Full Circle

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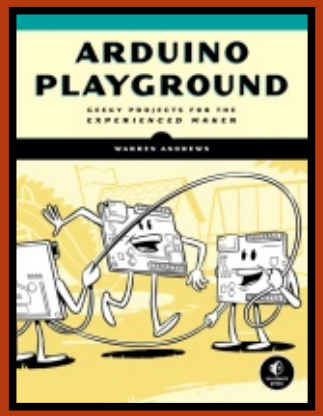
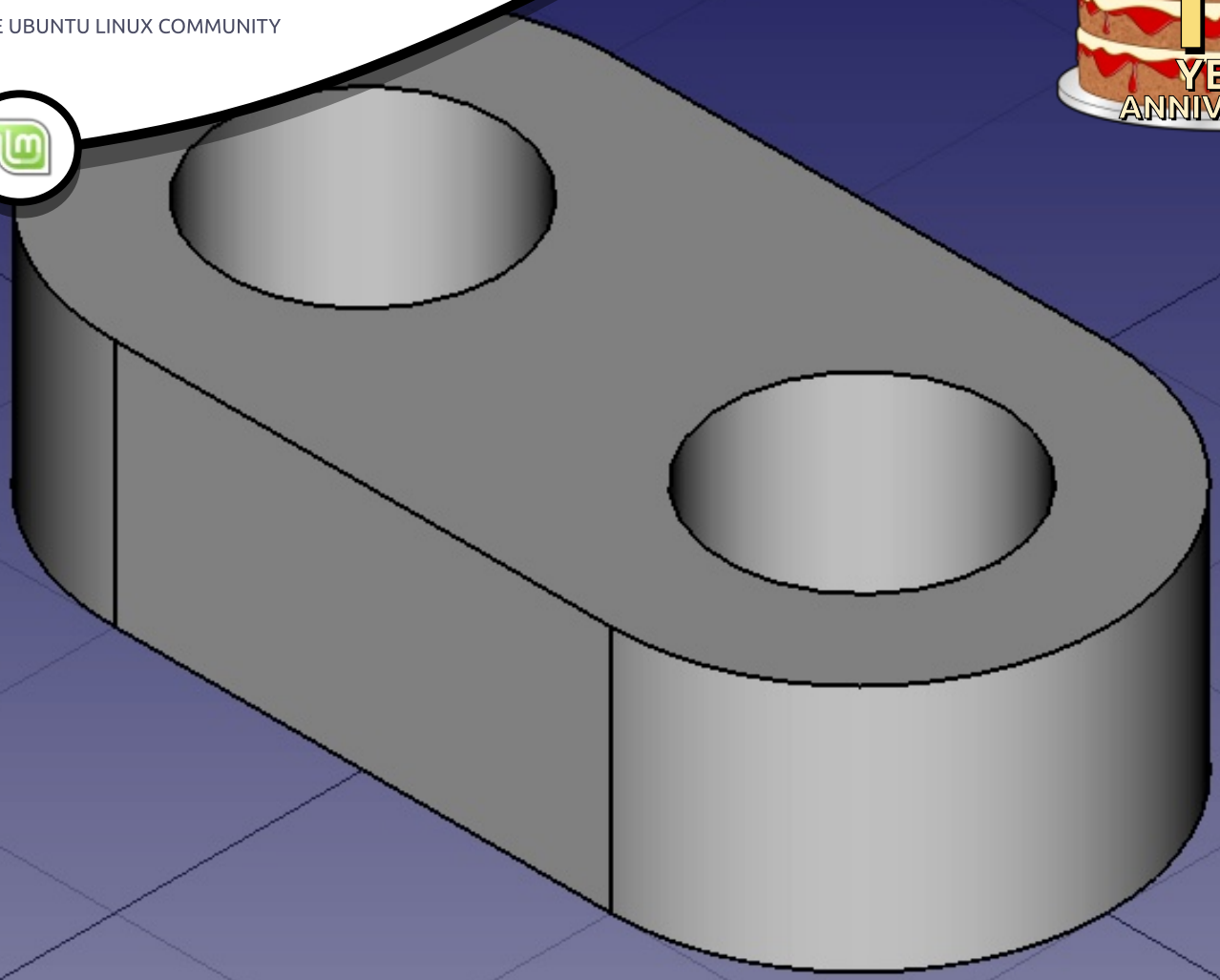
10 YEAR ANNIVERSARY

BOOK REVIEW





NEW

COMPUTER AIDED DESIGN

A PRACTICAL INTRODUCTION TO FREECAD

Full Circle

THE INDEPENDENT MAGAZINE FOR THE UBUNTU LINUX COMMUNITY

HowTo

Graphics

EDITORIAL

Welcome to this VERY special issue of Full Circle.

Well, here we are! This month marks the **tenth year** of Full Circle. It was in April 2007 that the first issue of Full Circle was released, and NEVER in my wildest dreams did I expect to still be exporting PDFs ten years later. I also have to thank the **many** people behind the scenes such as; proof-readers (and editors), writers (both regular, and occasional), webmasters (both past and present), translators (both English to other, and those creating epubs), and, of course, you, the readers, for sticking with FCM for so long. As seen in the survey results (which I won't spoil) a fair amount of readers have been here from the start!

With this being a special occasion I've packed more in than usual. There are the usual HowTo's on Python, Inkscape, Kdenlive, but we have a new series (from Alan Ward) starting this month on FreeCAD. For those of you following the Ubuntu Touch series (which only started a couple of issues ago) we've put it on hold until we know *for sure* what's happening with Ubuntu Touch. Another article from Alan is how he managed to cope for a week with no GUI. Is it even possible? I'll let you read on and find out.

Elsewhere we have Charles running some tests on older hardware, an interesting experiment on building Linux from scratch, an interview with a company who supplies telepresence robots, and an interview with a person who uses one of said robots. OK, they don't use Ubuntu/Linux, but it's still too interesting to pass up. Robin Catling reappears from the wild with a review of the LXLE desktop, and we have your thoughts on the Unity/Touch/convergence topic and the survey results.

All the best, keep in touch, and here's to another ten years!
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State Of The Union

As many of you know, Canonical has ceased all work on Unity (7 and 8), Mir, and Ubuntu Touch. Many foresaw the cancellation of Touch, but no-one predicted the cancellation of Unity and Mir. The fallout from this is still ongoing with many questioning what was going on. Here's what I've managed to find from various sources.

Mir was to be Ubuntu's replacement for the aging Xorg display system. With Mir cancelled it means that from 17.10 Ubuntu will use the Wayland display server. [1]

With Unity gone this means that from 18.04 onwards Ubuntu will return to using GNOME (or GNOME Shell as it's also known). [2]

While Ubuntu Touch has been abandoned by Canonical it seems that the UBports team is trying its best to keep Touch alive. Marius and his team managed to port Touch to several devices, so here's hoping they can take control of Touch and continue releasing OTA's for the current devices. [3]

It would seem that Canonical is trying to get back to basics and streamline themselves from the top down. CEO Jane Silber has resigned and Mark Shuttleworth will once again become CEO. [4] Lower down the ladder it's alleged that around 80 employees have been laid off [5]

No company suddenly decides to do these things, so there has to be a reason to this. It seems that Canonical is seeking outside investment (currently it is privately funded by Mark) and investors won't help a company that's hemorrhaging money through projects that aren't making any money. This seems to be the reason for the cost cutting. [6]

June 2017 will see the end of all updates from Canonical for all Ubuntu Touch devices. By the end of 2017 the Ubuntu Store (for Touch devices) will close. [7]

Sources:

[1] https://fossbytes.com/ubuntu-17-10-wayland-default-server/

[2] http://www.omgubuntu.co.uk/2017/04/ubuntu-18-04-ship-gnome-desktop-not-unity

[3] http://news.softpedia.com/news/ubuntu-touch-and-unity-8-are-not-dead-ubports-community-will-keep-them-alive-514620.shtml

[4] http://www.omgubuntu.co.uk/2017/04/jane-silber-canonical-ceo-steps-down

[5] https://www.theregister.co.uk/2017/04/12/80_canonical_staff_face_chop/

[6] https://www.theregister.co.uk/2017/04/06/canonical_cuts_jobs_with_unity_bullet/

[7] http://www.omgubuntu.co.uk/2017/04/ubuntu-phone-no-further-updates-truly-dead

Linux video editor OpenShot

Video editors have historically been a source of difficulty for Linux users. But, my oh my, has that changed in a big way lately.

I've personally been using Kdenlive—a video editor produced by the KDE project—with great success over the last year. I had absolutely no reason or need to look elsewhere for my video production needs.

But then along came OpenShot 2.3. And—holy guacamole, Batman—if it isn't absolutely amazing.

OpenShot is, quite simply, a cross-platform, free software (GPL licensed) video editing package.

It's available for Linux and, according to their download page, for Windows and Mac, as well.

Interestingly, OpenShot is distributed via appimage. That means they provide a single binary that can be run on just about any modern Linux distribution. I personally tested this out on openSUSE Tumbleweed with great success—but it should run just as easily on Debian, Fedora or others. I love this approach to distributing software directly from the developers.

Source: http://www.networkworld.com/article/3186857/open-source-tools/linux-video-editor-openshot-23-impresses-new-tools-fast-performance.html

Netrunner Desktop 17.03 'Cyclotron' Debian-based KDE Linux distro now available

When you choose a Linux-based operating system, you also choose a desktop environment. For many users, the DE sort of is the operating system. In other words, for some, they will really only interact with the user interface -- especially if they avoid the command line. A good operating system will get out of the user's way, allowing them to focus on the apps and tools they need.

If you are moving from Windows to Linux, KDE can be a great desktop environment. It is very reminiscent of the traditional Windows 95 to Windows 7 experience. Unfortunately, KDE can be a bit tedious to set up. Sure, it works fine "out of the box," but customizing it can be daunting. Luckily, there is a Debian-based operating system that is configured beautifully -- especially for those leaving Microsoft's OS. Called "Netrunner Desktop," it comes pre-loaded with many useful programs, making it an absolute joy to use. Today, it reaches version 17.03, code-named "Cyclotron."

Source: https://betanews.com/2017/03/31/netrunner-desktop-cyclotron-debian-kde-linux/

Linux Lite 3.4 Released With New Features

Linux Lite is one of the fastest growing Linux distributions around, there's no doubt about that. Apart from delivering a beginner friendly Linux experience, Linux Lite is also known for its low-resource requirement, something that makes it a great operating system for older PCs.

A couple of days ago, the Linux Lite developers announced the release of Linux Lite 3.4 Final. As expected, this release improves the overall user experience and continues its focus on security by providing all the latest updates. The highlight feature of this release is its latest application, Lite Updates Notify.

Lite Updates Notify is a desktop software that allows you to keep track of all the available updates. Depending on your preference, you can set Update reminders ranging from once in an hour to once in three weeks.

Linux Lite 3.4 is based on Ubuntu 16.04.2.

Source: https://fossbytes.com/linux-lite-3-4-released-new-features-download/

Linux Foundation blocks access to open source risks article

The Linux Foundation has blocked access to an article on its website about what are claimed to be the legal risks posed by open source software after its publication came in for criticism by members of the FOSS community.

The article, written by one Greg Olson, listed the supposed legal issues that companies using open source software could confront.

The Free Software Foundation's John Sullivan was one of the first to criticise the article, pointing out on Twitter, "There are many sites where I'd expect to see this article but not the Linux Foundation."

In reference to a claim in the article, he wrote, "Copyleft is not 'riskier'. Permissive licenses allow proprietary reuse, and *proprietary* licensing is far more complicated and risky."

And he added, "Copyleft is also not 'restrictive'. Responding to this, another well-known FOSS community member Simon Phipps created an annotated version of the article which was titled, "5 Legal Risks For Companies Involved in Open Source Software Development."

The article listed the licences created by the FSF, namely the GNU GPL, as among the more restrictive of open source licences.

Source: http://www.itwire.com/open-source/77519-linux-foundation-blocks-access-to-open-source-risks-article.html

Arch Linux 2017.04.01 Now Available for Download, Powered by Linux Kernel 4.10.6

The month of April kicks off with the release of a new ISO snapshot of the widely-used Arch Linux operating system, Arch Linux 2017.04.01, which brings the latest GNU/Linux technologies and Open Source applications.

Last month, when we reported on the release of the Arch Linux 2017.03.01 ISO snapshot, we told you that support for 32-bit installations was dropped from the official images of the independently developed GNU/Linux operating system, which slimmed down the images in size with a couple hundred MB.

While Linux kernel 4.10 was out for a while when the Arch Linux 2017.03.01 launched on the first day of March, it didn't make it to the stable channels as more testing was needed, so the ISO snapshot shipped with a kernel from the Linux 4.9 series.

Things have changed in this regard, and Arch Linux 2017.04.01 is the first ISO image of the GNU/Linux distro to ship with a kernel from the latest Linux 4.10 branch. Linux kernel 4.10.6 appears to be included in the ISO snapshot, along with all the updated packages released on the stable repos during the entire month of March.

Source: http://news.softpedia.com/news/arch-linux-2017-04-01-now-available-for-download-powered-by-linux-kernel-4-10-6-514525.shtml

AT&T and Intel-led DPDK Project moves to Linux Foundation, sets focus on open-source growth

AT&T, Intel, ZTE and a group of related telecom and technology companies have facilitated the transfer of the DPDK Project (Data Plane Development Kit) to the Linux Foundation, a move that will further open-source efforts.

AT&T, which just recently joined the Linux Foundation as a Platinum member, has been an advocate of open source and open networks.

Earlier this year, AT&T contributed several million lines of ECOMP code to The Linux Foundation, as well as the new Open Network Automation Platform (ONAP) Project based on production-ready code from AT&T and OPEN-O contributors.

Chris Rice, SVP of AT&T Labs, said in a release that bringing DPDK to the Linux Foundation will further drive open network standards across the telecom and IT industry segments.

By becoming part of the Linux Foundation, the two groups have established a governance and membership structure for the DPDK Project to nurture a vibrant and open community, and also provide financial support to help the community. A governing board will guide marketing and consider business impact and alignment with the community. Finally, a technical board, which is in charge of the technical direction of DPDK, is already established and consists of key contributors who lead the ongoing maintenance and evolution of the project.

Source: http://www.fiercetelecom.com/telecom/at-t-and-intel-led-dpdk-project-moves-to-linux-foundation-sets-focus-open-source-growth

Fedora 26 Alpha Linux distribution with GNOME 3.24 now available for download

Fedora is my absolute favorite Linux distribution. While it may not be the most popular such operating system, many in-the-know users ultimately choose it. Heck, Linus Torvalds, the father of Linux, famously uses the distro. It's not hard to see why many advanced users select it -- it is rock solid while being fairly bleeding edge. Also, for those that are fans of open source and FOSS, there are no proprietary packages, codecs, or fonts included "out of the box." It is just a refreshingly smooth and straightforward experience.

Today, Fedora 26 gets an Alpha release. While you might expect a pre-Beta release to be full of bugs and issues, that is absolutely not the case. I have been using the operating system all day today, and despite the "Alpha" tag, it is totally rock solid. I have yet to encounter a bug or issue. Of course, my experience won't necessarily be the same as yours. In other words, tread cautiously, and avoid installing this on a production machine.

If you do feel like living dangerously, however, you can get the default workstation ISO here. While I formatted an SSD to use for testing, you can totally run it in a virtual machine as well. Actually, a VM is probably a good idea for an alpha operating system.

Source: https://betanews.com/2017/04/04/fedora-26-alpha-linux-gnome/

Canonical Releases Snapd 2.23.6 Snappy Daemon for Ubuntu 16.10, 16.04, and 14.04

Snapd 2.23.6 is now the latest stable version of the daemon, available for all supported Ubuntu releases. It brings robustness improvements to the configuration hook system by implementing a 5-minute timeout for the configure hook, along with the ability to report any failure.

Additionally, Snapd 2.23.6 fixes the interfaces-cups-control component for the upcoming Ubuntu 17.04 (Zesty Zapus) operating system, renames the file that contains the snap-confine AA profile to "workaround dpkg," and updates the snapstate to restart when needed if the core or kernel snap was relinked.

Snapd 2.23.6 makes it possible for upgrades to always be installed by ignoring any configure hook failures on core refresh. To install it on a supported Ubuntu Linux operating system, run the following command in the Terminal app. Check out the GitHub release notes for more details on the new changes and if you want to download the source tarball.

Source: http://news.softpedia.com/news/canonical-releases-snapd-2-23-6-snappy-daemon-for-ubuntu-16-10-16-04-and-14-04-514577.shtml

Unpatched Wi-Fi SoCs leave iPhones and Android phones vulnerable to hacker hijacking

A recently discovered vulnerability in a Wi-Fi chipset could be exploited to take over devices without users' knowledge. A Google researcher publicly disclosed the bug in a blog post this week, which accompanied news from both Apple and Google that they're patching devices in response. In his post and as detailed by Ars Technica, Gal Beniamini demonstrates how he exploited a Wi-Fi SoC manufactured by Broadcom to execute malicious code by solely being within the same Wi-Fi range of the targeted phone. No user interaction is required. This attack is slightly terrifying because the chipset hardware is baked into lots of phones, including the Nexus 5, 6, and 6P, as well as most Samsung flagship devices and all iPhones since the iPhone 4.

The bad news is that although Google has issued a fix, lots of Android devices fall behind regular

patching schedules. More often than not, individual manufacturers or carriers have to push Android updates out over the air. This doesn't happen as frequently as it should, which leaves device owners to hope no one targets their device in between the time it gets updated and when the bug is publicly disclosed. The only way to definitely receive all Android security updates is by sticking with Google's phones, like the Pixel, or potentially unlocked Samsung devices, as the company says it'll issue monthly updates in the future.

Source: http://www.theverge.com/2017/4/5/15198362/broadcom-wifi-chipset-vulnerability-exploit

Ubuntu Boosts Linux Performance on AWS Cloud

Running Ubuntu Linux on the Amazon Web Services (AWS) cloud is a fairly common practice. Though Ubuntu has been available in the AWS marketplace for years, until recently there wasn't a version of Ubuntu with a Linux kernel that was specifically tuned for the AWS environment.

Udi Nachmany, head of public cloud at Ubuntu/Canonical, announced in an April 5 blog post that as of March 29, there were Ubuntu cloud images for Amazon that included an AWS-tuned kernel.

The specific kernel at this point is the Linux 4.4.0-1013.22 kernel that is aligned with the Ubuntu 16.04 release.

According to Canonical, the AWS-tuned kernel offers up to 30 percent faster kernel boot speed over a stock Ubuntu Linux kernel running in AWS.

The tuned kernel also takes direct advantage of AWS's Elastics Network Adapter (ENA). The ENA technology first became available on AWS in June 2016, providing high throughput of up to 20G bps for virtual instances.

When ENA debuted it was supported inside of the Amazon Linux AMI by default. The Amazon Linux AMI is loosely based on Red Hat's Fedora community Linux project. Now Ubuntu users will be able to easily and directly benefit from ENA as well.

Source: http://www.serverwatch.com/server-news/ubuntu-boosts-linux-performance-on-aws-cloud.html

Canonical changes Ubuntu's focus, OTA and ISOC come together, and the Open Network Automation Platform

Canonical, the company behind Ubuntu, is reassessing its initiatives and deciding to focus more on Ubuntu for Cloud and IoT rather than phone and convergence. According to Canonical, the choice is to invest in areas that are contributing growth to the company.

Mark Shuttleworth, founder of Ubuntu and Canonical, explained the biggest growth areas include Ubuntu for desktops, services, VMs, cloud infrastructure, cloud operations, IoT and Ubuntu Core.

The Online Trust Alliance (OTA) and the Internet Society (ISOC) announced they are combining resources to expand the reach and impact of the Internet Society. As part of this new partnership, the OTA will operate within the Internet Society and its members will become Internet Society members.

The two organizations will continue the OTA's work on its annual Online Trust Audit, Cyber Incident Response Guide and Internet of Things Trust Framework.

The Linux Foundation has announced the Open Source ECOMP and OPEN-O initiatives are forming a new Open Network Automation Platform (ONAP) project.

The ONAP project will allow end users to automate, design, orchestrate and manage services and virtual functions.

Source: http://sdtimes.com/canonical-changes-ubuntus-focus-ota-isoc-come-together-open-network-automation-platform-sd-times-news-digest-april-6-2017/

Hardened Node.js distro comes to Docker-friendly Alpine Linux

NodeSource is releasing a distribution of its enterprise-level, commercially supported NSolid Node.js runtime that works with Docker-friendly Alpine Linux. NSolid for Alpine Linux is intended to work with Alpine's small footprint and security capabilities, said Joe McCann, NodeSource CEO.

With the NSolid Node.js runtime, the company accommodates three critical enterprise technologies: the Linux kernel, Docker containers, and Node.js server-side JavaScript applications.

Containers using Alpine require a maximum of 8MB, and installing it to disk takes up as little as about 130MB. There has been a rise in Alpine Linux Docker distributions because of Alpine's tiny footprint, McCann said. The Alpine kernel also offers security enhancements preventing a class of zero-day and other vulnerabilities. Users get a secure option for running Node apps in containers, said McCann.

Built around the musl library and BusyBox utilities, Alpine is a noncommercial, general-purpose Linux distribution intended for power users.

Source:
http://www.infoworld.com/article/3190606/javascript/hardened-nodejs-distro-comes-to-docker-friendly-alpine-linux.html

Dell's new high-end all-in-one PC offers Ubuntu Linux or Red Hat Enterprise Linux

The Precision 5720 has just been released. This model comes with a 4K 27-inch display. You can power it up with a 7th-generation i5-7500 (Quad Core 3.4GHz, 3.8Ghz Turbo, 6MB) or a Xeon E3-1200 v6 series processor. Can you say fast? I knew you could.

In its default packaging, it comes with 8GB of RAM. You can expand it up to 64GB of RAM. For storage, the sky's the limit, with slots for a M.2 PCIe SSD and a pair of 2.5-inch SATA drives. When it comes to graphics, it comes with a wide variety of the option of AMD and NVIDIA cards. By default, its entry-level graphics is an AMD Radeon Pro WX 4150 with 4GB of RAM.

For an all-in-one PC, it comes with a great number of ports. These include five USB 3 ports, one with PowerShare, one DisplayPort 1.2 port, two Thunderbolt 3 ports (which support Type-C, DisplayPort, USB3.1, and PS), an SD card reader, a SIM card slot, and Gigabit Ethernet. For Wi-Fi, it uses a Qualcomm QCA61x4A 2x2 801.11ac + Bluetooth 4.1 chipset.

You can, of course, run it with Windows 10. But the really neat thing is you can run it with Ubuntu 16.04.02 LTS or Red Hat Enterprise Linux (RHEL) WorkStation (WS) 7.3. The base price is $1,699, and it goes up from there.

Source:
http://www.zdnet.com/article/dells-new-high-end-all-in-one-pc-offers-ubuntu-linux-or-red-hat-enterprise-linux/

Docker Completes Its Platform With DIY Linux

It all started with a new twist on an old idea, that of a lightweight software container running inside Linux that would house applications and make them portable. And now Docker is coming full circle and completing its eponymous platform by opening up the tools to allow users to create their own minimalist Linux operating system that is containerized and modular above the kernel and that only gives applications precisely what they need to run.

The new LinuxKit is not so much a variant of Linux as a means of creating them. The toolkit for making Linuxes, which was unveiled at DockerCon 2017 this week, is derived from containerd, the software container that Docker donated to the Cloud Native Computing Foundation, the open source consortium started by Google where its Kubernetes open source container orchestration system lives. Containerd is a daemon that runs with either Linux or Windows platforms, and it is an essential piece of the portability

story that makes Docker so compelling to hyperscalers, cloud builders, enterprises, and HPC centers alike.

Patrick Chanezon, who joined Docker in March 2015 as a member of the technical staff and who put together the Docker Enterprise Edition that was announced this March, explains why Docker got into the business of creating Linux distros and why it is opening up LinuxKit so others can create their own containerized Linux operating systems.

Source: https://www.nextplatform.com/2017/04/19/docker-completes-platform-diy-linux-kit/

System76 wants to build its own hardware for its Linux-based computers

System76 is building up quite a name for itself, being one of a very limited number of companies selling only computers running Linux-based operating systems. Now the aim is to branch out; System76 wants to design and build its own hardware, while representing the open source community as it does so.

At the moment, the hardware used in System76 systems is outsourced, but in the future this will change. The company says that it is moving into phase three of its development cycle, and this "moves product design and manufacturing in house." And you should set your expectations high: "We're about to build the Model S of computers. Something so brilliant and beautiful that reviewers will have to add an 11 to their scores."

This is a bold claim, and System76 has something of a reputation to protect. With this in mind, the company is sure to spend time making sure that it gets everything as close to perfect as possible -- and this is something that it makes clear in a recent blog post.

“It's going to take some years, but by the end of phase three, we'll be able to create anything. We'll apply our unique computers for creators perspective to every aspect of our products.”

Source: https://betanews.com/2017/04/23/system76-linux-hardware/

Ubuntu 17.10 (Artful Aardvark) Hits the Streets on October 19, with GNOME 3.26

It's probably the last thing hardcore Ubuntu fans want to know, but it looks like the upcoming Ubuntu 17.10 operating system was codenamed Artful Aardvark, and a preliminary release schedule is already online.

It would be awkward for Canonical CEO Mark Shuttleworth to announce the codename of Ubuntu 17.10 considering what happened lately with the layoffs, etcetera, so some of our readers spotted the release schedule of the upcoming Ubuntu Linux release on the official wiki.

According to the release schedule page, Ubuntu 17.10 will follow the same development cycle like before, which means that a total of two Alpha builds will be made available to public testers on June 29 and July 27, respectively, only for opt-in flavors, of followed by the first Beta, which lands on August 31.

It's important to mention here that the Ubuntu GNOME flavor is no longer called Ubuntu GNOME, but simply Ubuntu. Also, according to Canonical's Michael Hall, the Alpha 2 milestone is set as the target for Ubuntu 17.10 to get the GNOME desktop environment by default instead of Unity, as the first Alpha is based on Ubuntu 17.04.

The Final Beta or Beta 2 for the opt-in flavors is currently scheduled to land on September 28, and it looks like the final release of Ubuntu 17.10 (Artful Aardvark), which will probably sport the GNOME 3.26 desktop environment by default, set to launch on September 13, is hitting the streets on October 19, 2017.

Source: http://news.softpedia.com/news/ubuntu-17-10-artful-aardvark-hits-the-streets-on-october-19-with-gnome-3-26-515060.shtml

The Linux Foundation launches IoT-focused open source EdgeX Foundry, Ubuntu-maker Canonical joins

The Internet of Things is gaining in popularity just as many pundits have predicted for years. Having a connected home is easy and cost effective, thanks to devices like Amazon Echo, WeMo lights, and Nest thermostats. It really is an exciting time to be a tech-enthusiast consumer.

Unfortunately, while IoT is exciting, it can also be confusing and scary. Many devices do not work together due to fragmentation, and even worse, there can be security exploits that put the consumer's home network at risk. In other words, an internet connected refrigerator or webcam could be abused by hackers. Today, The Linux Foundation launches the open source EdgeX Foundry -- an attempt to unify and simplify the Internet of Things.

What makes this initiative so important -- besides its open source nature -- is that it has the potential to make consumers safer. Look, I get it -- innovation moves like a rocket, and a focus on security can slow that down. With that said, consumers deserve to have their privacy and security respected.

Manufacturers need to be on the same page not only for the benefit on consumers, but for them too. A security exploit in an IoT device can ruin a company's brand. It is time for everyone to pause, take a breath, and make sure that the Internet of Things progresses on the right track. Hopefully EdgeX can assist in that goal.

Source: https://betanews.com/2017/04/24/linux-foundation-iot-open-source-edgex-foundry-ubuntu-canonical/

Linux Kernels 4.10.12, 4.9.24 LTS and 4.4.63 LTS Bring x86 and OrangeFS Changes

The Linux 4.10.12, 4.9.24 LTS and 4.4.63 LTS kernels are here to improve support for the OrangeFS, CIFS, and EXT4 filesystems, as well as for the x86, PA-RISC, PowerPC (PPC) and MIPS hardware architectures, update the networking stack with small IPv4, SCTP (Stream Control Transmission Protocol) and SunRPC fixes, and update more drivers, this time for things like ACPI, CPUFreq, GPU (mostly Nouveau and Intel i915), IRQ Chip, NVDIMM, PWM, RTC, media, video, input, and SCSI.

The usual mm and core kernel improvements are also present, and we recommend studying the appended shortlogs if you're curious to know what exactly was changed in these new kernel releases. In the meantime, you can download the Linux 4.9.24 LTS and 4.4.63 LTS kernels, as well as Linux kernel 4.10.12, right now from kernel.org. Users are urged to update their GNU/Linux distributions to the new kernel versions at their earliest convenience.

Source: http://news.softpedia.com/news/linux-kernels-4-10-12-4-9-24-lts-and-4-4-63-lts-bring-x86-and-orangefs-changes-515068.shtml

Canonical Shuts Down Support For Ubuntu Phone, Updates Ending In June

Canonical's Ubuntu Phone OS for smartphones and tablets was already living on ventilator support since January when the updates were limited to critical fixes and security patches.

Now, the company has told that the operating system won't be getting any update following the month of June 2017. This would be accompanied by the termination of the app store in a couple of steps.

Network World received an email from Canonical, stating the latest development, reads that "it'll be no longer possible to purchase apps from Ubuntu Phone app store from June 2017." And it won't be possible to upload to new apps to the store.

The email further says that developers managing paid apps on the store can withdraw the apps or make them free to download. Moreover, users won't be able to download any apps from the store

after the year 2017 ends.

The news about Canonical terminating support for Ubuntu Phone OS builds upon their previous announcement about pulling funds off development for Unity 8 and Ubuntu Phone OS. The company has now removed another hurdle in their road to make Ubuntu a convergent OS.

Source: https://fossbytes.com/canonical-shuts-down-support-for-ubuntu-phone-updates-ending-in-june/

Hackers uncork experimental Linux-targeting malware

Hackers have unleashed a new malware strain that targets Linux-based systems.

The Linux/Shishiga malware uses four different protocols (SSH, Telnet, HTTP and BitTorrent) and Lua scripts for modularity, according to an analysis of the nasty by security researchers at ESET.

Shishiga relies on the use of weak, default credentials in its attempts to plant itself on insecure systems through a bruteforcing attack, a common hacker tactic. A built-in password list allows the malware to try a variety of different passwords to see if any allow it in.

The latest Linux-system targeting nasty could still evolve and become more widespread, but the low number of victims, together with the constant addition, removal, and modification of the components, code comments and even debug information, clearly indicate that it's a work in progress, according to ESET.

Shishiga is similar to other recent nasties in abusing weak Telnet and SSH credentials, but the usage of the BitTorrent protocol and Lua modules separates it from the herd, according to ESET.

Eset advises that "to prevent your devices from being infected by Shishiga and similar worms, you should not use default Telnet and SSH credentials."

Source: https://www.theregister.co.uk/2017/04/25/linux_malware/

N-day Nvidia, Android driver security flaw details revealed

The technical details of security vulnerabilities impacting the Nvidia Video and an Android driver have been revealed by Zimperium, which acquired the flaws as part of an exploit acquisition program.

On Tuesday, Zimperium zLabs researchers published a blog post detailing the security flaws, two escalation of privilege bugs found within the NVIDIA Video driver and MSM Thermal driver.

The Nvidia bug, CVE-2016-2435, impacts Android 6.0 on the Nexus 9 handset. The problem arises when attackers craft an application to tamper with read/write memory values and force privilege escalation.

The second security flaw, CVE-2016-2411, involves a Qualcomm power management kernel driver, the MSM Thermal driver, in Android version 6. If an attacker crafts a malicious application, they can give themselves root access through an internal bug in the driver, leading to privilege escalation.

These bugs are well documented, known, and for the most part security updates have been issued. However, Zimperium says that making the technical details available of these so-called "N-day" flaws is important and can act as a catalyst to boost the speed of patch production and to iron out problems arriving between a patch being created and vendors distributing the update in good time.

Source: http://www.zdnet.com/article/nvidia-android-driver-n-day-security-flaws-revealed/

New CloudLinux 7 Beta Linux Kernel Available for Testing, Two Crashes Addressed

The updated kernel is now available in the updates-

testing repository for CloudLinux 7 and CloudLinux 6 Hybrid users, and it was versioned as 3.10.0-614.10.2.lve1.4.46. It replaces kernel 3.10.0-427.36.1.lve1.4.45 and was rebased on the OpevVZ kernel rh7-3.10.0-514.10.2.vz7.29.2 from Red Hat Enterprise Linux 7.

Two Linux kernel crashes were resolved in this new update, namely CLKRN-104, a crash that occurred around rhashtable as part of rebase, and CLKRN-106, a crash that occurred when attempting to set the vm.vfs_cache_min_ratio option to zero in runtime. Therefore, we recommend updating your systems as soon as possible.

These issues can be fixed on your CloudLinux 7 or CloudLinux 6 Hybrid installations if you enable the updates-testing repository and install the new kernel version. For that, you'll have to run the following commands that correspond to your CloudLinux system on a terminal emulator or virtual console. Don't forget to reboot your machines after installing the kernel!

Source: http://linux.softpedia.com/blog/new-cloudlinux-7-beta-linux-kernel-available-for-testing-two-crashed-addressed-515199.shtml

Kali Linux 2017.1 Released With New Features

Offensive Security has updated the Kali Linux images with new features and changes. Termed Kali Linux 2017.1, this release comes with support for wireless injection attacks to 802.11ac and Nvidia CUDA GPU. You can simply update your existing installation by running few commands if you don't wish to download the updated images from Kali repos. Kali Linux is the favorite operating system of ethical hackers. Last year, the developers of this ethical hacking toolset decided to switch to the rolling release model. This means that instead of being based on the standard Debian releases, Kali Linux rolling distro ensures that it's regularly being updated with latest features and patches.

This release brings wireless injection support to 802.11ac standard. This has happened due to the implementation of drivers for RTL8812AU chipsets.

Thanks to the improvements in packaging, the users can now experience a streamlined GPU cracking process. The tools like Hashcat and Pyrit can take full advantage of NVIDIA GPUs within Kali.

As AWS P2-Series and Azure NC-Series allow pass-through GPU support, the corresponding images were made to support GPU cracking out of the box.

Kali devs felt that their ethical hacking OS lacked a full-fledged vulnerability scanner. With the addition of newly packaged OpenVAS 9, this gap has been filled.

Source: https://fossbytes.com/kali-linux-2017-1-features-download-torrent-iso/

What Is The Year 2038 Problem In Linux? Will Unix Clocks Fail On Jan. 19, 2038?

The Year 2000 problem, also known as the Millennium Bug or the Y2K problem, was a computer bug related to formatting and storage of calendar date. This problem started as the storage in early computers was expensive. So, to reduce the storage space, the programmers used the six-digit MMDDYY date format. As the programs were able to add 19 to year's YY, it saved money but reducing the size of files and databases. However, such programs found it hard to distinguish between the year 2000, 1900, and 19100.

To tackle this issue, governments set up special committees to make sure that critical infrastructure had fixed this problem. Now, analogous to the same, the Year 2038 problem is another issue for computing world.

The Year 2038 problem is also called Unix Millennium Bug or Y2K38 bug. This bug could cause

problems in the data storage situations in which time values are stored or calculated as a signed 32-bit integer.

The latest time that can be represented in Unix's signed 32-bit int time format is 03:14:07 UTC on Jan. 19, 2038, which is 2,147,483,647 seconds after Jan. 1, 1970. Beyond that time, due to integer overflow, the time values will be stored as a negative number and the systems will read the date as Dec. 13, 1901 rather than Jan. 19, 2038.

In simple language, Unix machines are eventually going to run out of the bits to tick off seconds. So, on this day, the C programs that use the standard time library will start to have problems with dates.

Source: https://fossbytes.com/year-2038-problem-linux-unix/

GRUB 2.02 Bootloader Officially Released with ZFS LZ4 & LVM RAID1 Support

The development team took their time to finalize the release of GRUB 2.02, which should soon make its way into the stable software repositories of your favorite operating system, but it's finally here and we want to thank them for all their hard work and the awesome new features and improvements implemented so far.

Prominent features of GRUB 2.02 include Big-Endian UFS1 support, experimental 64-bit EXT2 support, GPT PReP support, the ability to use LVM UUIDs if available, proper handling of partitioned LVM, CBFS (coreboot) support, ZFS LZ4 support, ZFS features support, XFS V5 format support, as well as LVM RAID1 support.

It also ships with various fixes for non-512-byte sector devices, a new "progress" module that displays the boot progress information while reading files, support for DragonFly BSD labels and compressed HFS+ partitions, and a new "proc" filesystem framework that's being used by LUKS encrypted disks.

GRUB 2.02 improves security by implementing an optional functionality that forces all files read by the core image from disk to have a valid detached digital signature, better handles DM-RAID partitions, and adds a new "nativedisk" command that lets users switch from firmware to native disk drivers.

Source: http://news.softpedia.com/news/grub-2-02-bootloader-officially-released-with-zfs-lz4-lvm-raid1-support-more-515240.shtml

Linux on Android smartphones: Project Halium wants your handset to run Ubuntu, Sailfish

A group of developers hope to unite several Linux-based mobile distributions with a common Android base that will make it easier for them to run on Android hardware.

The developers are aiming to create a better way for non-Android GNU/Linux distributions like Ubuntu Touch, Sailfish OS, Plasma Mobile, and others to make progress in the context of porting an OS to Android hardware.

As the developers behind Project Halium point out, a common link between each of these projects is that to get this particular job done they all use a 'libhybris', or Hybris, a compatibility layer that enables Android driver support.

It was created by a Mer developer, used in Sailfish OS, and later adopted by Ubuntu Touch and others.

However, as Project Halium argues, each project has laboured on its own implementation, which may have been unnecessary given the common goal of getting up and running on an Android device.

To end this fragmentation, Project Halium proposes a common base that includes the Linux kernel, Android Hardware Abstraction Layer or HAL, and

libhybris.

The developers note that the project is only at the draft document stage, and that they hope to begin work on a proof of concept using a Nexus 5, Oneplus one, and Nexus 5X as the reference devices.

They also clarify that they don't want to replace the actual mobile OS distributions, but become part of them as a common platform.

However, Sailfish OS developers have already raised potential obstacles to Project Halium's goals when they were shared with Sailfish OS and Mer developers at a recent meeting.

Jolla Community manager James Noori, known as Jaymzz, pointed out that whether the concept works is really contingent on support from original device manufacturers (ODMs).

Source: http://www.zdnet.com/article/linux-on-android-smartphones-project-halium-wants-your-handset-to-run-ubuntu-sailfish/

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

Webpack 2.0 and NPM

As should be common knowledge amongst my regular readers, I spend a lot of my professional time acting as a web developer. Naturally, this means I have to stay apprised of updates and new tools. One of these updates that I've been neglecting is updating my webpack from 1.4 to 2.3.2. As such, this month I will cover how I updated to webpack 2.3.2, while still allowing older projects to work with older versions.

The Basics

The way I set up almost any project I work on these days is using webpack, npm, and then whatever tools are needed for that particular project (SASS, Stylus, etc.). Every project typically includes postcss at some point, as the only section of the chain I would need to replace are then preprocessors.

Problems

For a long while, I would just npm install -g webpack, so I could run it from my path. Naturally, that meant I had to use the same version for every project, and if I'm planning on updating projects one by one, I couldn't just jump versions globally. Instead, I removed the globally installed webpack file, and am instead adding webpack to each project's package.json file.

Running webpack

Since webpack is now relegated to the project's path (as opposed to my actual $PATH variable), running webpack on its own doesn't work. Instead, I created a script in my package.json called start, that simply runs webpack once. For some projects, I may also create a script called watch, that runs webpack --watch instead.

```
  "scripts": {
    "start": "webpack --config webpack.config.js",
    "watch": "webpack --watch --config
webpack.config.js"
  },
```

Example (I typically add this, shown bottom left, after main):

Some predefined script names (such as start) can be run by simply using npm start. In the case of a custom name (like watch) it needs to be run like this: npm run watch.

Webpack config

My full config can be found here:
https://pastebin.com/1zv4DJw1

Keep in mind that webpack 2 has changed the format, and so the file above won't work for older versions.

Explanation

The var lines at the top of the file are defining a few tools that webpack will be using. Then follows the new module.exports definition, where the main file is defined, as well as the output files. The rules that follow first run .css files through postcss (for things like FontAwesome), then .styl files using stylus, postcss, and then the css loader. The last two entries are for ensuring that font files are correctly loaded and available.

The very last bit of the file simply extracts the CSS text from the output js file, and saves it into a .css file.

But wait!

The keen-eyed among you probably realized that I've not yet talked about my postcss configuration, nor my entry JS file. As both of these elements are separate files, I'm covering them separately.

Extra files

Newer versions of postcss and postcss-loader support having an external file called postcss.config.js with the modules postcss should use. It's a very

simple file in my case, as I just use rucksack (for easy media queries such as +above(1200px)), and autoprefixer (so I don't have to worry about prefixing all my CSS manually). The file looks like this:

The entry file for the entire process is pretty simple (as for most projects, I just use it to load the correct CSS files). It can naturally be more complicated if you're writing JS. I therefore call the file styles.js. The contents are typically something like that shown at the bottom of this page.

```
require('./reset.css');
require('./font-
awesome.css');
require('./styles.styl');
```

Naturally, I could just import the files from within a single stylus or css file, and have one entry in styles.js. However, this can get confusing if you're importing files that are importing files, and it can be hard to keep track of which imports you added, and which were present from the beginning. That's why I load all complete stylesheets in the JS file. In the case of mixins (such as variables or functions), I'll load those only in the files where they are needed, as they won't otherwise compile.

I hope this article was useful for anyone who wants to use NPM and upgrade to webpack 2. If you have any questions or comments, feel free to send me an email at lswest34+fcm@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.

```
module.exports = {
  plugins: [
    require('autoprefixer')({ /* ...options */ }),
    require('rucksack-css')({ /* ...options */ })
  ]
}
```

Python In The Real World - Pt 77

Written by Greg D. Walters

First, I'd like to say "***HAPPY BIRTHDAY***" to Full Circle Magazine. It's fantastic for a free Internet magazine to make 10 years.

Last month, I ended the article by saying that the Firmata solution will work only as long as we have a direct serial connection to the Arduino board and that we needed something in a wireless connection to really make serial communications a viable option for our future projects.

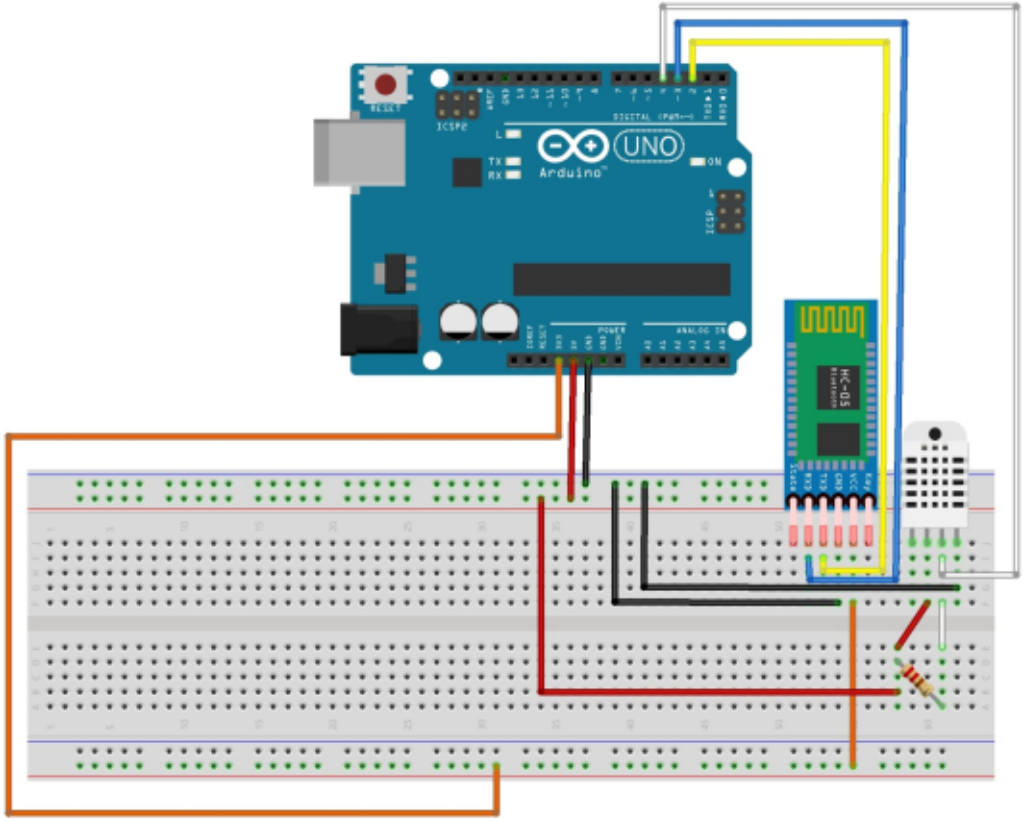
This month, I will begin to show you how to use an inexpensive bluetooth module to make this a reality.

We'll use the HC-06 Bluetooth module, which you can find on the web for around $3.00 US or less. While this isn't the best module to use, it will do the job for our projects. When I purchased mine, the HC-06 was much cheaper than the more capable HC-05, but the prices have pretty much evened out. The code and breadboard layout should work for either of them.

We'll also be using a DHT22 DIgital Humidity and Temperature module as our sensor. We've played with the DHT series of modules before in earlier articles.

In the Fritzing breadboard diagram, you should notice that I'm using the HC-05 bluetooth module part, since there isn't one for the HC-06. The two outer pins are not used.

Also, the HC-06 Module needs to be powered at 3.3VDC, NOT 5VDC. If you don't, the bluetooth module will probably go up in smoke.



DHT Test Code

I've used an example from Adafruit to create a test program for the DHT22 sensor. I also modified it to use the Switch statement available in the C language to make things a bit more readable. Notice in the loop routine, we simply call another routine named 'handleSerial'. This takes care of all of our serial communications with the outside world.

The Switch statement works like a bunch of if...elif...elif...else statements. It looks something like this:

```
switch (value) {
      case test1:
            statements
            break;
      case test2:
            statements
            break;
       …
       default:
            break
}
```

The statement tests the value with each case in the list, and, if it

matches, it runs the statements in that segment until it hits the break statement. You can also have multiple "cases" within the same logic set, as you'll see below.

So, here (shown right) is the DHT sensor test code. Any of the commented lines can be left out if you want.

Here (next page) we see the handleSerial routine with the switch case statements. In this example, we will be looking for four possible characters…"T", "t", "H" and "h".

Since we are using standard serial to test the DHT sensor, you can use the serial monitor built into the Arduino IDE. Simply send an "H", "h", "T" or a "t".

Bluetooth test code

In order for you to be able to use the ultimate project, you'll need to have a bluetooth device to send and receive data to the Arduino. For the testing phase, I used an app called "Bluetooth Terminal HC-05" on my Android phone, available for free from the Google Play store.

```
// DHT Temperature & Humidity Sensor
// Unified Sensor Library Example
// Originally Written by Tony DiCola for Adafruit Industries
// Released under an MIT license.
// Modified by G.D. Walters for Full Circle Magazine
// April, 2017

// Depends on the following Arduino libraries:
// - Adafruit Unified Sensor Library: https://github.com/adafruit/Adafruit_Sensor
// - DHT Sensor Library: https://github.com/adafruit/DHT-sensor-library

#include <Adafruit_Sensor.h>
#include <DHT.h>
#include <DHT_U.h>

#define DHTPIN                4             // Pin which is connected to the DHT sensor.

// Uncomment the type of sensor in use:
//#define DHTTYPE               DHT11         // DHT 11
#define DHTTYPE               DHT22         // DHT 22 (AM2302)
//#define DHTTYPE               DHT21         // DHT 21 (AM2301)

// See guide for details on sensor wiring and usage:
//   https://learn.adafruit.com/dht/overview

DHT_Unified dht(DHTPIN, DHTTYPE);

uint32_t delayMS;

void setup() {
  Serial.begin(9600);
  // Initialize device.
  dht.begin();
  // Print temperature sensor details.
  sensor_t sensor;
  dht.temperature().getSensor(&sensor);
  dht.humidity().getSensor(&sensor);
  // Set delay between sensor readings based on sensor details.
  delayMS = sensor.min_delay / 1000;
}
void loop() {
  handleSerial();
}
```

This sketch is one that I was able to get from the Internet. Notice, that I didn't change the logic from if statements to switch case statements in this case. We will be doing that in the combined project.

In the setup function (next page), we use bluetooth.print and bluetooth.println pretty much like we do when we print to serial.

Here in the loop function (see page 22), the only changes I made from the original code was to change the bluetooth printout lines from .print ("1") and .print ("2") to .println("Temp: 105.32") and .println("Humidity: 100.0"). This was just to make sure that there were no problems in sending multiple characters to the bluetooth host.

To test this, once you have paired and connected your project with the bluetooth phone, you should be able to send a "1", "0" or "b" and see the result on the phone.

Next time, we'll combine the two programs and get the RPi set up to act as host.

```
void handleSerial() {
        while (Serial.available() > 0) {
            char inChar = Serial.read();
            switch (inChar) {
          case 'T':
          case 't':
                    // get temp
                    sensors_event_t event;
                    dht.temperature().getEvent(&event);
                    if (isnan(event.temperature)) {
                        Serial.println("Error reading temperature!");
                    }
                    else {
                        Serial.print("Temperature: ");
                        Serial.print(event.temperature);
                        Serial.print(" *C - ");
                        Serial.print((event.temperature * 1.8) + 32);
                        Serial.println(" *F");
                    }
                    // Delay between measurements.
                    delay(delayMS);
                    break;
          case 'H':
          case 'h':
                    // get humidity
                    dht.humidity().getEvent(&event);
                    if (isnan(event.relative_humidity)) {
                        Serial.println("Error reading humidity!");
                    }
                    else {
                        Serial.print("Humidity: ");
                        Serial.print(event.relative_humidity);
                        Serial.println("%");
                    }
                    // Delay between measurements.
                    delay(delayMS);
                    break;
          default:
                    break;
      }
   }
}
```

I've uploaded the two sketches to pastebin:

https://pastebin.com/vnZ4ZJfT
(DHT22 test sketch)

https://pastebin.com/ZcWGLWXa
(Bluetooth test sketch)

```
#include <SoftwareSerial.h>

int bluetoothTx = 2; // TX-O pin of bluetooth mate, Arduino D2
int bluetoothRx = 3; // RX-I pin of bluetooth mate, Arduino D3

int led = 13;

int buttonPin1 = 7;
int buttonPin2 = 8;
int button1State = 0;
int button2State = 0;

int dataFromBt;

boolean lightBlink = false;

SoftwareSerial bluetooth(bluetoothTx, bluetoothRx);
```

```
void setup()
{
     Serial.begin(9600); // Begin the serial monitor at 9600bps

     bluetooth.begin(115200); // The Bluetooth Mate defaults to 115200bps
     bluetooth.print("$"); // Print three times individually
     bluetooth.print("$");
     bluetooth.print("$"); // Enter command mode
     delay(100); // Short delay, wait for the Mate to send back CMD
     bluetooth.println("U,9600,N"); // Temporarily Change the baudrate to 9600, no parity
     // 115200 can be too fast at times for NewSoftSerial to relay the data reliably
     bluetooth.begin(9600); // Start bluetooth serial at 9600
     pinMode(led, OUTPUT);
     pinMode(buttonPin1, INPUT);
     pinMode(buttonPin2, INPUT);
}
```

```
void loop()
{
     if(bluetooth.available()) // If the bluetooth sent any characters
     {
             // Send any characters the bluetooth prints to the serial monitor
             //Serial.println((char)bluetooth.read());

             dataFromBt = bluetooth.read();

             if(dataFromBt == '1'){
                    Serial.println("led on");
                    digitalWrite(led, HIGH);
                    //bluetooth.print("1");
                    bluetooth.println("Temp: 105.32");
             }
             if(dataFromBt == '0'){
                    Serial.println("led off");
                    digitalWrite(led, LOW);
                    //bluetooth.print("0");
                    bluetooth.println("Humidity: 100.0");
             }
             if(dataFromBt == 'b'){
                    Serial.println("a");
                    lightBlink = true;
                    }else{
                    lightBlink = false;
             }

     }

     if(Serial.available()) // If stuff was typed in the serial monitor
     {
            // Send any characters the Serial monitor prints to the bluetooth
            bluetooth.print((char)Serial.read());
     }

     // and loop forever and ever!
     if(lightBlink){
            digitalWrite(led, HIGH);
            bluetooth.print("1");
            Serial.println("HIGH");
            delay(500);
            digitalWrite(led, LOW);
            bluetooth.print("0");
            Serial.println("LOW");
            delay(500);
     }
}
```

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

My Week Without A Graphical Desktop

Written by Alan Ward

I acquired a lowly HP 255 G3 notebook several months ago. It must be said that the computer was not expensive, and one could even say that the screen and keyboard are quite nice, comparing favorably with laptops in a higher price range. But this hardware, though modern, does not offer what could be called stellar performance. The processor is an AMD E1-2100 with two cores, but each run at a mere 800 MHz. The hard drive is a 1 TByte model with spinning platter and abysmal performance. Once the integrated graphics card is done with the RAM, less than 3.5 GBytes remain available to the system. The end result is a 2016 laptop with a 15-inch screen, and about the power of a 2006 net-book.

What quickly became apparent is that modern software had advanced in the intervening years, to the point that any modern Ubuntu derivative (specifically: the 16.10 series) would struggle to work properly on the computer. To be completely honest, running a lightweight desktop manager such as LXDE or XFCE did work quite well, on their own or with fairly heavyweight applications such as LibreOffice or even Gimp. Things bogged down whenever anything had to be done through the browser. Having more than two or three tabs open at a time meant that responsiveness went down, moreso when perusing a website with a so-called "feature-rich" interface with much Javascript, server-pushing and the lot. What really broke it for me was using Google Drive (that I need for work purposes) and which works wonderfully and is nicely responsive on an Intel Core i7 with 8 GBytes of RAM even while editing longer documents. Unfortunately, the Drive does tax the AMD E1 to the limit when using either the Firefox or Chromium browsers. Other, lighter, browsers (such as Midori) cannot handle all the features of the web-based editor, and there can be some hiccups during regular use, as well as annoying error messages.

However, back in the day, we did manage to get some useful work out of one of these platforms. Actually, even further back in the day, some of us started using computers such as the Apple][or the IBM PC, in both cases with neither mouse nor a graphical screen. So I took the weaknesses of my new computer as a bit of a challenge, and set to drawing up a list of what could, and could not, be done effectively on this computer without resorting to graphical mode. I was going back to basics, or, at least, to using text mode exclusively.

The limits I set myself were on the one hand using only software that was still supported – I did not wish to run risks connecting to the Internet with an obsolete system. On the other, I needed to make sure the result would be something that could actually be used to get work done. This meant that the system would have to be sufficiently easy to use that I could take it for a period as my main means of computing, which I set - perhaps a tad arbitrarily - at a week. Within a week, I reasoned, I would know for sure that this could actually work, or, as seemed rather probable, I would be running screaming back to Linux Mint 18.1 with KDE on a much more powerful - though more expensive - piece of kit.

WHAT DOES ONE NEED FROM A COMPUTER?

The first thing I did was to compile a list of my actual needs. I could get by a week without playing any computer games, I reasoned, and even without updating my status on Facebook. Though it would be a pain, and I am not a masochist by inclination. So, a plan was hatched: I had set myself the task of seeing what was possible using the computer in text mode, but had said nothing to myself about a tablet. So the Nexus 7 tablet (with Ubuntu Touch) was pressed into service to handle gaming, social media, and anything else to do with leisure activities that really required graphical support. The computer would be used only for work activities, in text mode as

specified. Yes, this is cheating a bit, but it also made sure I would have a fair go at the experiment without abandoning mid-way through the week.

My list was set up in increasing order of difficulty so I could work my way upwards as I went. The first point concerned some custom fonts and colors, since I was about to spend quite some time in front of this screen. Transferring files from this computer to and fro with other computers would be a necessity at some point in time. Since it was possibly rather easy to accomplish, this became Point 2. General text editing was another activity to consider, which became Point 3. Making presentations and editing picture files are activities that I tend to need during my working week, but I reasoned that dispensing with these two for the time being would be best. Likewise, setting up a sound server and associated client software to play music seemed fairly useless, with the current abundance of devices that can reproduce music. So I went on with Point 4, accessing mail. I thought that would probably be easy to handle since mail has been around since who knows when - since before the Internet was a thing, to be precise. Finally, Point 5 on the list were activities that I usually do through a browser. For the reasons set out above, this was the main aspect of the question to my mind, and included general Web browsing (including searching), news sites and Wikipedia, connecting to a web-based Content Management System to handle administrative tasks at school, and, above all, Google Drive and its associated calendar.

INSTALLING UBUNTU SERVER

To set up my computer environment without graphics, I performed a fresh install of Ubuntu Server 16.10, for the amd64 architecture. The 700 MBytes ISO image was written to a USB stick. The HP laptop was quickly formatted with a BTRFS file-system, and the system installed. The entire process is not exactly the same as with desktop versions of Ubuntu, the installer being more related to Debian's application, but a user with some experience of installing any Ubuntu, or, generally speaking, any GNU/Linux system, will easily find his or her marks. The computer rebooted and came up again satisfactorily quickly, in about 20s from cold boot. This is much better than with any graphical interface, so I was ahead for the time being.

Once logged in, my next task was to set up networking. Connecting via a physical Ethernet cable is relatively fast and straightforward - if one is used to running servers, that is. Become root, then begin by determining the identification of the physical interface:

```
sudo bash
ip link list
```

The physical Ethernet connection is the one that starts with the letter 'e', in my case 'enp4s0'. So I then edited file /etc/network/interfaces, and inserted the stanza:

```
auto enp4s0
iface enp4so inet dhcp
```

I could then start the interface at will from the command line using:

```
ifup enp4s0
```

I then checked the connection was up, with command ifconfig, and then updated the system software with the most recent versions from the repositories:

```
apt-get update
apt-get install aptitude
aptitude safe-upgrade
```

I still prefer aptitude to the more recent apt command. Old habits die hard. A new version of the kernel was available, downloaded and installed with minimum fuss. However, it should be noted that a modern kernel does take some time to be installed and modules configured - more, in any case, than on a more powerful machine. The end result was a system that took up about 2.1 GBytes of disk space, and used some 151 MBytes of RAM with some applications in execution.

Once the system was up-to-date, I set about setting up a new connection, this time over WiFi. Staying tethered is all so old-school, but since we do have modern (i.e. post-year 2000) hardware available to us, it does make sense to use it. This one used

to be slightly more complex in the days when I needed to mess around with wpa_supplicant. Nowadays, however, WiFi can be set up by Average Joe using the command-line version of the very same NetworkManager used in most Ubuntu desktop environments. While still connected to the network over Ethernet, I installed package network-manager:

```
aptitude install network-manager
```

I now needed to start the network manager service, and then used the nmcli command to set up the WiFi connection. To successively look for available WiFi devices to use, then list access points or networks, and finally connect to one of them:

```
service network-manager start

nmcli d

nmcli d wifi list

nmcli d wifi connect your_wifi_network_name password your_wifi_password
```

Once up, I tested that the computer had actually obtained an IP address from the access point using command:

```
ifconfig
```

I also made sure the connection to the Internet and a DNS configuration were both working with:

```
host www.google.com
```

This last command should give whatever IP address Google is currently using in our local geographical region, both under IPv4 and IPv6.

The nice thing about NetworkManager is that it will try to connect to the same WiFi network each time we boot the computer. To disconnect from a network, or reconnect, I used the respective commands:

```
nmcli c down your_wifi_network_name
```

and

```
nmcli c up your_wifi_network_name
```

Needless to say, I also decided to use NetworkManager to manage my physical Ethernet connection over a cable. To do so, I removed the stanza in /etc/network/interfaces, and restarted both networking and network-manager (or I could alternatively reboot the computer). This is a good idea if the computer will not be continuously connected to physical Ethernet, since otherwise the boot process will block at each startup while trying to set up networking.

SETTING UP AN ENVIRONMENT

Once I had a working physical or wireless Internet connection, I went on to each of the tasks in my list. Point 1 - the easiest from a technical standpoint - was changing console fonts and colors. There is a short list of fonts available from the TTY console in a standard Ubuntu installation, in comparison to what Slackware used to offer us many years back - and, in fact, still does. This perhaps goes to show that Slack is aimed more towards the user of the text console. In any case, the root user can alter the system console font and font size by reconfiguring package console-setup:

```
dpkg-reconfigure console-setup
```

My personal choice went to the Terminal font, in 20 points. I find this helps me maintain a sane distance from the screen without having to squint.

As for colors, we can use standard terminal escape codes to alter screen background and text colors. For instance, the following two commands set the background color (color number 0) to green, and the text color (color number 7) to dark blue:

```
echo -en "\e]P0008800"

echo -en "\e]P7000040"

clear
```

For anyone used to working with HTML color codes, it should be easy to figure out the RGB (Red-Green-Blue) values to use for customizing screen colors to our wishes. Once I had found values to my liking, adding the three commands to the end file ~/.bashrc made the changes applicable every time I logged in. This is, as always, a matter of personal taste but I found that the combination of 000000 (black) for the background

and 806000 (gold) is a fair clone of the traditional amber computer terminal.

TRANSFERRING FILES

Point 2 was transferring files to and fro with other computers. If we have at our disposition any computer with an SSH server enabled, this is quite simple. For instance, to make a copy of this article, I simply used command:

```
scp my_week_without.txt 192.168.0.108:/home/alan/Desktop/
```

If, for some reason, I did not have a computer with SSH enabled, it would have been a simple matter to install one. On the receiving computer (the SSH server), I would have installed package openssh-server using any software manager. For instance:

```
sudo apt install openssh-server
```

I could also copy files over from that computer on to my new system. For instance, to synchronize an entire directory from that computer to the new one:

```
rsync -aruv 192.168.0.108:/home/alan/Documents .
```

EDITING TEXT

On to Point 3: editing text. The default editor in the text console under Ubuntu is nano, which can also be accessed through command 'editor', for instance:

```
editor my_week_without.txt
```

Another possibility is vi or vim, though its interface is even more basic (and relies on memorizing more key combinations) than nano. However, both of these admittedly fine text editors do have some shortcomings. For this reason, a popular text editor - back when using a console was more mainstream - used to be emacs. This is still available, and can be installed with:

```
aptitude install emacs-nox
```

This editor has the advantage of having quite a lot of documentation available on the Internet - a search for “emacs basic commands” should set you up. For example, one should use the key combination Ctrl-x,Ctrl-s to save a file, or Ctrl-x,Ctrl-c to save the file and then exit to the shell prompt. Selecting a block of text is done by placing the cursor at the beginning of the block, and hitting Ctrl+Space. The cursor is then moved to the end of the block, leaving selected text outlined in a different color combination. Cutting text is with command Ctrl+w, while pasting it back is Ctrl+y. As can be seen, the key combinations are slightly different from the more standard Ctrl+X, Ctrl+V, but they do work well once muscle memory sets in.

As a side perk, emacs is in fact a complete Lisp development environment. It also has many plug-ins that allow us to perform different tasks - such as reading mail - directly from within our text editor. A useful feature is syntax highlighting for various programming languages, a feature often encountered nowadays in text editors used from within a graphical desktop.

Spell-checking is available within most text editors. For instance, in emacs the ispell spelling checker can be invoked using key combination Alt-x,'$' to check a single word under the cursor, or Alt-x,'ispell' to have ispell check the complete document. The ispell package can be installed with the command:

```
aptitude install ispell
```

Supplementary dictionaries can be added, for instance, with:

```
aptitude install wcatalan
```

for the Catalan language.

RECEIVING AND SENDING MAIL

Point 4 concerned receiving mail. The text editor emacs has, in fact, been used to work with mail. However, there are several text-based mail clients available, such as mutt, pine and its descendant Alpine. I chose this latter application, both because it is present in the Ubuntu repositories and for its support of the IMAP protocol to access Gmail. There is a nice answer on how to configure Alpine for this on StackExchange, at the following link: http://askubuntu.com/questions/130899/how-can-I-configure-alpine-to-read-my-gmail-in-ubuntu. This simple - and rather lightweight -

program (see image) allowed me to access mail, reply, and send new mail, navigating within a system of text-based widgets with the keyboard arrows.

I could also open links within mail, using a (text-based) web browser described further down. While I did have issues with appending files to mail, downloading files attached to incoming messages did work well. I should probably have spent some more time to pursue this particular use of email, since the possibility of sending files attached to mail could be an important part of using a computer in text mode for sure. Alpine seems to work quite well in this sense.

Some other minor gripes concern having to enter my mail password every time I accessed the program, and not refreshing the message list automatically whenever a new message arrives. Initially accessing Gmail also required relaxing safety rules on the server side, which was graciously handled by Gmail's code but required at one point accessing my mail from another device to allow Alpine to connect as a "less secure" device. I may not wish to keep such access activated on a permanent basis.

BROWSING THE WEB AND ACCESSING ONLINE SERVICES

Finally, Point 5 on my list concerned browsing the Web in general, and accessing web-based Content Management Systems. There are at least two major text-based web browsers readily available in the Ubuntu repositories, lynx and w3m. I tried both of them on simple web pages such as our favorite http://fullcirclemagazine.org. Both worked well, and I was able to navigate links between pages and even download files. lynx offered an additional advantage of making me more aware of the use of cookies in modern websites, alerting me each time one was received from the server. I could authorize such cookies on an individual basis, or globally for a complete site. Wikipedia (see image, next page) worked more or less on the same basis, though the mobile version (http://en.m.wikipedia.org) gave clearer navigation.

As for sites with more complex design such as http://www.cnn.com, I was also able to globally navigate through the web pages. However, the experience was much less agreeable since, to get to the actual information on each page, I first had to skim through a large amount of the various headers that are used in graphical browsers to set up menu bars at the top and side of the browser window, and perhaps also to initiate various transparency layers and navigation.

I then tried a document management system, Google Drive. Perhaps because I had previously granted access to email to "less secure" devices for this account, I was immediately able to log on to the server. Obviously, however, I was unable to use any of Drive's options - such as uploading or downloading files - since all actions are, in fact, linked to scripts and faced with graphics likewise controlled by scripts. In essence, I was facing a wall of '(BUTTON)'s - that links could not press upon.

Apple's equivalent Cloud.com was even more explicit: JavaScript was needed to connect. End of story.

```
  ALPINE 2.20   MESSAGE TEXT   <Gmail> [Gmail]/All Mail   Msg  1 of 27 59%

Date: Tue, 5 Jul 2016 15:16:21 +0000 (UTC)
From: Google <no-reply@accounts.google.com>
To:                  @gmail.com
Subject: Access for less secure apps has been turned on
Parts/Attachments:
   1   OK    ~1.1 KB     Text
   2 Shown    ~63 lines   Text
----------------------------------------

[googlelogo_color_188x64dp.png]
[wrench.png]
Access for less secure apps has been turned on
Hi Alan,
You recently changed your security settings so that your Google Account
                  @gmail.com is no longer protected by modern security
standards.

Please be aware that it is now easier for an attacker to break into your
account. You can make your account safer again by undoing this change here

? Help       < MsgIndex   P PrevMsg      - PrevPage  D Delete     R Reply
O OTHER CMDS > ViewAttch  N NextMsg    Spc NextPage  U Undelete   F Forward
```

CONCLUSIONS

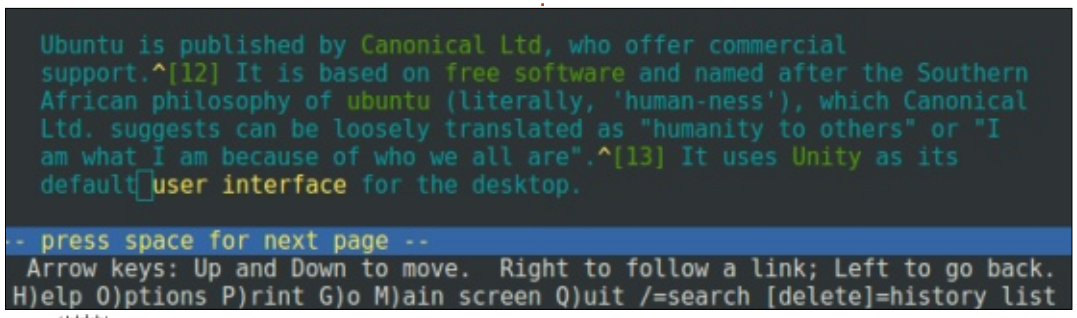
In all of my experimentation, it was clear that what could be called under-powered hardware actually works quite well in the text mode. The graphical layers do add much weight to the system. This fits in quite well with conventional knowledge, so I am not claiming to have discovered anything transcendental. However, it is occasionally nice to put one's preconceptions to the test.

Not being able to use windows to fit several areas on screen was not a difficulty. One can work on different things at one time by simply opening various virtual terminals on TTY1, 2, 3, etc. Switching between one and another using the Ctrl+Alt+Fx key combination is quite as fast as the Alt+Tab combination used in graphical interfaces to switch between topmost windows.

The second aspect I would like to mention is what I found lacking with the system. Obviously, not being able to handle images was a drawback, and one that made me realize how much we now depend on handling graphical content for our daily jobs. But the major niggle came from an unsuspected direction: we are now very used to the operation of copy-and-paste to insert snippets of text or other data from one application to another. To work well, this means we need to be able to first select the stuff to be copied - and this is something we do automatically with a mouse in a graphical environment. It is not so easy in most text user interfaces, to the point that some thought needs to be given to our new workflow. In the case of this article, I ended up having to copy the user commands into the text of the article by hand. However, a text editor such as emacs can handle much of the copying and pasting, at least between documents formatted as plain text.

A further disappointment was noting that battery life does not seem to go up much when running a laptop in text mode only. Factors such as screen back-lighting seem to have a more noticeable effect than CPU load.

On the other hand, the screen in text mode does seem to work better in practice at lower levels of lighting than those required for comfort in graphical mode, especially when fonts of large size (such as 20 points) are used. The combination of a relatively low level of back-lighting and large fonts is actually quite easy on the eyes, always a concern when working on written material for long periods at a time. This leads me to identify the main use case for which a text-based computer setup works well: banging in large amounts of text, such as long articles or books. A long and complex programming project could also be envisioned. The restful editor interface and the lack of distractions on screen help to get quite productive in such an environment.



In fact, I will be keeping at least one partition on this computer in this state for just such a reason, as a specific tool to use in specific circumstances.

However, for most usage that is required of a computer nowadays, it is clear that using only a text-based interface is no longer an option. We need access to graphical information, on a daily basis. Even if we are using the computer mainly for text-based tasks, our everyday work-flow can include moments during which we need access to images, maps or even video content. So having just one computer with a pure text interface is, perhaps sadly, a thing of the past.

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

Written by Alan Ward

A Practical Guide To FreeCAD - Pt 1

Affordable Computer Assisted Design (CAD) and its complement, Computer Assisted Manufacturing (CAM), have revolutionized many professional workflows in the last several years. There was a time when professional-grade software such as Dassault's CATIA – and the hardware necessary to run it – was out of reach of most small businesses and the occasional hobbyist. Nowadays, the advent of 3D printing using plastic extrusion has made physical prototyping a viable proposition, meaning, in turn, that a larger segment of computer users actually has a need for usable software to design their pieces.

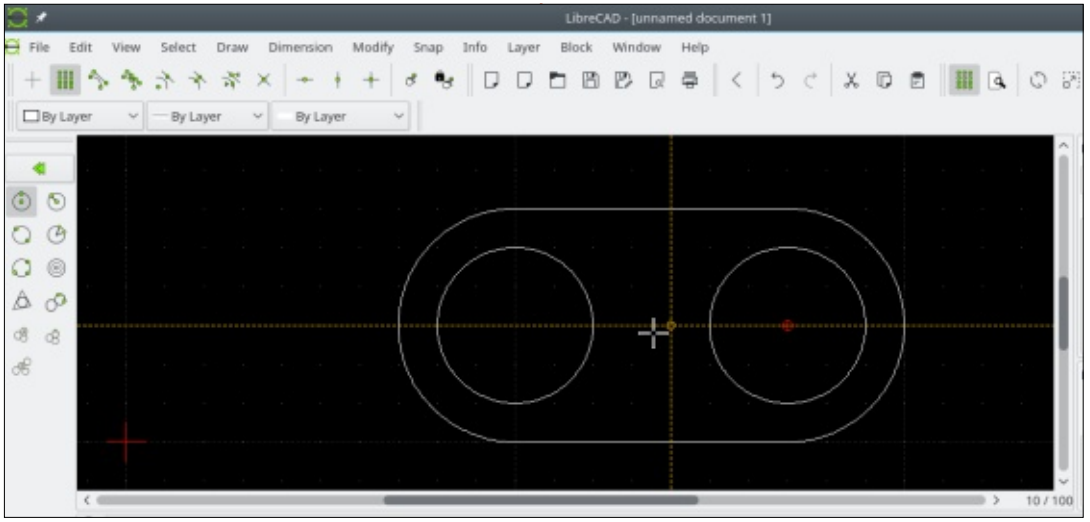
Another group of users includes people designing virtual 3D environments on computers. Many of the same principles apply as when building 3D objects, since working with spatial coordinate systems presents the same challenges in both scenarios, though virtual world designers and ray-tracing artists must additionally contend with object surface qualities and the behavior of light when interacting with the object.

Luckily, CAD software for the open-source software user has gone a long way from its (rather timid) beginnings. In this series, we will be examining the world of FreeCAD, an open-source CAD modelling application that it still in Beta, but has been gaining acceptance in recent years. Naturally, it is readily available in the Ubuntu repositories.

A CHOICE OF PROGRAMS

Industrial drawing and design software has historically been an area with a small number of offerings. Even in the world of commercial applications, until very recent years, one single name used to arise, repeatedly, enjoying a dominant position as well as defining file formats. This is perhaps understandable, since it does take some time to correctly operate what can be rather complex pieces of software. Once one has come to dominate a specific application, facing a similar and protracted process to learn another can be something of a challenge, even if one is not starting at the very beginning of the learning curve. So, it comes as a little surprise that the situation was even worse concerning open source CAD software. Ten years ago, perhaps the only application that ran on Ubuntu was qcad (http://qcad.org), still in its infancy back then but available in the Canonical repositories.

Nowadays, things have changed for the better, and there is a fair offering of programs available that can both read and produce DXF file format drawings. Both qcad, and its fork, LibreCAD, (http://librecad.org) are open-source design programs that focus on 2D, and can, within some limits, be seen as viable alternatives for the popular but non-free AutoCAD (http://www.autodesk.com) series. The price for both qcad and LibreCAD is right (as in free), and availability is for GNU/Linux, Apple's Mac OS, and Microsoft Windows. As can be seen in the screenshot, the LibreCAD interface is very similar to AutoCAD's original user interface, which can make conversion from one program to the other easier for the experienced user.



In this series, however, we would prefer the software to more easily create designs in 3D. This is both for ease of learning - correctly "seeing" a 3D object from flat plans can be somewhat difficult for beginners - and because our design will then be exported for printing in a suitable 3D printer, thus creating a physical object that we can compare to our original idea. In this scenario, a piece of software that has gained wide acceptance is SketchUp (formerly Google SketchUp, http://www.sketchup.com) for many reasons, including its ease of use. However, this program has been made available over the years exclusively for the Windows and Mac OS platforms. Though there have been reports of people installing and using it successfully from inside the Wine emulator, an open-source piece of software (as opposed to being merely free for use) that is better integrated into Ubuntu can be seen as preferable.

OpenSCAD (www.openscad.org) is another option for designing 3D objects suitable for 3D printing, though its use-case is focussed on Constructive Solid Geometry (CSG) and is thus perhaps a bit more limited than other applications. However, object creation can easily be conceived as a metalanguage or script, which may have its attraction for users of the Povray raytracer that uses a similar conceptual model.

Another option would be TinkerCAD (http://www.tinkercad.com), an online program that can be used for simple projects. However, it can only be used through a web browser and is closed-source, which can present both practical and philosophical inconveniences.

Finally, FreeCAD (http://www.freecadweb.org) is the application we will be focusing on in this series. There are several reasons for this choice, including a relative ease of use, being open source, and available for GNU/Linux but also Windows and Mac OS. It should be said that FreeCAD has modules for both 2D and 3D drawing, though its target seems to be mainly the latter. Interaction between 2D and 3D design is also possible as, for example, when building a 3D model from an initial 2D floor plan, or when exporting the 2D plans from a 3D model. Though the project does caution us on their website that "FreeCAD is under heavy development and might not be ready for production use" - which is coherent with their current 0.16 version number - in actual fact the software does seem to work quite well - at least well enough, in fact, to make this software a viable option for the enthusiast and for learning purposes. Professional users may wish to evaluate the application thoroughly before making a decision, to ensure it fits in well for their own particular needs.

There is a large corpus of user documentation available for this project on the site, and also on Youtube. As often with software under heavy development, the documentation often is not quite at the same level as the software and some discrepancies can be seen between versions in the documentation and on your computer, though it is usually not too complicated to figure out how to make things work out. This series of articles is, obviously, not meant to replace the official documentation and tutorials. What it is aimed at is to provide a practical introduction to the use of this software by someone who has not participated in its creation and who, for this reason, may have a slightly different point of view and priorities: those of an ordinary user.

Installation

```
sudo apt update ; sudo apt install freecad
```

Or use your favorite software manager in any version of Ubuntu; 'nough said. At the time of writing, version 0.15 is to be found in the Xenial repositories, which is a stable version. Developer version 0.17_pre can be downloaded for Windows and Mac OS, while stable 0.16 can be downloaded for GNU/Linux from the project's Github page (http://github.com/FreeCAD/FreeCAD/releases). Version 0.16 can be installed under Ubuntu as well by adding the project maintainer's PPA repository:

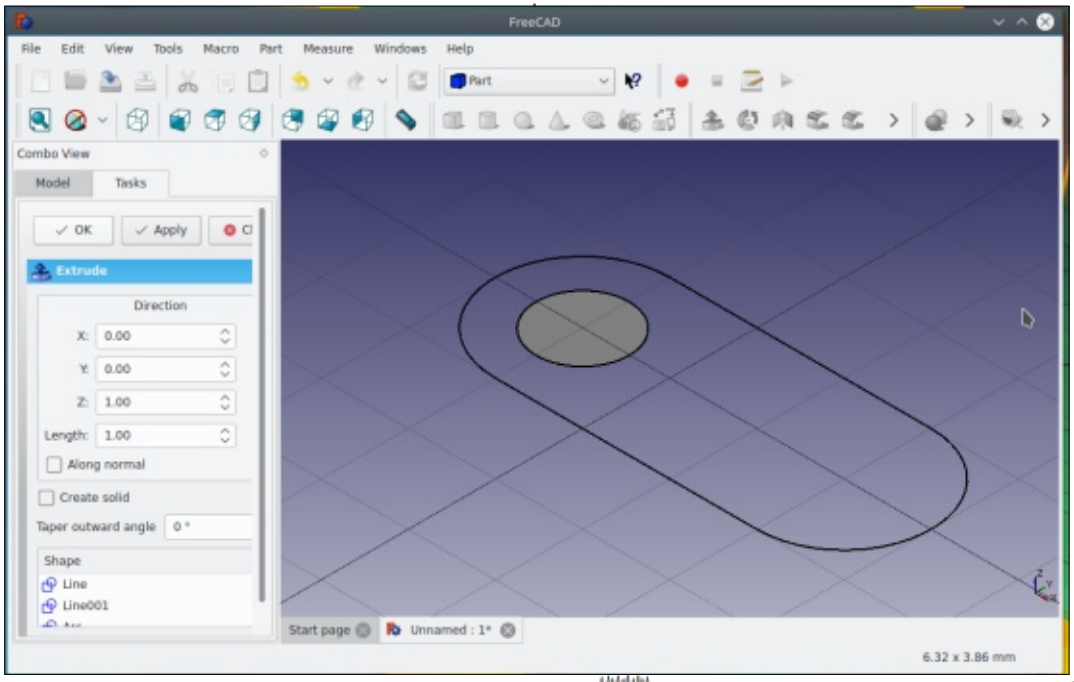
```
ppa:freecad-maintainers/freecad-stable
```

It must be said, however, that, with a project such as this one that is moving along quite quickly, it may be best staying with the version in Ubuntu's repositories -

even if it is slightly older than the one in the repositories. This more conservative choice means more bugs will have been ironed out and will not come down to bite us.

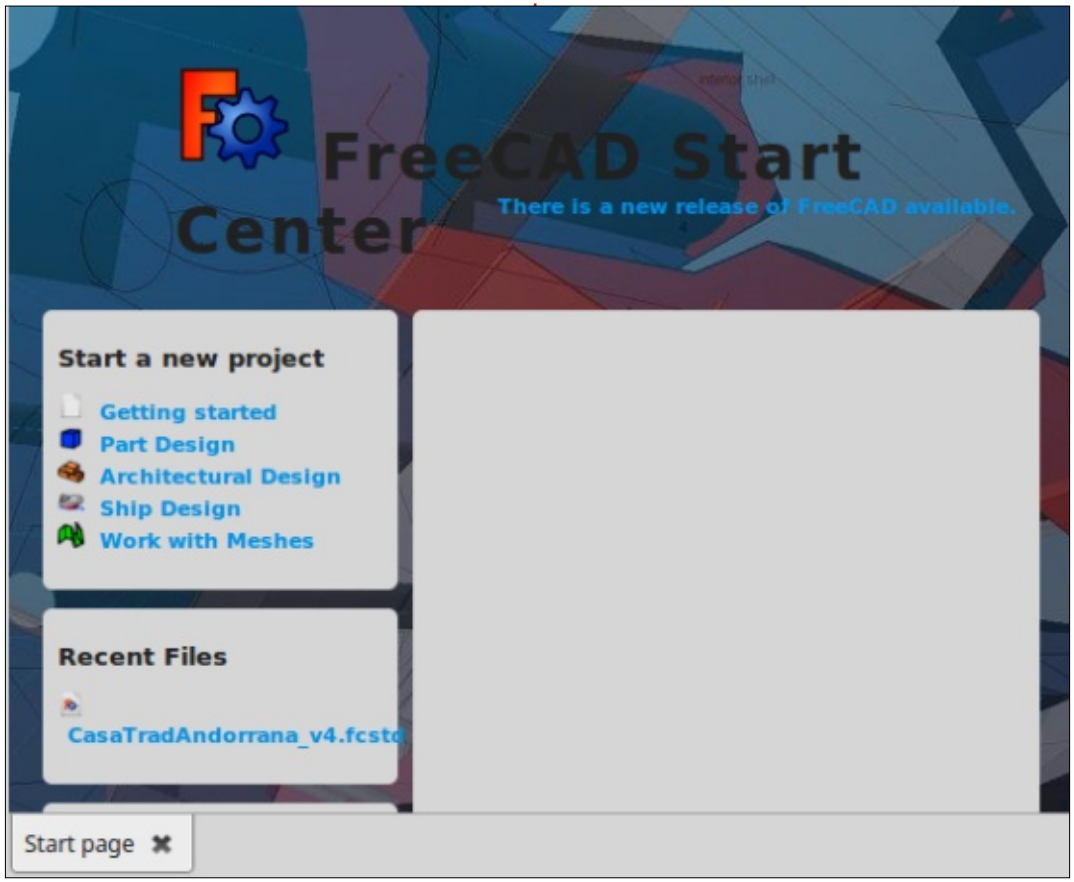
FreeCAD itself will take up only about 68 MBytes of disk space on our system, which can be rather impressive for users who are used to installing commercial CAD applications. It does come with several dependencies on other packages, such as the Python language it has been developed in, and other graphical libraries such as Boost. However, the sum total of software packages that are (automatically) downloaded and installed is well within the bounds of reason, even for systems with a low amount of available disk space. Not-so-recent processing hardware can be usable. The following screenshot was captured running FreeCAD - installed to RAM - within a Neon 5.9 live session on a laptop equipped with an AMD Athlon X2 processor and 2 GigaBytes of memory, but whose hard drive has been scrapped several years ago. This would clearly not be optimal for production use, but can be envisioned to work on simple projects.

The program interface



Designing a user interface for a CAD program is always complex, since there is a rather large amount of information to be displayed. Toolbars can include drawing tools for two- and three-dimensional objects, operations on objects such as scaling and duplication, operations combining objects, and different layers may be displayed or hidden. A program such as FreeCAD that works with an internal tree representation of the scene includes object inspection, thus allowing the user to edit object parameters (such as length and coordinates) directly. But this makes further demands on user interface space since these options must be displayed at some time.

As can be seen in the screenshots, the FreeCAD user interface has condensed all these elements into three main areas. The main space is at the bottom right. In this, we will see the start



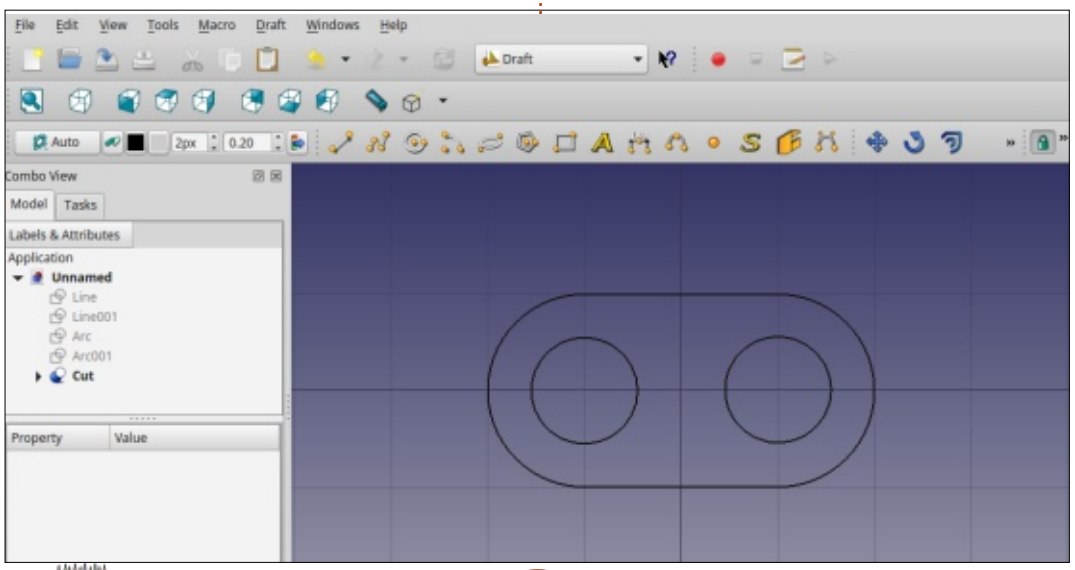
page or "Start Center" when the application is started up. This contains some rather handy links to various simple tasks that can be of help to the novice. Recent projects can also be opened directly from this pane, though they can also be opened from a more traditional File > Open menu option. This area has a system of panes, in which the different projects we are working on will be displayed one at a time. We can switch to one or another at any moment, making it easy to work on several projects, or several different pieces for a single final object.

On the left, we have a column that usually contains a dialog with contextual information on a specific object, either the project as a whole or the element selected at the time. This is also where the parameters relating to that object can be inspected, and altered manually, if needed.

Finally, the top of the screen is populated with toolbars that contain the different tools and other options. Herein lies the specificity of the FreeCAD user interface. Toolbar visualization is controlled by a system of "Workbenches". Within each workbench - with titles such as "Drawing", "Draft", "Part" or "Arch" - specific toolbars are activated. The paradigm is similar to a physical fabricator's workplace. In most shops, different working areas are disposed along the walls. Each bench will have nearby a set of tools, grouped according to the type of work being performed in that area in a way to minimize movement. A (physical) project may then be transferred to a workbench dedicated to soldering, or another specializing in electronic instruments, as the need arises.

In a similar fashion, the FreeCAD user will activate one or another workbench inside the user interface as the project evolves from one stage to another. In each workbench, only the toolbars with the most pertinent tools will be seen at any one time, thus reducing visual clutter on-screen. However, it should be noted that all tools within FreeCAD can be accessed from the menu system, even if they are not promoted within the active Workbench.

It should also be noted that windows and toolbars are fully floatable, and can be tailored to the user's specific needs (and the screen's available space), much in the way many modern word processing applications work. However, since there are very many different options available, it may be best for beginners to leave tools and toolbars in their default positions, at least while starting to become familiar with the application.



What next?

In this first article on using FreeCAD, we went over the basics of choosing and installing a CAD application for Ubuntu or GNU/Linux, and reviewed some salient points of the FreeCAD user interface. In the next part, we will be creating a simple planar object to illustrate the use of the main workspaces, drawing, and extrusion tools. Constructive Solid Geometry will also be demonstrated, to punch holes in an unsuspecting piece of plain material.

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

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Inkscape - Part 60

As you may have read elsewhere (you do read the rest of the magazine, right?), this issue marks the 10th birthday of Full Circle Magazine. As you may also have read, that means that we (the authors) have been given the freedom to do something a little different with our articles. So I've decided to make a cake.

Ingredients:
• One computer, suitable for running Inkscape
• One recent version of Inkscape
• One pointing device, suitable for controlling Inkscape
• A monitor, to provide feedback as you make the cake
• (Optional) Artistic talent

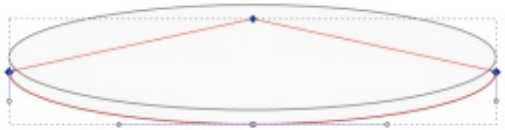
Luckily, I had all of the ingredients already – with the exception of the last one. That means that my cake will be acceptable, if a little ordinary: if you have some artistic flair, I've no doubt you can make a much tastier creation.

Method:
• Go to the shops and buy a real cake. Use it for reference, or simply eat it with a nice cup of tea or coffee to keep your spirits up when Inkscape crashes for the third time.
• Using the pointing device to control Inkscape, and the monitor to see the result, draw a cake.

What? You want something more detailed. Okay then...

We'll construct our cake layer by layer, starting from the bottom and working our way up. But before we can even begin to think about whether we want a vanilla or chocolate sponge, we'll need a platter for the cake to sit on. Start by drawing an ellipse, then duplicate it (CTRL-D) and move the duplicate up a little using the arrow keys.

To make it look less like one disk stacked on another, and more like a solid platter, we need to straighten the sides of the bottom shape. Select it and convert it to a path (Path > Object to Path, or press CTRL-SHIFT-C). Double-click on it to edit the nodes and you should see that there are four nodes. Drag a box to select the top three, then convert them all to corner nodes using the button in the toolbar. You should now have three selected diamond-shaped nodes, and one square node. Finally click the "Make selected segments lines" button on the toolbar to give you an elliptical pie-slice.

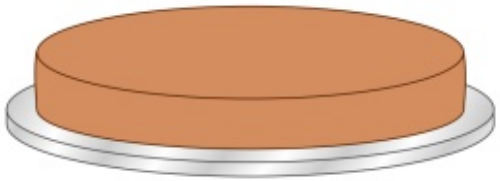


Now double-click on one of the straight lines to create an extra node, then drag the two top nodes to the left and right, so that they touch the edges of the upper ellipse to give the appearance of straight sides. You may need to zoom in to position the nodes accurately, or enable snapping to smooth nodes (which will also snap to the quadrant points of an ellipse). If everything has gone well, you should be faced with something like this:

Switch back to the selection tool, click on the background to de-select everything, and you should find your shapes give the appearance of a thin disc. You may want to add a gradient fill to give it more depth, but I'm going for a fairly flat effect on my image (that's non-artist speak for "getting highlights and shadows right is a bit tricky!"). Instead, I used a repeating linear gradient running from white to light gray, to give the impression of a simple silver finish to the platter:

Building the first layer of the cake is very similar. Start by duplicating the top of your platter then scaling it down (hold CTRL-SHIFT as you drag the resize

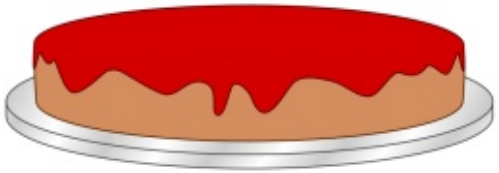
handles to get it to scale proportionally from the center). Give it a suitable fill and stroke (I've decided on vanilla sponge), then duplicate it, move it up with the arrow keys (a bit further this time), and repeat the steps above to form a layer of cake. You might want to bow the sides out a little to give it a better shape, but otherwise it's just a variation on making the platter.



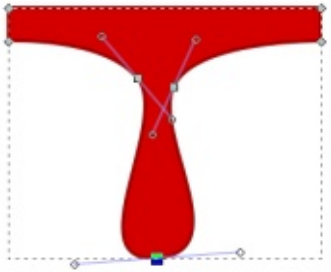
As any competent pâtissier knows, a cake is only as good as its filling. We'll go with the classic combination of jam ("jelly" to US readers) and cream. Obviously, once we spread jam all over the top of the cake, we won't be able to see that top ellipse any more, so we may as well change its fill and stroke to shades of red, and use it as the basis of the jam layer instead.

This is where a little psychology kicks in: when presented with the dessert trolley at a fancy restaurant, we tend to be attracted to the perfectly formed, beautifully mirror-glazed, geometrically precise offerings, rather than those which look like the chef may have accidentally sat on them. When drawing an image, however, a flat disc of jam lacks the appeal of an overloaded cake, gloopily dripping great gobs of strawberry goodness from its sides. So gloopy gobs it is for our image. Which means more node editing.

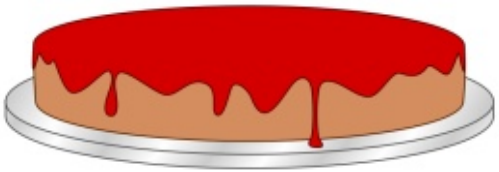
Convert your jam ellipse to a path, but this time we'll be working with the bottom half of the shape, not the top. Select the bottom three nodes, leaving the top one alone, but don't convert them to corner nodes this time: rather, press the INSERT key a few times to create more smooth nodes between the existing ones. Click the background canvas to de-select them all, then start dragging individual nodes downwards, working from the center out, to give the appearance of the jam flowing down the side of the cake. Move some of the nodes to the left or right, and add or delete some to give it a more random appearance – dragging the paths rather than the nodes can also help. Try to stick to smooth nodes – there are no sharp corners in our jam! Watch out when removing nodes, as the adjacent ones may be converted to corners automatically. With a bit of manipulation you should get something similar to this:



To really get a gloopy effect, we'll want to add some drips running down the side. The basic form of a drip is created by adding a couple of nodes to let you pinch in the "neck", with one in-between that you can drag down to form the base of the droplet itself. Make that center one into a symmetric node to save yourself a little editing work, and position all three to give you the desired appearance.



A drip running all the way down to the platter will need a couple more nodes to handle the transition from vertical to horizontal, but otherwise it's the same idea. With those additions, here's the cake so far – it's starting to look good enough to eat!

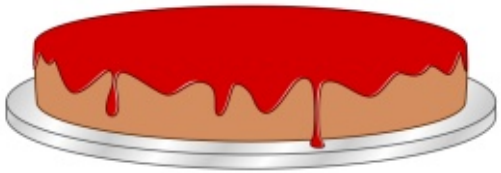


Despite my earlier avoidance of highlights and shadows, there's no denying that the best jam has a glistening surface that makes ours look somewhat lifeless. An obvious candidate for adding specular lighting would be to use the filter primitive of the same name – but that's probably overkill for the result we're looking for, and would likely take a lot of trial-and-error to even come close. For the comic-style image we're creating, hard-edged highlights are frequently a better choice, and can often be made using copies of the very shape you're trying to highlight.

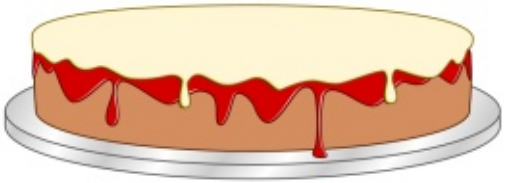
Start by duplicating your jam path and moving the duplicate up, away from the cake, by using SHIFT-UP ARROW. The advantage of moving it in this way is that the final result can be moved back

precisely by pressing SHIFT-DOWN ARROW, even if you've changed the zoom level whilst working. Remove the stroke from this copy. Now duplicate the new copy (so that you've got two duplicates of the original, stacked on top of each other), and give the top one a contrasting fill. Holding the ALT key, use the cursor keys to shift the top copy slightly to the left and down, so that you have a thin slice of the underlying red path peeking out at the right of each descending loop.

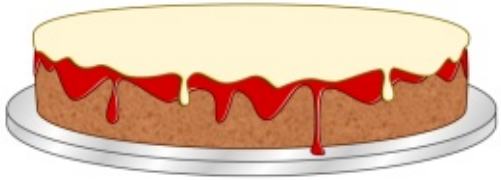
Drag a selection box around both duplicates (that's why we moved them away from the main part of the cake), and ensure that the status bar shows two paths are selected. Now use the Path > Difference menu entry to remove the top shape, leaving only those thin edges. Use SHIFT-DOWN ARROW to move the resultant path back into place, then set its fill to white. Holding the ALT key, you can now use the arrow keys to precisely position the highlights until most are in the right place. Now use Path > Break Apart to separate each highlight into its own object, making it easier to fine tune them, by moving, editing or even deleting those that don't look quite right.



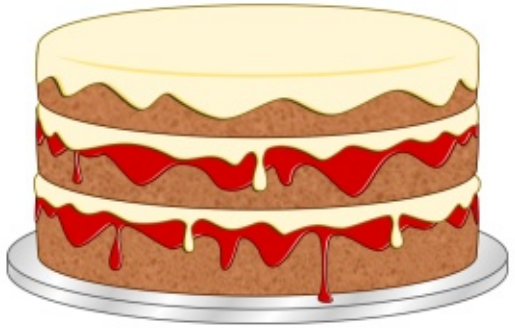
Repeat the jam layer, but with a pale yellow fill color to represent cream. Highlights don't work so well on something so pale, so, instead, create some lowlights – shifting your duplicate in the opposite direction, and using a slightly darker fill color to add a subtle shadow to each glob of cream. You can also give it a little more depth by simply putting a dark duplicate below the cream path and shifting it so that it peeks out ever so slightly.



That's the first layer of our cake pretty much finished, but there is one final trick that will make the sponge look more... well, spongey. Duplicate the beige sponge object and move it up away from the cake. Tweak the color to make it a darker shade, then duplicate it. Open the Fill & Stroke dialog, and select a pattern fill, specifically the "Sand (bitmap)" pattern. Depending on the size you're drawing at, the grain of the image may be too coarse or too fine, so, if necessary, double-click on the object to gain access to the handles for scaling the pattern. These appear as a cross, circle and square, anchored to the top-left of the page. Use the cross to reposition them, if you wish. Dragging the square will change the scale of the pattern, whereas the circle will let you rotate it (which you'll need later on). By the time you're finished, you should have a dark beige cake base completely covered by a course, sandy duplicate. Select both, then use Object > Mask > Set to reduce the pair to a single, blobby, brown shape. Move it back down over the cake, and use the Page Down key (or the button on the toolbar) to drop it down in the z-stack until it's above the cake base, but below the jam.



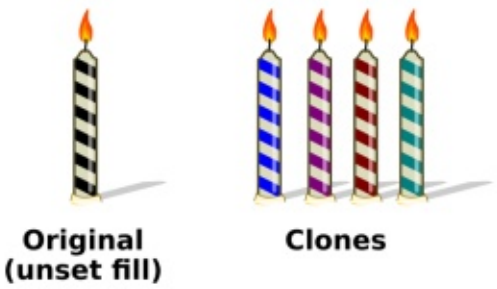
Repeat the steps above to create more layers of cake, jam and cream. On your topmost layer, add a little shadow to the front edge by using Path > Difference between two ellipses to create a thin crescent of color which helps to define the shape.



As this is a celebratory cake, it should probably have a little more decoration. How about some sprinkles? There are a few ways to approach this, but I opted to use tiled clones (see parts 33 to 36 of this series). My parent object was just a short straight line which I cloned into 10 rows by 20 columns. Each row and column position was randomised, as was the rotation of each clone. Once I achieved the sort of distribution I was looking for, I unset the stroke on the original object so that I could use the Color tab of the Tiled Clones dialog to set a random hue to each sprinkle, giving me this result:

Grouping the clones, then scaling the group vertically gives the right sort of perspective appearance. Clipping with an ellipse results in a neat top for the cake.

As this is specifically a birthday celebration, candles are also in order. I began by creating a single candle using the same basic techniques of drawing primitives, converting them to paths, and tweaking the shape using the node handles. To add stripes to the candle, I used the same approach (of a patterned fill masking a flat color) that I used for the texture on the cakes. This time the fill was "Stripes (1:1) White", and I used the previously mentioned pattern adjustment handles to not only scale, but also rotate the pattern. The object behind was given an "unset" fill, then the whole candle was grouped. Because of the unset fill, it was possible to clone the group and give each clone its own individual color:



After placing the candles onto the cake, there was one final step to really make the image stand out: in classic comic-strip style, I wanted to give it a thick black outline. To do this, I selected the whole image and duplicated it, then moved the duplicate well away from the original. I deleted the sprinkles, highlights and lowlights, since they wouldn't have an effect on the silhouette. Then I repeatedly used Edit > Clone > Unlink Clone and Object > Ungroup – until the status bar showed that there were no more clones or groups in the selection. Finally, Path > Union joined all those separate objects into a single shape, which I could fill with black as a silhouette. I moved it back over the original image, gave it a thick black stroke, then sent it to the back of the z-stack.

So here's the result of all that work: **Happy 10th birthday Full Circle Magazine!**

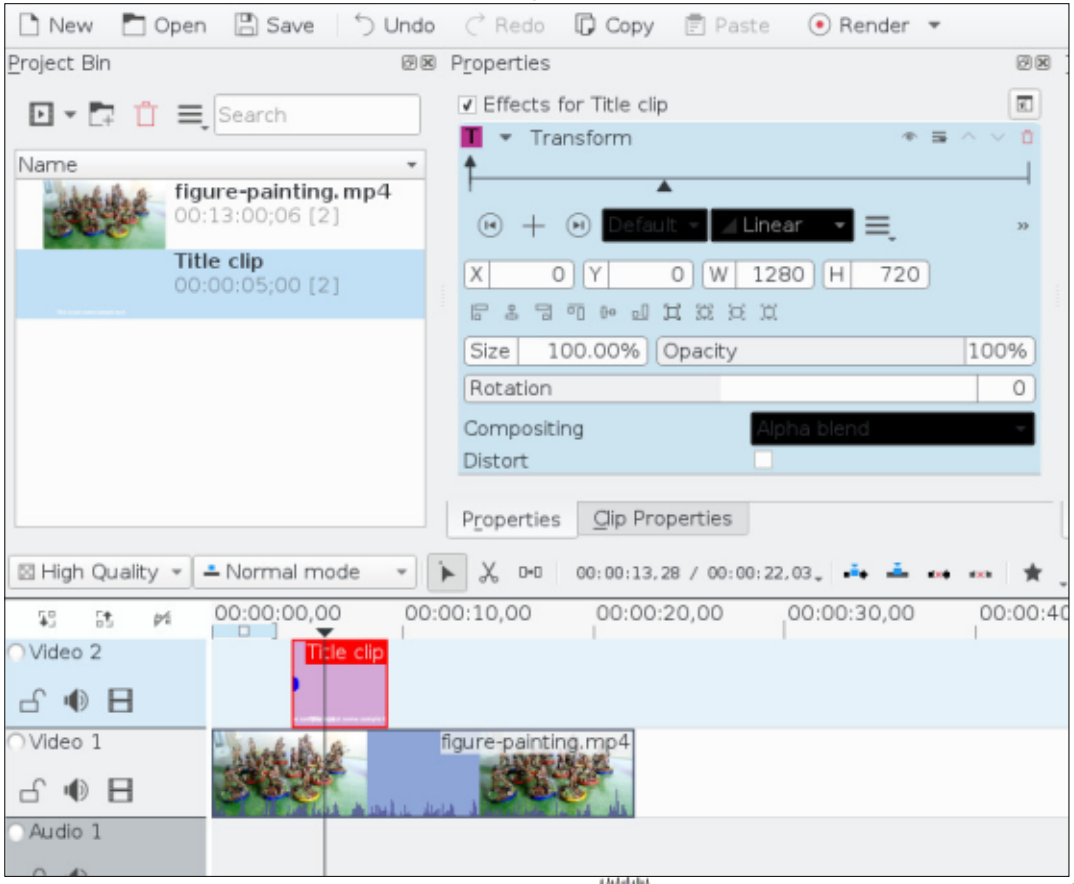
Mark uses Inkscape to create three webcomics, 'The Greys', 'Monsters, Inked' and 'Elvie', which can all be found at http://www.peppertop.com/

Kdenlive - Part 3

This month, as promised, we'll be looking at animating your video titles.

Keyframes

Before we do anything, let me quickly explain keyframes. In all animation, you have certain frames within the video that are 'key' to the animation. So, for example: you might have a title at position 0 (X) and 0 (Y) at (key)frame 0, and, at (key)frame 100, you might have the title at 100 (X) and 0 (Y). The computer will fill in the motion between frames 0 and 100 to create the animation. Let's do a quick example.



Scrolling

Once you have a video file with a title added (as I explained last month), right-click on the title and choose Add Effect > Crop-and-Transform > Transform. In the top middle section of the window, you'll see the properties for the Transform effect. If not, make sure you have selected the 'Properties' tab just above your video tracks.

If you click and drag the little arrowhead below the horizontal line in the Transform properties, you'll see that the start of the line is the start of your title, and the end of the line is the end of your title. Before we can do anything, we need to create keyframes along this line. Move the arrowhead to the start of the line. That other arrowhead is a keyframe that is added with the effect. Drag the arrowhead to the end of the line and click the addition/plus symbol (+) below the line. This will create a keyframe at the end of the title video.

The X and Y values (currently at zero) are the vertical and horizontal coordinates of the title (measured from the middle). The W and H are the width and height (also measured from the center). While the arrowhead is at the end of the line, change the X value to something other than zero. I'll use 400.

Now, if you drag through the horizontal line, you'll see the title move from left to right.

Similarly, if I was to make X=0 and Y=50, I'd see the text scroll

down the screen. Making Y=-50 would make it scroll up the screen.

Play around with these values and you'll have text whizzing all over the screen!

TIP: see the red circle in the middle of your video preview window? You can click and drag that red circle to move your title around the screen visually.

But wait! There's more!

Drag the arrowhead to the middle of the line and add another keyframe. So now we have one at the start, one roughly at the middle, and one at the end. These three are independent of each other. Tweak the three sets of values to have your text, say, move up then down, or to go up then go left. What if you wanted it to go up, pause, then move?

Well, you'd create a keyframe for the start, a keyframe for the end of the movement, a key frame for the end of the pause (which would be the same values as at the end of the movement), and then a keyframe for the end of the second movement.

TIP: use the 'previous' and 'next' buttons on either side of the 'add keyframe' (+) button to quickly jump to the next/previous keyframe(s).

Get creative!

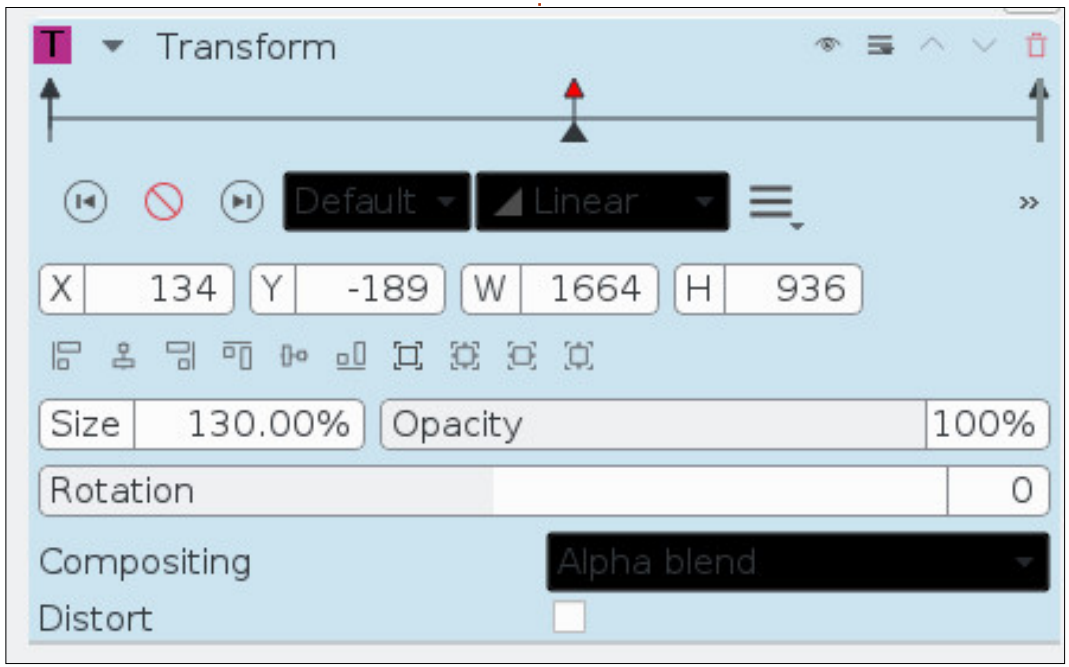
The distance (in frames) between keyframes is the speed of the animation, so, for slow animation, you'll need to have a longer time span. Less time is faster animation.

You may also have noticed other boxes below the X, Y, W and H numbers. Play with those too.

Size will grow/shrink your text. Opacity will make it more/less transparent, and Rotation will, of course, rotate your text. You have other options for interpolation and compositing. (Unfortunately shown as black boxes in my screens as Kdenlive isn't playing nicely with my new install of Mint 18.1.)

Tweaking values will let you scroll your text into place, and as it comes to the end of the scroll, fade in the text. Pause. Make it fade out, shrink, and move down out of the screen. Use your imagination.

In theory, you can add any effect to your title, but mileage may vary on which ones work well with keyframes and titles.



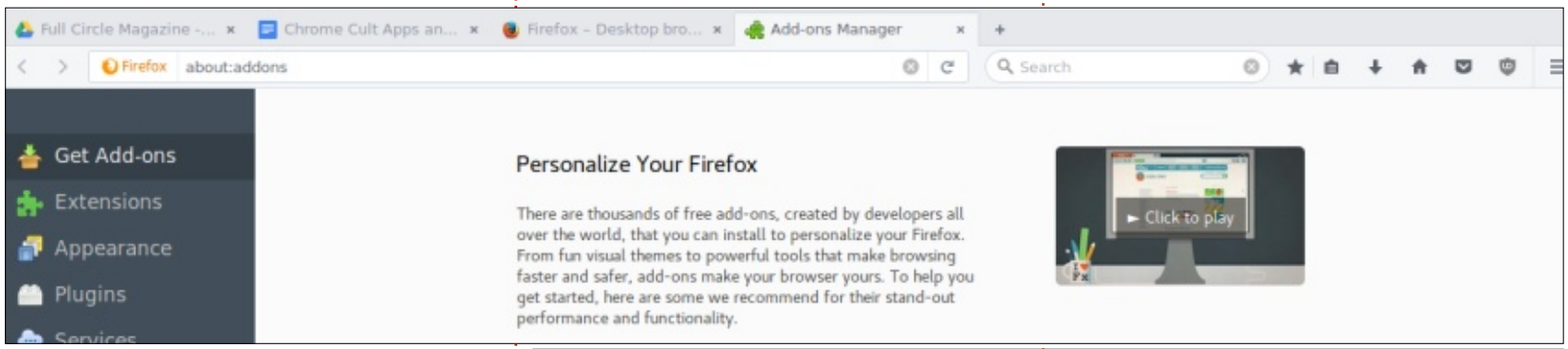
Ronnie is the founder, and editor, of Full Circle. His other interest is art, and his work can be seen at: ronnietucker.co.uk

Firefox Add-on Extensions

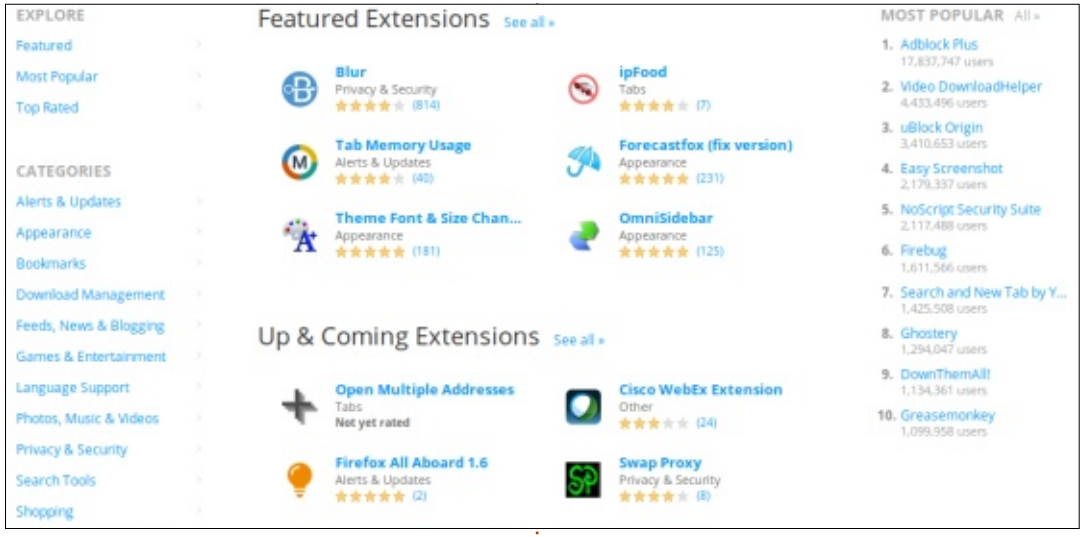
Firefox is perhaps the most popular browser that is shipped with many distros. There are apps and extensions available for productivity, privacy, and other areas, for this Mozilla product. The Chrome Web Store is scheduled for electronic extinction in 2018. I believe Google is attempting to use the Google Play Store as its replacement. Time to look at the Firefox addons.

If you open the menu bar, there is an option titled add-ons. If you click that option, you will be taken to the Add-ons Manager. There is a left sidebar that shows: Get Add-ons, Extensions, Appearance, Plugins, and Services. The Get Add-ons is akin to the Chrome Web Store. Extensions and Services are the installed options on the Browser. Plugins are the behind-the-scenes programs that enable Codecs or Flash. Appearance is the simple browser theme set by the user. At the bottom of the get page you can be directed to the Firefox Add-ons.

There are numerous categories for Mozilla Add-ons. In the past, I required my Chrome Browser to have privacy, word processing, encryption, and cloud telephony. I was pleasantly surprised at the vastness of this page.

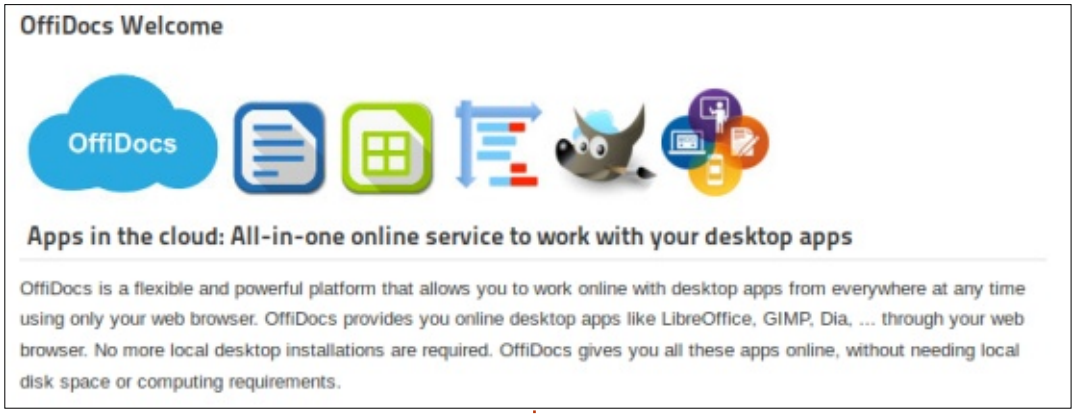


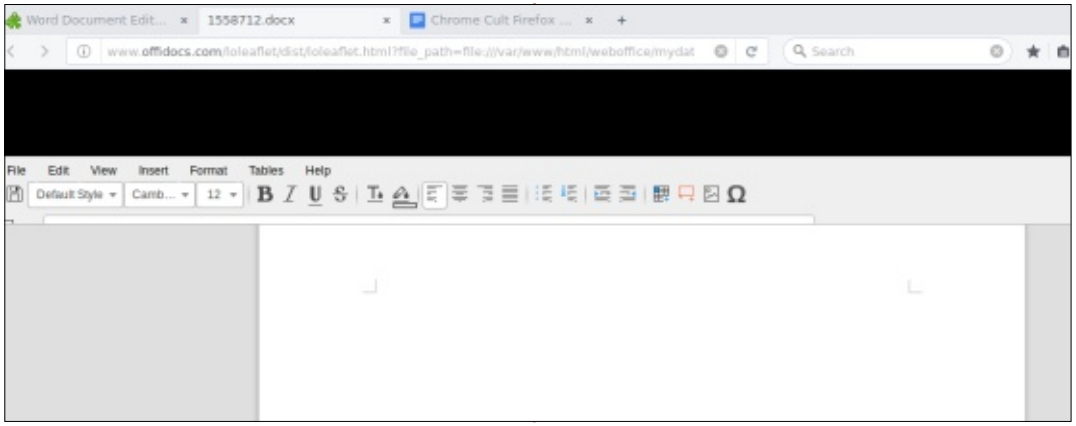
For privacy, I use Zenmate VPN, Ghostery, and Privacy Badger. Time to search for these three options in the Privacy and Security Tab for installation. Searching for these items was easy. Installation was simple. When you hover over the listed search items, a green add-to-Firefox becomes enabled on the right. Click that green popup and installation is done. The privacy apps are successfully installed. However Privacy Badger started to bog down the browser. I removed Privacy Badger to improve Firefox responsiveness. On to word processing options!



There are no productivity categories available. So I did a basic search for a word processor. And the results were not impressive, even Zoho Writer was not an option. I could still use Google Docs or the Zoho Website. Even Paper by Dropbox was missing. After a few minutes of haggling I found the Word Document Editor.

Word Document Editor is developed by offidocs.com. This editor is powered by Libreoffice. It is a simple online word processor. The files are stored on a cloud, but can be downloaded locally, or printed off. There is an ad banner

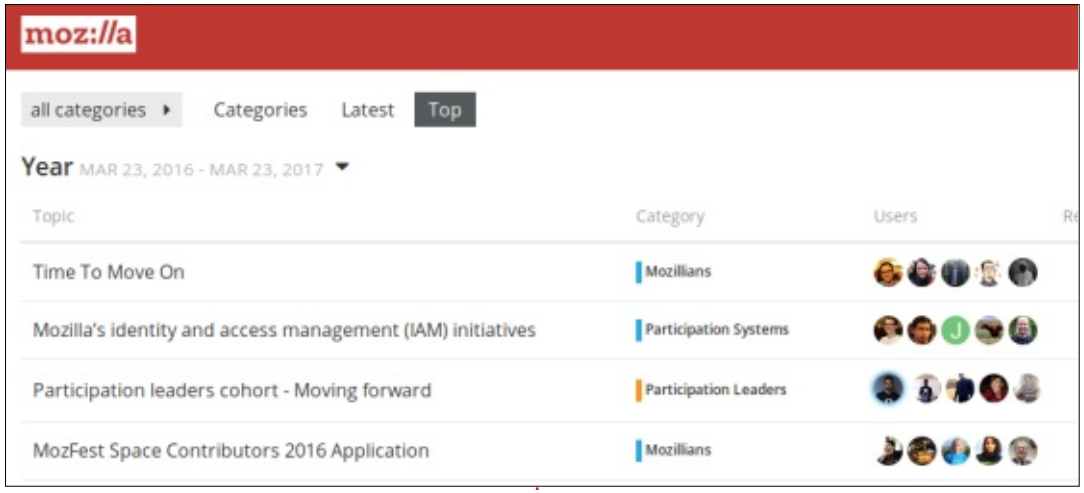




above the editor, however it is blocked out by Ghostery.

While poking around this website, it became apparent they enable open source software to be accessible by the Firefox browser. It appears that productivity extensions in Firefox do exist. The Chrome Browser is just a bit more affluent in this area. However, I did not need to register to use any of the available OffiDocs extensions. GIMP and Openshot are available here too. However, some of the extensions are not well implemented by Offidocs. The OpenOffice Extensions felt amateur and unpolished. Offidocs essentially offers many common Linux programs that are utilized by the Linux community at large.

Encryption is a hotly debated area. Searching through the system, I did find numerous encrypted email extensions. Yet there is no extension that allowed



for encrypting a single file. I tried using the top 3 encrypted extensions. None of these extensions interacted with my email account and did not populate on the Firefox browser. A simple search for telephone resulted in no cloud telephone extensions. So the encryption and cloud telephony is a bust.

However, despite the bust, Mozilla is attempting to improve the browser. They are launching Firefox Test Pilot. It is simply a beta software testing program for the browser. It is quite easy to sign up. Once you are enrolled you can choose a project to test and then give feedback via a Mozilla Forum.

After reviewing the various extensions, Firefox has a fairly impressive add-on list. However the lack of a reliable encryption email service is a bit of a disservice. It is not Mozilla's fault for this deficiency. Yet I am sure that with enough research, a robust encryption extension exists. Additionally the extension categories could be reshuffled and improved. Improving this area would help position Firefox against the Chrome Web Store. It is interesting there are no apps for Firefox, only extensions.

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.

Write For Full Circle Magazine

Guidelines

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

Rules

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

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

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

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

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

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

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

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

Translations

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

REVIEWS

Games/Applications

When reviewing games/applications please state clearly:

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

Hardware

When reviewing hardware please state clearly:

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

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

Old Hardware Benchmark Showdown

Written by Charles McColm

Back in 2002, I was lucky enough to own a computer that had a 1.4GHz Athlon processor. It was a custom job, assembled by a group of friends (thanks Peter, Jay and Andrew). In 2002, a 1.4GHz Athlon CPU was a pretty good processor. Intel's Pentium 4 Northwood processors (starting at 1.6GHz) were just being introduced to the market, and Pentium III's were still a thing on the mobile market.

Then tragedy happened, a short caused by a vacuum being plugged into a bad wall circuit fried not only the system's power supply, but several capacitors on the motherboard. Not having a lot of electrical experience, I didn't know how to de-solder the caps and replace them, so I simply threw out the motherboard and gave the processor to someone I thought could use it.

At the time, I was still paying back student loans and couldn't afford to replace the system with anything close to what I had, so I picked up a used Pentium II for $150CDN (which was actually a good deal at the time). The used computer came with no operating system – which wasn't an issue since I had several FreeBSD discs and a number of Linux distributions.

Whether you're in a rut, or helping someone else who's in a rut, or just wondered how badly old technology fares against something newer, this is the article that will hopefully put things in perspective. For this hardware showdown I selected a range of mostly older hardware available on the used market. I also tried selecting a mix of commodity hardware and custom-built hardware across lower and higher-end systems. There's nothing brand new in the mix and nothing with a solid state drive. Here's a low-down of the hardware:

- **Dell Optiplex 745** - Pentium D @ 3.4GHz (2 cores), 2GB RAM, 80GB HDD, Intel 965 Graphics (onboard)
- **Custom** - Phenom II 955 @ 3.2GHz (3 cores), 4GB RAM, 500GB HDD, Radeon HD 4290 Graphics (onboard)
- **Custom** - AMD Athlon 64 X2 4400+ @ 2.30GHz (2 cores), 4GB RAM, 160GB HDD, Radeon HD 4450 Graphics Card (1GB)
- **Dell Precision T3500** - Xeon W3520 @ 2.67GHz (4 cores), 8GB RAM, 500GB HDD, NVidia Quadro FX 580 Graphics Card (512MB)
- **HP 6000 Pro SFF** - Intel Core 2 Duo E8400 @ 3.00GHz (2 cores), 4GB RAM, 250GB HDD, Intel 4 Graphics (onboard)
- **Lenovo Thinkcentre M82** - Intel Core i5-3470 @ 3.60GHz (4 cores), 4GB RAM, 500GB HDD, Intel HD 2500 Graphics (onboard)

I fully expected the 3.60GHz 4 core i5 to win at pretty much every benchmark. Of course synthetic benchmarks don't say everything about a machine, but they can produce some interesting results. Phoronix Test Suite has been my goto benchmarking system for several years, but there are over 200 possible tests in the suite. For

the showdown, I chose the following Phoronix tests:

• **x264 encoding** - this measures how many Frames Per Second (FPS) a CPU can encode. OpenCL support is disabled so there's no GPU encoding going on.
• **RAMSpeed** - measures the Megabytes Per Second (MB/s) the RAM can process. This test actually runs several tests. I limited the tests to an average value of floating point operations.
• **Aio-Stress** - is an asynchronous I/O benchmark that uses a 2GB test profile and a 64k record size. It's used to measure drive I/O performance. Measured in Megabytes Per Second (MB/s).
• **X11perf** - is a measurement for 2D operations measured in Operations Per Second (OPS).
• **Ut2004-demo** - is a measurement of older 3D operations using the Unreal Tournament 2004 engine. I chose this test over others because it ran on all the hardware.

For the x11perf and ut2004 tests I used the same Dell P2213t monitor which has a maximum resolution of 1680x1050. I tested Unreal Tournament at 800x600 (bare minimum gaming), 1024x768, and 1680x1050. I tried to use the best video port available on each machine, but in the case of the Lenovo i5, I couldn't get video to display due to a bug that affects particular combinations of graphics and DisplayPort, so I used VGA for this connection. It's worth mentioning that, on one of the other machines, I tested both VGA and DisplayPort and the difference was minimal (1 FPS).

Given that the i5-3470 is a third generation i5 processor, I expected it would win the x264 encoding test. The i5 has an almost 1GHz clock rate boost over the Xeon. Here (shown below) are the results for the different machines.

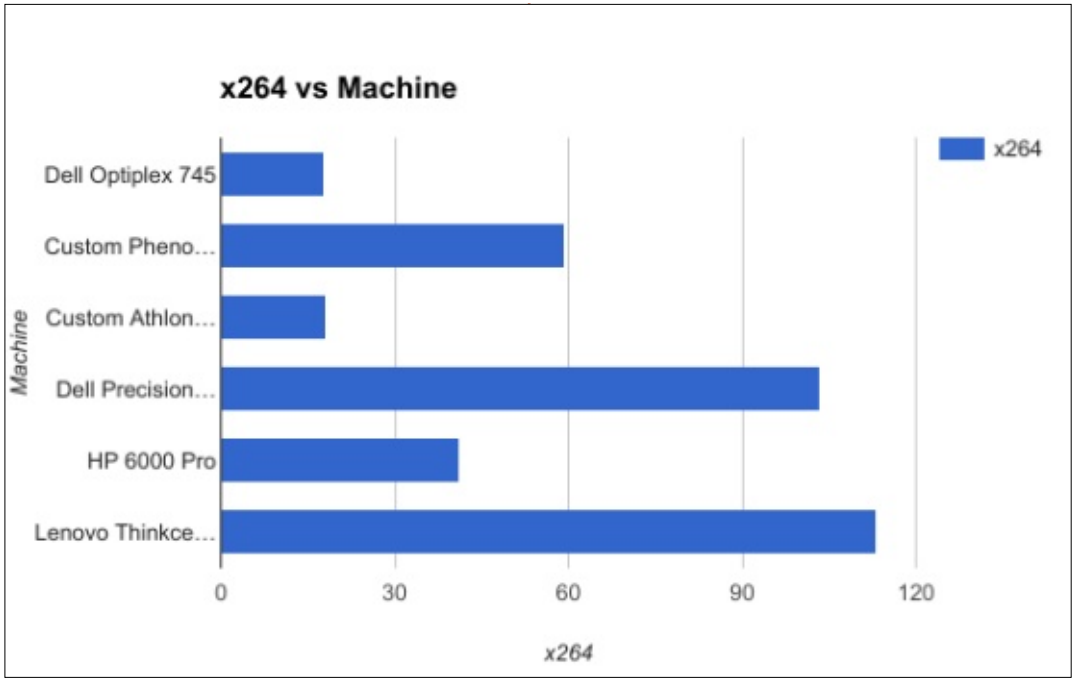
As expected, the i5 does the best job encoding video, though the hyperthreaded Xeon workstation isn't too far behind. The actual difference between the i5 and Xeon workstation is just over 9 MB/s. Here (shown above) are the actual numbers for each machine.

Our AMD Phenom had one core switched off, but came nowhere near either the Xeon or i5 processors. It outperformed the 3GHz Core 2 Duo by 18 FPS, which is significant if you're ripping DVDs or simply transcoding video files. Even though the custom Athlon 64 X2 has a 1GB video card, that card didn't help with the FPS score (as it might in a real test with OpenCL enabled - ripping and encoding using Handbrake). I mentioned earlier that this test is supposed to be strictly a CPU test and the numbers seem to reflect this.

When I chose these machines, I tried choosing machines that represented a pretty diverse set of machines. I would never expect to find a 1GB video card in an AMD Athlon 64 X2-based system except in the used market. On the other hand, people sometimes pillage their old video card from a higher-end system to put in a new upgrade. In some cases I've ham-stringed a system and in others attempted to give it a boost.

The x264 test was pretty much

Machine	x264 score
Dell Optiplex 745	17.7 FPS
Custom Phenom II X3 955	59.36 FPS
Custom Athlon 64 X2 4400+	18.08 FPS
Dell Precision T3500	103.37 FPS
HP 6000 Pro SFF	41.13 FPS
Lenovo Thinkcentre M82	113.29 FPS



as expected, but the RAMSpeed test (below) shows a lot more variation.

Keep in mind I tested only one aspect: an average floating point test. Had I run all of RAMspeed, it would have taken several hours and there would be many more numbers and charts just for the RAM test. Shown above are the actual results.

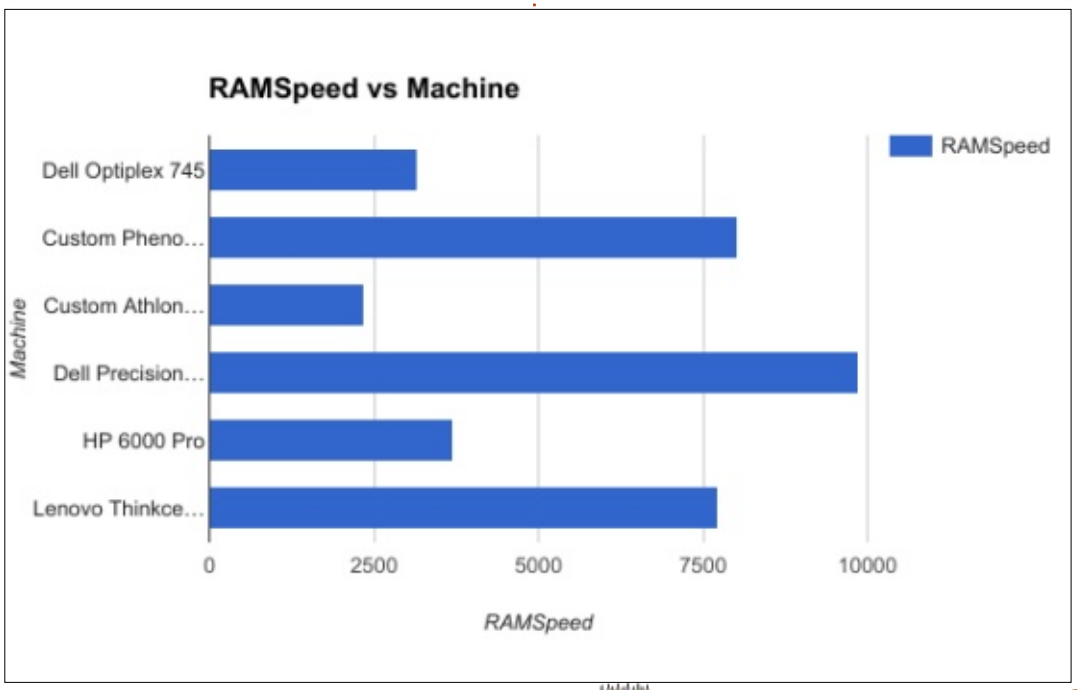
I would have expected the i5 Thinkcentre to win because of the newer DDR3 architecture, but both the Phenom and Xeon workstation beat the i5. While the Xeon has more RAM, more RAM isn't the key to the best score. The Phenom and i5 have identical amounts of DDR3 RAM. The i5 RAM is also faster than the Phenom RAM, clocking in at 1600MHz vs the Phenom's 1333MHz. The difference seems to come from the fact that the i5 is operating with a single 4GB stick of RAM whereas the Phenom has 2 x 2GB RAM sticks operating in dual channel mode. Similarly, the Precision T3500's RAM speed is only 1333MHz, but it too is operating in dual-channel mode, though both sticks are 4GB. The Xeon scored significantly better than both the i5 and Phenom.

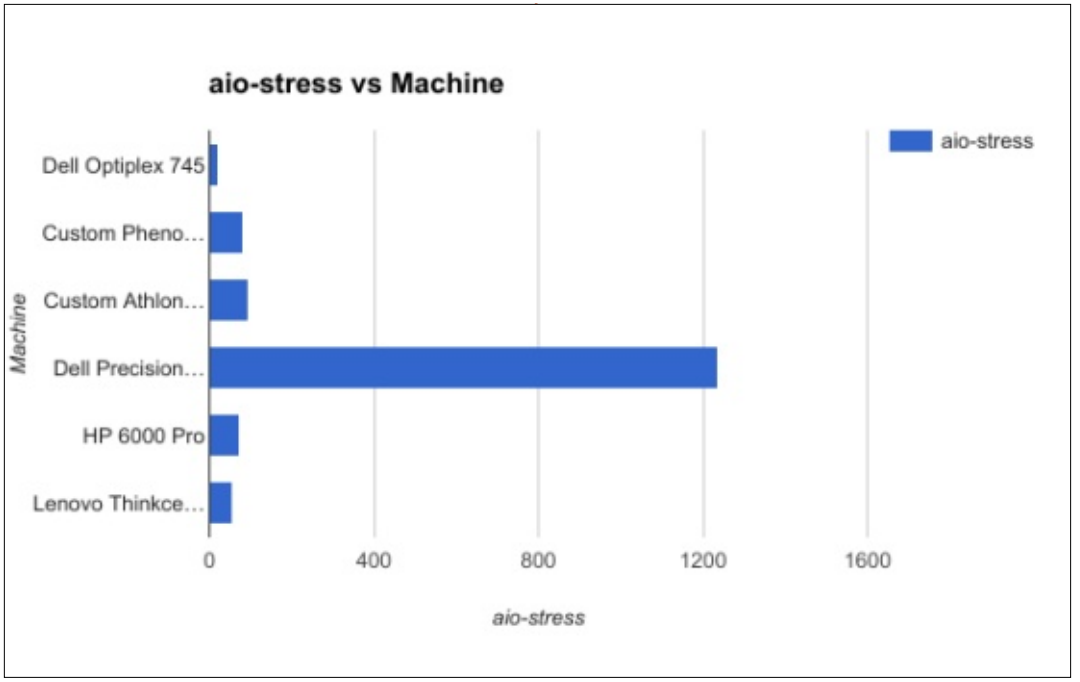
Whether this is due to the extra 4GB or the Xeon architecture I can't say for sure, but it's more than 2000 MB/s faster than the i5.

As with the other hardware, there was a real mixed amount of hard drives in the various systems, but generally lower end machines had smaller-sized drives. The smallest drive was in the Optiplex, which had a tiny 80GB drive, and

Machine	RAMSpeed score
Dell Optiplex 745	3159.49 MB/s
Custom Phenom II X3 955	8033.99 MB/s
Custom Athlon 64 X2 4400+	2343.8 MB/s
Dell Precision T3500	9870.23 MB/s
HP 6000 Pro SFF	3714.28 MB/s
Lenovo Thinkcentre M82	7719.61 MB/s

Machine	aio-stress score
Dell Optiplex 745	22.19 MB/s
Custom Phenom II X4 955	81.67 MB/s
Custom Athlon 64 X2 4400+	94.48 MB/s
Dell Precision T3500	1238.09 MB/s
HP 6000 Pro SFF	71.4 MB/s
Lenovo Thinkcentre M82	54.06 MB/s

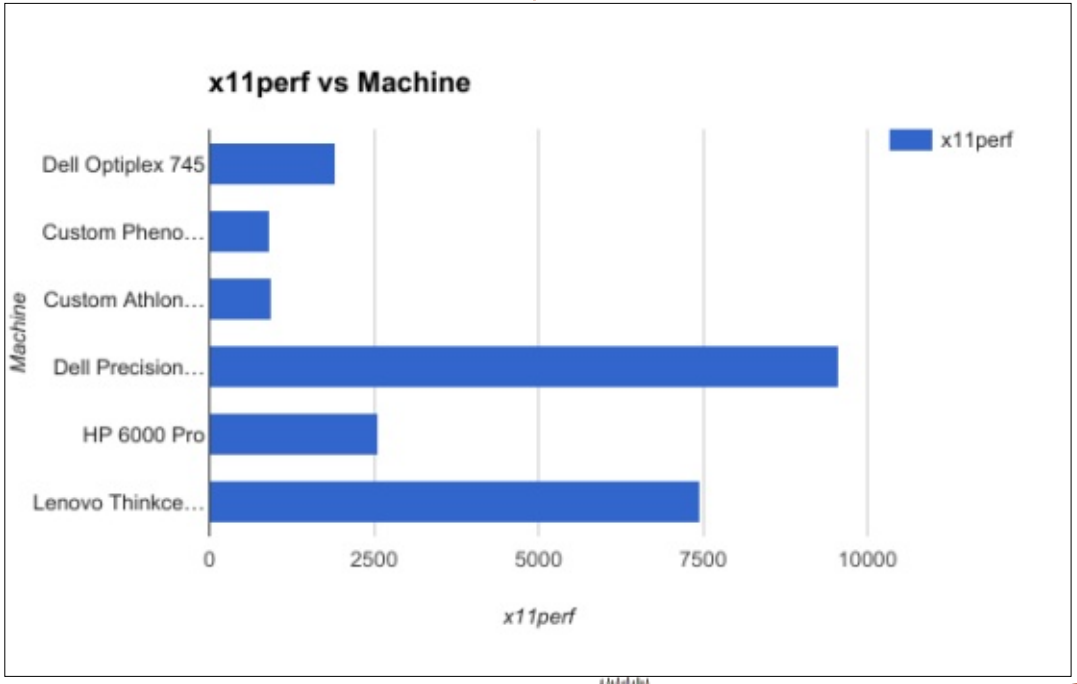




the largest in the Phenom, Xeon and i5 which all had 500GB drives. To provide a bit more variety, the Athlon 64 had a 160GB hard drive and the HP 6000 had a 250GB hard drive. The previous page (bottom right) has the results of the aio-stress test.

This chart is much more difficult to interpret because of the skewed results. I ran aio-stress several times on the Dell Precision T3500 Xeon-based system, and, each time, it scored over twelve hundred MB/s. All the rest of the machines in the test scored less than 100, with the next best machine the Athlon 64 X2 running a 160GB hard drive. The i5 actually found itself almost at the bottom of the pack faring just slightly better than the 80GB Optiplex 745.

Machine	x11perf score
Dell Optiplex 745	1930 OPS
Custom Phenom II X4 955	909 OPS
Custom Athlon 64 X2 4400+	959 OPS
Dell Precision T3500	9577 OPS
HP 6000 Pro SFF	2580 OPS
Lenovo Thinkcentre M82	7450 OPS



One thought was that perhaps the i5 Thinkcentre had a bad drive, but all drives underwent a basic SMART test and tested good. I'm not sure why the i5 drive did so poorly and the only co-relationship I can draw is that both the two worst performing drives are manufactured by Seagate. I actually love Seagate drives and have 2 x 3TB and a 2TB drive in our KODI server and all have performed well over a couple of years. Newness doesn't seem to matter either as the Phenom's 500GB hard drive (Western Digital) got edged out by the 160GB Western Digital drive in the Athlon 64 X2. The i5 Seagate drive is rated at 7200 RPMs, 6 GB/s and has a 16MB cache. The 160GB drive in the Athlon 64 X2 is also a 7200RPM drive and only has an 8MB cache. Clearly something was bottlenecking the i5 drive. Then there's the Precision T3500 drive, a Hitachi HDS72105. I was able to explain this crazy result by looking at the results of other machines on openbenchmarking.org. Looking at all the results, Xeon-based computers seemed to fare much better than any other system, including i5's with Solid State Drives (SSDs). The architecture of the Xeon seems to explain why it did much better than the rest. In those openbenchmarking systems all the systems were in the thousand plus range while other systems were in the hundreds or sub-hundred range.

Graphics are an integral part of any system, and 2D graphics, the X11 subsystem is important to daily desktop-Linux users. The x11perf, like the RAMspeed test, has several tests embedded in the single test. I chose to focus on the 500x500 pixel scroll test. There were some surprising and not-so-surprising results (shown bottom left).

The best machine was the Precision T3500 with its NVidia Quadro FX 580 video card. Although the FX 580 doesn't have the most amount of video RAM in the comparison (the 1GB Radeon card in the Athlon 64 X2 takes this honor) it wins hands down with 9577 operations per second (OPS). As expected the i5's onboard Intel HD 2500 does a pretty fair job coming in second. What's surprising is how poorly the AMD cards fared. In each case I enabled the proprietary driver to get the best performance out of the cards.

This didn't seem to help either the Athlon or Phenom.

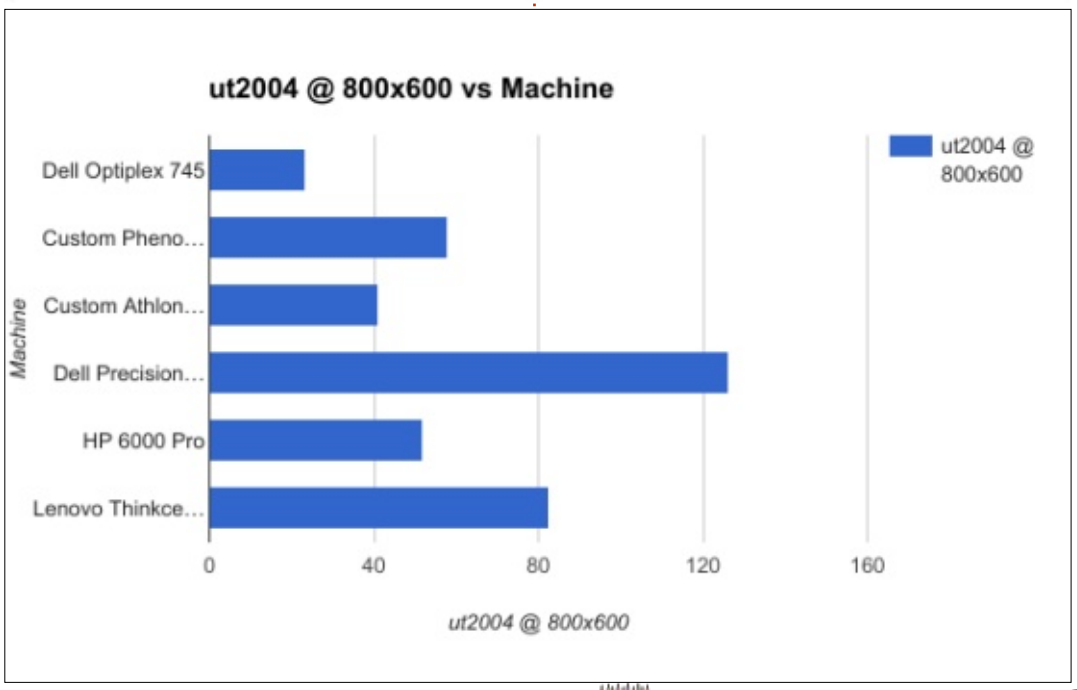
Given that these are the only two AMD-based systems on the list I wondered if it had something to do with older AMD architecture, so I ran the same test on my own AMD A8-5600k APU with an NVidia 650Ti boost video card. It scored almost 49000 OPS, way higher than anything on the list, so it doesn't appear to be architecture. Perhaps something was crippling the bus? In terms of actual use the Phenom felt quite usable. Opening and closing images in GIMP were fairly smooth and there was no glitching with Firefox. Although the Optiplex 745 and HP 6000 Pro fare better in the x11perf test they felt more sluggish than either the Athlon or Phenom. Maybe a better test might have been a scrolling video game.

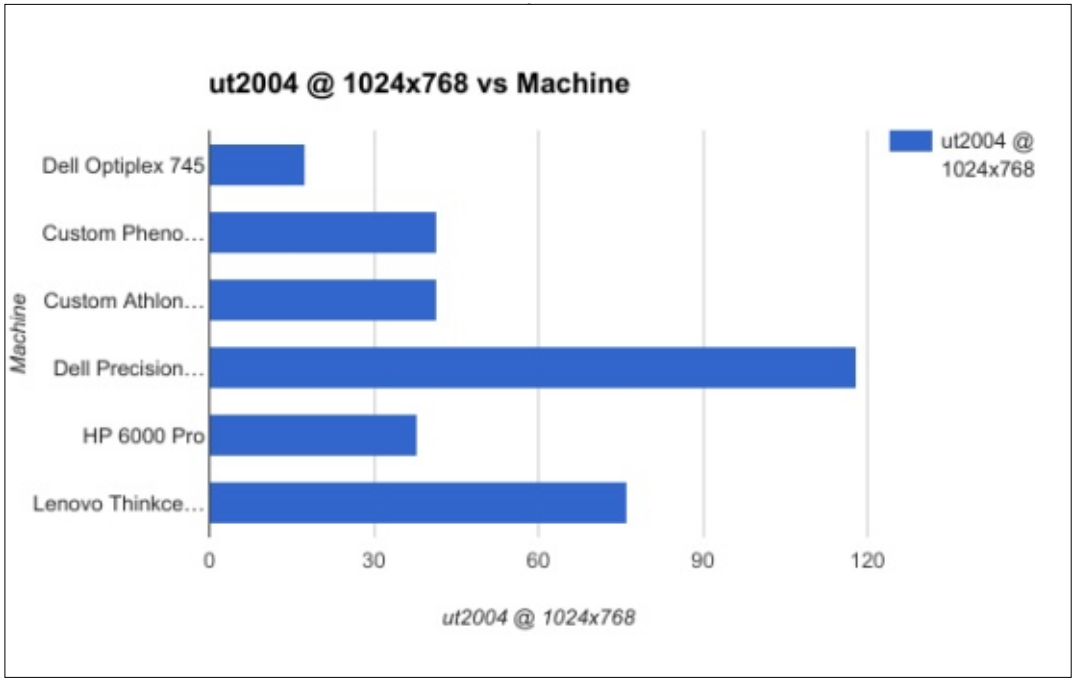
With that in mind, I loaded up the Unreal Tournament 2004 demo and ran it on each machine. Below right are the results at 800x600.

As expected, the onboard graphics of the Pentium D-based Optiplex 745 fared the worst with only 23.16 FPS at 800x600. I expected the Athlon 64 with it's 1GB video card to do much better than it did. The HP 6000 Pro's onboard video was almost 11 FPS better than the Athlon 64 which leads me to believe the card is pretty much wasted in this system. The Phenom fared much better in the Unreal Tournament test than it did in the x11perf test, helping the theory that the motherboard architecture of the Athlon 64 is at least partly to fault for the

Machine	Ut2004 @ 800x600 score
Dell Optiplex 745	23.16 FPS
Custom Phenom II X4 955	58.16 FPS
Custom Athlon 64 X2 4400+	40.92 FPS
Dell Precision T3500	126.25 FPS
HP 6000 Pro SFF	51.74 FPS
Lenovo Thinkcentre M82	82.53 FPS

Machine	Ut2004 @ 1024x768 score
Dell Optiplex 745	17.46 FPS
Custom Phenom II X4 955	41.66 FPS
Custom Athlon 64 X2 4400+	41.64 FPS
Dell Precision T3500	117.93 FPS
HP 6000 Pro SFF	37.92 FPS
Lenovo Thinkcentre M82	76.19 FPS





crippled card. Both AMD systems use Asus motherboards, but the Phenom motherboard supports PCIe 2.0 compared to PCIe 1.0 for the Athlon 64-based system. One thing worth noting in this comparison is that the Athlon 64 X2 may have fared a bit better with a similar NVidia-based card since the M2NBP-VM motherboard has an NVidia chipset. The lesson here, just because you have a good video card, it doesn't mean you'll necessarily get great results if the system is old enough.

Unfortunately, the only NVidia card in the mix was the card that reigned supreme in all the Unreal Tournament tests. As you might expect, the higher the resolution, the fewer the Frames Per Second (FPS). The one exception to this rule was the odd case of the Athlon 64 X2 computer which actually scored better as the resolution was increased. This is the same computer that seemed capped by the PCIe 1.0 bus. But the increase in Frames Per Second wasn't significant, less than a frame at 1024 x 768, and just over 2 FPS at 1680x768.

Generally speaking most games are acceptable at 30 FPS. Some people argue they can't live without 60 FPS, but most people tend to forget FPS once immersed in a game. This would rule out the Dell Optiplex 745 as a gaming machine, and as a refurbisher, we'd market it more as a machine for writing resumes and basic web surfing. It's possible to stick a half-height PCIe video card in the 745, but, given the low performance of the 1GB video card in the Athlon 64 X2, adding a card might only bring the system up to an acceptable level of performance. It's probably less costly just to buy a better system. At 1024x768, the Phenom and Athlon 64 X2 are closer matched, the Phenom drops over 16 FPS while the Athlon 64 X2 gains a little more than half a frame per second. Quickly looking at the two charts, the HP 6000 Pro appears to stay around the same until you notice that the 1024x768 chart is in 30 FPS increments versus the 40 FPS increments of the 800x600 chart.

At 1680x1050 (previous page, bottom right), our Frames Per Second drops the most across machines (again except the Athlon 64 X2 which saw a slight increase). Hardest hit is the leader of the pack, the Xeon with the NVidia Quadro FX card, which suffered a 38 FPS drop. At 1680x1050, three of our six test systems fall below the 30 FPS minimum.

The custom AMD Phenom drops below the 30 FPS threshold at 1680 x 1050. One explanation for the poor performance might be the fact that all of the graphics on the poor performing systems are integrated chipsets on older motherboards. The i5 Thinkcentre also has an integrated Intel 2500 HD chipset, but because it's a newer graphics chipset, it's better supported and simply better overall. Oddly, our Athlon 64 X2 4400+ system scored better than it did at either 800x600 or 1024x768, but only by a couple of frames.

Why go through all the trouble for what amounts to mostly low-end older systems? Mostly because they're still out there being repurposed. As a refurbisher, we no longer build systems like the Dell Optiplex 745, a Pentium D-based system, mainly due to the fact that we have enough systems that are more powerful, but systems like the custom Phenom II X4 and the Core 2 Duo-based HP 6000 Pro are pretty commonplace for us.

On eBay, people are selling similar HP 6000 Core 2 Duo based systems for between £45 - £60 including shipping. The decent performing Precision T3500 sells for around £140 when you include shipping. Local brick and mortar refurbishers sell systems like the HP 6000 for around $99CDN (around £58) as spec'd in this article (with a Windows 10 OEM refurbisher license). At the newest end of the spectrum, we found an ad on our local Kijiji for a Lenovo M82 with 12GB of RAM that was selling for $260 (£160). Sometimes, it takes a bit to find really good deals on used hardware, but, around here, there are always ads (by both brick and mortar stores and individuals) for graphics cards and systems. Of course there's always "buyer beware" when dealing with individuals and dealers that haven't been around long.

Summing up

If you're building a video editing machine, or want to re-encode media, your best bet is to buy the newest system you can get. The i5 scored the highest in x264 encoding and while it didn't

beat the Xeon-based Precision T3500 or the Phenom II X4 in the RAMspeed test, the memory also wasn't running in dual-channel mode. If you were short on cash, and could find a similarly spec'd T3500 for a good deal, then it certainly performed well and would be our second pick for video editing, especially with the hyper threading. Hyper threading theoretically can give the system up to a 30% boost in performance when the software takes advantage of it.

Although the Precision T3500 scored better in gaming performance than the i5, we'd probably still pick it over the T3500 for 3D gaming simply because we could add a newer PCIe video card to the system to outpace the T3500. Buying a slightly newer card can help with gaming performance on an old system like the Athlon 64 X2 4400+, but be aware that the card might be capped by a slower (PCIe 1) bus speed and may not do nearly as well as it would in a newer system. Generally the higher the gaming resolution, the fewer frames per second, so if you want to game higher than 1680x1050, be sure to get the best video card you can buy.

Systems like the Pentium D-based Optiplex 745 and Athlon 64 X2 4400+ are really near the end of their life, but two years ago, a Pentium D was all we had in our KODI server and it was okay paired with a GeForce 210 1GB video card. The Pentium D wasn't as responsive as the Core 2 Quad chip we switched it with, but we were able to play our locally stored HD content. As a refurbisher, we wouldn't sell these systems anymore, but it is possible to get by with a similar system if you're patient. Our Phenom II X4 did well in most tests, but when we tested at 1680x1050, the onboard Radeon 4290 showed that it just couldn't do what newer graphics chipsets or dedicated graphics cards could. I redid the ut2004-demo test with a dedicated 1GB Radeon 4870 graphics card, and the Phenom scored a respectable 86.85 FPS at 1680x1050. With people switching to newer generation i-series computers, it should be simple enough to find older Phenom systems fairly inexpensively. If you're not playing the latest and greatest games requiring more oomph, a Phenom paired with a discrete graphics card might be a good inexpensive fit.

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 works on reinventing his blog at http://www.charlesmccolm.com/.

Building Linux from Scratch

Written by Paul Romano

Would you like to learn more about Linux? If you do, one of the best ways is to have a go at building **Linux From Scratch**, also known as LFS. LFS was briefly mentioned in FCM#71, page 53. Some of the content of this article was taken from material on the LFS website, and the "book" that describes how to build LFS. The two guys who make up the mintCast team are each currently building LFS systems, and discussing their progress on their regular podcasts. These are broadcast every other Sunday at 19:00 UTC (my thanks to ***Gord Campbell*** for pointing me to mintCast).

Linux From Scratch is a project that provides you with step-by-step instructions for building your own custom Linux system, entirely from source code. It was created by Gerard_Beekmans, and initially released in December 1999. One important reason for this project's existence is to help you learn how a Linux system works from the inside out. Building an LFS system helps demonstrate what makes Linux tick, and how things work together and depend on each other. One of the best things that this learning experience can provide is the ability to customize a Linux system to suit your own unique needs.

Another key benefit of LFS is that it allows you to have more control over the system without relying on someone else's Linux implementation. With LFS, you are in the driver's seat and dictate every aspect of the system.

LFS allows you to create very compact Linux systems. When installing regular distributions, you are often forced to install a great many programs which are probably never used or understood. These programs waste resources. You may argue that with today's hard drive and CPUs, such resources are no longer a consideration. Sometimes, however, you are still constrained by size considerations if nothing else. Think about bootable CDs, USB sticks, and embedded systems. Those are areas where LFS can be beneficial. On completion, my LFS system was about 4.5 GB.

Another advantage of a custom-built Linux system is security. By compiling the entire system from source code, you are empowered to audit everything and apply all the security patches desired. It is no longer necessary to wait for somebody else to compile binary packages that fix a security hole. Unless you examine the patch and implement it yourself, you have no guarantee that the new binary package was built correctly and adequately fixes the problem.

LFS seems to release new stable versions on a six-monthly basis, at the end of February and September. At the time of writing, the latest version is v8.0 released on 2017-02-25.

Just be aware that when you finish a build of LFS, you end up with a minimal Linux system that has only a command-line interface and one user, root. There is a lot more work to do – using the Beyond LFS project book – to get any sort of GUI.

Building an LFS system is not a simple task. In particular, as an absolute minimum, you should already have the ability to use the command-line (shell) to copy or move files and directories, list directory and file contents, and change the current directory. It is also expected that you have a reasonable knowledge of using and installing Linux software. No previous experience of compiling is required if you can follow the instructions carefully, but it would be helpful if you have compiled a kernel before.

These are some of my experiences from builds of 7.6, 7.8, 7.10 & now 8.0. My first build of LFS 7.6 took me about 50 hours spread over 7 days. This was on a Pentium 4 box with only 512 MB of RAM. It included reading everything three times before actually doing it, and also reading multiple man-pages to understand what all the unfamiliar options I was using meant. My second build on a similar box ran into problems

(see 8.3 Compiling the Kernel (drivers) below), but by my third build, I was down to about 25 hours work (i7 CPU). My build of 8.0, on a box with a Celeron CPU, took about 34 hours. Of this, about 12 hours were taken to compile just GCC, so don't think you have to sit and watch your display screen the whole time.

LFS is designed to be built in one session. That is, the instructions assume that the system will not be shut down during the process. That does not mean that the system has to be done in one sitting. You can continue to do other work on your host system whilst compiling is being done in another (terminal) window. The issue is that certain procedures have to be re-accomplished after a reboot if resuming LFS at different points. The book does explain how to do this if necessary.

Architecture

Before you start, you have two decisions to make. The first is whether to build a 32-bit or a 64-bit system. A 32-bit system obviously will run only 32-bit executables. The default 64-bit build that results from LFS is considered a "pure" 64-bit system. That is, it supports 64-bit executables only. You have to recompile many of the packages again if you wish to run 32-bit executables as well. Instructions for both architectures are given in each book (see next section). My decision was 64-bit.

systemd vs sysVinit

The second decision determines which book you need to download from the website. Do you want to use systemd or sysVinit? I decided to go with systemd because most distros are using it now, including Debian, Ubuntu & Mint. It is also slightly less work to install.

On my first build, using v7.6, I started using the pdf version of the book. However, this is a little confusing in places as it does not have any hyperlinks. You can download the complete book in one html file (LFS-BOOK-8.0-systemd-NOCHUNKS.html), but my preference is for the tarball version. Download this from linuxfromscratch.org/lfs/downloads/stable-systemd/LFS-BOOK-8.0-systemd.tar.bz2 . Not only does this contain the complete book using smaller individual pages for each section (thereby making it easier to read), it also contains the md5sums and wget-list files, meaning it is the only file you need to download at this stage. It also has the smallest file size of the 3 different versions of the book.

The wget-list files for systemd & sysVinit versions of LFS appear to be the same, so if you use wget to download your packages, you get all the packages to build both versions. Note however, that the required packages for systemd & sysVinit are slightly different.

Of the 79 packages on the wget-list, 65 tarballs and 6 patches are common. For systemd, 2 tarballs are unique (dbus, systemd). For sysVinit, 5 tarballs & 1 patch are unique (eudev, bootscripts, sysklogd, sysvinit, udev, sysvinit-patch).

General Overview of Building LFS

The LFS system is built by using an already installed Linux distribution. This is referred to as the host system. After preparing a partition on which to build LFS, you download the various source packages (about 356 MB).

Then, a preliminary toolchain must be compiled consisting of the tools used to compile LFS, like GCC, glibc, binutils and other necessary utilities. Next, the root directory must be changed (using chroot) to the toolchain's partition to start building the final system. The final toolchain can then be compiled. One of the first packages to compile is glibc; after that, the toolchain's linker must be adjusted to link against the newly built glibc, so that all the remaining packages that will make up the finished system can be linked against it as well. After some simple configuration files are created, the kernel must be compiled and GRUB installed before booting into your new LFS system.

Host System Requirements

My host system for v8.0 used an Intel Celeron 1.80GHz CPU with 2GB of RAM. I recycled an old Seagate 160 GB SATA drive just for

this LFS build. I then installed, as the host system, a fresh install of Linux Mint 18.1 Serena. The majority of the host minimum requirements are met by installing the "build-essential" package. This did not meet the requirement for makeinfo which is part of the texinfo package, so I installed that as well. Two bash scripts are created to confirm your host system meets the software requirements.

Partitioning

My preference is to use a GParted live CD to do my partitioning work. I disconnected the existing 1 TB HDD in the host box, and installed an old 160 GB drive just for this LFS build. With KISS (Keep It Simple Stupid) in mind, using GParted I created three primary partitions. I used the older MBR partition table (msdos in GParted) rather than a newer GPT scheme.

```
/dev/sda1     Linux Mint 18.1
Serena
/dev/sda2     Swap
/dev/sda3     LFS 8.0
```

Make a note of the UUIDs for each of the partitions. You may want to include them in your fstab file (see 8.2 Filesystem Table below). I had no need to create a separate partition for /home as I did not intend to keep personal files on this drive. After booting into the host system, the new partition(s) can be mounted. Then I installed my host system on /dev/sda1.

Downloading the Packages

The source code packages and patches can be downloaded using the wget-list file included with the book tarball. DO NOT forget to check the md5sums of the downloaded files. When I downloaded the packages, wget did not report any errors. I went back and double-checked for this. However, the md5check showed an an error on one package. The file size was much smaller than it should have been, so I had to download that single package again to get it right.

Creating the $LFS/tools Directory

A /tools directory is created on the new partition to store the preliminary toolchain files. A new user is created with a clean environment before starting to compile the toolchain.

Constructing a Temporary System

This is when the preliminary toolchain is compiled from the source packages.

Uncompressing the Packages

This is one area in the LFS book which is not fully explained for the first-time builder. For each package just use "tar xfv filename". Then "cd" to the expanded directory before starting to follow the relevant instructions in the book. After you finish that section be sure to "cd" back up to the sources directory and remove the expanded directory before going onto the next package.

After completing section 5, I strongly recommend that you backup the /tools directory containing your preliminary toolchain. If you later make a mistake in section 6 it is then easy to recover the build without having to start from the beginning again.

Installing Basic System Software

From this point on the new user login is no longer used. You continue as logged in as root, then create and mount some virtual filesystems using the host as a basis. You then chroot to the LFS system and create a new filesystem tree on the LFS partition and create some essential files and symlinks. Next you re-compile the toolchain, this time putting them in their final places. This is followed by compiling and installing all the remaining packages.

System Configuration

In this section, you create the files necessary to configure a basic system. This includes network configuration, setting the timezone and locale, and setting up systemd to initialise the system.

Making the LFS System Bootable

In this section, the /etc/fstab file is created, followed by compiling and installing the Linux kernel and the GRUB bootloader.

File System Table

If, like me, you play around with multi-booting, multiple operating systems installed, changing partitions and booting from different drives in the same machine, the standard drive names (/dev/sda and so on) can easily change. I always modify my fstab file to use UUIDs instead (see section on partitioning). These do not change unless you reformat (make a new filesystem on) the drive.

Compiling the Kernel (drivers)

This is where I ran into problems on my second build. Everytime I tried to boot the system, it would freeze, usually, but not always, reaching a point of kernel panic. I went through a complete rebuild a second time with the same result. I had installed LFS with its own swap partition on a separate IDE hard-drive, so I moved the drive to a box with the same spec (Pentium 4 CPU with 512 MB of RAM) but about two years older. Although both boxes/motherboards had ports for SATA and IDE drives, the LFS system booted in the older box. What now? Eventually, I realized that the problem was somewhere in the kernel compilation. I moved the drive back to the first box, recompiled the kernel again with no success. I even tried copying the kernel from the host system, but got nowhere.

At this point, I started looking for more information on compiling the kernel. I found the same book that the mintCast team recently referred to; Linux Kernel in a Nutshell by Greg Kroah-Hartman. This can be downloaded for free from www.kroah.com/lkn. Even though this refers to compiling a very old kernel, I can not recommend this book enough. In it, Greg explains how to find out, among other things, what drivers the kernel of your host system is using. You can then decide which of these drivers is necessary when compiling the kernel for your LFS system.

It turned out that the newer motherboard used SATA drivers even for the IDE drive, but the older board did not. These boards dated from when SATA drives were still comparatively new. After following Greg's compilation instruction, success at last.

On building v8.0, I managed to get a bootable kernel first-time-around.

GRUB Installation

If you have installed LFS on the same HDD/SSD as your host system, it is NOT necessary to install GRUB for LFS. You can instead use the GRUB provided by the host system. Use "sudo update-grub" and it should pick up your new LFS system and show it as a new entry in the GRUB menu.

For me, the only reason to install the LFS version of GRUB is if you have installed LFS on a separate drive from your host system, and you can use the BIOS/UEFI to select which drive you wish to boot from, or you want to move that drive to a new box. In either case, make sure you install GRUB on the LFS drive, and not on the host drive thus unintentionally overwriting the original (host) GRUB installation.

I have in the past used other boot managers where you can select not only the drive you want to boot from, but also the individual partition you want. In this case, you can install the LFS GRUB to the partition boot sector and not to the MBR for the whole drive.

Rebooting the System

Congratulations if you have got this far! Well done.

Note that when you boot into your LFS system for the first time, and login as root, your prompt will show only as bash4.4#. To get a better prompt, you need to create at least a /etc/profile file. A sample file is shown in the BLFS book in Chapter 3 "The Bash Shell Startup Files".

BYOL Alternative

Another way of building Linux is available on the Linux Academy website. This is called Build Your Own Linux (BYOL). I have not tried this yet, but I did do a quick overview. BYOL suggests using

Fedora Core 24 as a host system and installing this in VirtualBox. The BYOL system is then created on a second block storage device, such as another HDD or a USB stick. It uses the same LFS wget-list of source packages and the build process is the same, except where changes are necessary because of the VirtualBox environment. The final result is a 64-bit system using sysVinit with a separate /boot partition that is compatible with both UEFI and BIOS hardware.

References:

Linux From Scratch:
www.linuxfromscratch.org

MintCast podcast: mintcast.org

Linux Academy:
www.linuxacademy.com

BYOL:
www.buildyourownlinux.com

Paul is a recently retired engineer who spent nearly all his working life with one vehicle manufacturer. Apart from cars and computers, his other main interest is aviation. Originally from London, he now lives in South Africa. He can be reached at paulromano@vodamail.co.za.

LXLE is an easy-to-use, lightweight desktop Linux distribution based on Lubuntu, an Ubuntu re-spin using the LXDE desktop environment. It is aimed at reviving or extending the life of ageing computers. It follows the same LTS schedule as Ubuntu to ensure stability, as well as hardware and software support.

The current release, LXLE 16.04.1 "Eclectica" was published July, 2016, and when you look at the installed set of software, 'eclectica' is an apt description of this Lubuntu off-shoot.

Finally unpacking in the new house, my old JVC Mini-note resurfaced over the holidays, but the last attempt to revive it with Lubuntu had broken down somewhere along the line. Looking around at the lightweight Linux distros currently on offer, LXLE bobbed up to the top of the list.

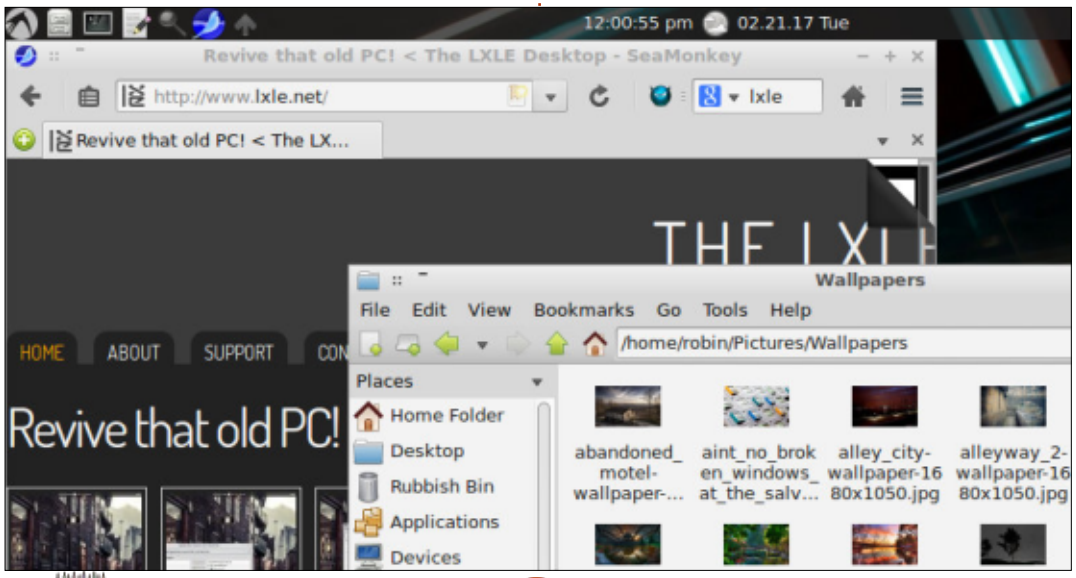
The Ubuntu/Lubuntu base is in my comfort zone and the system requirements fitted within the JVC's 1GB RAM and Centrino processor's capabilities.

In the re-spin world, there's 'lightweight' and there's 'lightweight'. LXLE is somewhere in the middle of the scale; the 1.3GB ISO installer image sits comfortably between the minimalist Puppy Linux, the now defunct Crunchbang, and the heavier, official Lubuntu, Arch or Debian (my regular Linux OS).

Both 32-bit and 64-bit OS versions are available, depending on your hardware. On older 32-bit machines like mine, you may need to adjust the install options to force the memory extension flags for PAE (add: forcepae -- forcepae).

The installer itself follows an established pattern; it is very stripped down with no custom options past the locale, keyboard and partitioning choices.

Take the quoted 7-9 minute install time with a pinch of salt; my first attempt, erasing the existing Lubuntu and replacing with LXLE crashed out after twenty-odd minutes with a complete fail. Not to be put off, I tried again and let the installer reformat the partition and start from scratch. Twenty-five faultless minutes later and LXLE declared itself ready. There's no messing with graphics or Wifi drivers - if you have standard hardware, the Ubuntu driver base takes care of those. The JVC display hasn't looked this good in years, and the wifi only needed the encryption key to be online and running.



Login to the LXLE desktop - based on OpenBox - and you'll be pleasantly surprised by two things: the responsiveness of said desktop even on ancient hardware, and the amount of software installed to cover most everyday needs.

It is an extraordinarily full collection for a 'lightweight' distro, from LibreOffice to the Mozilla-based SeaMonkey browser, Transmission, Guaydeque media player and codecs, Flash player (yeuk!), and even the Openshot video editor. I wouldn't say that last is a wise default choice, but it displays confidence and ambition.

Just look down the program docs page on the LXLE wiki: the usual accessories include the

Pluma text editor, there's an education category, a host of games, a ridiculously well-stocked graphics section (PDF Document Viewer, Font Manager, Gimp, LibreOffice Draw, Mirage, PhotoPrint, Scribus LS, Shotwell, Simple Image Reducer, SimpleScan); Gnucash, Planner, Homebank, and more sit in the Office section alongside the full LibreOffice suite; under media, you get the aforementioned player, codecs, video editor, and then Audacity, Xfburn, Simple Screen Recorder, and more; there's really very little you can't do out-of-the-box, with a modest 6GB installed base. And remember this is aimed at older machines.

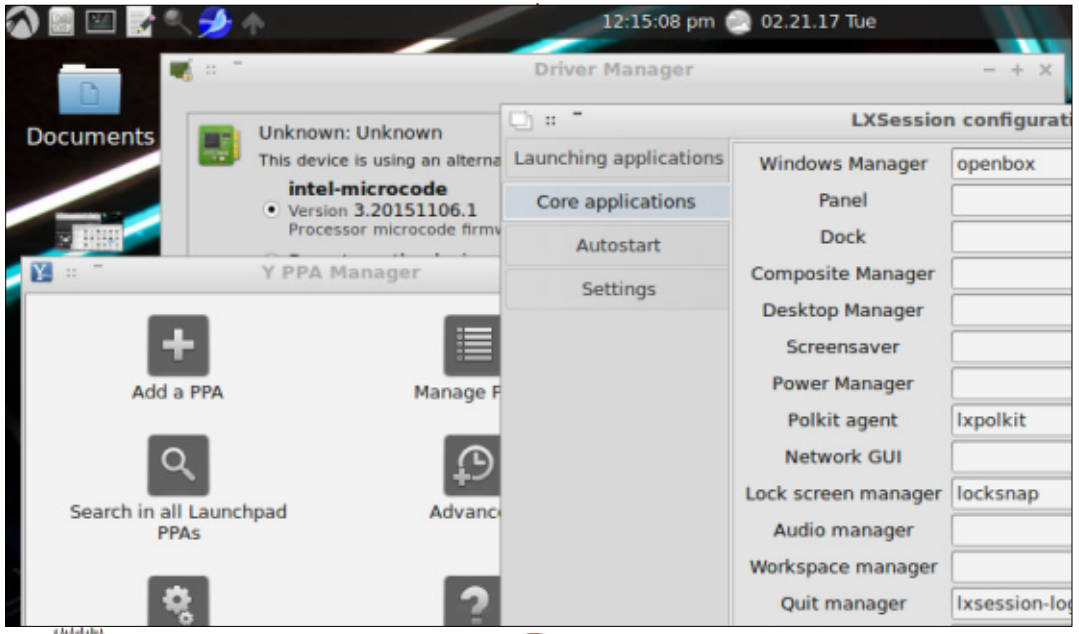
If that's not enough, you get access to more software via Lubuntu Software Center and Synaptic and the Y PPA Manager and the GDebi package installer.

If you look at the LXLE project team's stated goals, I can definitely go along with the statements "based on Lubuntu Linux to ensure a fast capable desktop for aging computers" and "stays with Ubuntu at the core of the system to ensure plentiful support options," for which LXLE scores full marks, enabling the third goal - "keeps desktop and other major software updated to the latest stable version." So far so good.

I will take issue with "a modern-looking, intuitive desktop - for anyone to use easily" and "provides a complete drop-in-and-go replacement for XP, Vista, 7 Starter/Basic." Come off it, folks; it's Linux; it's OpenBox. Those two things betray its roots and it's no Linux Mint MATE or Cinnamon desktop that you can dress up in Windows' clothing.

Moreover, I don't believe any desktop is intuitive; Windows, Mac or Android - just give one of those to your technophobe grandmother and see how far she gets. OpenBox is a branch line of a desktop paradigm that harks back to Xerox Parc in the 1960's; desktops are only 'intuitive' once you've learned the concepts they're based on. If it's so intuitive, I'd be able to find the settings for the ridiculous screen locker that does a weird 8-bit blur with no on-screen instructions. And I've been playing this game for twenty years or so.

I will say that LXLE's desktop does render smartly using the updated Openbox, reliable PCmanfm file manager, OpenJDK, Fast Forecast, Aero Snap and Quick Launch, and has a stunning set of wallpaper art. You can also say that it indeed "covers most users' everyday needs" by providing an excellent set of default apps.



LXLE has stable and solid performance once it's running, although I'd say the promoted boot to online time of 15 - 60 seconds (very dependant on hardware) is still optimistic.

Support looks to be good; besides the project homepage as a first-stop resource, there is a project wiki with good documentation, useful LXLE OS Forums hosting the usual Q&A threads which I've made use of, an LXLE OS IRC thread on freenode that I haven't tried yet, and the LXLE OS mailing list which I've joined.

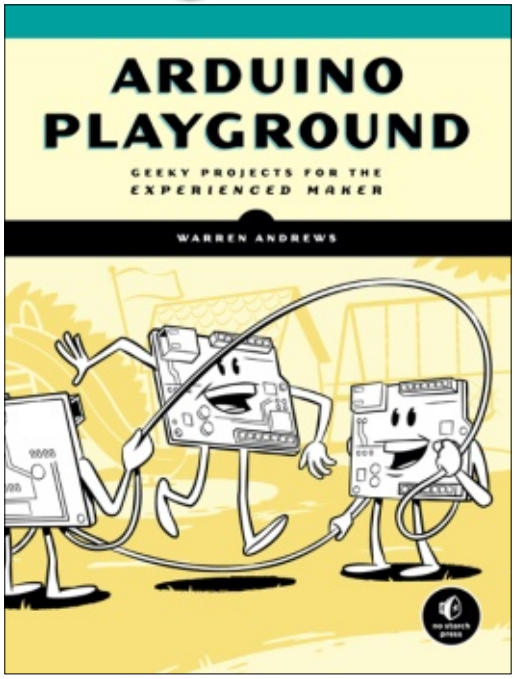
I may be coming late to the LXLE party, but this is one distro that has matured well and delivers on most of its promises.

Robin Catling is a project manager, writer and all-round eccentric, latterly the Web Systems Co-ordinator for Research in Practice at the Dartington Trust.

BOOK REVIEW

Written by Greg Walters

Geeky Projects For The Experienced Maker



Arduino Playground - Geeky Projects for the Experienced Maker
By Warren Andrews
March 2017, 334 pp.
Publisher: No Starch Press
ISBN: 978-59327-744-4

Of all of the books that I've reviewed, I have to say that Warren Andrews Arduino Playground has to be at the top of the list. When I received the book, I was immediately struck by the level of the projects. This isn't your run-of-the-mill DIY electronics book, nor is it for the faint of heart. Some of the projects are very complex. That doesn't mean that you shouldn't look into this book if you are a beginning Arduino DIY-er. However, you should have some basic electronics, soldering, programming (especially Arduino and Micro-Controllers) and hand-tool knowledge.

Warren Andrews lays out the projects in a logical and thoughtful manner, explaining the concept of the project, the parts list (including enclosures and tools needed if you are going to create a complete and stand-alone version), Printed Circuit Board images and source code for the Arduino (which can be downloaded from the No-Starch Press website). He even gives a list of the places where you can buy all of the parts and tools needed for the projects in the book. In addition, he devotes the entire first chapter on "Setting up and useful skills".

While a couple of the chapters don't seem to be something I'd rush out and make, the chapters on Regulated Power Supply and The Square-Wave Generator are my favorites. All of the chapters, however, are very clear and concise, and contain valuable information and insight that could be used in other projects.

I thoroughly enjoyed this book and I am happy to give this book 5 out of 5 stars

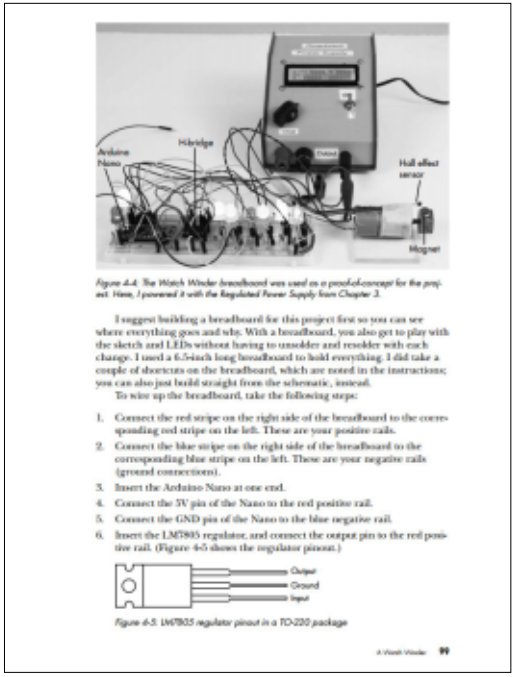


Figure 4-4: The Watch Winder breadboard was used as a proof-of-concept for the project. Here, I powered it with the Regulated Power Supply from Chapter 3.

I suggest building a breadboard for this project first so you can see where everything goes and why. With a breadboard, you also get to play with the sketch and LEDs without having to unsolder and resolder with each change. I used a 6.5-inch long breadboard to hold everything. I did take a couple of shortcuts on the breadboard, which are noted in the instructions; you can also just build straight from the schematic, instead.

To wire up the breadboard, take the following steps:

1. Connect the red stripe on the right side of the breadboard to the corresponding red stripe on the left. These are your positive rails.
2. Connect the blue stripe on the right side of the breadboard to the corresponding blue stripe on the left. These are your negative rails (ground connections).
3. Insert the Arduino Nano at one end.
4. Connect the 5V pin of the Nano to the red positive rail.
5. Connect the GND pin of the Nano to the blue negative rail.
6. Insert the LM7805 regulator, and connect the output pin to the red positive rail. (Figure 4-5 shows the regulator pinout.)

Figure 4-5: LM7805 regulator pinout in a TO-220 package

Table of Contents

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

MY OPINION

Written by John Eddie Kerr

Let's Celebrate 10yrs With Giving Back

In March, 2017, I decided to become a paying user of Ubuntu, or, let's say I decided to contribute some cash to the cause. It has been a wonderful free ride, and it still is a free ride, and I have been meaning to contribute for some time now, but one day, no more good intentions, I was motivated into action.

Two charities that I contribute to via my credit card called me on the same day. My credit card was no longer valid because I had to cancel my card when it went astray while on vacation. I now have a new number, but the two charities wanted to know if I would renew the monthly donations. The first call came from the Canadian Cancer Society; that is a no brainer, of course I renewed. The second call came from a social / political group I had forgotten that I was still contributing to. So I did not renew with them. I hate to say "no"; the fact is we are all in the same boat here, and there is a limit to the number of causes we can contribute money to without the risk of ending up being a "cause" ourselves.

It was moments after I got off the phone with the second caller, I started to think about my good intention to donate to Ubuntu. I have been a user of Ubuntu since the beginning in 2004 with Warty Warthog. At that time, I was getting a bit frustrated with Linux, but what I read about Ubuntu appeared to be the answer to my frustrations and it was.

We have had the option to make a donation at the download page for some time now. Ubuntu has given so much to me, I felt that I should contribute. Then I hesitate, because I live in Canada and our dollar is not worth a full dollar outside our borders, my donation is either not as strong as it should be, or it is going to cost more to give.

On the other hand, what about the money that I was giving the second charity that called? I really was not sure if I was getting the bang for the buck I expected. I could give at least some of that money to Ubuntu, and I would feel much better about it too. If all of us contributed just as much as we can, even if it is just a little bit, the total amount of money collected would go a long ways to help cover the overhead costs of Ubuntu. I gave to Ubuntu and Full Circle Magazine. Both donations are not huge, I would peg them both at around ten cups of coffee at my local coffee shop. Really folks, that is all it takes to make a difference.

So why not mark the Ten Years of Full Circle Magazine with a small donation to the free software project of your choice, including Full Circle Magazine? Ubuntu, Debian, the Free Software Foundation, or The Document Foundation are a few examples that come to mind. Many of these projects now have a page on the website to place your donation. Your donation does not have to be a lot of money, mine was not, but every little bit helps, no matter how much the donation is. With PayPal and credit cards, it has never been easier to give.

Resources:

The Document Foundation:
http://www.libreoffice.org/donate

Free Software Foundation:
https://my.fsf.org/donate

Debian:
https://www.debian.org/donations

Ubuntu:
https://www.ubuntu.com/download/desktop/contribute

Last but not least, there is a donation button on the **Full Circle Magazine** home page:
http://fullcirclemagazine.org/

John Eddie is is a law librarian at the Wellington County Law Association Library in Guelph, Ontario, Canada. Ubuntu powers his computers at home and at work, including some Raspberry PIs

The Telepresence Robot

Written by SJ Webb

I go to work, drink my morning coffee, and say Hi to Geoffrey-Allen on the college campus. We stroll down the hallway to attend our morning meeting. I am located in Missouri, while Geoffrey-Allen is in Georgia. Geoffrey-Allen is the owner of a telepresence robot. A robot that enables me to interact with him on a personal level. For me, Geoffrey-Allen is not an offsite co-worker, but a friend who communicates through a robotic body. This robot is manufactured by Double Robotics. This article will offer two sides: Double Robotics and Geoffrey-Allen. Let's get started with Double Robotics.

I contacted the company, and eventually I was directed towards Sara Boyles at Double Robotics. Below are her responses to some questions I previously asked her. I interviewed Sara back in September 2016. I would like to thank her for effort and time in answering these questions.

Q How did Double Robotics start? How long has it been in business?

A Double Robotics was founded in 2011 and officially launched in 2012 after graduating from the Palo Alto, Calif.-based startup incubator, Y Combinator, in August 2012. It has been in business for four years.

Q Why create a telepresence robot? Where do you think the future environment will be for such robots?

A Telepresence robots allow you to have a physical presence where you can't be in person. Compared to traditional video-conferencing systems where you're relying on someone to send you a login, open up your laptop, etc, using a telepresence robot creates a genuine feeling of autonomy for the remote person. Telepresence allows remote individuals to be in charge of their own movement and gives them a sense of truly being there. This is just the beginning for telepresence. Our core markets currently are enterprise and education, and we hope to continue expanding in those two markets, as well as grow in health care and other fields.

Q What is the most common use for these robots?

A The two most common uses for Double are enterprise and education. Companies of all sizes, such as LinkedIn, GE, WeWork and Reddit, see great success with Double by giving their remote workers a physical presence in the office. This is a game-changer for talent retention, keeping up company and team morale, and building a sense of camaraderie amongst a distributed workforce.

In education, school districts and universities worldwide appreciate Double for its ability to provide a way for remote or homebound students to attend school.

Q There are 3 parts to the robot, correct? Ipad, Stake, and Wheels. How does each interconnect to each other? Does it use Linux?

A There are two parts to Double: the iPad head and the base. They connect via Bluetooth and do not use Linux.

Q How does the user control the robot?

A Double can be navigated via our free iOS app using any iOS device, or any computer using the Google Chrome web browser. Simply log in to your account, select the Double you'd like to drive, and you're there.

Q What is the general reaction by the public?

A At first, as with most other new technology, people are sometimes skeptical or unsure about how Double can be beneficial. Once they hear about the unique use cases and how other companies and schools have deployed Double within their organizations, the general reaction is that of awe and excitement. Double is widely accepted as an excellent tool to bring distributed teams and classrooms together.

Q Where are your markets for sales? Europe? North America?

A Our core market is North America, with Europe following close behind. Double is also available in Australia, Asia, and South America.

Thank you for the interview, Susan.

It is apparent these robots are becoming more mainstream. In my time, I have seen positive reactions from the college students. And yes, I even heard one young lady scream upon seeing Geoffrey-Allen's robot. He fondly calls it Geetoo. Perhaps it is best to let Geoffrey-Allen impart his experience of being a telepresence robot owner.

Q Why purchase a telepresence robot?

A Telecommuting has many obvious advantages, you work in your home environment, you can wear your bunny slippers to meetings, and you save a lot of money on vehicle maintenance. However, telecommuting removes you from the office environment; you miss out on those in-between-the-meetings meetings. You can only form friendships with coworkers for the few moments before and after the video conference, or over Slack. It can be lonely being a telecommuter. I've worked full-time telecommute before, so I was aware of the limitations and I knew I needed a way to be present on campus. I researched several different telepresence options and found the Double 2 matched my needs.

Q What was your career like before the robot? After? Has it improved your overall job satisfaction?

A When your only interaction with coworkers is a large monitor stuck to a wall, it's awkward. For example, the video conference software we use allows the host to screen-share or show their local camera, so you lose the video of the conference room and see only their presentation. When this happens, it strips away all the visual cues from the people around the table, and you can't read the feeling in the room. With the robot, I'm sitting in the room with everyone, and I can see that the boss had checked-out and started checking his email. Another time the robot has helped was when I needed to consult on a problem in an office where there wasn't a teleconference node, or web camera, or even a telephone, and the problem was so complex that I just had to see the process so I could devise a solution.

So, using the robot at work has given me a freedom I didn't realise I was missing. I have coworker interaction I never had in other telecommute environments; I get invited to go to work events, parties and continuing education training that I would never have been able to attend without the robot. I even attended a national medical conference with the Institute via robot, something I would never have been able to do without my robot.

Q What are the most common challenges of owning this robot?

A I was worried that the biggest challenge would be acceptance of my co-workers to having a robot in their midst. Turns out the biggest issue I face, is with the campus Wifi network. We have good coverage in the areas where I roll around, but the authentication scheme on campus causes the iPad to fall off the network. When that happens, someone has to rescue the robot and reconnect me to the Wifi. After the network issues, I think opening doors, and turning

lights on or off, are the only other problems I face on a daily basis. People are generally very kind and are happy to hold a door for me to roll through, but sometimes they mistake me for a signpost and hurry past.

Q How reliable is it?

A Wifi issues aside, and that's a problem we have because of the campus network, when we're not on campus, the Wifi issues don't exist, the system is extremely reliable. The only other problems we've encountered were with the iPad and iOS updates, not the robot.

Q Are you concerned about hacking?

A I am not. The connection from the robot to my computer is encrypted, and the robot driver website uses HTTPS. I still cover my camera lens and mute my microphone when I'm offline, but I think everyone does that now.

Q Is the robot totally self-sufficient or does it need on-site maintenance?

A I have a charger dock, so at the end of the day, I roll into my cubicle...

Q Wait, did you say "your cubicle?"

A Yes. My coworkers decided I needed an office on campus, so they got a cubicle wall and put it up in the lab. I even have a nameplate and decorations on the wall. I don't have a desk or guest chairs, but I do have my charger. So at the end of the day, I roll into my cubicle and dock the robot which charges the robot and the iPad. I get a full day's use out of a single charge, if I turn down the brightness on the iPad; otherwise I get about five hours before I start worrying. So daily maintenance is simple, iOS updates to the iPad or firmware updates to the robot do require someone local to the robot to poke at the tablet.

Q Can you provide a picture of you next to it?

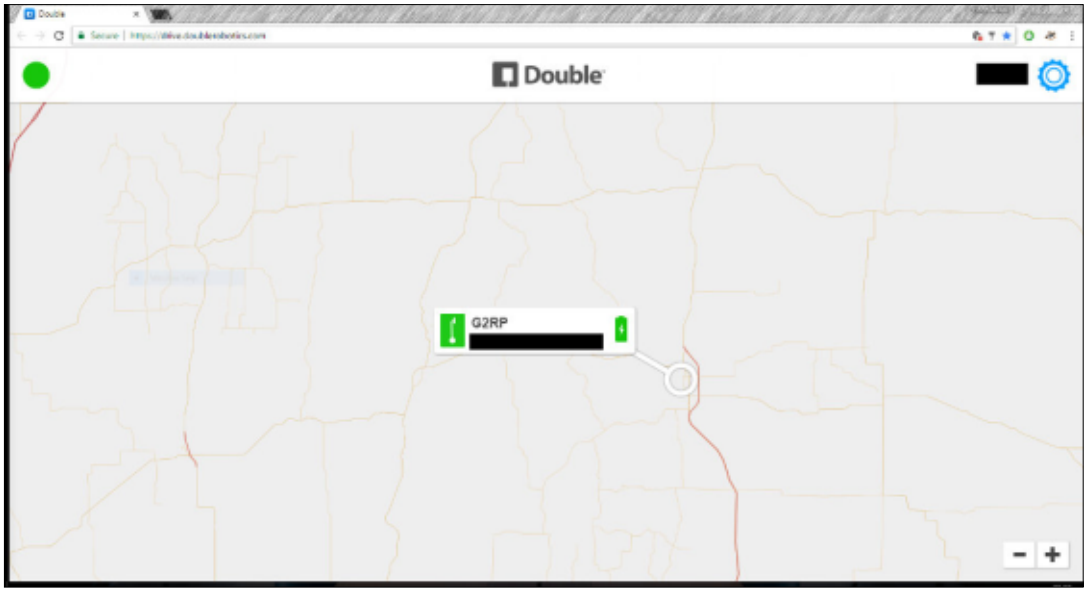
A Sure thing, here are two. One (shown right) is with me standing next to the robot and the other (shown previously) shows the robot in the Institute. The robot's height is adjustable, and in both of these pictures, it is at the lowest setting. This lower setting is the height I normally stay at when moving around, but when I stop to talk to people, I increase the height. It feels more natural for people to talk to me, I think.

Q Can you provide a picture of the interface that you use to control it?

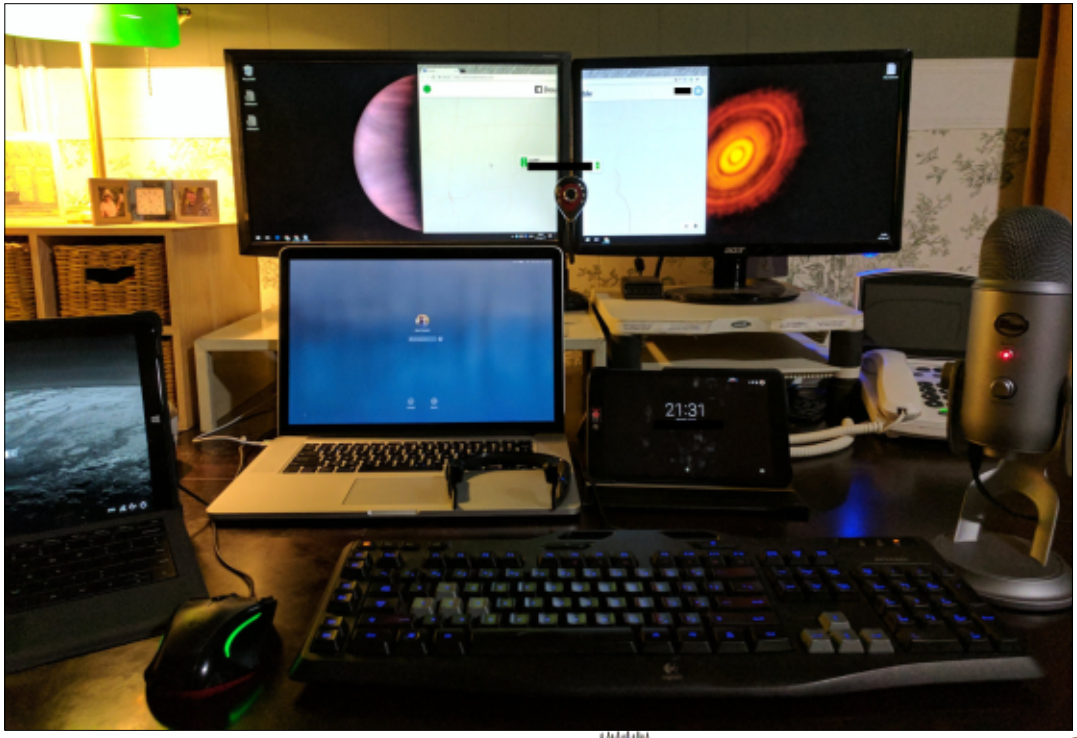
A This is a picture of my desk. I use a multiple monitor setup, and, rather than mount my webcam over the top of my monitors, I stuck it between the two. This lets me look straight

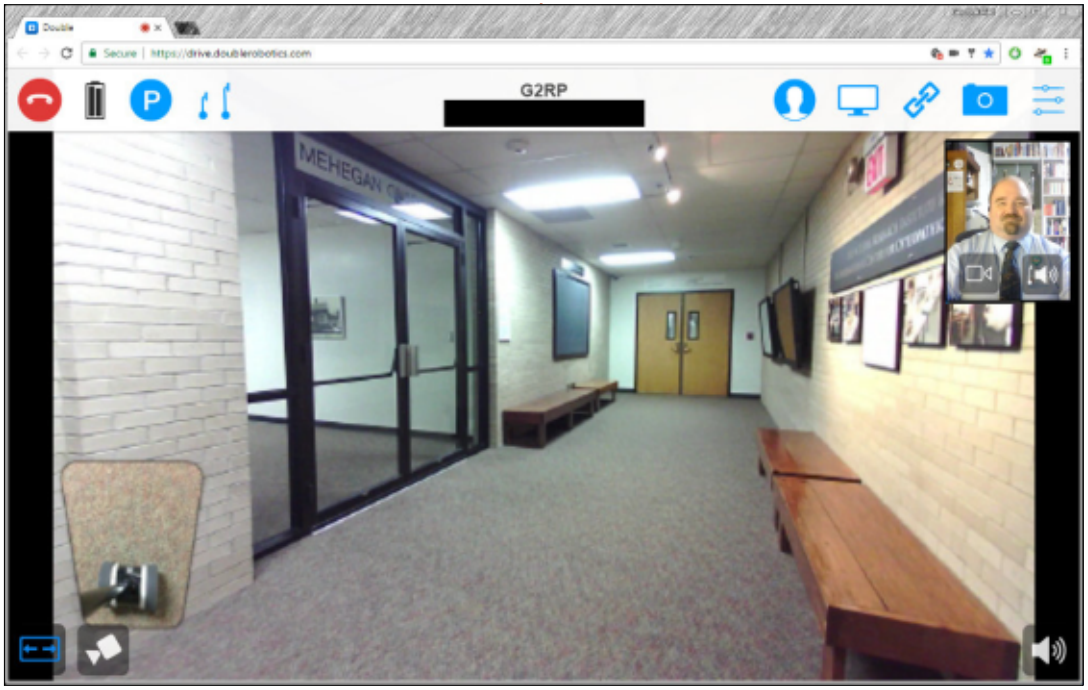
ahead into the camera when driving and interacting with people. It's a little more natural feeling for both sides of the conversation, in fact I often forget I'm sitting in a home office nine-hundred miles away with a webcam staring at me, it feels like I'm really there on campus. I use a Bluetooth bone conductive headphone and a high-quality condensor microphone, and you can see them there on my desk, these really help the sound quality on both ends of the conversation.

The interface runs in a web browser, I prefer Chrome, but it runs in all the major browsers. This is how it looks before you log in to the robot. The map shows where the robot is located and several dashboard statuses like battery level and if the iPad is communicating with the robot.



When you log in, the middle of the screen shows the view from the camera on the robot, a view of what is displayed to people talking to the robot, just like most other video chat windows, and a view straight down of the robot's foot or base. That last view is really helpful when docking in the charger or navigating around chairs and cables in offices. Up top, you can see your controls to disconnect the call, battery status, a button to park the robot, so it doesn't have to balance itself, then other controls to share your local





screen on the robot's iPad, and to take a picture from the robot's camera.

Q How long is the delay between your commands on the interface to the robot?

A The response time is pretty good, I don't think we would win any robot battles, but for moving around the campus, it's a respectable less than one second. When I started driving the robot around I found myself reacting to movement with rapid twitch gamer moves, that resulted in some unexpected quick turns, but it did not take long to reprogram my hand-eye coordination.

Q Has this robot been offsite? If so where? Any pictures?

A Yes it has! I was able to attend a conference in Colorado, even worked shifts in a booth with my coworkers. They gave me a conference badge, and put a tee-shirt on the robot, it was a lot of fun. The response from other attendees was fantastic, I was in a lot of selfies, but most people who stopped to talk to me were very interested in how I used the robot for work.

I wasn't just a walking billboard, I also ran the social media accounts for the Research Network. The Robot can take pretty good pictures and working from home let me process and post to the various social media accounts much easier than trying to do it from your phone or perched on a stool with your laptop.

Q How did you travel?

A The robot has a custom case. Everything breaks down fairly easily, I think it only has one screw to remove, it took my coworker about five minutes to disassemble and pack. It took about the same amount of time to reassemble on the other end. The case has flown in airplanes, ridden in the back of a van, and once was shipped via a courier delivery service.

Q So what do you do at the Institute?

A My official title is Data Manager, and while I do help organize and maintain the data collections, I work primarily as a knowledge wrangler and Data Engineer. I develop storage warehouses, write code, create task automation, and try to help our researchers and students find more efficient ways to gather, process, preserve, and disseminate their data.

Thank you for your time for this interview.

I hope these interviews illuminate the new phenomena of telepresence robots. The new dynamic changes ushered in from this new technology will be interesting. It has the chance to empower more individuals in the workplace.

LETTERS

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

As you may, or may not, know, Mark Shuttleworth (from Canonical) recently announced that all work will stop on Unity (both 7 and 8), Ubuntu Touch, convergence, and that, from 18.04 LTS, Ubuntu will return to using the GNOME desktop. I sent out a message to you, the readers, to ask for your thoughts on this. Some of them are presented here:

Mark Shuttleworth's blog post of April 5, 2017 has hit me with mixed feelings. Over the past six months I have been wondering about the viability of convergence. It is a great idea, but perhaps many of us do not want all of our eggs in one basket. Perhaps the hardware is too far away from providing this, at a reasonable price point.

The other factor that we cannot ignore is the state of the Android phone and tablet interface. Android now has a market share larger than Windows. I believe that Android is just too much to overcome. This is evident by the move to Android on the Blackberry phone by Research In Motion, the former giant in the phone business.

As for Unity, I like it. However, there are many who do not, and, although they are strong members of the Ubuntu camp, they prefer other desktops than Unity. So if it takes too much effort to support Unity, and Unity is dividing us (no pun intended), then I can live with Gnome.

The business side of Canonical is different today than when they launched Unity. Mark Shuttleworth can see what the customers want, what will work best both today, and in the future. He probably has a better view of the future, a view that is better than what we could have, just through the people he has contact with.

It is the end of the convergence dream and the end of Unity desktop. But if this is what it takes to strengthen our position, then so be it. Thank you for all of your efforts, Mr Shuttleworth. We continue to be better off because of them.

John Eddie Kerr

This sounds good to me as I am running Gnome Shell.

John Niendorf

Sad. I love Unity. Simple, working fast, very nice.

Finn Andersen

I think it's a loss. The ease of finding programs and files has been really great with Unity. I cannot imagine the same ease of use with gnome.

I think that, after all these years, unity has started to become a trademark of Ubuntu.

lars blomgaard

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Full Circle Needs You!

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

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

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

All in all, I think it is a good idea, but I don't have a Linux phone so my opinion is biased.

Edwin Bailen

I was really sad after reading Mark Shuttleworth's post about the end of Unity, convergence, and the return of GNOME.

I really do not understand how could it be that the community is not interested in convergence and a phone with Ubuntu on it.

As Mark writes, instead of seeing all this as innovation it has been taken for fragmentation.

I remember I was very excited about convergence when I first read about it, and I was also very fond to take part in writing autopilot tests for Ubuntu Phone.

I just couldn't wait for the day I would come home with my Ubuntu phone, plug a display, a mouse, and keyboard, and make it turn into my computer.

I am really sorry about this, and I think we are missing a great opportunity for the open source community.

Carla Sella

I switched last year from using ubuntu on my primary system, to xubuntu, primarily because I found the Unity desktop too restrictive with very little capacity to customize the look and feel in the way I wish. I now run xubuntu with a common desktop on my primary, and three laptops. With a return of ubuntu back to the Gnome desktop, I would reconsider that decision.

Douglas R. Brown Ph.D.

I think it is a wise decision to return to the Gnome desktop. Gnome has developed itself over the years into an adult desktop. I've been using KDE over the last 5 years and returned to Gnome almost a year ago. I'm very satisfied with Gnome, specially with the option to add extensions to the shell.

Peter Min

Oh, come on! First, they try to convince us all to their new desktop paradigm, which - by Unity 7 - is actually pretty convincing and the desktop itself is quite reliable and makes sense; then they just abandon it. I actually started to use Unity with 16.04 and it works good for me. Now I'll have to change it, again... and the last desktop which succeeded in merging all ridiculous styles, widgets, frameworks, etc is now dying. This is a joke.

Marc

I always have, and always will, view Ubuntu intimately as it's been my default desktop for 10 years. However, this time I saw Canonical diving too deep into the abyss. The purpose and drive for unity 8, mir and convergence was noble, but too much. why, I asked myself, is Canonical trying to reinvent the wheel when there are already infrastructures out there that already exist that Canonical can invest in to accomplish the same thing, and they cost not nearly as much? Here is where the rubber meets the road. When Canonical announced that they were going to launch 18.04 LTS with snappy and mir as default, with snappy as prefered package management, that signaled a "bridge out ahead" for me. I knew mir was not going to be ready for production machines; even in a year's time. The way to convergence would have been the way kubuntu did it with an android app. How hard would it have been to develop an android app that would serve as a front end to a vpn service that connects your phone to your ubuntu desktop? Or… since Canonical already pretty much owns cloud services.... use the cloud for convergence. These are infrastructures that already exist… no need to reinvent the wheel, but for some reason, Canonical was on a crash course to own it all… noble, but not practical. So this is why i jumped ship. I really didn't want to, and started seeking for something else towards the end of last year, and very reluctantly so! Turns out, kubuntu beat Canonical out the door both with kde plasma phone o/s AND the kde app for android! Now I believe kde plasma o/s is dead or will die, but the app is the way to go; using an o/s that already exists (and as of this week, boasts to be the most used o/s, even above windows!). What a missed opportunity to have an app

that works on the most used o/s!!!!

So these are my opinions of Canonical's direction. i will always love ubuntu. it was my first linux o/s. and I might even come back to it, who knows? For now, the way it looks, I'm already running a version of 18.04; just with a different engine under the hood.

Jace Brodsky

I get the issues, and am not disappointed that Unity 8 won't be continued. But, what about existing Unity? I guess that is Unity 7? I like Gnome also, and, in fact, would not have great difficulty getting used to it, but I have lived with Unity 7 since birth and it is now solid and practical. Will Unity be gone completely, or are they just doing away with future dev on Unity 8?

Jon Loveless

As you will see, I lost faith in Ubuntu a long time ago. I presently use Mint, the LMDE variety, which is based on Debian packages, so that I have no direct Ubuntu dependencies...

As an early rat deserting the sinking ship named Unity, I wonder why it has taken Canonical so long to dump Unity. Especially when there was an excellent distro called Mint with Cinnamon that came with a proper menu that didn't clog up the desktop.

So I have no problems with Cinnamon + GNOME and I've never bothered with Compiz. An easy alternative for me would also have been plain vanilla Debian.

Since the introduction of Unity, Canonical have always thought that they needed to do things in a different way to other distros, for example, forcing the user to start a program by putting its name in a search box.

I don't think the phone thing was ever taken seriously by anyone - Canonical are much too small to take on Samsung, etc!

Canonical seem to branch off wildly in all directions until Ubuntu is now effectively unusable for me. Their cloud associations cause me to lose trust in the Ubuntu monolith. I've absolutely no interest in the "Internet of Things" and converging with it. The consequent complexity effectively prevents me from knowing if I've accidentally mis-configured something and made a big hole in something unknown.

Basically, if Canonical had directed their efforts in a more focussed way, Ubuntu could have been a much better distro. But it's probably now too late to rescue it.

Jeremy Boden

I think the shift was needed. The Unity desktop drove me to using Linux Mint. They lost touch with their core product by doing unity, convergence, and telephone. Fix the desktop OS and prepare for the cloud.

SJ Webb

Interesting post from Mark Shuttleworth. He had a vision, and the money to try to make it a reality. He pushed it despite the number of people who were against it for one reason or another. I think that the crowd-source failure of the Ubuntu phone, four years ago, was the first indication that this wasn't the way forward, and the slow adoption of the Ubuntu tablet last year was another indicator. Ultimately he had to make the difficult decision to end the project, something that is hard for many business people to do considering the money and resources that went into it. While I was never a fan of the Unity interface, having adopted Mint several years ago as my default distribution, I can't fault him on his determination. My feeling is that Ubuntu will be the better for it, with resources redirected into what they do well and moving them forward.

Ed Pflager

One of the reasons I switched to Xubuntu was to get away from Unity.

B. Ross Ashley

Without Unity I will likely switch to Triskel, Unity is just about the thing Ubuntu has done right for a while now.

Daniel Sprouse

Sounds like a good idea from what I see. Ubuntu has lost a lot of users to Mint since the roll out of Unity. I never tried to use Unity. I looked at, but didn't like it, so I just went elsewhere. I use PCLOS KDE for my main distro. I have installed and used the Mate version of PCLOS. Gnome, to me, would be a good choice to regain some users.

Harold

I think that Mark Shuttleworth has made the correct decision for Canonical.

I shall miss Unity, and I am not looking forward to having to learn a new interface. But, the fragmentation that Shuttleworth mentions is indeed problematic: without market support, Unity will end up taking away rather than giving.

I believe that the decision will make Ubuntu stronger in the longer term.

Paddy Landau

I, like thousands of others, moved away from Ubuntu as I didn't like unity. These days, I am using Ubuntu with the Mate desktop. I love its retro look.

I haven't looked at Gnome for a while, and it would have to be Earth shatteringly great for me to move away from Mate.

Davo Batty

Obviously, this was an incredibly difficult decision, one that could not be made by a person ruled by ego.

However, it means that Canonical has a brighter future. Concentrating on commercial success, and exiting the money-pits is never a bad business decision.

I just hope that the people involved with Unity and convergence have been redeployed on the winning projects.

Gord Campbell

Unity needs to die and be quickly forgotten!

Reminds me of Vista, Windows 8 or Windows 10 - not user-friendly or practical in any way.

Gnome 2 was much better than Gnome 3 - stop with the features bloat causing instability and make sure it just works.

Same applies to KDE and the other desktop interfaces.

Phil Tkachuk

I think it is a good move. Gnome 3.20+ is a stable, well supported product, with lots of development funds given. It will mean that Ubuntu's out-of-pocket costs to enhance and maintain Unity are going to drop. That is a plus for users, but a negative for those who put their heart and soul into the Unity project.

I have used the latest gnome for 3+ years. The feature that Gnome offers is extensions. Extensions allow you to tweak Gnome to your liking. One extension can make Gnome look somewhat like KDE, another, like Unity. Yes, Gnome has leap-frogged past Unity. That's what has happened. Gnome is used for RedHat, Centos, SUSE, Arch, Debian, and every other interesting distribution.

That's it in a nutshell,

Leslie Satenstein

No, NO, NO, Unity 8 is awesome! Hate those old worn out conventional layers of menus.

Charles Mishmash

Never liked it. Never used it. Don't like GNOME 3 nor KDE either. MATE and XFCE work like the original GNOME, which I like. Convergence is a non-issue for me, since neither Ubuntu tablets nor phones were available in the US. The things that are going are the things that got in the way of production with Ubuntu -- back to basics is a good thing.

Bill Berninghausen

I am a volunteer Linux support person because I believe in the principle of FOSS. I do not promote any Linux distro. Typically, I recommend Debian and show interested people three or four desktops, then discuss the features of various distros, and let the user decide what he or she would like to try. I always show Ubuntu with the Unity desktop as one option, but out of the last 20 installations, only one has chosen Ubuntu with Unity.

My own opinion: the Unity desktop is quite attractive but it does not offer any "must have" features and the matter of convergence does not come up because here in Canada the vast majority of tablets and smartphones are either Android or Apple. There have not been any Ubuntu phones or tablets available and nobody sees any pressing need to have one.

So, people install what appeals to them provided that it does not require a huge amount of re-learning. The main problem I encounter is that there are too many Linux distros and that confuses potential users. Even just showing a few is enough to make eyes glaze over. Most new users ask me what I use, and opt for that, even if I use one of the more complex desktops (KDE). Others will often choose the Mate or Cinnamon version of Linux Mint because they feel comfortable with them, probably because of familiarity with Windows XP. I think that Ubuntu with a Gnome desktop will probably have more installations in this region than Ubuntu with Unity previously did, as long as Canonical does not try to link commercial players to it like they did for a time with Unity. That was a big turn off – even though potential users were told that such links could be ignored or switched off. New users felt that they were being enticed into an unknown where they might be tricked into spending money and/or they would be spied upon.

I am sorry that Canonical did not succeed with Unity and their plans for convergence, but it was apparent to me, years ago, that it was an elegant solution in search of a problem. I have been there and done that myself. Sometimes our dreams just do not materialize.

Mac

I was one who stuck to Gnome for as long as I could. I had tried Unity, but it was new and unfamiliar. I wanted to get on with my work and not spend time familiarising myself with Unity, so I kept going with Maverick Meercat and Gnome for two years after support ended.

Eventually Maverick became so outdated that I decided that it was time to move on. I thought that I could take the latest version of Ubuntu (I forget which one), change the desktop to Gnome, and carry on. I found a website that explained how to do just that. Amongst the instructions was a link. The author suggested spending a few minutes reading the link and learning about Unity before changing back to Gnome. I read it, tried the suggestions, and was sold. I did not even bother to finish reading the instructions for changing back to Gnome.

I installed the latest Ubuntu and started using Unity. In a very short time, I was switching desktops with ease. I liked the idea of multiple desktops and I set up my computer to give me five by three, that is, fifteen desktops. Friends asked why I didn't just use ALT TAB. I preferred the Unity way. Also, I liked being able to call up a program quickly. For example, "Home, t, e, Enter" started Texworks. I could do it without looking at the screen. "Home, c,a, Enter" started LibreOffice Calc.

I am going to be one who misses Unity. I hope some of it will stay built in to Gnome, lurking in the background.

I would think that Mark Shuttleworth has come under pressure to change back to Gnome. Many of us have to admit that we learned to use computers the Microsoft Windows way. Gnome is, therefore, more comfortable to many of us. I will be sorry to see Unity go, it appears that most users would prefer Gnome. I will accept what I get; after all, it is still worth the price.

Victor Moisey

Now to my opinion of Unity. I hated it. It put me right off the good feeling I had of Ubuntu actually.

I think that Ubuntu started

coming off the rails when they put the window buttons on the wrong side and tried to make themselves look like Apple.

That was when I moved to Xfce.

I feel Mark has started to see sense at last. I just hope that he puts the buttons back on the correct side also. Yes I know you can change them, but it shows that he is being a follower, not a leader, doesn't it? Plus, who wants to be an Apple fan boy.

But I do respect Mark for having the guts to admit his mistake.

Don't follow Apple or Microsoft. They are the reasons people use Linux.

Ray

I'm disappointed. I, for one, was looking forward to convergence leading the way.

Maybe devs will always need powerful PCs, but, for office workers, the notion of my workplace providing me a phone, which becomes a PC when docked, and saves all data to the cloud, is the best idea to come out since the PC revolution itself.

Sorry, but Linux Mint is a chromium-plated boring rework of early Ubuntu. Spiffy looking, but actually bog-traditional.

I like Unity. It was an Ubuntu style statement. Ubuntu, alone out of all distros, came up with its own, original user interface to replace boring old menu crap.

Just as Windows was an ugly copy of the best that PARC came up with (where OS X was quite a good looking copy at one time), Windows 8 was a failed, ugly mess of (ugh) gaudy tiles that never came close to competing with Unity's elegance. I was very tired of only two mainstream styles, and Unity (and convergence) presented a refreshing alternative.

Ubuntu has been leading the world in OS style. Windows got off its glacial butt and introduced (oh, wow, man) a package manager, decades later than Linux, thanks to Microsoft's Ubuntu-envy. Windows was close to convergence, but at a price, and anyway, who wants a Windows phone?

I, for one, want an Ubuntu phone, and tablet - all I lacked was Whatsapp (OK, Franz solves that) and Uber. They would have come along. The Ubuntu phone look and feel is fantastic.

I understand convergence was an expensive mission, but I still think it will happen. Who will win? Canonical got close to leading the world, then hurled the towel in. What a shame. Having said all this, all credit to Mr. Shuttleworth and Canonical for giving it a go. It was close - a very near miss.

Canonical has vision in spades, but they need a deeper purse, and I hope the new direction toward Snappy and IOT brings them the rewards they deserve.

Jasper Cook

Well I never did like Unity. Put the window control buttons on the left and you could not change them! Also, app menus only appeared in the desktop top bar not in the app bar.

As for Gnome - well they ruined a perfectly good desktop by 'dumbing it down' so that it became very tiresome to use.

Fortunately, we have MATE - a proper, usable desktop. So no, I will not miss Unity, nor will I consider going back to Ubuntu.

Ian Pawson

I never liked Unity… or the Windows desktop after Win 7 either. So I would be happy to see Gnome return. Meanwhile, I have switched to other versions: Linux Mint, which doesn't run well on all hardware, and Linux Lite just this year which I really like. My ultimate go-to, just to make a slow computer run at a decent speed, is Puppy Linux. I'm a person who likes to get work done--and I never found later versions of Ubuntu or Windows conducive to that, for me at least.

Sr. Dorothy

Last month, we had a brief look at Estuary, the new face of KODI 17. This month, we'll check out Chorus, one of the web interfaces available for KODI 17. Before we dive into Chorus, I should mention that I had fewer problems accessing Chorus/KODI through Google Chrome and the Chromium web browser than I did with Firefox.

Chorus is the built-in web interface for KODI. To install Chorus, we simply need to enable the KODI web interface:

Click the Settings gear in the top left of the KODI Estuary interface. Click Service Settings. Click Control. Click allow remote control via HTTP.

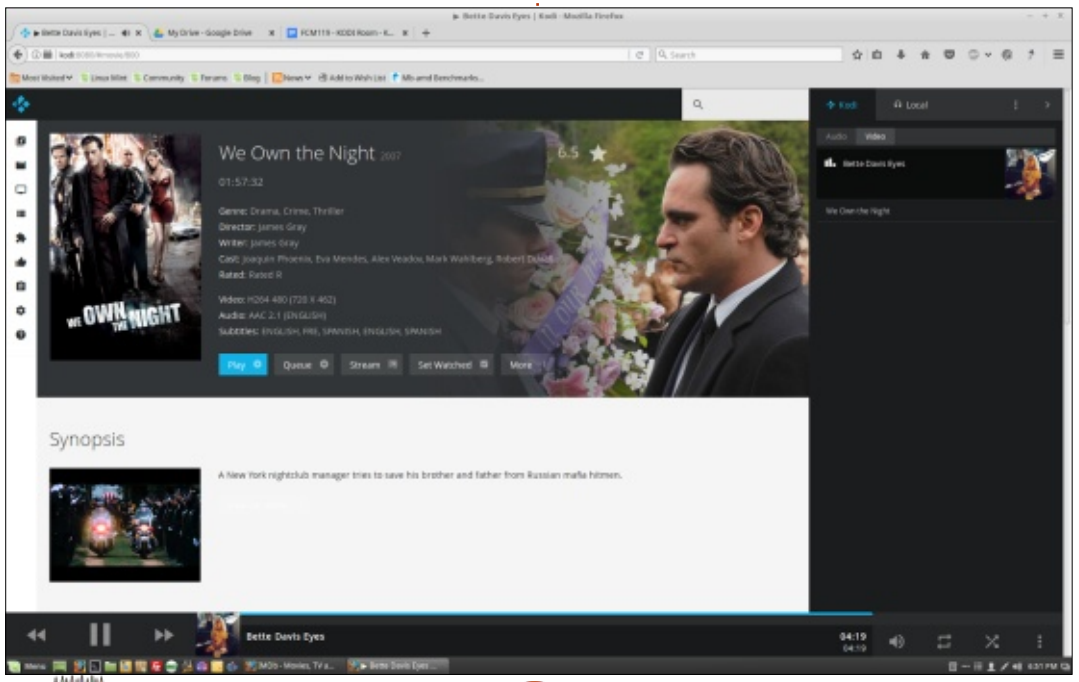
Enter a username and password for the web interface. By default the username is kodi with no password.

If you want to control KODI from other systems like a tablet, or simply another computer, click the 'Allow remote control from applications on other systems' button. If you're using KODI on just a single computer, you might want to leave this unchecked.

Once you have the web control enabled, open your browser and type http://your_kodi_hostname:8080. For example: http://kodi:8080/

In this example, I've given our main KODI server a hostname of 'kodi'. I'm accessing the KODI server from a browser on another desktop within our local network. This works for mobile devices too, though they'll display a more simplified mobile web interface.

It's worth noting that not only can you use the web interface to control KODI on your server/desktop, but you can stream simultaneously to multiple machines on the same network: whether it's a tablet, phone, laptop or desktop. As I type this, I'm listening to AC/DC streaming from our server to my desktop while our son watches a movie on the server (which is connected to our television).



The Chorus web interface looks simple enough, but there's actually a lot going on. On the far left side below the KODI logo are a number of icons: music, movies, tv shows, browser (for all sources of media), addons, thumbs up, playlist, settings, and help. Within each of these categories are other options. For example: within the music menu option are: Music, Genres, Top Music, Artists, Albums, and Videos (music videos if you have them stored on your server).

Like Estuary, when you first click on Movies, you'll get a listing that's divided into movies in progress, recently added movies, and a selection of random movies. Also, like Estuary, there's a small blue bar at the bottom of recently watched movies that shows how far into a movie you've watched. The longer the blue bar – the longer into the movie/tv show.

If you check out the top right of the browser, there are tabs with the search bar, the hostname of the server (in this case KODI) and for Local (the machine you're accessing your server from). If you click the Local tab, you can stream server media to the local machine.

Beside the local tab is a tab with 3 vertical dots, clicking on it lets you clear the current playlist, refresh the playlist, switch to party mode (random music stored on your server), or save the playlist.

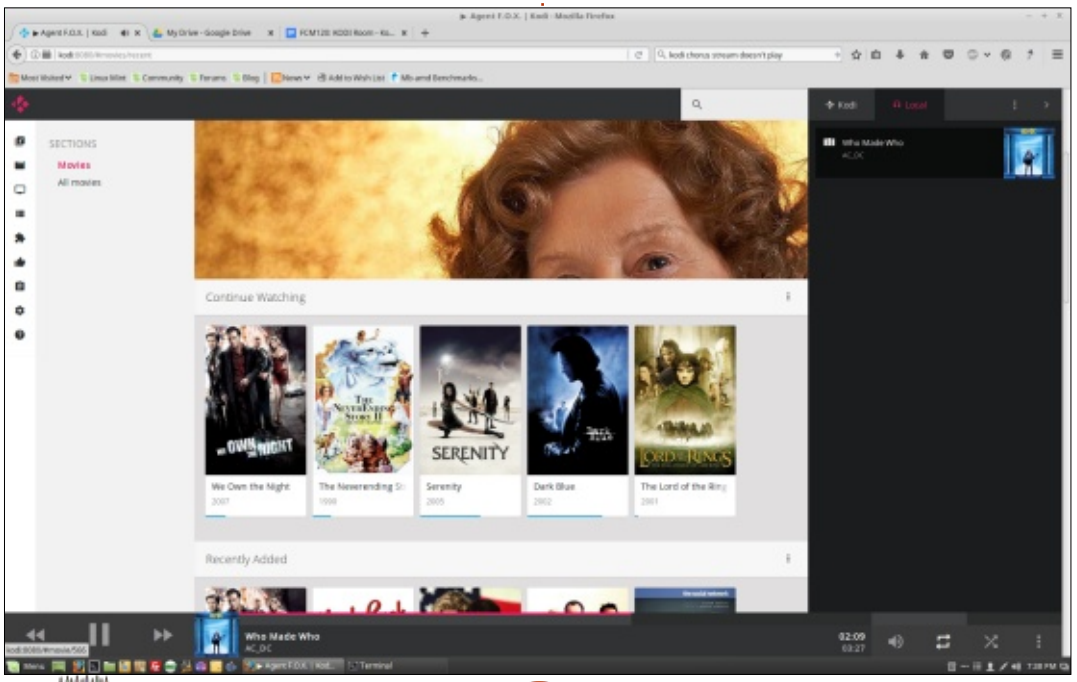
The arrow beside the three dots opens and closes these menu options. By default you might only see the search context. The search field lets you search across media. Chorus doesn't care if you're listening to tunes and searching for a movie title.

You can queue media to play different kinds of media (playlist). You might start with a song, then have a movie or television show queued afterwards. Of course the usual thing to do is create a music playlist. Chorus/KODI will automatically create a playlist of an entire album (like the screenshot showing the Queen playlist on the right side) if you hover over an album and click on the play button that appears in the bottom left of the album art.

The display of movies and television shows on the main Chorus interface is slightly different: the movie rating is shown for movies, and the number of episodes is shown for television shows. If you click on a movie/show, you can get more information about the movie/show as well as activate options to Play, Queue, Stream, set the media as watched, and execute a number of searches (Local, Google, IMDB, TVDB and Youtube) on the title.

For audio, this includes a SoundCloud search.

At the bottom of the screen are the media control buttons: Rewind, Play, Fast Forward, the media playing, the length of the media playing, the sound control button, replay button, shuffle button, and an options button that, when clicked, opens up a menu allowing you to scan your music or video library, send a text string to KODI, or learn about The Lab or Chorus. The Lab page is for tinkerers who want to run API code, take a screenshot, or have a gander at all the icons in the Chorus pack.



Chorus is nice because it allows you to queue and stream media without needing to run KODI on your local machine. It's great when you're composing a paper and want background music, or working in the kitchen and want to listen to some tunes from your KODI server on a tablet.

References:

Jeremy Graham's Chorus page: http://jez.me/article/chorus-web-interface-kodi-and-xbmc

KODI Chorus2 page: https://kodi.tv/article/new-webinterface-called-chorus2

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 works on reinventing his blog at http://www.charlesmccolm.com/.

Q&A

Compiled by Gord Campbell

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

Q I just decided to switch to Ubuntu. I installed Ubuntu 16.04 on my Lenovo T420. Unfortunately the keyboard does not work correctly. Some elements do not appear like @.

A During installation, you can select your keyboard type. After installation: http://www.wikihow.com/Change-Keyboard-Layout-in-Ubuntu

Q Is there a way to send 'yes' so I can run autoremove from within a script?

A (Thanks to ***bonestabone*** and deadflowr in the Ubuntu forums) Two ways:

```
yes | sudo -S apt autoremove

sudo apt autoremove -y
```

Q After a reinstall of minimal xubuntu 16.04 xenial using the xubuntu netinstaller / mini.iso, I can no longer access my huawei p9 as a drive.

A (Thanks to ***leuname12*** in the Ubuntu forums) Edit the /etc/udev/rules.d/51-android.rules file to allow Huawei:

```
#Huawei Technologies Co., Ltd.
SUBSYSTEM=="usb", ATTR{idVendor}=="12d1", MODE="0666", GROUP="plugdev"
```

Q I would love to know if I could install Ubuntu Touch on my tablet. I use a Dell Venue 8 3830, specs:

...

Intel Atom Processor (Up to 2GHz Dual-Core)

A Ubuntu Touch runs on ARM processors, your tablet has an Intel CPU. So the answer is "no".

Q Basically, I have to perform an offline scan for about 30 Workstations installed with various OS (Ubuntu, Windows, Red HAT). I have to use McAfee VirusScan Command Line for Linux in a live version of Ubuntu. I did the same some months ago and every time I had to install the antivirus and update the definition..... is very boring.

A See this tutorial about creating a Live USB with persistence: https://www.howtogeek.com/howto/14912/create-a-persistent-bootable-ubuntu-usb-flash-drive/

Q I'm completely new to Ubuntu and I want to wipe a few drives using a bootable USB with Ubuntu. I've looked at several videos and done what I could googling, but the command lines I write in the terminal aren't working.

A To securely wipe a hard drive, most people use DBAN. Make sure the only hard drive which is connected, is the one you want to wipe.

Q I watched a movie on my TV the other day, thru an HDMI cable. Ever since then I have no sound on Firefox, Chrome or VLC.

A (Thanks to ***lammert-nijhof*** in the Ubuntu Forums) Install PulseAudio Volume Control:

```
sudo apt install pavucontrol
```

That package has two tabs more than the standard installed Sound Settings. Check which audio device your applications are using now, probably most programs try now to use the HDMI device. Start pavucontrol and select the playback tab, Start your application and look, which audio device that application is using in the "playback" tab of pavucontrol. Use the button to select the correct audio device – maybe change from something with "HDMI" to probably something with "built-in stereo"

Top questions at Askubuntu

* Why doesn't Ctrl-C kill the Terminal itself?
https://goo.gl/C3iIFF

* Meaning of exit 0, exit 1 and exit 2 in a bash script
https://goo.gl/S6CyFC

* Is there a way to use JAVA on Ubuntu after FF stopped NPAPI support?
https://goo.gl/5PeO46

* Can I edit hosts without sudo?
https://goo.gl/AVYrSZ

* Why does no file manager ask for higher permission if needed? [on hold]
https://goo.gl/pe3WCu

* How can I tell if I have permission to run a particular command?
https://goo.gl/4SjVuI

* What is the meaning of combined commands `curl` + `apt-key add`?
https://goo.gl/RcvB0T

* How can I view history in terminal for specific date?
https://goo.gl/CrbqFg

* How to set up localhost to redirect a website
https://goo.gl/twvdu8

Tips and Techniques

Unexpected Greatness

When I set up my SSD, I installed an evaluation version of Windows 10, dual booting with Linux Mint 18. When the evaluation copy of Windows expired, I had a partition available to look at new versions of Linux.

As soon as the second beta of Xubuntu 17.04 appeared, I installed it. I was fully aware of the warning about beta software: don't count on it, expect it to break.

I installed all the software I use routinely, and that went smoothly. I rebooted when a new version of the kernel came along.

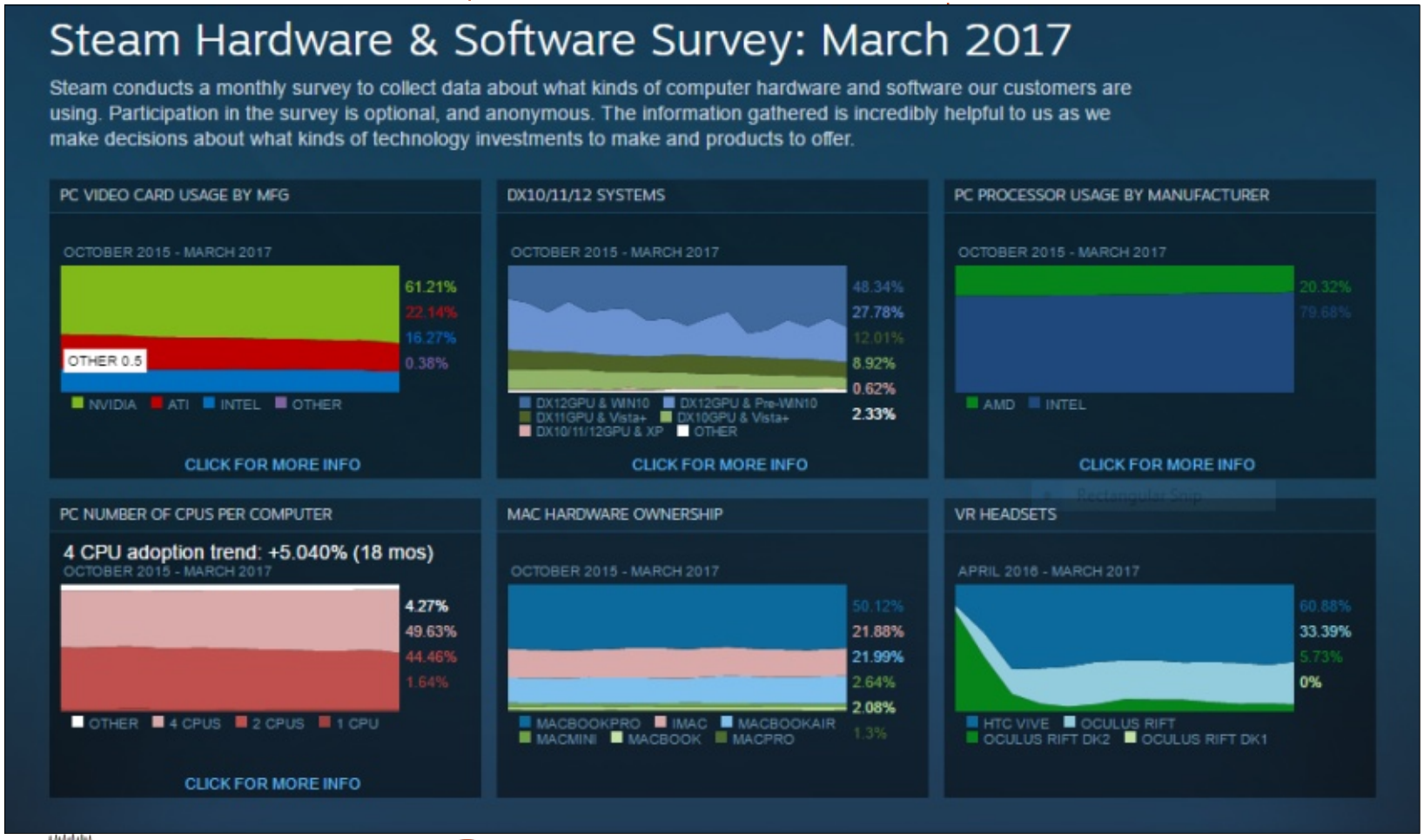
That was two weeks ago. Everything has just worked, and I have not even considered rebooting. This is the best experience I have ever had with beta software!

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.

Steam Hardware Survey

First of all, I'd like to begin by wishing Full Circle Magazine a happy 10th anniversary! Also a big thank you goes out to our fearless editor Ronnie Tucker who somehow manages to keep all contributors (including me) somewhat organized to bring you the best Ubuntu magazine every month. I began using Linux with the release of Ubuntu 10.04 which seems like just yesterday – even though it's been almost seven years. When I first began using Ubuntu, the default desktop environment was Gnome. Then, soon thereafter, Ubuntu introduced Unity which was not well received. I didn't really like Unity at first but it has since grown on me. With the recent news of Unity being dropped by Ubuntu, I was reminded that nothing lasts forever, especially experiments such as Unity and maybe also Linux gaming.

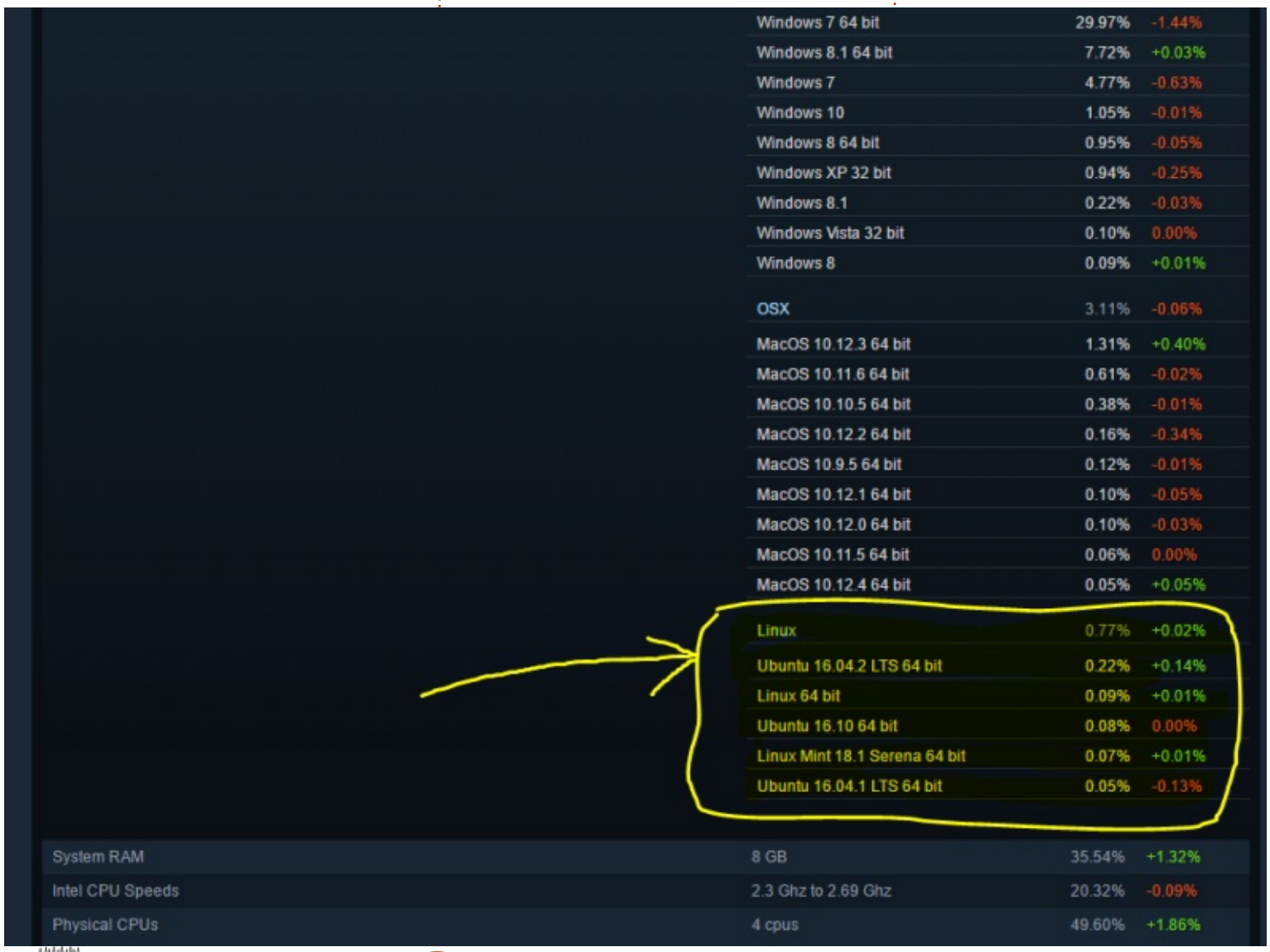
Back in 2010, the state of Linux gaming was pretty stagnant, empty, deserted, but little did I know that it was all about to change. My first full video game review was of a game titled Limbo – which is a black & white platformer with a few twists that make it very entertaining. I obtained that game as part of the Humble Indie Bundle V before Steam decided to bring some of its library to Linux. The Linux gaming landscape was on the cusp of its greatest expansion. I've witnessed the wave of top quality games being brought over to Linux and have been writing reviews of this current Linux gaming revolution over the last couple of years. As fortunate as we've been in recent years in regards to Linux gaming, and as much as the Linux gaming landscape has grown, there are always threats, menaces and obstacles around every corner. The biggest hurdle we've faced is the fear from game developers and distributors that there aren't



enough Linux gamers willing to spend money on their product. It's a very real fear especially given the fact that the methods used to gauge the number of Linux gamers are very flawed.

One of the better known surveys used to determine potential sales figures for games is the monthly Steam Hardware Survey. Every month, Valve (the company behind the Steam game engine) puts out its results gathered from the Steam Hardware Survey. This survey gathers information regarding what kind of hardware you're using, such as CPU, RAM, GPU, monitor, internet connection, and other hardware components. However, software information is also gathered through the survey, such as whether you're using 32-bit vs. 64-bit, and it lists what operating system you're using. The latest March 2017 survey (http://store.steampowered.com/hwsurvey?platform=combined) lists Linux use at 0.77% which is up 0.02% from the previous month. There is even a further breakdown that shows Ubuntu 16.04.2 LTS 64-bit as the leading Linux distribution at 0.22% and further down is Linux Mint 18.1 64-bit at 0.07%.

This survey is supposed to be gathered from random users and should technically be triggered when you run Steam at random once per month at most. However, it has been well documented that there is a huge flaw (perhaps a bug) in the way that Linux gamers receive the survey. Over the last year I've only had the Steam Hardware Survey show up in my computer once while using Ubuntu. Between two desktops and one laptop, I use Linux about 70% of the time. The remaining 30% of the time I use Windows 10, and, sometimes, although very rarely, I actually play games on Windows. Oddly enough, over the



last year, the Steam Hardware Survey has shown up almost every month that I've used Windows. I hadn't played games on Windows since summer 2016 until March of this year. On March, the Steam Hardware Survey popped up on me the one and only time I used Windows. Then two weeks ago in April, the Steam Hardware Survey showed up again the one time I turned on Steam while on Windows. In 2017, the survey still hasn't shown up on Linux even though I've spent about 95% of my time on Steam while using Ubuntu. I can testify based on personal experience that the frequency of the Steam Hardware Survey appearing on Windows vs. Linux is extremely off balance. How is it possible that out of 100+ hours of Linux use the survey has appeared only once, yet out of 12 hours of Windows use, it's shown up about 4 times over the last year?

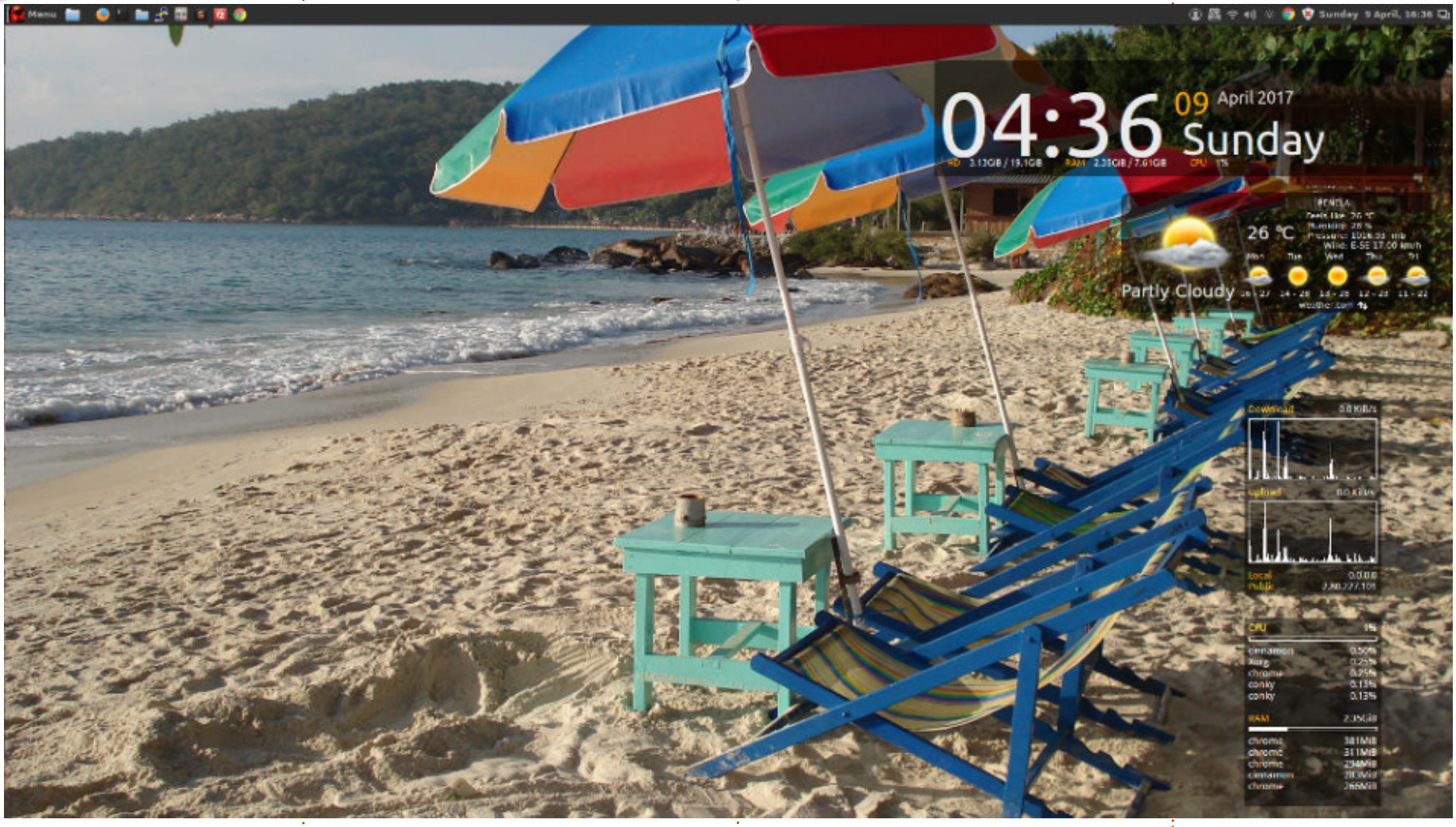
By the way, this is not an opinion article but rather a factual account as evidenced by reports from other users in places such as reddit (https://www.reddit.com/r/linux_gaming/comments/3cey4c/do_you_get_any_steam_hardware_surveys) among others. This is a real problem that very clearly undermines and under-represents Linux gamers and should be taken seriously, especially given the fact that an actual bug has been filed in Valve's own GitHub page (https://github.com/ValveSoftware/steam-for-linux/issues/2286). There have also been more than a couple of articles criticizing flaws in how Steam conducts its survey in publications/websites such as GamingOnLinux (https://www.gamingonlinux.com/articles/linux-usage-on-steam-is-better-than-people-think.6756), PC World (http://www.pcworld.com/article/3045249/linux/linux-gaming-is-much-healthier-than-steams-hardware-survey-implies.html) and more. So this is obviously a problem in that although it seems like Linux users account for less than 1% of all gamers on Steam, the real figure is almost certainly higher. Until the Steam Hardware Survey bug is addressed, the figure isn't likely to go up, and, until then, Linux gaming won't be able to flourish as much as Android gaming has (for example). Android, by the way, is based on Linux, which makes one wonder why Android has been successful in gaming yet Linux desktop hasn't. The answer comes down to sales figures.

So, what can be done about it? The first and most obvious tool at our disposal is to buy games while running Linux. Nothing speaks more to developers and distributors than sales figures. Every time we buy a game, whether through Steam, Humble Bundle, GOG (https://www.gog.com/), etc, while using Linux, we're sending a clear message. There are other actions we can take such as deciding whether or not to participate in the Steam Hardware Survey. Let me explain: If chosen to participate in this survey, your participation is optional. Thus, if you're using Linux while the survey appears, please participate in it. All information is automatically gathered with the exception of one or two questions at most. Your participation won't take more than half a minute. If, on the other hand, you're using Windows when the survey appears before you, then decline to participate in it. The more often we participate in the Linux survey as opposed to the Windows survey, the better it will be for us Linux gamers in the long run. Another thing we can do is to let Valve know that we're not being included in their survey. A good place to let them know is the GitHub bug I previously mentioned. Just add your name and a comment to that bug. The more of us who do it, the more likely it is that Valve will take this seriously. So, even though we are saying goodbye to the Unity desktop, there is still a chance we won't have to say goodbye to Linux games.

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

MY DESKTOP

If you have a desktop you'd like to share, email it to: misc@fullcirclemagazine.org. Please include as much information as you can. Such as where you got the icons, wallpaper, widgets, etc.



Here's my desktop. I use Linux Mint 18.1 Cinnamon. The wallpaper is a photo of a Thai beach taken while on holiday. (I actually play the background wallpapers as a slideshow changing every 10mins but that is what is on now)

I use Conky manager with Gotham for the time and also the Network and current processes

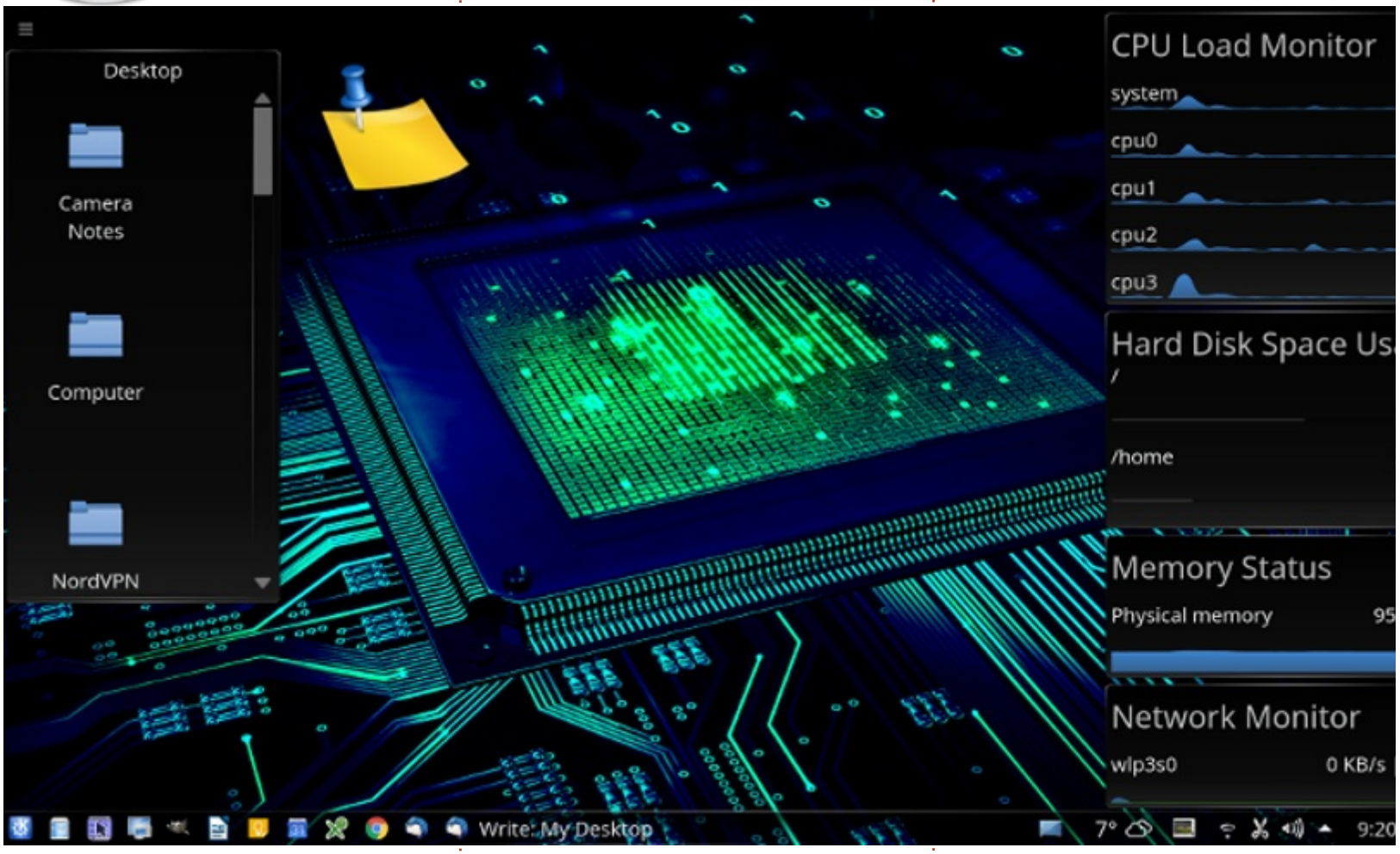
I also have the Accuweather widget with my home town: Penela in Portugal.

Fairly standard (except I much prefer the menu on the top bar) but it works for me.

Richard Cain

MY DESKTOP

If you have a desktop you'd like to share, email it to: misc@fullcirclemagazine.org. Please include as much information as you can. Such as where you got the icons, wallpaper, widgets, etc.



Here is my current favorite desktops of six monitors we use. The system is KDE 16.04 KDE Plasma Version 5.8.5

The background was downloaded from KDE Download Wallpapers, but I do not have a reference name.

The desktop widgets are stock Plasma widgets from KDE with the exception of the Weather Widget on the right side of the panel. It was added using the "Get more Widget" in the Widget options. Clicking on it will show current and 5 day graph and forecast for every 6 hr. period of each day and can be set to show multiple locations.

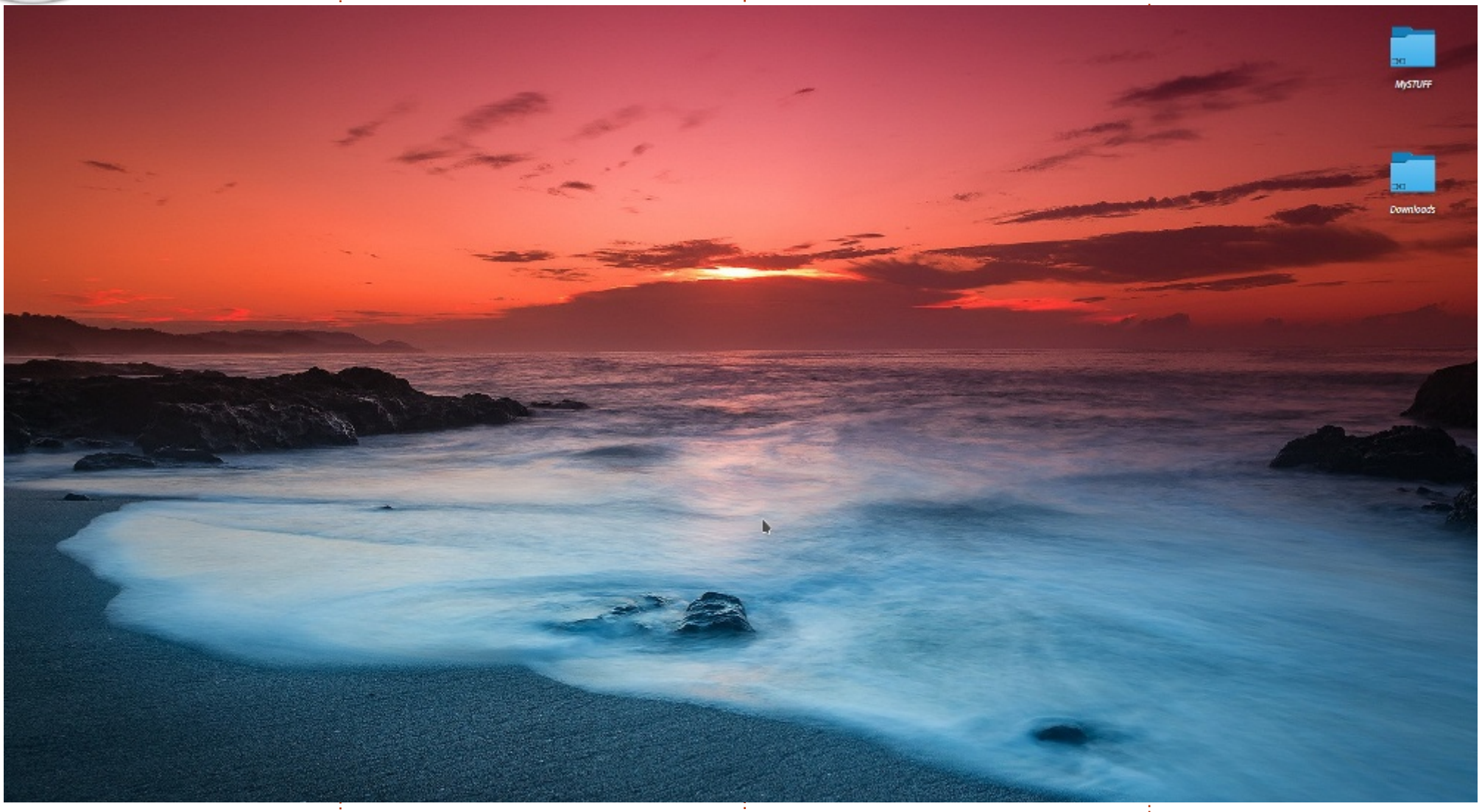
The titles of each widget are obvious with the exception of the Yellow "Desktop Sticky Note" which when clicked displays the contents of the note.

Plasma 5 widgets are still being refined. They are clunky compared to previous Plasma desktops but having used them for a few months, I have grown to like them.

Mac

MY DESKTOP

If you have a desktop you'd like to share, email it to: misc@fullcirclemagazine.org. Please include as much information as you can. Such as where you got the icons, wallpaper, widgets, etc.



Have a look at my desktop.

Few additional information:

Distro: KDE Neon (User Edition)
Workspace Theme: Breeze (not dark)

Desktop Theme: Breeze Dark
Classic Icons only

Icons Theme: Breeze

Angelos Alexiou

MY DESKTOP

If you have a desktop you'd like to share, email it to: misc@fullcirclemagazine.org. Please include as much information as you can. Such as where you got the icons, wallpaper, widgets, etc.

I am running Debian 8.7 LXDE on this machine. I also have Lubuntu on a laptop.

For the credits - the image is an orchid cuckoo bee taken from an exhibition of photomicrographs created by Levon Biss for the Oxford University Museum of Natural History: oum.ox.ac.uk/about/Microsculpture%20Levon%20Biss.pdf

Alan Page

SURVEY RESULTS

Section Ratings

Ubuntu News

533 out of 533 people answered this question

4.13
Average rating

► Hide detail

1	★★★★★	232 / **44%**
2	★★★★	184 / **35%**
3	★★★	80 / **15%**
4	★☆	27 / **5%**
5	☆	10 / **2%**

Command & Conquer

533 out of 533 people answered this question

3.51
Average rating

► Hide detail

1	★★★★★	144 / **27%**
2	★★★★	141 / **26%**
3	★★★	134 / **25%**
4	★★	72 / **14%**
5	★	42 / **8%**

How-To's

533 out of 533 people answered this question

4.28
Average rating

► Hide detail

1	★★★★★	251 / **47%**
2	★★★★	197 / **37%**
3	★★★	74 / **14%**
4	☆☆	7 / **1%**
5	☆	4 / **1%**

Inkscape

533 out of 533 people answered this question

2.87
Average rating

► Hide detail

1	★★★	137 / **26%**
2	★	126 / **24%**
3	★★★★★	101 / **19%**
4	★★	94 / **18%**
5	★★★★	75 / **14%**

SURVEY RESULTS

Linux Labs

533 out of 533 people answered this question

3.85
Average rating

▶ Hide detail

1	★★★★	191 / **36%**
2	★★★★★	166 / **31%**
3	★★★	125 / **23%**
4	★★	34 / **6%**
5	★	17 / **3%**

Letters

533 out of 533 people answered this question

3.73
Average rating

▶ Hide detail

1	★★★★★	192 / **36%**
2	★★★★	128 / **24%**
3	★★★	119 / **22%**
4	★★	65 / **12%**
5	★	29 / **5%**

My Story/Opinion

533 out of 533 people answered this question

3.57
Average rating

▶ Hide detail

1	★★★★★	160 / **30%**
2	★★★	155 / **29%**
3	★★★★	117 / **22%**
4	★★	70 / **13%**
5	★	31 / **6%**

Software Review

533 out of 533 people answered this question

3.98
Average rating

▶ Hide detail

1	★★★★	202 / **38%**
2	★★★★★	183 / **34%**
3	★★★	109 / **20%**
4	★★	31 / **6%**
5	☆	8 / **2%**

Book Review

533 out of 533 people answered this question

3.38
Average rating

▶ Hide detail

1	★★★	162 / **30%**
2	★★★★	141 / **26%**
3	★★★★★	111 / **21%**
4	★★	76 / **14%**
5	★	43 / **8%**

Q&A

533 out of 533 people answered this question

4.19
Average rating

▶ Hide detail

1	★★★★★	251 / **47%**
2	★★★★	164 / **31%**
3	★★★	91 / **17%**
4	★☆	20 / **4%**
5	☆	7 / **1%**

Ubuntu Phones/Devices

533 out of 533 people answered this question

2.91
Average rating

▶ Hide detail

1	★★★	130 / **24%**
2	★★	112 / **21%**
3	★	104 / **20%**
4	★★★★	100 / **19%**
5	★★★★★	87 / **16%**

Ubuntu Games

533 out of 533 people answered this question

2.69
Average rating

▶ Hide detail

1	★	148 / **28%**
2	★★	113 / **21%**
3	★★★	111 / **21%**
4	★★★★★	84 / **16%**
5	★★★★	77 / **14%**

More/Less of:

Graphics

533 out of 533 people answered this question

2.22
Average rating

▶ Hide detail

1	★★	267 / **50%**
2	★★★	192 / **36%**
3	★	74 / **14%**

Office

533 out of 533 people answered this question

2.37
Average rating

▶ Hide detail

1	★★★	265 / **50%**
2	★★	200 / **38%**
3	★	68 / **13%**

Video/Multimedia

533 out of 533 people answered this question

2.33
Average rating

▶ Hide detail

1	★★★	242 / **45%**
2	★★	226 / **42%**
3	★	65 / **12%**

Games

533 out of 533 people answered this question

1.69
Average rating

▶ Hide detail

1	★	268 / **50%**
2	★★	163 / **31%**
3	★★★	102 / **19%**

Audio/Music

533 out of 533 people answered this question

2.29
Average rating

▶ Hide detail

1	★★★	233 / **44%**
2	★★	222 / **42%**
3	★	78 / **15%**

Programming/Development

533 out of 533 people answered this question

2.38
Average rating

▶ Hide detail

1	★★★	287 / **54%**
2	★★	162 / **30%**
3	★	84 / **16%**

Full Circle Weekly News:

Have you, or do you, listen to the Full Circle Weekly News?

533 out of 533 people answered this question

1	No	349 / **65%**
2	Yes	184 / **35%**

How would you rate the Full Circle Weekly News?

446 out of 533 people answered this question

★★★½☆ **3.45** Average rating

▶ Hide detail

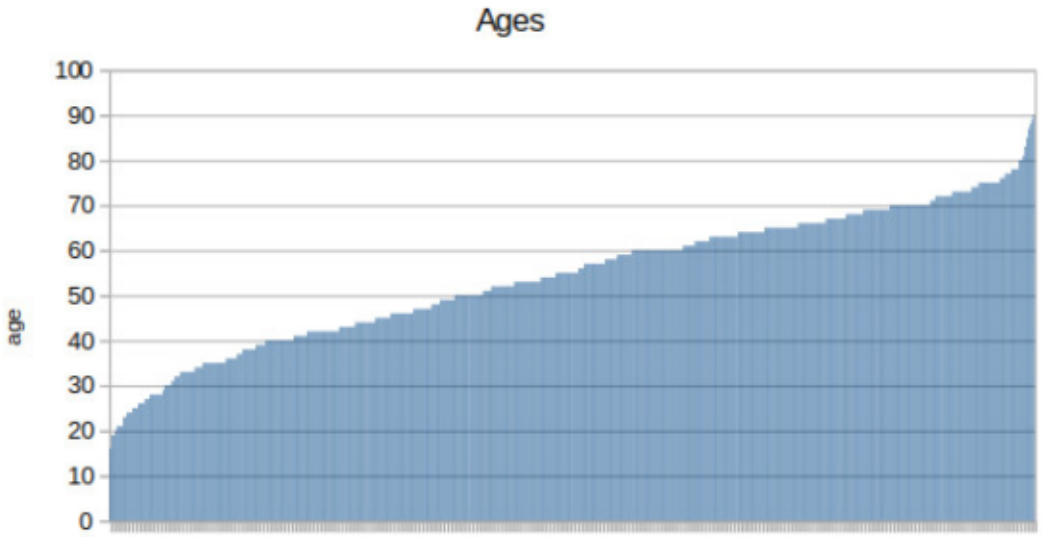
1	★★★	169 / **38%**
2	★★★★	135 / **30%**
3	★★★★★	77 / **17%**
4	★★	40 / **9%**
5	★	25 / **6%**

About You:

Gender

533 out of 533 people answered this question

1	Male	513 / **96%**
2	Female	20 / **4%**



How did you discover Full Circle?

533 out of 533 people answered this question

1	Ubuntu Forums	149 / **28%**
2	Web Search	147 / **28%**
3	... none of the above	110 / **21%**
4	From a blog	44 / **8%**
5	Ubuntu Weekly News	31 / **6%**
6	From a friend	26 / **5%**
7	Ubuntu Wiki	17 / **3%**
8	Read on Issuu	8 / **2%**
9	Read on Magzter	1 / **0%**

How long have you been a reader?

533 out of 533 people answered this question

1	Since FCM#01!	165 / **31%**
2	Three years	70 / **13%**
3	Four years	69 / **13%**
4	Five years	59 / **11%**
5	Two years	55 / **10%**
6	Six years	26 / **5%**
7	One year	23 / **4%**
8	Eight years	20 / **4%**
9	Seven y ears	18 / **3%**
10	Nine years	14 / **3%**
11	A couple of months	11 / **2%**
12	One month	3 / **1%**

Which Operating System(s) do you use?

533 out of 533 people answered this question

1	Ubuntu	319 / **60%**
2	Android	230 / **43%**
3	Windows 10	213 / **40%**
4	Ubuntu derivative (eg: Mint)	179 / **34%**
5	Windows 7	150 / **28%**
6	Other	74 / **14%**
7	Xubuntu	74 / **14%**
8	Apple OS	65 / **12%**
9	Windows XP	60 / **11%**
10	Lubuntu	59 / **11%**
11	Apple iOS	56 / **11%**
12	Kubuntu	50 / **9%**
13	Windows 8	48 / **9%**
14	BSD/FreeBSD	26 / **5%**
15	UNIX	19 / **4%**

SURVEY RESULTS

If you use an Ubuntu flavour which do you use?

470 out of 533 people answered this question

1	16.04	290 / **62%**
2	16.10	129 / **27%**
3	14.04	85 / **18%**
4	17.04	32 / **7%**
5	12.04	24 / **5%**
6	14.10	12 / **3%**
7	15.04	11 / **2%**
8	15.10	11 / **2%**
9	11.04	7 / **1%**
10	12.10	5 / **1%**
11	11.10	3 / **1%**
12	13.04	3 / **1%**
13	13.10	2 / **0%**

If you use Linux, which desktop environments do you use?

525 out of 533 people answered this question

1	Unity	211 / **40%**
2	GNOME	135 / **26%**
3	Cinnamon	122 / **23%**
4	XFCE	120 / **23%**
5	Mate	107 / **20%**
6	KDE	92 / **18%**
7	LXDE	64 / **12%**
8	I don't need no GUI!	30 / **6%**
9	Other	18 / **3%**
10	Budgie	10 / **2%**

What do you use Linux mostly for?

527 out of 533 people answered this question

1	Home	481 / **91%**
2	Business/Office	252 / **48%**
3	Multimedia	231 / **44%**
4	Development	196 / **37%**
5	Music	193 / **37%**
6	Graphics	158 / **30%**
7	Education	124 / **24%**
8	Other	33 / **6%**

Last, but not least, is a brief list of the subjects that some of you wanted to see covered in Full Circle.

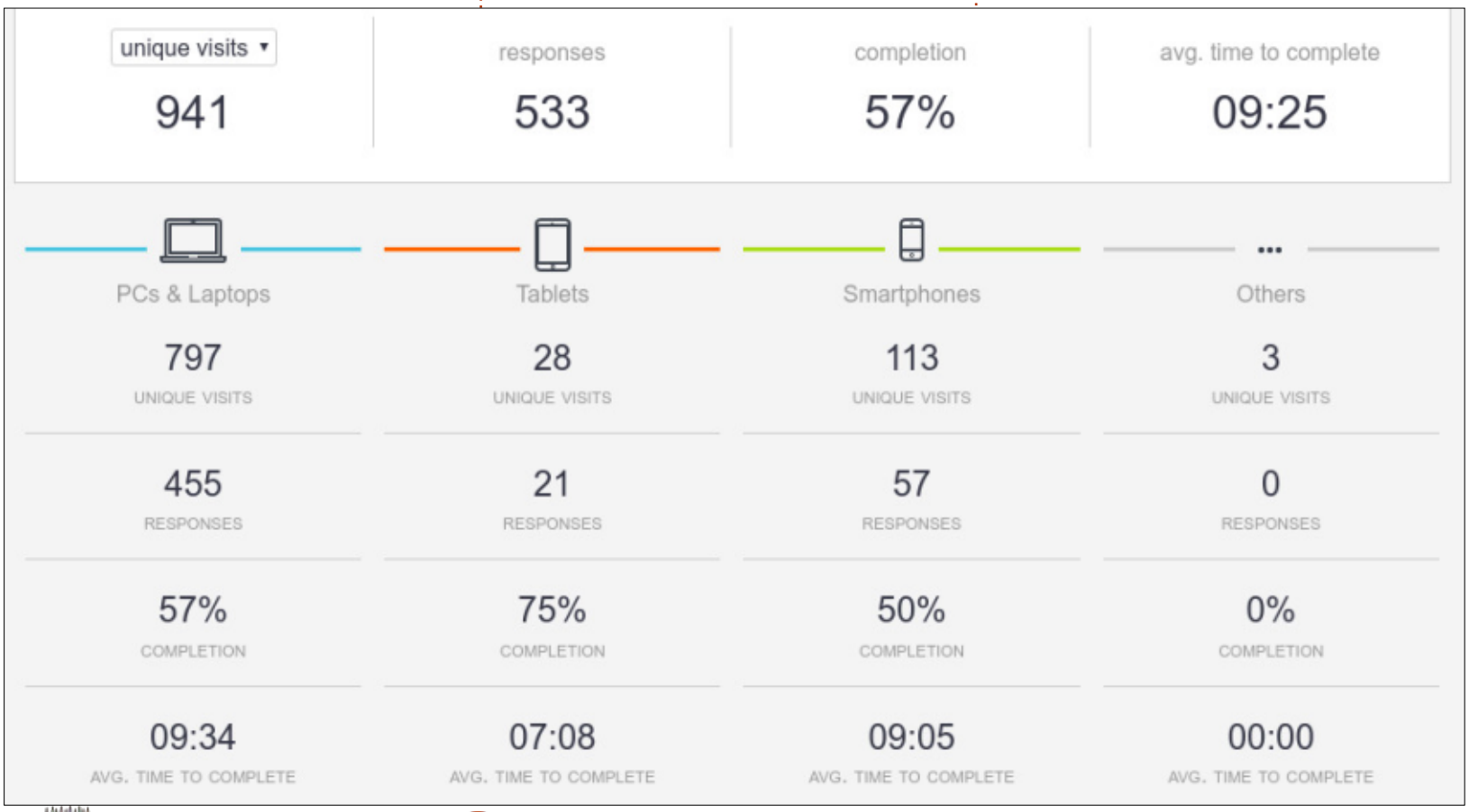
If anyone out there wants to write about these subjects please drop an email to me, Ronnie, at: ronnie@fullcirclemagazine.org and give a brief outline of what you're thinking of writing about.

You don't have to be an expert in something to write about it. If you know the basics or something and can help someone else learn the basics then that's what Full Circle is all about. We need you, the readers, to submit articles.

One final note on 'things you'd like to see covered': putting '*more articles for newbies*' (as many people did) doesn't mean anything. We need to know exactly what it is you don't understand. Where you're getting stuck. Feel free to send an email to the above address detailing more about your problems with articles in FCM, or just in using Ubuntu/Linux.

- Server
- Security
- Networking
- Themes
- Window decoration
- Shell scripts
- Windows > Ubuntu
- Ardour
- Music programming
- VPS
- Web design
- 3D printing
- Statistics with Python
- Business software
- Tips and tricks
- Distro reviews
- Windows alternatives
- Wine configurations
- Desktop environment configurations
- Performance tweaks
- Compile portable distro (for USB)
- BASH scripts
- First setup guidelines
- Download from non-Ubuntu sources
- Partitioning to preserve /home
- Optimise partitions
- Amateur radio (HAM)
- Kernel stuff
- Small server setups
- Security articles
- Home automation/control
- Forensics
- Bug tracking
- LTS vs Current release
- Linux system files

Several people asked about a table of contents for Full Circle. While we don't have all 120 issues in it, there's a link to a Table of Contents at the top of the Full Circle web site. I think it currently only covers FCM#01-80, but if anyone out there wants to take on the task of updating that wiki page, or making a new ToC, feel free.



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2017:

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2017:
Linda Prinsen
Shashank Sharma
Glenn Heaton
Frank Dinger

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

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

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

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

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Donate with PayPal
https://paypal.me/ronnietucker

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

FCM#121
Deadline:
Sunday 14th May 2017.
Release:
Friday 26th May 2017.

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
Hardware/software **reviews** should be sent to: reviews@fullcirclemagazine.org
Questions for Q&A should go to: questions@fullcirclemagazine.org
Desktop screens should be emailed to: misc@fullcirclemagazine.org
... or you can visit our **site** via: fullcirclemagazine.org

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

For the Full Circle Weekly News:

You can keep up to date with the Weekly News using the RSS feed: http://fullcirclemagazine.org/feed/podcast

Or, if your out and about, you can get the Weekly News via Stitcher Radio (Android/iOS/web): http://www.stitcher.com/s?fid=85347&refid=stpr

and via TuneIn at: http://tunein.com/radio/Full-Circle-Weekly-News-p855064/

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