited for a beginner, but the other two modes, although more difficult, are also more realistic in that they come very close to recreating actual historic battles like the Battle of Stalingrad for example. Although the battles themselves are, in a way, recreations, the outcome is entirely up to the players involved in each battle. In Arcade mode, it doesn't matter which is your country when it comes to matchmaking. In other words, you might have teammates from any of the other countries and you may be fighting against players from the same country that you have chosen. In Realistic and Simulator modes, your chosen country is a determining factor for matchmaking. When playing each of these two modes, your teammates will be fighting for the same country as you, and the battles themselves will be recreations of real historic battles.

Depending on how experienced you are at flying airplanes or driving armored tanks, your experience will be drastically different. According to the game's about page, “multiple realism settings allow advanced virtual pilots, tankers and beginners to enjoy the game regardless of experience.” Basically, if you're a beginner (like me), when it comes to flying a plane, then you can use a mouse/keyboard or a gamepad controller while having a 'virtual pilot' help you in flying the plane, thus making the game easy to play. If you're a bit more advanced, and want more of a challenge, then you can even go so far as using special devices like a joystick, throttle control and rudder pedals, thus making the experience more realistic. So, no matter what your previous pilot resumé might be, you are bound to be challenged without sacrificing any fun.

As I stated earlier, you can play using either a mouse/keyboard, a gamepad controller, or special flying simulator devices (joystick, throttle control & rudder pedals). Regardless of what vehicle you choose, you will be flying a plane or driving an armored tank while shooting and blasting your way up the ranks. The kind of vehicle you're using will determine what kind of ammo you'll be able to dispense. Since over 500 vehicles are available, it would take me forever to explain what all sorts of artillery you can fire. A basic umbrella description would be to say that you've got everything from machine-gun ammunition all the way up to some pretty heavy-duty bombs and explosives. There are different buttons to be pressed to fire different items, and if your plane happens to be damaged while in battle, you also have the choice of pressing a button to eject yourself out of the plane before it crashes – in which case you'd see the plane's crew eject and slowly descend with a parachute. There are also different PoV camera angles you can choose from, depending on preference or depending on what you're doing at the time. I like to use one point of view for when I'm flying, but, when I'm about to fire at the enemy, I like to switch to a different point of view where I can get a better look at my target.

Concerning the graphics, they are phenomenal. The tanks and aircraft look amazing, but the true gem in this game is the detail in the terrain, which is second to none. Whether you're flying over snow-covered mountains, lush green fields, or above the ocean as

contents

the sun reflects on the water, the game makes you forget that this is a Linux native port because, not even two years ago, this was the kind of game that only consoles and Windows PCs could enjoy. Oh, and by the way, I've played under medium, low and custom settings. Even on low settings I still get to enjoy some really exquisite graphics. I have, however, encountered glitches a few times, but they don't happen often enough for me to have a bad playing experience. Usually when I have encountered a problem, it's been because I've been taking screenshots for this review. The problem is that (usually after taking a screenshot), gradually the graphics begin to deteriorate until I can no longer see what I'm doing. I've submitted a bug report to Gaijin regarding this problem, they were quick on getting back to me to inform me that they're working on it. A temporary solution I found is to exit the game and then restart it, then everything goes back to normal upon re-start.

Conclusion

All in all, this is a fun game to play, and it has lots of room for you to grow as a player. As stated earlier, one of the strongest points of the game is its graphics. The game-play feels very natural. So far, the War Thunder community seems to me to be more friendly than not, as long as you watch your language (people HAVE been known to be reprimanded for using even mildly foul language). Leveling up doesn't seem to be affected by either participating or not in micro-transactions purchases. If it weren't for the graphics problems I've encountered, I would give this game a perfect 5 out of 5 stars, but because of this problem I am forced to subtract one star from its rating. I hope this gets fixed in one of the upcoming updates.

My Gaming Setup

I played War Thunder with my custom made desktop PC consisting of an AMD FX-6100 3.3GHz CPU (overclocked to 3.5GHz), an Asus M5A97-EVO motherboard, a Sapphire Radeon HD 5770 graphics card, 8GB of Kingston Hyper X RAM, and a 2TB Western Digital hard drive. The software used was Ubuntu 14.04.1 LTS, with Unity desktop and AMD Omega 14.12 proprietary graphic drivers.

Minimum Requirements

(according to War Thunder website)

- OS: most modern 64-bit Linux distributions, SteamOS
- Processor: Dual-Core 2.4 GHz
- Memory: 4 GB
- Video Card: AMD/Nvidia
- Network: Broadband Internet connection
- Hard Drive: 11 GB

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MY DESKTOP

Your chance to show the world your desktop or PC. Email your screenshots and photos to: misc@fullcirclemagazine.org and include a brief paragraph about your desktop, your PC's specs and any other interesting tidbits about your setup.

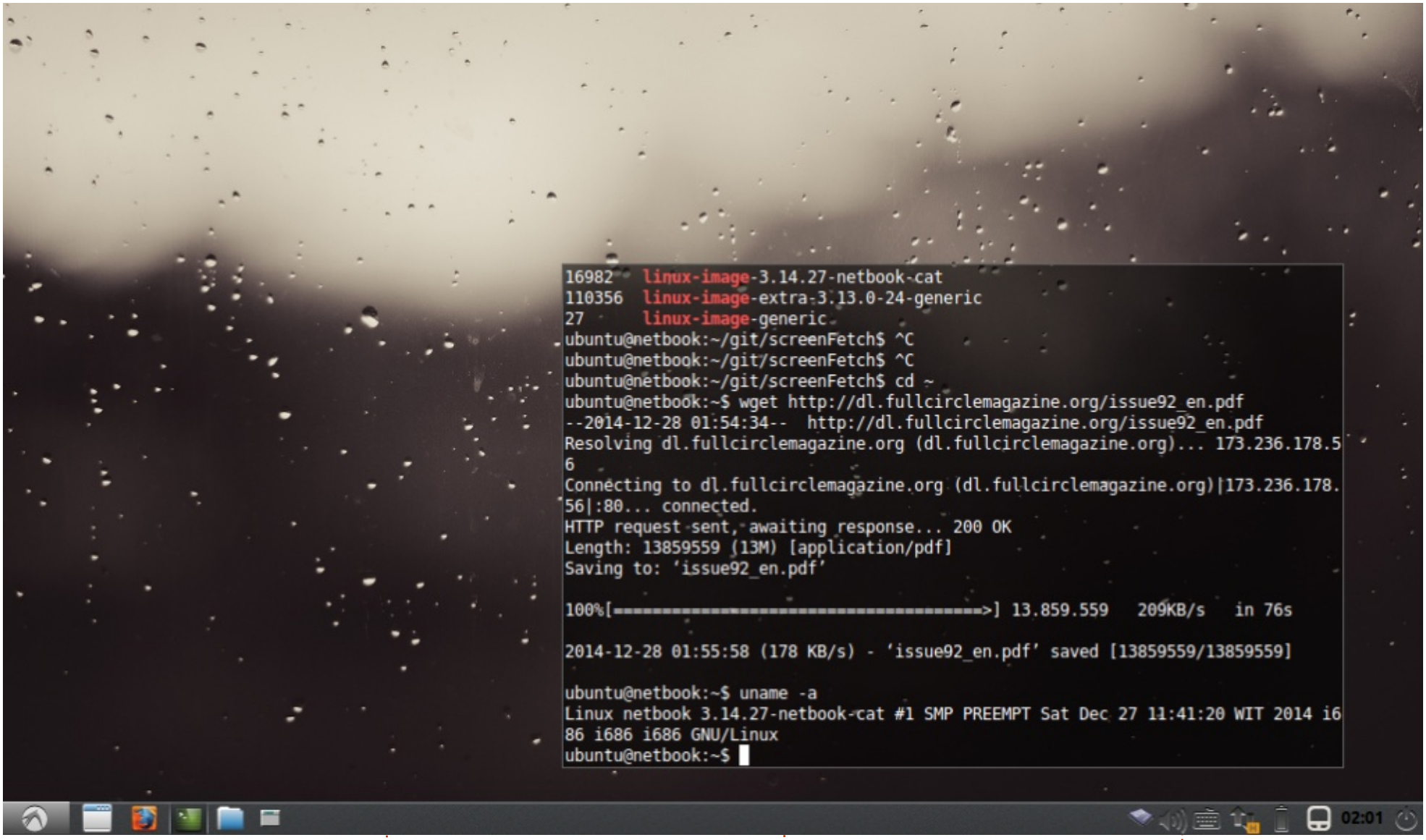
I'm using Lubuntu 14.10, the best OS for ageing PCs like mine. My desktop contains the following customizations:

- Numix GTK theme
- Numix icon theme circle

I use conky manager http://teejeetech.blogspot.in/p/conky-manager.html to easily configure conky. You can set up conky with just a few clicks!

Intel Celeron 1.80GHz Processor
2GB DDR2 RAM
160 HDD

Mohamed Rizmi



Hello, I am a Lubuntu User from Indonesia.

My netbook is a Axioo PICO DJH, 1 GB RAM, and Intel Atom N270.

I'm using Lubuntu 14.04 LTS with specific Linux kernel for netbook. It is installed on an 8 GB flashdrive (because I want to make it more portable for any work).

This is the most useful Linux Distribution that I have ever found. It is fast and very comfortable for my small screen.

For the icons, I just use default icons (Box). The wallpaper is from Devianart, named "Rain".

Faqih Juantomo

HOW TO CONTRIBUTE

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