



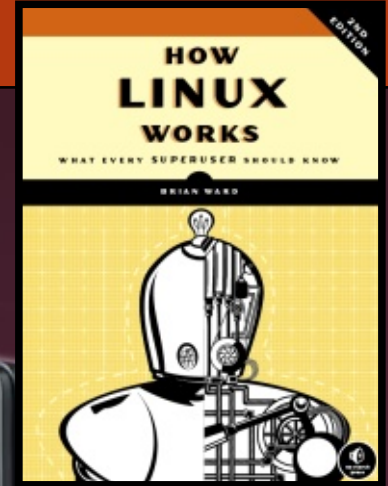
# Full Circle

THE INDEPENDENT MAGAZINE FOR THE UBUNTU LINUX COMMUNITY

ISSUE #99 - July 2015



BOOK REVIEW

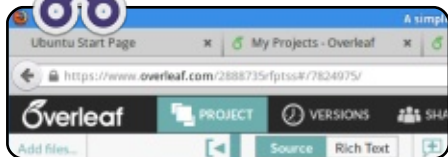


## MEIZU MX4 & BQ AQUARIS E5 THE TWO NEW UBUNTU PHONES REVIEWED

Full Circle Magazine is neither affiliated with, nor endorsed by, Canonical Ltd.

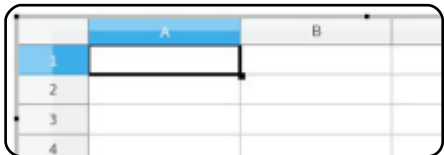


## HowTo



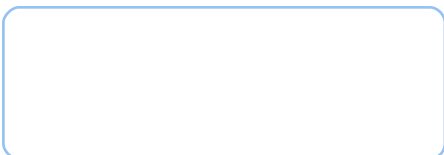
LaTeX

p.13



LibreOffice

p.15



...

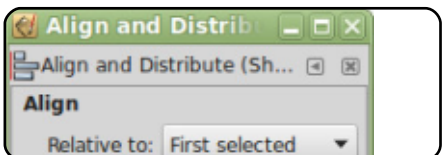
p.XX



NEW

Programming JavaScript

p.18



Inkscape

p.21



## Graphics



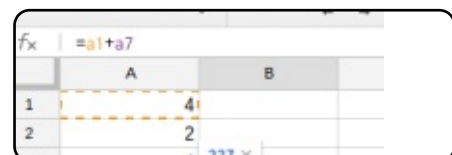
# Full Circle

THE INDEPENDENT MAGAZINE FOR THE UBUNTU LINUX COMMUNITY



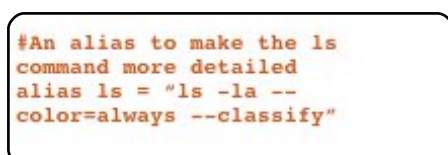
Linux News

p.04



Chrome Cult

p.27



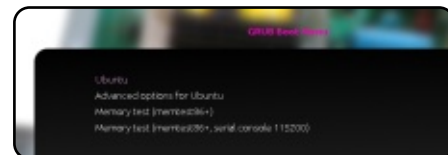
Command & Conquer

p.11



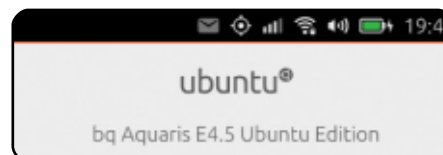
Arduino

p.25



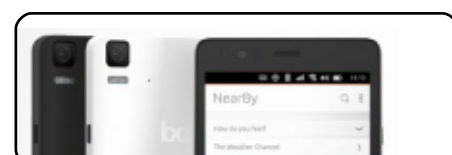
Linux Labs

p.31



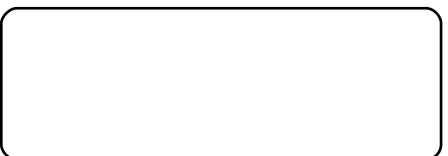
Ubuntu Phones

p.36



Review

p.37



My Story

p.45



Letters

p.46



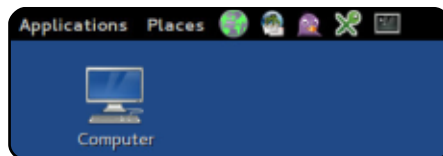
Tuxidermy

p.47



Q&A

p.48



Install TAILS to USB

p.51



Ubuntu Games

p.54



The articles contained in this magazine are released under the Creative Commons Attribution-Share Alike 3.0 Unported license. This means you can adapt, copy, distribute and transmit the articles but only under the following conditions: you must attribute the work to the original author in some way (at least a name, email or URL) and to this magazine by name ('Full Circle Magazine') and the URL [www.fullcirclemagazine.org](http://www.fullcirclemagazine.org) (but not attribute the article(s) in any way that suggests that they endorse you or your use of the work). If you alter, transform, or build upon this work, you must distribute the resulting work under the same, similar or a compatible license.

**Full Circle magazine is entirely independent of Canonical, the sponsor of the Ubuntu projects, and the views and opinions in the magazine should in no way be assumed to have Canonical endorsement.**



## WELCOME TO ANOTHER ISSUE OF FULL CIRCLE.

No Python again this month, I'm afraid, as Greg is feeling a bit under the weather, but he will be back for next month. We do have a fourth LaTeX article along side the usual LibreOffice, JavaScript and Inkscape HowTo's.

If you're thinking of getting an Ubuntu Phone then you should definitely read the reviews this month of the Meizu MX4 and the BQ Aquaris E5. Both have their plus and minus points that you need to weigh up before making your choice. Personally, I've used the MX4 and the BQ E4.5 and much prefer the MX4. I haven't tried the E5, so I can't speak for that device.

If you need some browsing privacy then you should probably read my article on how to install TAILS to a USB stick. TAILS is a distro that comes with TOR by default. The idea behind it is that you'd boot from the USB stick, connect to a WiFi/network and all your browsing would be done through TOR.

Next month is, of course, the one hundredth issue of Full Circle. Never in my wildest dreams did I think FCM would reach 100 issues, and it's all down to you, the readers, and those who submit articles. Whether they be regular submissions, or just a single article, they all help to keep FCM going. I thank you all. I already have a few articles lined up for FCM#100. I also want to make #100 less HowTo and more of a retrospective issue. We'll see how it pans out over the next few weeks.

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

*Ronnie*

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



This magazine was created using :



## Full Circle Podcast

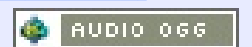
Released monthly, each episode covers all the latest Ubuntu news, opinions, reviews, interviews and listener feedback. The Side-Pod is a new addition, it's an extra (irregular) short-form podcast which is intended to be a branch of the main podcast. It's somewhere to put all the general technology and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

### Hosts:

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



<http://fullcirclemagazine.org>



Download



## FCM#100 SURVEY

The question is:

**What are your most loved/hated flavors and releases?**

Take the quick survey and we'll publish the results in FCM#100.

<http://goo.gl/DPt2q0>

## KALI LINUX 2.0 TO LAUNCH AT DEF CON 23

A small cadre of hackers has announced the next version of the Kali hacker arsenal, codenamed Sana, will be released on 11 August.

The popular penetration testing platform brings hundreds of the best open source hacking tools into a Debian-based distribution that is a staple for hackers and forensic analysts.

Kali Linux developers say the first revamp of the platform since it was reborn in 2013 will be showcased at the DEF CON hacking confab.

*"We've been awfully quiet lately, which usually means something is brewing below the surface," the team says.*

*"In the past few months, we've been working feverishly on our next generation of Kali Linux and we're really happy with how it's looking so*

*far.*

*"There are a lot of new features and interesting new aspects to this updated version, however we'll keep our mouths shut until we're done with the release."*

The platform sports a redesigned and streamlined user interface, new menus, and the latest penetration testing tools.

Source:

[http://www.theregister.co.uk/2015/07/08/kali\\_20/](http://www.theregister.co.uk/2015/07/08/kali_20/)

Submitted by: Arnfried Walbrecht

## LINUX FOUNDER: NO NEED TO FEAR AI

Linux founder Linus Torvalds doesn't understand the fear Tesla CEO Elon Musk, Professor Stephen Hawking and Apple co-founder Steve Wozniak share about artificial intelligence.

Musk said creating artificial

intelligence would be equal to "summoning a demon", and has even donated millions to protect humans from the impending doom.

Torvalds, on the other hand, described such fears as "bad" science fiction, during a Q&A session with Slashdot users.

*"We'll get AI, and it will almost certainly be through something very much like recurrent neural networks," he said in response to one user's question. "And the thing is, since that kind of AI will need training, it won't be 'reliable' in the traditional computer sense. It's not the old rule-based prolog days, when people thought they'd understand what the actual decisions were in an AI.*

Source:

<http://www.itproportal.com/2015/07/07/linux-founder-thinks-we-shouldnt-fear-ai/>

Submitted by: Arnfried Walbrecht



## UBUNTU MATE GETS ANOTHER HARDWARE DEAL, WILL POWER THE LIBREBOX MINI-PC

Some of the more observant users might notice the word Libre in the name of the company, but that's not a coincidence. There are other companies and projects out there that follow this Libre trend, which is all about incorporating only completely free and open source components.

In case you're wondering, the explanation is quite simple. For example, the Linux kernel has some proprietary blobs from various companies, so it's not considered transparent. There is also a Libre Linux kernel out there that just strips all the proprietary blobs and that is considered OK.

Also, any kind of proprietary drivers are not accepted, so you can see where this is going. In fact, the new LibreBox from LibreTrend is the first PC from this company, and they decided that Ubuntu MATE will also be provided.

Source:

<http://news.softpedia.com/news/ubuntu-mate-gets-another-hardware-deal-will-power-the-librebox-mini-pc-485967.shtml>

Submitted by: Arnfried Walbrecht

## WHY UBUNTU PLANS TO REPLACE TRADITIONAL LINUX PACKAGES WITH SOMETHING BETTER

Ubuntu's Snappy system is currently used for cloud servers and smart devices, and the Snappy Ubuntu Core debuted recently in Ubuntu 15.04 .

Snappy works differently. Applications are no longer installed system-wide. The base Ubuntu operating system is kept securely isolated from applications you install later. Both the base system and Snappy packages are kept as read-only images.

Those applications are installed to separate directories and isolated from each other via the Linux-kernel-based AppArmor system. Snappy packages can include all the libraries and files

they need, so they don't depend on other packages. Ubuntu is currently working on "deduplication" support, which means duplicate copies of files won't be kept—if two Snappy packages include the same library, it will only be stored in one place on disk.

Source:

<http://www.pcworld.com/article/2942267/why-ubuntu-plans-to-replace-traditional-linux-packages-with-something-better.html>

Submitted by: Arnfried Walbrecht

## LINUX BIDS FOR UAV WORLD DOMINATION BY ENSLAVING FUTURE SKYBOT ARMY

The Dronecode open-source UAV platform initiative has announced that it has welcomed on board a raft of new members, who'll help drive the project towards becoming a de facto standard for consumer and commercial drones.

The non-profit organisation – governed by the Linux Foundation

– was formed in late 2014. Founding members 3D Robotics (3DR) and Yuneec International have since been joined by 27 other organisations and sponsored members, keen to participate in the "neutral, transparent initiative for advancing UAV technology", as the Linux Foundation's marketing big cheese Amanda McPherson described it.

The latest recruits to the cause include US autopilot outfit Arsoy RC Technology and Chinese UAV manufacturer Walkera.

Source:

[http://www.theregister.co.uk/2015/06/29/dronecode\\_linux/](http://www.theregister.co.uk/2015/06/29/dronecode_linux/)

Submitted by: Arnfried Walbrecht

## LINUX KERNEL 4.2 MAY END UP BEING THE BIGGEST RELEASE, SAYS LINUS TORVALDS

According to Linus Torvalds, it would appear that the wonderful team of kernel developers and contributors are in the middle of the merge window, and they will end up merging more

commits for Linux kernel 4.2 than they were during all of the releases of Linux kernel 4.1.

*"4.0 was pretty small (by our modern standards, which is to say it was still a lot of changes), 4.1 was about average, and it looks like 4.2 may end up being the biggest release (in number of commits, at least) we've ever had," says Linus Torvalds in the Google+ post. "So much for the summer slowdown."*

The development cycle of Linux kernel 4.2 might start this coming weekend with the first Release Candidate version, and it should have about seven or eight RC versions until the final release, which might see the light of day sometime in the fall of 2015.

Source:  
<http://linux.softpedia.com/blog/linux-kernel-4-2-may-end-up-being-the-biggest-release-says-linus-torvalds-485451.shtml>

Submitted by: Arnfried Walbrecht

## OPEN SOURCE HISTORY: WHY DIDN'T BSD BEAT OUT GNU AND LINUX?

If you use a free and open source operating system, it's almost certainly based on the Linux kernel and GNU software. But these were not the first freely redistributable platforms, nor were they the most professional or widely commercialized. The Berkeley Software Distribution, or BSD, beat GNU/Linux on all of these counts.

So why has BSD been consigned to the margins of the open source ecosystem, while GNU/Linux distributions rose to fantastic prominence? Read on for some historical perspective.

Understanding BSD requires delving far back into the history of Unix – the operating system first released by AT&T Bell Labs in 1969. BSD began life as a variant of Unix that programmers at the University of California at Berkeley, initially led by Bill Joy, began developing in the late 1970s.

Source:  
[http://thevarguy.com/open-source-application-software-](http://thevarguy.com/open-source-application-software-companies/062615/open-source-history-why-didnt-bsd-beat-out-gnu-and-linux)

[companies/062615/open-source-history-why-didnt-bsd-beat-out-gnu-and-linux](http://thevarguy.com/open-source-history-why-didnt-bsd-beat-out-gnu-and-linux)

Submitted by: Arnfried Walbrecht

## ENDLESS: A COMPUTER THE REST OF THE WORLD CAN AFFORD

Rural Mexico, the backstreets of Guatemala City, the outskirts of Mumbai; these aren't places where you find a lot of computers – for one simple reason; most computers are far too expensive. What you do find are lots of TVs, so why not build a cheap, flexible computer without a display? And ship it without a keyboard and mouse because those are items that can usually be sourced locally at low cost.

What would computers do for people in these places? They would deliver information, education, and opportunity. Record keeping for farmers, reading lessons for children, tools for creating and communicating ... the potential for computers to improve the lot of millions of people – are just waiting on the right gear, and I

think the right gear is what a new company, Endless, is about to launch.

What sets the Endless apart from other low cost machines is Endless OS, a highly customized version of Ubuntu Linux with Gnome (and lots of other interesting technology such as Xapian and OStree), that not only handles TVs as output devices (it scales and formats video output for readability), but also includes a huge library of applications and educational content. This is important because in emerging markets the Endless system will be useful and well-featured, even if you don't have any kind of networking services available.

Source:  
<http://www.networkworld.com/article/2945802/green-it/endless-a-computer-the-rest-of-the-world-can-afford.html>

Submitted by: Arnfried Walbrecht

## RICHARD STALLMAN 'BASICALLY' HAS NO PROBLEM WITH THE NSA USING GNU/LINUX

If you have been keeping an eye on what the NSA has been up to while they were busy reading your emails, you might be aware of the XKEYSCORE program run by the agency. According to Edward Snowden, as told to Glenn Greenwald, the program was used to "sweep up countless people's Internet searches, emails, documents, usernames and passwords, and other private communications."

This is old news, you say. We've all known about it since 2013. So what's the big deal and why am I bringing it up now? The big deal is that the NSA was allegedly running the program on 'Free and Open Source' software.

This story generated mixed responses from the Open Source community. Many bashed Red Hat, even though we don't know if the NSA is a Red Hat client. Others bashed the NSA for using Free Software to perform its 'evil'

deeds.

I was among those who didn't see any problem here. I have been using and advocating Free Software since 2005, and I have met numerous people from different walks of life who use Free Software. Back in 2007, I met Mohammad Khansari, director of the National Linux Project, Iran, who said that when the U.S. closed 'Windows' on them, they moved to 'Open Source'.

Source:

<http://www.itworld.com/article/2946683/linux/richard-stallman-basically-has-no-problem-with-the-nsa-using-gnulinix.html>

Submitted by: Arnfried Walbrecht

## CORE LINUX TOOLS TOP LIST OF MOST AT-RISK SOFTWARE

The CII (Core Infrastructure Initiative), a Linux Foundation effort assembled in the wake of the Heartbleed fiasco to provide development support for key Internet protocols, has opened the doors on its Census Project -- an effort to figure out what projects need support now, instead of

waiting for them to break.

According to the current iteration of the survey, the programs most in need of attention are not previously cited infrastructure projects, but common core Linux system utilities that have network access and little development activity around them.

The Census, with both its code and results available on GitHub, assembles metrics about open source projects found in Debian Linux's package list and on openhub.net, then scores them based on the amount of risk each presents.

Risk scores are an aggregate of multiple factors: how many people are known to have contributed to the project in the last 12 months, how many CVEs have been filed for it, how widely used it is, and how much exposure it has to the network.

Source:

<http://www.infoworld.com/article/2946566/security/core-linux-tools-top-the-list-of-most-at-risk-software.html>

Submitted by: Arnfried Walbrecht

## MICROSOFT ADDS LIMITED SUPPORT FOR LINUX ON AZURE CLOUD

Microsoft has done the previously unthinkable and said it will now provide "limited support for major Linux distributions, third-party and open-source technologies" on its Azure cloud.

To get the ball rolling, Microsoft will support what it describes as the most popular Linux distros as of July 15.

Microsoft officially says its support will be "limited" and it's a pretty apt description, given that it consists of "Help with installation and configuration of Supported Linux Distributions on the Azure platform and services" and "Recommendations applicable to the Azure platform and services" that pertain to performance and networking issues.

Source:

<http://siliconangle.com/blog/2015/07/16/microsoft-adds-limited-support-for-linux-on-azure-cloud/>

Submitted by: Mike Wheatley

## CANONICAL AND FREE SOFTWARE FOUNDATION COME TO OPEN-SOURCE LICENSING TERMS

For years, Canonical and Ubuntu have been accused of playing fast and loose with Linux-related licenses. Now, Canonical and the FSF have reached a common understanding over Ubuntu licensing.

Canonical, Ubuntu Linux's parent company, has often rubbed other free software groups the wrong way when it came to open-source licenses. On July 15, Canonical, with support from the Free Software Foundation (FSF) and the Software Freedom Conservancy (SFC), have changed Ubuntu's licensing terms. The FSF states that Canonical's new intellectual property (IP) policies "unequivocally comply with the terms of the GNU General Public License (GPL) and other free software licenses."

Source:

[http://www.zdnet.com/article/canonical-and-free-software-](http://www.zdnet.com/article/canonical-and-free-software-foundation-comes-to-open-source-licensing-terms/)

[foundation-comes-to-open-source-licensing-terms/](http://www.zdnet.com/article/canonical-and-free-software-foundation-comes-to-open-source-licensing-terms/)

Submitted by: Steven J. Vaughan-Nichols

## WHAT THE UBUNTU IP ANNOUNCEMENT MEANS

The announcement by the FSF and Software Freedom Conservancy has a lot of jargon in it so to help people better understand I am going to do an analysis. Mind you, back in 2012, I reached out to the FSF on these very licensing concerns which no doubt combined with other developers contacts set in motion these discussions.

In a nutshell, the FSF is making it clear while some progress was made that the Ubuntu IP Policy is still not a good example of a policy that protects the freedoms you have to using code under the licenses of software Ubuntu bundles into the distro we use and love. This is concerning because Canonical has essentially made some concessions but put its foot down and not made as much change as it needs to.

Source:

full circle magazine #99

<http://benjaminkerensa.com/2015/07/15/what-the-ubuntu-ip-announcement-means>

Submitted by: Benjamin Kerensa

## KUBUNTU'S JONATHAN RIDDELL SAYS UBUNTU POLICY IS STILL LACKING

Kubuntu's Jonathan Riddell talked about the recent changes to the licensing procedures on the Ubuntu project, and he said that there are still some important problems that have been left unresolved.

Canonical announced a couple of days ago that the company had made some changes to its policies in order to comply with GPL, but voices in the community are saying that it's not enough and that more effort needs to be made. Kubuntu's Jonathan Riddell talked about the remaining issues at length on his blog.

Many of you will remember the conflict between Jonathan Riddell and Canonical, which ended with his removal from the Kubuntu Community Council. He's now just a simple member of the community and developer for

Kubuntu. He said on numerous occasions that Canonical's policy regarding Ubuntu is not well put together and that it causes problems for other projects as well. In fact, these issues were in a discussion during his conflict with Canonical and the Ubuntu Council.

Source:

<http://news.softpedia.com/news/kubuntu-s-jonathan-riddell-says-ubuntu-policy-is-still-lacking-487186.shtml>

Submitted by: Silviu Stahie

## ONE UBUNTU PC MAKER IS KICKING ADOBE FLASH OFF ITS LINUX SYSTEMS

System76, a Denver-based vendor of Ubuntu Linux laptops and desktops, has stopped pre-loading Flash on its machines. The company is also strongly recommending that current customers purge Flash from their systems as well.

Amid calls to accelerate the death of Adobe Flash Player, at least once PC vendor is taking matters into its own hands.

Citing security and irrelevance,



System76 stops bundling Flash with Firefox, and recommends that all customers purge the plug-in from their systems.

Source:

<http://www.pcworld.com/article/2949106/software-web/one-ubuntu-pc-maker-is-kicking-adobe-flash-off-its-linux-systems.html>

Submitted by: Jared Newman

## LINUX MINT 17.2 OFFERS DESKTOP FAMILIARITY AND RESPONDS TO USER WANTS

These days, the desktop OSes grabbing headlines have, for the most part, left the traditional desktop behind in favor of what's often referred to as a "shell." Typically, such an arrangement offers a search-based interface. In the Linux world, the GNOME project and Ubuntu's Unity desktop interfaces both take this approach.

This is not a sea change that's limited to Linux, however. For example, the upheaval of the desktop is also happening in Windows land. Windows 8 departed from the traditional

desktop UI, and Windows 10 looks like it will continue that rethinking of the desktop, albeit with a few familiar elements retained. Whether it's driven by, in Ubuntu's case, a vision of "convergence" between desktop and mobile or perhaps just the need for something new (which seems to be the case for GNOME 3.x), developers would have you believe that these mobile-friendly, search-based desktops are the future of, well, everything.

Source:

<http://arstechnica.com/gadgets/2015/07/rare-breed-linux-mint-17-2-offers-desktop-familiarity-and-responds-to-user-wants/>

Submitted by: Scott Gilbertson

## CONTAINER COMPETITORS GOOGLE, COREOS, JOYENT AND DOCKER JOIN NEW LINUX CLUB AS KUBERNETES TURNS ONE

Kubernetes, the container management solution originally open sourced by Google GOOGL +0.43%, is deemed ready for mainstream use as it reaches

version 1 today. Alongside this software versioning milestone, Google is joining a host of familiar names in a new Cloud Native Computing Foundation, under the auspices of the Linux Foundation. Google is gifting Kubernetes to the new Foundation, which some will see (rightly) as a useful base upon which to build, and which others will see (also, perhaps, rightly) as a way to ensure that the new Foundation's work is Googley from the outset. Other partners in this new endeavor include container hotshots like Docker, CoreOS, Joyent and others. Will the new Foundation lead to a meeting of minds, or is it just another forum in which they can sling mud?

The Linux Foundation, unsurprisingly, is definitely hoping for the meeting of minds. Executive Director Jim Zemlin commented,

*"The Cloud Native Computing Foundation will help facilitate collaboration among developers and operators on common technologies for deploying cloud native applications and services. By bringing together the open source community's very best talent and code in a neutral and collaborative*

*forum, the Cloud Native Computing Foundation aims to advance the state of the art of application development at Internet scale."*

Source:

<http://www.forbes.com/sites/paulmiller/2015/07/21/container-competitors-google-coreos-joyent-and-docker-join-new-linux-club-as-kubernetes-turns-one/>

Submitted by: Arnfried Walbrecht



# UbuContest 2015



**Canonical Ltd., the Ubucon Germany 2015 team, and the UbuContest 2015 team, are happy to announce the first UbuContest!**

Contestants from all over the world will have until September 18, 2015 to build and publish their apps and scopes using the Ubuntu SDK and Ubuntu platform, starting today.

We are proud to present five dedicated categories:

- **Best Team Entry:** A team of up to three developers may register up to two apps/scopes they are developing. The jury will assign points in categories including "Creativity", "Functionality", "Design", "Technical Level" and "Convergence". The top three entries with the most points win.
- **Best Individual Entry:** A lone developer may register up to two apps/scopes he or she is developing. The rest of the rules are identical to the "Best Team Entry" category.
- **Outstanding Technical Contribution:** Members of the general public may nominate candidates who, in their opinion, have done something "exceptional" with an Ubuntu-based device, Unity8, Mir, etc. on a technical level. Each jury member has one vote, and the nominated candidate with the most jury votes wins.
- **Outstanding Non-Technical Contribution:** Members of the general public may nominate candidates who, in their opinion, have done something exceptional, but non-technical, to bring the Ubuntu platform forward. So, for example, you can nominate a friend who has reported and commented on all those phone-related bugs on Launchpad. Or nominate a member of your local community who did translations for Core Apps. Or nominate someone who has contributed documentation, written awesome blog articles, etc. The rest of the rules are identical to the "Outstanding Technical Contribution" category.
- **Convergence Hero:** The "Best Team Entry" or "Best Individual Entry" contribution with the highest number of "Convergence" points wins. The winner in this category will probably surprise us in ways we have yet to imagine.

Our community jury panel members Laura Cowen, Carla Sella, Simos Xenitellis, Sujeewan Vijayakumaran and Michael Zanetti will select the winners in each category. Successful winners will be awarded items from a huge pile of prizes, including travel subsidies for the first-placed winners to attend Ubucon Germany 2015 in Berlin, four Ubuntu Phones sponsored by bq and Meizu, t-shirts, and bundles of items from the official Ubuntu Shop.

**We wish all the contestants good luck!**

Go to [ubucontest.eu](http://ubucontest.eu) for more information, including how to register and nominate folks. You can also follow us on Twitter [@ubucontest](https://twitter.com/ubucontest), or contact us via e-mail at [contest@ubucon.de](mailto:contest@ubucon.de).



Over the course of time, I've picked up a lot of rudimentary skills in various programming languages. Some of them I chose to deepen, and others have stagnated. The largest problem I often run into is deciding what to program, and in what language. If you're like me, and in need of some challenging exercises to work through, skip to part two. If you're still trying to learn a language, stick with me.

### LEARNING A LANGUAGE

There are various ways to learn a language - buy a book, take a course, or follow a tutorial online. However, some options can be expensive, or simply difficult to accomplish, as it removes the explanation factor of why one method is better than another (for example). Instead, here is a short list of online sites that offer free courses. Depending on what you want to learn, you may need to browse each in turn.

#### Code Academy

<http://www.codecademy.com/learn>

The site offers a relatively small list of courses (though they keep expanding). However, they offer an interactive set of exercises that you can work through straight from the browser. As such, if you're trying to learn a language that they offer, I would recommend starting there.

#### Khan Academy -

<https://www.khanacademy.org/computing/computer-programming>

This site follows the more traditional online university system - you watch a video with an explanation, and then do quizzes/exercises after each video. Currently their offering is mainly focused around JavaScript and HTML. They do, however, offer many other (non-programming) courses as well.

#### Coursera -

<https://www.coursera.org/>

The offering here is typically segments or complete videos from actual university courses. They offer a good deal of options, but

some of the videos can be out of date. If you're looking to get into the more abstract discussions on programming or programming languages in general, this may be a good spot to start.

There are, of course, other options out there. However, I have actively tried each of these offerings, and come to see each of their strengths. If you're looking for a programming language not listed, my suggestion is to check the language's homepage. Most offer some sort of introduction or tutorial.

### I'VE LEARNED A LANGUAGE - NOW WHAT?

Once you've learned a language, it's time to put it into use. If you have ideas for programs, then that's great. Sometimes, however, you won't have a specific need to fill, or problem to fix. At times like that, I like to fall back to some form of programming challenge. This way, I improve my understanding and knowledge -

and sometimes, you'll end up with a reusable library of functions. Or, better yet, you'll have an idea for a program yourself. Two of my favourite offerings are as follows:

#### Project Euler -

<https://projecteuler.net/>

This site offers a massive number of math-related challenges. They are typically difficult questions that could not be reasonably answered with a calculator and patience - instead, the quickest solution is to write a program to test solutions until finding the correct one. If you absolutely loathe mathematics, or, after reading some questions, you feel Project Euler isn't for you, then move on to my next suggestions. The major benefit to Project Euler is simply the fact that it is language agnostic - so long as you can calculate in a language, you can do the challenges. Some languages (such as Python) offer helpful mathematics functions, but if you keep track of your functions in a library, you shouldn't be repeating yourself too often.

## Exercism -

<http://exercism.io/>

Exercism is a command-line tool, linked into a tiered library of exercises to be done in a variety of languages. The exercises don't typically change between languages, but are good practice nonetheless. The way it works is by fetching the exercises, and then choosing a language to start with. You then get a README file, as well as a \*\_test file. The test file contains actual programmatic tests, to ensure that your answer is complete. If you're never worked with tests before, I highly recommend Exercism as an introduction to tests. The actual submission is simple - if the test file clears without errors, and you're happy with your file, you can submit it. It then appears on the Exercism site under your account's name. Then other programmers can discuss it - where you may learn a new trick or two. You can, naturally, also check out other people's submissions. If you later want to update your file, you can do so. It keeps track of your iterations, and each iteration has a separate discussion. And if you're tired of having your code analyzed - you can mark a task as done, and close all discussions on it.

## Extra: Dev Docs

Sometimes, you'll be working on a program, and realize you don't remember the exact format of a function, or if the built-in function actually exists. This is where you can either turn to a manpage, the language's documentation, or <http://devdocs.io>. Devdocs.io is a site that offers a huge library of documentation on various languages. The site itself will let you save the library for offline access, meaning you shouldn't ever be without documentation. However, as it's an open source project, you can also install a completely local instance of the site. Submissions are also accepted, and as such the information is usually up to date, and expanding at a brisk pace. It also includes some documentation for tools (SASS, Bower, npm, etc.).

## CONCLUSION

I hope this article is helpful for anyone who wants to learn to program, or anyone who feels they are stagnating at their current level. If you know of another great site, or an awesome set of challenges, please let me know! As always - suggestions, comments, or

requests can be sent to me at [lswest34+fc@gmail.com](mailto:lswest34+fc@gmail.com).



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

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

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

[podcast.ubuntu-uk.org](http://podcast.ubuntu-uk.org)





# HOW-TO

Written by John Eddie Kerr

# LaTeX on XUbuntu Pi and in The Cloud

First of all let's clear up a small problem. Those of you using TexStudio may have experienced a problem with the icons not appearing in the menu bar. This is fixed by installing libqt4-svg:

```
sudo apt-get install libqt4-svg
```

This is one of those secrets that you have to dig for, but the LaTeX community does have the answer.

## XUBUNTU, L<sup>A</sup>T<sub>E</sub>X, AND THE RASPBERRY PI 2

I have installed the XUbuntu image for the Raspberry Pi 2 that is available from the Ubuntu website: <https://wiki.ubuntu.com/ARM/Raspberrypi>

The link above takes you to an easy-to-follow recipe to install the image on to an SD card. You may want to review the commands for Fdisk before you start, as you will be using Fdisk on the command-line and it is not something most of us are used to. Fear not, just make sure you are writing to the

right disk, and, if anything goes wrong with the install, gparted will come to the rescue. You will not destroy the SD card.

XUbuntu On The Raspberry Pi 2 Is Fantastic.

I have installed Tex-live on the Rpi2 as well as the LaTeX editors Gummi and TexStudio, and both have worked flawlessly. Now, compared to my Dell Optiplex 755 with 2 gigs of RAM, the Rpi2 is a bit

slower, but it is not a show-stopper.

Playing some YouTube videos can be a problem, and some websites can crash the system, but it is a quick automatic reboot. IMHO, you can use the Rpi2 as a real computer, and, with no moving parts, it runs silently, and since it draws less than 10 watts of power, you can leave it powered on. Best of all, you can compose in LaTeX on it.

I digress, back to LaTeX.

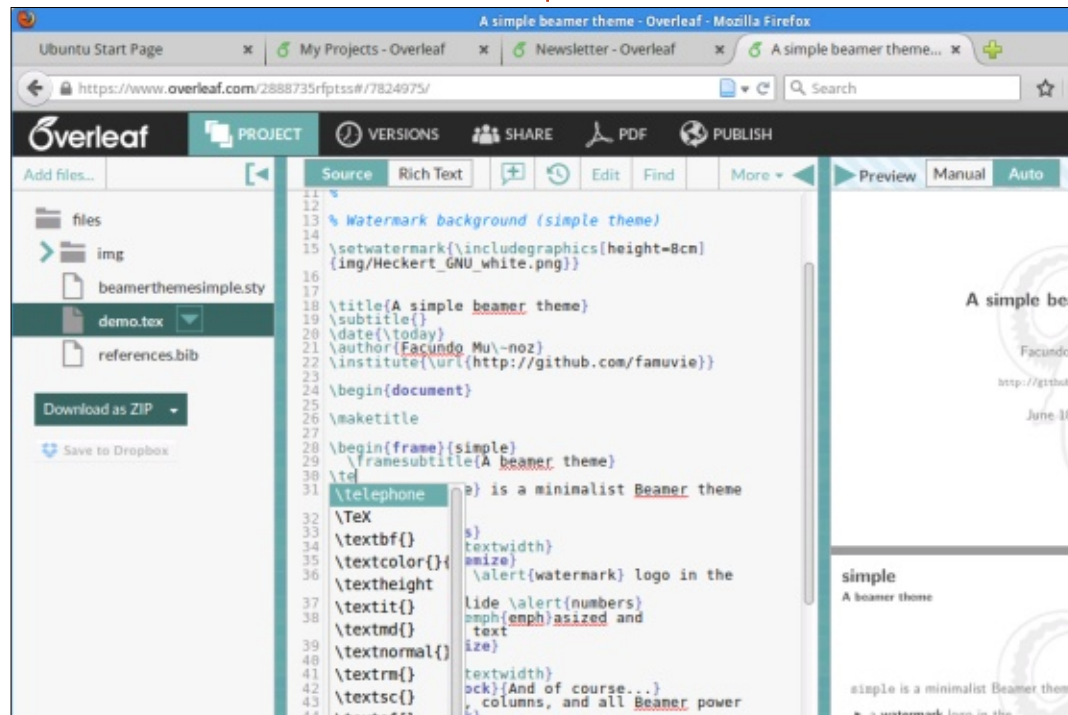
## L<sup>A</sup>T<sub>E</sub>X IN THE CLOUD

In previous articles, I have mentioned a number of LaTeX editors that you can download to your computer to create documents. A relatively new way of composing in LaTeX is an online service that provides a LaTeX editor in the Cloud.

Overleaf and ShareLaTeX are two of the best online LaTeX editors that I have seen.

OverLeaf (<https://www.overleaf.com/>) is a re-launch of WriteLatex which is an online LaTeX editor that has been around for a while. There is also ShareLaTeX (<https://www.sharelatex.com/>).

Best of all, they all provide a very good service which is free. Overleaf and ShareLatex offer extra service plans starting at \$8.00 per month, but the free service is as good as what you can



do with a LaTeX editor at home.

Both of the Cloud LaTeX editing sites offer an extensive collection of templates for you to use as a starting point for your project. It is a great way to learn LaTeX as the templates have lots of commands built in, and you can see how they work. There is auto-completion of commands in both online services, but TexStudio can be a little more helpful if you can't remember how the command starts or goes.

So why would anyone want to use a LaTeX editor running on your own computer such as TexStudio? All applications that you use in the Cloud are dependent on an Internet connection to work or give you access to your files. Some of us are not too comfortable with that; I like the independence of having my files on my own computer. It is a great theory, working on your portable computer from anywhere, any place that has WiFi, but we both know how spotty public WiFi can be.

I also have to admit that editing my LaTeX files in the Cloud has the advantage to work on the same file from any one of my four

computers. Also, if I was working on a project with someone else, that person could log in to the service and edit the file as well.

Fortunately, you can download your files from both sites and you can cut and paste to and from your computer. So you are not locked in to any one of the services.

I have logged into both of these online LaTeX editors with my Raspberry Pi 2, and it worked very well – again kudos for the Raspberry Pi 2.

## INSTRUCTIONAL VIDEOS

In an earlier article I mentioned that there are plenty of instructional videos about LaTeX. I found a new set recently and even though the video was recorded on a MacIntosh with a plain text editor, the videos are excellent. The videos focus on the commands that you type and not on any particular editor. Go to YouTube and look for the videos uploaded by Alexander Baran-Harper. These videos take out the steep slope of the so called LaTeX learning curve, and are presented with crisp clear images and at a good pace.

Until next time enjoy exploring LaTeX.



## EXTRA! EXTRA! READ ALL ABOUT IT!

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

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

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

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



**John Eddie Kerr** is a Law Librarian at a county law library in Guelph, Ontario, Canada. Ubuntu powers his desktop at work and at home. He is a member of the KitchenerWaterloo Linux Users Group and the WFTL LUG.



# HOW-TO

Written by Elmer Perry

## LibreOffice Pt.51 - Link or Embed in Writer

Jimmy Fixit is a self-employed handyman. He does carpentry, roofs, plumbing, lawn work, and flooring. He created a spreadsheet to invoice his customers, but when a customer didn't pay in the allotted time, he needed to send them a late notice. The notice was a detailed letter of what they owed, and a request for them to pay by a certain date. He wanted to add in a table listing the work done and any payments made. He could use a Writer table and do the calculations himself, but if he could insert a spreadsheet into the middle of his text document, he would have everything he needed. Turned out, he can.

### EMBED A SHEET IN WRITER WITH OLE

Jimmy solved his problem by using Object Linking and Embedding (OLE) to embed a Calc sheet in his writer document. By embedding a sheet in his document, he was able to use formulas to do calculations on the tax and the total. The embedded sheet worked like a mini spreadsheet within his document. He was able to format the cells, adjust columns and rows, merge cells, and anything else he might do in a spreadsheet opened in Calc.

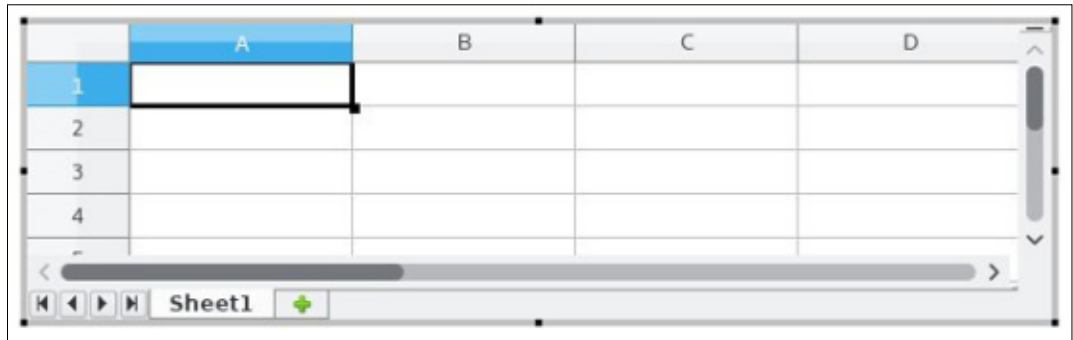
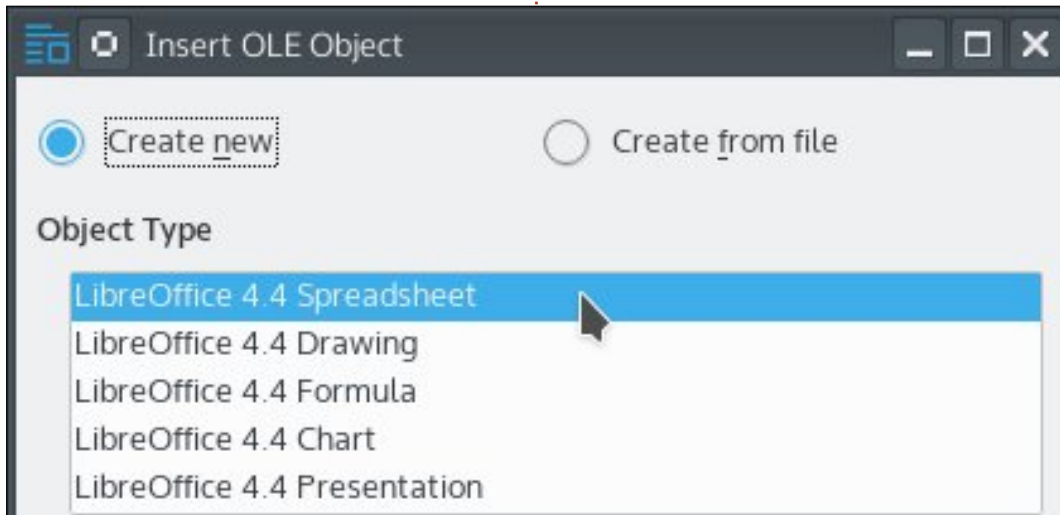
To embed the sheet into his document, Jimmy selected the position in the document where he wanted the sheet to appear. Insert > Object > OLE Object brought up the Insert OLE Object dialog. From the dialog, he selected LibreOffice Spreadsheet from the list. After selecting the spreadsheet object type, he clicked on OK, and Writer created a mini Calc spreadsheet inside Jimmy's document.

Jimmy used the eight adjustment handles to fit the inserted object to his document. The cells behaved just like the cells in a regular Calc sheet. He adjusted his rows and columns as needed, formatted his total column, and inserted formulas to calculate the tax due and total. When Jimmy finished, he clicked outside the

embedded object to return to writing his document. The tabs and row/column headers disappeared. If at any time, he noticed he had made a mistake, double-clicking inside the embedded object allowed him to edit it again. While editing the object, Writer's toolbars and menus changed to Calc's toolbars and menus. Even the sidebar became the Calc sidebar. Editing the spreadsheet object was the same as having it opened in Calc.

### OLE LINK TO AN EXISTING DOCUMENT

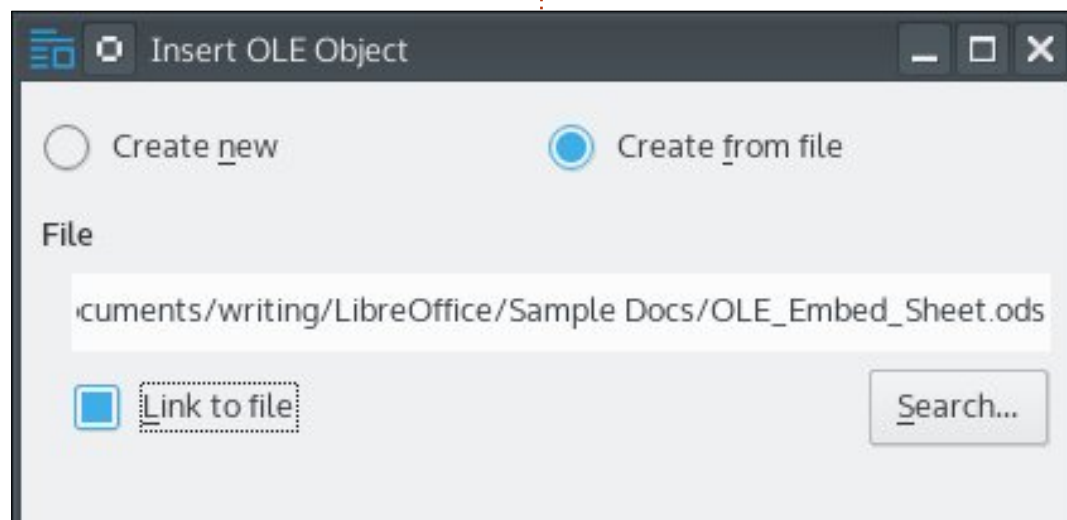
Later on, Jimmy started tracking his customers in a Calc document – with each customer's transactions listed on a different





sheet. When he had to create a collection notice for a customer, he felt like he was wasting his time just retyping information that already existed. After a little homework, Jimmy discovered that he could insert the data from the existing spreadsheet into the document using OLE linking.

Insert> Object > OLE Object once again brought up the Insert OLE Object dialog. Instead of selecting the object type, this time Jimmy clicked "Create from file." Clicking on the Search button, Jimmy browsed to the location of the spreadsheet containing his customers' records. Selecting the file, he clicked the Open button. Back in the Insert OLE Object dialog, he selected "Link to file" to create a link between the two



documents. If he had not selected "Link to file", the sheet would have been embedded instead of linked. More on the difference in a moment.

Just like before, Jimmy got a mini Calc spreadsheet inserted into his document. However, this one was linked to the original spreadsheet document. On the tabs for the different sheets, he clicked the customer which he was creating the document for. Just like before, he had the full use of the Calc menus and toolbars as though he was editing the object directly in Calc. Once he clicked out of the linked sheet, the

selected sheet showed in the document without tabs or row/column headers.

## THE DIFFERENCE BETWEEN LINKING AND EMBEDDING

When Jimmy selected "Link to file", he created a link between the spreadsheet file and the object in his Writer document. If he had not selected "Link to file", the spreadsheet would have been embedded instead. When Jimmy linked the two, he created a very powerful tool for himself. Any changes he makes to the original spreadsheet will automatically update in the Writer document. Likewise, any changes he makes to the object in the Writer document will update in the original spreadsheet. The link created a two-way connection between the two documents. He could edit the sheet only in one document at a time. If he opened one document and the other was already open, the spreadsheet opened as read-only copy in the second document. However, if he had only embedded the sheet into the Writer

document, no connection is created. Changes to one document would not affect the other. When using OLE, it is important to decide which method is going to best suit your purposes. For Jimmy, linking was the best choice.

## LINKING ONLY A PART OF A SHEET WITH DDE

As time passed on, Jimmy hired an accountant to keep his books. At the end of every month, Jimmy asked for the business financial status, and the accountant would send him a balance spreadsheet. Jimmy plowed through the long sheet for a few months before deciding it was too much.

*"Just give me a summary,"* he told the accountant.

The accountant began copying the summary section of the sheet and sending it to Jimmy, but now, Jimmy was asking for the summary two or three times a week.

The accountant needed an easier way; so, he did some studying and discovered Dynamic Data Exchange (DDE). DDE was the predecessor to OLE, but it had one



feature he liked. He wanted the ability to give Jimmy a document that would automatically update, but a document Jimmy could not edit. DDE creates a one-way link from the original to the linked document. Formatting and cell styling do not transfer. The table looked like a plain Writer table. Jimmy could edit the cells, but when he reopened the document, any changes were replaced with the data in the original.

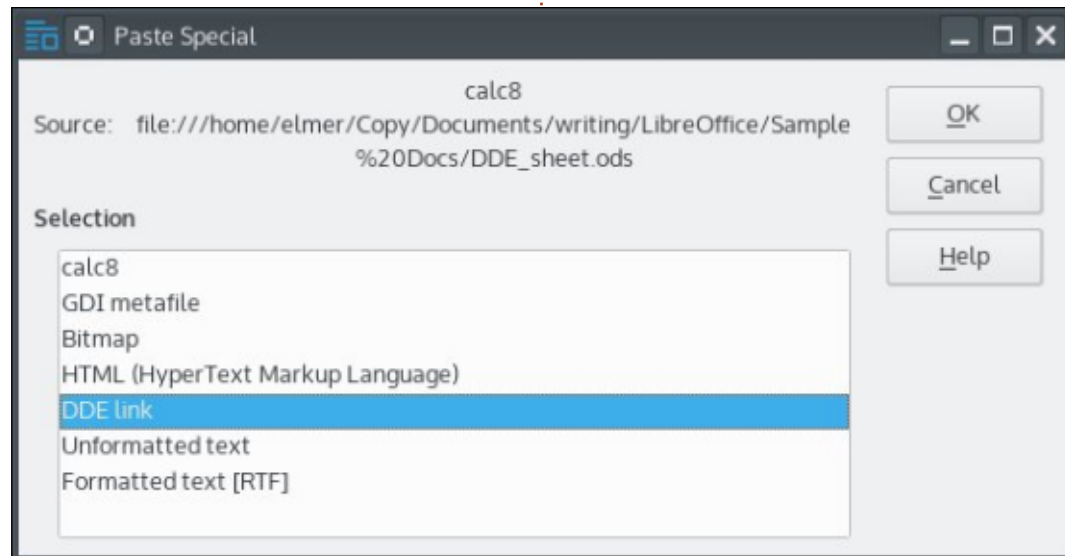
To create the DDE link, the accountant copied the cells he needed from the original document. In the new document, he selected Edit > Paste Special. In the Paste Special dialog, the accountant chose the DDE Link

option and clicked OK. The data was inserted into the document in a plain, unformatted table.

Once the accountant created the document, he no longer had to worry about it. Jimmy could open the document at any time, and the table would update with the latest data in the spreadsheet. Anytime Jimmy asked him for a summary of the business financial status, the accountant just sent him a link to the document containing the DDE link.

Jimmy started out with a simple need: to insert a sheet into his document. He was able to accomplish this by embedding a sheet in his document using OLE.

As his needs became more complex, he switched to linking to his customer spreadsheet using OLE linking. When Jimmy hired an accountant, the accountant grew tired of providing Jimmy with updates on the business financial status; so, he used the old DDE method to create a link to the document that Jimmy could not change. OLE and DDE allowed Jimmy and his accountant to embed and link data to their documents and automate some of their work.



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



Last time, we covered the installation of node.js and we implemented a basic random number generator which we used for generating lotto numbers.

In this part, I thought it would be good to see how linux commands, like yes, word count, or cat, can be implemented in JavaScript using node.js. In this part I will cover the yes command ([https://en.wikipedia.org/wiki/Yes\\_\(Unix\)](https://en.wikipedia.org/wiki/Yes_(Unix))). First let's see the code (right) and I will explain the details afterwards.

The first line of the file is simple and, if you have ever written a bash script, you know what is it for; it gives a hint to the command line what app to use for executing the script. In this case, I wrote to use node from /usr/bin.

After that, I have a description of the app and what it should do, the description is taken from the man page of the command.

I defined two constants, DEFAULT\_TEXT and

CUSTOM\_TEXT. The DEFAULT\_TEXT is used to write out the y character and a newline. The CUSTOM\_TEXT will contain the text which the user wants to repeat.

Then, I define three functions (printUsage, writeDefaultText, writeCustomText), their names are self-explanatory, but their content might need some attention. In node, using the process.stdout object means that we can access any outgoing stream and we can write to it. For example, if you want to add the output of the yes command to a file using this command: ./yes.js >> resultTextFile.txt, then this should work without any problem.

The most important part comes now; in the application, I subscribe to the signal SIGINT (which is usually triggered on all operating systems when the user presses CTRL+C keys) using the process.on(...) function. When the signal is sent, I clear the repetition setup of the functions writeDefaultText() and

```
#!/usr/bin/env node
/*
This small node.js app should do exactly what the yes linux
command does. Quote from man yes: Repeatedly output a line
with all specified STRING(s), or `y`.
*/

var DEFAULT_TEXT = "y\n";
var CUSTOM_TEXT = "";

var printUsage = function() {
  process.stdout.write("yes [custom text]");
};

var writeDefaultText = function() {
  process.stdout.write(DEFAULT_TEXT);
};

var writerCustomText = function() {
  process.stdout.write(CUSTOM_TEXT);
};

//handler for CTRL + C
process.on("SIGINT", function() {
  clearInterval(writeDefaultText);
  clearInterval(writerCustomText);
  process.exit(0);
});

if(process.argv.length == 2) {
  setInterval(writeDefaultText, 2);
}
else if(process.argv.length == 3) {
  CUSTOM_TEXT = process.argv[2];
  if(CUSTOM_TEXT[CUSTOM_TEXT.length - 1] != "\n") {
    CUSTOM_TEXT += "\n";
  }
  setInterval(writerCustomText, 2);
}
else {
  printUsage();
}
```

`writeCustomText()`. I know we have not set up the repetition of these yet, but it will come shortly. I set up the repetition of a method (either `writeDefaultText()` or `writeCustomText()`) using the `setInterval(...)` function. With the repeated execution of `writeCustomText()` or `writeDefaultText()` methods, I manage to repeat the same output many times.

Next, I check if the process was started with or without parameters. If it was started without parameters (`process.argv.length == 2`\*\*), it means that I need to set the `writeDefaultText()` method to be repeated until the user sends a SIGINT signal and the application will stop. The repetition is set up using the code: `setInterval(writeDefaultText, 2)`. The `setInterval()` function takes two parameters; the first one is the method which needs to be executed and the second is the interval when that method (parameter #1) needs to be run. The second parameter needs to be a number and it represents milliseconds; in this case the `writeDefaultText()` will be invoked every two milliseconds.

In case the program was started with three parameters (`process.argv.length == 3`\*\*), it means that the user passed in a custom text which he/she wants to be repeated, so, I set the `writeCustomText()` method to be executed every two milliseconds, but before that I do an extra check and see if the text provided by the user has a newline at the end or not. If it does not have a newline character, then I will add the newline character.

In case the number of process arguments is not two or three, I invoke the `printUsage()` method which prints to the user how to use the program.

You could ask why did I set the interval to two milliseconds and not to one. The answer is simple, if I set the interval to one millisecond, then the app will not be able to receive the SIGINT event when the user presses CTRL+C keys.

This is just one implementation of the yes command; there are other ways to do it, but I've chosen to do it this way because I could use signals and intervals, plus had

to take into account the number of parameters passed to the program. In the next part, I will implement word count (wc) using node.js. Till then try to do another implementation of the yes command, or any other linux command, and please send it to me, I will put it in the next article and highlight pros and cons of the implementation.

\*\* According to the node documentation ([https://nodejs.org/api/process.html#process\\_process\\_argv](https://nodejs.org/api/process.html#process_process_argv)) the first item in argv array is the word "node", the second is the name of the JavaScript file which is executed.



**Gergo Bogdan** is a software engineer, blogger, tech enthusiast from Budapest who is riding the waves of the constantly changing IT ocean. You can check his website at: <http://grelution.com>.

# Get *unlimited* access to a cutting-edge technology and business library with **Apress Access!**

## For **\$199**

### YOU GET:

- Unlimited access to Apress titles for a full year
- Instant access to each new Apress publication
- Compatibility with any device—desktop, laptop, or mobile
- Use of our new exclusive-to-Apress reader with unparalleled search functions
- Option to download any eBook for just \$4.99 for a limited time



[www.apress.com](http://www.apress.com) |  @apress

Want more info? Check out [www.apress.com/subscription](http://www.apress.com/subscription)





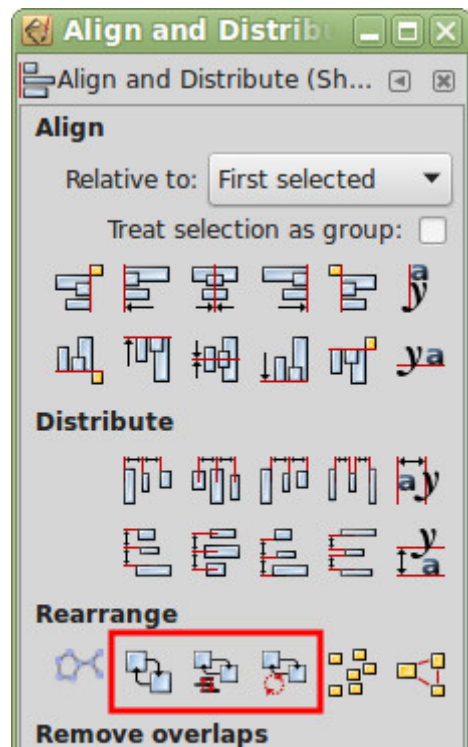


# HOW-TO

Written by Mark Crutch

## Inkscape - Part 39

Last time I introduced the Align and Distribute dialog, but went only as far as describing the Align part. This time I'll continue – not only onto the Distribute section, but down through the remaining sections of the dialog as well. Let's start with a reminder of what the dialog looks like, noting that there's been a little rearrangement of the buttons between 0.48 and 0.91, and the ones outlined in red are new to 0.91.



Much like the Align section, the Distribute part of the dialog is split into two rows of buttons, governing horizontal and vertical distribution, respectively. Using these, you can distribute a number of objects so that they're spaced evenly along the horizontal axis or the vertical axis. If you want to distribute along both axes – to create a staircase effect – you'll need to press a button from each row in turn.

As you might expect, the objects to be distributed are the ones that are selected on the canvas. Selection order doesn't matter, and you can't choose the anchor objects: everything is calculated implicitly from the positions of the elements. When distributing horizontally, for example, the objects furthest to the left and right will be left in place, with all the others being distributed between them. For vertical distribution, the rules are the same, except with the highest and lowest (by y coordinates) being left in place.

What this means, in practice, is that you need to get your first and last objects into the right place before trying to use these buttons. Often that involves snapping to the grid, or aligning to another object as described last time. Only once those are in the right locations should you select all the objects you want to distribute – including the first and last ones – and then click on one of the buttons.

The difference between each of the buttons is quite well represented by their icons. Considering each of the five buttons in the first row (I'm sure you can infer the equivalent functions for the second row), the buttons move your selected objects so that:

- The left edges of their bounding boxes are evenly distributed
- The centers of their bounding boxes are evenly distributed
- The right edges of their bounding boxes are evenly distributed
- The space between each bounding box is evenly distributed

- The space between baseline anchors of text objects is evenly distributed

That last one probably needs a little more explanation. Much like the text alignment buttons mentioned in the previous instalment, these two text distribution buttons work only with a selection of text objects. When you edit text in Inkscape, you may notice a small square below the text you enter. This is the baseline anchor, and its position varies depending on the text justification. These buttons move your text objects so that the baseline anchors are evenly distributed. Before rushing to use these buttons to distribute your text, however, do consider whether that's really what you want: usually the previous button (even spaces between objects) gives a better result.

Often you'll find that the difference between distribution options is negligible, especially when the objects are all similarly sized. When you start to distribute

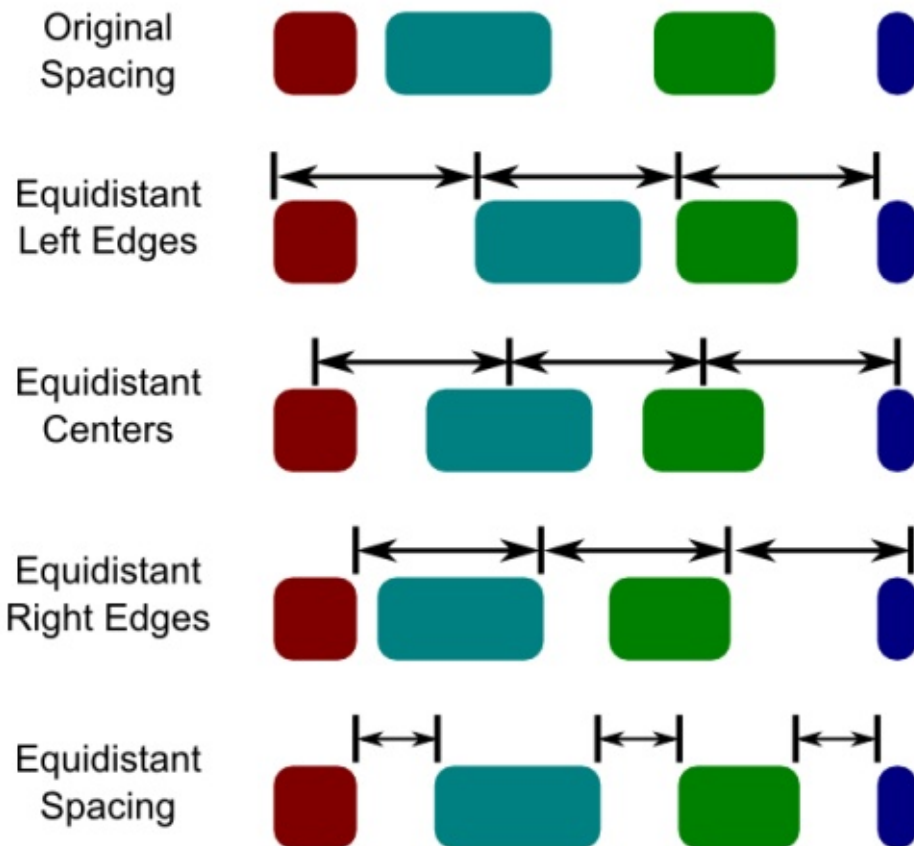
differently sized elements, however, the differences can be significant, as you can see from the image shown below.

Continuing downwards, the layout of the dialog diverges between versions 0.48 and 0.91. For the latter, the next section of the dialog is labelled as “Rearrange”, and consists of six icons of varying provenance:

- Arrange Connector Network:

Moved from the “Connector network layout” section in 0.48

- Exchange positions, selection order: New to 0.91
- Exchange positions, stacking order: New to 0.91
- Exchange positions, clockwise rotate: New to 0.91
- Randomise centers: Moved from the “Distribute” section in 0.48
- Unclump objects: Moved from the “Distribute” section in 0.48



The first of these works only if your selected objects form a network that was created with the Connector tool (see part 27 of this series for more details). It's just a duplicate of the same button in the Connector tool controls – except that this one offers fewer settings. My advice is to use the dedicated connector toolbar if you need this functionality, but really you're better off using a different application altogether for anything more than a trivial connector layout.

Have you ever wanted to swap the positions of two objects? To move the left one to the right, and the right one to the left, for example? In that case the three new buttons in 0.91 are for you. With two objects selected, their positions will be swapped, but if you have more than two things selected then the first moves to the position of the second, the second to the third, the third to the fourth, and so on. The last moves to the position of the first.

But what determines which object is first, second or third? That's simply down to which button you click. The first button bases it on which order the objects

were selected in – so it's best to hold shift and click on each one individually to ensure you know the selection order. The second button uses the stacking order, or z-index, of the selected objects. The one on top is moved to the position of the one beneath it. That moves to the position of the one beneath that, and so on down the stack. The bottom object is moved to the position of the topmost item. Note, however, that it's just the positions that are changed, not the z-indexes, so the stacking order remains the same. The final button swaps the positions of the selected objects in a “clockwise” direction, based on the x and y coordinates of each object.

Whilst these buttons are a welcome addition, I hope that their functionality will be expanded further in a future release. There's no option to reverse the order, for example. If you want to rotate 100 objects one step anti-clockwise you currently have to do it by clicking the clockwise button 99 times!

The “Randomise centers” button does exactly as its name suggests. Click it and your selected

objects are randomly moved around. This may be useful if you've used the Spray tool or Tiled Clones dialog to create a lot of objects that you then want to randomly distribute – but the same effect can often be better achieved by using the Randomise fields in the Tiled Clones dialog, or with the Tweak tool (see part 22).

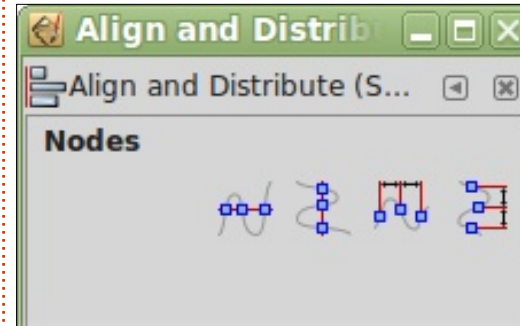
The final button in this section is described as “Unclump objects”. In practice, it moves your objects a little in order to more evenly space the edge-to-edge distances. You can apply it repeatedly, but it will eventually reach equilibrium. It can be useful for neatly arranging objects in two dimensions – think of it as a 2D equivalent to the “equidistant spacing” buttons in the Distribute section. Be careful if your objects overlap too much, as it can tend to pull them all together into a single pile rather than separating them out – the exact opposite of “unclumping” in my book!

In fact, separating objects out is really the job of the last section in this dialog: Remove overlaps. The spinboxes allow you to specify the minimum distance between bounding boxes in both horizontal

and vertical directions, whilst clicking the button at the right will actually perform the operation. You can use the H and V parameters to push your objects further apart by setting them to values greater than 0 (in pixels). You can also enter negative values, but doing so won't pull your objects closer together: because this is the minimum spacing, it simply means that already overlapping objects can continue to overlap to some degree. Do note that the calculations are based on the rectangular bounding boxes, though, so if you're working with objects such as circles you can sometimes find that their movements aren't what you expected. Take a look at the bounding boxes to see what really happened.

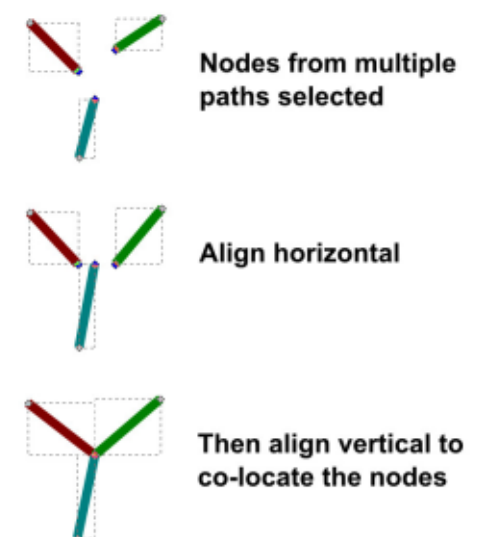
If you look again at the screenshot of this dialog, you might be forgiven for thinking that I've covered all of it, but that's only because you've been misled by a slight oddity in this dialog. On first opening it, there's a section at the bottom labelled “Nodes”, with four additional buttons – as seen in last month's screenshot. As you start to select objects, however, that section disappears from sight. In

practice, it's still available, but only when you switch to the Node tool in the main toolbar. On doing so, the dialog changes completely to just show this:



To use this mode, you must first select some nodes using the Node tool. You can even select nodes from multiple different paths, if you wish. Clicking on the first button will align the nodes along a single horizontal line that lies halfway between the top and bottom of the nodes' bounding box. The second button does the same trick along the vertical axis. There's no option to align to the top, bottom, left or right of the box, nor to the first node selected. If you need a specific alignment then the best approach is to set a guide at the right place, align horizontally or vertically, then drag the still selected nodes to the guide, preferably with snapping enabled.

Clicking both of the alignment buttons in succession is a quick way to collapse all the nodes down to a single point, and can be particularly useful for ensuring that nodes from different paths are co-located, such as when trying to fake the appearance of a connection between more than two paths at a single point. Unfortunately all the selected nodes move, with no option to use one as an anchor point, so, whilst it's a quick way to co-locate them, it's not so useful if you need them at a specific position. It's also important to note that this is just a visual effect – there's no native support for co-located nodes in SVG – so you have to take care to select all the relevant nodes if you need to move them later.





## HOWTO - INKSCAPE

The last two buttons in Node mode distribute the selected nodes evenly. Like the equivalent tool for objects, they are distributed between the nodes that are positioned furthest to the left and right (or top and bottom for vertical distribution).

That concludes our tour of the Align and Distribute dialog. It may not offer all the options of a fully-fledged CAD application, but once you get used to the features it does have, it can quickly become an invaluable addition to your toolbox. If you want to produce good looking diagrams with evenly spaced, neatly-aligned content, it's well worth spending a little time becoming familiar with its capabilities.



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

## PYTHON SPECIAL EDITIONS:



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



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



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



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



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



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







# HOW-TO

Written by Ronnie Tucker

## Automatic Chicken Feeder

Last month I discussed the background and gave the layout for my Arduino powered automatic chicken feeder. This month we'll discuss the code that it runs.

### GRAB THE CODE

You should first grab my code from:  
<https://gist.github.com/ronnietucker/a68b26ff53b7164b7775>

### THE CODE

Lines 8 to 61 are all procedures for the DHT11 (temperature) sensor. I'm not even going to pretend I know the ins and outs of them, but I know they are used in converting the DHT11 values to human readable temperature values.

Lines 62 to 68 are all includes for the various libraries required. Each line has a comment which says what that library is used for.

Line 81 is where the good stuff

starts.

```
UTFT
myGLCD(QD_TFT180A, 11, 10, 9, 12, 8);
```

This line is for the TFT screen I used. The command myGLCD() contains the setup info for my particular screen. QD\_TFT180A is the type of screen I used, and the numbers 11, 10, 9, 12 and 8 are the pins I used for the screen.

We then have some setup for the various values that I need later.

### SETUP()

After some myGLCD commands (that we've used before), we have:

```
setSyncProvider(RTC.get);
```

This is to grab the time from the RTC (Real Time Clock). The RTC has a battery on board so it keeps the time even when the Arduino (and RTC board) is powered down. After that comes an if statement to see if the grab was successful.

```
Alarm.alarmRepeat(9, 00, 0, RTCA
alarm);
```

```
Alarm.alarmRepeat(11, 00, 0, RTC
Alarm);
```

The Alarm.alarmRepeat commands are daily. So, in the case above, the 'alarm' will go at 9am and 11am precisely every day. The 9,00,0 refers to hour, minutes and seconds. RTCAlarm is the procedure to jump to when the alarm time is reached. We'll discuss that later.

In my code, I have several daily alarms.

Now that I've told the Arduino when I want alarms, I set up the servo and set the pin modes for my manual button and my green LED (which will illuminate when a feed is in progress).

### LOOP()

First in the loop, we jump to the digitalClickDisplay() procedure which will show the current time to the serial window. Next, we jump to the digitalTriggerDisplay()

procedure. This will print the time of the next alarm to the serial. These were used prior to the screen being fitted.

Lines 131 to 148 are where we begin printing the DHT11 temperature data to the serial too. Again, prior to the screen.

Line 150 is the beginning of the LCD screen outputs.

```
myGLCD.setColor(0, 255, 255);
```

```
myGLCD.printNumI((float)DHT11
.temperature, 1, 1);
```

```
myGLCD.print("'C", 35, 1);
```

```
myGLCD.printNumI((float)DHT11
.humidity, 90, 1);
```

```
myGLCD.print("%", 130, 1);
```

The code above is setting the colour to yellow, printing the temperature, printing 'C, printing the humidity and, finally, a percentage (%) symbol. The two numbers at the end of each line are where that text should be printed with 1,1 being the very top left of the screen (in pixels).



# HOWTO - ARDUINO

Lines 158 to 164 are the same idea with white text, but for the light level from the LDR.

```
myGLCD.printNumI (hour ()+1, 1, 45);  
  
myGLCD.print (":", 33, 45);  
  
myGLCD.printNumI (minute (), 45, 45);  
  
myGLCD.print (":", 80, 45);  
  
myGLCD.printNumI (second (), 95, 45);
```

These lines (above) are printing the time to the screen. The reason for the +1 is for daylight savings here in the UK.

```
myGLCD.setColor (0, 200, 255);  
  
myGLCD.printNumI (hour (Alarm.getNextTrigger ())+1, 1, 65);  
  
myGLCD.print (":", 33, 65);  
  
myGLCD.printNumI (minute (Alarm.getNextTrigger ()), 45, 65);  
  
myGLCD.print (":", 80, 65);  
  
myGLCD.printNumI (second (Alarm.getNextTrigger ()), 95, 65);
```

The lines above are for setting an orangey colour then printing the next alarm (again, +1 hr).

Lines 186 to 219 are commented out and were used

when I originally used a small font. I kept this chunk of code in there in case the big font didn't work out and I had to revert back.

```
button=digitalRead(4);
```

Now we check to see if the button has been pressed for a manual feed.

```
if (button==HIGH)  
{  
    digitalWrite(greenLED,  
HIGH);    // GREEN LED ON  
  
    Serial.println("Button  
pressed");  
  
    dispense (opened, closed);  
  
    digitalWrite(greenLED,  
LOW);    // GREEN LED OFF  
}
```

If the button is pressed (it goes HIGH) then we light the green LED, print a confirmation to the serial, jump to a procedure called dispense(), then turn the LED off.

Lastly, we have a one-second delay.

Jumping down to line 279 we see the RTCAlarm() procedure. In here we do a confirmation print to the serial, light the LED, jump to the dispense() procedure, and

return to turn off the LED.

Line 238 is the dispense() procedure. This is the main crux of the machine. It dispenses the grain for the chickens.

```
myServo.write (opened);  
  
myGLCD.setColor (0, 0, 255);  
  
myGLCD.print ("FEEDING", CENTER  
, 110);  
  
delay (2000);  
  
myServo.write (closed);  
  
myGLCD.setColor (0, 0, 0);  
  
myGLCD.fillRect (0, 109, 160, 128  
);
```

Here we turn the servo forward ("opened" was defined at the start of the code and is the angle the servo is to turn to). Next, we set the LCD colour to red, print 'FEEDING' to the screen, wait two seconds (the length of time for just enough grain), turn the servo back ("closed" was also declared at the start), set the LCD colour to black, and draw a rectangle to erase the 'FEEDING' text.

It's definitely the most difficult code I've worked on and it's not perfect. More work could have been done in displaying the time.

It's a bit botched, but to write further code would have taken me over the limit for the Nano I used.

For sheer amusement, have a look through the eight revisions on my GitHub Gist page and you'll see it evolve through time.



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

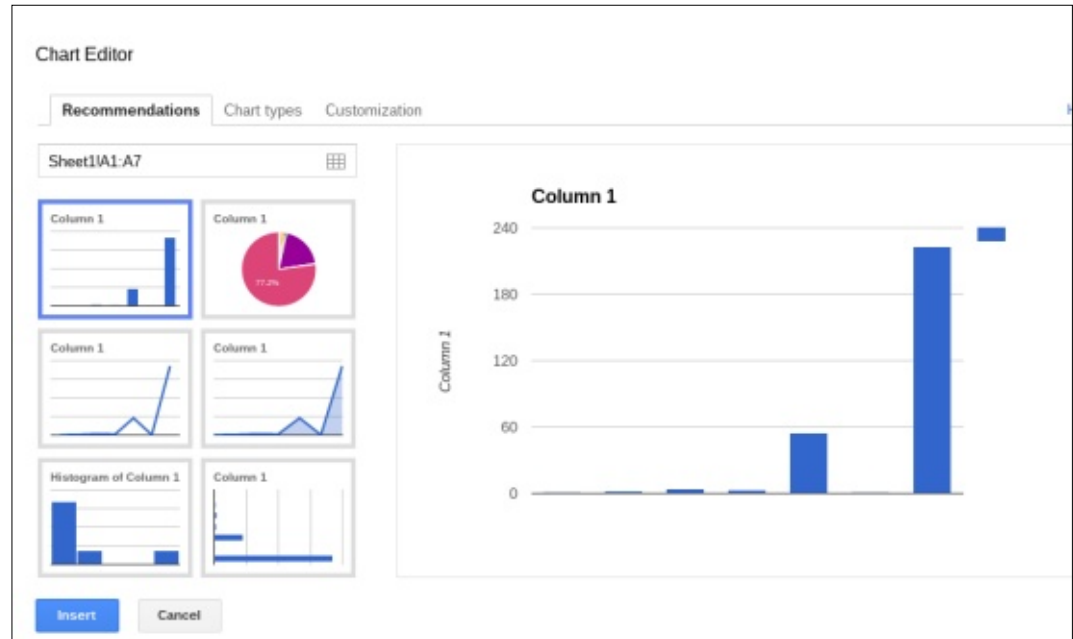
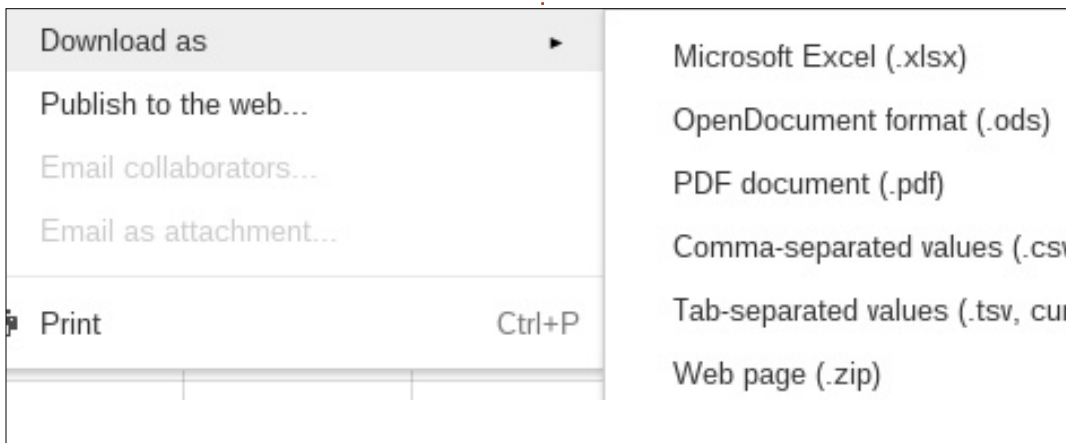
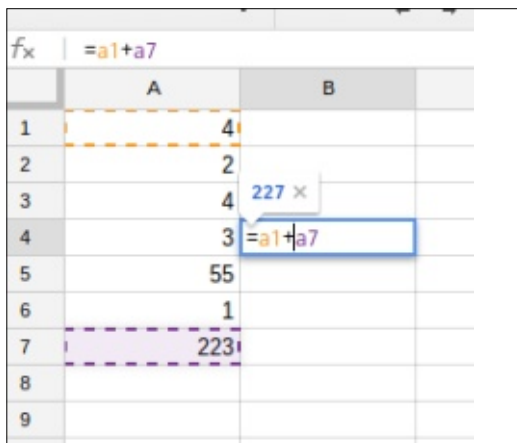
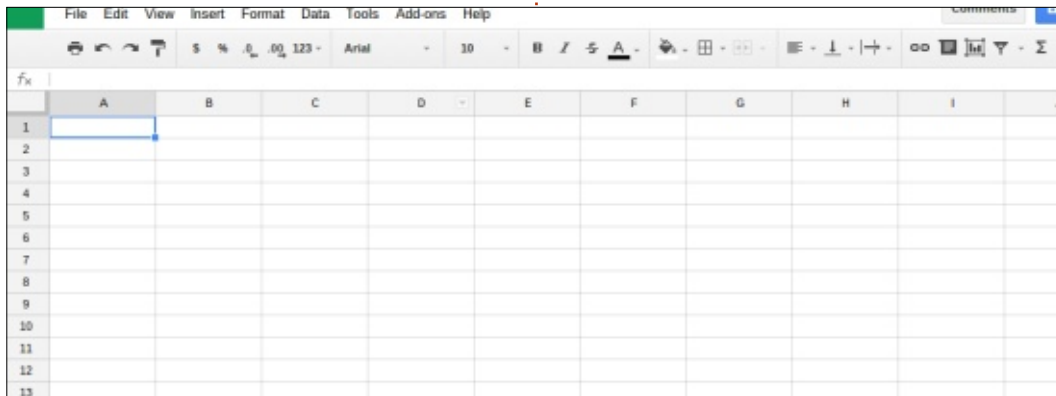




I utilize Google Sheets and Google Slides on a less frequent basis. I use these two programs to share my ideas or quick data results with my fellow staff members. I typically share these files instead of emailing. My work uses the Google Ecosphere which maximizes my use to Google's products.

You start Google Sheets and Slides in the same manner as Google Docs.

Google Sheets is a very simple program. It does not drown you in menu overload. It allows for simple calculations and charts. You can filter out data sets. You can enter cell formulations. It does a wonderful job of opening Excel or

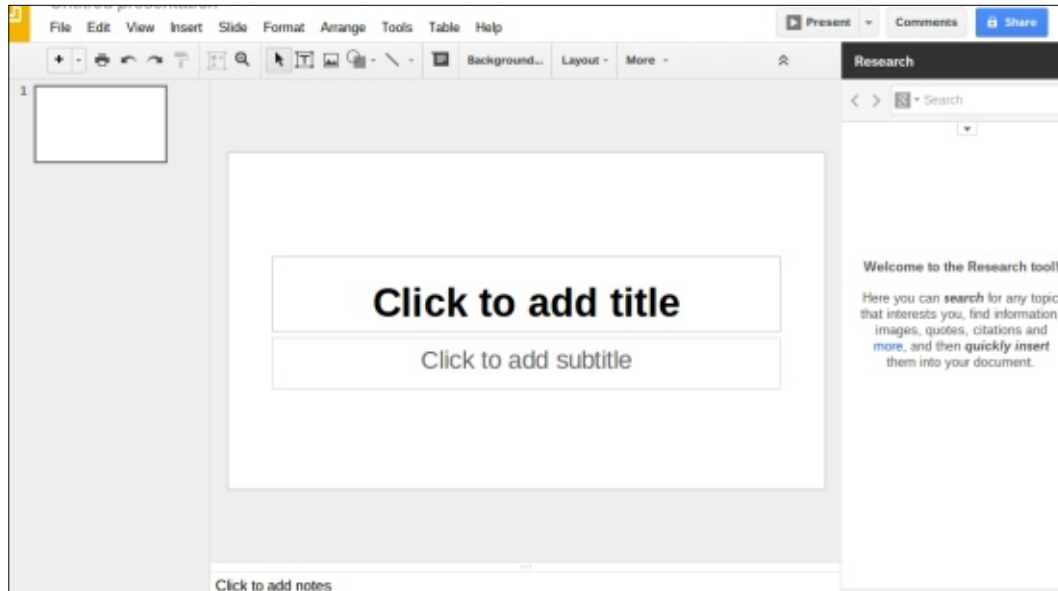


LibreOffice spreadsheets. I hit a snag where some specialized graphs created using R are not visible. You can save it to the formats shown below.

One gripe is that it does not do more of the complex graph styles such as 3D or Animated. You can add in various apps or extensions to increase your Sheets productivity. However be wary of which apps or extensions you are adding to the Chrome OS.

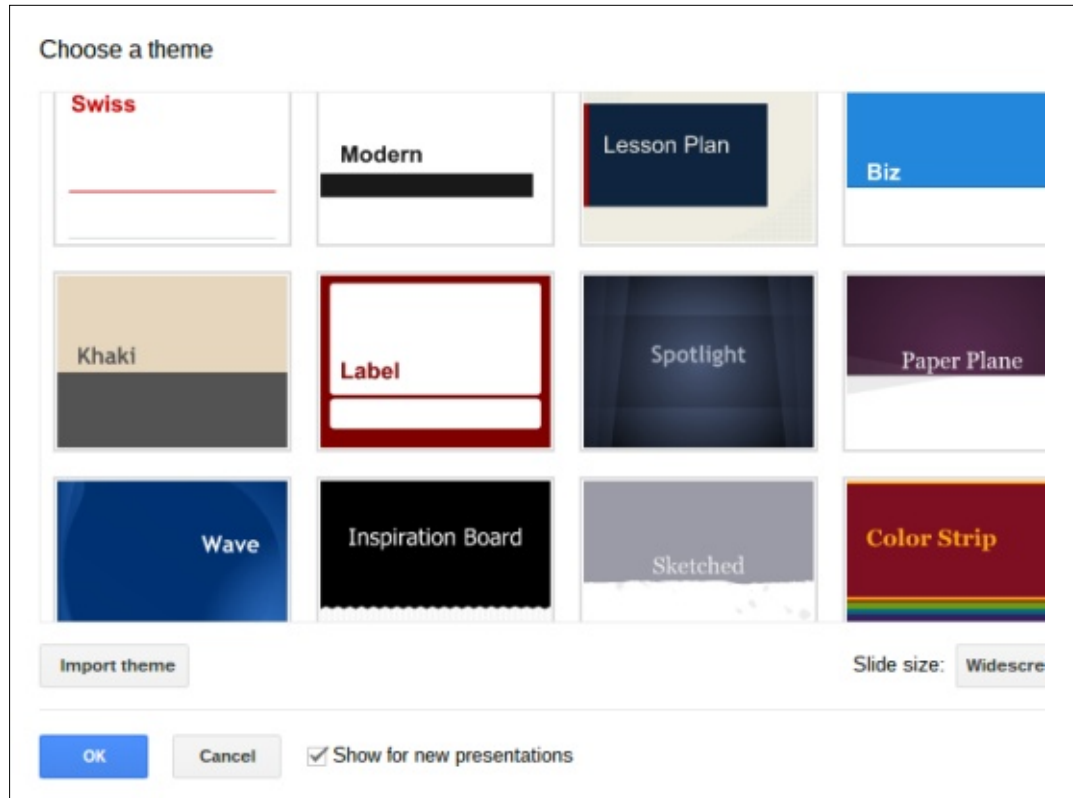
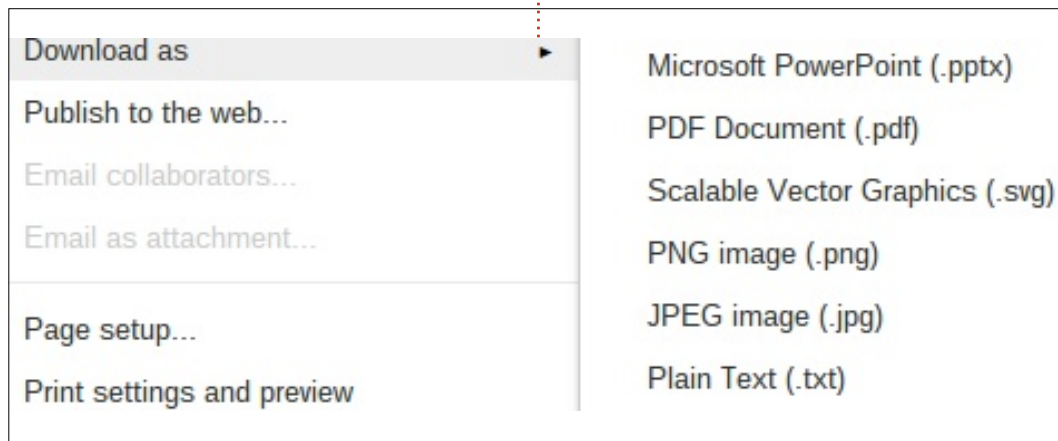
The Google Slides – like Sheets and Doc – is an intuitive menu. There are various themes within Slides.

These themes transition well to



LibreOffice and Powerpoint. If you ever created a presentation, then Sheets is easy to learn. You can do simple animated transitions from slide to slide. Inserting charts and pictures is easy. I do not have any gripes about Slides.

Like Google Docs, the files for Sheets and Slides are saved automatically to Google Drive. You then save it to your desired format. The file will show up in your Chrome Browser's Downloads folder just like Google Docs.



The Google Docs, Sheets, and Slides are strong online productivity programs. At this time, LibreOffice is not available as an online Cloud service. However Microsoft has online versions of Word, Excel and Powerpoint. If a person knows the limitations to Google's programs, they can be quite successful in developing quality products for their career. A college friend is successfully using his Chromebook for presentations and papers for his classes. A few of

my summer interns at my research lab are using the Google Docs and Sheets successfully in large groups for editing.



**SJ Webb** is a Linux Hobbyist and Research Coordinator. He enjoys fishing, hot rodding, and spending time with his kids and wife. He thanks Mike Ferarri for his mentorship.





# HOW-TO

Written by Ronnie Tucker

# Write For Full Circle Magazine

## GUIDELINES

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

## RULES

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

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

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

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

document.

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

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

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

When you are ready to submit your article please email it to: [articles@fullcirclemagazine.org](mailto:articles@fullcirclemagazine.org)

## TRANSLATIONS

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.**





Online  
**BACKUP**

Secure  
**SYNC**

Easy  
**SHARING**

Whether you need to access a document you have stored on a remote server, synchronize data between a Mac, Windows or Linux device, share important business documents with your clients, or just rest easy knowing all of your data is safely, securely, and automatically backed up - SpiderOak's free online backup, online sync and online sharing solution can handle all your needs!

SpiderOak offers a different approach to online backup by combining a suite of services into one consolidated tool - free online backup, synchronization, sharing, remote access, and storage. This difference is further measured in our zero-knowledge privacy policy - the first one ever employed in this setting. Our flexible design allows you to handle data from any operating system (Mac, Windows and Linux) or location (external drives, network volumes, USB keys, etc...) using just one centralized account.

- ➔ Access all your data in one de-duplicated location
- ➔ Configurable multi-platform synchronization
- ➔ Preserve all historical versions & deleted files
- ➔ Share folders instantly in web ShareRooms w / RSS
- ➔ Retrieve files from any internet-connected device
- ➔ Comprehensive 'zero-knowledge' data encryption
- ➔ 2 GBs Free / \$10 per 100 GBs / Unlimited devices

<https://spideroak.com>

Download mobile clients  
for **iOS & Android**

**JOIN SPIDEROAK NOW**  
Get 2 Free GBs

Get 25% off any SpiderOak package  
with the code: **FullcirclemagFans**



One of the things I've always loved about Linux is the fact you can customize the heck out of it without buying third-party add-ons. The first interface hack that put a big smile on my face was when I hacked my Mythbox (MythTV) so the LILO boot loader displayed a Simpsons TV show background and the OS choice text on top - it was one of those moments that reminded me of the awesome ANSI BBS art days.

I got all excited about customizing LILO (Linux LOader) further, and then along came GRUB (GRand Unified Bootloader). When GRUB first came out, I found myself scratching my head wondering why fix something that seemed way better than the solution? I'm sure more than a few of us have questioned several choices made in the open source movement, but those choices are what make the movement so great.

GRUB has evolved and the cool factor is definitely back. For reference, I'm actually referring to

GRUB2, the version included on most recent \*buntu distributions. Specifically, I'll be using GRUB version 2.02~beta2-22ubuntu1 on Ubuntu 14.04. To see what version of GRUB2 you're running type:

```
grub-install -V or grub-install --version
```

If Ubuntu is your only OS installed, GRUB2 will not display the GRUB menu, it will just load Ubuntu. To display the GRUB menu, hold down SHIFT before

Ubuntu starts to boot. A default GRUB2 menu is very plain-looking with Ubuntu, Advanced options for loading Ubuntu and a couple of Memory Test (memtest86+) options. If you've never tested your RAM before, or are having some glitchy OS issues, this is a great tool for testing RAM.

If you press e while the reverse video is over an option, you can edit that option. Just pressing e

and modifying GRUB boot options saves the edit only for the current boot - but this is still useful. Editing how Ubuntu boots can be a lifesaver, I learned this the hard way when I installed Ubuntu server on a 1U server and a 24" LCD. When I went to boot the server on a 17" LCD it just kept going out of range. Holding down SHIFT to display the GRUB menu then 'e' editing the options you can set the gfxmode option to 800x600:

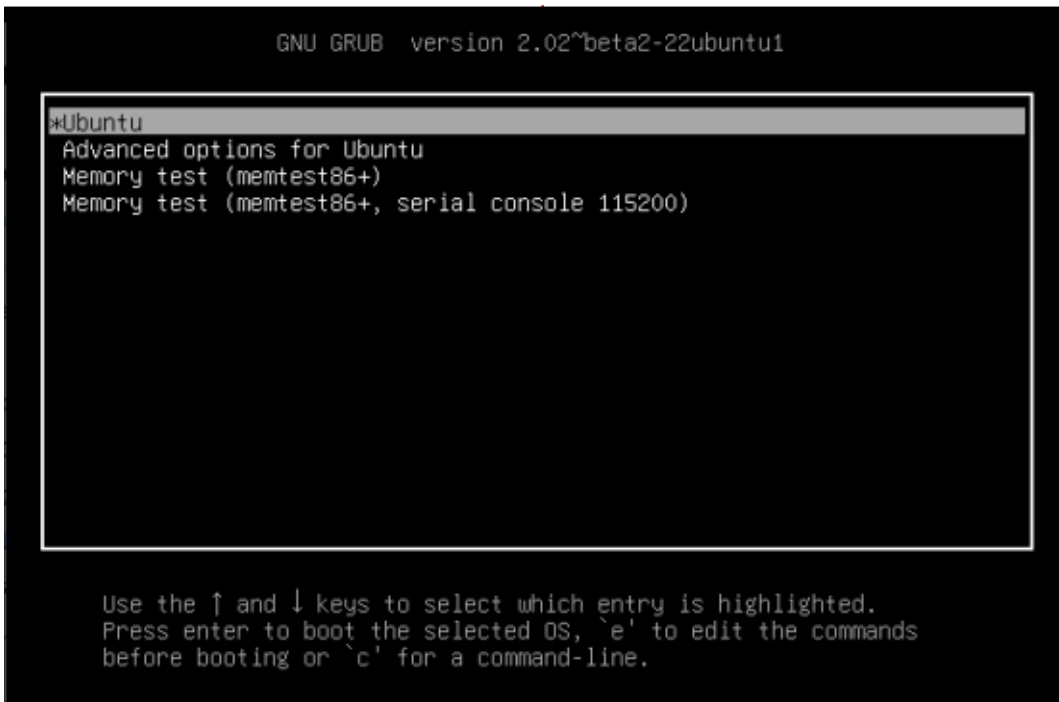
```
# gfxmode $linux_gfx_mode
gfxmode 800x600
```

Once the system booted I was able to edit the /etc/default/grub file and include:

```
GRUB_GFXMODE="800x600"
```

GRUB won't update until you run: update-grub. After running update-grub, the change should be permanent. Just pressing e and modifying GRUB boot options saves the edit only for the current session.

The /etc/default/grub file is





where you make all your GRUB2 changes, including adding a background image. To keep from infringing on copyright in FCM, I've chosen a picture I took from the back of a television we were trying to troubleshoot. Busy pictures tend not to be great backgrounds so I've blurred the photo a bit. I called the photo circuit.png, and saved it as a PNG image. You can save photographs as JPEG, but if you do, you're limited to 8-bit and 256 colors. Saving in PNG enables the full range of 24/32bit color. To use the circuit.png photo I modified /etc/default/grub to include:

```
GRUB_BACKGROUND="/home/charles/Pictures/circuit.png"
```

I had to run update-grub to make the change. When I ran update-grub, there was a message about GRUB\_TIMEOUT=10 being incompatible when GRUB\_HIDDEN\_TIMEOUT=0 was set, so I also commented out:

```
#GRUB_HIDDEN_TIMEOUT=0
```

Then I reran update-grub and rebooted. Sure enough the GRUB2 menu came up without pressing SHIFT (for 10 seconds), and my

cool circuit image was in the background, but because of the light text it looked washed out.

The black Ubuntu text on the grey bar doesn't look bad, but I think we can do much better. But before we address the look of my theme, I want to touch on another annoyance, the blank screen before the Ubuntu splash screen. Those of you with really fast machines may not notice, but if you're working with a slower machine, it can be a few seconds before there's any sign of Ubuntu

actually loading - to the unknowing eye it can look like Ubuntu just crashed to a blank screen. I've always liked seeing what's actually loading. Long ago all the Linux distributions displayed what was loading during boot, but in the interest of not scaring away people from Linux, many distributions opted to blank the screen until their fancy splash screen loaded. To get Ubuntu to display what's loading during the boot process, remove the word 'quiet' from the line that reads GRUB\_CMDLINE\_LINUX\_DEFAULT=

"quiet splash" in the /etc/default/grub file – and don't forget to update-grub.

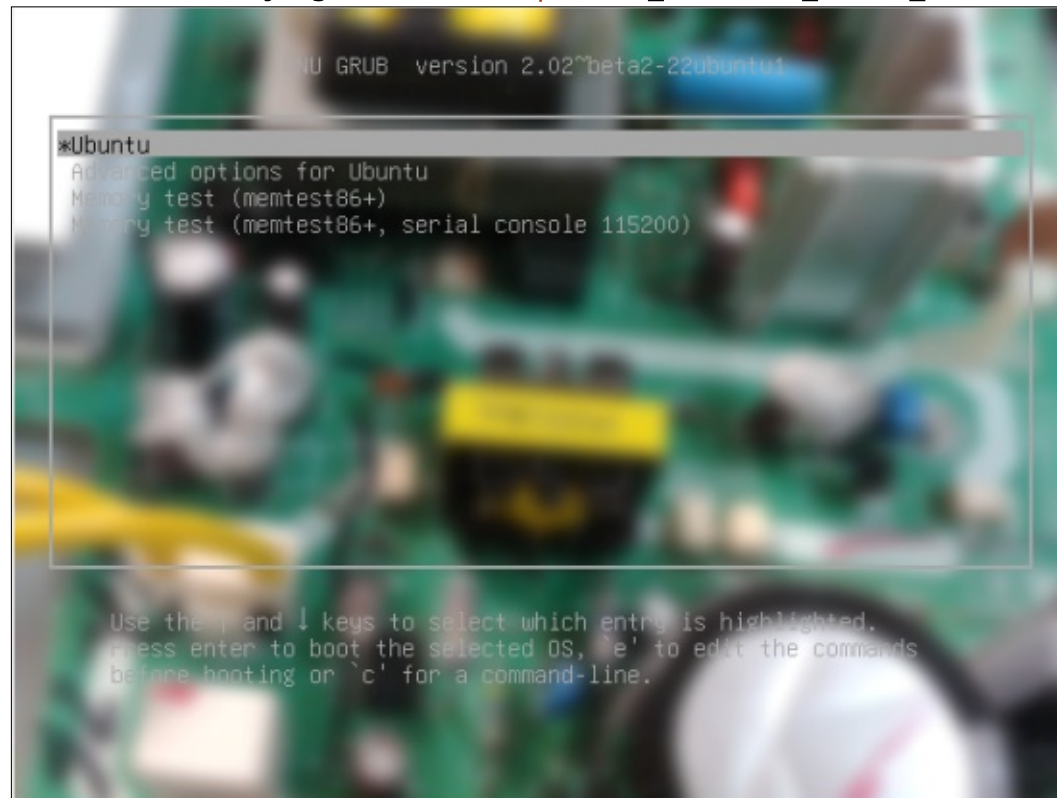
Now back to addressing our GRUB2 theme problem. The grey text doesn't show very well on light colors. When I first set out to change the light text, my research led me to believe it would be a pretty easy task to accomplish by simply creating a theme file and making some font color adjustments to my theme file. Several hours later (in fact a whole other day working several hours into the night), I still didn't have the results I wanted. Fonts I created using the grub-mkfont tool were not showing correctly, everything was spaced badly, and the complimentary colors I chose (complementary to green) were not looking so hot. A little more digging and I figured out how to just adjust the menu text, in the file /etc/grub.d/05\_debian\_theme. You have to find the text:

```
if [ -z "${2}" ] && [ -z
"${3}" ]; then

    echo " true"

fi
```

I comment out echo " true" and





added:

```
echo "      set
color_highlight=white/light-
blue"
```

```
echo "      set
color_normal=blue/black"
```

Unfortunately, you're limited to 16 colors. The article that finally helped me change only the menu colour was on The Geek Stuff: <http://www.thegeekstuff.com/2012/10/grub-splash-image/>

The resulting Grub menu ended up looking like the screenshot shown below.

Because 05\_debian\_theme is a GRUB2 script, I had to run update-grub for the results to take effect. The result wasn't much better than the original theme because of the limited color choice and the busy background (plain color background works much better).

I mentioned a theme file earlier. It turned out that creating a theme was a lot more complicated than it first looked, and that it was more about graphic elements than text elements.

Before we create the theme

we'll set up a directory to hold our theme:

```
cd /boot/grub

sudo mkdir -p themes/circuit

sudo touch
themes/circuit/themes.txt
```

The -p switch for mkdir creates the parent directory if it doesn't exist. On the test machine I was working on, there was no themes directory. The mkdir -p themes/circuit command created both the themes and circuit sub-

directory all in one shot. The touch command created a blank file called themes.txt in /boot/grub/themes/circuit. Now we have to tell GRUB2 to load the themes file, we do this in /etc/default/grub by adding:

```
GRUB_THEME="/boot/grub/themes
/circuit/theme.txt"
```

Here's what I added to my theme.txt file:

```
title-font: "Ubuntu Bold 18"

title-color: "EE00BB"
```

```
desktop-image:
"/home/charles/Pictures/circu
it.jpg"
```

```
+boot_menu {

left = 10%

top = 15%

width = 85%

height = 75%

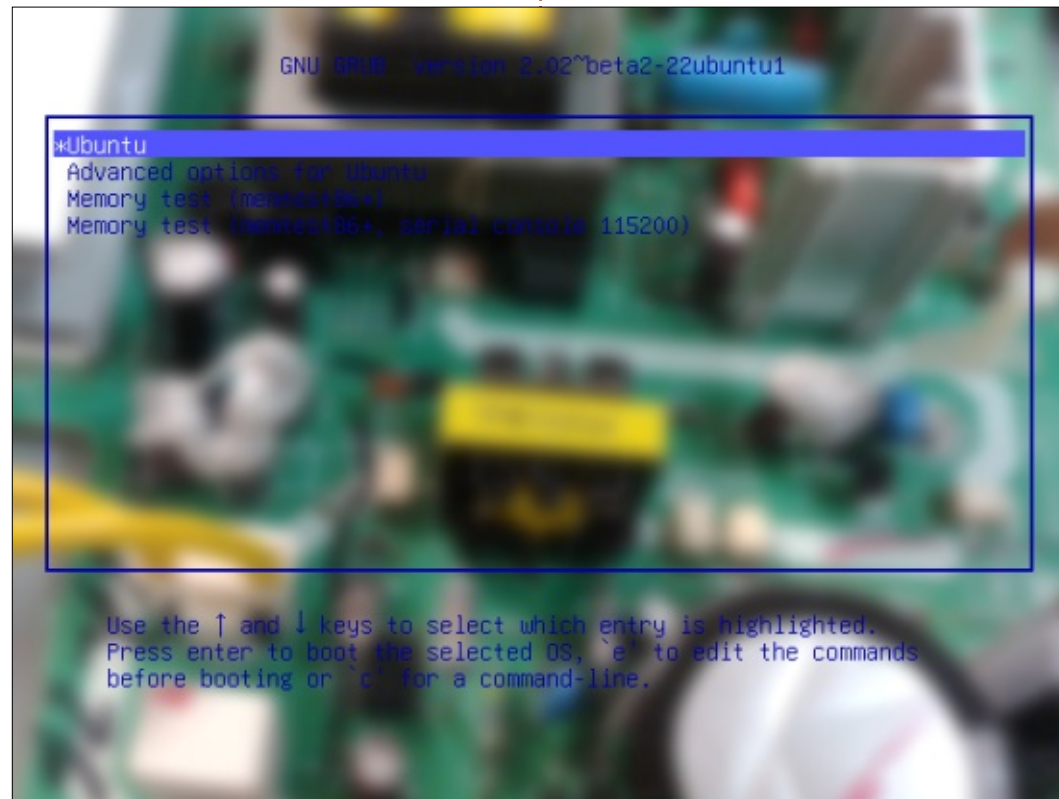
item_font = "Ubuntu Regular
12"

item_color = "#631C53"

selected_item_color =
"#EAA6DB"

}
```

The first line title-font: "Ubuntu Bold 18" defines the font to use for the GRUB2 title element. Unfortunately, defining which font to use in the menu is not as simple as picking a font Ubuntu can normally display; fonts have to be converted to .pf2 format and placed either in your theme folder or the provided /boot/grub/fonts folder, then symbolically linked to your theme folder (the recommended way to do it since you can reuse the font). Notice from the example above that I use Ubuntu Bold 18 (Ubuntu-B.ttf) and Ubuntu Regular 12 (Ubuntu-R.ttf). To create the .pf2 files, I first



located the fonts responsible for Ubuntu Bold and Ubuntu Regular in `/usr/share/fonts` (they're actually in `/usr/share/fonts/truetype/ubuntu-font-family`, but you'll want to know about `/usr/share/fonts` so you can convert other font families). Then I copied the two files to my theme directory.

```
cd
/usr/share/fonts/truetype/ubuntu-font-family

sudo cp Ubuntu-B.ttf Ubuntu-R.ttf
/boot/grub/themes/circuit
```

Then I ran the `grub-mkfont` tool with the following options:

```
sudo grub-mkfont --verbose --range=0x0-0x7F --size=18 --output=/boot/grub/themes/circuit/Ubuntu-Bold-18.pf2
Ubuntu-B.ttf

sudo grub-mkfont --verbose --range=0x0-0x7F --size=12 --output=/boot/grub/themes/circuit/Ubuntu-Regular-18.pf2
Ubuntu-R.ttf
```

This created the font files in my theme directory in the preferred format. However, when I rebooted, I discovered the font files were not appearing as they should. I scoured Google some more – but no luck. I

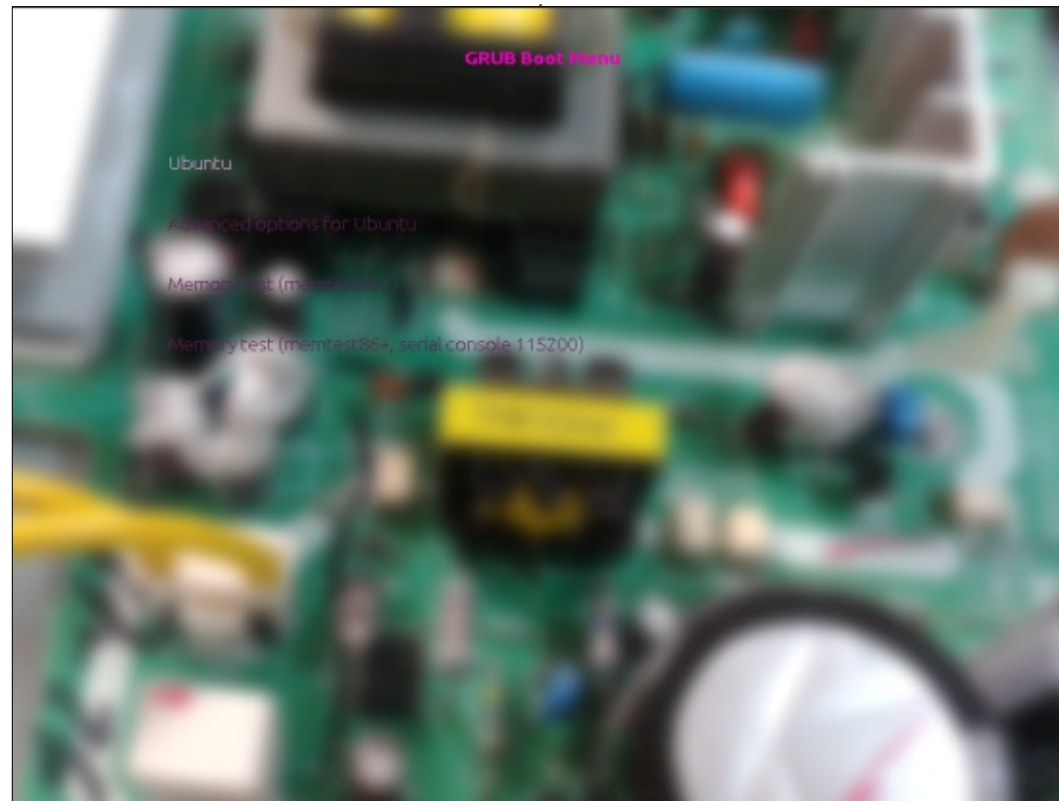
was about to give up, but then found the problem, the fonts were not showing because the `GRUB_GFXMODE` was set in `/etc/default/grub` to `640x480`. Once I set this higher, and ran `update-grub`, the fonts took effect. You can specify a resolution and a fallback resolution like so:

```
GRUB_GFXMODE=1024x768x32, 640x480
```

With this adjustment (don't forget to `update-grub`), GRUB2 changes to `1024x768` with 32-bit

colors. If `1024x768` is unavailable, it goes back to the standard `640x480`. Now the fonts displayed as they should. See image below.

Again the menu doesn't look great, but at least now the Ubuntu fonts worked. I mentioned earlier that there was a lot more to theming than changing the font size and style and the background image. There are several good resources that cover GRUB2 theming. If you're comfortable with MVC and image editing, these resources will be a good help:



A theming thread on Ubuntu Forums:  
<http://ubuntuforums.org/showthread.php?t=1823915>

Rosa desktop GRUB2 theming page:  
[http://wiki.rosalab.ru/en/index.php/Grub2\\_theme\\_tutorial](http://wiki.rosalab.ru/en/index.php/Grub2_theme_tutorial)

Ramki's java blog GRUB2 page:  
<http://www.ramkitech.com/2012/01/grub2-and-themes-customization.html>

Ramki's java blog and the Rosa desktop GRUB2 theming page go more into creating the graphical elements that you'll need to create complex – but very cool-looking – GRUB2 themes. It's also worth mentioning the 2008 GRUB Google Summer of Code page:  
<http://grub.gibibit.com/>. Unfortunately, all the themes are obsolete, but it might help further understanding of how to theme GRUB2 graphically.

I hope I've provided some light on theming GRUB2, and shown some of the frustrations that someone new to theming GRUB2 can run into. In the end, I managed to get around some of the

problems using some GIMP trickery. I modified my original circuit.png using the select tool to select an area where the boot-loader menu text would be displayed. I checked off the selection tool rounded corners option and chose 25 pixels. Then I dumped a black to dark-gray gradient in the selected area. I also set the item\_color = "#FFFFFF" (white) in my /boot/grub/theme/circuit/theme.txt file for better visibility. I also

adjusted the spacing by adding item\_height=20 and item\_spacing=10 to the same theme file. This hack led to a GRUB2 menu (shown below) that was a slight improvement in readability.

Just after finishing this article, I found one more great GRUB2 resource on the Ubuntu web site located here:

<https://help.ubuntu.com/community/Grub2/Displays>. This resource is

a bit more complete and up-to-date for current versions of Ubuntu.



**Charles** is the author of Instant XBMC, and the project manager of a not-for-profit computer reuse project. When not building PCs, removing malware, and encouraging people to use GNU/Linux, Charles has a blog at [charlesmccolm.com](http://charlesmccolm.com).

## GRUB Boot Menu

Ubuntu  
Advanced options for Ubuntu  
Memory test (memtest86+)  
Memory test (memtest86+, serial console 115200)





# UBUNTU PHONES

Written by Ronnie Tucker

## BRIEF LIST OF CHANGES IN STABLE'S OTA-4 (JUNE).

**B**ear in mind that there are many more changes in the update because of the baseline switch from 14.09 to Vivid [15.04]. This is also the reason why this changelog has much less detailed information than the previous ones.

### Most important changes:

- Change of the base distribution from 14.09 to Vivid:
- This also means differences in the tool chain and libraries
- For easy comparison: 14.09 was based on a pre-Utopic system
- Further improvements to location accuracy
- MMS group-chat support
- Oxide 1.7.8 with multiple fixes and improvements
- Welcome wizard code now in Unity8, different tutorial design
- Ubuntu UI Toolkit 1.2:
- New ListItem with fancy features
- New UbuntuShape rendering properties
- New header design
- Qt 5.4

- New monochromatic indicator icon design
- Scope tagging to be used by the scopes aggregator
- Importing SIM contacts
- Full fix for reboot loops caused by segfaults in log.c code
- Multiple common crash fixes
- Most up-to-date core-applications (dialer, web-browser, messaging, address-book)

## EXPECTED CHANGES FOR OTA-5 (JULY)

### General improvements:

- Refreshed icons throughout including apps and indicator icons
- Shell rotation
- Additional keyboard layouts added for Romanian, Scottish, Gaelic, Greek, Norwegian, Ukrainian, Slovak, Icelandic

### Scopes

- Keyword tagging support added to News, Photos and Today

### Store improvements

- Refunds (The Store will now let users 'cancel' a purchase up to 15

- minutes after an app is purchased)
- Edit app ratings

### Browser improvements

- Bookmark folders
- Keyboard shortcuts

### Other

- Improvements to Call forwarding UI (in System settings > Phone)
- WPA Enterprise support added to System settings and networking
- MX4 LED pulses when there is a notification
- In-line contact editing in Dialer and Messaging apps
- Group MMS support in Dialer and Messaging apps
- GPS location tagging added to Camera
- SDK has added the ability to allow apps to keep the display on (e.g for games developers that need to avoid the screen timeout)
- More than 50 other issues resolved

## MEIZU LAUNCHES THE MX4 UBUNTU EDITION IN EUROPE

**S**martphone manufacturer **Meizu**, in partnership with Canonical, announces the launch of the MX4 Ubuntu Edition in Europe to smartphone enthusiasts. This follows the recent device launch in China specifically aimed at developers [..]. The Meizu MX4 Ubuntu Edition will be available to buy as of 25th of June across Europe, priced at 299.00 Euros. The devices are accessible via Meizu's website:

<http://www.meizu.com/en/ubuntu/index.html>.

The **Meizu MX4 Ubuntu Edition** will be available in silver and gold colours. This sleek device has 16GB internal memory, and features an astounding 20.7 megapixel rear-facing camera with autofocus and dual LED flash, plus a 2 megapixel front-facing camera. It also features a large 5.36" Sharp premium retina screen with scratch-resistant Corning® Gorilla® Glass 3.







# REVIEW

Written by Ronnie Tucker

## Meizu MX4 Ubuntu Edition

The BQ Aquaris E4.5 has the honour of being the world's first ever Ubuntu phone. They've now followed that up with the E5. The Meizu MX4 has the honour of currently being the world's most powerful Ubuntu phone.

There is no point in comparing the MX4 with the E4.5 as they are two completely different beasts. What I'll be concentrating on here is the hardware, and how Ubuntu runs on it. I'll link to several YouTube videos that I've since made showing how to use Ubuntu, and the applications it runs.

### SPECIFICS

The MX4 is a powerful beast. It has a true eight-core CPU (MediaTek 6596, Meizu customized) with 2.2GHz x 4 and 1.7GHz x 4 (all eight cores can be turned on simultaneously), a PowerVR G6200 GPU (again, Meizu customized), 2GB LPDDR3 RAM (at 933MHz), and dual ISP chips with 4-channel processing. It has 16GB of storage for your files.

Its display is the most striking thing about it when you first turn it on. There are only a couple of millimeters (at most) between the screen and the metallic edge. It's a 5.36 inch Sharp/JDI screen with over 2,000 brightness levels, and protected by Gorilla Glass 3. The resolution is 1920 x 1152 pixels.

The rear camera is where I have an issue with Meizu. They state on their site that it's a 20.7 megapixel (MP) camera. All the photos I've taken show as being 14.7MP. From what I've seen around Launchpad, it seems that the problem may be the camera app within Ubuntu Touch. The sensor is a Sony IMX220 Exmor RS. It has a 300-degree panoramic view which I noticed immediately as any items close to you look quite distant on screen. The camera is capable of 30 photos per second, and is also protected by Gorilla Glass 3. The front camera is a similar model, but is 2MP and apparently has (and I quote from Meizu) 'FotoNation smart selfie enhancement' (whatever that might be!). The camera is placed in



# REVIEW - MEIZU MX4 UBUNTU PHONE

the center and about three quarters of an inch down on the back of the phone. Below the lens are the dual-colour flashes.

The MX4 does all the usual wireless stuff that you'd expect such as WiFi (dual-band), Bluetooth (v4), and GPS. It has sensors for light, gravity, hall effect, IR proximity, gyroscope and ambient light, and a digital compass.

For audio files, it can accept FLAC, APE, AAC, MKA, OGG, and (of course) MP3. For video; MP4, 3GP, MOV, MKV, AVI, FLV and MPEG. Images; JPG, PNG, GIF and BMP.

All of the above is powered by a Sony/Samsung 3100mAh battery.

The top edge of the phone has the power button and the headphone jack. Bottom edge has the speaker, microphone, and the USB (and charging) port. The left edge has the volume buttons, while the right edge has no functions. On the front are the speaker (top middle) front camera (top right) and a home button (bottom middle). The back has a nice bluish tint to the brushed metal cover. This is removable – to

let you insert your SIM card.

I created a YouTube video showing what you see on first use of an MX4:



<https://www.youtube.com/watch?v=XCQKZlwWve8>

## UBUNTU TOUCH

The phone I received came with Ubuntu 15.04 r0 installed on it. This was upgraded to r1 (on first boot) and a further upgrade (to r2) has since been released as I write this. By the time you read this, I expect there will have been another update. At the moment, the Ubuntu Touch OS is using a similar codebase to desktop Ubuntu, but this is set to change soon with Touch using the new Snappy base.

Needless to say, Ubuntu is as smooth as silk on the MX4. Getting used to scopes can be tricky at

first, but it becomes second nature in no time. Some scopes are good and helpful, but some are really just downloading a list of images with links which open in the browser, so they're pretty pointless, I think.

Transferring files via USB is done using MTP since almost all devices nowadays don't mount as a USB device. I had problems with this in KDE Plasma 5 (works fine in Plasma 4), and other users have had no problems with it in other desktops.

To see how to use Ubuntu Touch on a phone, I made a video:



<https://www.youtube.com/watch?v=fUGHhGWDNB0>

## APPS

Everything works out of the box. Ubuntu Touch comes with the usual phone, SMS messaging,

contacts, browser, calculator, gallery, music, media, email, and social media apps. There's also the Ubuntu Store for adding/removing apps and scopes.

Be aware that some apps are quite basic. The camera app springs to mind. It has only the most basic of options. The gallery app has basic cropping and rotation of photos. The Gmail app is really just the mobile web pages, but it does work and give notifications. The unofficial dropbox app (udropcabin) lets you upload/download files, but has no way of sharing files.

These quirks aren't the end of the world, but just something to be aware of.

To show that there are Ubuntu apps for Android apps I use, I created a video showing some:



<https://www.youtube.com/watch?v=1bDHF9wJGM8>

## CONCLUSION

This is a beautiful phone. I was immediately impressed with the screen when I turned the phone on for the very first time, and, for the amount of power in there, it's a surprisingly light device.

There isn't a huge amount of customization over Ubuntu itself though. You can add wallpapers, but it's only seen on the lock screen (and covered by the

notification circle which can't be turned off), and the icons are set and cannot be replaced with your favourite icon pack.

Having said all those good things about it, there are some things you should be aware of. Since Ubuntu Touch, like its desktop counterpart, is constantly under construction, you should expect to find things that may, or may not, work at times. As I write this, I've been having some quirks with the GPS where it seems that

some apps don't release their hold on it when you start up another GPS compatible app. I've also yet to see a notification LED.

I'm sure any and all problems will be ironed out over time. But I'd be neglecting my duties if I didn't warn you about these things before you spend your money on this. While Canonical is, as of writing, throwing out updates almost monthly, that will soon change to updates being released every six weeks.

In short: as long as you don't mind being on the bleeding edge of Ubuntu Touch, you will absolutely love this phone.



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

[HTTP://WWW.MEIZU.COM/EN/UBUNTU/FEATURES.HTML](http://www.meizu.com/en/ubuntu/features.html)



MX4 ubuntu<sup>®</sup> edition

New Scope, New Vision

Learn More





# REVIEW

Written by Benoit Benedetti

## BQ Aquaris E5 HD

Spanish BQ manufacturer, which has been the first to offer a mobile phone that supports Ubuntu Touch natively, the Aquaris 4.5 (A4.5), continues its collaboration with Canonical and offers us the Aquaris 5 HD (A5HD), available for sale since late June. Like its elder, the A5HD is a device—initially available in Android—that BQ ported to Ubuntu Touch.

In this review, I will present my impressions of using this new device that BQ France kindly made available to me, and compare it to the A4.5 that I bought right when it was released.

This device is a slight material upgrade. Here is a list of its specifications:

- 5-inch Capacitive IPS multi-touch HD display with a resolution of 720 x 1280 pixels, 294 hdpi, Dragontrail Protection Glass
- CPU: MediaTek quad-core Cortex A7 CPU at 1.3 GHz
- GPU: Mali 400-MP2 up to 500 MHz
- 1GB of RAM

- 16GB eMMC storage
- Expandable memory Via microSD card (up to 32 GB)
- Rear camera: 13 Mp(f/2.2) BSI sensor with autofocus and Dual flash
- Front camera: 5 Mp (f/2.0)
- Full HD video recording (1080p)
- Dual-sim
- 3G: 3G + (HSPA+/UMTS/GSM)
- Bands supported: GSM (850, 900, 1800 and 1900) and UMTS (900, 2100)
- Connectivity: BlueTooth 4.0, GPS, Wi-Fi 802.11 b/g/n, micro-USB, jack 3.5mm
- Lipo 2500 mAh battery
- Weight: 0.1340
- Dimensions: 71 x 142 x 8,65 mm.

We can see that the A5HD shares some specifications with A4.5, which is not necessarily to delight us: cpu and gpu are the same, same RAM, only wifi b/g/n, no 4G or NFC, and always restricted to Europe market—therefore no support for US LTE Bands.

In terms of improvement, there is an internal memory that goes



## REVIEW - BQ AQUARIS E5 HD

from 8 to 16GB, and a more powerful battery. I'm not addicted to my smartphone, and with my A4.5, I have an autonomy of about 24H; with the A5HD I can stand 48 hours before needing to recharge. While remaining as thin as the A4.5, the A5HD becomes a bit wider and longer, allowing it to offer a 5" screen.

It is this larger screen, HD in addition, that really makes this model interesting. The resolution is much higher and makes it more pleasant to use, whether to read the displayed information, videos or photos. This device holds another upgrade compared to A4.5, the rear camera (based on specifications, it does not seem to me that the front camera had an upgrade, and to be honest, it is only now as I write the article that I realize I have not tested the front camera before returning the A5HD: sorry not to be addicted to selfies!). The camera is more pleasant to use than its predecessor. It is more responsive, with better focus, better resolution, and an HDR mode that I found most effective. Nevertheless, the A5HD remains a mid-range device, and do not expect to make beautiful pictures

(or videos, for which I have not noticed real improvements compared to A4.5) out of it, the results are still noisy and predominantly white, particularly in HDR mode.

It does not bother me; the camera phone helps me out when needed, this is not the first use I make of my phone, especially if I turned to Ubuntu Touch. It's not for the hardware performance, but rather for its OS, on which you already read descriptions and rave reviews in these columns. I tested both the A5HD and A4.5 under Ubuntu 15.04/release 23, and I did not notice any differences in terms of performance in navigation, the use of scopes, etc – surely due to the fact that both devices ship with the same CPU and GPU.

### PROS:

- + better battery life
- + better video
- + better camera
- + HD display

### CONS:

- no 4G
- photos/video noisy, especially in low light
- no NFC

- only Wifi b/g/n

The Aquaris 5, 4G, or 6 would have been a better new flagship device running Ubuntu Touch from BQ, but I can live without 4G, fast WiFi, NFC, and be content with a mid-range camera. The screen of the A5HD is really its strong selling point, and I would see myself trying it if I did not already own an A4.5. If you have not yet taken the step of Ubuntu Touch, the little extra price difference for a better screen should convince you to try this OS that gets better gradually.



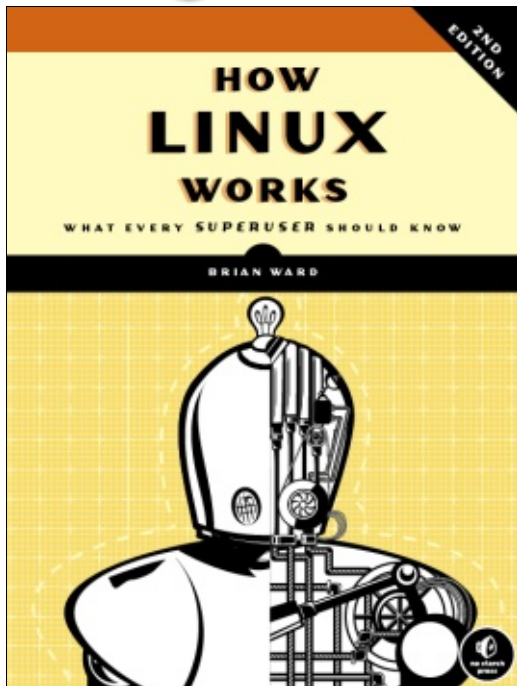
Left: BQ E5. Right: BQ E4.5



# BOOK REVIEW

Written by Mark Crutch

## How Linux Works (2nd Edition)



**Publisher:** No Starch Press

**Author:** Brian Ward

**Pages:** 392, B&W

**ISBN:** 978-1-59327-567-9

<http://nostarch.com/howlinuxworks2>

Now in its second edition, “How Linux Works” is a useful reference for any would-be system administrator, or even just a technically curious user. It’s a whistle-stop tour of a typical Linux system – from booting up right through to a graphical desktop. On

the way, it visits shell scripts, file systems, processes and networking – although each stop on the journey is but a brief one.

You won’t find much in-depth coverage here, but rather a broad collection of topics that are briefly introduced. To that end, the author does a great job of including suggestions for other books and resources that cover each element in more detail. For example, although SSH gets a mention, the four pages dedicated to it aren’t enough to talk about using key-based authentication rather than passwords, nor any details about how to forward ports over an SSH connection. Instead, there is a short overview of the client and server configuration, together with suggestions of a pair of dedicated SSH books, and another on cryptographic algorithms. In this way, “How Linux Works” manages to cover a lot of ground without getting caught up in the minutiae of every single command.

This is a book for people who don’t know what they don’t know.

The sort that will sit on a shelf until you find yourself faced with an odd question about how your machine boots, how to configure systemd, or what the hell PAM is. If nothing else it will provide you with enough basic details of a topic to make your online searches more productive.

Despite its title, this book doesn’t really tell you much about how Linux, the kernel, really works. You won’t find a discussion of different scheduling algorithms, and kernel structures really get mentioned only when they relate to user-space tasks. At a higher level, if you want to know about how all the files on your Linux box fit together, and the contribution each one makes to your system, you’d be better off setting up a “Linux From Scratch” system on a virtual machine – although this book would probably be a useful companion to the official LFS documentation.

Similarly, a competent system administrator with a few years experience of Linux, isn’t likely to

find much in this book that will surprise him/her – although there’s enough detail that you’re bound to learn a few things along the way. But if your admin skills are new, or you feel there are some gaps in your knowledge, this book could easily help to fill those holes. Even for a user on a home machine, if you’re interested in learning about the nuts and bolts of your operating system, this book would be a good starting point.

My one complaint about “How Linux Works” is that too much space is wasted on unnecessary detail – space that could have been better used to provide more information elsewhere. Nobody picking up this tome is likely to need an introduction to the shell right down to the level of the “cd” and “mv” commands, whilst at the other end of the spectrum (and the book), there are two whole chapters dedicated to development tools and installing from source. The content here is not only less relevant in a world of unofficial repositories and development PPAs, but



concentrates on how to locally resolve the sort of build and compilation issues that should probably be raised with the upstream developers anyway. Meanwhile, a subject such as printing gets just over a page in the book, and the Apache web server warrants a single mention in a final chapter that just reels off different ways in which you can use a Linux box.

Despite this minor complaint, there's still plenty of information to be gleaned from this book and I'd definitely recommend it to would-be administrators, or just the technically curious. With references and suggested reading dotted liberally around, this could be the book to start you descending into a rabbit hole of information if you're so inclined. But even if you choose not to follow up on any of the topics in more detail, this is a handy guidebook to the extensive collection of bits that make up a Linux box these days.



### TABLE OF CONTENTS

Chapter 1: The Big Picture  
Chapter 2: Basic Commands and Directory Hierarchy  
Chapter 3: Devices  
Chapter 4: Disks and Filesystems  
Chapter 5: Linux Booting: Boot Loaders and Kernel  
Chapter 6: How User Space Starts  
Chapter 7: System Configuration: Logging, System Time, Batch Jobs, and Users  
Chapter 8: A Closer Look at Processes and Resource Utilization  
Chapter 9: Understanding Your Network and Its Configuration  
Chapter 10: Network Applications and Services  
Chapter 11: Introduction to Shell Scripts  
Chapter 12: Moving Files Across the Network  
Chapter 13: User Environments  
Chapter 14: A Brief Survey of the Linux Desktop  
Chapter 15: Development Tools  
Chapter 16: Compiling Software from Source Code  
Chapter 17: Building on the Basics



**Mark** uses Inkscape to create three webcomics, 'The Greys', 'Monsters, Inked' and 'Elvie', which can all be found at

<http://www.peppertop.com/>

# Able2Extract PDF Converter 9

## All-in-one PDF solution

- ✓ Convert PDFs to Microsoft Word, Excel, PowerPoint, Text, Images, OpenOffice and more with precision.
- ✓ The most accurate converter for PDF tables to spreadsheet format.
- ✓ Generate industry standard PDFs with powerful PDF creations options.
- ✓ Protect and Secure your PDFs.
- ✓ Resize, rescale, delete and move pages inside PDF.

Works with:



Ubuntu



Fedora



@able2extract



[www.investintech.com](http://www.investintech.com)

 **INVESTINTECH.COM**  
PDF SOLUTIONS



## MY STORY

Written by Roland Hunt

In my last article, I talked about my full-time switch to Linux, and, after trying various distributions including Ubuntu Studio 15.04, my reasons for choosing Kubuntu 15.04. In this article, I'll go into the details of changes in my Linux distribution of choice.

After having annoying screen glitching, I decided to switch back to Ubuntu Studio 15.04. With Ubuntu Studio, using the XFCE Desktop Environment, I've got a glitch-free screen on both the laptop's internal screen and external monitor.

As I'm trying to get into YouTube content production, the lightweight desktop you get with XFCE, along with a low latency kernel, coupled with having all of the packages required for video production, audio production, graphic design, photography and publishing, along with having the ability to install LibreOffice, games and any other Linux application, makes Ubuntu Studio an ideal distribution, even if you're not into any of the groups that install when

you do a full install.

I've got a 1TB HDD in my laptop and with a full install of Ubuntu Studio (all the different Ubuntu Studio categories installed), a full LibreOffice install, and the About Me settings applet installed, I've still got 921.9GB of free space for documents, applications and video or audio content.

I've had my Toshiba Laptop since 2010, and in that time it's had a RAM upgrade to 4GB, an intel WiFi card installed, and a battery replacement.

Replacing the laptop with a better one is currently not an option as I'm in-between jobs at the minute, and since I'm also trying to post regular videos to my YouTube channel – it makes sense to use Ubuntu Studio as that is one of the target markets for Ubuntu Studio. I would also like to do DVD Authoring, or some other type of publishing – which would also make Ubuntu Studio ideal, apart from being able to install games that can distract you from your

## My Switch To Ubuntu Studio

work. Also, as I went for all the categories that are available on install, I've covered all bases for it with the full LibreOffice installed.

The one thing that's really starting to grow on me with the XFCE Desktop Environment is how much more customizable it is compared to KDE or Unity, as I've created a Mac OS X style dock out of the hidden panel at the bottom of the Ubuntu Studio desktop, and added shortcuts to LibreOffice Writer and LibreOffice Calc to it. I've also replaced the standard XFCE Menu in the top panel with a Whisker Menu, and kept the Ubuntu Studio icon, as well as replaced the workspace switcher with my local weather and created a new panel on the right side for the workspace switcher.

My only slight problem: the sensitivity of my touchpad is high even though I've got it turned all the way down – meaning that it's hard to actually type on my laptop's keyboard which is kind of annoying, but I'll keep having a go at fixing the problem – it doesn't

affect me that much because it's rare that I use my laptop's built-in keyboard and mouse. If I ever need to use the built-in keyboard, I can just use a wireless mouse and switch the Touchpad off – either until I get the problem sorted or permanently.

I'm not going to let one little problem like this spoil what is an amazing OS, with a very customizable Desktop Environment, and that's both lightweight on resources and has made the battery feel like new (even though it's not charging up to its full capacity any more). But since I mainly use the laptop as a desktop, and it's connected to the mains when in use or with the charger close by, then battery life doesn't really matter all that much to me.

Ubuntu Studio has definitely breathed some much needed life back into my ageing laptop.







# LETTERS

If you would like to submit a letter for publication, compliment or complaint, please email it to: [letters@fullcirclemagazine.org](mailto:letters@fullcirclemagazine.org). PLEASE NOTE: some letters may be edited for space.

Join us on:



[goo.gl/FRTMI](http://goo.gl/FRTMI)



[facebook.com/fullcircle-magazine](https://facebook.com/fullcircle-magazine)



[twitter.com/#!/fullcirclemag](https://twitter.com/#!/fullcirclemag)



[linkedin.com/company/full-circle-magazine](https://linkedin.com/company/full-circle-magazine)



[ubuntuforums.org/forum-display.php?f=270](https://ubuntuforums.org/forum-display.php?f=270)

## VERACRYPT UPDATE

**T**hank you for your article on VeraCrypt.

There were two important omissions from your article.

### First:

VeraCrypt is available on a PPA, so installing on Ubuntu or any Debian system is a breeze. Add the repository to your repositories, update, and install VeraCrypt.

```
sudo add-apt-repository
ppa:unit193/encryption
```

```
sudo apt update
```

```
sudo apt install veracrypt
```

### Second:

VeraCrypt has a facility to convert TrueCrypt volumes (but not, sadly, partitions) to VeraCrypt. Obviously, you want to back up your volume before doing so in case something goes wrong (e.g. a power failure), but you would be recommended to use the VeraCrypt format rather than TrueCrypt specifically because the former is more secure.

By the way, VeraCrypt comes with a proper man page, unlike TrueCrypt.

**Paddy Landau**

## UBUNTU AFTER INSTALL

**I**'ve been reading your magazine for some time now, and find that it keeps adding to my Ubuntu knowledge. After a recent 15.04 install, I was working through setting it up and came across this great little piece of software that I think deserves a bit of promotion: Ubuntu After Install (<https://www.thefanclub.co.za/how-to/ubuntu-after-install>). It worked flawlessly on my 64-bit install, even though it's still in beta. It loads a whole bunch of essential PPAs, then installs the software. You get to select what you don't want, but their choices are pretty much what you would want anyway.

**Guy Chilvers**



## FCM#100 SURVEY

The question is:

**What are your most loved/hated flavors and releases?**

Take the quick survey and we'll publish the results in FCM#100.

<http://goo.gl/DPt2q0>



## FULL CIRCLE NEEDS You!

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

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

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



# Tuxidermy

FROM THE DIARIES OF  
DOCTOR ABRAHAM  
VAN PENGUIN...



I'VE ARRIVED IN CASTLE  
JERKULA LATE AT NIGHT,  
GUIDED BY THE TESTIMONIES  
OF RECENT SURVIVORS...



THAT MONSTER WAS THERE, SUCKING THE  
SOUL AND PRIVACY OUT OF ANOTHER  
UNSUSPECTING VICTIM.



WAIT! STOP! MY  
BLOOD IS PRIVATE, YOU  
HAVE NO RIGHT TO  
TAKE IT! GO AWAY!

SHUT UP,  
WILL YOU? I'M  
TRYING TO  
TASTE IT.

SEEING SUCH HORRID SCENE,  
I HAD TO MAKE MY MOVE.



LET THE  
POOR GIRL GO, YOU  
FIEND! I'M HERE TO  
UNINSTALL YOU!

HE LOOKS LIKE HE'S WEAK  
ENOUGH FOR ME TO TAKE HIM  
DOWN, BUT SINCE YOU'RE  
HERE... COULD YOU DO IT  
FOR ME?

NO  
PROBLEM,  
MISS.



BUT ANYWAY, HE WAS  
ALL BRAVADO AND NO  
SUBSTANCE...

WHAT WILL YOU DO,  
MY LITTLE HUNTER?  
YOUR FOSS MAGIC HAS  
NO POWER IN MY  
REALMS!



SO IT WAS NO TROUBLE AT ALL  
TO GET RID OF HIS SORRY  
FREEDOM-SUCKING @SS.

W-WAIT!  
WHAT'S THIS MUMBO  
JUMBO SIGN YOU'RE...  
NOOOO!



IT'S CALLED  
A CIRCLE OF  
PROTECTION.

HE'S GONE FOR NOW, MISS. IF I  
MAY SUGGEST, PLEASE REFRAIN  
FROM LETTING SPYWARE VAMPIRES  
INTO YOUR LIFE THE NEXT  
TIME, OK?

YOU KNOW, DOC?  
YOU'RE KIND OF NERDY  
BUT I LIKE YOU.

POOF!



OUCH!





# 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** What is this Snappy thing I'm hearing about?

**A** A nice writeup is here: <http://goo.gl/r7TU3b>  
(That points to [pcworld.com/article/2942267/why-ubuntu-plans-to-replace-traditional-linux-packages-with-something-better.html](http://pcworld.com/article/2942267/why-ubuntu-plans-to-replace-traditional-linux-packages-with-something-better.html))

**Q** I wish to upgrade my Xubuntu 12.04 to Xubuntu 14.04. When I run the update manager, and hit the upgrade to 14.04 button, a window pops up and says: "Welcome to Ubuntu 14.04 'Trusty Tahr'"

I don't want Ubuntu 14.04, I want only Xubuntu 14.04

**A** Go ahead, you will get Xubuntu 14.04. There are several places where Xubuntu is identified as "Ubuntu," (eg. grub) and this is one of them.

**Q** I have a bunch of files in my Downloads folder with no

extension. How can I determine what type of file they are?

**A** Use these two commands:

```
cd Downloads
file *
```

**Q** I added a 1 TB hard drive to my computer, but it does not show up in the file manager.

**A** You might need to install Gparted. Then run this command:

```
sudo gparted
```

In the top-right is a drop-down box to select a specific drive. Select your new drive. Then create one or more partitions, and format the partitions. The new partition(s) should appear in your file manager.

This process is actually a little bit simpler than the similar process under Windows.

**Q** My system was running when the power went off. Now it won't boot! It displays these error messages:

```
error : unknown filesystem.
Entering rescue mode...
```

**A** (Thanks to *oldfred* in the Ubuntu Forums) Boot from a LiveCD or flash drive and run this command:

```
sudo e2fsck -f -y -v
/dev/sda1
```

**Q** I'm having video playback problems on a low-powered system with Intel graphics.

**A** See this thread in the Ubuntu Forums: <http://goo.gl/3TzD9y>

On my Acer Aspire One, it didn't work a miracle, but it appeared to help.

**Q** I'm dual-booting with Windows 8, and Windows suffered a catastrophic failure. I thought I could just click on the

partition from Ubuntu, and save a copy of my files. However, I get a long error message which includes this: "The NTFS partition is in an unsafe state."

**A** (Thanks to *grahammechanical* in the Ubuntu Forums) The solution is spelled out in this article: <http://goo.gl/dGjL4L> (It's at [webupd8.org/2015/06/workarounds-for-not-being-able-to-mount.html](http://webupd8.org/2015/06/workarounds-for-not-being-able-to-mount.html))

**Q** I am having trouble assigning a static IP address to my Ubuntu Server, which is connected to my router by an Ethernet cable.

**A** (Thanks to *Chili555* in the Ubuntu Forums) Edit (sudo nano) /etc/network/interfaces as follows:

```
auto lo
iface lo inet loopback
auto eth0
iface eth0 inet static
address 192.168.1.25
netmask 255.255.255.0
gateway 192.168.1.1
```





## Q&A

```
dns-nameservers 80.58.61.250  
80.58.61.254
```

Then restart the interface:

```
sudo ifdown eth0 && sudo ifup  
-v eth0
```

To check it:

```
ifconfig  
ping -c3 www.ubuntu.com
```

You will probably choose a different address and nameservers.

## TOP QUESTIONS AT ASKUBUNTU

\* How do I increase the number of lines shown on the Ubuntu terminal window?

<http://goo.gl/bA9XFB>

\* Keep /home directory when installing Ubuntu 14.04

<http://goo.gl/hBcFaL>

\* Why does apt-get not require restarts, where the update manager does?

<http://goo.gl/T47YAe>

\* What kind of scheduling algorithms are used in 15.04? Is it possible to change it?

<http://goo.gl/ftMp2G>

\* How to get date and time using command line interface?

<http://goo.gl/iF1ft1>

\* How can I reliably check which is the last time an Ubuntu machine has been connected to the internet?

<http://goo.gl/q4U4xX>

\* How can I turn photos of paper documents into a scanned document?

<http://goo.gl/7cLJKV>

\* How to wipe a hard disk completely so that no data recovery tools can retrieve anything?

<http://goo.gl/T0nC40>

\* What happens if you Trash the Trash?

<http://goo.gl/eRoMJE>

## TIPS AND TECHNIQUES



### A nostalgic time-sink

Issue 100 of Full Circle Magazine is coming up, which put me in a nostalgic mood. I'm sure I'm not the only person here who grew up in an IBM mainframe environment.

For those of us who are long in the tooth, April 7, 1964 was "the day the world changed." Fortune Magazine called it "The \$5 Billion Gamble," as IBM announced

System /360, which was supposed to combine scientific and commercial computing in a single box. (IBM's annual revenue at that time was about \$5 billion, which made it by far the largest computing company.)

A few months later, I joined IBM, and a year later was assigned to help a customer use the initial release of OS/360. That was a horror show, but it got better. By release 16 it was quite solid.



It turns out that you can emulate that environment right on your own PC. The solution is in two parts. First, you need Hercules. "Hercules is an open source software implementation of the mainframe System/370 and ESA/390 architectures, in addition to the new 64-bit z/Architecture. Hercules runs under Linux, Windows (98, NT, 2000, and XP), Solaris, FreeBSD, and Mac OS X (10.3 and later)."

Then you need an operating system. There are several choices, older IBM operating systems including OS/360, DOS/360, DOS/VS, MVS 3.8, VM/370 and TSS/370, which are widely believed to be either public domain or "copyrighted software provided without charge." The most popular is probably MVS (Multiple Virtual Storage,) which was an improvement over MVT, (Multiprogramming with a Variable number of Tasks). A lot of my early career was spent on MVT.

It's all available online for free. The operating systems include language compilers such as COBOL, but not CICS (Customer Information Control System), which was the most efficient way

to set up online applications, or DB2.

It's tempting. COBOL was the first programming language which I felt I mastered. However, it's irrelevant to my life today, supporting users in an Active Directory environment. If I had a lot of time on my hands, I could certainly consume all of it, playing with my personal mainframe.



**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.



**F**irst things first: what is Tails. Well, Tails (or TAILS) stands for **The Amnesic Incognito Live System**. Or, as they say on the site: Tails is a live operating system, that you can start on almost any computer – from a DVD, USB stick, or SD card. It aims at preserving your privacy and anonymity.

In short: Tails will boot from DVD/USB; while you're online, it'll keep you as anonymous as possible, and, on exit, leave no trace of what you were doing.

Thankfully, though, you can save data to an encrypted persistent volume on a USB stick.

## BURNING BEFORE INSTALLING

Before you can put Tails on a USB, you need to have Tails up and running. This means, in my case anyway, burning it to a bootable DVD.

Head over to <https://tails.boum.org/>, download

the latest ISO image, and burn it to a blank DVD.

Once you have Tails on a bootable DVD, you can pop it into your machine and boot from it.

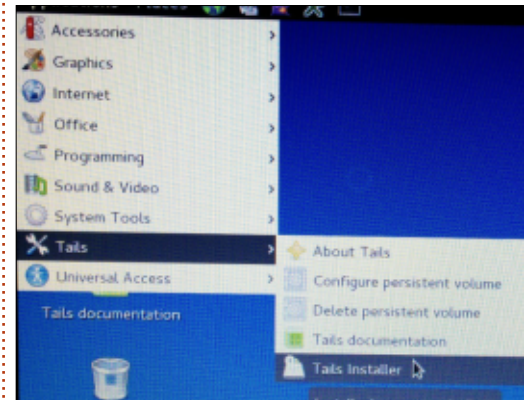
On booting, you'll be asked if you require more options (tick NO), choose your language at the bottom of the screen, and click 'Login'.

Now you're in Tails. You can, of course, just play around in here doing whatever you want. But you've nowhere to save any files to. Which is fine if you're just browsing, or checking email. To save files, we'll need that persistent volume, and we can get that only by using this live boot to install Tails to a USB stick.

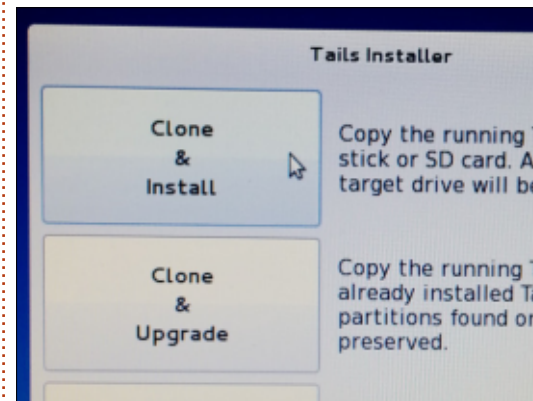
## TAILS TO USB

Pop a USB stick into your machine. For a persistent volume, with Tails, you'll need a stick larger than 4GB. I'm using an 8GB stick in this example.

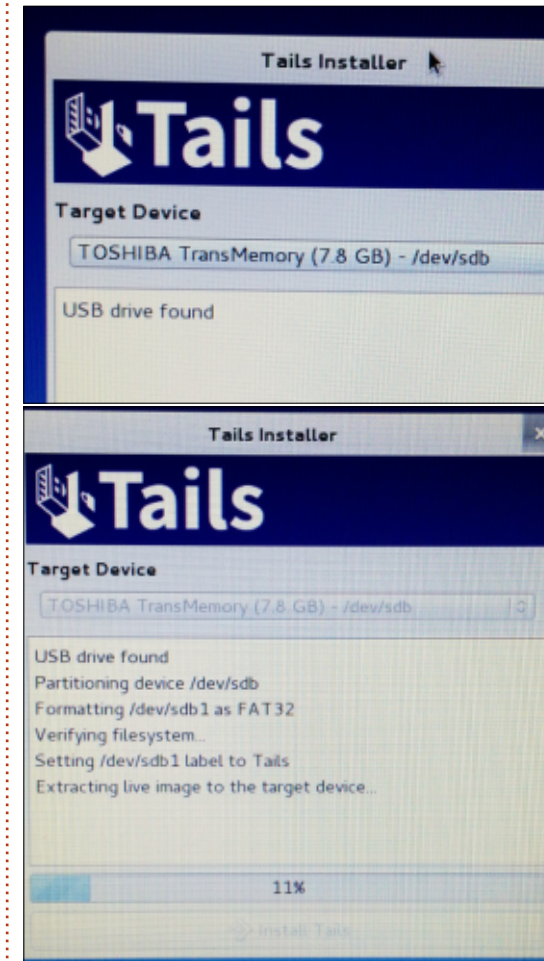
In your live boot, go to Applications > Tails > Tails Installer.



From the window that opens, choose 'Clone & Install'.



If you have more than one USB device in your machine, this is where you choose which device to install Tails to.



Click 'Install Tails' and wait for a few minutes while your USB stick is partitioned, formatted, and has Tails copied to it.

Once that's done, click OK.

You now have a bootable USB



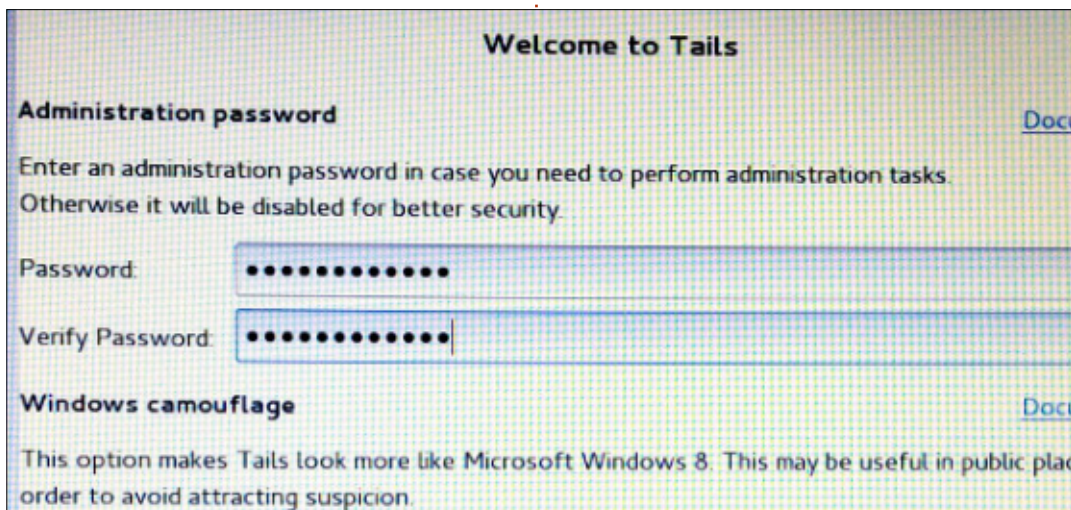
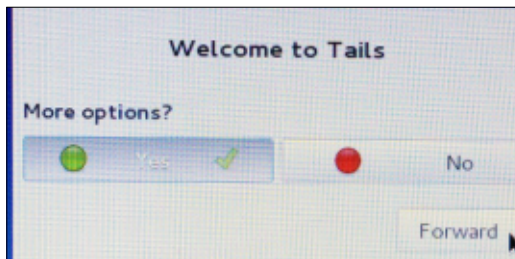
# SECURITY

with Tails.

Use the power button icon at the top right of the screen to shut down (or reboot) Tails, but be sure to remove the DVD first – we want to boot from the USB this time.

## IN THE USB

So, we're back to the 'More Options' window again. This time I need to choose YES as my WiFi is not detected by most Linux distros and I need to run a SUDO command to activate it.



By default you cannot run admin/sudo commands in Tails as this would compromise your security. Choosing YES lets you choose an admin password.

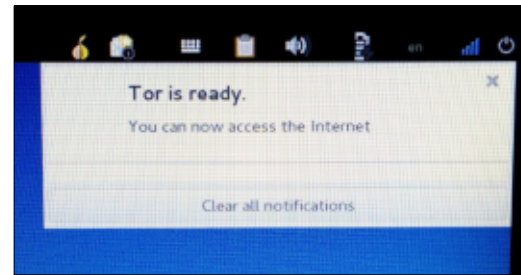
And, yes, you can even camouflage it as Windows 8 with a Windows background and Windows 'start' button.

Enter a password you want to use for admin commands in this boot, and click 'Login'.

So, I ran my SUDO command, got my WiFi working, and it's connected to the Internet.

After a few moments, Tails will display a system message that 'Tor is ready' and will display the Tor

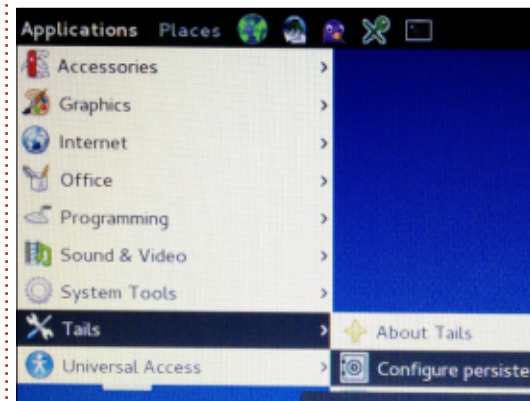
onion logo.



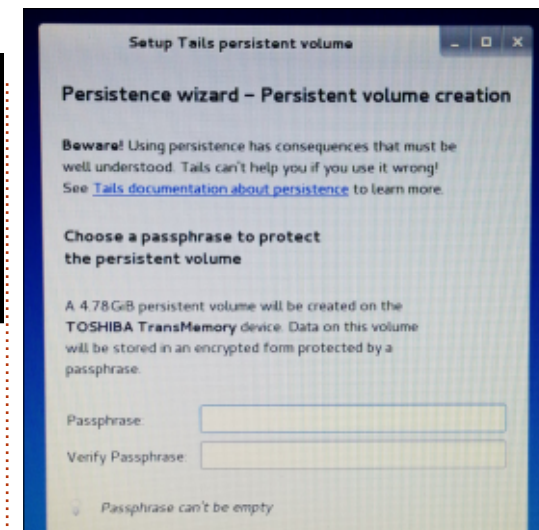
Anything you do in your browser from now on is done through Tor.

## PERSISTENT VOLUME

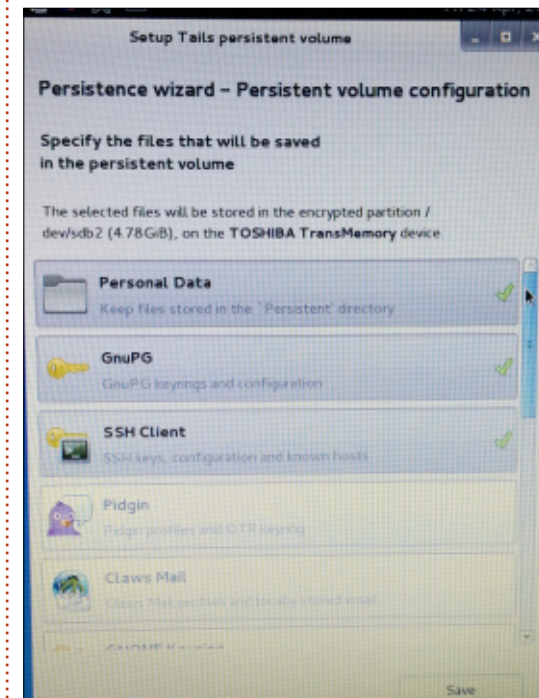
To get a persistent volume we need to go to Applications > Tails > Configure persistent volume.



In this window, you need to enter a passphrase which is used only for the persistent volume. This is completely separate from the admin/sudo password we used earlier.



Click 'Create' to continue.



Now we come to the 'Persistence Wizard' which determines what will be allowed

# SECURITY

on the persistent volume. Choosing 'Personal Data' means you'll have a folder to put what you want on there. Choosing bookmarks means anything you bookmark will be saved and available on next boot. Same with all the other options in the wizard.

When you're happy with those things, click Save.

And that's that! Reboot Tails to have your persistent drive available.

## TAILS & PERSISTENCE

On booting from the USB stick, you'll see the usual 'more options', but also a new 'use persistence?' option. Clicking YES for that will ask for the passphrase used when creating the volume.

Now, finally, you have Tails with a persistent volume. To see your space, open the HOME folder.

You'll see folders named Persistent and Tor Browser. This is a bit confusing and took a bit of Googling to find this out – the Tor Browser folder you see in /home is only for the browser, and anything

you save in here will be wiped on exit. Inside the Persistent folder is another Tor Browser folder. This folder will NOT be wiped, and is where you should save your files. Saving files anywhere else is, technically, possible, but you won't be able to access those files in any apps. Confusing, I know, but in short:  
/home/Tor Browser = temporary  
/home/Persistent/Tor Browser = permanent

As ever, be careful out there as – even with Tor (and the like) – I still don't trust it to be 100% anonymous.

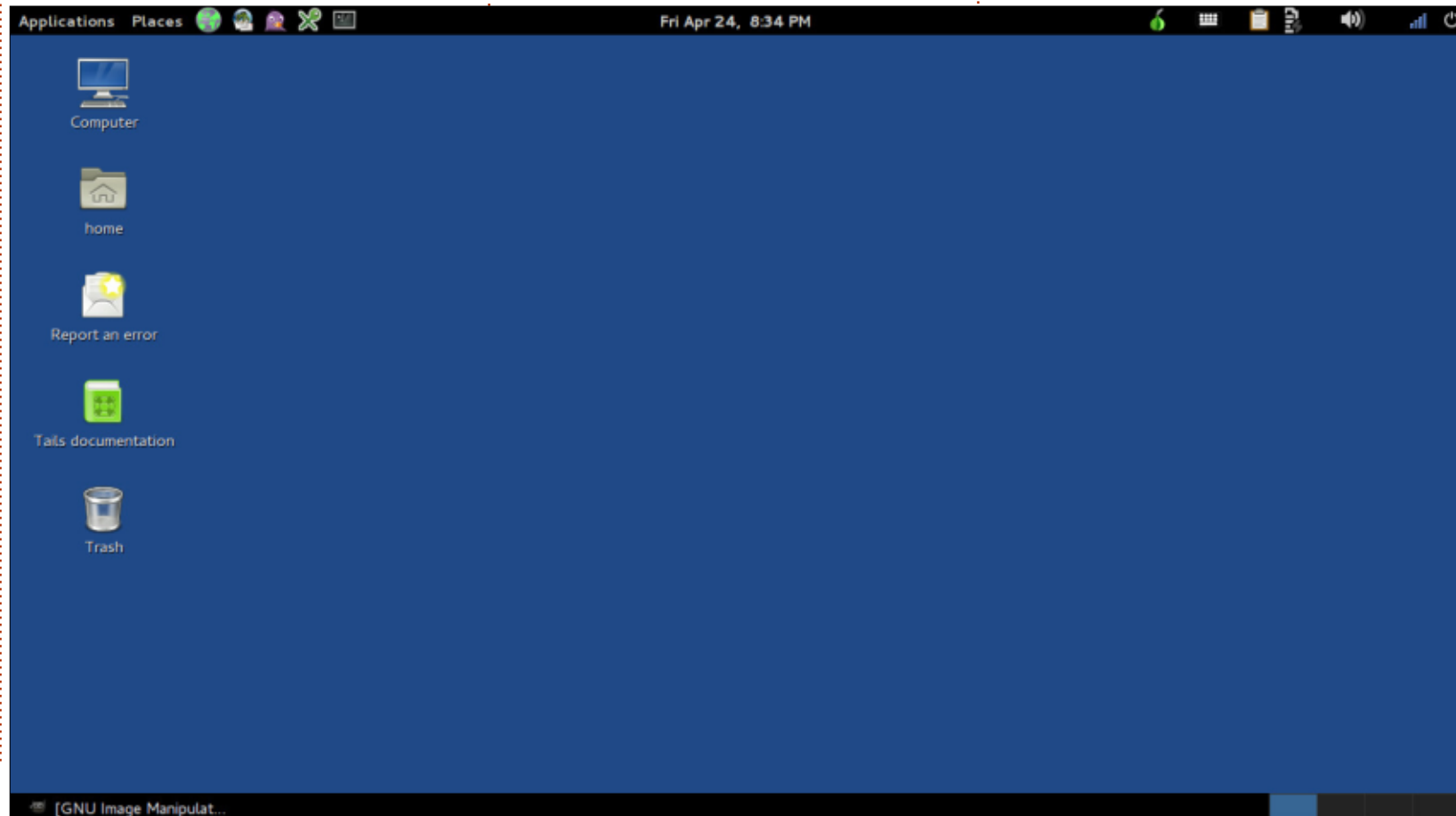
## FURTHER READING:

<https://tails.boum.org/doc/about/warning/index.en.html> - Tails Warning page. **PLEASE READ!**

<https://tails.boum.org/doc/index.en.html> - Tails Documentation



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







**B**rutal Doom is actually a mod for the original Doom engine that is now open source. It brings to the Doom engine all the things that take it completely over the top. You think I'm kidding? Here's the trailer (18 CERT):

<https://www.youtube.com/watch?v=oSzYliSASKc>

### INSTALLING DOOM

First, we must install the open source Doom engine. This can be done with either GZDoom or Zandronum. GZDoom requires the downloading of source and compiling, so let's just go with Zandronum for the sake of simplicity.

First, we'll add the drdteam repo to our list:

```
sudo add-apt-repository 'deb
http://debian.drdteam.org/
stable multiverse'
```

Then add their GPG key:

```
wget -O -
http://debian.drdteam.org/drd
team.gpg | sudo apt-key add -
```

Now update our list of sources:

```
sudo apt-get update
```

And, finally, install Zandronum:

```
sudo apt-get install
zandronum doomseeker-
zandronum
```

So, now that you have the Doom engine, there's one more ingredient: the original Doom WAD files. The WAD files are the original Doom levels and are not free. How you acquire them is entirely up to you, but once you get that DOOM.WAD file, you should copy it into

/home/username/.zandronum. If the hidden .zandronum folder isn't there (ie: you have not run Zandronum before), then you'll need to create a new folder called .zandronum then copy the DOOM.WAD in there.

Now, when you start





Zandronum, you'll have the original Doom!

## BRUTAL DOOM

Adding Brutal Doom is easy enough.

Head over to:

<http://www.moddb.com/mods/brutal-doom/downloads>, and click on Brutal Doom (version 20 as I write this). You'll get a popup window, but wait a second/two and your download will start.

While it's downloading, go into your .zandronum folder and create a new folder called 'skins'.

The downloaded file (brutalv20.zip in my case) has two files in it. We're interested only in the .PK3 file. Unzip the PK3 file into .zandronum/skins.

## ADDITIONS

I also recommend you download the accompanying metal soundtrack. This is the original Doom tracks, but completely remade using real instruments, and adds a lot to the excitement of Brutal Doom. Same download page

as Brutal Doom, but choose to download the Doom Metal Soundtrack Mod. This time the file is a .WAD (DoomMetalVol4.wad in my case). Uncompress it to .zandronum/skins too, same as the Brutal Doom PK3 file.

Now you're ready to rock 'n' roll!

## CONCLUSION

Brutal Doom adds so much

additional madness to Doom that it's almost like a new game. You can kick, punch, and shoot everything. Walk through your mess to create bloody footprints. With your new-found abilities, you can now move barrels and such like to set traps. Also, rather than just shooting in a vertical line, you now have to aim. Yes, you can look around with 360 degrees of freedom. There's also beautiful lighting (which you can shoot out).

If you thought Doom couldn't get any crazier? You were wrong. So very wrong!



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





The cloud-like and ethereal turquoise Aurora Borealis are dancing over your head, while, a few steps behind you, there's a bed on the snow in which a body lies dormant. You slowly walk through the snow and approach the bed to find out what kind of a person could be sleeping out here. To your surprise, it's your own body sleeping on the bed.

Sounds bizarre, right? In fact, that's the beginning of Dreamfall Chapters, a game being described as a story-driven adventure but which to me seems more like a fantasy, science fiction, interactive movie – riddled with puzzles in which you, the player, have a direct influence on the outcome based on the choices you make. According to developer and publisher, Red Thread Games, Dreamfall Chapters is “a game about choice and consequence, about dreams and reality, magic and science, chaos and order” – and parallel worlds, and the people in these worlds. This game is a true gem which I highly recommend. Dreamfall Chapters is visually stunning with

an emotionally engaging soundtrack which, together with the compelling voice-acting, draws the player into its sci-fi, fantasy dream in which every decision we make weighs in on the balance of a possibly catastrophic or enlightening consequence. The more I play the game, the more I find that my decisions may render either consequential repercussions

or illuminating revelations down the line.

Dreamfall Chapters can be bought directly from redthreadgames for \$29.99, or better yet, for \$34.99 you can get the Dreamfall Chapters Season Pass which not only gives you the game as it currently stands, but it also grants you the remaining

chapters still waiting to be released. Dreamfall Chapters is also available through Steam, gog.com, and through humblebundle, for more or less the same price. You may be lucky and find it on sale at any of those three stores. I originally bought the game through gog.com while it contained only the first two books, but having paid for the Dreamfall





Chapters Season Pass, I am now about to update the game to include the third out of five books released so far. If you buy the Dreamfall Chapters Season Pass through Steam, the game will be patched by Steam as the remaining books are released. If you buy it through other sources, like myself, you'll have to manually patch the game at your own convenience. Having found it on sale for a great price, I opted to go through gog.com, which is a digital game distribution store which prides itself on offering DRM-free content to Windows PC, OS X and Linux.

Book One: Reborn was released in October 2014, followed by Book Two: Rebels which was released in March 2015, and most recently Book Three: Realms was released in late June 2015. All three books are currently available for Windows PC, OS X and Linux. They will also be released for PS4 in the near future, but a date hasn't yet been announced. The remaining two books don't have a release date or title announced yet, but, judging by the rate at which the first three were released, a conservative forecast would have four and five released by the end

of 2015.

The two main characters in Dreamfall Chapters are Zoë Castillo and Kian Alvane. However, these characters each exist in two completely different parallel worlds. Zoë lives in Stark, a futuristic cyberpunk society here on Earth around the year 2200. Kian lives in Arcadia, a sort of Tolkien-inspired magical fantasy land. The game begins with Zoë

being trapped in a coma and existing in "Storytime," which is where other people addicted to the "Dreamachines" are also trapped. She sets out to help these people wake up and eventually she also manages to wake up. Awake, she then has to undergo therapy to restore her memory which she lost when she first began using her first Dreamachine. About the time I was getting used to playing as Zoë and getting used to the mechanics of

the game, the first chapter ended with Zoë waking up from her coma. Chapter two begins with Kian Alvane trapped in a prison apparently due to high treason. His first interactions are with the warden who is giving him the news that he is about to be executed. Shortly after this, a riot erupts in the prison, and resistance fighters manage to help Alvane escape from prison through the use of some dark magic as the second





chapter ends. The third chapter shifts back to the future as Zoë is beginning her therapy to regain her memory. Overall, the two worlds are a refreshing contrast as they shift back and forth from Stark to Arcadia.

The lack of a dedicated tutorial made the first chapter a bit harder than the rest to play, but once I got used to the game mechanics, it was a pleasant experience which would in time clutch me in its orbit as the story-line would unfold all around me. To play as one of the two primary characters, you move around using the WASD keys and the mouse. There are certain objects and people with which you can interact, and it's pretty easy to distinguish these from the very beginning. When selected, some objects or people reveal an interface which prompts you to make a choice ranging from slowing down time, or grabbing an object, to choosing between two or more arguments as a response in a dialogue with another character. Some of the puzzles I had to solve were frustratingly hard, and I must admit, I had to look online for how to solve the problem at hand. Unless you go into Settings and select to play

offline, some of the more important choices you have to make will allow you to click on a balance which reveals the choices other players have made. After making your choice, the game tells you that "the balance has shifted."

## PRO'S

I really liked the graphics in Dreamfall Chapters. The characters were near life-like and there were certain facets of the game's graphics which really grabbed my attention, such as the water in many places which looked unmistakably real as it reflected the environment through its ripples. The futuristic city of Stark was also visually pleasing to the eye with its myriad of 3-D holograms, robots and skyscrapers. The soundtrack proved to be a real strength in this game as it often helped to set the mood and further draw me into the characters and the story. The voice-acting, though not groundbreaking, is also a strength.

## CON'S

One aspect which did aggravate me was how at times there seemed

to be too much reverb/echo as the characters spoke. There was also too much repetition in some of the lines spoken by non-playable-characters which was happening a little too often for my taste. These two voice-related con's make me deduct a full star from a perfect five star rating.

I definitely recommend Dreamfall Chapters to anyone looking for a good adventure-puzzle game. Though it may seem like the game is too short, I assure you, it isn't. So far, only three out of five books have been released, so by the time all five books have been released, the game will be just the right length, not too long, not too short. I haven't come across any glitches yet and I'm about to begin the third chapter, so that's a good sign.

## Minimum system requirements:

- Linux: Linux Mint 17 or Ubuntu 14.04
- Processor: Core 2 Duo 2GHz or equivalent
- Memory: 3 GB RAM
- Graphics: Intel HD Graphics 4000
- Hard Drive: 5 GB available space

## My gaming box:

- AMD FX-6100 3.3GHz CPU (overclocked to 3.5GHz)
- Asus M5A97-EVO motherboard
- Gigabyte Windforce GeForce GTX 960 graphics card with 346.72 proprietary driver
- 8GB of Kingston Hyper X RAM & 1TB Seagate Barracuda hard drive
- Ubuntu 14.04.2 LTS with Unity desktop



**Oscar** graduated from CSUN, is a Music Director/Teacher, beta tester, Wikipedia editor, and Ubuntu Forums contributor. You can contact him via: [www.gplus.to/7bluehand](http://www.gplus.to/7bluehand) or email: [www.7bluehand@gmail.com](mailto:www.7bluehand@gmail.com)



# PATRONS

## PATRONS

Bill Berninghausen  
Jack McMahon  
Linda P  
Remke Schuurmans  
Norman Phillips  
Tom Rausner  
Charles Battersby  
Tom Bell  
Oscar Rivera  
Alex Crabtree  
John Malon  
Ray Spain  
Richard Underwood  
Charles Anderson  
Ricardo Coalla  
Chris Giltane  
William von Hagen  
Mark Shuttleworth  
Juan Ortiz  
Joe Gulizia  
Kevin Raulins  
Doug Bruce  
Pekka Niemi  
Rob Fitzgerald  
Brian M Murray  
Roy Milner  
Brian Bogdan  
Scott Mack  
Dennis Mack

## DONATIONS

John Niendorf  
Daniel Witzel  
Douglas Brown  
Donald Altman  
Patrick Scango  
Tony Wood  
Paul Miller  
Colin McCubbin  
Randy Brinson  
John Fromm  
Graham Driver  
Chris Burmajster  
Steven McKee  
Manuel Rey Garcia



## CHA CHA CHA CHANGES

Our admin went AWOL for months, and I had no idea if/when the site would/wouldn't get paid. Initially the plan was to move the site and domain name to my hosting, but eventually I managed to track him down and get the FCM domain name, and site hosting transferred to me.

The new site is now up. **HUGE** thanks to **Lucas Westermann** (Mr. Command & Conquer) for taking on the job of completely rebuilding the site, and scripts, from scratch, in his own time.

The Patreon page that I've set up is to help me pay the domain and hosting fees. The yearly target was quickly reached thanks to those listed on this page. FCM is not going away. Don't worry about that.

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

**A big thank you to all those who've used Patreon and the PayPal button. It's a big help.**

<https://www.patreon.com/fullcirclemagazine>





# HOW TO CONTRIBUTE

## FULL CIRCLE NEEDS YOU!

A magazine isn't a magazine without articles and Full Circle is no exception. We need your opinions, desktops, stories, how-to's, reviews, and anything else you want to tell your fellow \*buntu users. Send your articles to: [articles@fullcirclemagazine.org](mailto:articles@fullcirclemagazine.org)

We are always looking for new articles to include in Full Circle. For help and advice please see the **Official Full Circle Style Guide**: <http://url.fullcirclemagazine.org/75d471>

Send your **comments** or Linux experiences to: [letters@fullcirclemagazine.org](mailto:letters@fullcirclemagazine.org)  
Hardware/software **reviews** should be sent to: [reviews@fullcirclemagazine.org](mailto:reviews@fullcirclemagazine.org)  
**Questions** for Q&A should go to: [questions@fullcirclemagazine.org](mailto:questions@fullcirclemagazine.org)  
**Desktop** screens should be emailed to: [misc@fullcirclemagazine.org](mailto:misc@fullcirclemagazine.org)  
... or you can visit our **site** via: [fullcirclemagazine.org](http://fullcirclemagazine.org)



### FCM#100

#### Deadline:

Sunday 09th Aug. 2015.

#### Release:

Friday 28th Aug. 2015.



## Full Circle Team



**Editor** - Ronnie Tucker

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

**Webmaster** - Lucas Westermann

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

**Podcast** - Les Pounder & Co.

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

### Editing & Proofreading

Mike Kennedy, Gord Campbell, Robert Orsino, Josh Hertel, Bert Jerred, Jim Dyer and Emily Gonyer

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

## Getting Full Circle Magazine:



**EPUB Format** - Recent editions of Full Circle have a link to the epub file on the downloads page. If you have any problems with the epub file, you can drop an email to: [mobile@fullcirclemagazine.org](mailto:mobile@fullcirclemagazine.org)



**Issuu** - You can read Full Circle online via Issuu: <http://issuu.com/fullcirclemagazine>. Please share and rate FCM as it helps to spread the word about FCM and Ubuntu Linux.



**Google Play** - You can now read Full Circle on Google Play/Books. Either search for 'full circle magazine' or click this link: <https://play.google.com/store/books/author?id=Ronnie+Tucker>

