



Full Circle

THE INDEPENDENT MAGAZINE FOR THE UBUNTU LINUX COMMUNITY

ISSUE #90 - October 2014



Photo: miss_millions (Flickr.com)



PRISON ARCHITECT BUILD YOUR OWN OPEN SOURCE PRISON

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HowTo

```
Please enter your username and password
USERNAME:llazinskiy
Password:
POST https://gw. .com/+
Got CONNECT response: HTTP/1.1 200 OK
CSTP connected. DPD 30, Keepalive 20
```

OpenConnect to Cisco p.14

```
Name MyDataRange
Range $MyData.$B$1:$E$5
Scope MyData
```

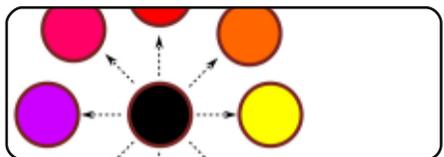
LibreOffice p.15



Broadcast With WCS p.17

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Blender p.XX



Inkscape p.22

Graphics



Full Circle

THE INDEPENDENT MAGAZINE FOR THE UBUNTU LINUX COMMUNITY

```
#An alias to make the ls
command more detailed
alias ls = "ls -la --
color=always --classify"
```

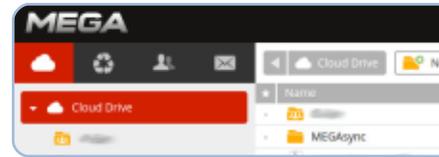
Command & Conquer p.12



Arduino p.25

```
.config - Linux/x86 3.13.11.2 Ker
Linux/x86 3.13.
Arrow keys navigate the menu.
submenus ----). Highlighted
includes <N> excludes <M>
```

Linux Labs p.28



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My Story p.37



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Tuxidermy p.41



Q&A p.42

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WELCOME TO ANOTHER ISSUE OF FULL CIRCLE.

No Python or Blender again this month I'm afraid. [Greg](#) has injured his back and [Nicholas](#) is now officially a father. Feel free to drop them both some encouraging emails. I've written up a HowTo on using WebcamStudio this month. It stemmed from me trying to stream my Euro Truck and X-Plane adventures with Stream Studio, but I wanted more control over the video output. Hence, WebcamStudio. I wasn't having much luck with it to be honest, but the developer, Karl, was very helpful over Google+ and I finally got there in the end with video, audio and text merged into one video output.

Mark continues to show us how to use Inkscape, and my current Arduino project (the laser trip wire alarm) is coming to an end. There are still a couple of months left of that project before I start a new one. And this month Alan shows you how to finally get your kernel up and running.

Another one from me is a review of MEGA file hosting. It's 50GB free, has a Linux client and leaves Google as the odd one out with no Linux client as yet for Google Drive. Oscar reviews the game Prison Architect. I've played this in the past and it's really quite fun, and the developers are continually adding new stuff each month. Check out their YouTube channel (Introversion Software) for their monthly update videos. For my fellow virtual pilots I've written a piece on how to install plugins for X-Plane 10 (now finally up to 10.3 on Steam) and then show how to use a plugin to show your position, in real time, on a map.

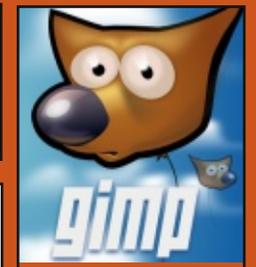
All the best, and keep in touch!

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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HP IS THE NEW OPENSTACK LEADER: WHAT DOES IT MEAN FOR RED HAT?

Red Hat (NYSE:RHT) is the largest distributor of commercial Linux products and the undisputed leader in the Linux enterprise market. The company also was the first to achieve the psychological billion dollars in open-source product sales.

It therefore comes as a surprise to learn that Red Hat could slowly be losing its grip on the open-source universe. A recent report on the top OpenStack contributors revealed that HP (NYSE:HPQ), the leading server vendor, has, for the first time, surpassed Red Hat, long-time leader of the OpenStack platform, as the top contributor of code to the open-source platform. HP contributed 20% of new code to the OpenStack platform over the last year compared to Red Hat's 17%. That's quite a big change from a year ago when Red Hat was the top contributor with

19% and HP generated just 13% of code. OpenStack is a set of open-source software tools that allows users to build and manage their own cloud platforms

Source:
<http://seekingalpha.com/article/2523745-hp-is-the-new-openstack-leader-what-does-it-mean-for-red-hat?source=cc>
Submitted by: **Arnfried Walbrecht**

IBM WANTS ENTERPRISES TO CONSIDER POWER 8

During the event, the IBM Power Architecture folks discussed the Power 8 architecture and how it can accelerate performance for many workloads. They also discussed IBM's work with several Linux distributors, using Flash memory as extensible memory rather than either cache or as a replacement for rotating storage media for processing on some new System p computers, and how the combined platform can easily support many Web, Big Data and Analytics, and "system of

record" processing – without customers feeling the pain of a migration. IBM has worked with SUSE and other Linux distributors to make sure that many Linux tools and applications are available on both X86 and Power-based systems, and that they work in exactly the same way. This means that using Power might be as simple as moving data or changing a pointer to where data might be found. Does this mean enterprises of all sizes might be well served by re-hosting their X86 applications?

Source:
<http://www.zdnet.com/ibm-wants-enterprises-to-consider-power-8-7000034100/>
Submitted by: **Arnfried Walbrecht**

MK902 II LE IS A TINY UBUNTU PC WITH A ROCKCHIP RK3288 CPU

Rikomagic launched a new TV box with a Rockchip RK3288 processor and Google Android software this summer. It's called the MK902 II, and I've got one

sitting on my desk waiting for me to find the time to put it through the paces. While the box is designed to let you run Android apps on a TV, it's basically a tiny computer... and, if you don't want to use Android, there's a Linux model. Rikomagic UK is now selling the MK902 II LE (Linux Edition) at its Cloudsto store for £110 (\$179) and up. That price may seem a bit high when you can get an Android model for \$115. But at least you won't have to install Linux yourself, and Rikomagic UK tells me there are a few small differences in the hardware for the Linux Edition model. The MK902 II LE features a RK3288 quad-core processor, 2GB of RAM, 8GB to 16GB of storage, a microSD card reader, 802.11n WiFi, HDMI output, 4 USB ports, Gigabit Ethernet, AV, and SPDIF jacks. It ships with Xubuntu 14.04, which is basically Ubuntu Linux with the Xfce desktop environment.

Source:
<http://liliputing.com/2014/09/mk902-ii-le-tiny-ubuntu-pc-rockchip-rk3288-cpu.html>
Submitted by: **Arnfried Walbrecht**

LINUX-READY INDUSTRIAL PCs ARE TOUGH AS NAILS

MEN Micro announced two rugged, Linux-ready box PCs with 3rd Gen. Intel Core i7 CPUs: the video storage oriented “BL70S”, and the wireless focused “BL70W.”

The BL70S and BL70W are fanless industrial computers that operate from -40 to 85°C, and feature aluminum fins that facilitate conduction cooling. Earlier MEN Micro box computers had much the same appearance, including the circa-2011, AMD G-Series based BC1. Both computers support Linux, as well as Windows 7 and WES7.

Although the computers have many features in common, the BL70S is designed for storage applications such as video recorders or content servers, while the BL70W supports wireless computing, “whether used alone or connected to a display computer,” says MEN Micro. The BL70S is notable for its 4-port gigabit Ethernet switch, Power over Ethernet (PoE) support, and

external, hot-pluggable HDD/SSD shuttles. The BL70W stands out with its four mini-PCI Express slots, each with a dual SIM card, and its wide support for wireless technologies.

Source:

<http://linuxgizmos.com/linux-ready-industrial-pcs-are-tough-as-nails/>

Submitted by: **Arnfried Walbrecht**

A NORSIFIED LINUX FOR WINDOWS AND OS X WOBLERS

First things first: the name. The next Elementary OS was codenamed Isis – as in the Egyptian goddess of magic and life. That was until Islamic State became a thing, and the distro’s team decided such associations were unwanted. Now it’s Freya, as in the Norse goddess of love and, er, war.

Conflict aside, what a nice update to last year’s Luna release of Elementary Freya is shaping up to be. The Norsified Elementary builds on Ubuntu 14.04, though, as always, the Elementary developers pick and choose when it comes to the distro’s base tools.

You’ll find all the updated hardware support in Ubuntu 14.04, but Elementary replaces GTK 3.10 with the more cutting edge GTK 3.12, which gets Elementary a nice combined window bar/title bar that saves a bit of space and looks great with the rest of Elementary’s very polished desktop theme.

You’d be forgiven for thinking Elementary is based on GNOME Shell. It looks a bit like GNOME Shell, with a clock in the middle of the top bar, an Applications menu to the left, and some indicator apps to the right. In Luna, the top bar was black by default, which made it look even more like GNOME Shell.

Source:

http://www.theregister.co.uk/2014/09/26/elementary_freya_review/

Submitted by: **Arnfried Walbrecht**

WEB SOFTWARE VS. NATIVE LINUX SOFTWARE

In years past, it wasn’t uncommon to rely on a particular operating system because of the software it provided. Mind you, this was before the popularity of web-based applications that can work on any

Internet-capable platform. Back then, any task – ranging from word processing down to video editing – had to be done from locally installed software.

Flash forward to now; web applications today have the ability to offer office suite functionality and make live edits to various forms of video/audio media. In this article, I’ll explore the differences between locally installed Linux applications and their web-based counterparts.

Source:

<http://www.datamation.com/open-source/web-software-vs.-native-linux-software-1.html>

Submitted by: **Arnfried Walbrecht**

BUILDING A LINUX LAB AND ITS GREAT POTENTIAL IN EDUCATION

It was 1995, and I had received an email from my brother James asking if I’d ever heard of Linux. I had, but barely. A high school student at my alma mater had built a web server with Linux. Eventually, out of curiosity, I purchased a copy of Red Hat 6.0 (which pre-dates Red Hat

Enterprise Linux or RHEL), and got it running with GNOME on a Hewlett-Packard Vectra 75, which had a Cyrix processor upgrade installed. RHEL 6.0 had a Mozilla browser, OpenOffice 1.0, and some other software I'd never heard of.

At that time, I was the technology director at Franklinville Central School in western New York State. I worked there for 26 years and retired in August 2013. I shared it with my IT staff, and we built a machine that we toyed around with that could read Yahoo Mail using the browser, but we couldn't use it with Lotus Notes which was our workplace official email system. Then, in early 2001, after talking to a content filtering vendor about my displeasure with content filters in general, the vendor said, "Why don't you build your own?" So, I said, "With what?" And, he answered, "Linux!"

Source:
<https://opensource.com/education/14/9/linux-education-public-school>

Submitted by: **Arnfried Walbrecht**

LINUX FOUNDATION LAUNCHES REFERENCE PLATFORM FOR 'CARRIER-GRADE' NFV

The Linux Foundation launched its Open Platform for NFV Project, designed as a "carrier-grade, integrated, open-source reference platform intended to accelerate the introduction of new products and services."

Founding members of the program include a long list of companies participating in the software-defined networking and network function virtualization space, including "Platinum" members AT&T, Brocade, China Mobile, Cisco, Dell, Ericsson, Hewlett-Packard, Huawei, IBM, Intel, Juniper Networks, NEC, Nokia Networks, NTT DoCoMo, Red Hat, Telecom Italia, and Vodafone. "Silver-level" founding members include 6Wind, Alcatel-Lucent, ARM, CableLabs, Cavium, CenturyLink, Ciena, ClearPath, ConteXtream, Coriant, Cyan, Dorado Software, Ixia, Metaswitch Networks, Mirantis, Orange, Sandvine, Sprint, and Wind River.

Source:
<http://www.rcrwireless.com/20140930/bssoss/linux-foundation-launches-reference-platform-for-carrier-grade-nfv-tag2>

Submitted by: **Arnfried Walbrecht**

LINUX MICRO COMPUTER RUNS ANDROID AND UBUNTU

We have discovered another Linux computer module, the HummingBoard from Israeli firm SolidRun.

The HummingBoard allows you to run many open-source operating systems – such as Ubuntu, Debian and Arch, as well as Android and XBMC. It is powered by single or dual ARM9 core Freescale i.MX6 processor with 512Mbyte or 1Gbyte of memory. Graphics comes from a Vivante GC880 GPU core which supports OpenGL ES 3.0 API, and capable of outputting multiple 1080p videos. There are two USB ports and an Ethernet network port, as well as a standard array of interfaces for UART, GPIO, SPI with two CS, I2C. There is also an optional 802.11 Wi-Fi interface.

Source:

<http://www.electronicweekly.com/news/design/embedded-systems/linux-micro-computer-runs-android-ubuntu-2014-10/>

Submitted by: **Arnfried Walbrecht**

EVIL PATENT TROLLS POISED TO ATTACK OPENSTACK, SAYS LINUX PROTECTION SQUAD

A group established to shield Linux from patent trolls has warned OpenStack will be the next big target for intellectual property hoarders.

The Open Invention Network (OIN) reckons the open-source cloud is ripe for plucking by trolls, who would easily be able to box off and claim core technologies as their own. That would see developers and customers using OpenStack forced to hand over fistfuls of cash in royalties – following either cases or, more likely, closed-door deals that avoid the expense of court. Keith Bergelt, OIN chief executive, told The Reg OpenStack lacks an IP rights protection policy beyond its basic Apache licences to protect itself.

“It creates a potential situation for mischief and for people to start inventing ahead of where core technology is being invented,” he said. “I have more than a little concern this could be a flash point or a battleground.”

According to Bergelt, there’s nothing to protect the cross licensing of technologies between OpenStack’s sub projects. That’s a problem because OpenStack meetings are open, so anybody can attend, take notes and walk away to file a patent in an area of prospective development.

It’s a problem Bergelt said he’s raised with OpenStack’s legal affairs committee, whose official members are drawn from Canonical, SUSE, Hewlett-Packard, AT&T, and Rackspace, with two unofficial members from IBM and Red Hat.

Source:
http://www.theregister.co.uk/2014/10/02/oin_openstack_warning/
Submitted by: **Arnfried Walbrecht**

How GNOME 3.14 is WINNING BACK DISILLUSIONED LINUX USERS

GNOME 3.14 is now out. It’s a release full of polish from the desktop environment once preferred by most Linux distributions – and almost a story of redemption. After arguably losing its way around GNOME 3.0, GNOME is back with a vengeance.

GNOME Shell has matured immensely since their immature launch. Thanks to solid releases like GNOME 3.14, GNOME will once again be the default desktop on Debian, pushing out Xfce. GNOME 3’s “classic mode” offers enough familiarity to be the default desktop on Red Hat Enterprise Linux 7, too.

GNOME 3.14 includes several redesigned applications. The Weather app has been reworked with a new layout, and now uses GNOME’s built-in geolocation features to automatically display the weather for your current location.

The Evince app – GNOME’s PDF viewer – now has less interface

getting in the way so it can display more of your documents at once. It also supports high-resolution displays and offers improved accessibility features.

GNOME now has multitouch support, too. Gestures involving multiple fingers can be used to navigate the desktop interface. Evince, and GNOME’s image viewer, Eye of GNOME, now support pinch-to-zoom.

The Photos app gained support for Google accounts, meaning photos uploaded from Android, through Google+ or via Picasa, are now integrated. It already allows you to access photos from Facebook and Flickr. Photos can also now access local photo servers over the DLNA protocol.

Source:
<http://www.pcworld.com/article/2691192/how-gnome-3-14-is-winning-back-disillusioned-linux-users.html>

Submitted by: **Arnfried Walbrecht**

IBM POWER SYSTEMS GET A BOOST WITH SUSE LINUX AND MARIADB BACKING

IBM’s Power Systems platform has been given a boost with the announcement of a partnership between Linux firm Suse and database developer MariaDB to drive a wider variety of applications on its Power8 systems. Announced at the IBM Enterprise2014 event in Las Vegas, the first fruit of the partnership is set to be a version of the MariaDB Enterprise MySQL database optimised for the Suse Linux Enterprise Server 12 platform on Power8 servers.

The partnership agreement will also provide customers with access to enterprise-class support from both Suse and MariaDB. Suse Linux Enterprise Server 12 is due for release sometime in the fourth quarter of 2014, but the two firms did not indicate when the optimised version of MariaDB is set to be available. However, Suse and MariaDB stated that their intention is to go further and enable IBM customers to be able to run a wider variety of applications on Power8, and have more flexibility and choice within their existing IT infrastructure.

Nils Brauckmann, president and general manager of Suse, said that

the partnership is an example of the opportunity that open-source brings to the IBM Power Systems ecosystem.

"Working with MariaDB in our strong ecosystem of partners offers our customers new and innovative ways to make the most from their existing IT investments, while accessing the latest and most powerful computing applications and technologies."

Source: <http://www.v3.co.uk/v3-uk/news/2374246/ibm-power-systems-get-a-boost-with-suse-linux-and-mariadb-backing>

Submitted by: **Arnfried Walbrecht**

LINUX FOUNDATION: CERTIFICATION MORE POPULAR BUT TOUGH TO GET

The Linux Foundation's "Introduction to Linux" MOOC on edX has enjoyed impressive popularity since launching in the summer. And the organization's Certification Program for open-source engineers, which went live in August, is also rising in stature, according to data the Foundation

has made available.

The Linux Foundation and edX never publicly set any specific targets for the Introduction to Linux MOOC, but it's a pretty safe bet they're happy with the response so far. As of this week, 270,000 users, representing more than 100 countries, have registered in the course, according to the Linux Foundation. That's solid evidence of the demand for free, Internet-based, instruction in using Linux.

And while taking the MOOC may impress some employers, the Linux Foundation is hoping its Certification Program will prove more persuasive as a measure of expertise in open-source systems administration and programming. One figure that may help convince employers and the channel that the certification means something is the sub-60 percent rate at which applicants have successfully completed the exams to date, according to the Linux Foundation. That statistic may reflect, in part, a low level of preparation among students in the course, but it also speaks to the certification's seriousness, and bodes well for candidates who are hoping a

certificate will mean something to employers.

Source:

<http://thevarguy.com/open-source-application-software-companies/100714/linux-certification-rising-popular-tough-get-says-linux-f>

Submitted by: **Arnfried Walbrecht**

WHAT'S COREOS? AN EXISTENTIAL THREAT TO LINUX VENDORS

Open-source has never been shy about eating its young – or, in the case of CoreOS, its old.

While sometimes dismissed as the newest entrant in the "just enough operating system" pageant, CoreOS threatens to displace incumbent Linux distributions with a minimalist approach that seeks to emulate how Google and other Web companies manage distributed systems. CoreOS uses Docker to handle the addition and management of applications and services on a system.

Indeed, by changing the very definition of the Linux distribution,

CoreOS is an "existential threat" to Red Hat, Canonical, and Suse, according to some suggestions. The question for Red Hat in particular will be whether it can embrace this new way of delivering Linux while keeping its revenue model alive.

Linux vendors, particularly Red Hat, have built their businesses on meeting the needs of operations professionals. Developers, as I wrote recently, have been a secondary concern.

That strategy worked great while operations ruled, but as developers have increasingly taken control, the ops-first strategy looks increasingly suspect. Indeed, Gartner estimates that 38 percent of total IT spend comes from outside IT today, and will balloon to 50 percent by 2017 as lines of business take more responsibility for their systems.

Source:

<http://www.infoworld.com/article/2692889/open-source-software/coreos-an-existential-threat-to-linux-vendors.html>

Submitted by: **Arnfried Walbrecht**

DRONE DEVELOPERS GET BIG OPEN-SOURCE BOOST FROM LINUX FOUNDATION, VENDORS LIKE 3D ROBOTICS AND BOX

Drones are a hot topic right now, attracting not just big names like Amazon and Google, but thousands of independent developers who want to use aerial technology for fields like conservation, commerce, search and rescue, and scientific research.

On Monday, those developers got a big piece of good news: the Linux Foundation and ten companies announced the "Dronecode Project," which will offer a huge repository of open-source code for people to build aerial operating systems, navigation tools and other features for unmanned aircraft.

While Linux code is already part of many drone-related projects, the new initiative consolidates many of these assets under one roof, providing a common platform as well as communications and governance tools. And, of course, the code will be available to

anyone who wants to use it.

The Dronecode Project will be overseen by the Linux Foundation, but it is also receiving some high-profile industry support, including from Chris Anderson, the former Wired editor who now runs the robot company 3D Robotics, and Box CEO Aaron Levie.

The project is moving quickly, according to Jim Zemlin, executive director of the Foundation, who says 1,200 developers are already working on Dronecode, and that some projects are receiving 150 contributions of code a day.

Source:

<https://gigaom.com/2014/10/13/drone-developers-get-big-open-source-boost-from-linux-foundation-vendors-like-3d-robotics-and-box/>

Submitted by: **Arnfried Walbrecht**

CHROME OS DISSES LINUX USERS, DROPS EXT2/3/4

Sometimes people make decisions that are so baffling – and so far out of left field – that you are left simply... dumbstruck. Case in point: ChromeOS is

dropping support for ext2, ext3 and ext4 file systems – the file systems used by the vast majority of Linux systems.

Now, I hear what you're saying. "Isn't ChromeOS... Linux? Don't they simply get full support for these file systems for free?" Yes, it is. And, yes, they do. Which begs the question... why, on Earth, would anyone think this is a good idea?

After digging through issue #315401 (titled "Drop support for ext2/3/4 from Files.app") a bit, it turns out there are two reasons given for dropping ext2/3/4 from ChromeOS.

One, as stated by one contributor, is that it is simply an unnecessary feature: "Every feature comes with complexity. Complexity adds maintenance cost, QA cost, slows down development, and adds surface of security exploits. We should add a feature only if its benefit clearly outweighs its cost, but this particular feature was slipped in for some historical reason."

Two things made me giggle there:

• The notion that having support for ext3 is a possible security issue is just plain silly. Note that there isn't actually any security exploit that people are concerned about there – just the nebulous threat of possible security problems because, you know, software is involved. In other words... pointing at an invisible boogie man that nobody has reason to believe even exists. Also, if there is an exploit in these critical file systems, it would undoubtedly be fixed at an astounding speed.

• The idea that ext2/3/4 support was a feature that was added to ChromeOS "for some historical reason." Maybe that historical reason is that, just maybe, you got it for free. You know. 'Cuz Linux.

Source:

<http://www.networkworld.com/article/2824764/opensource-subnet/chromeos-disses-linux-users-drops-ext2-3-4.html>

Submitted by: **Arnfried Walbrecht**

MACHINE VISION COM AND CAMERAS GO LINUX

Vision Components has launched two Linux-based, smart machine vision cameras, and

a COM built around a Xilinx Zynq SoC, each supporting up to 4.2MP video.

Over the last decade, smart cameras for machine vision have been transitioning from DSPs to systems that combine DSPs or FPGAs with ARM or x86 processors running Linux. The latest to join the Linux camp is Ettlingen, Germany based machine vision manufacturer Vision Components, which, with its latest "VC Z" cameras, has switched from a DSP-based system to a tuxified ARM/FPGA combo. Thanks to the Xilinx Zynq, the company was able to accomplish this with a single system-on-chip. The VC Z is available in a VCSBC nano Z computer-on-module, which also appears to act as the foundation for the new VC nano Z and VC pro Z cameras.

The company's VC cameras, which are still available, incorporate freely programmable DSPs combined with the proprietary VCRT operating system. The new VC Z devices switch to the Zynq running Linux, thereby using less board space while becoming more easily programmable, says Vision Components.

Source:

<http://linuxgizmos.com/machine-vision-com-and-cameras-go-linux/>

Submitted by: **Arnfried Walbrecht**

CANONICAL DETAILS PLANS FOR UNITY 8 INTEGRATION IN UBUNTU DESKTOP

Ubuntu users now know for certain when Unity 8 officially arrives on the desktop flavor of the distribution.

Users might have noticed that Ubuntu developers have been putting much of their efforts into the mobile version of their operating system, and the desktop has received less attention than usual. They had to focus on that version because most of the things that are changed and improved for Ubuntu Touch will eventually land on the desktop as well.

Not all users know that the desktop environment that is now on Ubuntu Touch will also power the desktop version in the future, and that future is not very far ahead. In fact, it's a lot closer than users imagine.

Source:

<http://news.softpedia.com/news/Canonical-Details-Plans-for-Unity-8-Integration-in-Ubuntu-Desktop-462117.shtml>

Submitted by: **Silviu Stahie**

KDE PLASMA 5 NOW AVAILABLE FOR UBUNTU 14.10 (UTOPIC UNICORN)

The new KDE Plasma and KDE Frameworks packages are now out of Beta and users can test them in various systems, including Ubuntu. In fact, installing the latest KDE is quite easy now because there is a PPA available.

A lot of users are anxious to use the latest Plasma desktop because it's quite different from the old one. We can call it "the old one", even if the latest branch, 4.14.x, is still maintained until November.

The KDE developers split the project into three major components: Plasma, Frameworks, and Applications. Plasma is actually the desktop and everything that goes with it, Frameworks is made up of all the libraries and other components, and Applications gathers all the regular apps that

are usually KDE-specific.

Source:

<http://news.softpedia.com/news/KDE-Plasma-5-Now-Available-for-Ubuntu-14-10-Utopic-Unicorn-462042.shtml>

Submitted by: **Silviu Stahie**

VIRTUALBOX 4.3.18 HAS BEEN RELEASED WITH LOTS OF FIXES

Virtualbox 4.3.18 has been released, and brings many different fixes for major operating systems such as Ubuntu Linux, Windows, and Mac OS X. The potential misbehavior after restoring the A20 state from a saved state has been fixed, virtualbox does not crash anymore in Linux hosts with old versions of the linux kernel, a few remaining warnings in the kernel log if memory allocation fails have been fixed and the GNOME Shell on Fedora 21 is not prevented anymore from starting when handling video driver display properties.

Thanks to this maintenance release, Ubuntu users have now the possibility to use legacy full-

screen mode under Unity without experiencing multi-screen issues. Another important issue related to Unity that has been fixed with the release of 4.3.18 version is the quirk in full-screen mode Unity panels caused by mini-toolbar code changes in last release.

Source:

<http://www.unixmen.com/virtualbox-4-3-18-released-lots-fixes/>

Submitted by: **Oltjano Terpollari**

AMAZON WEB SERVICES AIMS FOR MORE OPEN-SOURCE INVOLVEMENT

In 2006, Amazon was an E-commerce site building out its own IT infrastructure in order to sell more books. Now, AWS and EC2 are well-known acronyms to system administrators and developers across the globe looking to the public cloud to build and deploy web-scale applications. But how exactly did a book seller become a large cloud vendor?

Amazon's web services business was devised in order to cut data-center costs – a feat accomplished largely through the use of Linux and open-source software, said

Chris Schlaeger, director of kernel and operating systems at Amazon Web Services, in his keynote talk at LinuxCon and CloudOpen Europe today in Dusseldorf.

Founder Jeff Bezos “quickly realized that [...] he needed a sophisticated IT infrastructure,” Schlaeger said. That required expensive proprietary infrastructure with enough capacity to handle peak holiday demand. Meanwhile, most of the time the machines were idle. By building their infrastructure with open-source software, and charging other sellers to use their unused infrastructure, Amazon could cover the up-front cost of data center development.

Source:

<http://www.linux.com/news/featured-blogs/200-libby-clark/791472-amazon-web-services-aims-for-more-open-source-involvement>

Submitted by: **Libby Clark**

SYSTEMD CREATOR SAYS LINUX COMMUNITY IS ROTTEN, POINTS AT LINUS TORVALDS AS THE SOURCE

The creator of systemd, Lennart Poettering, had some very harsh words to say about the Linux community and about one of its role models, Linus Torvalds.

It might seem that the Linux community in its entirety is all about rainbows and bunnies, but the truth is that it's made up of regular people and the likes. Most of the other communities are formed in this way and Linux is no exception. The problem is that Linus is pegged as one of the people responsible by Lennart Poettering.

There has been some small friction between Linux and systemd, when asked what he thought about systemd, just a couple of weeks ago, Linus Torvalds was actually very tactful about it.

Source:

<http://news.softpedia.com/news/Systemd-Creator-Say-Linux-Community-Is-Rotten-Points-at-Linus-Torvalds-as-the-Source-461219.shtml>

Submitted by: **Silviu Stahie**

TEN YEARS OF UBUNTU: HOW LINUX'S BELOVED NEWCOMER BECAME ITS CRITICIZED KING

In October of 2004, a new Linux distro appeared on the scene with a curious name—Ubuntu. Even then there were hundreds, today if not thousands, of different Linux distros available. A new one wasn't particularly unusual, and for some time after its quiet preview announcement, Ubuntu went largely unnoticed.

Today, Canonical, the company behind Ubuntu, estimates that there are 25 million Ubuntu users worldwide. That makes Ubuntu the world's third most popular PC operating system. By Canonical's estimates, Ubuntu has roughly 90 percent of the Linux market. And Ubuntu is poised to launch a mobile version that may well send those numbers skyrocketing again.

Source: <http://arstechnica.com/information-technology/2014/10/ten-years-of-ubuntu-how-linuxs-beloved-newcomer-became-its-criticized-king/>

Submitted by: **Arnfried Walbrecht**



CLARIFICATIONS

I received some feedback on my last article from the author of the script. As I find some of his corrections/clarifications important, here are the two main corrections (there were others that, while relevant when I was writing the article, are difficult to implement after the fact):

- Where I said that the line `/bin/sh` set the environment for Linux, he suggested a more accurate description would be “assigning the default interpreter (here `/bin/sh`) in order to execute the script”.
- “This pattern can also be a basic regular expression” - He pointed out to me that regular expressions are the default, and you would need the option `-F` in order to find a literal “.” in the PDF.

In recent months, I've dedicated a few articles to web design aspects (Node.js, npm, SASS), and now I'd like to add even more information to this. I've recently

starting using Bower to install and manage various versions of Foundation and Twitter Bootstrap in various projects. As such, I will cover installing Bower, configuring it, and then configuring Grunt to utilize foundation (after it was installed with Bower).

WHY?

You may ask why anyone would want to use Bower to install something like Foundation or Twitter Bootstrap - and the answer is relatively simple. It's their supported method for installing SASS versions of their frameworks. This means you'll receive SASS files of Foundation or Bootstrap, enabling you to enable/disable features, and minimize the overhead of your website. It also gives you an automated system for getting the newest versions.

INSTALL BOWER

Assuming you've configured npm as explained in Issue #87, then you've done everything required to

run the following command:

```
npm install -g bower
```

(That command may require a sudo if it fails as a normal user).

CONFIGURE BOWER

This will result in a `bower.json` file (similar to the `package.json` file from npm). It can be done interactively, or you can simply copy a framework file and edit it. The interactive method will be run using the following command:

```
bower init
```

Now you'll be expected to fill in certain information; it's all relatively straightforward - if you have specific questions, bower's documentation should suffice.

INSTALLING PACKAGES

Once the `bower.json` file is created, you're ready to install new packages. To do this, and configure the json file for it, you can use the following command:

```
bower install <package> --save-dev
```

You can also use `--save`, which will add the package to the dependencies list in the `bower.json` file. Since these frameworks fall under development, it makes more sense to put it in `devDependencies` (with `--save-dev`).

An example:

```
bower install foundation --save-dev
```

This will install foundation into `bower_components` within your project's folder, and add a line to your `bower.json` file that looks like this:

```
"foundation": "~5.4.5"
```

This is the line that tells bower it needs to install foundation as of version 5.4.5, in case you need to re-configure or update the project.

USING FOUNDATION FROM BOWER WITH GRUNT



If you followed along the last article I wrote on Grunt, this should seem pretty straightforward. What you need to do is point Grunt to the foundation folder, under `bower_components`. This means that you'll need to add (or edit) the foundation line in the project object of your `Gruntfile.js`. It should look like this:

```
project: {  
  css: [  
  
    'bower_components/foundation/  
    scss/foundation.scss'  
  ],  
  js: [  
    'javascripts/*.js'  
  ]  
},
```

Assuming you also want to include the javascript from foundation, you'll also need to add it to the js area, though generally importing the `foundation.min.js` file directly into your webpage should suffice. If you use lots of javascript files and want them merged, you will need to point Grunt to each of the files in turn, and configure it to merge and compress them.

And this (along with my previous articles) concludes using SASS within your web project. We

have covered: Installing Node.js, npm, grunt, bower, and a framework such as Zurb Foundation. If you combine this information with my articles on setting up git repositories, you're all set to configure your next web project in a relatively robust way - or to create a repository containing your basic setup for any and all future projects.

If anyone is interested in further web design articles, please do let me know by email at lswest34+fcm@gmail.com. If you have any other suggestions or requests, feel free to email me those ideas too.

FURTHER READING

<http://bower.io/> - Bower website containing documentation.
<http://foundation.zurb.com/> - Zurb Foundation website, containing information on using the Foundation framework.



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.

PYTHON SPECIAL EDITIONS:



<http://fullcirclemagazine.org/issue-py01/>



<http://fullcirclemagazine.org/issue-py02/>



<http://fullcirclemagazine.org/python-special-edition-issue-three/>



<http://fullcirclemagazine.org/python-special-edition-volume-four/>



<http://fullcirclemagazine.org/python-special-edition-volume-five/>



<http://fullcirclemagazine.org/python-special-edition-volume-six/>



Many businesses and universities use Cisco AnyConnect as their VPN solution. Although there is a native Linux client offered by Cisco, it is not very well supported, and in some cases the user does not have access to the client. Fortunately, there is a simple solution to this problem – thanks to OpenConnect. OpenConnect is a client for Cisco's AnyConnect VPN. It is free software, and is released under the GNU LGPL v2.1.

Getting connected to an AnyConnect VPN is easy with OpenConnect and the TUN/TAP kernel module that is built into the Linux kernel.

ACTIVATE THE TUN MODULE

Enter the following into a terminal:

```
sudo /sbin/modprobe tun
```

INSTALL OPENCONNECT

Enter the following into a terminal:

```
sudo apt-get install openconnect
```

CONNECT TO THE VPN

OpenConnect has many optional arguments that can be passed in the connection string. These arguments are explained well in the OpenConnect documentation. The basic structure of the connection string that enables the VPN connection is shown below. In a terminal, enter:

```
sudo openconnect yourvpn.example.com
```

OpenConnect prompts for a username and password. Once these are authenticated, the VPN connection is established, and the

terminal output should look something like the image below.

Keep the terminal window open while the VPN session is active. Network resources such as shared folders, NAS drives, servers, and workstations should now be available. To close the VPN session, type Ctrl+Z into the terminal window. Abruptly killing the terminal window without properly closing out of the VPN session can lead to issues when attempting to reconnect in the future. These issues can typically be resolved by restarting the machine.

As we have seen, OpenConnect makes it easy to connect to a Cisco AnyConnect VPN. If your employer or educational institution utilizes AnyConnect, this tool enables full access to network resources with a

stable, secure, and reliable connection.

EXTERNAL LINKS

Cisco AnyConnect VPN
<http://www.cisco.com/c/en/us/solutions/enterprise-networks/anyconnect-secure-mobility-solution/index.html>

OpenConnect
<http://www.infradead.org/openconnect/>

TUN/TAP
<https://www.kernel.org/doc/Documentation/networking/tuntap.txt>

```
Please enter your username and password.
USERNAME:llazinskiy
Password:
POST https://gw. .com/+webvpn+/index.html
Got CONNECT response: HTTP/1.1 200 OK
CSTP connected. DPD 30, Keepalive 20
Connected tun0 as 192.168.53.8, using SSL + deflate
Established DTLS connection (using OpenSSL)
```



Lev is a graduate computer science student at NOVA Southeastern University, and works as a systems engineer for a software company in Cincinnati, OH. He has been using GNU/Linux for over 10 years.





I didn't have to work for very long in Calc before I needed to use cell names to reference values in different cells. This need was followed by those same reference names failing to do what I was expecting from them. While referencing cells is not complicated, it sometimes requires a little thought about what you're trying to accomplish.

At its heart, there are two reference types: relative and absolute. Relative references refer to a set of offsets from the current cell. Absolute references refer to the exact (or fixed) cell, column, or row. With these two types we can show references in four different ways. Cell references can even cross between sheets.

Sometime, you will need to reference more than one cell. This is done with cell ranges. You can make a cell range relative or absolute just like the cell reference. You can even name a cell range.

RELATIVE REFERENCES

A relative cell reference is a set of offsets from the current cell. If you put a reference to C4 in cell D6, the reference is to the cell one column to the left and two rows up. If you copy this reference to other cells, say D7, it will refer to the cell C5, which is one column to the left and two rows up from D7.

Let's create an example to clear up any confusion. Create a new Spreadsheet document. In the cells B3 and B4 put the values 15 and 46. In the cells C3 and C4 put in the values 11 and 14. Select cell B5 and enter the following formula (yes, the equal sign [=] is necessary):

=B3+B4

When you press enter, it will show a total of 61, the sum of the two values in B3 and B4. Now, right-click B5 and copy. Select C5, right-click, and paste. In C5 you get the total 25, the sum of the two values in C3 and C4. See how the reference shifted to the new column? Since we didn't change rows, the row references stayed the same. However, if we did, the

relative cell reference would have shifted to accommodate the change.

So, when we make a relative reference, it will move positions, keeping the same offsets, when copied to a new location.

ABSOLUTE REFERENCES

An absolute cell reference is fixed. If you make an absolute reference to cell C1, then no matter where you copy that reference, it always refers to C1. We create absolute references by adding the dollar sign (\$) before the column or row we want to remain absolute. For example \$C\$1 is an absolute reference to the cell C1.

Let's do another example to illustrate absolute references. Imagine we need to multiply a group of numbers by a factor. In cell D1 we put 0.75. This is our factor. In D2, D3, and D4 we put 10, 20, and 30. In the E column, we will put our calculations. In cell E2 put the formula:

=D2*D1

This will give us the answer 7.5, which is correct. However, if we copy the formula in E2 to E3 and E4, we get answers of 200 and 600, which are wrong. If you look at the copied formulas, the references shifted. This is because we used a relative reference. We do want the first number to shift when we copy, but we need D1 to stay fixed. Edit the formula in E2 and change it to

=D2*\$D\$1

We still have the right answer in E2. Now, copy the formula in E2 to E3 and E4. We get the answers 15 and 22.5, which are the correct answers. If you look at the copied formulas in E3 and E4, you find the reference to D1 remained fixed.

FOUR WAYS TO REFERENCE CELLS

With this in mind, this gives us four different ways we can reference a cell. They are relative, absolute, and two partially absolute references.



- D1 – Relative, from cell E3, it is one column left and two rows up
- \$D\$1 – Absolute, from any position references cell D1
- \$D1 – Partially absolute, column D is fixed but the row is relative
- D\$1 – Partially absolute, column is relative but the row is fixed to 1

REFERENCE CELL IN ANOTHER SHEET

To reference a cell in another sheet, we use dot notation to add the sheet name to the reference. For example, Sheet1.A1. This is handy if you need to carry a calculation or figure from one sheet to another. To illustrate, we will rename our current sheet, add a new one, and create a reference from one to the other.

Right-click on the tab for the current sheet and select “Rename Sheet.” When prompted, name the sheet MyData and click OK. To create a new sheet, click on the plus (+) at the end of the sheet tabs. Select cell A1 in the new sheet. Type in

`=MyData.E2`

which will pick up the value of 7.5

from the cell E2 in the MyData sheet.

NOTE: If the sheet name contains spaces, surround the name with single quotes, as in 'My Sheet'.C3.

Just like other references, the reference to the sheet is absolute or relative depending on whether we put the dollar sign (\$) in front of it.

CELL RANGES

Sometimes, you need to reference a group of cells rather than just one. For such cases, we use cell ranges. A cell range is created by separating two cell references with a colon (:). The left cell references the upper left corner of the cell range, and the right cell references the lower

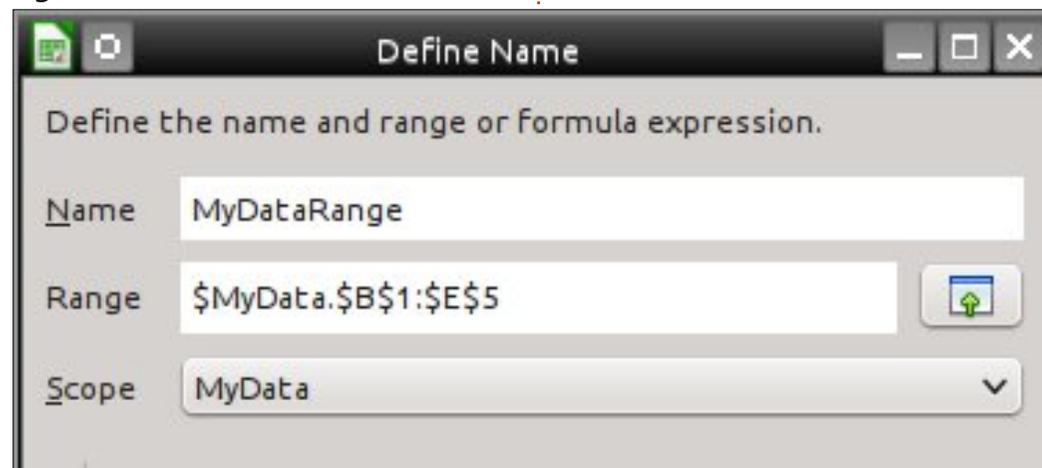
right corner of the cell range. For example A1:C2 represents a range of six cells: A1, A2, B1, B2, C1, and C2. However, the range can also represent just one column or row as in C2:C100 or B3:H3.

The same rules for relative and absolute references apply to cell ranges. You can create a full or partial absolute reference. You can even apply a range across sheets. Let's say you need a cell range of all the A1 cells on all the sheets named Sheet1 through Sheet10. You would use the cell range Sheet1.A1:Sheet10.A1.

For convenience, you can name a range. To name a range, select a range of cells in the sheet. Insert > Names > Define brings up the “Define Name” dialog. Give the range a name. Keep in mind that

cell range names can contain only letters, numbers, and underscore (_). Note the use of absolute references in the Range field. You can adjust your range as needed, manually or by clicking the range button and selecting the range with the mouse or cursor. The Scope field allows you to define whether the named range applies to the entire document or just a certain sheet. Click OK to save the range with the new name.

Cell references and ranges are fundamental when you begin to work on more complex sheet layouts, functions, and formulas in Calc documents. Understanding how relative and absolute references work can save time and prevent mistakes when copying formulas and references. While simple, incorrect use of references can lead to the wrong answer.



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>



HOW-TO

Written by Ronnie Tucker

Broadcasting With WebcamStudio

There are several applications out there in Linux land which will let you stream/broadcast your desktop, windows, games, etc. Webcam Studio is different in that it will, like the others, let you stream, but it has the added bonus of letting you mix many different inputs into one single output. You could, for example, have a window input (let's say, a game), an input from your webcam (you), the audio from your game, the audio from your microphone, and an input which will overlay text on the screen. Webcam studio will let you input all that, arrange it as you like (in a preview), then output it to whichever broadcast service you like (Twitch, YouTube, Google Hangouts, etc.) using the WSVideoDevice (aka: fake/virtual webcam).

How It's Done

When you start WebcamStudio (WCS from here on in), you have a clean slate to work from (right).

Along the top are buttons to let

you load/save studios and choose a master output from FFmpeg, AVConv, and GStreamer. The last button is to clean up used RAM. I'm told by the creator, Karl Ellis, that it's best to use GStreamer so that's what I've set my WCS to use as output, but feel free to try the others as maybe they'll perform better for you.

The left column is the preview window with two tabs below it:

Channels and Mixer. I've not used the Channels tab much myself, but it will come in handy if you want to automate your broadcast a bit by having playlists and such like. Mixer I'll get to later.

The middle of the WCS window is the Sources. It's here you'll add your inputs using the buttons just above that middle column. You can choose from: media, media folders, DVB-T, URL stream, IPCam, DVCam,

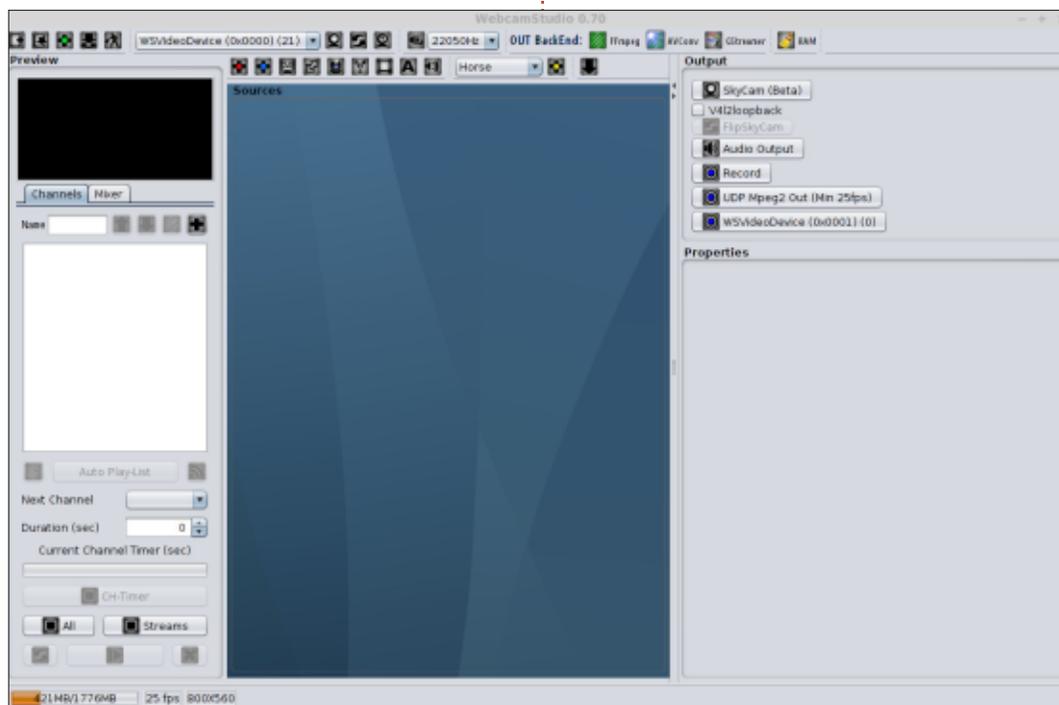
Desktop, Text, and Audio. This article will really focus only on the Desktop, Text, and Audio inputs. There are also inputs for animation effects.

The right column is for output. Here you choose from: SkyCam, V4L2Loopback, Audio, Record, UDP, and WSVideoDevice. I'll use SkyCam, Audio, and WSVideo in this tutorial, but you can easily record your output (rather than stream/broadcast it) using the Record button. Click it and choose where to save the file. Click it again to stop recording. It's as easy as that.

Below the Output items, and once you add an input, you'll get Properties tabs. These let you add effects and what-not to your inputs.

STARTING A STUDIO

I'm planning to broadcast a single window with some audio and text. So, first things first, let's add the window as an input.

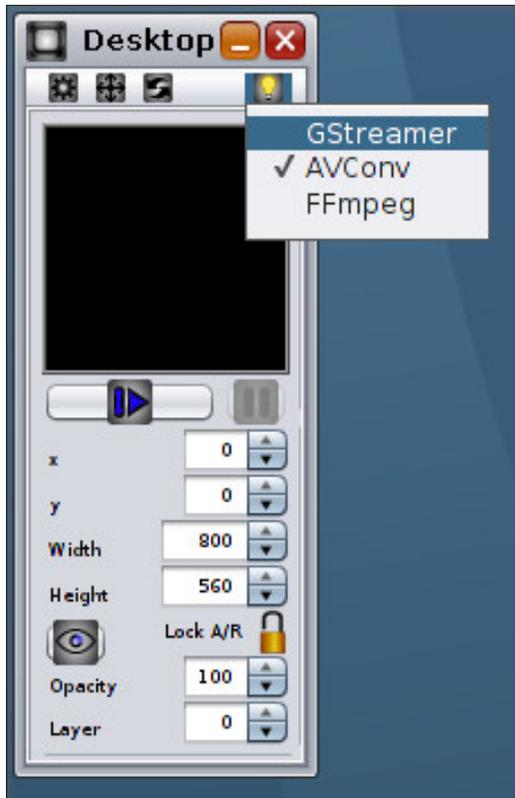


HOWTO - BROADCASTING WITH WEBCAMSTUDIO

Click the Desktop input:

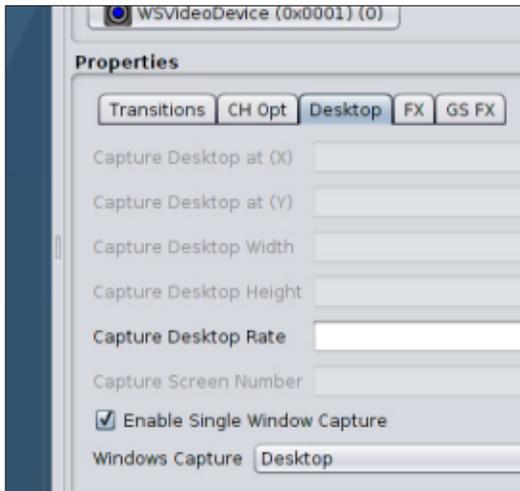


You'll see a Desktop window appear in your Sources panel, and tabs in your Properties panel. The desktop window has a couple of options along the top (more settings, refresh, etc.) but we want to click the last icon to make sure this desktop input is using Gstreamer:



Why choose GStreamer? Well, if you don't you can still broadcast a

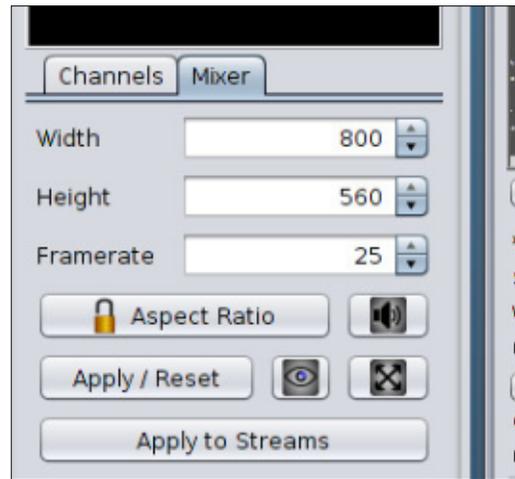
full desktop, or part of a desktop, but you won't be able to select a single window which is a handy feature as – even if you move something over the chosen window – only the contents of the chosen window are shown. The GStreamer output will let you check the 'Enable Single Window Capture' in the Desktop tab in Properties:



I'm going to choose my Home window that I've got open.

Before doing a test, let's set a few things. Click the Mixer tab in the left panel and set the width and height to what you'd like to output. I'm going to choose 800 x 560. When you've done that you must click the Apply/Reset button.

Now click the blue PLAY button in your desktop output.



You may want to tweak the width/height in the desktop output window too, but you'll see a preview of your final output in the top left of the WCS window. Don't worry that your desktop output looks a bit squished up. As long as

the preview looks OK, that's the main thing.

Let's preview this in VLC. Click the SkyCam button in the Output panel. This will ask for your password, it's to set up a virtual webcam. Next, click the WSVideoDevice button:



It may not seem like it, but you now have a virtual webcam running. To check this, load up VLC and, in the menu, go to Media > Open Capture Device. Where it says 'Video device name' click the drop down menu to choose the /dev/video0 and click Play.

Whatever I do inside my Home folder (scroll up/down, open a folder, etc.) will be broadcast to VLC from WCS.

LET THERE BE SOUND

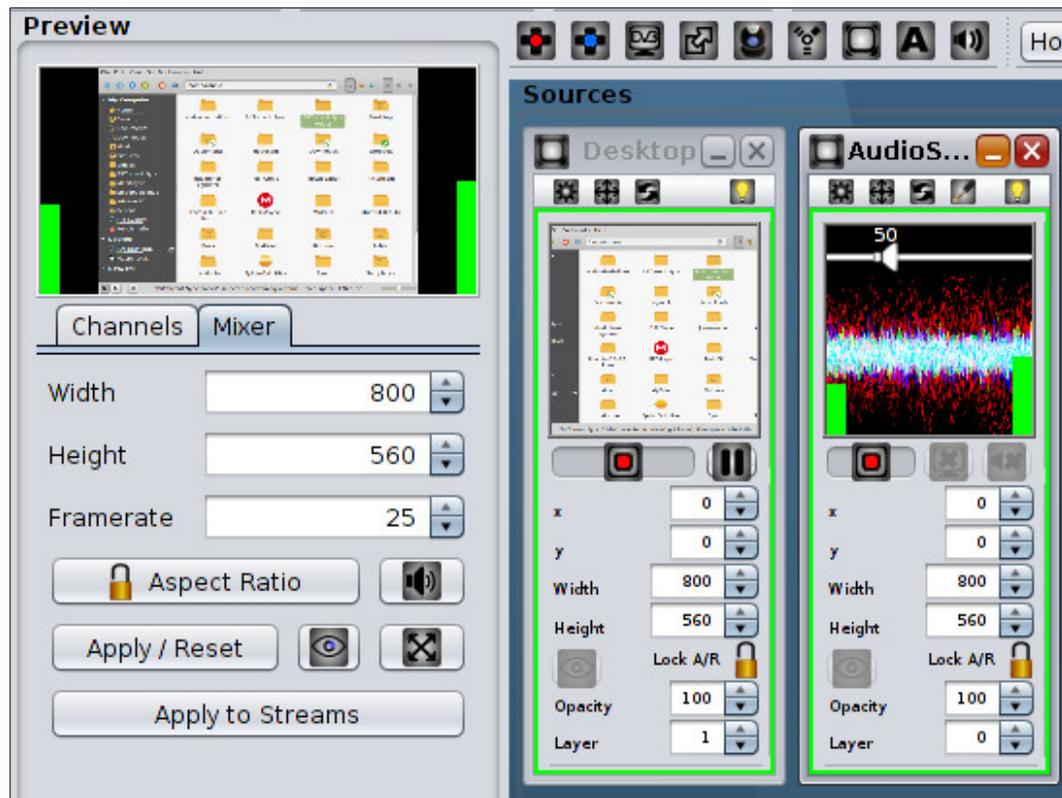
Adding sound is a similar procedure. You click the Audio input:



Your audio input window will appear, but it needs tweaking like the desktop one did. Click the Audio Source icon and select your audio source:



Click PLAY on the audio input and a curious thing happens. Your preview will black out. This is because the audio input (with no video) is equal with the video. You need to change the Layer setting for the desktop output to 1. It's at the bottom of the desktop output window. Now your video is playing above the audio input. I've set my audio input to broadcast whatever my computer is playing, so I'm



going to play an audio file and click PLAY on my audio input (above).

Voila! Video and audio from two different sources in one output. You can drag the white on black speaker icon to raise/lower the volume. The green bars will raise/lower with your audio to let you know the audio is actually being input. To save on CPU usage, you can click the X beside the PLAY button to disable the waveform from being created.

To have your audio as part of the output, don't forget to click the 'Audio Output' button in the Output panel on the right.

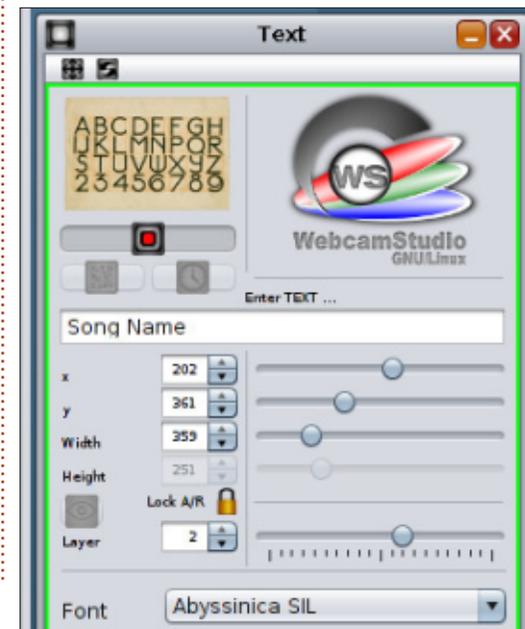
Checking the audio (live) in VLC is a bit tricky, but check it using the Record button (in the Output panel). It will prompt you for a location and name. You can then stop the audio and play the recorded video to make sure it has recorded the audio.

WHAT'S THE SONG?

Now you know that someone is going to ask what the song is that's playing. Let's show them the name with some overlaid text. Click the Text input:



This is a big input window which lets you enter text to display, change the X/Y coordinates of where the text should display, how big the text should be (width/height) and the font and color. Remember though, like the audio input, you'll need to change the Layer setting to 2 this time as it



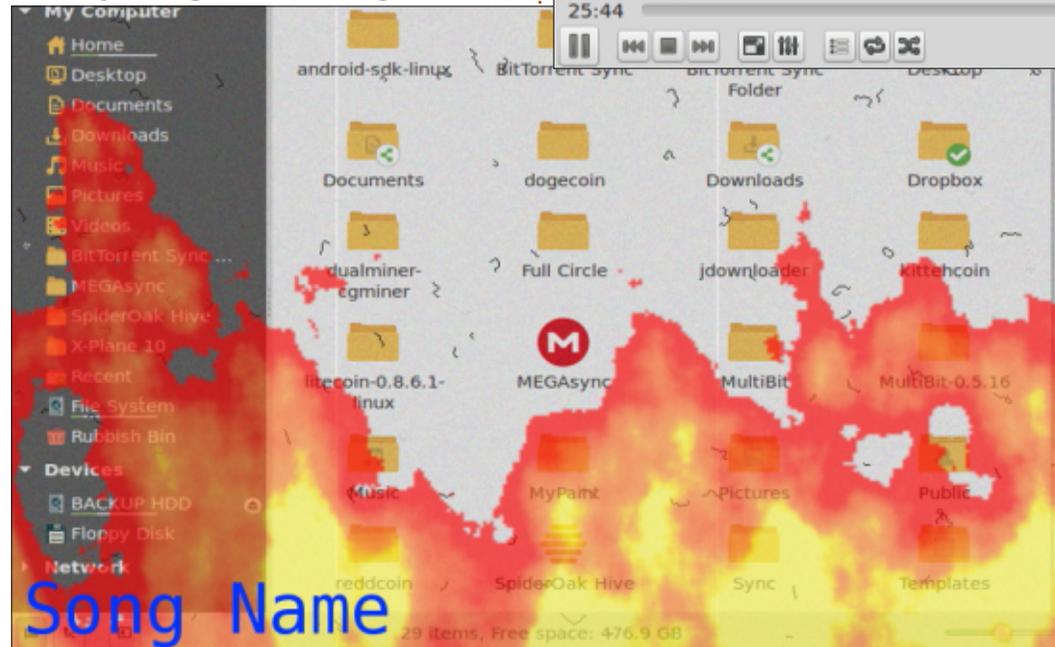
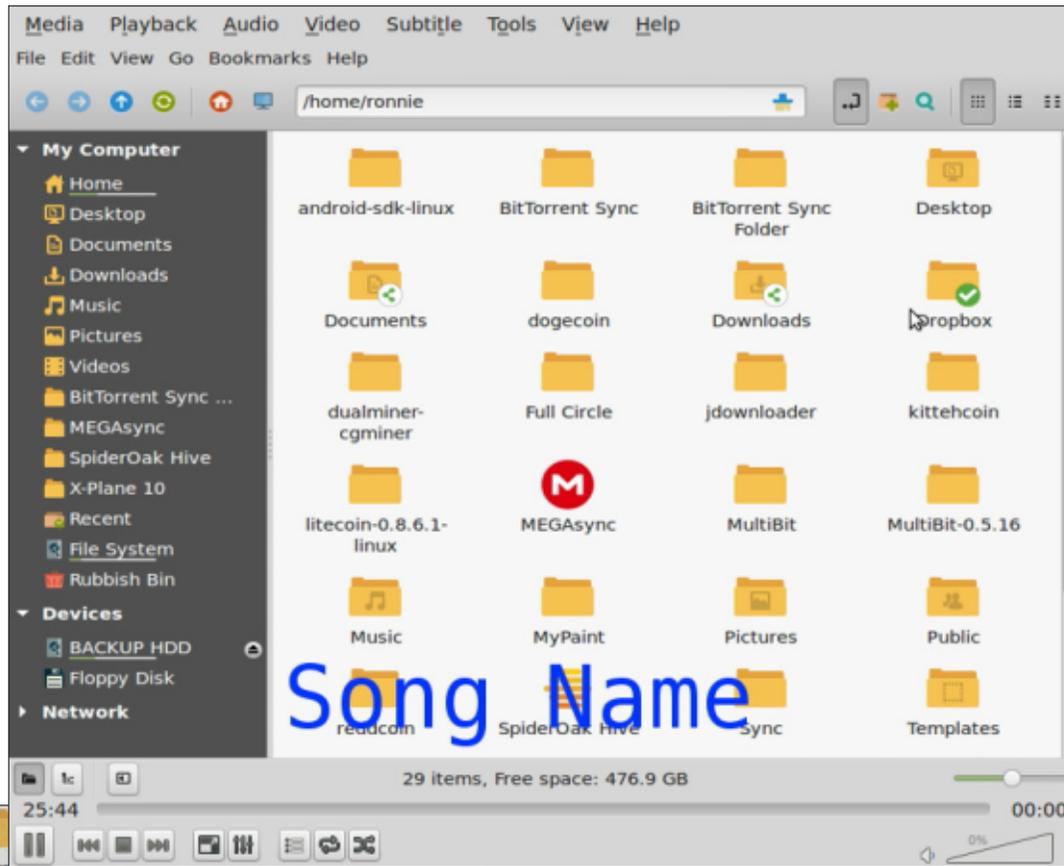
HOWTO - BROADCASTING WITH WEBCAMSTUDIO

needs to be above the video.

And there you have it. Three separate input sources in one virtual webcam output (right).

There's a lot more you can do with WCS. You can apply video effects to your input; have your text flash or wobble around the screen; add animations to your output; tweak the Opacity to have things faded on top of one another. Lots, lots more. Click your input window then check the FX/GSFX tabs for effects.

Keep an eye on your layers though. If something doesn't show initially it might need a higher



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!**



Ronnie is the founder and (still!) editor of Full Circle. He's a part-time arts and crafts sort of guy, and now an Arduino tinkerer.

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HOW-TO

Written by Mark Crutch

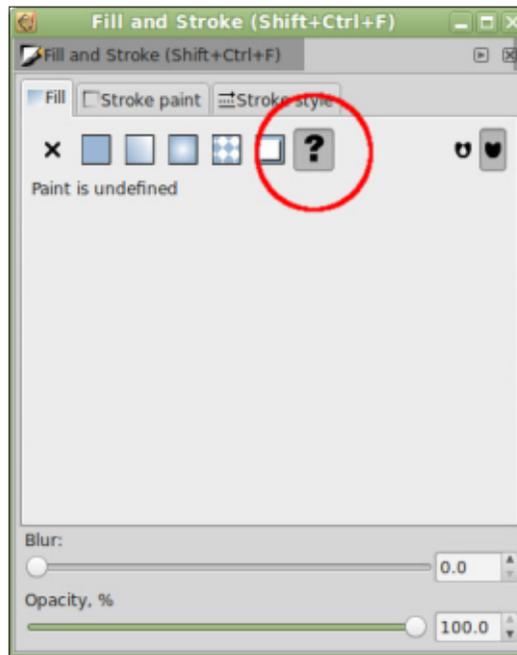
Inkscape - Part 30

Using clones makes it easy to create identical copies of objects or groups in your image. As we saw last time, breaking your groups down into smaller chunks to clone lets you add a little variety, and you can always draw extra objects on top of your clones to further distinguish them. But you can't make significant changes to a clone – altering the shape of a path, for example – without first converting it to a normal copy.

Although you can't make significant changes to clones, they're not entirely inert either. I've already shown how they can be rotated, flipped, scaled and skewed independently of their parent objects. But there's one other little trick in the clones' arsenal which requires a bit of effort to set up, but can be well worth it for some situations: clones can change their fill and stroke separately from their parents.

You can't just take any old clone and give it a new fill and stroke, though. Instead, the parent object has to have its fill and/or stroke

“unset”. The quickest way to unset the fill or stroke is to right-click on the relevant swatch in the status bar at the bottom of the Inkscape window. Towards the bottom of the context menu will be an option for “Unset fill” or “Unset stroke”. Select this item and the corresponding color swatch will be replaced with the word “Unset”. You can also unset the fill or stroke using the “?” button in the relevant tab of the Fill and Stroke dialog.

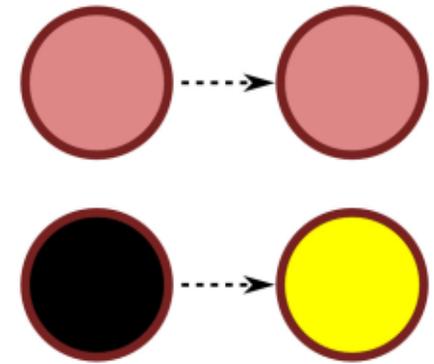


Unfortunately, unsetting the fill

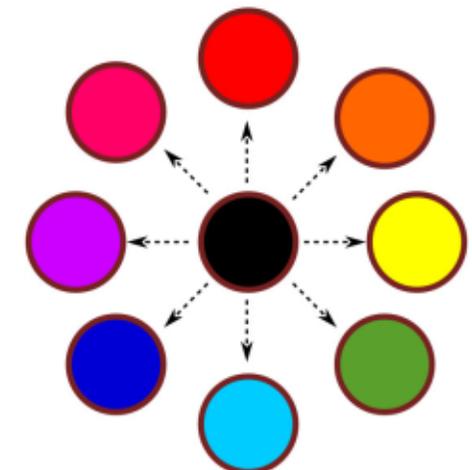
or stroke on your object has side effects. An unset fill is rendered in black which is often bad enough, but an unset stroke doesn't render at all which can be disastrous if the object you want to clone is all stroke and no fill – making it effectively disappear from the screen! Because strokes are trickier to illustrate (an invisible object doesn't make for a great screenshot), we'll start by just considering unset fills, and come back to strokes later in the article.

As a demonstration I've drawn two identical circles, then unset the fill in the bottom one. You can easily spot it because the fill has been drawn as solid black. It's important to note that “black” and “unset” are not the same thing, though, even if they appear that way on screen. Next, I've cloned each circle, then set the fill color for each clone to yellow. As you can see, the top clone ignores the fill that's been set, just like all the clones we looked at previously. The bottom clone, on the other hand, has replaced the black “unset” fill with the color that's been set on

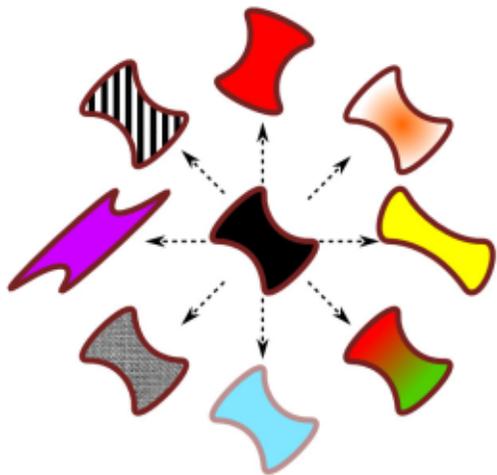
the clone itself.



The yellow clone has inherited its shape, size and stroke from the parent object, but carries its own fill color. We can extend this further by creating additional clones from that one parent and giving each of them their own color.



When dealing with something as simple as a circle, there's probably no real benefit in creating clones like this compared with simply duplicating the parent and changing the fill. But the parent object is rarely as simple as a circle, and these clones can still also be rotated, flipped, scaled and skewed independently. Furthermore, the fills don't have to be simple colors: you can use patterns and linear or radial gradients, too. Admittedly the Inkscape UI struggles a little with anything other than simple colors as the gradient editing handles tend to appear out of place, and the pattern scaling handles don't appear at all – but SVG itself allows for all these possibilities.

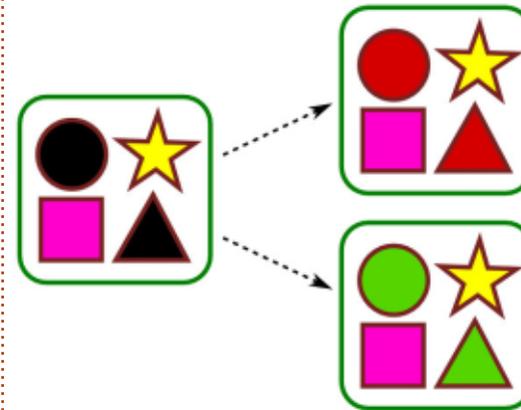


Taking our previous example, let's mix it up a little to demonstrate some of these capabilities. First I've converted the parent circle to a path, then tweaked its nodes to give a more interesting shape. Then I've squashed, skewed and rotated some of the clones, and given others different fills or transparency. They're all still clones – a change to the parent path will affect them all – but combining transformations with an unset fill lets them each take on a distinctly different appearance.

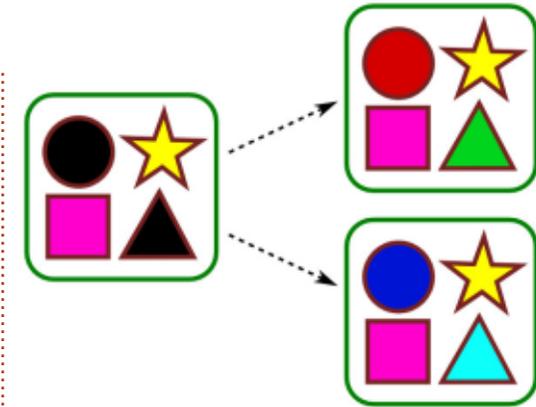
In the previous article, I was extolling the virtues of cloning groups rather than single objects, so you'll be pleased to hear that you can use unset fills in cloned groups as well. Any objects within your group that have their fill unset will be given the clone's color, whereas other objects will be cloned as normal, inheriting their fill from the parent. This ability to mix normal and unset fills within the parent can be very useful if you require a few similar copies with just part of the design changing color with each clone – consider creating some characters for a crowd scene, each of which has a

different colored T-shirt.

In this example, I've cloned a group of five objects – four shapes inside a larger rounded square. The circle and triangle have their fills unset, whereas the star and square have them set to specific colors. You can see that in each clone the shapes with the fixed colors appear the same as the parent, but those with the fill unset use the color that's set on the clone itself.

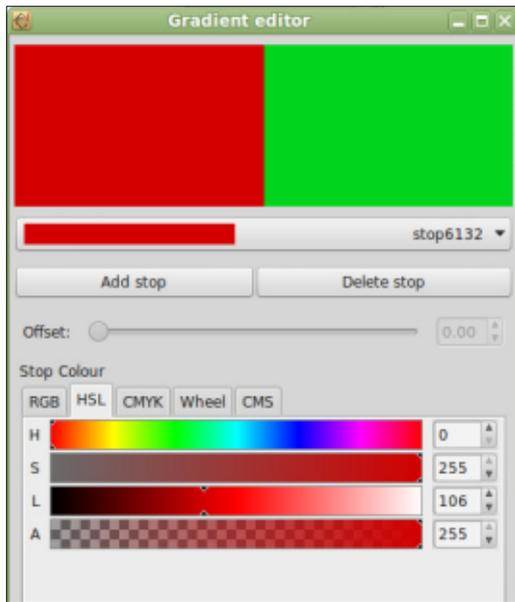


You'll notice that both the circle and the triangle take on the same color in each clone. One major limitation of this approach is that SVG considers all unset fills in a clone to be identical. There's no way to apply two colors to your clone and have one affect the circle whilst the other affects the triangle. Or is there...?



If you really want to get extra colors into your clones, there are ways to do it by being underhanded and devious. One approach is to stack identical clones on top of each other, each set to a different fill color, then use clipping paths to only show the relevant parts of each clone. Another technique I've used in the past is to create a filter in the parent that "rotates" the color of one of the unset objects – more on that when we get onto filters later in this series. For this example, however, I kept it simple: I managed to use two colors in the unset objects by using a linear gradient as the fill. By creating a couple of extra stops in the gradient and setting them to the same colors as the start and end points, I created gradients like this, to allow me to fake the appearance

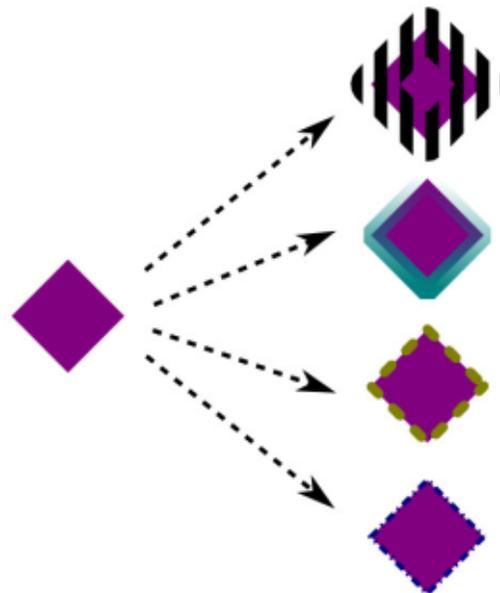
of having two separate fill colors.



At the start of the article I did promise to come back to unset strokes. Whereas an unset fill is rendered in black, making it easy to see and work with, an unset stroke is also rendered in black, but with a width of zero! If your object has a fill – even an unset one – it will still be visible on screen. But, if you unset the stroke of an object with no fill, it will disappear from view entirely. For this reason my first rule of working with unset strokes is to unset them as the last step. Work with a colored stroke while you're creating your parent object or group, and unset it only at the last minute.

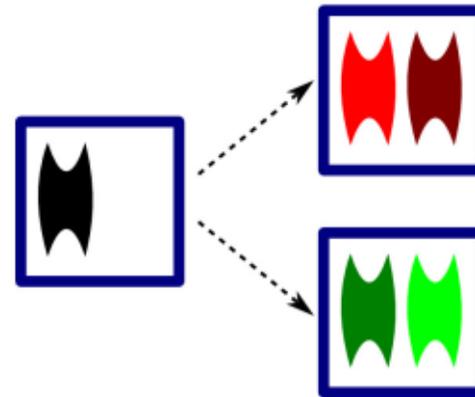
The second rule is not to panic if you do lose track of your object. Just use the View > Display Mode > Outline menu to switch to a mode where even the most invisible of Inkscape objects appears as a skeletal outline. Even in this mode you can still select and manipulate your objects, and they will remain selected when you switch back to another display mode.

With an unset stroke in your parent object or group, you can now set not only the stroke color (or pattern, or gradient) on each clone, but also its width, join style, end caps and dashes. In fact, at a minimum you have to set the color and width if you want the stroke to



be visible. Unfortunately, you can't set markers on a per-clone basis – if you want arrows or chevrons marking the nodes of your path, they have to be set on the parent object.

With unset strokes, you now have another method of getting an extra color into your clones. With a little lateral thinking, you can even usurp the stroke to provide a second fill color, if that suits your needs better. In this final example, I've used an unset fill on the left hand shape, that's clear enough. But where is the right hand shape coming from?



You've probably already guessed that there's an unset stroke involved, but how does that turn into a shaped fill in the clones? The trick was to draw a single vertical line in the parent and give it a really large width value – 40px

in this case – effectively creating a 40px wide rectangle. Then I used a path to clip that “rectangle” to the shape I wanted, before finally unsetting the stroke. On each clone I have to only set the stroke to the color I want, with a 40px width, and my second “filled shape” appears. You can also perform a similar trick using masks, which can be particularly useful for faking a gradient in your clones.

The ability to use different fills and strokes on clones can make them extremely versatile, at the expense of leaving you with black areas or invisible lines in your parent object. Being able to set only two “parameters” on each clone can be limiting, but hopefully you've seen how, with a little lateral thinking, the use of masks, gradients, clipping and filters can let you break that restriction to some degree.



Mark uses Inkscape to create three webcomics, 'The Greys', 'Monsters, Inked' and 'Elvie', which can all be found at <http://www.peppertop.com/>



HOW-TO

Written by Ronnie Tucker

Last month, our circuit could determine whether a code entered via keypad was right or wrong. This month, I've added to it using a simple IF/ELSE statement to do one of two things.

I've added an LED and an integer called 'armed'. Initially 'armed' equals zero, and armedLed equals A0. I'm now having to tweak the rules to use the analog pins for digital components as I'm quickly running out of pins all together!

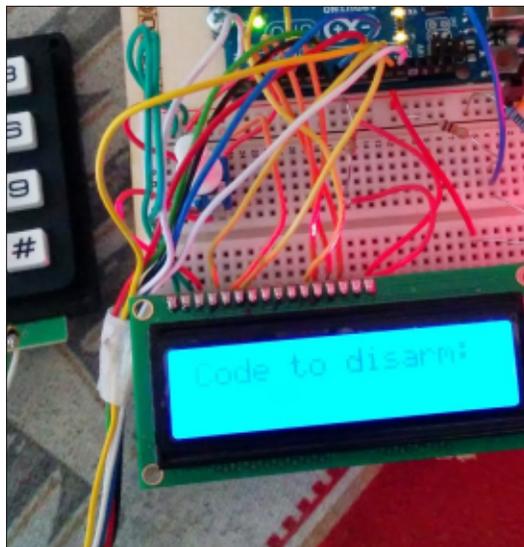
The main crux of this 'armed' change is the IF/ELSE command that's embedded in the existing IF/ELSE command in the guessPassword() section of the code. Basically here's what's happening: if the password is correct and armed=0 (in other words: the system is off) then it will clear the screen, display ARMED!, change armed to equal 1, and light the red LED. Finally it will display "Code to disarm:". Otherwise, armed must equal 1 (system is on) so display DISARMED!, make armed=0, and display "Code to arm:".

I have to admit to my faults and I spent hours trying to figure out why my IF/ELSE wasn't working properly. Rookie mistake: I forgot to use == in the IF statement.

After getting success with armed/disarmed, I went and dug out one of my 37-in-1 sensors and a photoresistor (a Light Dependent Resistor, LDR for short). The LDR goes to A1 with a 220 ohm resistor on one leg and taking its other leg to ground. The laser sensor goes to the positive LED leg and to ground. Now, when the system is armed, the laser flicks on and is made to point at the LDR.



To test that the LDR is actually registering anything, you'll notice that I've reintroduced the serial code (again, using 9600 baud rate). In the main loop, I have the code do an analog read from pin A1 and print the result to the IDE serial window. In other words, the number that the LDR is returning via its analog pin. With no laser and at room lighting, the serial window shows a stream of numbers averaging 400-450. When I cover the LDR, it drops to as low as 100-150. With the laser on, and pointing directly at the LDR, the serial output shoots up to a touch over 1,000. Almost the maximum it can



reach. So, with the laser on, I place an obstruction to the beam and the LDR registers the loss of the laser.

Next time we meet, we'll (hopefully!) have a working laser tripwire alarm...

Code:

<http://pastebin.com/AjFDajHm>

Are there any similar projects you'd like me to try? Drop me an email at: ronnie@fullcirclemagazine.org. Remember: I'm a beginner, don't ask me to design the next NASA rover!



Ronnie is the founder and (still!) editor of Full Circle. He's a part-time arts and crafts sort of guy, and now an Arduino tinkerer.





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).**

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• 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>

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

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- 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

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- 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.





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In the first part of this series, we saw what the Linux kernel is, and in the second chapter we saw the various ways of obtaining the source code and the other pieces we need to compile it. Now that we have all the bits and required pieces, in this third part we are about ready for the main course: configuring, compiling and installing the kernel.

In this part, I will be using specifically the version of the kernel source code from the Ubuntu repositories. There will be few differences if the reader should choose to use the version downloaded directly from the Kernel.org project. One reason to do so would be to work on the most recent kernel version – or even, if we are feeling really adventurous, on a release candidate for the next version.

THE KERNEL CONFIGURATION SYSTEM

If we take a look at the source

code directories and the files contained within, we can find a series of files whose purpose we can quickly understand. Files with extension `.c` are clearly source code files in the C programming language, and those with extension `.h` are header files for the same code. In part 2 of this series, we also learned that the Makefile we find in each directory and subdirectory is a file that gives the compiler instructions on how to compile the source code: which source files to compile, how the output files are to be named, and what compiler parameters are to be appended.

When we peruse each Makefile, we can see that the file in each directory refers only to the source code placed in that directory. This means there is a separation between the different parts of the kernel source tree: each directory or subdirectory may be compiled independently. When we come to the concept of kernel modules, we will see this means we will be able to compile just a single module at a time, without having to compile

the entire kernel if it is not necessary.

But what about the Kconfig files we can also find in each directory?

The Kconfig files are instruction files targeted at the kernel configuration system. The Linux kernel is a very large piece of code. In fact, it hit 15 million lines of code back in 2011 (see <http://arstechnica.com/business/2012/04/linux-kernel-in-2011-15-million-total-lines-of-code-and-microsoft-is-a-top-contributor/>) and 17 million lines in June 2013 version 3.10 (<http://www.extremetech.com/computing/175919-who-actually-develops-linux-the-answer-might-surprise-you>). These two references are quite interesting, by the way, since both address the question of who contributes to the kernel source code.

With such a behemoth to compile, we will need some sort of automated configuration system. This is where the Kconfig files come in, giving instructions on

which options are available in each directory, and helping create a giant kernel configuration script.

For example, in source directory `security/selinux`, the Kconfig file contains the stanza:

```
config
SECURITY_SELINUX_BOOTPARAM

bool "NSA SELinux boot
parameter"
depends on SECURITY_SELINUX
default n
help
This option adds a kernel
parameter 'selinux', which
allows SELinux to be disabled
at boot. If this option is
selected, SELinux
functionality can be disabled
with selinux=0 on the kernel
command line. The purpose of
this option is to allow a
single kernel image to be
distributed with SELinux
built in, but not necessarily
enabled.
```

If you are unsure how to answer this question, answer N.

This should be largely self-explanatory. The stanza indicates the configuration script that the user must be shown a boolean (true/false) checkbox, through

which the new kernel can be configured to accept or not the “selinux” boot parameter that allows the Security Enhanced Linux kernel module (SELinux) to be deactivated at boot. Naturally, this is not a very good idea on a production system, which is why the default option is “n” - for “no”.

In file `net/ipv6/Kconfig`, we find a more complex example:

```
config INET6_TUNNEL
    tristate
    default n
```

```
config IPV6_TUNNEL
    tristate "IPv6: IP-in-IPv6
    tunnel (RFC2473)"
    select INET6_TUNNEL
    ---help---
    Support for IPv6-in-
    IPv6 and IPv4-in-IPv6 tunnels
    described in
    RFC 2473.
    If unsure, say N.
```

The first stanza concerns the module that allows the kernel to create tunnels through IPv6 address space. The user will, in this case, be shown a tristate option box, that will give several options:

- “Y” to compile the module directly into the kernel. It will be included in the `vmlinux` file and loaded at system boot, whether used or not.

- “N” to exclude the module from the new kernel.
- “M” to compile the module as a loadable file, that will not be loaded into RAM at boot, but only if required during system operation.

The second stanza depends on the presence of the above: if present, the user may configure support for RFC2473 tunnels in either modular or built-in forms.

Now, we need to access the configuration script itself. However, before doing so, it is usually recommended to begin by clearing up any leftover configuration. To do so, issue:

```
$ make mrproper
```

As discussed in part 2, we have at least four different configuration scripts we can use. Two are based on text environments: “make config” and “make menuconfig”. Two more are based on graphical toolkits: “make xconfig” on the Qt toolkit, and “make gconfig” on the Gtk libraries. Take your choice – as a last resort, all of these scripts rely on the same `Kconfig` files. In my case, I will be using

```
$ make menuconfig
```

largely because I am comfortable with this lightweight environment that I have been using

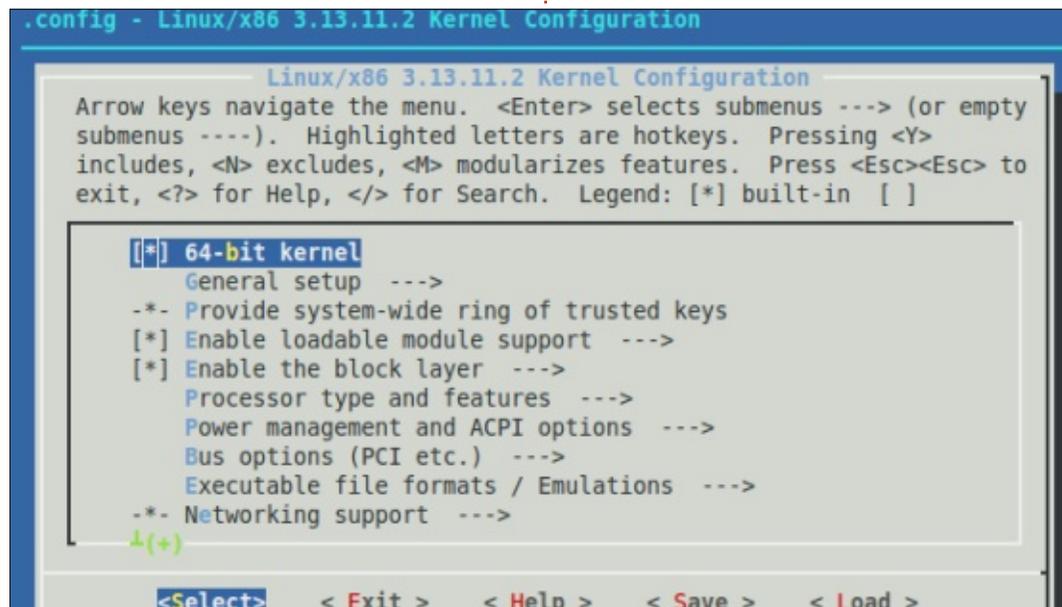
since way back when (Slackware days, to be precise). This is what you should see something like the image shown below.

CONFIGURING THE KERNEL

Options within brackets are the boolean choice widget that allow us to activate “[*]” or deactivate “[]” a feature. Some choices may be forced upon us by other options we have taken previously, in which case the widget will appear as “-*-”. Options within keys correspond to the tristate widget, that allow us to activate a feature directly within the kernel “<*>”, as a loadable module “<M>” or deactivate the feature “< >”. In this latter case, the feature will not be available at all to the new kernel.

Options with the “--->” tail on their description indicate a sub-menu that can be accessed with the ENTER key. Most navigation keys are indicated on-screen, the only prominent exception being the SPACE key that is quite useful to switch between option values.

Most available options will not be immediately of use when



compiling our first kernel. I would suggest the reader leave the default options on, they are fine for typical use patterns. Instead, I would like to point out several specific features that may be more of interest.

The first place I would stop at is the very first option presented in the menu, “64-bit kernel”. It does seem likely that one could compile a 64-bit kernel on a 64-bit platform (computer and operating system), since the appropriate C library functions will be available, and likewise for compiling a 32-bit kernel on a 32-bit system. However, it should also be possible in theory to go a little further in the Linux world, as for UNIX from which it is derived. In these systems, it should be quite possible to perform what is called “cross-compiling”, in which a program destined for one platform is compiled upon another. This holds both for compiling a 64-bit kernel on a 32-bit machine, and the opposite. Unfortunately, in practical terms my experience with the Ubuntu 14.04 distribution and kernel source code version 3.13.11.2 leads me to say that things are broken and cross-compiled kernels will actually

compile, but will not run on the target computer (the new kernel will not find the init program, even with the appropriate “init=” kernel parameter). So the takeaway for the time being is indeed that we need to compile a 32-bit kernel on a 32-bit operating system, and a 64-bit kernel on a 64-bit computer.

At the second option, “General setup”, we have access to several very basic choices for our new kernel. We shall leave most of these alone, except for “Default hostname” and “Arbitrary version signature”. These two options are the ones that stamp each kernel with the information that can be retrieved in the /proc virtual file system. Try this out on your computer, it can do no harm:

```
$ cat /proc/version_signature
Ubuntu 3.13.0-24.47-generic
3.13.9
```

In my case, no hostname is indicated on which the kernel has been compiled, so whoever compiled kernel 3.13.0-24 for Linux Mint left the Default hostname option at its default “(none)” value. On the other hand, the “Ubuntu 3.13.0-24.47-generic 3.13.9” character string is what they had in

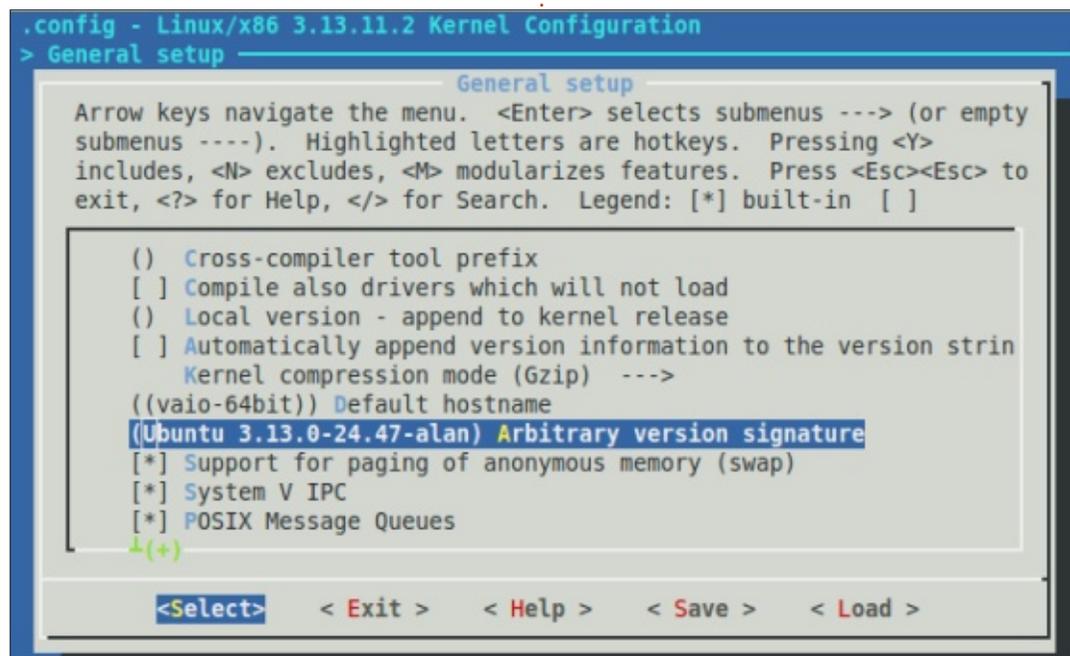
the “Arbitrary version” option.

I have changed these in the screen capture (below), since it is always a *Good Idea*™ to give your kernels an identifying string. This can help understand later on what particular purpose you were compiling a particular kernel for. A version number can also come in useful when a series of kernels are compiled to try to solve a particular problem: they can be used to note and keep track of progress.

Let us go back up to the initial menu level, and enter the “Processor type and options”

configuration setting. This is where the heavy lifting starts, and we can fine-tune our new kernel to the hardware we wish to run it on. This section also gives us a feeling for the extreme range of different physical architectures the Linux kernel handles: specific microcode for Intel and AMD range processors, software options such as Linux as a guest virtual machine operating system within Linux itself, etc.

If we stop a minute at the “Symmetric multi-processing support” option, this is where we can deactivate multi-processor support within the kernel. Some of



```
.config - Linux/x86 3.13.11.2 Kernel Configuration
> General setup

General setup
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty
submenus ----). Highlighted letters are hotkeys. Pressing <Y>
includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to
exit, <?> for Help, </> for Search. Legend: [*] built-in [ ]

() Cross-compiler tool prefix
[ ] Compile also drivers which will not load
() Local version - append to kernel release
[ ] Automatically append version information to the version string
Kernel compression mode (Gzip) --->
((vaio-64bit)) Default hostname
((Ubuntu 3.13.0-24.47-alan) Arbitrary version signature
[*] Support for paging of anonymous memory (swap)
[*] System V IPC
[*] POSIX Message Queues

<Select> < Exit > < Help > < Save > < Load >
```

us still remember when multi-processor support was a (paid) extra on a Windows system, even the server variants. In any case, it is standard in the Linux kernel since the 2.0 version series. Though it can be deactivated, this really makes little sense at this point in time. Most current processors contain multiple cores, or at the very least HyperThreading which makes a single core appear to the operating system to contain various logical cores (usually two per physical core). SMP is the subsystem that handles all this. On the other hand, when compiling a kernel for a very limited processor on a machine with very little RAM, it is possible to remove this part of the kernel and release a few tens of kBytes of RAM that otherwise would be occupied.

Going down to the “Processor family” sub-menu, we are given the choice of a specific family of processors to compile for. If we have chosen to compile a 64-bit kernel, the choice is between the original Opteron/Athlon family, the older and newer Intel Xeon families, the 64-bit Intel Atom, and finally a default “Generic-x64-64” option. This latter is the most conservative choice, and possibly the best if our new kernel may eventually get executed on more than one computer.

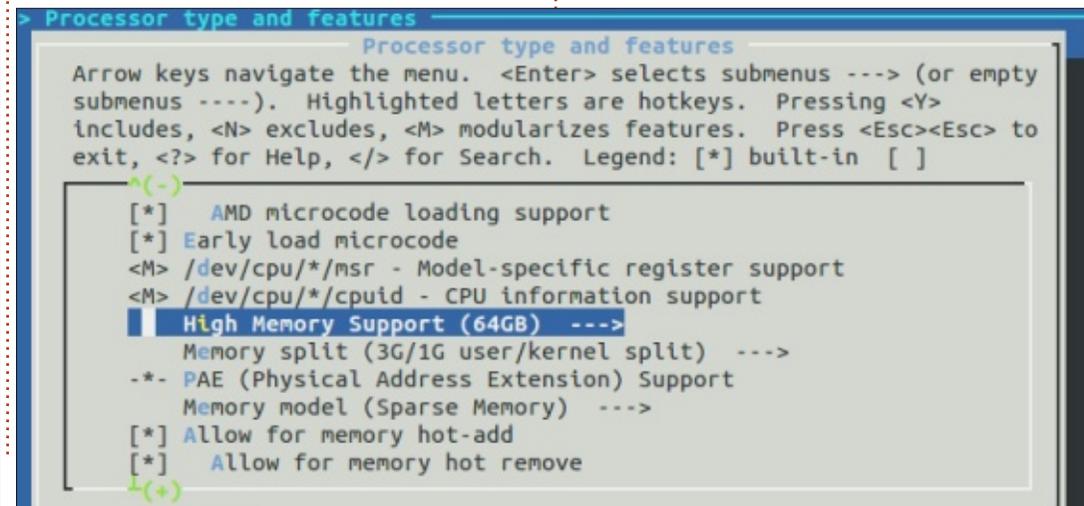
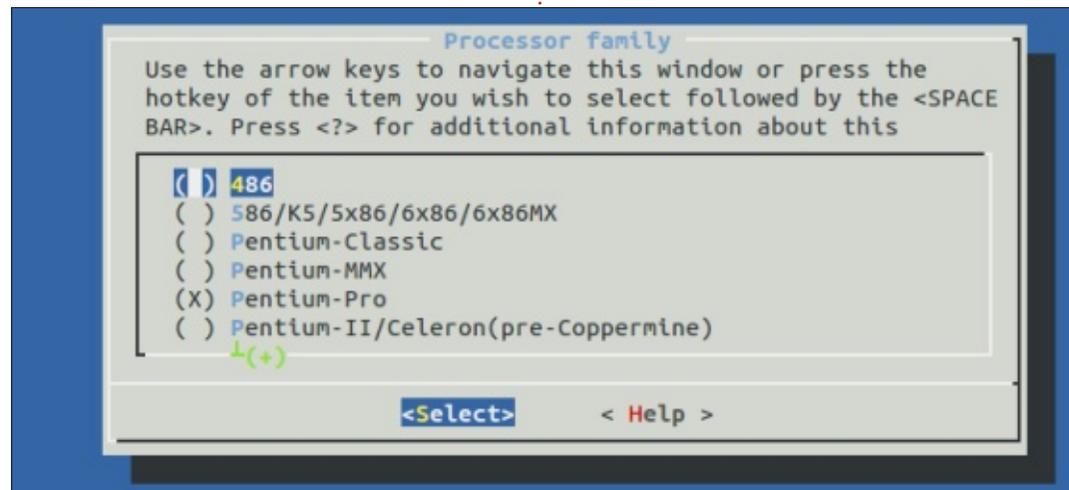
If we have chosen to compile a 32-bit kernel, the range of options is rather more vast, reflecting the evolution of the IA-32 processors over the years. The very early i386 has now been removed, and choices start at the i486, going on

up through the various generations of 32-bit Pentium I, II, III and IV processors, several variants by AMD and other brands, ending up with the Intel Core 2 and 32-bit Intel Atom. As a general policy, it is perhaps best to aim lower rather than higher, since more recent processors will usually have backward-compatibility with older offerings. Nowadays, compiling a kernel with the “Pentium-III/Celeron/Pentium-III Xeon” is probably a reasonable choice for most use cases (below left).

As mentioned in the first part of this series, there has been some talk about the recent move by some distributions to include the Physical Address Extension (PAE) feature by default in default kernels. Some versions of the

Pentium III had this deactivated within the hardware, so a kernel that has PAE activated cannot work on these processors. In order to compile a kernel with PAE deactivated, in the first place it must be a 32-bit kernel: 64-bit versions always contain a mechanism similar to PAE since these processors are built to handle more than 4GBytes of memory – this is one of the advantages of using numbers with more bits in your architecture.

When you have chosen the 32-bit kernel option, navigate to “Processor type and features”, and towards the last third of the list there is an option called “High Memory Support” (shown below right). This needs to be activated in order to access the full contents of



a 4 GByte RAM memory, or to go further up to 64 GBytes. If the 64 GByte option is on, the PAE option will be inserted into the menu a bit lower down. If the High Memory Support is either off (use up to 3 GBytes of RAM) or at the 4 GByte choice, PAE should be automatically deactivated.

Finally, if you wish to examine and/or configure the additional drivers contributed by Canonical to the kernel source, navigate back to the main menu and you will find a separate “Ubuntu Supplied Third Party Drivers” sub-menu (shown below) that contains some of their input. Naturally, this is included

only with the version of the kernel code from the Ubuntu repositories.

When you are satisfied with your choices, exit the configuration menu, saving the configuration in the default file `.config`.

COMPILING THE NEW KERNEL

Compiling the kernel has two different stages: compiling the kernel itself, and compiling the loadable modules – though this second part is performed only if the option for modules has been activated, as it usually is.

To start this quite lengthy process, issue the command:

```
$ make
```

and the default Makefile target of compiling the kernel will be executed. Initially, this command compiled only the kernel proper, however in recent versions of the kernel source both the kernel and its modules are compiled and updated.

Be prepared for the processor to work quite hard and for an extended period of time. It is important to make sure ventilation is adequate since the computer will tend to heat up (this is best done on a desktop machine, if at all possible), and will consume power liberally – so plug it in if running off the battery! On a dual-core Intel Core i5, the complete compilation process took about two hours:

```
real 126m0.103s
user 117m35.622s
sys 13m31.106s
```

If we make a change in the kernel configuration, such as changing the Arbitrary version character string as above, executing a new compilation process will need to compile only

those parts that have changed. If our alteration affects only the kernel proper, all modules will need to be checked, but not compiled. Many subsystems of the kernel itself will not need to be recompiled – whole directories of the source code will be left unchanged. Compilation time will be significantly reduced, for example:

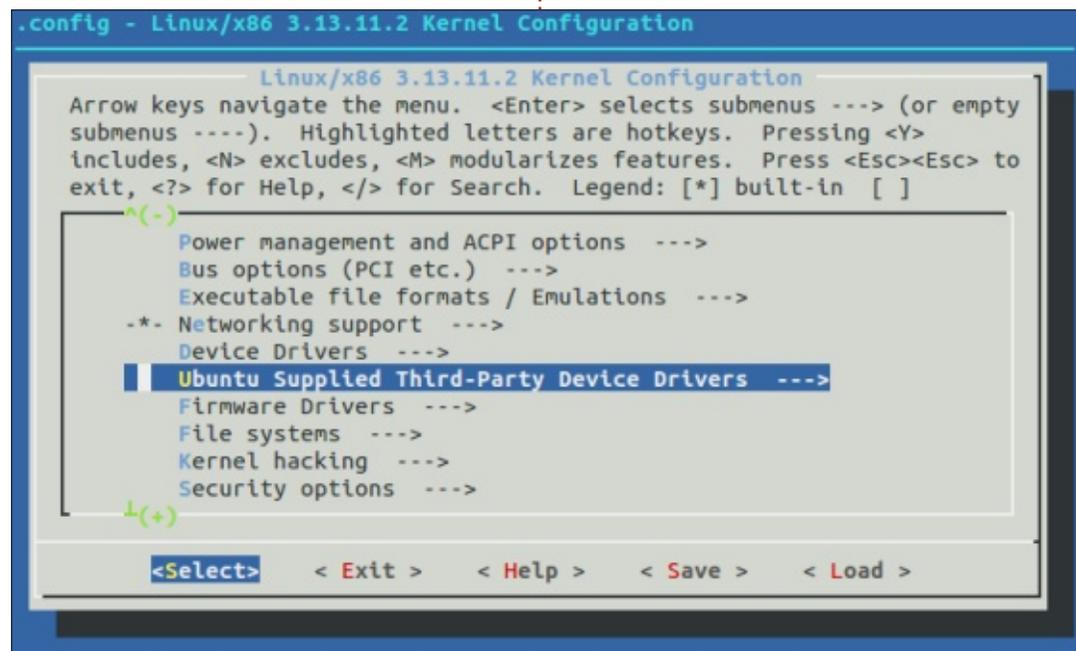
```
real 5m51.928s
user 2m19.265s
sys 0m27.180s
```

On the other hand, if a modification has been made in one of the modules, we can specify that just the modules need to be checked for alterations and compiled if needed, and not the kernel itself. This is managed with command:

```
$ make modules
```

and can considerably shorten compilation time, depending on the number of modules changed and the importance of these changes. For example, on my system:

```
real 2m42.214s
user 1m29.390s
sys 0m16.867s
```



INSTALLING THE KERNEL

Once the kernel and modules have been compiled, they can be found in the very same sub-directories as the source files. For example, in the mm (memory management) subdirectory, you will find both memory pool routines source in mm/mempool.c, and the compiled object file mm/mempool.o .

Once each source file has been compiled into an object, they must be linked together into an executable file for the kernel, and transformed into loadable module files for each module. The kernel itself is file vmlinux in the tree root, and should weigh in at about 158 MBytes. This file will need to be compressed and placed in directory /boot. Once compressed using gzip, bzip or LZMA, the kernel size can go down to the 5-6 MBytes that can be expected of Linux kernel files.

As for the drivers, their compiled and linked loadable module files have extension .ko

("kernel object"), and are distributed around the source tree side-by-side with the .c and .o files. For example, the IPv6 tunnel module will be found in compiled and linked form as net/ipv6/ip6_tunnel.ko.

In order to execute our new kernel, we will need to perform four distinct actions:

- The modules must be separated from the source files, and copied into directory /lib/modules/<kernel-name>/kernel.
- The kernel itself must be compressed, and the compressed file placed in /boot.
- The modules must also be integrated into an initrd (initial file system) compressed file, also placed in /boot.
- We must also update the GRUB bootloader configuration so as to include the new kernel in the boot options.

Luckily, there is a specific make target available to do all this automatically. Since we will be making changes in the system configuration, we will need to do it with administrator privileges – thus the "sudo" command. It is also the time when we can seriously break

things in our system, so proceed with caution and only when satisfied the previous steps have taken place correctly. Then, to install the modules in /lib (step 1 above), issue:

```
$ sudo bash
# make modules_install
```

You will see each .ko file pass by on screen as it is copied over. Now, we are ready to do the kernel itself. Issue:

```
# make install
```

and the script will perform steps 2, 3 and 4 all together for you. You will now see the output of the GRUB configuration tool grub-mkconfig on screen, and in directory /boot the new files will make their appearance:

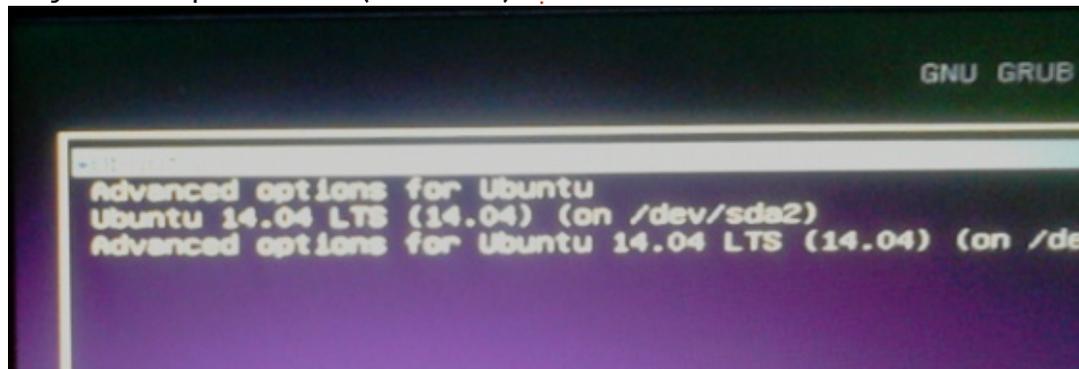
- vmlinuz-3.13.11.2 (or similar): the compressed kernel;
- System.map-3.13.11.2 (or similar):

a table of the symbols in the kernel, and their corresponding positions in memory;

- initrd.img-3.13.11.2: the compressed file system (with modules generated from /lib) needed to perform initial system boot.

TRYING OUT YOUR NEW KERNEL

Since the automatic install process has taken care of the GRUB configuration for us, all we have to do now is reboot our computer. In the GRUB menu, the first entry we find is simply labeled "Ubuntu", and this is the one corresponding to our new kernel. At least one other entry will be found underneath, labeled "Ubuntu 14.04 LTS" or similar. This is the older kernel, still available as a backup just in case the new kernel does not work as expected.



Boot into the new kernel -just hit ENTER- and hopefully the system should come up. In fact, it should be rather difficult to note that the new kernel is being used. However, if we open a terminal and use the uname command, we should see the description and compile date of our new kernel:

```
$ uname -a
```

```
Linux alan-lenovo 3.13.11.2  
#5 SMP Sat Jul 19 21:32:47  
CEST 2014 x86_64 x86_64  
x86_64 GNU/Linux
```

This information can also be found by listing file /proc/version , while /proc/version_signature contains the free-form “Arbitrary version” character string we entered during configuration:

```
$ cat /proc/version_signature
```

```
Ubuntu 3.13.0-24.47-generic-  
alan
```

If you have managed to follow us so far, congratulations! What you have just achieved is quite difficult - or nearly impossible for mortal humans - with most current operating systems. Now, have some fun and try out your new kernel. How does it compare with the old one? What about speed and

memory usage?

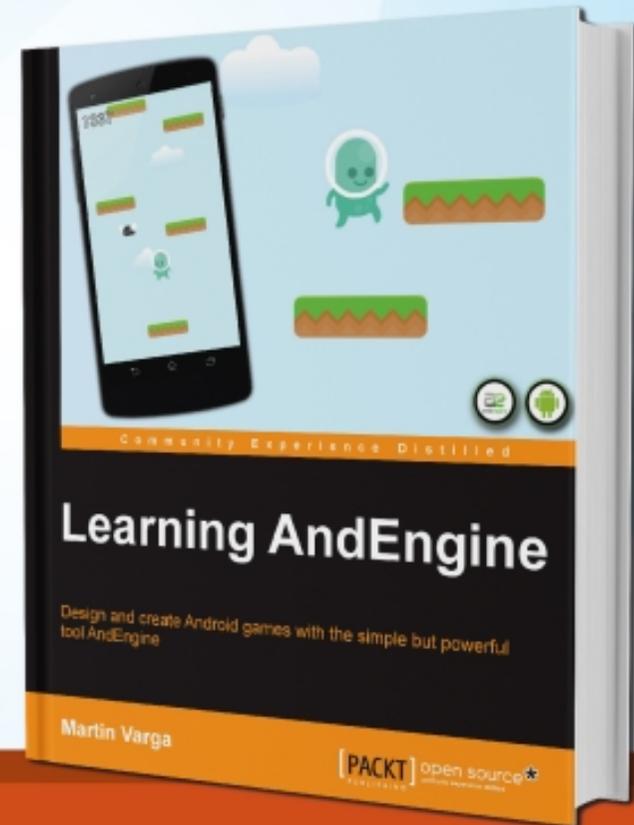
In the next part of this series, we will be looking into how to make some changes and apply simple tweaks to our kernel, and how they affect system performance.



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).



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REVIEW

Written by Ronnie Tucker

MEGAsync

After the notorious Megaupload was disbanded its founder, Kim Dotcom, founded MEGA. MEGA is a cloud hosting site which offers users a whopping 50GB of space for free. They've always said there'd be a Linux client, and now there is.

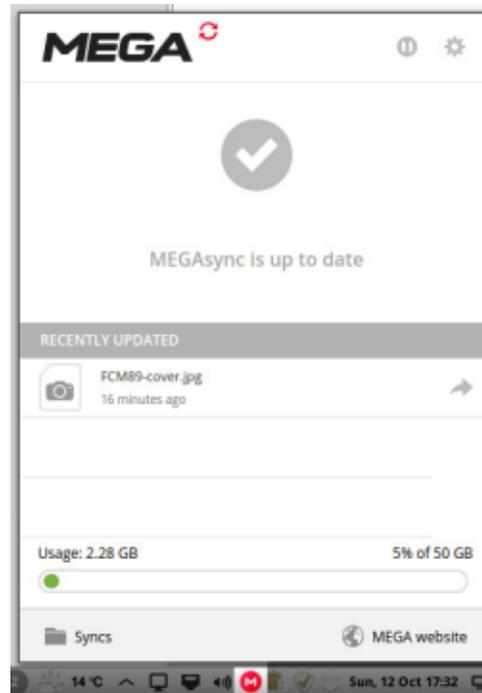
Heading over to <https://mega.co.nz/#sync> you'll be greeted with a choice of several Linux distros (both 32 and 64-bit) and a download button.



For Ubuntu (and variants) you'll download a DEB file which you can double click to install as normal.

You'll need to sign up for a free account on the site too. You'll use these login details when installing MEGA. During the install you'll also get to choose where to put your main MEGAsync directory (in /home/username by default) and if there are any other directories you want to keep sync'd to the cloud.

Once it's installed you'll see, in your taskbar, a red circle with a white M in it. Clicking that gives you some basic stats on your MEGA account.



Assuming you did a default install then you'll also see a new folder in your home directory, it's called MEGAsync.

Anything you put/save in this folder will automatically be uploaded to your MEGA cloud space. This folder acts just like Dropbox currently does. And, like Dropbox, you can access your files via the web interface.

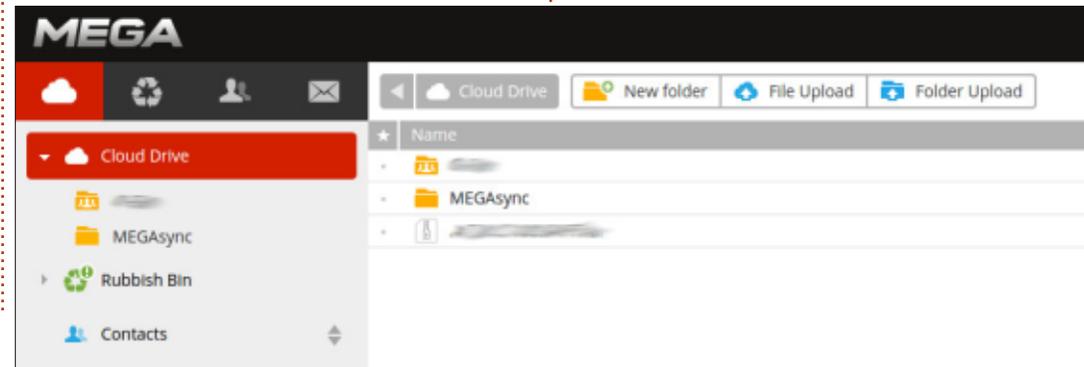
In the web interface, you can upload/download files and the MEGAsync folder will update accordingly. You can also use their Chrome/Firefox plugins, or their mobile apps, to access your space.

Credit where it's due. Dotcom

and his crew have certainly put a lot of work into this. There aren't many other hosting sites offering 50GB for free (with, of course, upgrade options), mobile/browser apps, a slick interface, and a pretty damn secure hosting service. Dotcom has regularly paid out bounty awards for people spotting bugs/vulnerabilities (https://mega.co.nz/#blog_19).

My only criticism of MEGA is the lack of a timed update. My Internet upload speed is pretty dire, so I'd prefer my folder(s) to sync at 4am when I'm sleeping. I'm hoping that'll be a feature in a future update.

So, this just leaves you, Google, to give us a Linux client for Google Drive. Hello? Are you listening?





MY STORY

Written by AURO KUMAR SAHOO

I am a very basic user and just migrated from Windows completely.

My first encounter with Linux was in my office where I saw the servers were running on some other OS. When asked what it was, the reply was Red Hat Linux, and they told me it was mostly for IT and Computer people, and it had less support for multimedia – compared to Windows or Mac which support Adobe, Corel, and like programs.

I am a Cinematographer who graduated from a Govt. Film school with in-depth knowledge on celluloid, chemical processing, and studying optics. When I entered industry in Odisha, India; I noted that it is slowly transforming to digital, and one part of my country (Mumbai) is almost digitized as far as multimedia creation is concerned.

As a struggling cameraman, I came to Mumbai, and my surroundings were all digital, so slowly I started exploring digital

things, and, after 4 to 5 years, I've gained extensive knowledge in handling an OS (here Windows XP), re-installing it, installing programs like Adobe, Corel, etc, and understanding cleaning an OS, and maintaining system like de-fragmentation, cleanup, etc. During my self-gained knowledge (thanks to WWW and Google), I destroyed much of my data, many times. I install and uninstall programs, even OS, but I know only the very basics of computing by the way.

Then I was gifted with a Laptop which had windows XP pre-installed, and I used it, but I was frustrated with its start up, slow processing, hanging and virus problems. These lead me to search for another OS which would be more stable, and which I could use for home computing like processing a word file, creating some presentations, viewing photos and videos, and listening to music.

Truly speaking, I am unable to buy a Mac as it's much costlier, so my Google search leads me to

Ubuntu. I had also seen it previously on my sister's PC, but never thought of it, as when I asked what it was, she replied that she was doing programming for her engineering on it.

So my impression was that it is an OS for programmers and advance system engineers or computer personnel, but not for basic users.

Then, after a year, when I asked a colleague, who is an IT professional, about a substitute OS, and explained my requirements, he suggested to me on an afternoon tea that Ubuntu would meet my needs as a home PC, and it does everything, and it's free. It was December 2013, and on Windows sites, they were constantly advising to upgrade XP to 7 or 8 before April 2014.

I upgraded, but to Ubuntu 12.04. I went through their website, read how to install and use the software center, etc.

Now my 10 years previous era

reappeared. As an experimenting guy, I started exploring it, and as a very new user and basic user, who never used even MS DOS, you can't imagine what happened to me. When reading different articles, I didn't understand it when they were writing about sudo, or get apt, etc. One day, in the software center, I found Full Circle Magazine (its 80th), and then I download all from zero to 79 and read them from the start. I got an introduction to Linux, and learned many more things, and about available distros. I downloaded Bodhi Linux, Kubuntu, LXDE, Lubuntu, Pinguy OS, Crunch bang and Ubuntu studio, and explored them all.

I have spent much time in learning it – at home I read your PDFs all the time, like preparing for exams. And I've spent much money (in India, internet is slow, and data plans are costly too and cloud computing is still a nightmare, except in big cities) – I have upgraded my XP with it, but I am happy because I now have the freedom of choice.



I am installing a new Linux distro every 1 or 2 weeks for my own satisfaction, and I am now 2 months with Linux and more than a month with FCM. I am happy to choose and get programs to substitute for Windows for my home computing (I'm not yet prepared to suggest its use in the office as I am still exploring the power of Linux), and I'm even creating home multimedia, even some level of professional multimedia creation is possible – with Ubuntu Studio.

I have also posted some suggestions to Ubuntu and Canonical on their mail, and I want to suggest them to you too, and I'm hoping for some articles considering my knowledge is 0.1% and mostly in Graphical representation as I am a very new user.

1. Can we make Ubuntu more GUI than command-line, as I think a person having zero knowledge can start using Windows even without community support, and you can consider Android also. People using smartphones even don't know it is an OS, they just use it. They download apps from the

store, edit photos, share videos, etc.

So, personally I think Ubuntu should be more user friendly rather than as it is today. Just install it and use it.

2. As everyone doesn't have internet, or may have only a slow internet, and as Ubuntu is only less than 1 GB (with much free space left over), you should add some additional software's like Gimp, Inkscape, VLC, to applications in the repository. Because I saw people install them and then removed them because they can't play a mp4, or some image and audio files.

My suggestion is: can we add some more applications as we have space in a DVD. If there's a problem in some countries, then we can make different distribution ISOs for USA, China, UK, India, etc.

As an example, openSUSE has additional packages and languages in ISO form to be downloaded for systems which have no internet connection.

3. Many people migrated from Ubuntu to other distros when Unity

was introduced. My suggestion is: can Ubuntu be installed with different desktop environments, and the user can then select one during login – like (s)he can now do with 2D & 3D Unity.

4. I understand the differences between Deb and exe. Deb has many dependencies but can we make a package and when clicked on the link, it offers to save or install. So one can save the download files and can distribute them, or install them in offline system. We should make available applications in ISO files so one can download all ISOs and write them to DVDs and make an offline repository easily. I also suggest that although there are many solutions like aptoncd, but there should be programs like application backup, super backup, etc, like in the Android sector that saves Android apps like Angry Birds, Gmail, Temple Run, etc.

5. One of my strong suggestions is that as Ubuntu is a community driven system, it should use opinion polls during its release, at least for LTS, to establish what users want, what programs to be included or removed.

6. I know many of my suggestions have answers, but I want Ubuntu to be more user friendly – even for those who migrated from another OS, or for a new one to Ubuntu or computers – without a fear of the command-line. Let the OS do most of its work through a GUI.

7. The last line I may suggest: can Ubuntu give users freedom to make one's own OS; in a browser, ask what kernel they want, what software should be included, what desktop environment is needed. It will be then called Linux for freedom, or MY LINUX.

Now, some personal problems; can you send it to the right person on my behalf, and help me please?

I am still confused on which distro to use; some say Debian is best, some say it needs skill and knowledge; some say Ubuntu as it is community driven, and some say it's now gone its own way rather than what users want and collaborated with. Some say Mint and other distros. As I told you before, I have tried many distros, Ubuntu Studio I liked (as a cameraman), Mint also I liked (now I am on Mint 16 and it's fully

loaded). Pinguy is also very feature loaded. I am now confused.

When I first used Ubuntu, and when reading your previous articles and looking at my desktop, I got a different feeling, and I now think that Ubuntu has fixed itself on Unity. When I tried Mint, I got much more freedom to customize. I am confused which one to use, which is more stable. Ubuntu requires extra work after installatio, such as getting an image editor like GIMP, Raw, Darktable; a video editor like Pitivi, a software manager like Synaptic and Gdeb, or a video player like VLC, and Java, Flash, and multimedia codecs. MINT is mostly loaded and customisable. But Ubuntu is the parent on which Mint is based. I am confused, Ubuntu is less than a GB and it has much free space, then why don't they provide other user interfaces along with Unity, or some more softwares (like Ubuntu studio)?

I am now using a Lenovo B560 laptop and I posted a question in 'ask' but didn't get any reply. I have finger scanner hardware, and it worked with XP but there is nothing in any distro of Linux which detects it. I have one 'key recovery'

button located just near to the power button, but don't know how to use it with Linux, so some of my laptop's potential is unused.

Which Linux distribution do you prescribe for my Lenovo B560.
Specification- Processor: Intel Pentium CPU p6200 @ 2.13GHz x 2
Memory: 2.8 GiB

I have heard many times that there are Linux viruses in the wild As I am using only Linux Mint and have completely removed Windows, what is your basic security advice? I know you may be protective in making a statement, but should I really use any antivirus or firewall for accessing the internet, and for distributing some files by flash drive which maybe came from a Windows or any other Linux system. If yes, then please advise on some home computing system protection against viruses, worms, etc.

How can I backup my applications which I have downloaded, as I am thinking about a fresh installation rather than upgrading, so I have to avoid re-downloading these applications?



WEBMIN

I am a new reader of Full Circle. I read the article on server install and management with interest. I noted the use of Putty for remote management. While Putty is useful for remote shell access (ie, command-line instructions), a more effective solution for day-to-day server management is Webmin.

What is Webmin?

"Webmin is a web-based interface for system administration for Unix. Using any modern web browser, you can set up user accounts, Apache, DNS, file sharing and much more. Webmin removes the need to manually edit Unix configuration files like /etc/passwd, and lets you manage a system from the console or remotely. See the standard modules page for a list of all the functions built into Webmin, or check out the screenshots."

source: www.webmin.com

When I transferred from Novell and Microsoft servers to Ubuntu

servers, I missed the ease of use of GUIs for management. I felt I had gone back to the 80s and DOS. Then I started to use Webmin for server management; it became easier and more effective.

Webmin for Linux can be downloaded from www.webmin.com. A cookbook and manuals are also available.

Once Webmin is installed on your server and set up, it can be accessed by a web browser from anywhere.

Neil

CHEATING

It's a slippery slope, like smoking or drinking. You finally quit Windows, but little things suck you back in. "Come on man, just one drag... just one drink."

You need one program for work, you want iTunes because the company gave you an iPhone. You

bought Google Sketchup. That is what brought me back to Windows.

I feel dirty everytime I boot up, especially when I pass by Linux and go into Windows to do something Linux could do. And if I get distracted and end up just looking at the internet on Windows, am I really cheating on Linux? Probably. But when I want to get stuff done, I use Linux. If I want to recover erased photos or an accidentally formatted drive, I'm in Photorec on Linux. If I want to make a stand-alone motion detecting camera out of an old IBM Thinkpad, I use Linux. If I want to upload firmware to my 3D printer, I use Linux. But, to be honest, I feel like it's like cheating on my wife; the mistress does things my wife won't... But I worry about viruses. That's my two cents.

Peter Liwyj

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ubuntuforums.org/forum-display.php?f=270

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.

Tuxidermy





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 Can the free version of Macrium Reflect create an image of a complete hard drive on a desktop machine running Ubuntu?

A (Thanks to **John P.** at *Macrium Support*) Yes, providing:
1) You boot from the PE rescue CD.
2) The system is MBR/GPT partitioned. LVM configurations are not supported.

Q I am running Ubuntu 14.04. What should I do about Ubuntu 14.04.1?

A Ignore it. It just includes the updates you have already installed.

Q Is the Adobe Reader for Ubuntu up to date?

A No, the Linux version of Adobe Reader has not been updated since May, 2013. Since then, several vulnerabilities have

been identified, and fixed in versions for other operating systems.

Q I'm using an old laptop with an Intel Core 2 duo at 1.5 GHz with 2 GB of memory and an Intel GM965/GL960 graphics card, It runs Ubuntu 14.04. When using the Chrome browser to navigate to the Chrome Web Store, Ubuntu completely freezes for about 10 seconds, and then the screen goes blank and the entire system is 100% unresponsive.

A (Thanks to vasa1 in the Ubuntu Forums.) Please type `chrome://settings` in Chrome's address bar and hit enter. Then go to the bottom of that page and click on Show Advanced Settings. Then go to nearly the bottom of the new page and see if "Use hardware acceleration when available" is ticked. If it is, try the Web Store after you untick that setting and restart Chrome.

Q I used Bluefish to create a website; however, I'm going with a third party hosting site. Can I use bluefish to upload and manage my site from their server?

A Have a look at Filezilla, one of several FTP options.

Q In my effort to enjoy cycling even more and also improve fitness, I bought a Garmin Edge Touring. Great, all excited and can't wait to download maps and reference points. Garmin web site tells me "Garmin does not support your OS, only Windows and Apple." I despair!

A Garmin Edge Touring is a standalone GPS navigator. It doesn't require a computer to work; it may require a computer to update its firmware and maps but if the manufacturer doesn't provide solutions for Linux then there's little to nothing anybody else can do. Use it with a Windows PC for the occasional update you might need.

TOP QUESTIONS AT ASKUBUNTU

* How would I speed up a full disk dd?

<http://goo.gl/ln2QXr>

* How do I find number of NICs in my system?

<http://goo.gl/mN49HH>

* Where are my browser passwords stored?

<http://goo.gl/uBD3Kt>

* Why do I get "connection refused" errors connecting to a server via SSH?

<http://goo.gl/lbymbB3>

* What is the CVE-2014-6271 bash vulnerability (Shellshock) and how do I fix it?

<http://goo.gl/ym8j0J>

* Identify the server I'm working at

<http://goo.gl/wy3YJz>

* Why does Ubuntu 14.04 keep shutting down when playing video?
<http://goo.gl/uqEliO>



* How do I change the GRUB 2 menu?

<http://goo.gl/2hT2Wk>

* How to safely remove proprietary Intel driver

<http://goo.gl/3yaBBo>

TIPS AND TECHNIQUES



Corporate versus personal computing

As my client prepares to move to a new location, I'm seeing how the gap between home computing and corporate computing has become a huge chasm.

Before the actual move, I need to make sure that all the in-wall cables are working properly, that the new server rack is ready to hold the switches and firewall computer, and that we have as much backup as possible. At home, my router knows about 20 devices, but there are no in-wall cables, no switches, no dedicated firewall and no equipment rack. I think my backup is pretty good, but there

are weeks when it is not up to date.

The company is not huge; I bought three, 2 TB hard drives to hold the extra backups, and that will be more than enough storage. At home, there is almost that much in various media files, with far fewer people.

If a computer does not survive the move, we will have a credit card at the ready to replace it, and an image backup ready to restore. When I buy a computer for home use, I agonize for weeks over the configuration.

Expectations are also rather different. If the Internet is not working at home for four hours, it's inconvenient, but we survive. At the office, if the network is down for four hours, all work stops. My boss expects to shut down at the old location at noon on a Friday, and be fully functional at the new location sometime Monday morning -- well, except for that computer that was destroyed in the move. And if it was the main server, we should have the backup running by noon.

The chasm extends to operating systems. At home, my essential

applications are email, web browsing and an office suite. My client's essential applications include Taxprep and Quickbooks, and a bunch more along the same lines -- and none of them run under Linux. A couple of the applications include server components, so I can't even suggest using Linux on the server.

When there's a Quickbooks for Linux, we will know that Windows is doomed.



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.

Full Circle Podcast Episode 41, Trusted To Fail!!

Welcome to our new format show, there are several changes from the previous format, the most important being we are now recording together at the Blackpool Makerspace in the office. This Episode we Test Ubuntu 14.04, Review of Official Ubuntu Server Book.

Your hosts:

- Les Pounder
- Tony Hughes
- Oliver Clark



from the
Blackpool (UK) LUG
<http://blackpool.lug.org.uk>

Download



Have you ever been to prison? Have you ever wondered what it's like to work at a prison? Better yet, have you ever had the oddball desire of building your own prison? Regardless, you may want to check out the video game Prison Architect.

Prison Architect is a Construction and Management Simulation (CMS) video game released by Introversion Software, and is available for Linux, Windows & Mac OSX. As of September 25th 2014, the video game Prison Architect is on its 25th Alpha release, although its initial Alpha release was exactly two years earlier in September 25th 2012. It is currently available through the Introversion Store and through Steam as a Steam Early Access game. According to Introversion Software, Prison Architect is expected to stay Alpha for a long, long time. Here's what the developers had to say, as quoted on the Steam Store page: "Prison Architect is currently in Alpha, which means we haven't finished it yet - it's full of bugs and glitches, and you're

not going to get a polished experience if you buy it at the moment. What you will get is early access to a bullfrog-style Prison Management Sim (Simulation) that over 250,000 gamers have already thought is worth a look at."

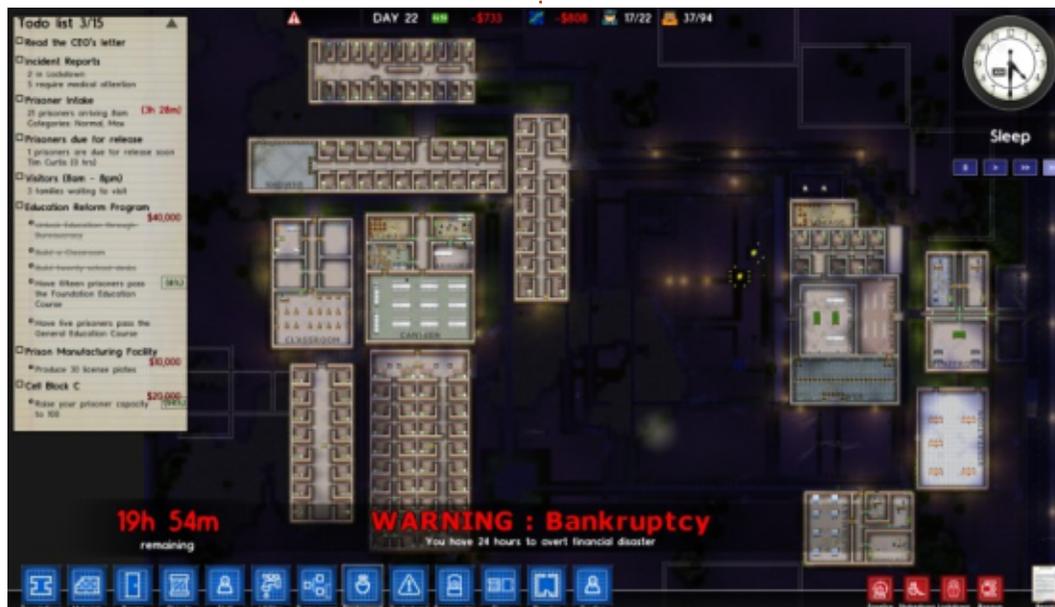
Prison Architect is definitely worth taking a look at, and that's just what I did this month. I got lucky and found Prison Architect as part of the Humble Indie Bundle at the end of September. I ended up paying a third of the \$30 price tag because it was part of the Humble Bundle. Would I pay the full \$30

now that I've played it? Most definitely. In fact, I considered paying a little extra to have a prisoner look like me by sending in a picture of myself. Unfortunately, by the time I decided to do it, that option had already sold out. However, according to the Introversion Prison Architect website, it's still possible to pay \$50 to "Immortalize yourself, by getting a prisoner named after you, and supplying the info for his rap-sheet. Your prisoner will be in the final version of PA, and everyone will know that *YOU* helped make the game a reality."

These are a couple of examples of the added bonuses we get from playing Prison Architect while still an Alpha early-access release. This is not to say that Prison Architect is unplayable and filled with bugs; on the contrary, the game is in fact very smooth and entertaining.

SO WHAT EXACTLY IS PRISON ARCHITECT?

The purpose of the game is to build your own for-profit prison from the ground up. You are in complete control of building your prison, which includes laying down the foundations, putting up walls, doors, windows, connecting the utilities, the toilets, the beds, the shower heads, etc. In short, providing everything a prison might need to be able to run itself. Not only must you build the prison, but you're also expected to micro-manage the prison's economy, its staff, and the prisoners themselves. So, in a way, you act not only as the main architect but also as the warden (who by the way is the first person you hire). You





Last month, I reviewed X-Plane 10; this month, I thought I'd show how to extend X-Plane using Python and several other scripts.

Before doing anything else, you'll need to install Python. I would recommend installing the package named 'python' via your package manager (or a terminal), but be sure to install some version of Python 2.7. As of writing, I have 2.7.5-5ubuntu3 listed in my package manager.

PYTHON INTERFACE

The Python Interface is written

by Sandy Barbour and is available from http://www.xpluginsdk.org/python_interface_latest_downloads.htm.

What you'll download is a ZIP file which should be unarchived to your X-Plane plugins folder. I have X-Plane via Steam, so I unarchived the ZIP file to /home/ronnie/.local/share/Steam/SteamApps/common/X-Plane 10/Resources/plugins. You may need to show hidden folders to see the .local folder. Your desktop window manager should have an option under View for this. So, if you go into your plugins folder, you

should see a folder called PythonInterface.

On loading X-Plane, you should now see Python Interface mentioned in the Plugins menu at the top of the screen.

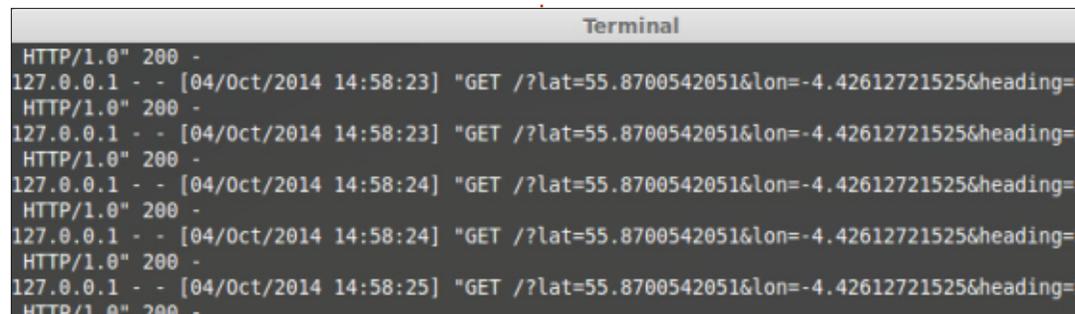
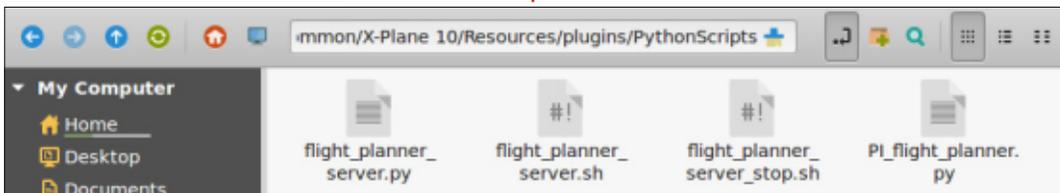
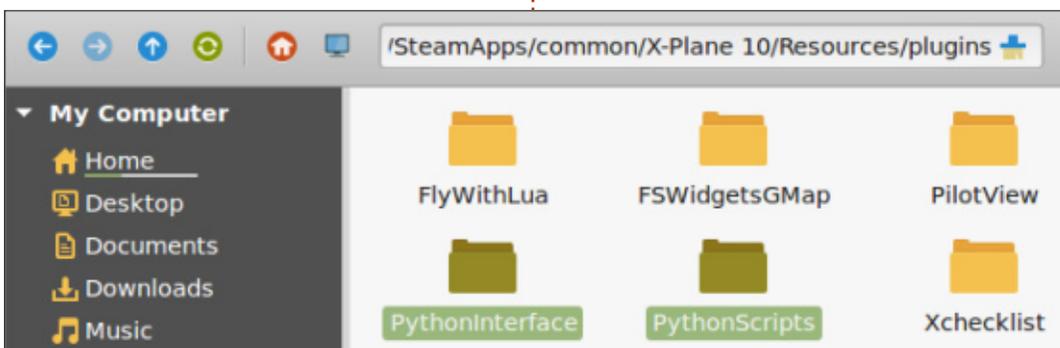
FLIGHT PLANNER

I'm a complete beginner at X-Plane and flight simulations, so I like to see my position, in real-time, on a map. The site X-Plane Flight Planner is completely free, and excellent for this. It's at <http://xplane.anzui.de:3000/flight-planner>. Let's install their Python script to use X-Plane outputs to plot our location, in real-time, on a Google Maps style map.

The site gives good information on installing the script

(<https://github.com/der-On/X-Plane-Flight-Planner/wiki/Quickstart-Guide>), but here's the basics.

Download the Python file from https://github.com/der-On/X-Plane-Flight-Planner/raw/master/python_interface/PI_flight_planner.py and save/copy it to Plugins > PythonScripts (shown bottom left). If you don't have a PythonScripts folder, then you'll need to make one. In that same folder, save/copy the file https://github.com/der-On/X-Plane-Flight-Planner/raw/master/python_interface/flight_planner_server.sh and https://github.com/der-On/X-Plane-Flight-Planner/raw/master/python_interface/flight_planner_server.py.



Now, open a terminal and cd into your PythonScripts folder. Once in there, do:

```
./flight_planner_server.sh
```

Now start X-Plane. Once X-Plane has gone through some of its loading, you'll see it start to send info in your terminal.

To stop the server you can run the file https://github.com/der-On/X-Plane-Flight-Planner/raw/master/python_interface/flight_planner_server_stop.sh (again from your PythonScripts folder), but I usually just stop the server by pressing CTRL+C in the terminal.

Shown below left I am in X-Plane, parked up at Glasgow Airport (EGPH).

Below right is the X-Plane Flight

Planner site (the pink plane beside the big yellow one is me).

If I was to move off from there (in X-Plane) and taxi to the runway, you'd see it in real-time in the Flight Planner site.

Be sure to click the + symbol and check the 'follow' box – so that it centers your plane on the screen.

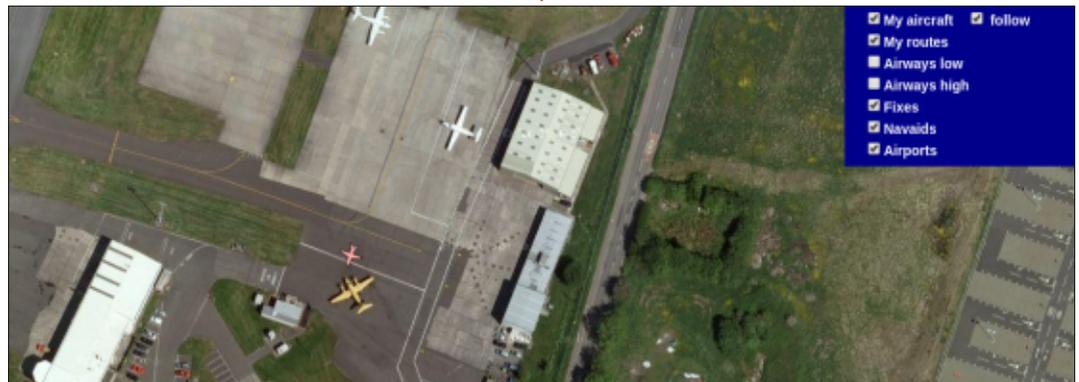
Now that you've got Python Interface installed, and you know how to install a Python script, I highly recommend (if your machine can handle it) installing the Fly With Lua plugin (<http://forums.x-plane.org/index.php?app=downloads&showfile=17468>) which extends the scripting abilities of X-Plane. With it installed, you should install Real Terra Haze (<http://forums.x-plane.org/index.php?app=downloads&showfile=22387>). It will give you fantastic atmospheric effects

(shown in the screen capture below). Fly With Lua goes into your Plugins folder, and Real Terra Haze goes inside the Fly With Lua folder.

If there's interest in more X-Plane, then next month I'll discuss using the X-Plane Flight Planner site to plan your route; and then how to enter it into your flight management computer (FMC).



Ronnie is the founder and (still!) editor of Full Circle. He's also a self-taught (part-time) artist who draws both serious and silly things. His work can be seen at: <http://ronnietucker.co.uk>.





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.



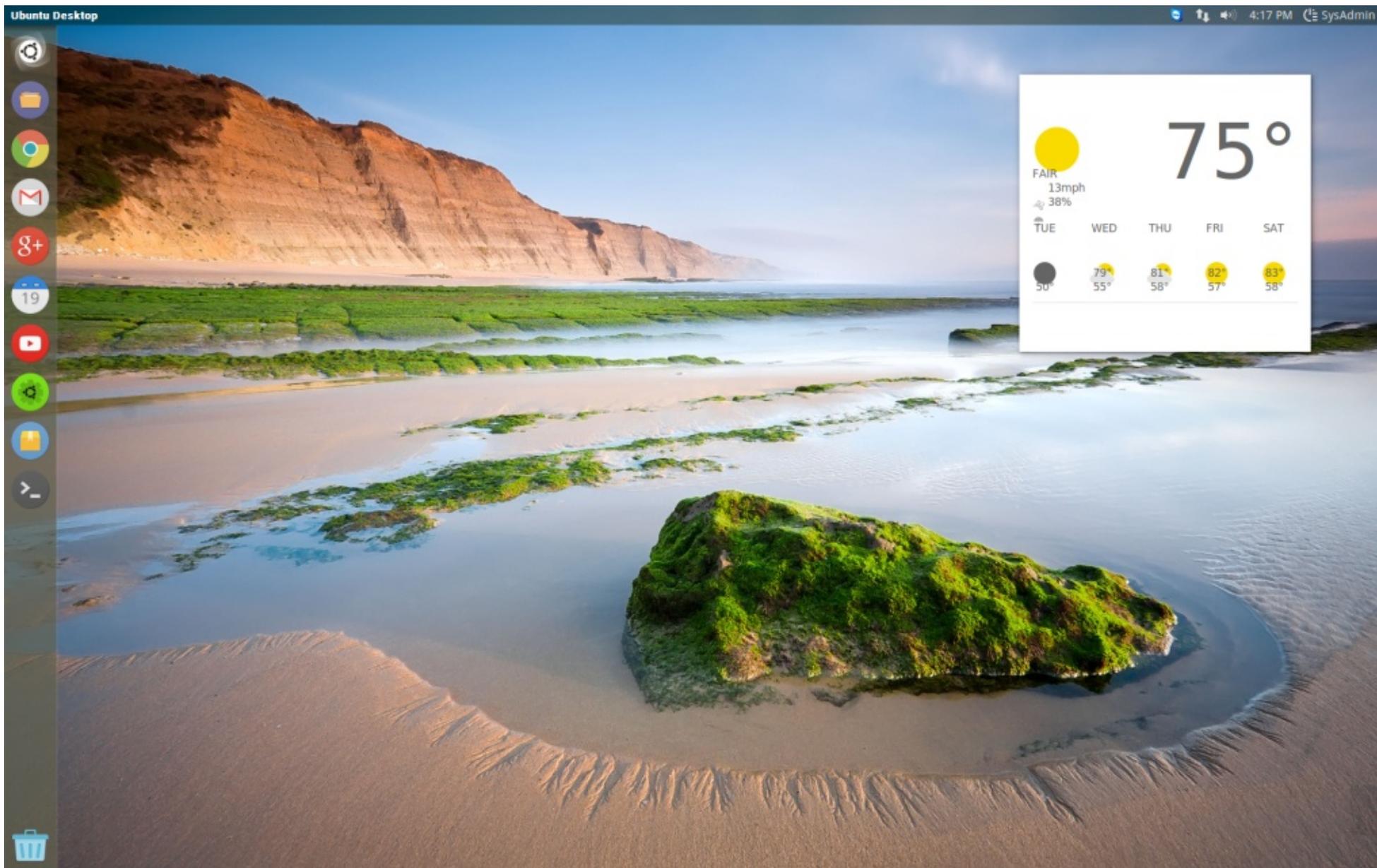
I'm a Linux user and I follow your magazine. This is Lubuntu 14.04x86_64

My PC is a notebook HP G62.

Screen: 15.6 inch LCD 1366x768 pixels
CPU: AMD Turion 2 P540 (Dual-Core)

GPU: AMD/ATI Radeon HD 4250 RS880 (open driver)
RAM: 4 GB DDRIII
HD: Sata 500 GB
Other OS: Windows 7 ultimate x64

Daniele Spina



Wanting to show off one of my virtual machines. It's pulling 2 cores and 2GB of ram for the settings. Despite having Unity,

it's not as slow as 13.04 and 13.10 were. Sporting the Numix GTK theme as well as the Numix Circle icon set with a Google Now Conky

theme, and a ChromeOS wallpaper.

Ubuntu 14.04.1
VirtualBox

Dual Core CPU
2GB of RAM

Don McCollough



HOW TO CONTRIBUTE

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... or you can visit our **forum** via: fullcirclemagazine.org



FCM#89

Deadline:
Sunday 09th Nov. 2014.
Release:
Friday 28th Nov. 2014.



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Our thanks go to Canonical, the many translation teams around the world and **Thorsten Wilms** for the FCM logo.

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