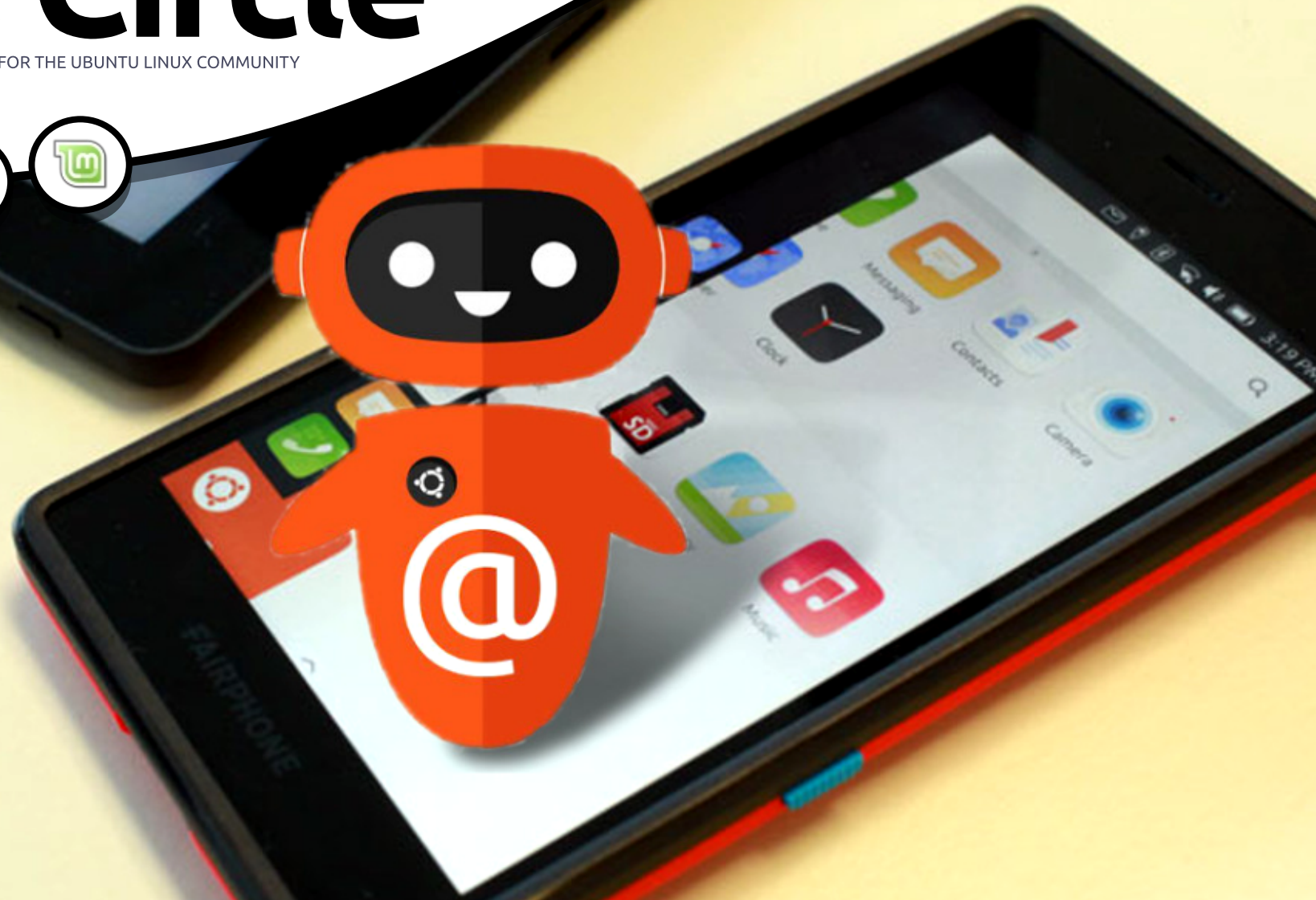




# Full Circle

THE INDEPENDENT MAGAZINE FOR THE UBUNTU LINUX COMMUNITY

ISSUE #122 - June 2017



Base photo: [ut4fp.org/page/getting-started](http://ut4fp.org/page/getting-started)  
Manip (added UBports logo): Ronnie Tucker

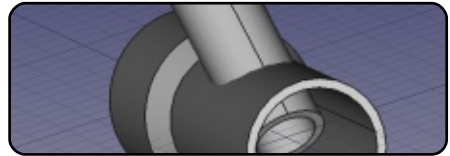
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## HowTo



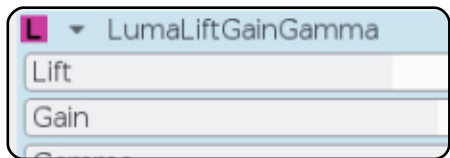
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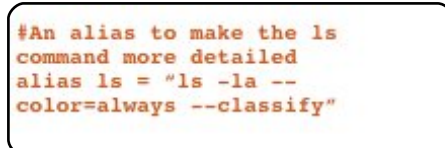


## Graphics



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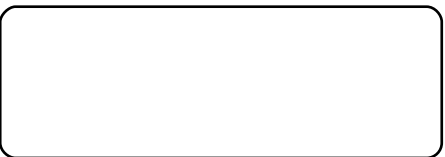
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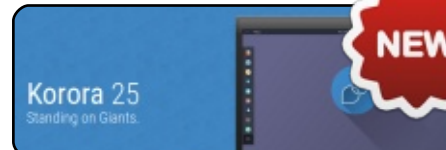
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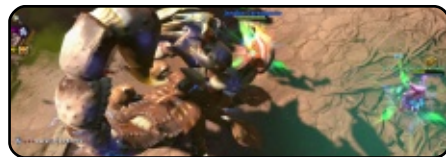
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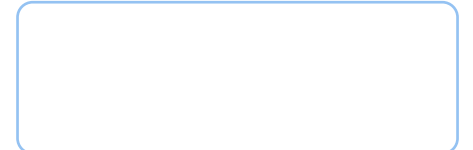
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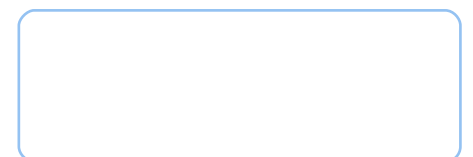
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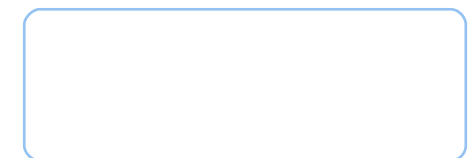
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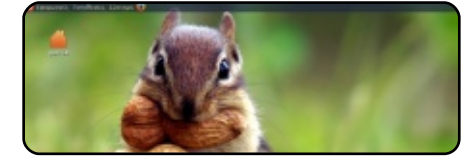
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## WELCOME TO THE LATEST ISSUE OF FULL CIRCLE.

As per usual we have some Python, FreeCAD, Inkscape, and Kdenlive. To round things off I've written up a quick HowTo on installing UBports (formerly known as Ubuntu Touch) on your devices. I have a Meizu MX4 phone and a BQ M10 tablet which both had Ubuntu Touch OTA-15 on them. UBports have now released the first version of non-Canonical Touch: UBports r1. Previously it would have meant installing this to your device via the command line, but the UBports team have now released a nice GUI that will do all the hard work for you. So, get your devices charged up and ready to go. There are some changes though: the Today scope isn't part of the default UBports, neither is Here maps (UBports don't have the license for that), but most of the familiar stuff is there, or can be installed from either the (soon to close) Ubuntu Store, or via the installed Open Store. Just remember that UBports is still very young and very much under construction.

A new series begins this month from SJ Webb (formerly of Chrome Cult) who is going to use this new column (well, replacing his previous one) to discuss the medical research that he does using Linux. Now, brace yourselves, it's not Ubuntu. It's Fedora! So this is probably the first non-Ubuntu series in the history of FCM. No pressure SJ. No pressure.

Don't forget to keep in touch. Send in your comments to fill the Letters page, and your desktop screenshots for the My Desktop section. Send it all to me, Ronnie, at: [ronnie@fullcirclemagazine.org](mailto:ronnie@fullcirclemagazine.org).

The **Full Circle Weekly News** is still going, albeit that I've missed a couple of weeks due to work, but thank you to all those who download and listen.

**All the best, and keep in touch!**

Ronnie

[ronnie@fullcirclemagazine.org](mailto:ronnie@fullcirclemagazine.org)



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<http://tunein.com/radio/Full-Circle-Weekly-News-p855064/>



## WPS OFFICE'S LINUX DEVELOPMENT HAS BEEN HALTED

Users looking for a Microsoft Office clone on Linux will be disappointed to hear that WPS Office's development on Linux has been halted. The most recent build for Linux was released almost one year ago, with the most recent version being v10.1.0.5672 Alpha.

The fact that development had stalled was raised after one Twitter user reached out to WPS Office to ask why there hadn't been a new release for a while. The response came back saying that it was "on a halt" and that it needs "community builds"; there's little chance that community builds will become a thing within the next few months given that WPS Office is not even open source, making community maintenance somewhat of a challenge.

In a follow-up tweet, WPS Office did confirm that while the focus right now is on mobile, they will focus more on Linux towards

the end of the year. The response came when a user asked if the office suite will be made open source.

Source:

<https://www.neowin.net/news/wps-offices-linux-development-has-been-halted>

## DEBIAN GNU/LINUX 9 "STRETCH" WILL SHIP WITH NEW DIGITAL FORENSICS TOOLS

Last week, we told you about the announcement of the release date of Debian 9.0 Stretch GNU/Linux distro. According to the announcement, Debian 9.0 is slated to arrive on June 17, 2017. Prior to that, another exciting development was made in the Debian world in the form of release of systemd-free Devuan 1.0.0 distro.

Debian 9 GNU/Linux release is supposed to ship with many digital

forensics tools and their dependencies. Spotted by Softpedia's Marius Nestor, the announcement was made by Debian developer Michael 'mika' Prokop.

Prokop wrote: "Debian/stretch AKA Debian 9.0 will include a bunch of packages for people interested in digital forensics."

He added that the packages will be maintained by the Debian Forensics team. They'll also be accompanied by their libraries.

Some of the digital forensics tools shipping with Debian 9 are as follows:

- bruteforce-salted-openssl
- cewl
- dislocker
- pompem
- unhide.rb

Source:

<https://fossbytes.com/debian-gnulinix-9-stretch-digital-forensics-tools/>

## OWNCLOUD CONFERENCE 2017 ANNOUNCED FOR SEPTEMBER 20-23 IN NÜRNBERG, GERMANY

OwnCloud Conference 2017 is an event targeted at ownCloud developers and users alike, and it looks like the upcoming one is the fourth ever, opening its gates on Wednesday, September 20, until Saturday, September 23. Over 200 people from all the corners of the world are expected to attend the conference.

There, you will attend two days of conference and three days of hacking and hands-on, so no matter if you are an ownCloud developer, contributor, reseller, hoster, admin, user, translator, or even value-adder, you are encouraged to attend oCCon17 this September for another round of ownCloud hacking.

Take a look at the official website of the conference if you want to learn more about how to

get there, where to stay, etc., and please try to keep in mind that the call for sessions and sponsors is now officially open. Registration will also open in the coming days for attendees, so bookmark the event's page for upcoming details.

Source:

<http://linux.softpedia.com/blog/owncloud-conference-2017-announced-for-september-20-23-in-nrnberg-germany-516146.shtml>

## KDE PLASMA 5.10 OFFICIALLY RELEASED, FOLDER VIEW IS NOW THE NEW DEFAULT DESKTOP

When the Beta milestone launched two weeks ago, KDE also unveiled all the features they managed to implement in this major release, which will make its way into the software repositories of your favorite operating system in the coming weeks, so you should already have an idea about what's new.

If not, let us tell you that KDE Plasma 5.10 packs Folder View as the default desktop interface

instead of the Folder Widget that was used until now. Folder View features spring loading functionality which you can see in action in the gallery below, space-saving icon grid, unified drop menu, and better mouse behavior.

Source:

<http://news.softpedia.com/news/kde-plasma-5-10-officially-released-folder-view-is-now-the-new-default-desktop-516127.shtml>

## PATCHES AVAILABLE FOR LINUX SUDO VULNERABILITY

Red Hat, Debian and other Linux distributions yesterday pushed out patches for a high-severity vulnerability in sudo that could be abused by a local attacker to gain root privileges.

Sudo is a program for Linux and UNIX systems that allows standard users to run specific commands as a superuser, such as adding users or performing system updates.

In this case, researchers at Qualys found a vulnerability in sudo's `get_process_ttyname` function that allows a local

attacker with sudo privileges to run commands as root or elevate privileges to root.

An alert on the sudo project website says SELinux must be enabled and sudo built with SELinux support for the vulnerability to be triggered. Sudo 1.8.6p7 through 1.8.20 are affected. Users should update sudo to 1.8.20p1.

Source:

<https://threatpost.com/patches-available-for-linux-sudo-vulnerability/125985/>

## BODHI LINUX 4.2.0 UBUNTU-BASED OPERATING SYSTEM NOW AVAILABLE

Bodhi is an interesting Linux distribution thanks to its lightweight nature. If you have an older PC that isn't particularly powerful, the operating system could breath new life into it. Unlike some other distributions that are light on resources, Bodhi is not ugly -- its Moksha desktop environment looks rather modern. I highly recommend giving the OS a try.

Today Bodhi reaches version 4.2.0. It is quite the boring release, as there isn't much to it. It is merely a rollup, incorporating many of the updates that were released since the previous stable version, 4.1.0. If you are already running Bodhi and have been installing updates, there is no reason to bother -- this is more for those that aren't already running the OS.

Source:

<https://betanews.com/2017/05/31/bodhi-linux-420-ubuntu/>

## LINUX BITCOIN USERS NEED TO BE AWARE OF THE NEW SAMBA VULNERABILITY

As is the case with any potential cyber threat these days, it is unclear what the impact will be exactly. A new Samba vulnerability has been discovered, which can affect Linux distributions as well. This means anyone who runs a version of the Linux operating system on their computer may find themselves on the receiving end of a major cyber attack. That is, unless they take notice of

mitigation options available to them.

More specifically, Linux and Unix system are susceptible to a Samba vulnerability, which could result in attacks similar to the global WannaCry ransomware outbreak a few weeks ago. All versions of Linux and Unix released on March 1, 2010, and later are vulnerable to this attack vector as of right now. It is possible for criminals to remotely exploit the Samba vulnerability. Moreover, hackers could upload and execute payloads on the infected systems.

For the time being, it does not appear there are any active exploits available right now.

Source:

<https://themerkle.com/linux-bitcoin-users-need-to-be-aware-of-the-new-samba-vulnerability/>

## TOYOTA'S ENTERTAINING THE IDEA OF LINUX IN CARS

The Linux Foundation's Automotive Grade Linux project is celebrating its first big-name user, after Toyota said it will

employ the OS in the 2018 Camry model it will sell in the United States.

Automotive Grade Linux (AGL) is an effort to create a cut of Linux capable of being dropped into cars with minimal integration hassles, so that auto-makers and manufacturers of in-car electronics can all build to a common standard.

The Camry will use AGL in its infotainment system, which is where the project currently focuses its efforts.

In future the project's participants want the OS to handle just about everything inside a car, including the instrument cluster, a heads-up-display, telematics services, advanced driver assistance systems and even autonomous driving.

Car-makers should, in theory, like that plan because it's clear that drivers increasingly expect all sorts of assistance in the cabin, but if those services come from multiple devices it will increase cars' bill of materials and therefore increase complexity. A single unit to handle all tasks is therefore advanced as more sensible, especially if efforts

like Xen Embedded and Automotive can let different services run in nicely-isolated-and-secure virtual machines.

Source:

[https://www.theregister.co.uk/2017/06/02/toyota\\_camry\\_to\\_run\\_automotive\\_linux/](https://www.theregister.co.uk/2017/06/02/toyota_camry_to_run_automotive_linux/)

## LINUX MINT 18.2 'SONYA' BETA UBUNTU-BASED OPERATING SYSTEM NOW AVAILABLE FOR DOWNLOAD

Today, the upcoming version of Linux Mint, 18.2 "Sonya," achieves BETA release. It is based on Ubuntu 16.04 and uses Linux kernel 4.8. You can download either the Mate or Cinnamon ISOs now. Yeah, it's a pre-release operating system so you should proceed with caution, but historically, these BETA releases have proven quite stable -- you will probably be fine.

The Linux Mint team is making a big deal of improved Bluetooth support and settings (Blueberry) in Sonya, but I haven't experienced issues in that regard in the past.

More important to users will be the improved Update Manager, which now includes a new slick help section. Also user-facing is the LightDM display manager, which offers a prettier login screen with HiDPI support.

Source:

<https://betanews.com/2017/06/06/linux-mint-182-sonya-beta/>

## CANONICAL OUTS MAJOR LINUX KERNEL SECURITY UPDATE FOR UBUNTU 17.04 AND 16.04 LTS

While the kernel update for Ubuntu 16.10 systems patches buffer overflow discovered in Linux kernel's trace subsystem, which could have allowed a local privileged attacker to execute arbitrary code, it looks like a total of 15 and 13 kernel vulnerabilities were patched for Ubuntu 17.04 and Ubuntu 16.04 LTS machines, respectively. For Ubuntu 16.04 LTS (Xenial Xerus), users will have to install the linux-image-4.4.0-79 (4.4.0-79.100) kernel package on 64-bit and 32-bit PCs, linux-image-4.4.0-1018-aws

(4.4.0-1018.27) on Amazon Web Services (AWS) systems, and linux-image-4.4.0-1014-gke (4.4.0-1014.14) on Google Container Engine (GKE) systems.

Additionally, you need to install the linux-image-4.4.0-1057-raspi2 4.4.0-1057.64 kernel on Ubuntu 16.04 LTS for Raspberry Pi 2 systems and linux-image-4.4.0-1059-snapdragon (4.4.0-1059.63) on Snapdragon processors. An HWE kernel is also available for Ubuntu 16.04.2 LTS users, namely linux-image-4.8.0-54 (4.8.0-54.57~16.04.1).

On the other hand, if you're running the Ubuntu 17.04 (Zesty Zapus) operating system, you'll need to install the linux-image 4.10.0.22.24 kernel packages on 64-bit and 32-bit machines, as well as the linux-image-raspi2 4.10.0.1006.8 kernel on Ubuntu 17.04 for Raspberry Pi 2 computers.

Source:

<http://news.softpedia.com/news/canonical-outs-major-linux-kernel-security-update-for-ubuntu-17-04-and-16-04-lts-516294.shtml>

## LINUX MALWARE MINES FOR CRYPTOCURRENCY USING RASPBERRY PI DEVICES

**A** Linux trojan detected under the generic name of Linux.MulDrop.14 is infecting Raspberry Pi devices with the purpose of mining cryptocurrency.

According to Russian antivirus maker Dr.Web, the malware was first spotted online in the second half of May in the form of a script that contains a compressed and encrypted application.

Experts say the initial infection takes place when Raspberry Pi operators leave their devices' SSH ports open to external connections.

Once a Raspberry Pi device is infected, the malware changes the password for the "pi" account.

After this, Linux.MulDrop.14 shuts down several processes and installs libraries required for its operation, including ZMap and sshpass.

The malware then launches its

cryptocurrency mining process and uses ZMap to continuously scan the Internet for other devices with an open SSH port.

Once it finds one, the malware uses sshpass to attempt to log in using the username "pi" and the password "raspberry." Only this user/password combo is used, meaning the malware only targets Raspberry Pi single-board computers.

This is somewhat out of the ordinary since most malware tries to target as many platforms as it can. Nonetheless, this version of the malware may be still under development, and other username & password combos may be added at a later date.

Last but not least, Dr.Web researchers also said they discovered a second Linux malware strain, which they named Linux.ProxyM.

As this malware's name implies, this Linux trojan is used to start a SOCKS proxy server on infected devices, which the trojan's author then uses to relay malicious traffic, disguising his real identity and location.

Source:

<https://www.bleepingcomputer.com/news/security/linux-malware-mines-for-cryptocurrency-using-raspberry-pi-devices/>

## FINALLY! UBUNTU 17.10 DAILY BUILDS USING GNOME DESKTOP BY DEFAULT

**I**n the past couple of months, the world of open source was dominated by Ubuntu's upcoming switch from Unity desktop to GNOME. Ubuntu boss Mark Shuttleworth made this announcement and said the Ubuntu GNOME development team will be merging with Canonical's Ubuntu Desktop team. Since then, people had been wondering about the future of Ubuntu Desktop.

Well, after some wait and development work, the Ubuntu 17.10 daily builds are shipping with default GNOME desktop environment. This way, Ubuntu has finally ditched the Unity desktop in the true sense, which had been the default choice since 2011.



At the moment, LightDM is the Ubuntu display manager, but the final version will ship with GDM. LightDM has two sessions: GNOME and GNOME Wayland. These builds are early releases, so expect a few bugs while trying them.

Source:

<https://fossbytes.com/ubuntu-17-10-daily-build-gnome-default/>

## HOW TO USE LINUX'S BUILT-IN USB ATTACK PROTECTION

There are USB sticks that will destroy your computer, USB sticks loaded with spyware, and even official enterprise USB sticks infected with malware. Last, but not least, when it comes to stealing data from a computer, you can't beat a USB stick. There are devices like the USG USB stick firewall, which can protect you, or if you're a Linux user, you can always stop attackers armed with USB sticks with USBGuard.

As anyone who's ever watched a TV show with our heroes sneaking out sensitive data from a computer with a USB stick knows,

Windows and Macs are easy to crack with USB-borne tools. In the real world, Linux-based USB distributions such as live-boot Tails makes this easy. USBGuard can stop any such attack.

USBGuard, as current stable Linux kernel maintainer Greg Kroah-Hartman recently pointed out, has been around for over a decade. For some reason, this user-space tool, which provides access control to USB devices, is not well known. It should be. It's a great addition to anyone needing to protect a Linux desktop or server.

This software framework is designed expressly to protect your computer against rogue USB devices by implementing basic whitelisting and blacklisting capabilities based on device attributes. It enables you to lock-down all USB devices from user space.

Source:

<http://www.zdnet.com/article/how-to-use-linuks-built-in-usb-attack-protection/>

## LINUX 4.14 WILL BE THE NEXT LTS KERNEL BRANCH

In a Google+ post, Linux kernel developer and maintainer Greg Kroah-Hartman said that Linux kernel 4.14 will be the next LTS kernel series. He asked for suggestions from the community and told that 4.14 will remain supported for at least two years. If the development process gets completed at the regular pace, we can expect to witness the final release in November. Last year in August, we told you that Linux 4.9 was going to be the next LTS kernel release. It arrived towards the November end and brought tons of new features and hardware support. That official announcement was first made by renowned Linux kernel developer Greg Kroah-Hartman.

Now, first spotted by Softpedia, Greg has once again announced on his Google+ page that the next LTS kernel branch will be Linux kernel 4.14.

In his post, Greg wrote: "As no one seemed to make 4.9 blow up too badly, let's try this again! 4.14

== next LTS kernel." He further wrote that Linux kernel 4.14 will be supported for at least 2 years.

Source:

<https://fossbytes.com/linux-4-14-next-lts-kernel/>

## UBUNTU 17.10 TO IMPROVE SECURE BOOT FOR BOOTING WINDOWS FROM GRUB, AND ENABLE PIE

The first Alpha builds of Ubuntu 17.10 are almost here, due for release next week on June 29, 2017, for opt-in flavors, so the Ubuntu developers are working around the clock to add various new features, such as PIE (Position Independent Executables) support enabled by default for better security, as well as some other improvements in many areas of interest like Secure Boot.

PIE support is good news for Ubuntu Linux users as all PIE-enabled binaries will now be automatically loaded into random locations within the virtual memory, along with all of their dependencies, each time the



respective applications are being executed. This makes Return Oriented Programming (ROP) attacks harder to execute properly.

Among other noteworthy enhancements that are coming to the Ubuntu 17.10 operating system later this year, we can mention the implementation of Netplan, Canonical's consolidated YAML network configuration across Ubuntu, in the Ubuntu Cloud images. Netplan is also being used by default to configure networks when installing an Ubuntu Server via the Debian Installer.

Other than that, there's good news for those who want to boot Ubuntu Linux alongside a Windows OS, as the Ubuntu developers are working on improving Secure Boot chainloading so you'll be able to properly boot Windows from the GRUB bootloader. Some patches were also added so that u

Source:

<http://news.softpedia.com/news/ubuntu-17-10-to-improve-secure-boot-for-booting-windows-from-grub-enable-pie-516534.shtml>

## DEBIAN 9 'STRETCH' GNU/LINUX DISTRO RELEASED

The Debian Release team has finally released the Debian 9.0 "Stretch" stable GNU/Linux distribution. Named after Toy Story's rubber toy octopus, Stretch, this release will remain supported for 5 years. Debian 9 ships with Linux kernel 4.9, new digital forensics tools, GNOME 3.22, default MariaDB, etc. You can either update your existing installation or download the new installation media from the project's website. Last month, we reported about the Debian Release Team's plans to ship the final release of Debian 9.0 "Stretch" GNU/Linux distribution on June 17. Well, acting well on their promise, they have shipped the new stable version, i.e., Debian 9, code named Stretch. For those who don't know, Debian codenames are based on the characters in the famous animated movie Toy Story. This release is named after the glittery purple rubber toy octopus, Stretch.

After a combined effort of Debian Security team and Debian LTS team, this release will be

supported for the next 5 years. The Release Team has also dedicated this release to Debian founder Ian Murdock, who passed away in December 2015.

Debian 9 could be easily called one of the most important Linux distro releases of 2017 because in the upcoming months, tons of other distros will be based on it.

Source:

<https://fossbytes.com/debian-9-stretch-features-download-torrent/>

## CANONICAL WANTS TO ADD HARDWARE ACCELERATED VIDEO PLAYBACK BY DEFAULT TO UBUNTU

In his latest report, Canonical's Will Cooke reports on the efforts the Ubuntu Desktop team is making to enable hardware-accelerated video playback for the upcoming Ubuntu 17.10 (Artful Aardvark) by default.

According to Will Cooke, the team's goal right now is to lay the

groundwork for a solution that would enable hardware-accelerated playback of video files by default, with a focus on making it work on Intel graphics cards. Support for Nvidia and AMD Radeon GPUs should come at a later time thanks to Canonical's new testing infrastructure.

The Intel SDK (Software Development Kit) issue with the LibVA library should soon be resolved as Intel is currently working on a fix. In related news, Canonical announced that it will soon unveil a call-for-testing programme for Ubuntu, inviting users to take part of small and quick tests that they can regularly perform for continued feedback on the work done so far by the Ubuntu Desktop team for the upcoming release of the operating system, Ubuntu 17.10.

This will help the Ubuntu Desktop team and Canonical ensure the overall quality of the Ubuntu Desktop Live images is kept high throughout the entire development cycle, which will end on October 19, 2017, when the final release of the Ubuntu 17.10 (Artful Aardvark) operating system hits the streets.

Source:

<http://news.softpedia.com/news/canonical-wants-to-add-hardware-accelerated-video-playback-by-default-to-ubuntu-516555.shtml>

## CANONICAL OUTS MAJOR SECURITY UPDATES FOR ALL SUPPORTED UBUNTU LINUX RELEASES

Canonical released major kernel security updates for all supported Ubuntu Linux operating systems patching up to eleven vulnerabilities across all of the supported architectures.

Most of the patched kernel vulnerabilities in these updates are new, and they've been recently fixed upstream in the Linux kernel. Therefore, it's now time for OS integrators to update their repositories and keep users safe, and Canonical is always known for doing a great job releasing up-to-date kernels for Ubuntu.

After the update, check if you're running linux-image 3.13.0.121.131 on Ubuntu 14.04 LTS or linux-image-lts-xenial 4.4.0.81.66 on Ubuntu 14.04.5 LTS

with HWE kernel, linux-image 4.4.0.81.87 on Ubuntu 16.04 LTS or linux-image 4.8.0-56.61~16.04.1 on Ubuntu 16.04.2 LTS with HWE kernel, linux-image 4.8.0.56.69 on Ubuntu 16.10, and linux-image 4.10.0.24.26 on Ubuntu 17.04.

The updated Raspberry Pi 2 kernels are linux-image-4.4.0-1059-raspi2 4.4.0-1059.67 for Ubuntu 16.04 LTS for Raspberry Pi 2, linux-image-4.8.0-1040-raspi2 4.8.0-1040.44 for Ubuntu 16.10 for Raspberry Pi 2, and linux-image-4.10.0-1008-raspi2 4.10.0-1008.11 for Ubuntu 17.04 for Raspberry Pi 2. Again, please update your installations to the new kernel builds as soon as possible.

Source:

<http://news.softpedia.com/news/canonical-outs-major-security-updates-for-all-supported-ubuntu-linux-releases-516567.shtml>

## SYSTEM76 DEVELOPER WORKS ON GNOME ENCRYPTED HOME FOLDER SUPPORT FOR UBUNTU 17.10

System76's kernel engineer Jeremy Soller announced that he's been working on bringing encrypted Home folder support in the GNOME desktop environment for the upcoming Ubuntu 17.10 (Artful Aardvark) operating system.

Last month, the Denver-based computer reseller specializing in the sale of laptops, desktops, and servers pre-loaded with the Ubuntu Linux operating system revealed their plans for preparing a consistent GNOME experience for their computers powered by Ubuntu 17.10 later this year when the OS launches officially.

While not many were impressed by the new Pop theme that System76 wants to offer by default for their Ubuntu 17.10 system with GNOME desktop, some were thrilled to learn that KDE Connect will become a first class citizen to provide users with seamless notifications from their Android devices.

And now you'll also be surprised to find out that System76 plans on allowing the Home directory on new installs of Ubuntu 17.10 with

the GNOME desktop environment to be encrypted during the creation of a new user, a functionality that appears to be implemented in the CreateUserDBus call.

Source:

<http://news.softpedia.com/news/system76-developer-works-on-gnome-encrypted-home-folder-support-for-ubuntu-17-10-516602.shtml>



Being a self-taught programmer and web developer, I frequently hear questions like “how did you get started?” or “how did you learn this on your own?”. This month, I thought that dedicating an article on how I approach learning a programming language might be a good way to formulate my future answers, and to encourage anyone who has even a passing interest to begin their journey. I will be splitting this article into two distinct sections - local (i.e. programs to be run on your local machine) and web (web apps, websites, etc).

## WHO IS THIS ARTICLE FOR?

This article is geared towards anyone remotely interested in programming, but who is uncertain about where to begin, or what approach to take. This can be designers who feel they ought to learn a little about HTML and CSS, to budding computer enthusiasts who want to learn a programming language for future careers.

## WILL THIS ARTICLE TEACH ME A LANGUAGE?

No. This article is geared towards my personal approach to learning a language. I’ll refer to some websites and books, but the actual learning of the language is out of scope.

## A FEW GENERAL POINTERS.

The following points apply to anything you decide to learn, and is therefore in a separate section:

- Do not rely on autocomplete or tools like Emmet too early on. Once you’re comfortable writing the code without a helper, feel free to enable one to save time. However, it is not supposed to be a crutch when you forget the syntax.
- Always try something new. Do not stick to the same program format - even if you just work on improving the help menu in every program you write, or trying to reduce any repetitions. You may struggle a bit, but it will help you learn.

- Look at some open source projects on GitHub. You don’t need to contribute, and you don’t need to feel too comfortable with your skills. Even just viewing someone else’s source code can help you test your understanding (i.e. can you tell what the code does), as well as seeing examples of things to do (or not do) with regards to formatting and comments.
- Lastly: Comment everything. While this is a terrific habit to build up if you’re planning to make this a profession, it will also help you immensely if you look at older programs.

## LOCAL

There are a mass of local programming languages - Python, C++, Perl, and Java just to name a few. There isn’t typically a “best language”, although there are scenarios where some languages are better suited for a particular task. If you don’t know what language to learn, there are a few ways to decide. Either see what programmers in your local area are learning (via job postings), or see

what languages are supported by your favourite devices (computers, phones, RPi, etc). It can even be something as arbitrary as liking the logo.

## THE APPROACH

Learning a local language will typically require a bit more setup than a web language. You’ll want to find a good IDE or text editor you feel comfortable in. An IDE is very useful when learning something like C++ or Java, as the tools included can help you debug issues early on. Personally, I prefer a text editor, as it’s something I’ll always have access to, instead of relying on tools included in an IDE. You’ll also want to set up a good folder structure to keep your source code, and possibly even store it in a Git repository (or something like Dropbox). That way, you can recover previous iterations of code, if necessary, or easily carry it between devices.

Lastly, ensure you’ve installed a compiler or interpreter for your chosen language. Once you can run





it in a terminal or within your IDE, you're all set.

- After you have your environment set up, look for any official tutorials/tours. These typically cover some basic 'hello world' programs. While the programs themselves aren't very creative, they help you learn the syntax and the way a language functions.
- Once you've completed the Hello World program, try to branch out into user input and/or command-line arguments (depending on the language). As the most useful applications require some form of input, it's useful to learn this early on. I typically do this using the official documentation of features, as opposed to a full-fledged guide.
- The next step should be to branch out and learn some of the oddities or strengths of your language. You can typically find a listing of these features by finding a comparison of various languages.
- At this point, I always evaluate the utility of the language. To do so I ask the following questions:
  - Does this language suit the way I think/work?
  - Is it in demand (i.e. in the workplace)?
  - Can I live with any drawbacks/oddities?

- Can it do everything I plan to achieve?
- If you answered yes (or even 'maybe') to these questions, you'll probably want to continue learning the language. To do so, I'd recommend either finding some need that you want to fill, or finding a good website with challenges, which you can implement in your chosen language.
- Here are a few things you may also want to focus on:
  - Testing (writing tests, as well as simply debugging issues).
  - Sharing/Compiling (i.e. how can you package this program up to putting it on a new computer).
  - Storing information/data. This can be done with databases, JSON, or just normal text files.
  - Reading information.
  - Executing commands from your desktop or their equivalents

- (such as using ls to list files).
- Regular expressions. Even just learning a few standard regex for searching strings or filenames will be useful.
- Lastly: learn a new language! Or, at least, stay up-to-date on the new versions of your chosen language. To keep your skills sharp and your habits ingrained, you will want to regularly try to learn something new.

## WEB

Web languages can be a bit quicker to the starting line than local languages. Using something like CodePen or a JS Fiddle, you can easily write some HTML, CSS and JavaScript without having to worry about an IDE or a hosting solution. You should definitely not

work solely with this approach, but if you're not sure

whether or not to devote time here, it's an easy way to try it out.

It may be confusing to see HTML, CSS and JS in the first step of my approach. You may be wondering what's left. There are a variety of frameworks (bootstrap, react, angular, etc) that offer more functionality to the standard HTML. There are also other languages (such as Go, Python), and expansions on JavaScript (such as ECMAScript).

To set up your development area locally, you'll need a text editor (you can also go for a WYSIWYG (what you see is what you get) program, but I would really not recommend it). Personally, I use the Atom text editor. Beyond the text editor, you'll also want some sort of LAMP stack (Linux Apache, MySQL, and PHP). My recommendation is not to install it on your main system - instead, you can set up something like Vagrant (a VM) or Docker (a containerization tool). This is for two main reasons - if you use frameworks or tools like Node or NPM, you can more easily control the installed versions for optimal support, and because Docker is



gaining massive popularity in the workplace. Docker is also portable, making it easier to carry your projects over to a new computer. I've previously written about Docker in FCM#107. If you're looking at Python or Go, both offer a local development server built into the compilation tool. WebPack (covered in C&C in FCM#120) also offers a local development site for working on HTML, JS and CSS.

## THE APPROACH

- Learn HTML5, CSS and JS. You don't need to master JavaScript, but you do need a basic understanding of it. Neither HTML nor CSS are terribly complex - the moment you feel comfortable creating a basic 'hello world' HTML page with a bit of styling, you're ready to carry on. This can easily be done in CodePen.
- The first step I would recommend is learning the "modern web" - HTML5 (which should have been done in #1), @supports, Flexbox, and CSS Grids in CSS 3. The three elements of CSS I listed are currently supported in the most recent versions of every popular browser, and mitigate a lot of headaches that developers

previously had. If you begin a project with the goal of supporting older browsers, I would still recommend beginning with the modern tools, and then creating either a fallback stylesheet, or wrapping the modern code in @supports. If you're unsure what the difference is between old versions of HTML and HTML5, you should look into the new elements introduced in HTML5 (such as <main>, <aside>, <footer>, <header>).

- At this point, you should decide on what language you're focusing on. If you just want to continue learning HTML and CSS, you may want to look into CSS custom properties, as opposed to finding a preprocessor. You'll also want to look into something like Grunt or Webpack to use autoprefixer, which will help reduce how much CSS you have to write (see FCM #120 for my WebPack article). If you decide to focus on a language like Python or Go, you'll want to make sure you install it correctly and can run the commands from a terminal. If you choose to learn PHP, make sure support is enabled/installed on your system or Docker (using Apache or Nginx). Or perhaps you're just interested in learning about AMP

(Accelerated Mobile Pages) by Google.

- You should begin with a tour or tutorial on the language you've decided upon. Depending on what language you're looking at, the steps may vary.
- After the tour or tutorial, you'll want to see about integrating what you learned about HTML and CSS into the new language. In Go and Python, this means templating, and, in JS frameworks, you'll probably already be integrating some of this.
- Content. Here you should focus on how to get content into your website or web app. This can be databases, a content management system, a static site generator (such as grow or jekyll) or pulling information from a feed (RSS or JSON). If you use a content management system, I would recommend starting with an API Content Management System (such as Cockpit) first, as it can help you understand how all CMS systems work, as opposed to jumping right into something like WordPress.
- Testing. You should look at your resulting website or web app on a few different devices - phones, tablets, computers, and varying browsers. You'll quickly

understand how wide-ranging the support is, and how many issues can crop up. Don't be disheartened - you don't typically need to support every possible device, and there are a variety of tools to help you improve support.

- Lastly, deployment. You should look into how you would go about hosting your application, and also how you would "go live". This can be FTP + Docker + DigitalOcean, or Git + Heroku, or GitHub Pages + Git. Every combination has its strengths and weaknesses, which is why you should do some research to see what works for your language choice.

## DESIGN

While the approach above focuses on the programming aspect, creating a visually appealing site is largely dependent on your design. At any time after Step 2 in the approach above would be an acceptable time to start reading on design approaches. Covering things such as Material Design, or reading articles from Smashing Magazine or CSS-Tricks are a good place to start. There are also a few books that I highly recommend: Smashing

Book 5 (from Smashing Magazine) is written by a variety of authors, and is a terrific insight into common design approaches. Also, *Hardboiled Web Design* by Andy Clarke (Fifth Edition) is an excellent read on new technologies, approaches, and tips for creating modern websites. Both are available in physical copies, or digitally. Even just taking the time to analyse source code on websites you like is a terrific way to learn - I would recommend keeping either a local wiki or some form of journal outlining things you've seen that you would at some point want to implement. Naturally, if you're not planning to turn this into a job (or even put it on your CV), you can choose to ignore anything outlined here.

I hope this article proves useful to anyone who was feeling overwhelmed by the mass of options and instructions to be found on the web. When in doubt - start with a basic 'hello world', and then go from there! If you have any tips you'd like to share, send them to me at [lswest34+fcem@gmail.com](mailto:lswest34+fcem@gmail.com). I will collect any responses together into an article at a later date. Feel free to also email me with any

questions, suggestions, or ideas for articles.

## FURTHER READING

CodeFights (programming challenges) - <https://codefights.com/home>

Project Euler (largely mathematical programming challenges) - <https://projecteuler.net/>

2016/2017 MUST-KNOW Web Development Tech Video (YouTube) - <https://www.youtube.com/watch?v=sBzRwzY7G-k&index=7&list=PLQjv2GANsZ1JAKzoz631tlyIOZiJ3T2R6>

CodeAcademy (website to learn coding with free courses) - <https://www.codecademy.com/>

Code School (website to learn coding, with some free courses) - <https://www.codeschool.com/>

Videos/Workshops from Google IO, the AMP Conference, or Beyond Tellerrand (all found on YouTube).

C&C in FCM #121 - All about Go

C&C in FCM #73 - A basic introduction to some websites for learning to code.

Udemy (online library of paid courses, frequently on sale) - <https://www.udemy.com>

Udacity (online university that offers micro degrees and some free courses, in partnership with Google/Facebook/etc.) - <https://www.udacity.com/courses/all>



**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](mailto:lswest34@gmail.com).

## THE FULL CIRCLE WEEKLY NEWS



### Full Circle Weekly News

A short podcast (<10min) with just the news. No chit-chat. No time wasting. Just the latest FOSS/Linux/Ubuntu news.

**RSS:**  
<http://fullcirclemagazine.org/feed/podcast>







Welcome back to our 'Temp/Humidity via Bluetooth' project. As you will remember, last month we got everything working to a smartphone. This month, we will be working on getting things up and running on the Raspberry Pi.

The first thing we have to do is get the RPi Bluetooth connected to the Arduino. I'm going to assume that you already have the proper bluetooth software installed on your RPi. I've installed bluetooth-5.23-2+rp12, bluez-5.23-2+rp12, bluez-firmware-1.2-3+4rp11, pi-bluetooth-0.1.3 and pulseaudio-module-bluetooth-5.0-13 on my RPi3. I'm sure that some of those are not needed for basic bluetooth communications. There are many places on the web that can explain the process. Once you get everything installed, connect to your Arduino bluetooth device. I had to use "1234" during the pairing process. I also marked it as a trusted device.

Once we have it paired and trusted, we need to do some

command-line magic to create a virtual serial port named 'rfcomm1'.

In a terminal type:

```
hcitool scan
```

You should see something like:

```
pi@raspberrypi:~ $ hcitool scan
Scanning ...
          98:D3:31:30:49:B1
HC-06
pi@raspberrypi:~ $
```

The big thing you should take away from this is the mac address of the bluetooth device (hopefully the arduino) that you are connected to. You will be using this address in the next command.

Now, type:

```
sudo rfcomm bind /dev/rfcomm1
98:D3:31:30:49:B1
```

Where the 98:D3:31:30:49:B1 is the mac address of the bluetooth H05/06 module on the Arduino that was obtained from the hcitool command above. Yours will be

different, so use it.

Now in the terminal type:

```
rfcomm
```

Again, you should see something like this:

```
pi@raspberrypi:~ $ rfcomm
rfcomm1: 98:D3:31:30:49:B1
channel 1 clean
pi@raspberrypi:~ $
```

This tells you that you now have an open serial port into the Arduino bluetooth device.

Finally, in the terminal type:

```
sudo picocom -c /dev/rfcomm1
```

In the terminal, you should see:

```
rfcomm1: 98:D3:31:30:49:B1
channel 1 clean

picocom v1.7

port is           : /dev/rfcomm1
flowcontrol      : none
baudrate is      : 9600
parity is        : none
databits are     : 8
escape is        : C-a
```

```
local echo is    : yes
noinit is       : no
noreset is      : no
nolock is       : no
send_cmd is     : sz -vv
receive_cmd is  : rz -vv
imap is         :
omap is         :
emap is         :
crclrf,delbs,
```

Terminal ready

This will allow you to send a "T" for temperature, an "H" for humidity, or an "A" for both.

You will have to repeat most of this process each time you reboot the RPi. I made a shell script that contained those lines so I could run it as needed.

However, this series is about using Python, so, next, we'll write a simple program to communicate with our Arduino.

## A SIMPLE TERMINAL PROGRAM

Below is a very simple program in Python that will allow us to communicate to the Arduino via

the serial port.

The first three lines import the pyserial library and set up the port.

```
import serial

port = "/dev/rfcomm1"
baud = 19200
```

The next line uses only some of the parameters available since the others aren't needed. The important one is the timeout parameter. If we set the timeout to "none", the system will wait forever (blocking) until the specified number of characters have been received in the .read command. If we set the timeout to 0, the system will return immediately, returning 0 or more characters from the port. We, however will set the timeout to 1 second. You can specify the number of seconds for the system to wait and you can use a float value.

```
ser = serial.Serial(port,
baud, timeout=1)
```

In the next two lines (plus the comment), we are simply verifying the serial port is open and then printing that fact.

```
# open the serial port

if ser.isOpen():
    print(ser.name + ' is
open...')
```

Now comes the meat of the program. We start a "forever" loop, sending out a prompt to enter a command or to enter 'exit' to quit, and wait for input from the user. This works perfectly for our purposes, since the Arduino is also waiting for a command. It also allows us to terminate the program properly.

```
while True:
    cmd = raw_input("Enter
command or 'exit':")
    # for Python 2
    # cmd = input("Enter
command or 'exit':")
    # for Python 3
    if cmd == 'exit':
        ser.close()
        exit()
```

Now that there is something in the cmd variable, we encode it to ascii, append a CRLF to it, and then write it to the serial port. We then use the ser.readlines() command to get the data from our Arduino. We actually have several options here to read from the serial port. If we had used ser.read(), we would have had to specify the number of bytes to be received. Since that can

change depending on the command we send, that option isn't really a good one without a lot of work. We also could have used the ser.readline() command, but that only reads up to the CRLF being sent in, so while good for the "T" or "H" command, the "A" command which sends two lines, would have some problems. The timeout value we set earlier is important, since the system would block until the CRLF is returned.

```
else:
    ser.write(cmd.encode('ascii')
+'\\r\\n')
    out = ser.readlines()
    for l in out:
        print l
```

The source (short as it is) is available on pastebin at <https://pastebin.com/tXWirGCX>

So, that's it for this month. We've successfully created the Temp and Humidity sensor circuit and are now able to read its values with a remote Raspberry Pi using Python.

We'll see you next month.



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



# HOW-TO

Written by Alan Ward

# Intro To FreeCAD - Pt3

In this series, we will be examining the world of FreeCAD, an open-source CAD modelling application that is still in Beta, but has been gaining acceptance in recent years. Naturally, it is readily available in the Ubuntu repositories. In the second article on using FreeCAD, we created a simple planar object to illustrate the use of the main workspaces (Draft and Part), drawing tools, and extrusion.

In this part, we will use further tools to create a more complex 3D object, representing a Y-junction

between two pipes of different diameters. This project is actually quite involved from the standpoint of technical drawing, since at one point we will be representing the intersection between two curved surfaces - which always makes for interesting shapes as any pipe welder can testify to.

## ROLLING A PIPE

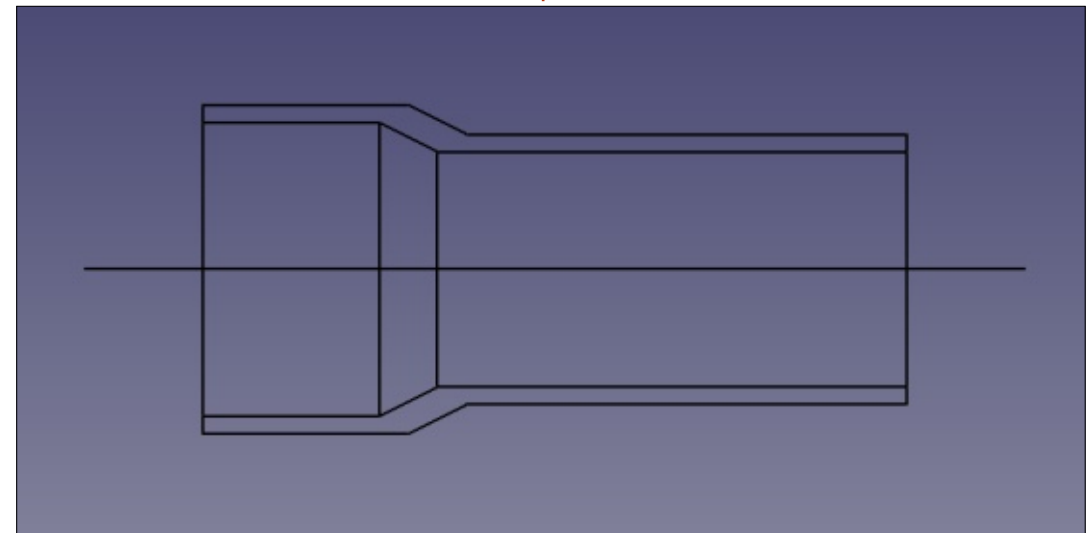
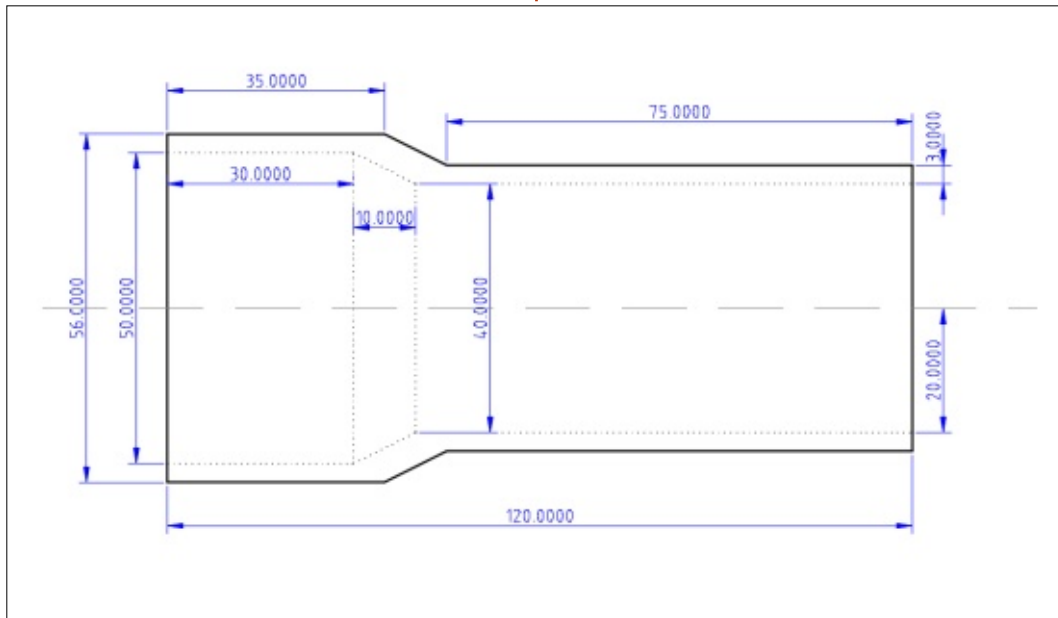
Let us begin with the section of thin-walled pipe shown here. All dimensions are in millimeters. In this example, total length is 120

mm, with an initial flared section 30 mm long on the inside and 35 mm outside. The shell is 3 mm thick along most of its length, with a slightly thicker section where the flare meets the main tube body. This is done with a gradient of 1:2 both inside and outside. Finally, the main tube body has an inner diameter of 40 mm, while the flare goes out to 50 mm internal diameter.

What is particularly interesting about this piece is the axis of revolution shown in dashed gray: if we take the outside edge of our object and make it revolve around this axis, we will be creating the

outside shell of our solid object in 3D. Likewise, the inside edge of the wall (in dotted lines) may also be revolved around the same axis, giving us the inner shell of our 3D object. In essence, we will be using a similar tool to the extrusion used in the last part of this series, but running around a circle instead of moving in a straight line.

To design this part, I could have begun within the Draft workbench of FreeCAD, and drawn each line section needed to complete a section of the tube wall. However, I actually started out with LibreCAD. As discussed previously, the LibreCAD application is best suited





# HOWTO - FREECAD

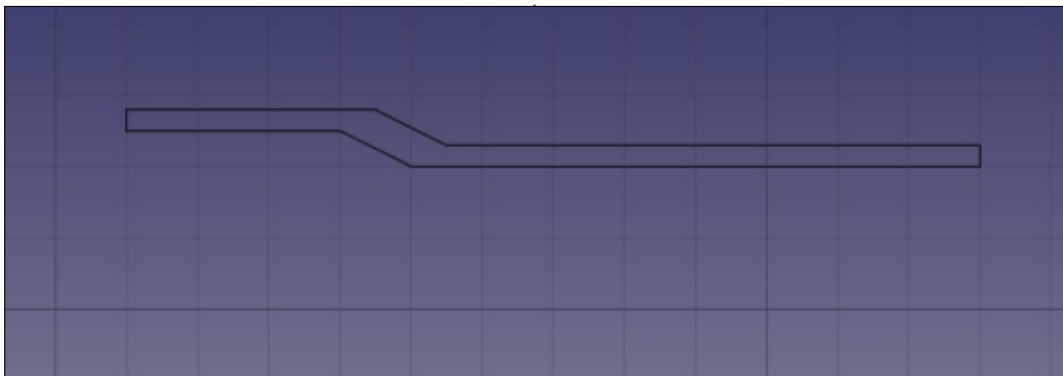
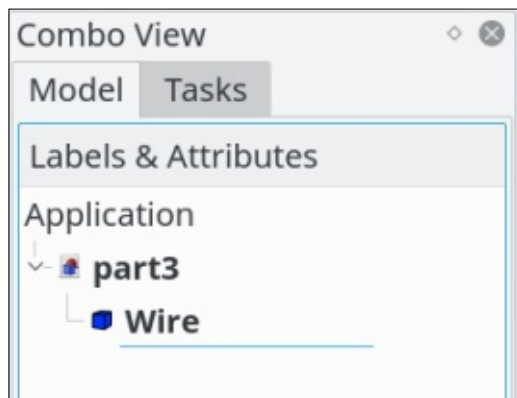
to drawing objects in two dimensions, which is why FreeCAD had been preferred as a base tool for this series. However, LibreCAD does have an option to export drawings in the widely-used DXF (AutoCAD) file format, which can then be imported into FreeCAD and used as a basis to work with. Since the lines are already correctly positioned, it may be advantageous to use this scheme to set up our FreeCAD object.

In FreeCAD, begin by starting a new project. Now choose menu option File > Import

Now, we have several more elements than are needed for the tube wall. The axis needs to be removed, as well as the (previously dotted) lines denoting rotated edges. The lower copy of the wall section will also be erased, leaving just the higher copy, ready to be

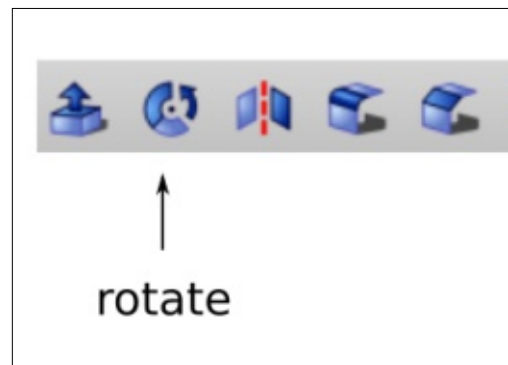
rotated. In the Draft workbench, examine the Combo view on your left, and you will see each individual line from the DXF file, that can then be erased, moved, or modified, as needed.

When we are satisfied, as before, we will need to combine the collection of Lines into a single Wire object with the "join objects" tool in the modification toolbar (whose icon is the blue up arrow). Select all segments, either in the combo view or in the drawing itself - holding down the Ctrl-key to



select multiple objects - and use the join tool. In the combo view, we will see the four segments disappear, to be replaced by a single Wire object.

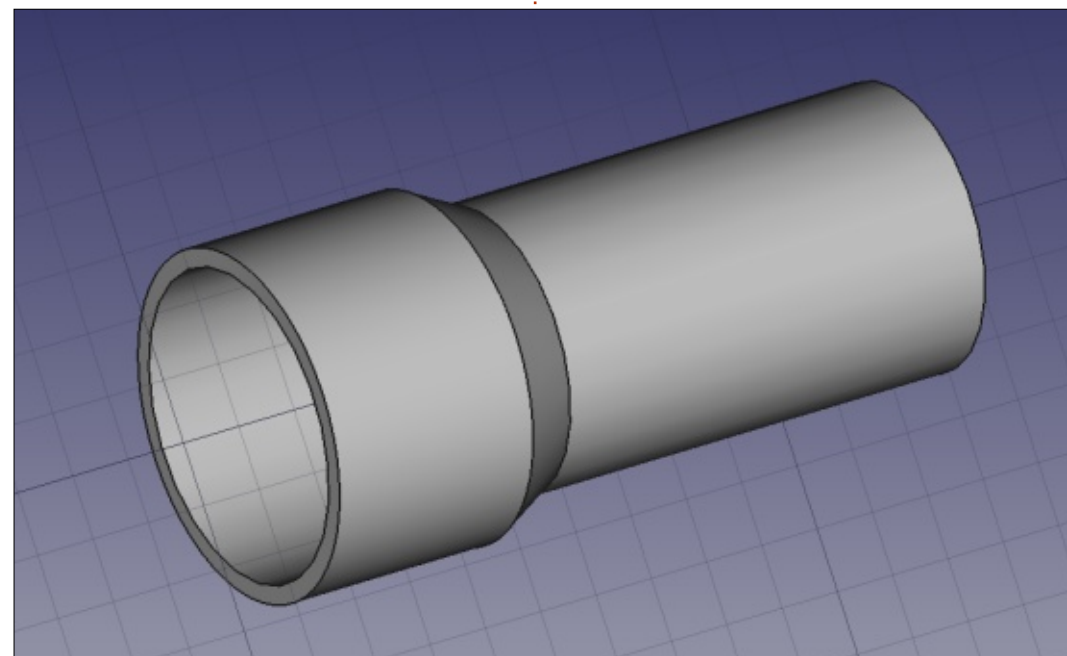
To create the actual 3D tube, let us move to the Part workbench. Now choose the "Rotate object" tool from the 3D toolbar.



Be sure to select the X axis to rotate around, since the tube object is symmetrical about this horizontal axis. Also, activate the "Solid object" checkbox. This will allow us to use this part as a complete object further on, and to make holes in it to allow branching with the lateral piece of pipe.

## ADDING A LATERAL PIECE OF PIPE IN A Y-JUNCTION

We are now going to add a small piece of pipe, with inner diameter 20 mm and outer diameter 26 mm, attacking our existing tube at an angle of 45 degrees. The axis of



the new pipe will intersect our existing axis at 100 mm along its length.

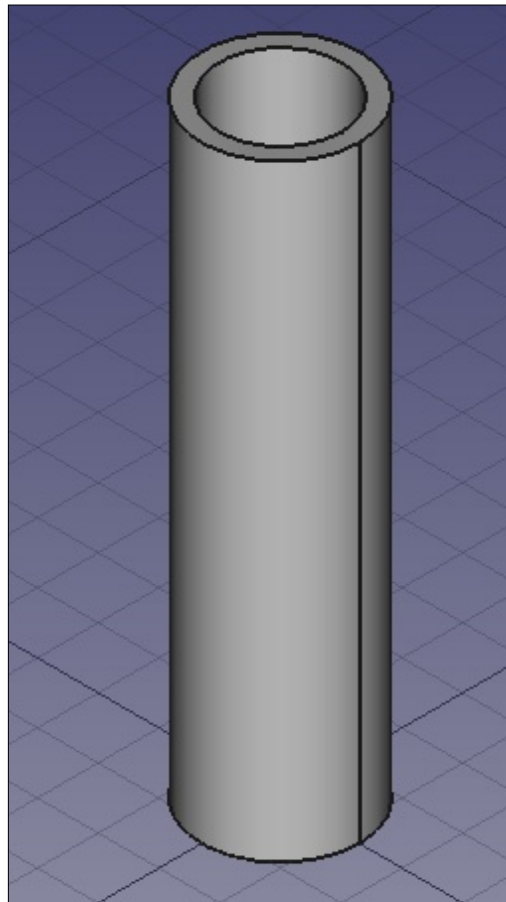
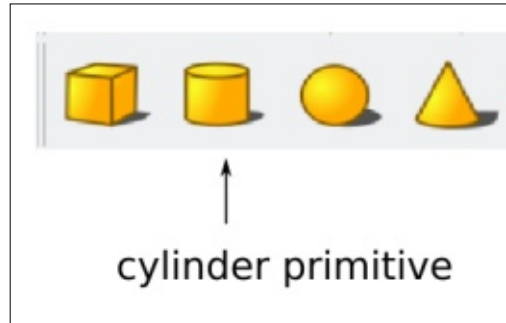
There are several ways of creating this new piece of pipe. We could proceed as before, drawing the outline with Line segments and then rotate the piece to create a 3D revolution solid. This can be created aligned with one of the standard axes, for example the Y axis, and then moved into position as required. However, since the shape of the new piece of pipe is rather straightforward, it may be easier to use pre-existing primitive

shapes to form it.

Let us begin by hiding the existing tube. This is done by going to the Combo view on the left, selecting the Revolve object, and hitting the space key on the keyboard. It will not remove the tube from our project, but simply make it invisible - thus making the construction of the smaller tube easier to visualize.

Now, using the Primitives toolbar visible in the Part workbench, let us create two cylinders. For the time being, they

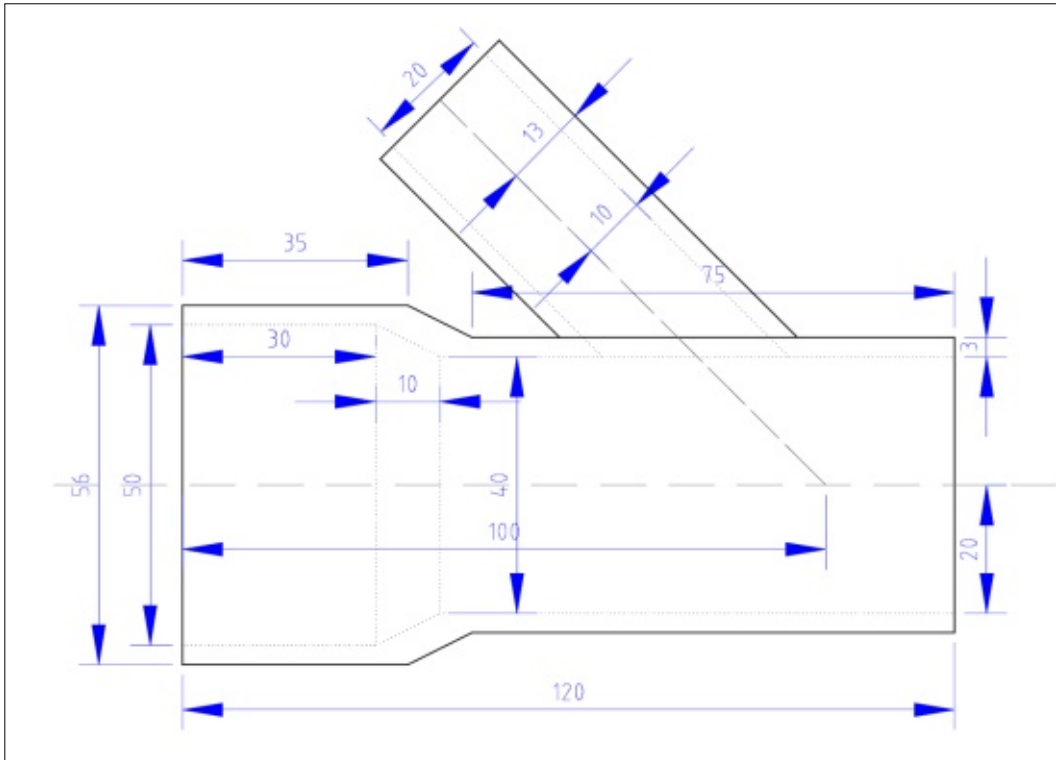
will both appear in the same position, as "Cylinder" and "Cylinder001". Default characteristics are a radius of 2 mm and height of 10 mm.



Now, using the Combo view on the left, choose the first Cylinder and go to the bottom tab marked "Data". Here, change the radius to 13 mm and the height to 100 mm. This will be the solid material for our new tube.

Choose the second Cylinder, and do the same, giving it radius 10 mm and height 104 mm. This is the shape we will cut out from the first cylinder, making it hollow. However, as in the part created in the last article of this series, both cylinders end at the same Z-coordinate. This means FreeCAD can have difficulties calculating exactly where the cutout is to end. To make things more clear, let us move the second cylinder downwards by 2 mm, making it protrude slightly from each end of the first cylinder. This is done by editing Placement > Position > z in the same tab, and giving it negative value -2 mm.

We will now use the second cylinder to cut a hole in the first. In the Combo view, choose in sequence the first cylinder, then the second, holding down the Ctrl-key when choosing the second object. Then, choose menu option Part > Boolean > Cut, and the two



cylinders should be combined into a single hollow tube using Constructive Solid Geometry.

We are ready to assemble the two parts of our project. Go back to the Combo view, choose the Revolution object - the main tube - and press the space key. Both objects should become visible at once, with a bit of zooming. However, the new Cut object is still

vertical and needs to be tilted to 45 degrees, while the larger Revolution object has been placed at some distance from the coordinate system's origin for some reason, perhaps related to the use of a DXF file to import its basic shape.

To tilt the Cut object, go to the Combo view, select this object, choose the Data tab as before, and

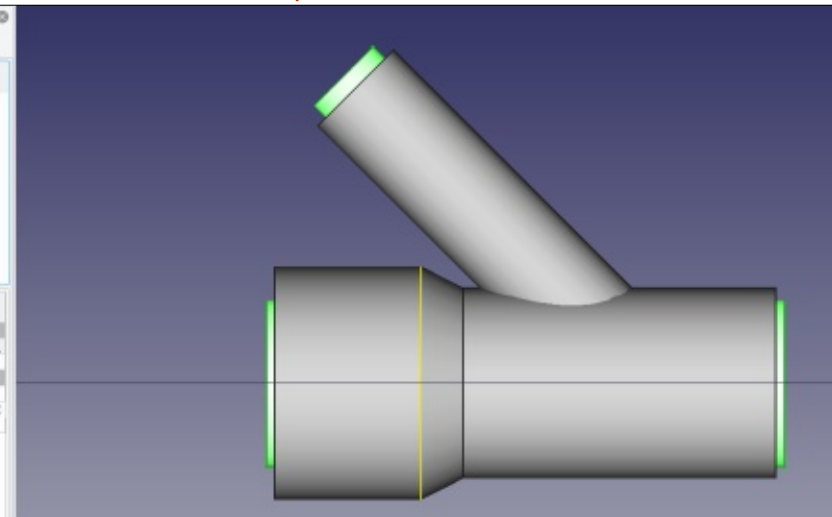
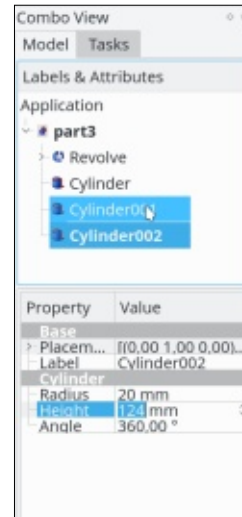
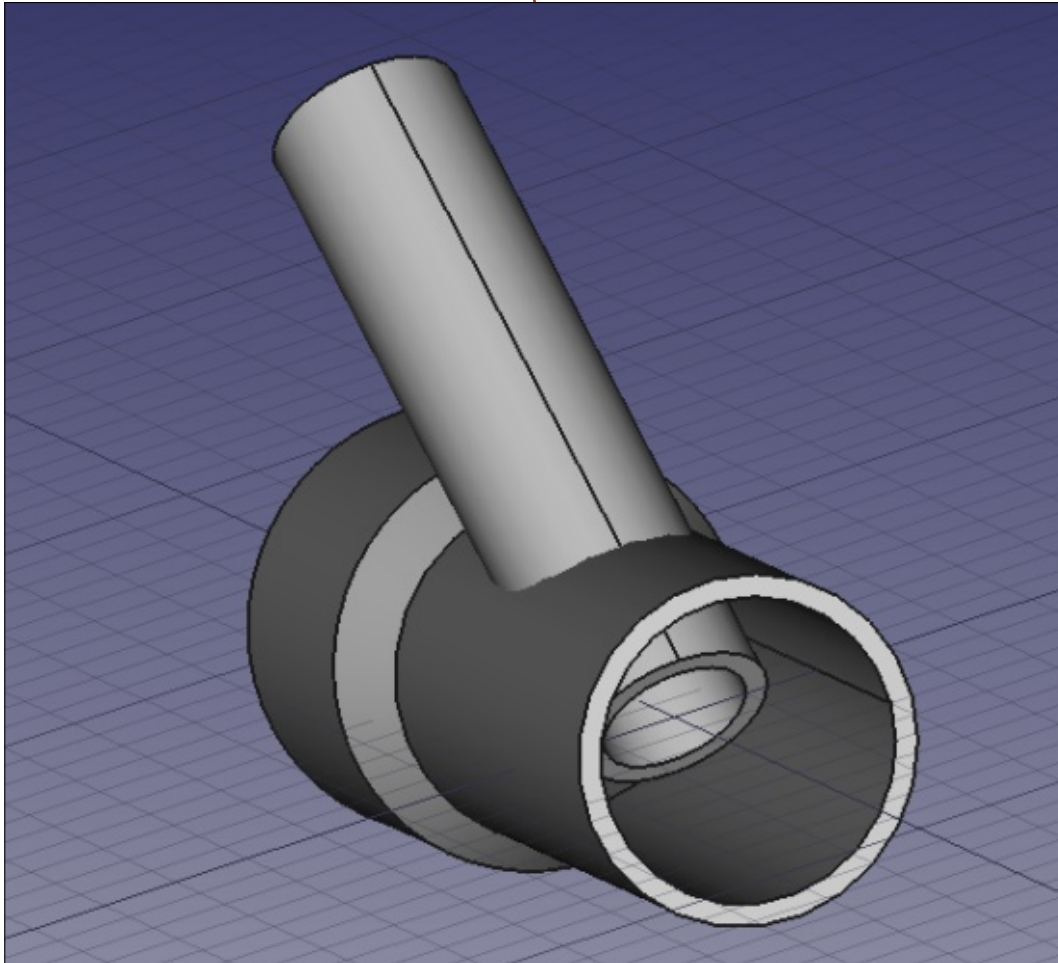
unscroll Placement. We need to change the Axis values to [0.00, 1.00, 0.00] since we will be rotating around the Y axis, and then change Angle to -45 degrees to tilt the Cut object backwards to our left.

Now select the Revolution object, and modify Placement > Position > x value until the two parts are assembled in their correct position. I needed to specify -200 mm for this to happen.

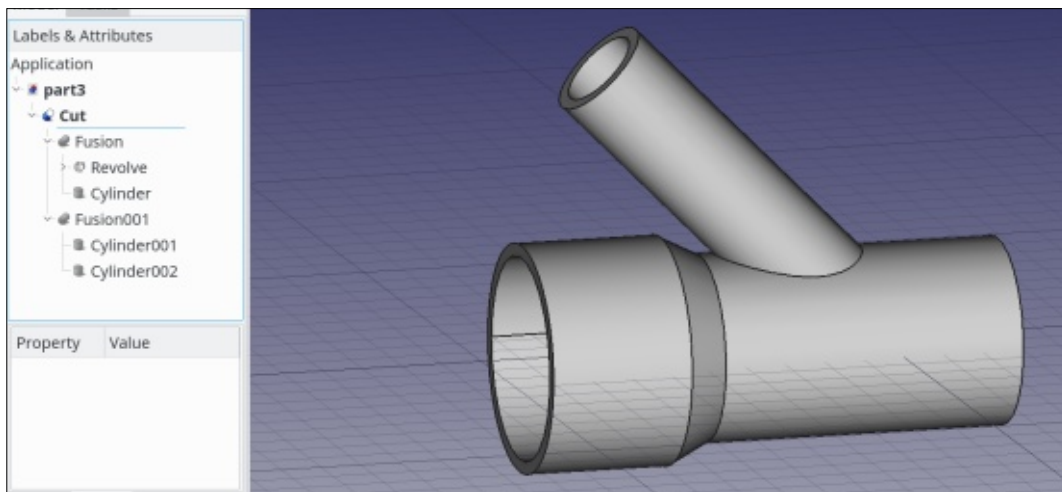
We still have a couple of problems, however. The small pipe is protruding through the wall of the main tube, but it is not yet cutting a hole in that wall. On the other hand, there is a piece of the small pipe within the large one that also needs to be cut off.

The easiest solution for the first bit is simply to undo our boolean cut operation by simply clicking on the Cut object in Combo view, and deleting it. We should now have three objects in our project: the Revolve object representing the large tube, Cylinder as the outer shape of the small pipe, and Cylinder001 the inner shape of the cutout. The two Cylinder objects will need to be rotated once more to -45 degrees along the Y axis, since the rotation we had applied previously concerned the combined Cut object which we have since erased.

Now, add a third Cylinder object - labelled Cylinder002 - to represent the interior of the large tube. It should have radius 20 mm,







height 124 mm, be rotated on Axis [0.00, 1.00, 0.00] (the Y axis) by +90 degrees, and then placed to the left by 92 mm by changing Position > x value to -92 .

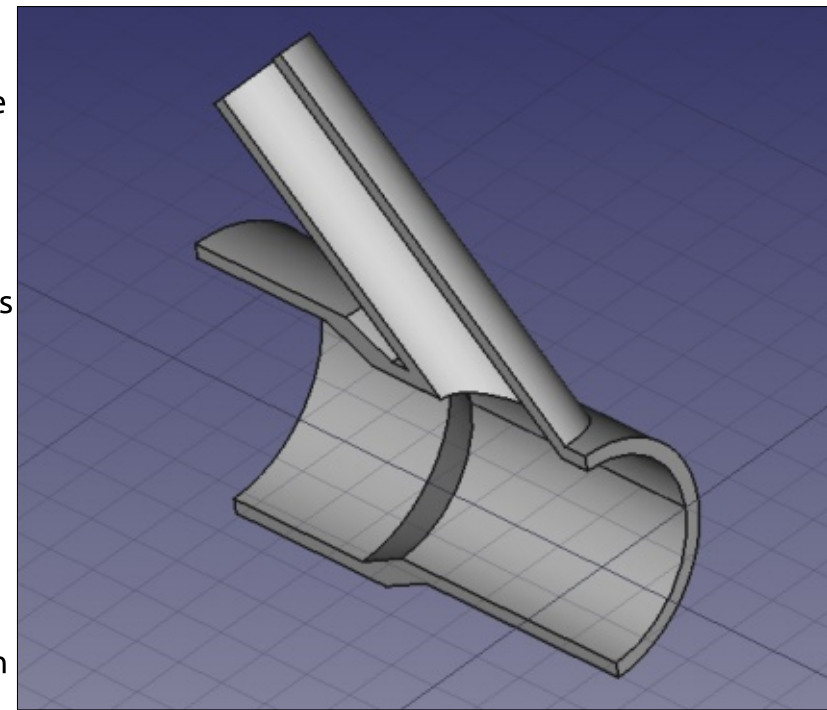
Finally, we can join the two external objects, Revolve and Cylinder, in a single Fusion object: choose Revolve, then Cylinder with the Ctrl-key pressed, and finally menu option Part > Boolean > Union. This should create a new object called "Fusion". Now, do the same with Cylinder001 and Cylinder002, creating "Fusion001". At this point, we should see only the two Fusion objects, one representing the material we are adding to our project, and the second representing the cutout or material we will be subtracting. Now choose these two objects in

order: Fusion, then Fusion001, and choose Part > Boolean > Cut. We should end up with our final, finished tube Y-union. We can note the shape of the union between the two tubes.

This technique of combining all the bits of our project that add material into a single Fusion object, and all cutouts into another before making the final Cut, can come in useful when designing parts with complex CSG geometries. The general workflow is similar to that used in Sketchup, which should mean making the transition from one program to the other is rather painless.

Once completed, our object can be cut open as needed to examine the interior geometry and the

section of each piece, for instance to make sure there is enough material to support any structural or pressure stresses that the finished part may encounter. This cutting open is left as an exercise to the reader. Hint: try Part > Boolean > Intersection with another object.



## WHAT NEXT?

In this article on using FreeCAD, we used several techniques to create a complex 3D object, representing a Y-junction between two pipes of different diameters. The Revolution tool was used to create the form of a tube in 3D, from a plane section of the tube wall. The Cylinder primitive was used to create the form of the small pipe attached to the main tube, and then to create cutouts to empty out both forms. In the next part of the series, we will

investigate the use of sketches to implement constraints on segment placing.



**Alan** holds a PhD in Information and the Knowledge Society. He teaches computer science at Escola Andorrana de Batxillerat (high-school). He has previously given GNU/Linux courses at the University of Andorra and taught GNU/Linux systems administration at the Open University of Catalunya (UOC).



# HOW-TO

Written by Ronnie Tucker

# Install UBports (Ubuntu Touch)

As many device holders will know, Canonical has discontinued Ubuntu Touch and this means our devices would sit dormant with no future updates. Not so! UBports have come to the rescue, and will continue to maintain Ubuntu Touch for all official devices which came via Canonical, and the devices that UBports ported Touch to. The full list (as of writing) is:

- Nexus 5*
- Meizu Pro 5*
- Meizu MX4*
- Fairphone 2*
- BQ M10 HD*
- BQ M10 FHD*
- BQ Aquaris E5*
- EQ Aquaris E4.5*

So is there anything you need to do? Yes. You need to flash your device to the UBports version of Touch. This is quite painless and has been made moreso by the release of the UBports Installer software.

**WARNING!** Flashing your device will completely erase it and install a new OS. Be sure you have backed up any necessary files before doing anything else.

## DEVELOPER MODE

Before we continue, it's usually best to put your device into 'Developer Mode'. You do this by going into System > About > Developer Mode. In this screen, you'll see a switch for Developer mode. Slide the switch to make it show green. A popup will appear at the top of the screen asking if you want to allow/disallow this. You need to allow it.

## DOWNLOAD

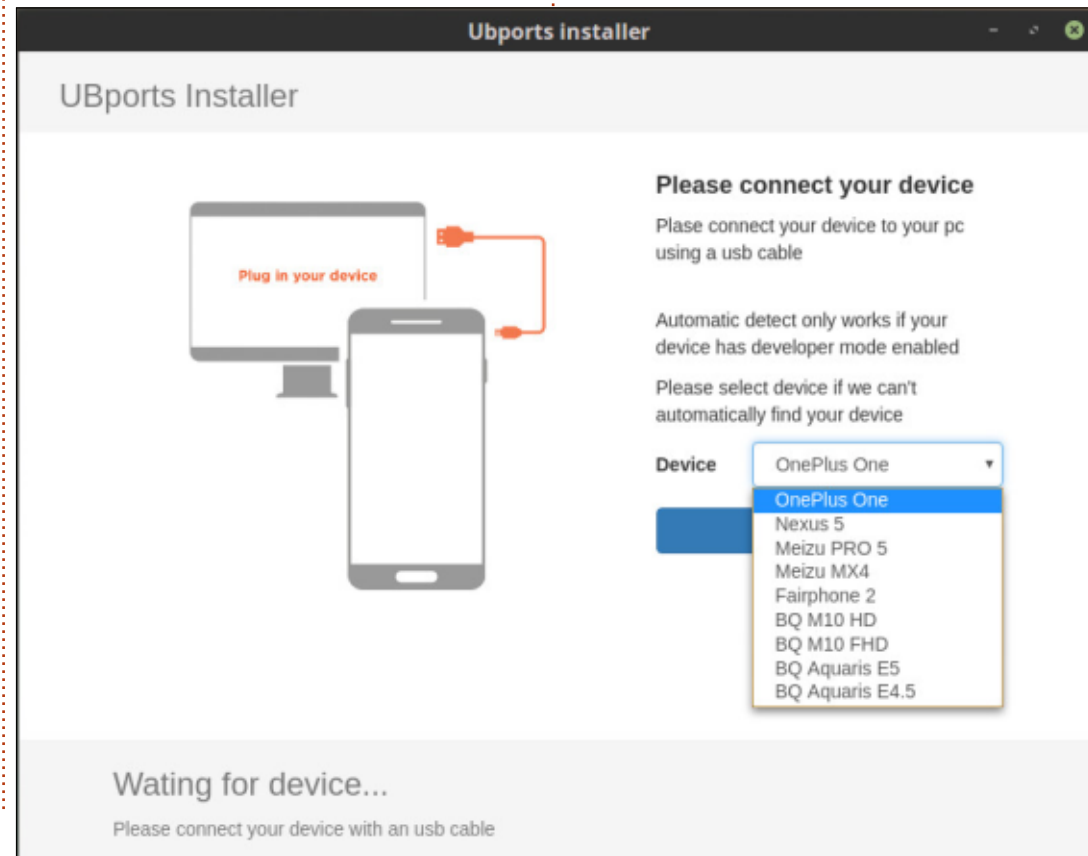
The first thing you need to do is download the installer. This is done via: <https://github.com/ubports/ubports-installer/releases>. If you want to compile source code, you can, but for this I'll be using the Applmage version. Save the file ubports-installer-0.1.4-beta-

x86\_64.Applmage to your system.

Once it's finished downloading, you need to check that it'll execute. Right click on the file and (in the menu) go to Properties. There should be a tab for Permissions. Click that, and you should see something along the lines of 'Allow executing file as

program'. Check the little box beside that. Close that Properties window. Now you can double click on the file to run it.

On first run, you'll see the app window. It has a dropdown menu of the supported devices and is displaying 'Waiting for device...' at the bottom.



## FASTBOOT

The device has to be in 'fastboot' mode. Getting the device into Fastboot mode is different for each device. For my BQ M10 FHD, I had to turn off the device then hold down volume-up and power. This took about 5 or 6 seconds before the device came on with the white screen. I let the buttons go, and up came a menu with several options. Using the

up/down volume keys, I selected fastboot and pressed the power button. That put the device into fastboot mode. For the Meizu MX4 (that I'm going to use for this tutorial), it was volume-down and power. Again, it took a few seconds before the device reacted and it went straight to fastboot mode. No menu.

You'll know when the device is in fastboot mode as the screen will be blank apart from some very

small white text at the bottom saying '=> **FASTBOOT mode...**'

## FLASH! AH-AAA!

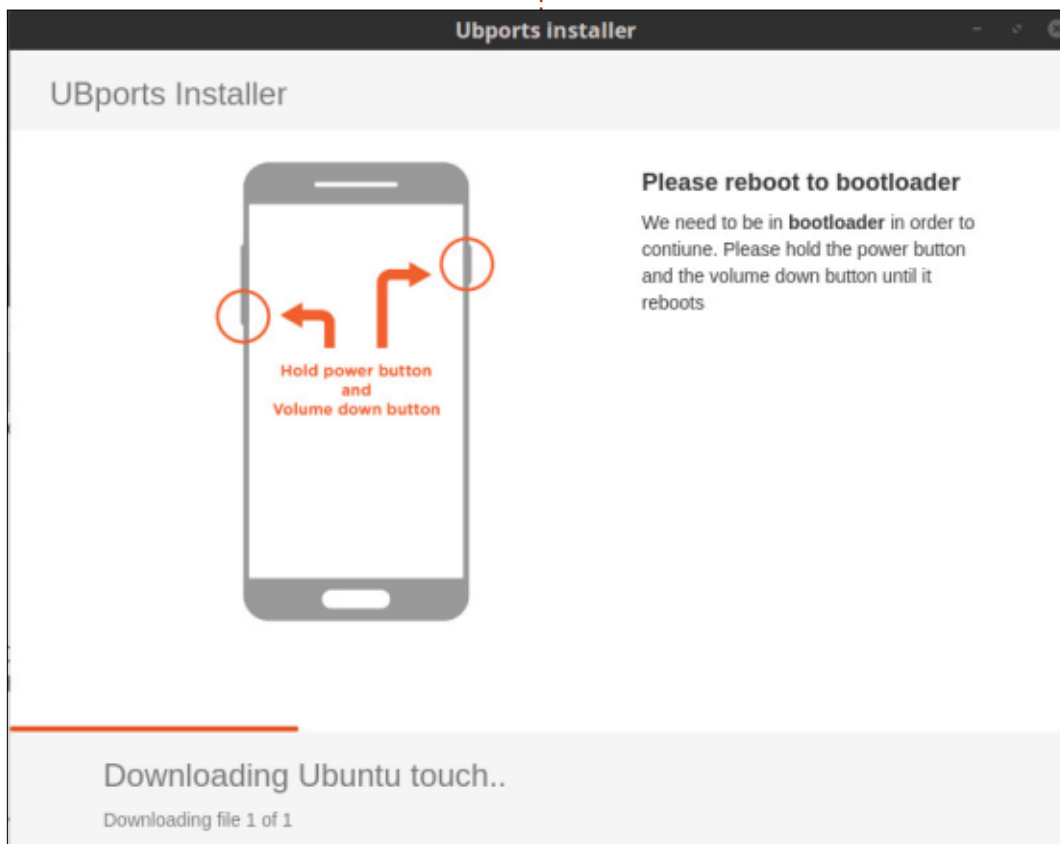
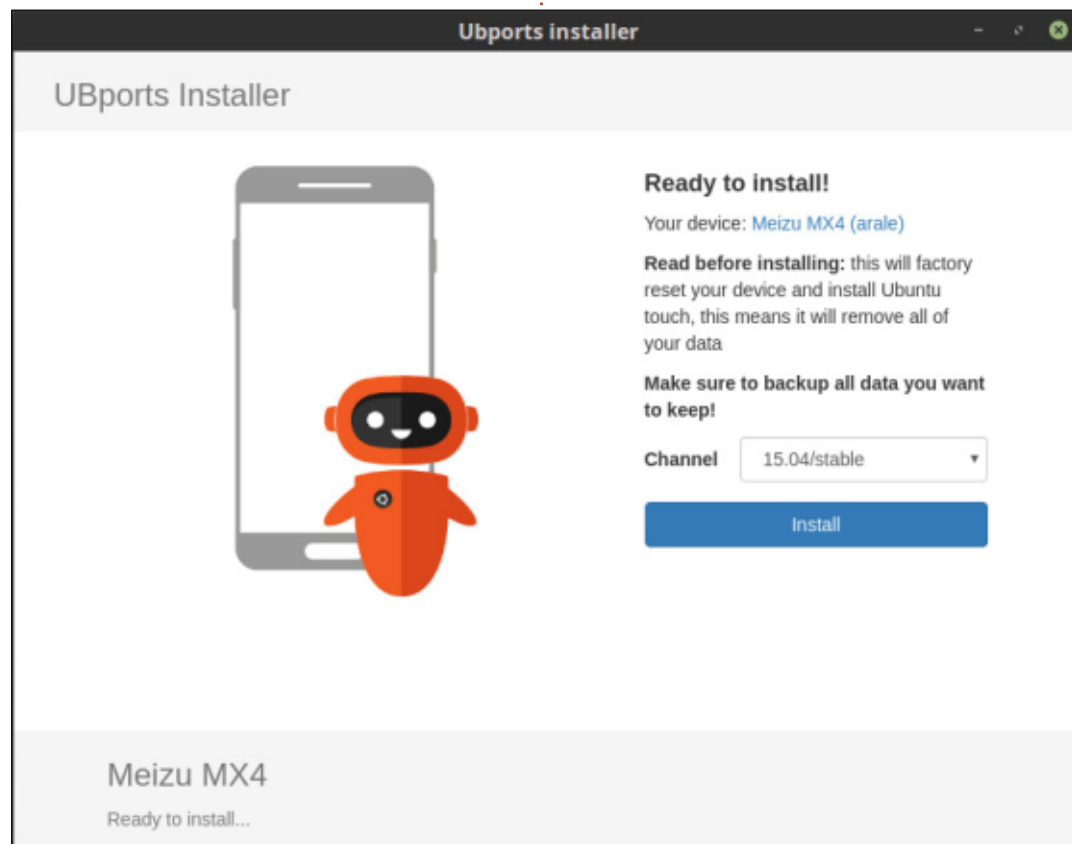
With the device in fastboot, it's time to plug in the USB cable. I chose the MX4 from the list and clicked select. If your device is in developer mode, it will auto detect the device for you.

The app agrees that it is an MX4 and is now ready to install

15.04/stable. You can choose to install the rc, or developer, channels, but I'm sticking with stable. Now I click install.

The installer will remind you that you're about to factory-reset and lose all data. Click install as long as you don't mind losing all data on the device.

Now the installer asks for a password. This is your desktop root password. Enter that and click



# HOWTO - INSTALL UBPORTS

OK.

You're off!

After Touch had downloaded, the flashboot text at the bottom of my MX4 changed (I couldn't manage to get a photo of it) and the phone rebooted with the Ubuntu logo on the screen and the installer changes to say that it's downloading more files.

All the while, my MX4 sat there

with the purple wallpaper and white Ubuntu logo.

After downloading all the files, the installer will begin pushing the files to the device.

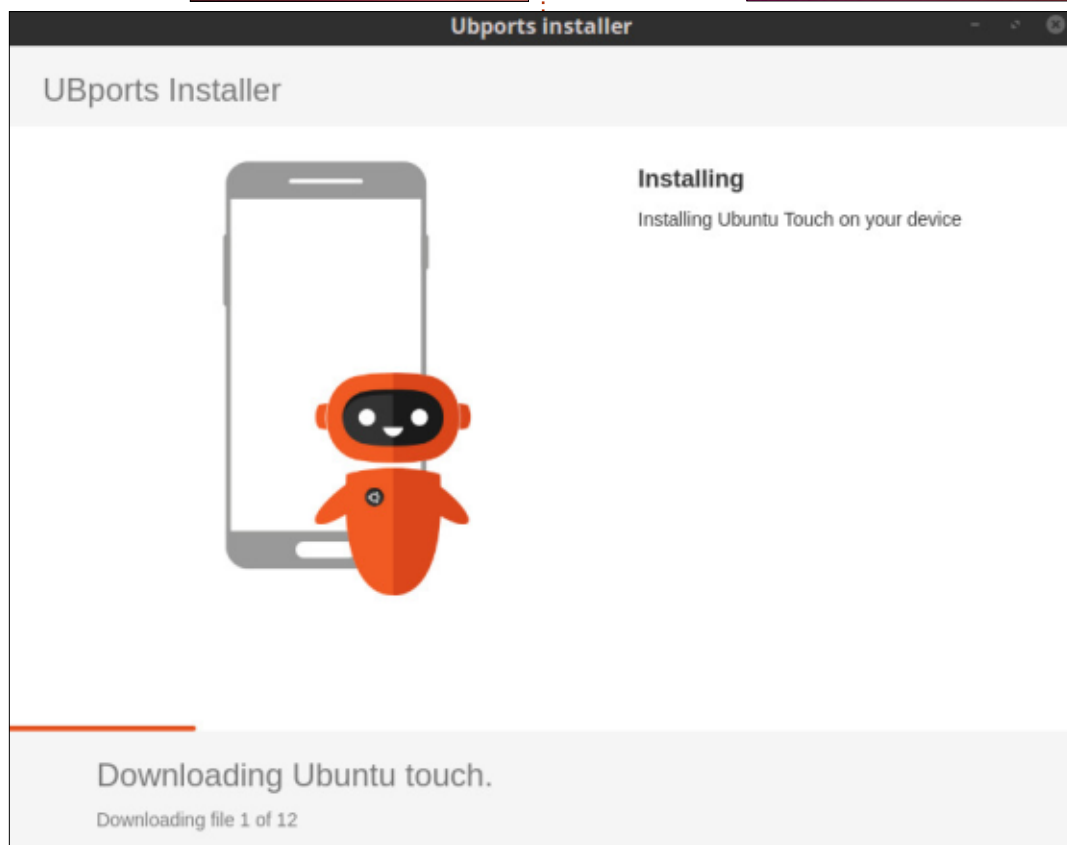
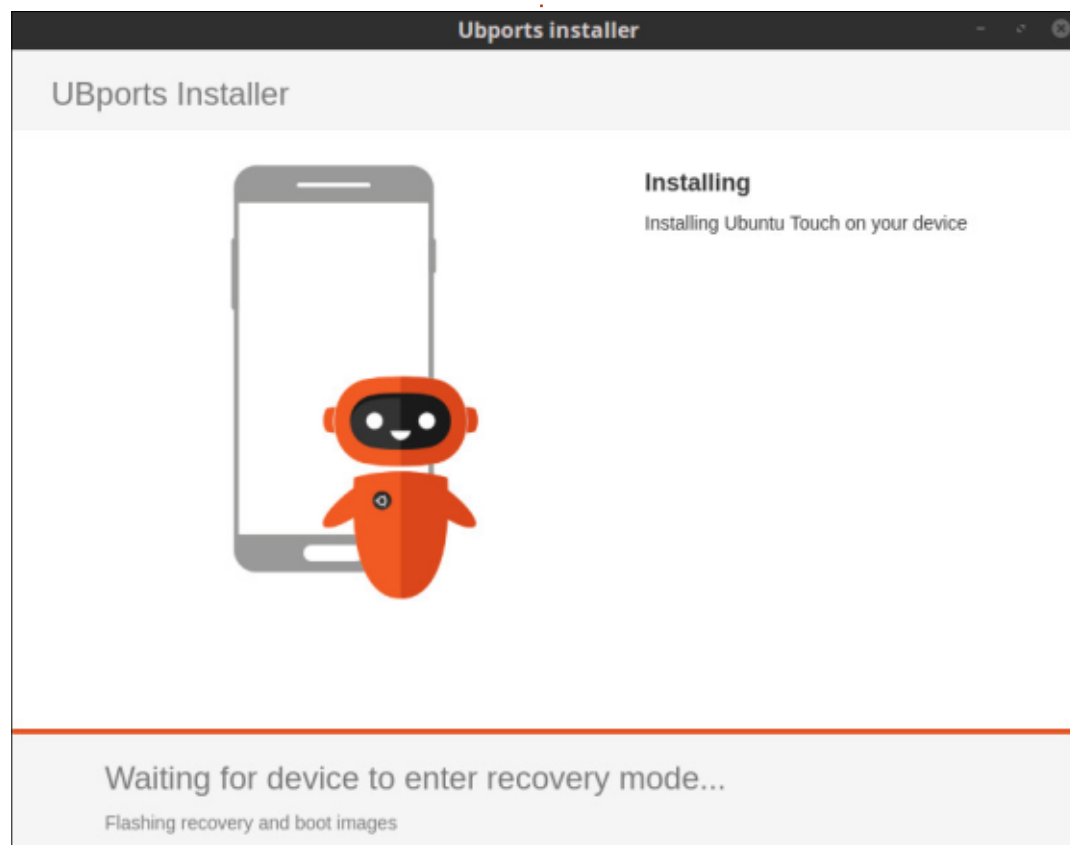
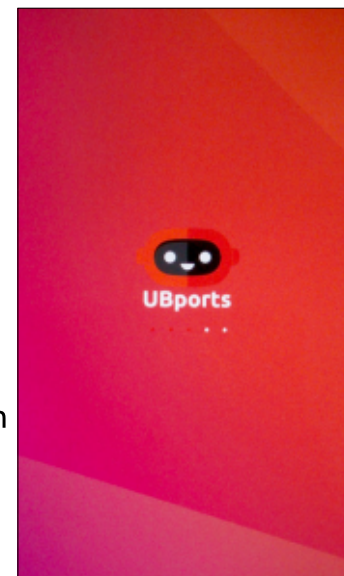
Now, remember how I said you'd lose all your data? Well, you probably won't. Most times, flashing UBports Touch doesn't wipe the device. I threw in that disclaimer JUST IN CASE it does happen. Maybe future installers

will wipe the caches and so on. For now? They don't.

The device will reboot showing the ever familiar Ubuntu loading

screen, but (after a while) it'll change to show the UBports loading screen.

Going into System Settings > About it should say





# HOWTO - INSTALL UBPORTS

Ubuntu 15.04 (r1).

Done! This device is now using the UBports Touch.

What I did next (on my MX4) was to go into System Settings > Reset, and do a factory reset to

remove all the old apps and data. I don't want to end up with a device that has UBports OS but with Ubuntu Store apps. Remember: the Ubuntu Store will close soon. UBports has its own OpenStore that is installed with the OS.

## HELP:

UBports Telegram Supergroup:

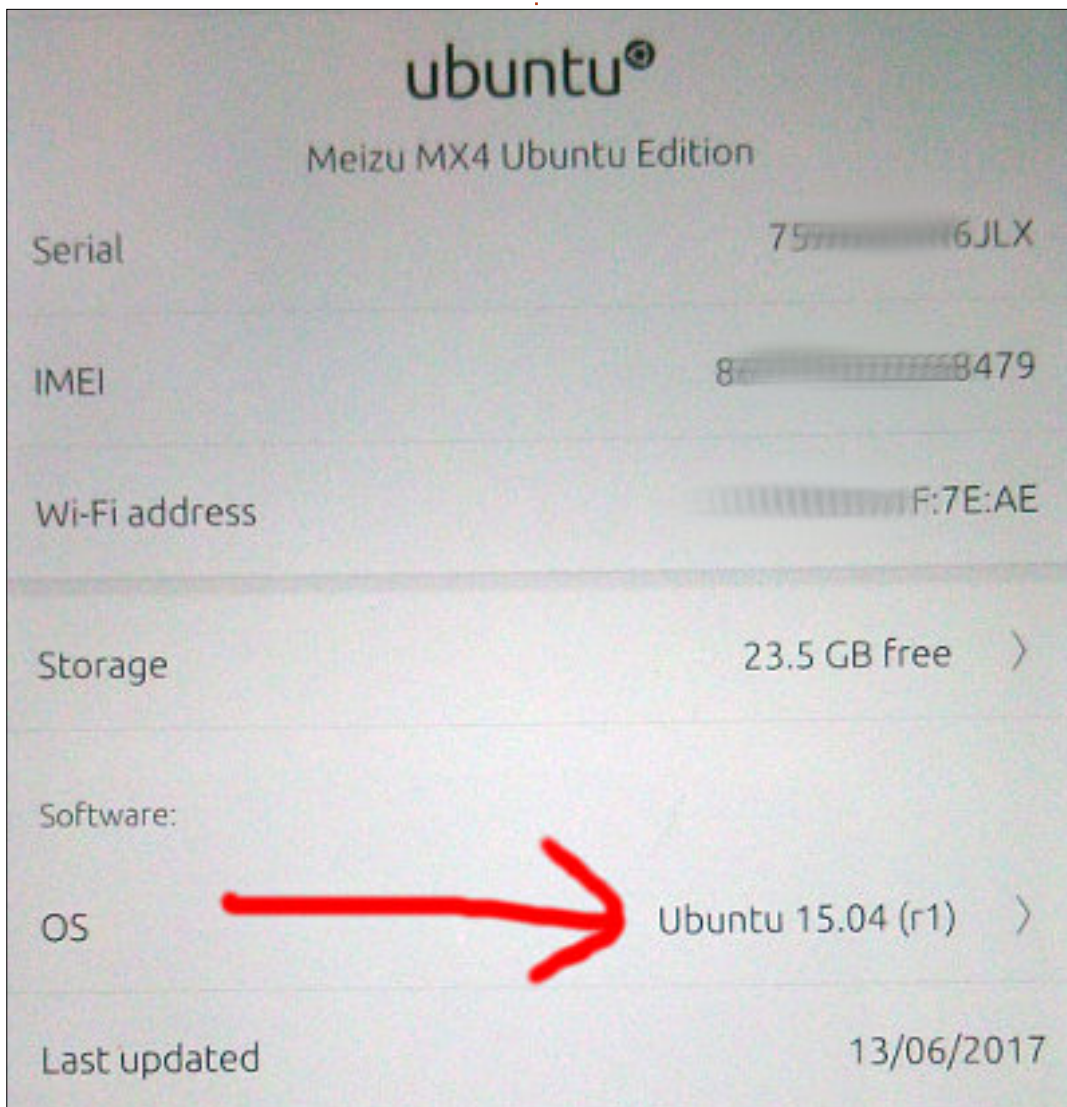
<https://t.me/ubports>

UBports forum:

<https://forums.ubports.com>

UBports bug tracking:

<https://wiki.ubports.com/wiki/UBports-Bug-Trackers>



**Ronnie** is the founder, and editor, of Full Circle. His other interest is art, and his work can be seen at: [ronnietucker.co.uk](http://ronnietucker.co.uk)

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# HOW-TO

Written by Mark Crutch

# Inkscape - Part 62

One area of functionality that has received a huge boost in 0.91 and 0.92 is finding and selecting objects. There are many situations in which you may need to find similar, or identical objects in a busy drawing, perhaps to delete or change them all at once. In previous versions, this was a chore, especially if you had to make the same selection multiple times. So let's look at the various ways in which recent releases make this easier. I'm going to use this contrived grid of objects to give you a feel for how the new tools operate:



The first few items all live under the Edit > Select Same submenu, and offer several different ways to select all items which share a particular visual style. To use any of them, you must first select one or more objects whose close relatives you wish to also select. As a first example, if I select the teal square at the top left of my grid, then use Edit > Select Same > Object Type, all the other squares are selected. In my image I've given the selected items a gold colored background to make them stand out a little better, but you won't see that in normal use.



One important thing to note is that selecting the same "object type" purely refers to the type of underlying Inkscape object – so squares and rectangles, or circles and ellipses, are considered equivalent. You can see this effect if I select the green star on the top line, then use Select Same > Object Type. Not only are the stars selected, but so are the triangles, as they were all created using the 'star' tool.



Frustratingly, the select by type option doesn't work terribly well with multiple items selected. If every object in the selection is

already the same type, it will work to select the other objects of that type; but if any one of them is of a different type then, rather than selecting all the objects of either type, everything is de-selected instead.

Select Same > Fill Color has no such problem: if I have both the teal square and the green star selected, then all the objects with a teal or green fill will be selected by the command.



Note, however, that selecting by color is extremely specific: it will only select items whose fill



## HOWTO - INKSCAPE

color is absolutely identical to your starting object. There's no way to set a threshold, in order to select all the items with approximately the same shade of green, for example.

There's also a Select Same > Stroke Color option, which does the same thing, with the same exacting requirements for a match, but based on the stroke color rather than the fill color. For example, selecting the teal square once again (before executing the command) will select all the shapes on the top and bottom rows; they all have a black stroke, even though the stroke thickness and dashes are different between them. Once again, starting with a multiple selection will result in a cumulative set of items whose stroke colors match any of the objects in your initial line-up.

The counterpoint to selecting by stroke color is to select by Stroke Style. This matches objects only if they have the same stroke thickness and dashes – including the same dash offset, which seems a little strict, in my opinion. Stroke color, line caps, join type and markers don't seem to have an effect, whereas the mitre limit

does. The choice of what properties do and don't contribute to a "matching" line style seem rather arbitrary and counter-intuitive, which may limit the usefulness of this option in many situations.

Even more limiting, however, is the Select Same > Fill and Stroke menu entry. This will match items only with an identical stroke, but where both the fill and stroke colors also match. It's the digital equivalent of a club doorman not only refusing entry for wearing sneakers, but actually only allowing entry to people with exactly the same shoes as him, in the same color and style – and only then if they're also the same size.

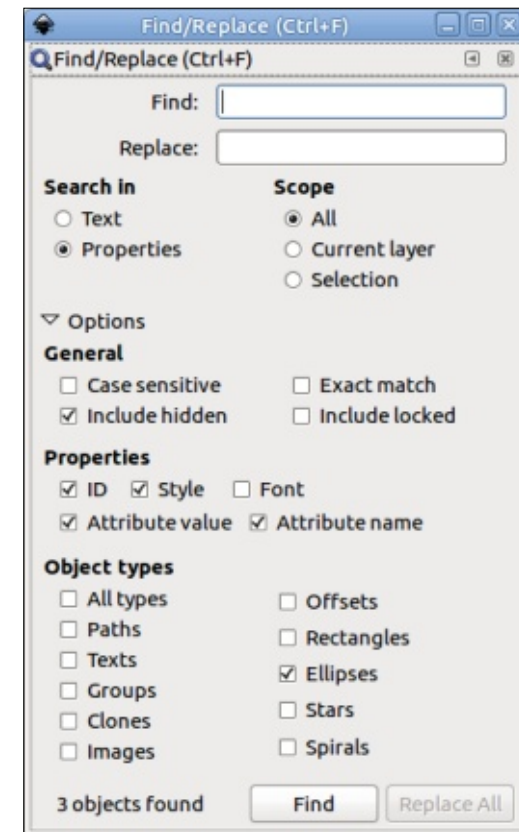
The next tool we'll look at this month is the recently souped-up Find/Replace dialog, which can be opened from the Edit menu or by pressing Ctrl-F. The key to working with this dialog effectively is to understand that all it's really doing is a search (and possibly a replace) of text within the XML code that makes up an Inkscape document. So, first, a quick recap on XML using a heavily abridged snippet of code representing a text object in Inkscape:

```
<text id="text1178">
  <tspan
    id="tspan1180"
    style="font-style:normal;
      font-weight:bold;
      font-family:Arial;
    -inkscape-font-
specification:'Arial Bold';
    fill:#000000;"
    x="320.68646"
    y="86.745667">
    This is some text
  </tspan>
</text>
```

XML represents a tree structure in text. Here you can see that we have an opening <text ...> element, which gets closed by the </text> line at the end. Inside of that is a single <tspan ...> element, again being closed near the end. Inside that is the text itself, "This is some text". This is between the opening and closing <tspan> tags, but is not a tag itself. This piece of literal text is what XML refers to as a 'text node', whereas <tspan> and <text> are 'element nodes'. The element nodes also have name=value pairs of extra data,

referred to as 'attributes'. In the <text> node, for example, the id="text1178" is an 'id' attribute, with a value of "text1178". The 'style' attribute is a little special – it holds CSS style data, which itself takes the form of a list of 'property:value;' pairs.

With that information in mind, let's take a look at the Find/Replace dialog, with its Options section expanded:





As you might expect from a Find/Replace dialog, the first two fields allow you to type in text to be searched for and, optionally, text to replace it with. The search will match against substrings, unless the 'Exact Match' checkbox is ticked, so searching for "Fred" will match against Fred, Freda, Winifred and Alfred – although the latter two will match only if the 'Case Sensitive' checkbox is cleared. Interestingly, you can search with this field left blank. As you might guess, an empty string matches against everything, but the match is further restricted by the choices in the 'Object types' section at the bottom. Usually you would probably leave this set to 'All types', but, by setting specific checkboxes and leaving the search field blank, it provides a fast way to select all the objects of specific types – a workaround for the Select Same > Object Type's restriction on finding only one type at a time.

Assuming the more common case, where a search string is entered, the 'Search in' radio buttons determine whether the XML text nodes will be searched, or the attributes on the element nodes (though the latter is labelled

as 'Properties' in the Inkscape UI). Use the former to search and replace text content – handy if you're using Inkscape as a poor-man's desktop publishing program (though I do recommend that you learn how to use Scribus if you need to do any significant text layout work). Use the 'Scope' buttons, and the checkboxes in the 'General' section to limit your search a little, if necessary.

Switching the 'Search in' control to 'Properties' provides a great deal more power, if you're comfortable enough with the insides of an SVG file to know what to look for. By 'Properties' it means attributes and attribute values, including CSS properties. Making a distinction between these terms might seem a little petty, but understanding them is key to making effective use of this section of the dialog. There you'll find checkboxes to tell Inkscape which parts of the XML it should search:

- ID – Only search the value of the 'id' attributes.
- Style – Search for CSS properties and CSS values within the value part of 'style' attributes.
- Font – Presumably this searches for only CSS font names, but I was

unable to get it to work at all on my test file. Use a 'Style' search instead.

- Attribute Value – Search within the values of attributes. This includes searching the values of id and style attributes, even if the earlier checkboxes are blank.
- Attribute Name – Search for elements with a particular attribute name. Not as useful as searching for values.

Usually, searching for an attribute value is sufficient. It will find matching IDs, styles and font names, without you having to understand how they're stored in the XML. Only if it finds too much, is it worth switching to search only IDs or styles. Searching for attribute names is never really necessary for normal users, but might have its place if you're using Inkscape to work on graphics for a web application that carry additional custom metadata.

There are a couple of things to beware of when using this dialog in 'Properties' mode, however. Firstly, it can end up selecting objects you didn't expect. Consider an element with a red stroke; later you change the stroke width to zero, so it isn't

visible any longer. If you search for "#ff0000" hoping to select all the elements with a red fill, you'll also select the object with no stroke. Although it might not be visible, there will still be a color stored for the stroke in the style attribute, which is enough for it to become part of your selection.

The second warning is with regard to the 'replace' field: performing a find and replace in text mode is generally safe; doing so in properties mode could have unforeseen results. Thankfully, Inkscape is sensible enough to stop you performing a replace operation if the 'Attribute name' checkbox is selected, but arbitrarily replacing strings within attribute values can be almost as destructive. It might seem safe enough to replace your black fills with white, by searching for "000000" and replacing it with "ffffff", but a series of six zeroes could easily appear in the coordinates of your objects, where hexadecimal values are an error that could break your entire drawing. If in doubt, save a backup of your file first.

Having used the previous tools to make a selection, Inkscape now

## HOWTO - INKSCAPE

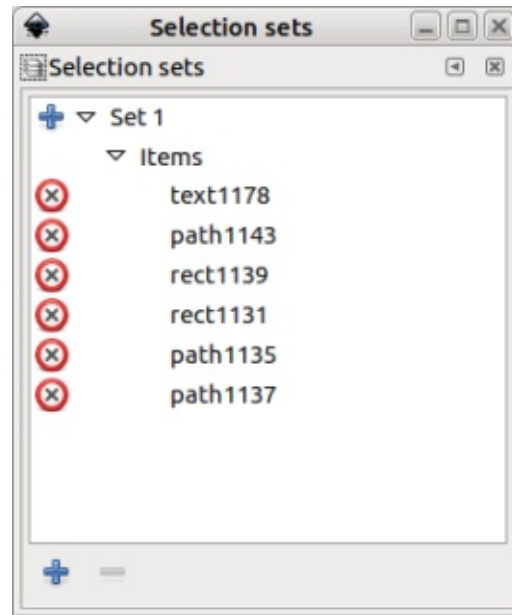
also provides a way to save that selection for later use. The Object > Selection Sets... menu item opens a rather empty dialog for managing stored collections of selections:



The most important thing to note about this dialog is that the "+" button at the bottom does not create a set containing your current selection. Instead it creates a new, empty selection set which has another "+" button next to it. Only when you click this other button will your selection be stored in the set. The same button can be used later to add another selection to any existing items in the set.

If you click on the triangle next

to a set, hoping to view the elements within it, you'll quickly find that there's a rather useless intermediate level, labelled "Items", that you also have to expand. If you click the triangle next to the "Items" entry to expand it, you'll finally get to a list of the objects in your selection.



Clicking on the cross next to an item in the list will remove it from the set. Clicking on a name in the list will select it, whereas clicking on the Set itself will select all the items in that set. Unfortunately, clicking on a Set doesn't highlight all the items within it, so, if you want to re-select all the items except one, for example, you have

to highlight each entry separately whilst holding the CTRL-key. You can even use the CTRL-key to select multiple Sets, or combinations of Sets and individual items. What you can't do, however, is select something from this dialog, then add to (or remove from) the selection by CTRL-clicking on objects on the canvas, which is a pity as it effectively turns Selection Sets into a separate selection mechanism rather than something which integrates seamlessly into your normal Inkscape workflow.

Selection sets are preserved when you save a document, however they do get cleared when the Edit > Clean Up Document menu is used. Nevertheless, they have their uses – for example, as another means to work around the restriction on Select By Type only working with a single type at a time. If you want to select, say, all the circles and rectangles, you could use the Select By Type option twice, adding each resultant selection to the same Set.

The new and extended selection tools in 0.92 are a welcome addition, especially when working with complex documents.

They do have their limitations and idiosyncrasies, but hopefully they'll continue to mature in future releases to provide even more capabilities.



**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

# Kdenlive - Part 6

Another quick one this month, but it's an important one: colour correction.

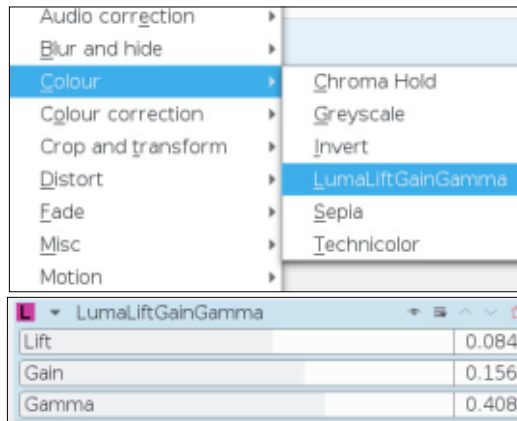
Inevitably, at times, your video will be dark (again, I'm looking at you, mobile phone users!) and will need some colour, and/or brightness adjustments.

## LUMA LIFT/GAIN/GAMMA

First, as ever, add a video to the timeline.

Right click on it and go to Add Effect >

Colour>LumaLiftGainGamma



There's a similar, but different, option under Colour Correction, but I prefer this one.

I won't go into what each slider does, as you'll see the results when you move the slider (or change the numerical value), but the Gamma slider will enhance the colour of your video. The other two will effectively adjust the brightness and contrast.

So now you know how to get your video files looking much better. The tricky bit is trying to get all those video files looking the same throughout the video without one being brighter/darker than the previous one. Unfortunately, I don't have a fix for

that, but my advice is to try and keep the same lighting in your scenes when making the video in the first place. That will save time in the long run, effectively eliminating this step altogether.



**Ronnie** is the founder, and editor, of Full Circle. His other interest is art, and his work can be seen at: [ronnietucker.co.uk](http://ronnietucker.co.uk)







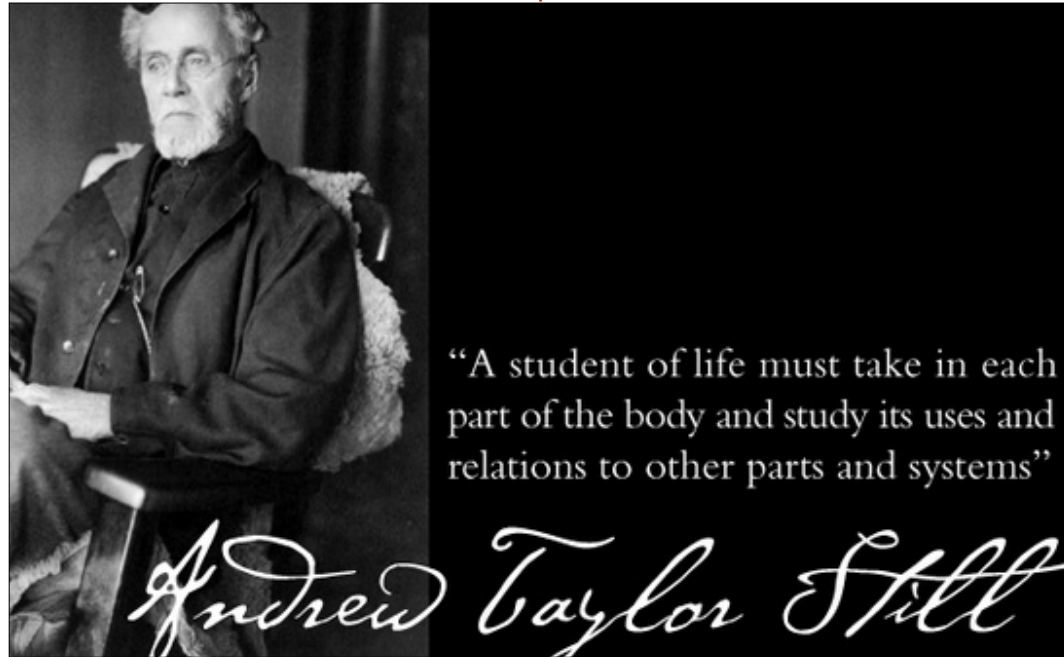
# RESEARCHING WITH LINUX

Written by S. J. Webb



**M**y occupation is a research coordinator. I am essentially a project manager in the clinical research realm. My expertise focuses on instrumentation for osteopathic manipulative medicine (OMM). Before I start talking about my career and Linux, I need to describe osteopathy.

Osteopathy is the sublime art of treating physical somatic symptoms using various techniques of counterstrain, strain, and therapeutic palpatory treatment. This treatment is called OMM. Osteopathy is a fairly young medical science developed by A.T. Still in the United States. He believed the human body can heal itself if the musculoskeletal framework is balanced. In the United States, osteopathic doctors are considered equal to medical doctors. Today, some osteopathic doctors employ OMM to treat their patients. However, worldwide the standards for osteopathic practitioners are varied. In some countries, they are family doctors or they are equivalent to physical therapists. I work with primary



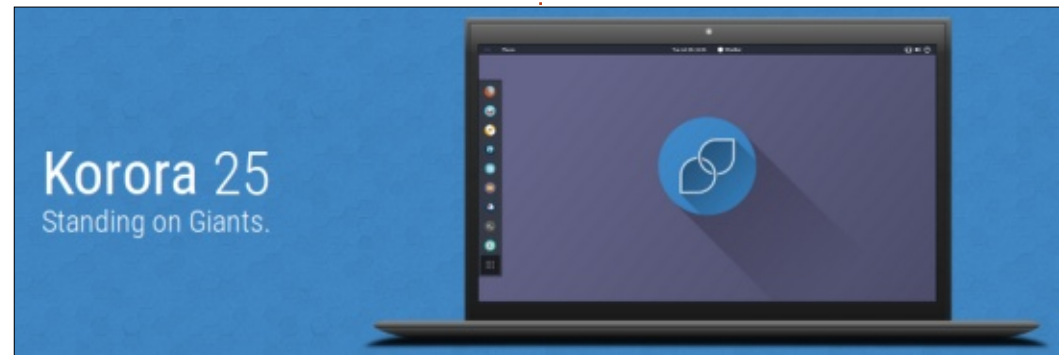
investigators in developing new teaching methods or research questions using OMM. To quantify the scientific capabilities of OMM, I use instrumentation to answer various research questions.

Instrumentation is simply the term used to describe cutting-edge technology to collect data. At my university, I use motion capture systems and pressure pads to objectively collect and quantify

data. After collecting the data, I then process it and hand it off to a bio-statistician for statistical analysis. I use Linux on a daily basis for my various research studies.

There are a number of Linux variants directed towards research. Ubuntu has a variant called Ubuntu Sci. I started using Scientific Linux. It was originally based off Fedora or Redhat Enterprise Linux. Today, it is based off CentOS. CentOS is a great LTS distro, however the software packages are older and stable. I prefer having newer software in my daily distro.

I use a Fedora Remix that is called the Korora Project. There are a number of reasons I use Korora. It is downstream from Fedora, so updates are implemented easily. It implements media codes not supported by Fedora. The tools I need from Scientific Linux are available. My old mentor, Mike Ferarri, uses Fedora, so I have support if I break my system. Luckily the documentation for Fedora is thorough. The Korora Project does





# RESEARCHING WITH LINUX

not support a forum, but there's an activity thread for help via this Engage link, or you can access their IRC Channel. The volunteers are very quick in helping new users. If you want to be involved in helping a distro, consider contacting the Korora Project. The Korora Project team members are largely based in Australia, so a time delay may apply.

The main tools I use for my job are varied – like my daily job duties. As a research coordinator, I have recruited individuals for clinical studies, written manuscripts, collected data sets, processed data sets, managed

projects, trained new hires, done basic statistical analysis, edited videos, taken photographs, encrypted files, and other duties as needed. Fedora has the basic tools, while Korora fills in the gaps. I use Kdenlive, LibreOffice, GIMP, R, Gnuplot, Veracrypt, Planner, and other tools. I will cover these items from a rpm perspective, however I will include instructions for Debian-based distros when needed.

Before getting into the tutorials on the various programs I employ, let's do a short review of the Korora OS. The default DE for Fedora is Gnome, however there

are Fedora Spins. The Fedora Spins would be equivalent to Kubuntu, Lubuntu, and Xubuntu. It is from these Spins the Korora Project enables XFCE, Cinnamon, MATE, KDE, and Gnome. I originally used Gnome, but my hardware barely supported it.

I employ the MATE DE. This is the default layout as seen below left. They use Plank on the left side of the display, which is reminiscent of Gnome. It comes loaded with LibreOffice, Firefox, and the standard fare of programs that appear on most Linux Distros today. If a person uses Ubuntu MATE, then using Korora MATE would be an easy transition.

However, there are some key differences between Ubuntu and Korora. The installation process is a bit of a bump using the Anaconda Installer by Fedora. You have to reclaim your hard drive space, and then approve it. Ubuntu has an easier installer. The command-line interface is very different, using

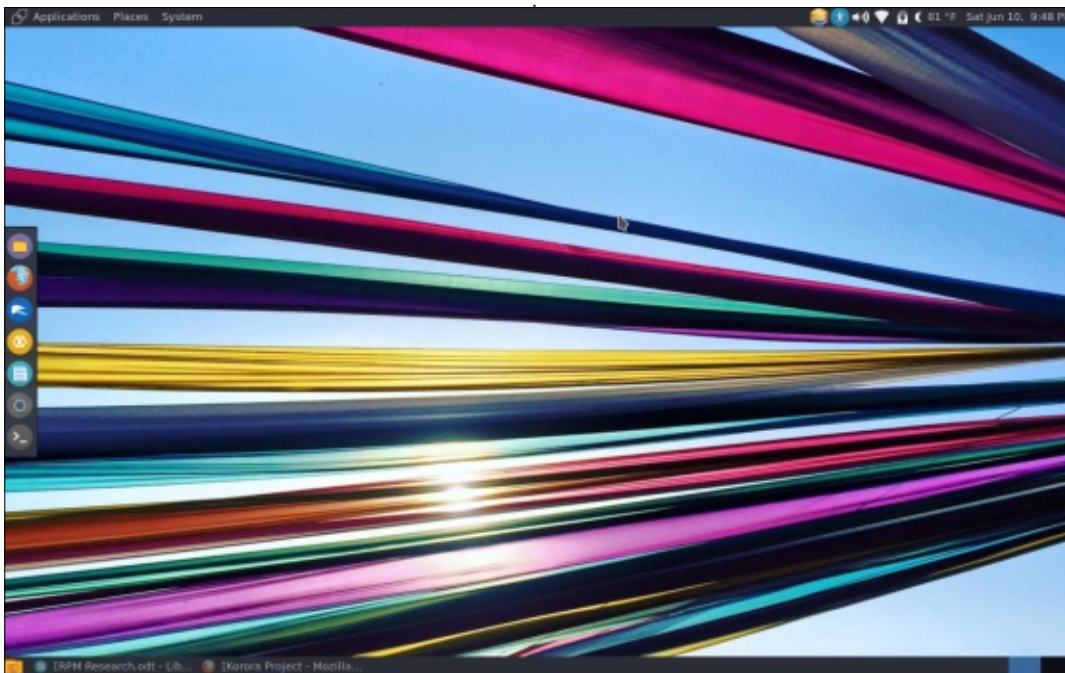
```
sudo dnf install
```

versus

```
sudo apt-get
```

commands. The software center is in transition for the non-Gnome desktop environments. For a number of years, Yum Extender was the graphical software center, now it is being transitioned to DNFdragora, which will be released in future Korora editions. Yum Extender is a dead project, and DNFdragora is the new replacement.

In the upcoming months, I will peek into the various ways I use Linux in my job.



**SJ Webb** is a researcher coordinator. When he is not working, he enjoys time with his wife and kids. He thanks Mike Ferarri for his mentorship.



## GUIDELINES

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

## RULES

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

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

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

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

document.

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

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

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

## REVIEWS

### GAMES/APPLICATIONS

When reviewing games/applications please state clearly:

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

### HARDWARE

When reviewing hardware please state clearly:

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

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





Several months ago, I migrated one of the software packages we use at work to a new server. Getting time to focus on something as large as a server migration is rare for me since I usually have a bit less than 6 hours a week to look into anything new. In this instance, I was familiar with the software package, PCRT (PC Repair Tracker), but the migration was both a change in hardware and updated software - what could possibly go wrong?

Our original "Repair Tracker" was running smoothly to this point, but there were several problems:

- We were using a fairly outdated version of PCRT (v2.2 when 4.1 was out).
- The "server" we were running it on wasn't in as secure a location as most of our other servers.
- We weren't even sure we had regular backups (we had a "dd" backup that was old, so we could restore the machine if we needed to, but we wouldn't have recent data).
- We've started to virtualize more

servers and this was another physical machine that could break down.

The plan was to migrate the existing database and v2.2 of PCRT to our newly spun virtual server, do all the necessary upgrades to get to version 4.1, then tackle backups. As it turned out, we were regularly backing up the database and software, but as hinted, the installation didn't go so smoothly on the new server.

The problem? Ubuntu 16.04 server. More accurately, the newer version of PHP on Ubuntu server and PCRT 2.2 didn't seem to jive well together. Luckily, one of our sysadmins had run into a similar issue with other software. The solution was to run an older version of PHP (we ended up with two versions of PHP installed with the older active). Lorna Jane Mitchell (author of PHP Web Services and PHP Master) also ran into this issue and documented which PPA she used to install both versions of PHP, I just reversed the second last step:

<https://lornajane.net/posts/2016/php-7-0-and-5-6-on-ubuntu>

```
sudo add-apt-repository
ppa:ondrej/php

sudo apt update

sudo apt install php5.6

sudo a2dismod php 7.0

sudo a2enmod php5.6

sudo service apache2 restart
```

Of course this wasn't the only answer, there were a number of PHP 5.6 dependencies I also needed to install, but they all got sorted out by reading the error logs during the install of PCRT.

All of this could have been avoided if we just installed Ubuntu server 14.04 and used the version of PHP default with it, however one of our goals was to be as up-to-date as possible, and, when I took this approach on another development machine, it also didn't quite work out as expected.

On that development machine we wanted to run a number of non-

virtualized PHP software packages, one of which was PCRT, the other Owncloud. Because it seemed the simplest route to get PCRT installed, we installed Ubuntu server 14.04. But that turned out to be a mistake because Owncloud wanted a later version of PHP (5.59 was installed; it needed 5.6).

In this case, I employed the same tactic, but ran a2dismod for version 5.59 and a2enmod for 5.6. Better planning might have foreseen this problem, but often time is precious and I end up having to figure out issues as we go. Two separate virtualized environments would have also solved this problem, and it's the direction we're headed, but it just got me thinking that it's a bit of a pain having to maintain several versions of PHP to run the software we want to run.

Technologies like Docker suddenly seem more viable, even for a smaller organization.



# REVIEW

Written by Paul Romano

Etcher is a cross-platform GUI application to flash OS images to SD cards & USB drives, safely and easily. The OS images can be in the format of .iso, .img or .zip files. It was originally released on 5 April 2016, and on 12 May 2017 version 1.0.0 was released.

From the web site: *"Etcher is a powerful OS image flasher, built with web technologies to ensure flashing an SDCard or USB drive is a pleasant and safe experience. It protects you from accidentally writing to your hard-drives, ensures every byte of data was written correctly, and much more."*

More specifically... Etcher is hard-drive friendly. It makes drive selection obvious to avoid wiping your entire hard-drive(s). After flashing, it goes on to validate the burnt image, so that there is no more writing images on corrupted cards and wondering why your device isn't booting.

## Supported Operating Systems

- Linux (32-bit & 64-bit) - most distros

- Microsoft Windows 7 and later (32-bit & 64-bit)
- macOS 10.9 and later

## INSTALLATION

The downloads for Linux are provided from the home page in a zip file of the Applmage package format. Applmages are self-contained runtimes that do not require manual installation or root (but do require you to give them the necessary permissions to run as a program). They will run on pretty much every distro out there — just download, and double-click to run. (This paragraph originally from **OMGUbuntu**).

Alternatively, if you have a Debian or Ubuntu based distro, you can install Etcher from the command-line by:

Save the following as /etc/apt/sources.list.d/etcher.list (this is a one-line command):

```
deb
https://dl.bintray.com/resin-io/debian stable etcher
```

Trust Bintray.com's GPG key (also a one-line command):

```
sudo apt-key adv --keyserver
hkp://pgp.mit.edu:80 --recv-
keys 379CE192D401AB61
```

Update and install:

```
sudo apt-get update
sudo apt-get install etcher-
electron
```

The etcher-electron package is 68.4 MB.

## UNINSTALL

```
sudo apt-get remove etcher-
electron
```

```
sudo rm
/etc/apt/sources.list.d/etche
r.list
```

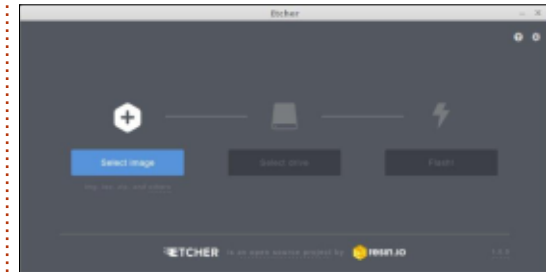
```
sudo apt-get update
```

## USE

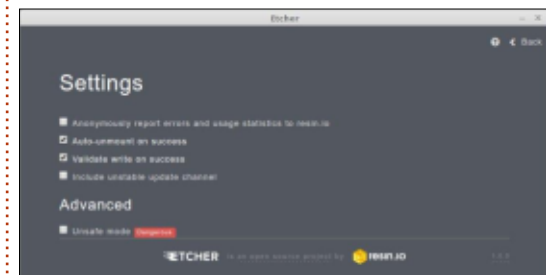
I have used Etcher to burn images to only USB sticks. Until I get one, I will leave it to the Raspberry Pi users out there to try it with SD cards. The numbers 1-7

below refer to the screenshots.

The interface is very easy to use:



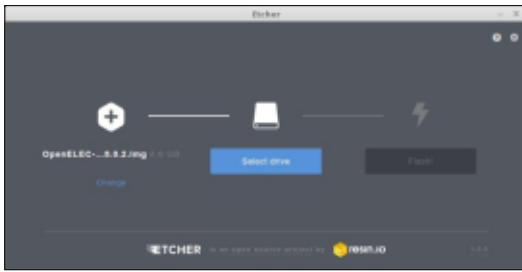
In the top right-hand corner are two icons. The question mark takes you to the Help Page. The gear icon takes you to a simple Settings screen.



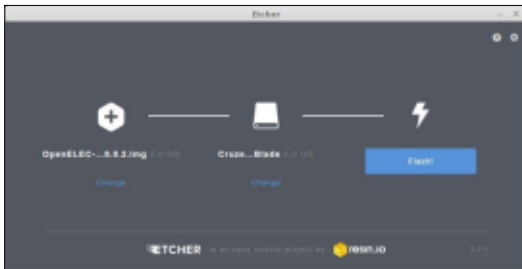
Back on the main screen, click on the left-most icon (a plus sign) and select the image (.iso, .img or .zip) that you wish to burn:







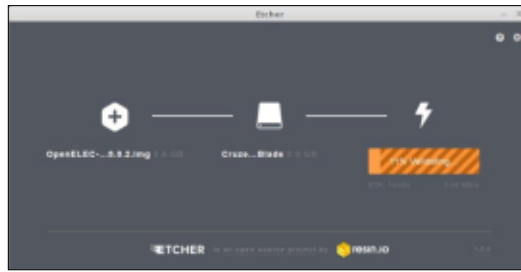
Plug in your USB stick and it is automatically recognised, unmounted if necessary, and ready to be flashed.



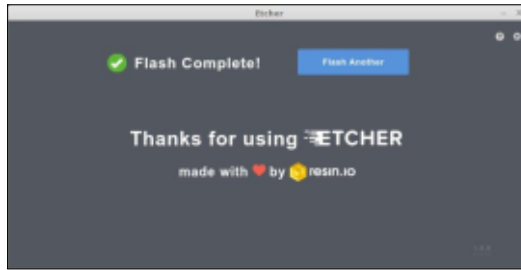
Click on the right-most icon to start the actual flashing. The bar changes to indicate progress.



When flashing is completed, the burnt image is validated and again progress is indicated.



After a few minutes the screen will change to show that the flash is complete.



## To Come

According to the Etcher website, future improvements will include 50% faster burns, and simultaneous writing for multiple drives.

## ETCHER CLI

Also released at the same time as version 1.0.0 was a command-line tool that aims to provide all the benefits of the Etcher desktop application in a way that can be run from a terminal, or even used from

a script. However, you are warned that the CLI version is currently experimental and to proceed with caution.

## CONCLUSION

I have been happy burning images to USB sticks using the command-line. However, this is a multi-stage process. Firstly, many distros automatically mount USB sticks so you must find out what device the stick is identified as, and then unmount it. Secondly, you must remember to prefix the dd command with sudo and then enter your password. This dd command has the potential for disaster. If you incorrectly identify your output device, you could easily destroy data on a hard-drive. Thirdly, to verify the integrity of the files, you can:

- Boot from the newly flashed device and hope there is an option in the boot menu to check the files. Or
- You have to mount the device, look for a file called MD5SUMS, SHA256SUM.txt or something similar, and then decide what is the appropriate command to verify the integrity.

In comparison, Etcher does all of the above automatically and easily. I think Etcher is worth keeping an eye on, especially if it can reach its goals of faster burns and simultaneous writing for multiple drives. A persistent storage option would be nice as well.

## REFERENCES

Home Page: [etcher.io/](https://etcher.io/)

GitHub: [github.com/resin-io/etcher](https://github.com/resin-io/etcher)

Help Page: [github.com/resin-io/etcher/blob/master/SUPPORT.m  
d](https://github.com/resin-io/etcher/blob/master/SUPPORT.md)

Review: [www.omgubuntu.co.uk/2017/05/h  
ow-to-install-etcher-on-ubuntu](https://www.omgubuntu.co.uk/2017/05/how-to-install-etcher-on-ubuntu)



Snappy allows you to install an application automatically and fully updated, properly stable application on any distribution that supports it. This currently includes Ubuntu, Fedora, Arch, Debian, openSUSE and Gentoo. Snappy applications can even be installed from the graphical software center, if the software center supports it.

Why is installing an automatically and fully updated, properly stable application on Linux not currently possible? Well this is a big problem on the current Linux desktop. There's an apparently unresolvable dilemma between having stable applications and having up-to-date applications. This arises due to the nature of the Linux desktop's shared dependency system. If you have fully up-to-date dependencies all the time—i.e., a rolling-release distribution model—you may find that you end up breaking slightly older applications that haven't been updated upstream to work with the newer dependencies. This

means that users are faced with significant bugs which they should never have had to deal with. It's impossible to test properly for these occasions because, in order to get the updates out as fast as possible, the testing period is very short—which means less time to catch the bugs, and less time to make patches to fix them. You may think that this is possible, but reality has shown that it is not. On pressing those who claim that distributions like Arch, Antergos and Manjaro are stable, you find that actually they have to do various package management and configuration tasks, which an ordinary end-user should not have to do. Further, updates to dependencies on these rolling distributions can break key features of the desktop which should never be broken, not just applications. Antergos broke LightDM for at least a few hours (possibly more if it was a while between when the bug occurred and when the developers filed a blog post on it). If millions were using the Antergos operating system, this would have resulted in

a great many unhappy users.

So much for the rolling-release model. As for the release-based distributions, they have the opposite problem. They may not be able to install a newer application because they rely on and expect a newer dependency that isn't yet in the distribution—so they get bugs that way. If you update the dependency, you risk introducing bugs into other programs that depend on the same dependency, and this is why PPAs on Ubuntu, for example, can be quite risky and why packages aren't always kept completely up-to-date by default in the first place.

So how do we get properly up-to-date applications that work without these dependency-related bugs? Well, you allow the developer to bundle the dependency versions that they expect! This means that an update to a dependency does not result in users being left with a broken application; the developer of the application can update the

dependencies and their application, ensuring that it still works correctly, in their own time. Snappy adopts this approach. There are still a few shared dependencies like `libc`, but much less than there were previously.

At this point, people complain about the file size. The file size does now increase because you have multiple copies of the same library used on the operating system. This is probably the only real disadvantage of snappy, but there are several reasons why this is not as big an issue as it seems. Firstly, with delta updates, once you have a snap installed, your computer downloads only a small amount of data to update the snap. Secondly, the file size of individual snaps can be cut down by stripping out unneeded features of dependencies, like Peek has done with `ffmpeg` and `imagemagick`. Thirdly, there's usually quite a lot of a hard drive space on today's laptops and desktops, so a big file size isn't too much of an issue. Finally, there is a precedent for this way of handling

packages: Android, for example, which has many duplicate Jar files, and even macOS and Windows, to a lesser extent.

There's another big advantage of snappy that makes it worth using: background updates happen without a prompt, like in ChromeOS, so there is less user interaction and users can just get on with using their operating system. Could this mean that an update breaks the app without the user's permission? Perhaps, but this is less likely because there's few shared dependencies and updates can be rolled back if necessary. Perhaps this seems insecure? But the applications are confined, they don't have access to your whole system (they can if they need to – if they use classic confinement, but these snaps are manually reviewed before entering the snappy store), so this is not really a problem. Indeed, the confinement of snaps is itself another reason why snappy is great. They're confined Android-style, they have access to only certain parts of the system, not the entire filesystem like with Linux applications packaged traditionally. Programs that really need to access the filesystem, like

code editors, can do so, this is called Classic confinement, but the vast majority of snappy applications are confined properly.

Snappy would make regular application updates on desktop Linux very easy for the end user, and will continue to result in a better end-user desktop experience as development on the format continues. But snappy is also excellent for developers writing desktop Linux applications. They need to write only one declarative `snapcraft.yaml` file to build a snap of their application, and only a couple of commands (or even a couple of clicks) to get it published on the snappy store and thus published on every Linux install which has snappy installed – with no packager middleman. Despite the possibility of having no packager middleman, non-programmers like myself can get involved by helping upstream developers out by creating `snapcraft.yaml` files for them to adopt. Just go to the `snapcraft` (the name of the tool which makes snaps) tutorial, complete it (20 mins), then go and complete more `snapcraft` tutorials if you wish (like for Python, and websites), find a program that hasn't been snapped

yet, and snap it, then forward the working `snapcraft.yaml` to the developer to use themselves. If you face problems along the way, you can check out the `snapcraft` documentation, and you can ask questions to the friendly `snapcraft` community on the forums, Rocket Chat, and Stack Overflow.

This is our opportunity to solve an old problem with the Linux desktop and drastically improve the usability of that desktop for ordinary computer users. Let's grasp that opportunity.



## SHOULD LINUX DROP 32-BIT SUPPORT?

I don't think that it is a matter of "should" or "shouldn't", but rather of what is helpful.

For modern distributions designed for modern machines, e.g. Ubuntu, Mint, Kubuntu, Fedora, Red Hat, and so forth — even Xubuntu — it has come to the point where supporting 32-bit machines makes no sense. What 32-bit machine has the RAM and CPU to support them?

However, there are still many, many older devices in use throughout the world, and I'll bet that in poorer areas, replacing them is not the cheap option that it would be for those living in a rich society. Think about what is probably the most popular Linux distribution on Earth: Android. The old 32-bit smartphones will probably be around for at least the next five or six years!

For their sakes, we still need 32-bit support. It would be welcome

for certain distros, such as Lubuntu, Puppy, Android, and so forth, to continue providing both 32-bit and 64-bit.

I realise that this is more work for the people who create these products, so naturally we cannot insist that they do so. However, I hope that they will manage to have the resources to continue to support both 32-bit and 64-bit, at least for the next (say) five years — until the relevant hardware becomes so cheap relative to today that replacing old devices becomes viable for the poor.

**Paddy Landau**

## PYTHON 2.X TO 3.X?

I'm beginning to learn programming and I thought about Python. Recently I found Full Circle, but I had some issues why try to apply, and when I asked I found out that the code in the magazine is for an older version, so I thought that if I asked you to

make a new update for the 3.6 version, I may be lucky and have an answer. I'll be grateful.

**Ahmed EB-BANA**

Greg replies: *All the code from the early versions was produced for Python 2.x. After a while, I tried to stick to code that would support versions 3.x as well as 2.x.*

*Not all code, however can easily support both major versions of Python. This is the reason for so many libraries not being available in 3.x.*

*The usual culprits are the print statements since Python 3 REQUIRES the statement to use parens. Try converting:*

```
print x
```

to

```
print (x)
```

*(in other words, try to enclose the statements following the word "print" in parens.)*

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[ubuntuforums.org/forumdisplay.php?f=270](https://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.



*There is one other thing you can try, There is a conversion utility that is included with Python 3.x which is called 2to3. I briefly touched on this in part 16 of the series which was in FCM#42.*

## UPDATING THE KERNEL

I have recently acquired a Lenovo yoga 300. It is a nice laptop which lacks some power, but Xubuntu runs well on it and it does well for general stuff and image editing which is my thing. I like to use LTS versions of Ubuntu. Xubuntu 16.04 uses kernel 4.8 which lacks some drivers for this machine, the main one being for power and battery information and management. I read that it is easy to change kernels but, not having done that before, researched it a bit carefully. I tried the app for kernel management which some recommend as the easy way to do it but that failed. So I downloaded kernel 4.10.11 from <http://kernel.ubuntu.com>, following the instruction to download the header files and the kernel.deb files. Then a `sudo dpkg -i *.deb` did the magic.

After a reboot the battery tools were working in the XFCE taskbar. I have done some extensive testing, and, so far, everything seems to work very well on this hardware. Yet another win for Linux I say.

I know that 17.04 has the 4.10 kernel but I did not want to reinstall unless I had to, and now I should be able to run 16.04 on this hardware through to the next LTS. These are the great things about Linux, and the community who share information out so that people like me can benefit. So thanks for all the work you do, it is appreciated. Full Circle is a great magazine which I look forward to receiving.

**Iain Mckeand**



# Q&A

Compiled by Gord Campbell

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

**Q** How can I change where Cheese saves the pictures it takes?

**A** You might need to install dconf-editor.

When I run dconf-editor, I can go to org/gnome/cheese/path. I toggle "Use default value" and enter "Pictures" as the Custom value.

Sure enough, Cheese saves images in my Pictures folder.

**Q** I'm having trouble running scangearmp on Linux Mint 18.1. I'm using a Canon mg6320 and would like to get the scanner going.

**A** (Thanks to *pdC* in the Ubuntu Forums) For quite a few years now, Canon has supplied drivers in 3 formats for Linux users: rpm packages, debian packages, and source code. Mint uses Ubuntu; Ubuntu uses Debian, so debian packages are used; so just use a

debian package from Canon.

For the MG6300 series drivers, I would start at the Canon Asia website <http://support-asia.canon-asia.com/?personal> and that takes me to <http://support-asia.canon-asia.com/contents/ASIA/EN/0100470702.html> and you get scangearmp-mg6300series-2.00-1-deb.tar.gz

So that is a debian package, compressed into a tar.gz format. It is a 5yr old driver; if you were to click to download and select SAVE, it should end up in your Downloads folder. Commands to install; one line at a time, and hit ENTER after each paste, would be:

```
cd Downloads
tar -zxvf scangearmp-
mg6300series-2.00-1-
deb.tar.gz
cd scangearmp-mg6300series-
2.00-1-deb
./install.sh
```

and then to run it the command would be:

## scangearmp

**Q** My primary drive has started to fail SMART testing, running afoul of the "reallocated sectors" problem. Since this device has the UEFI boot sector, and three operating systems on it, I'd like to clone the device to a new disk. Can I just do this with dd?

**A** (Thanks to *TheFu* in the Ubuntu Forums) Same here. I'm doing a

```
sudo ddrescue --force
/dev/sdb /dev/sda
/tmp/log.file
```

Where **sdb** is the source, and **sda** is the target.

This is backwards from what most people would see. I swapped the ports on purpose and powered down/removed all other storage (about 20TB) to prevent issues.

Using ddrescue is important since it will continue AFTER errors are seen.

When all done, I'll restore the backup from 3 days ago to fix any failed sectors from the original. Last time I looked, about 90MB of errors were shown in the ddrescue output.

That single command will create all the formatting, partitions, LVM stuff, everything. At first reboot, I expect to have to change the UUIDs for the partitions. But since I'm still trying to recover the last possible bits, I cannot say for certain that my plan will work.

ddrescue completed. Lots of bad sectors, a few important, but the system booted. boot, lvm, partitions, and most data were all handled as expected. The 2nd GPT record was corrupted. Easily fixed. Replicated the data from the backup disk back over. Life is good.

Had a corrupt DB (it was a media center), restore fixed that.

If the clone hadn't worked, I would have followed my normal restore processes for that



machine.

(From the Original Poster)  
Happy to report that ddrescue did the trick, although the drive did not display any errors. I guess the SMART warning was early enough that the problematic sectors had yet to be used. Plugged in the replacement drive, ran

```
sudo ddrescue -f /dev/sda  
/dev/sdb /tmp/mapfile
```

and waited for it to complete. Swapped the cables and booted successfully off the replica.

**Q** I'm unable to mount the Win 10 disks in my PC when in Ubuntu. I get an error message about an "unclean file system."

**A** (Thanks to *kag Ashe* in the Ubuntu Forums) Shutdown Windows using the following command:

```
Shutdown /s /t 0
```

**Q** During startup, three error messages flash by too quickly for me to write them down. How can I get rid of them?

**A** Use your phone to take a video of the startup sequence. Plug the exact text of a message into Google, and you will probably find your answer.

## TOP QUESTIONS AT ASKUBUNTU

\* Making a PDF document  
<https://goo.gl/aLO4AG>

\* What is the "Wanna Cry" ransomware's possible impact on Linux users?  
<https://goo.gl/GNHPqg>

\* How can I know from which partition I had booted?  
<https://goo.gl/XC0A7G>

\* Does someone other than Canonical provide paid support for Ubuntu?  
<https://goo.gl/jTm9ct>

\* Write the dynamic output of terminal into a text file

<https://goo.gl/CfXKpw>

\* Where do files rsynced to a host go?  
<https://goo.gl/2P5bkt>

\* How to open two different files using the vi editor?  
<https://goo.gl/5YgfpU>

\* Purging a software package, reinstalling it, it remembers settings  
<https://goo.gl/4cZyTy>

\* What would cause an installed application to not be recognized as such?  
<https://goo.gl/pYHE8z>

## TIPS AND TECHNIQUES

### What the big boys want

**W**e all like a distro which installs smoothly and quickly, but for some people it's essential.

Many large web sites run on on-demand servers, where they pay based on the resources they use. A large site might have hundreds,

thousands, even hundreds of thousands of virtual machines running. Then demand goes up a little, and they need several hundred more VMs -- right now.

How quickly can the additional VMs start serving clients? That is a major competitive measurement.

It's a different world from what "we" experience -- you know, people running a desktop or laptop computer with Linux as the operating system.

This is where we get into a lot of foreign terminology, such as Openstack, Docker, Vagrant, MAAS, LXD, containers, and system images.

I haven't seen any benchmark results, but speed of deployment must be one of the factors helping Ubuntu succeed in the cloud.



**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.





Valve has just released Siltbreaker Act 1 which is a new, story-driven, campaign-style, action-adventure, co-op game. The game was released on June 8, 2017 and, although it was one week late, it's a welcome addition to my video game library. It's a tough game to play, but in the couple of days I've played it, it's been a very rewarding experience. The game is actually more of a game within a game as it is available for owners of 2017 Dota 2 The International Battle Pass for the low price of \$9.99 which can be bought either within Dota 2 or else separately through Steam's Battle Pass page at <http://www.dota2.com/international/battlepass>. Siltbreaker, like Dota 2 is developed and released by Valve, the company behind the Steam game engine. Battle Pass owners get a bunch of other items besides Siltbreaker, and proceeds from the sales of the Battle Pass go toward the prize pool for this year's The International 2017 event which will be held in Seattle, Washington from August 7th through the 12th, 2017. This year's

Battle Pass is very similar to last year's, with a few changes, the main change being the addition of the Siltbreaker campaign game

In typical Valve fashion, the original release was delayed. The game was scheduled to be released sometime during May 2017 but ended up being released

in early June. After I got a Battle Pass, I was disappointed that I wouldn't be able to review the game in time for this month's magazine but, just in the nick of



time, Siltbreaker was released.

My expectations were high and the excitement was almost at boiling point by the time the game was released. It was a most definite welcome sign when I started Dota 2 on June 8 and immediately there was a banner informing me of Siltbreaker now being available.

Upon starting Siltbreaker, a digital comic book appears which slowly tells of the tale behind Siltbreaker concerning the happenings in the Dark Reef. A left mouse-click is required to cycle through the comic book. The story is pretty interesting and can be read while you wait for the network to match you up with a team. Once your match begins, the first thing you must do is select a hero with which to play the game. The game is limited to only 14 heroes out of the 110+ available in a regular game of Dota 2. The 14 available heroes play very much like they play in a regular game of Dota 2. The items you build are the same for the most part, except for new items that are available only in Siltbreaker. Leveling up your hero is also similar to Dota 2... but this is where the similarities end

and the differences begin. From here on, Siltbreaker sits on a class all of its own and feels & plays very different from Dota 2.

For starters, you are teamed up with three other players which makes you belong to a team of four instead of the standard 5v5 in Dota 2; not to mention the fact that you're not playing against other players but rather you're playing against the computer AI. The campaign is rather hard to beat, and will definitely require you to run through it a few times before being able to reach and defeat the final boss Rhyzik.

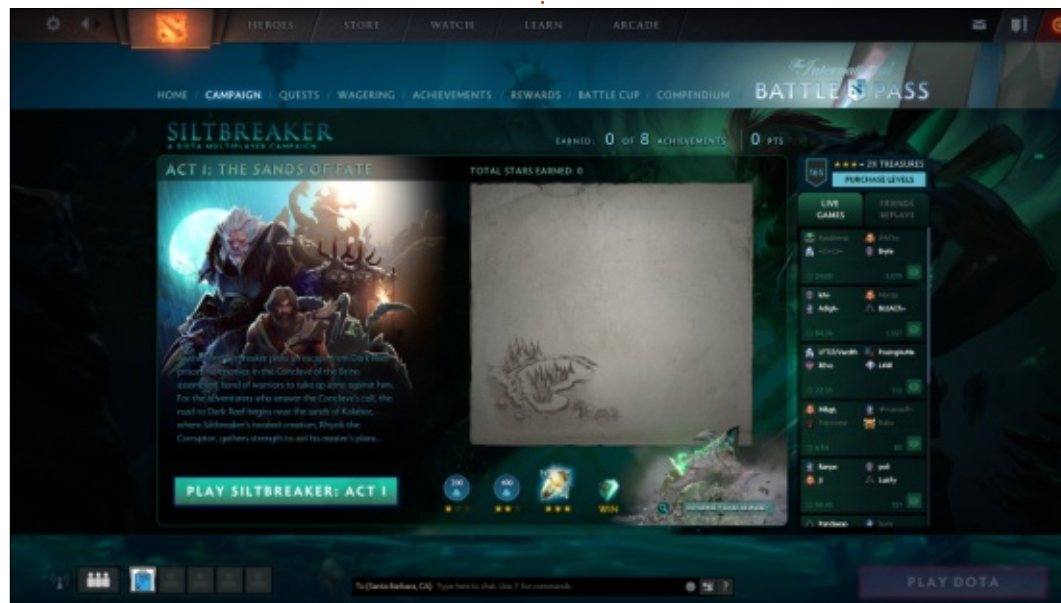
You have to progress through

different zones to beat the game. The first couple of zones are not too hard, but they introduce the concept of the game and give you an idea of what to expect. Unlike Dota 2, the camera is not controlled 100% by the player but rather it moves with you as you make your way through each zone. As you explore each zone, you encounter lots (and I do mean lots) of foes along the way. In addition to these enemies, some of the zones have a mean, scary boss that needs to be beat. Unfortunately there are few guides available as of now – because the game is so new – but, by the time you read this, I'm sure there will be more than a handful of guides to help

you along your way.

Some of the levels (or zones) will have other obstacles besides enemies – kind of like puzzles that need to be timed properly to get through. One of the unique aspects of this game is that it doesn't allow you to save your progress – which means it has to be beat in one sitting or not at all. So, for older gamers like me, this is reminiscent of the old arcade games when you put in a quarter and played on that arcade machine until your character died. In fact, this almost reminds me of the classic The Gauntlet video game. Even if you don't beat the game, there is still benefit to be gained from playing it as each zone will award you anywhere from one to three stars, depending on different factors, as long as you perform well. One star will give you 200 points toward your Battle Pass, two stars will give you 400 points toward the Battle Pass, and three stars will give you a treasure which will contain rare and hard-to-find items that are available only through this game.

The game is played with a mouse & keyboard, and, depending on which hero you select, the





actions for your key bindings will differ. The graphics are phenomenal but, at times, it almost seems like there's too much action on the screen and it may even feel a bit too clustered. The surround sound is superb, and the accompanying soundtrack is deserving of an award. I have not encountered any problems yet with the game in the few days I've been playing it except for Internet lag from other players – which once forced my team to pause a couple of times to allow for the player who had disconnected to re-connect. But I suppose that's something to be expected from co-op multi-player online games anyway.

I enjoyed playing Siltbreaker very much. Perhaps my only complaint about it is that there is no tutorial at all. The only way to learn how to play this game is to just jump right in and start playing it, which can be intimidating – especially if you take into account that other players with whom you might be paired up are likely to get annoyed with your mistakes due to your lack of experience. Siltbreaker Act 2: A Vault in the Deep is due to be released in July of this year. Unfortunately, it

seems like Siltbreaker will be a limited edition game that will vanish shortly after the completion of The International 2017, which may be sometime in September 2017. Then again, if Valve has enough positive feedback from gamers, there is a small chance that this game might live to see another day beyond its expiration date. Not having released any new content in quite a while (fans are still waiting for Half-Life 3), it wouldn't be a bad idea for Valve to give Siltbreaker the chance to stick

around for a while. Although I've really enjoyed playing Siltbreaker, the fact that it will most likely go away in a few months and the lack of any sort of tutorial makes me deduct a whole star from my rating.



## Minimum Requirements

Operating System: Ubuntu 12.04 or newer  
CPU: Dual core from Intel or AMD at 2.8 GHz  
RAM: 4 GB  
GPU: Nvidia GeForce 8600/9600GT (Driver version 331 or newer), AMD HD 2xxx-4xxx (Driver mesa 10.5.9), Intel HD 3000 (Driver mesa 10.6)  
Hard Drive: 16 GB available space  
Additional Notes: Broadband Internet connection



**Oscar** graduated with a music degree from CSUN, is a Music Director/Teacher, software/hardware beta tester, Wikipedia editor, and active member of the Ubuntu community. You can email him at: [7bluehand@gmail.com](mailto:7bluehand@gmail.com)





# MY DESKTOP

Written by The\_LinuxGK



Ubuntu Mate 16.10 Ambient Mate / Humanity Icon Set (in Greek language), with transparency on the bars

Wallpaper:

<http://www.wallpapermania.eu/wallpaper/funny-little-squirrel-with-almonds-hd-animal-wallpaper>

Have a nice day!



# MY DESKTOP

Written by David



I'm using Ubuntu (16.04) but with a pretty standard desktop. Below you'll find Docky and I have hidden the Unity bar. I like this background pic that I found on the internet, so took that one.





# MY DESKTOP

Written by Vince



I am currently using Elementary OS 0.4 Loki (64 bit). I am a big enthusiast of Linux and I have been using Ubuntu for several years, but some time ago I discovered elementary OS. Its simplicity and nice look and feel made me give it a try.

As you can see, I like a look and feel very clean and relaxed with just a few indicators – (My-Weather-Indicator and System-Monitor-Indicator) and the Insync application for Google drive

(<https://www.insynchq.com>) at the top of the screen.

My theme is basic "Elementary" and it is improved by a very beautiful set of icons called "Sardi" (<https://github.com/erikdubois/Sardi>)



# MY DESKTOP

Written by Siddharth Sundaresan



I have a HP 630, which originally came with Windows 7, an operating system I had used for 2.5 years. I switched to Ubuntu 14.04 Unity in `15, which was my first introduction to any form of Linux. Since then, I have experimented with many distributions and have a folder containing ~120 gigs of ISOs for live booting....

Display: 1366 \* 768 HD  
Processor: Intel Core i3 @ 2.40 GHz \* 4  
RAM: 4 GB  
HDD: 320 GB Internal Hard Drive + 1 TB Sandisk External HDD  
Graphics: Intel IronLake mobile

All my drivers, including wireless, processor and multimedia keys are supported perfectly in all the distributions I've tested so far.

Operating System: Ubuntu 14.04, with Unity, GNOME (with PixelSaver extension, as seen in the screenshots), XFCE and KDE4 on the Internal Hard disk. OpenSUSE GNOME Next on External HDD. Fedora 26 Alpha on a flash drive. feren OS for testing, and possibly reviewing...



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The current site was created thanks to **Lucas Westermann** (Mr. Command & Conquer) who took on the task of completely rebuilding the site, and scripts, from scratch, in his own time.

The Patreon page is to help pay the domain and hosting fees. The yearly target was quickly reached thanks to those listed on this page. The money also helps with the new mailing list that I set up.

Several people have asked for a PayPal (single donation) option, so I've added a button to the right side of the website

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## FCM#123

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