



Full Circle

THE INDEPENDENT MAGAZINE FOR THE UBUNTU LINUX COMMUNITY

ISSUE #117 - January 2017

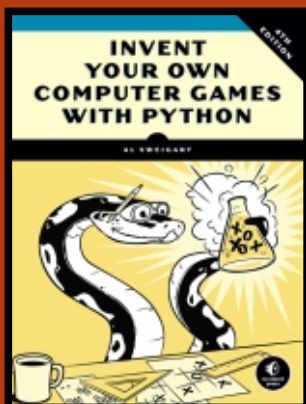


NEW SERIES

NEW



BOOK REVIEW



SPEECH RECOGNITION DICTATING A NOVEL USING LINUX

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HowTo

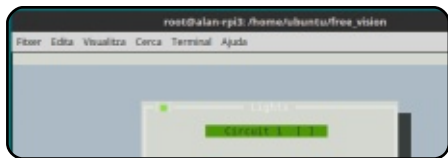


Python p.18

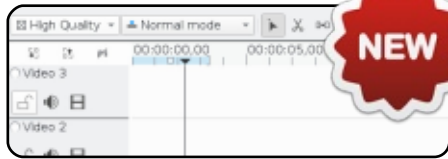
```
alan@alan-vaio:~$ ssh alanw
Welcome to Ubuntu 16.04.1 L

* Documentation: https://
* Management: https://
```

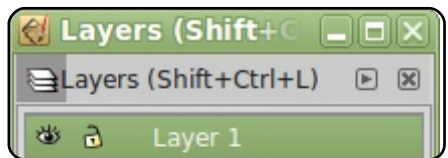
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Kdenlive p.37



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Graphics

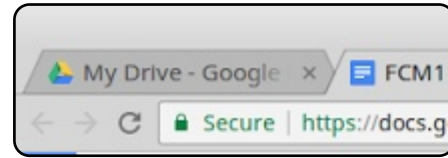


Full Circle

THE INDEPENDENT MAGAZINE FOR THE UBUNTU LINUX COMMUNITY

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

Command & Conquer p.16



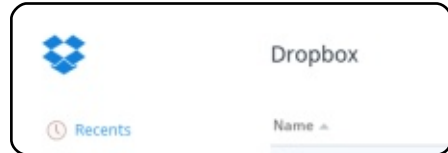
Linux Labs p.42



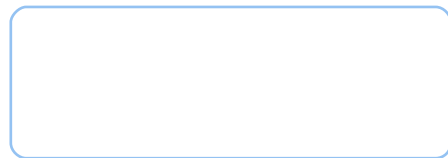
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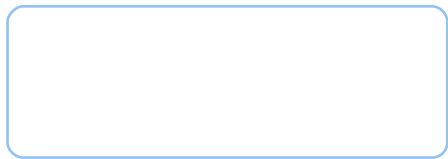
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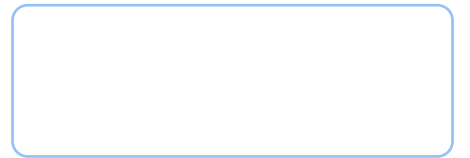
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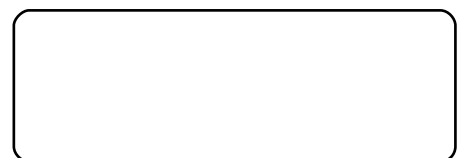
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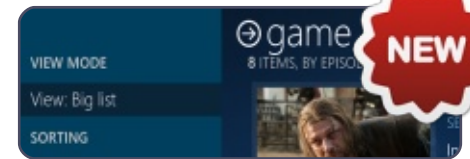
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WELCOME TO THE LATEST ISSUE OF FULL CIRCLE.

Once again, we have Python, Inkscape, Kodi, a game review, and the final part in our FreePascal series. A new series (from yours truly) starts this month: **Kdenlive**.

As some of you may know I've been regularly updating my YouTube channel with board gaming videos (and some art stuff). Doing YouTube videos means getting familiar with video editing, and video editing is a touchy subject in Linux. Yes, there are quite a few video editors out there, but most are either too simplistic, or missing features. To me, Kdenlive is the one that is the best of the bunch.

This month's issue contains what is, quite probably, the most unusual article in FCM's illustrious history. Charles' Linux Lab article is written audibly. Yes, Charles sat down with some speech to text software and wrote his article using it. Most of the mistakes made from the speech to text conversion are kept intact, and on purpose. It's an interesting article and definitely worth a read. Some readers out there may, for whatever reason, find typing difficult, so a speech to text application could come in handy for them. Speech to text has certainly come a long way since the early days of Dragon Dictate on Windows. Although, having said that, I personally may give it a try as quite a lot of speech recognition software fails miserably with my Scottish accent. I'm looking at you Google and Amazon (Echo).

I've set up a poll which I hope you'll fill in. It's located at: <https://goo.gl/Q8Jm4S>. I'm interested in what you like/dislike about FCM. What I can change/add, and anything else you want to add. I'll publish the results in a future issue.

All the best, and keep in touch!

Ronnie

ronnie@fullcirclemagazine.org



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



FCM POLL

I've set up a poll which I hope you'll fill in. It's located at:
<https://goo.gl/Q8Jm4S>.

We're interested in what you like/dislike about FCM. What I can change/add, and anything else you want to add.

We'll publish the results in a future issue.

LINK: <https://goo.gl/Q8Jm4S>

GENTOO-BASED CALCULATE LINUX 17 LAUNCHES WITH KDE PLASMA 5.8.5 LTS AND MATE 1.16

Alexander Tratshevskiy announced the release and general availability of Calculate Linux 17, a Russian desktop-oriented computer operating system based on Gentoo.

Calculate Linux 17 comes seven months after the Calculate Linux 15.17 release and promises great new features, including the latest KDE Plasma 5.8.5 LTS, MATE 1.16, and Xfce 4.12 desktop environments, along with the long-term supported Linux 4.4.39 kernel.

However, the biggest new feature of this release appears to be a brand-new server edition called Timeless, which incorporates the OpenLDAP 2.4.43 open-source implementation of LDAP, and Calculate Utilities 3.5.0.10.

Calculate Linux 17 Timeless

features a bunch of functions, including LDAP server configuration, user account management via LDAP, backup, CLI and GUI interfaces, client-server architecture, and integration with the built-in package manager.

Source:

<http://news.softpedia.com/news/gentoo-based-calculate-linux-17-launches-with-kde-plasma-5-8-5-lts-and-mate-1-16-511415.shtml>

NETRUNNER DESKTOP 17.01 'BARYON' DEBIAN 9 STRETCH-BASED KDE LINUX DISTRO NOW AVAILABLE

If you are a fan of KDE, I hope you are aware of Netrunner Desktop. If not, please know that it is one of the most polished Linux distributions available. If you haven't tried it, you definitely should -- it is a wonderful "out of the box" experience. It is a great choice for those looking to switch from Windows too.

The operating system reaches version 17.01. Code-named "Baryon," it is based on the upcoming Debian 9 "Stretch." Users can choose to either run the OS as a stable release or opt for a more bleeding-edge rolling release.

Source:

<http://betanews.com/2017/01/02/netrunner-desktop-17-01-baryon-debian-linux/>

"CLEAR LINUX" BY INTEL — THE NEXT GREAT LINUX DISTRO FOR GAMING?

Gaming on Linux is going to get better, thanks to the upcoming Steam support on Intel's Clear Linux distribution. Currently focused on workstation and server performance, this OS already ships with the latest Mesa stack. While Clear Linux doesn't offer dedicated graphics support, it can surely help one build a good Steam gaming box with Intel hardware.

For the past couple of years, Intel's

Open Source Technology Center has been working on its Clear Linux distro to bring the best Linux support for Intel hardware in cloud-based deployments. While Clear Linux is mostly focused on workstation/server performance, its developers are working to bring the support for Steam.

Source:
<https://fosbytes.com/intels-clear-linux-distribution-might-soon-become-a-great-choice-for-gaming/>

PELICANHPC 4.1 GNU/LINUX DISTRO HITS STABLE AFTER MORE THAN A YEAR IN THE MAKING

After entering the testing channel one and a half years ago, on March 3, 2015, the Debian-based PelicanHPC 4.0 GNU/Linux distribution designed for setting up a high-performance computing cluster has finally hit stable.

PelicanHPC 4.1 is now the latest stable version of the computer operating system, and it comes as a drop-in replacement for the

previous stable release, PelicanHPC 3.1, announced almost two years ago, on February 18, 2015. It's based on Debian GNU/Linux 8.6 "Jessie" and the Debian Live scripts build 4.x.

The PelicanHPC 4.1 release isn't a big one, though, as the release notes say it only fixes various bugs discovered since last year's PelicanHPC 4.0 testing version, addresses an SSH (Secure Shell) issue with the Xfce desktop environment, adds support for mounting PELHOME partitions, and introduces the distributed monitoring system.

Source:
<http://news.softpedia.com/news/pelicanhpc-4-1-gnu-linux-distro-hits-stable-after-more-than-a-year-in-the-making-511449.shtml>

SECURITY-ORIENTED KODACHI 3.6 LINUX OS IMPROVES VPN AND TOR CONNECTIVITY, MORE

Released on December 29, 2016, Kodachi Linux 3.5 is a major release that appears to have

been in development for the past two months, rebased on Debian 8.6 "Jessie" operating system and shipping with a highly modified Xfce desktop environment.

Probably the most exciting change is that the OS is now bundled with the Refracta Installer, which lets users install the distro on their personal computers, but there are many other cool new features to get excited about in Linux Kodachi 3.5, such as the introduction of the Gibru engine for searching bookmarks.

A brand-new tool called MAT can act as a metadata anonymization toolkit, the script for displaying CPU and network monitors on the taskbar was improved, and it looks like there's an in-house built VPN (Virtual Private Network) utility that promises to let you use your own VPN.

The detection of your monitor's screen resolution changes has been improved in Linux Kodachi 3.5, and it will now be displayed accordingly. Also improved is the Kodachi script, and the Electrum Bitcoin wallet, various Firefox plugins, VeraCrypt disk encryption tool, and Mozilla Firefox web

browser, and Komodo IDE were updated.

Source:
<http://news.softpedia.com/news/security-oriented-kodachi-3-6-linux-os-improves-vpn-and-tor-connectivity-more-511447.shtml>

INKSCAPE VERSION 0.92 IS RELEASED!

The Inkscape project announces a new version 0.92 of its popular vector drawing software. New features include mesh gradients, improved SVG2 and CSS3 support, new path effects, interactive smoothing for the pencil tool, a new Object dialog for directly managing all drawing elements, and much more. Infrastructural changes are also under way, including a switch to CMake from the venerable Autotools build system.

Source:
<https://inkscape.org/en/news/2017/01/04/inkscape-version-092-released/>

UBUNTU-BASED EXTON|OS DISTRO NOW SHIPS WITH MATE 1.16 DESKTOP & LINUX KERNEL 4.9

Exton|OS Build 161231 launched on December 31, 2016, based on the stable Ubuntu 16.10 (Yakkety Yak) operating system and MATE 1.16 desktop environment. However, the most exciting thing about the new release is the implementation of a custom and fully patched Linux kernel 4.9.0-11-exton build.

Linux kernel 4.9 brings lots of improvements for AMD Radeon GPU users and many other goodies. Apart from that, Arne Exton managed to include Refracta tools, which let users create their own live Linux OS based on Canonical's Ubuntu 16.10.

Other than that, users will find popular apps like Firefox, Google Chrome, VLC Media Player, and GIMP. As mentioned before, Exton|OS Build 161231 is based on Ubuntu 16.10 (Yakkety Yak), the 64-bit version, but it also looks like it includes various packages from the Debian Testing (upcoming

Debian GNU/Linux 9 "Stretch") repositories.

Source: <http://news.softpedia.com/news/ubuntu-based-exton-os-distro-now-ships-with-mate-1-16-desktop-linux-kernel-4-9-511488.shtml>

CENTOS 7.3 (1611) LINUX DISTRO OFFICIALLY RELEASED FOR ARM64/AARCH64 MACHINES

CentOS Linux 7.3 (1611) is based on the freely distributed sources of Red Hat Enterprise Linux 7.3. Coming three weeks after Karanbir Singh's announcement of CentOS Linux 7.3 (1611) on x86_64 (64-bit) hardware, as well as Fabian Arrotin's release for the CentOS userland 7.3 (1611) on ARMhf platforms, the latest version of the server-oriented operating system can now be used on AArch64 (ARM64) machines, too.

Before getting all excited, take a moment and read the known issues for this release of CentOS Linux 7.3 (1611) on ARM64

hardware architectures. For starters, if you're deploying the operating system on Mustang-based boards, you should know that they must have the latest firmware version installed or there won't be proper network support when the Linux 4.5.0-19 or later kernels are used.

Source: <http://news.softpedia.com/news/centos-7-3-1611-linux-distro-officially-released-for-arm64-aarch64-machines-511534.shtml>

UNAV 0.64 TURN-BY-TURN GPS NAVIGATION APP NOW AVAILABLE FOR UBUNTU PHONES

UNav 0.64 comes four months after version 0.63, which was a minor update improving the simulator, adding support for skipping confirmation of routes, rounding off the distance to the nearest turn in guidance mode, fixing the '???' string in POI names, adding CartoDB layers, as well as a bash script to generate translations.

Not that uNav 0.64 is a major release, but it looks like it adds some improvements over the previous version. Among these, we can mention centering on POI (Point of Interest) in search instead of in an area, correct roundabout of arrow directions for some countries, and Breton voice support.

Source: <http://news.softpedia.com/news/turn-by-turn-gps-navigation-app-now-available-for-ubuntu-phones-511576.shtml>

LINUX MINT 18.1 XFCE EDITION ENTERS BETA, BASED ON UBUNTU 16.04 AND XFCE 4.12

Borrowing the internals from its bigger brothers, namely Linux Mint 18.1 "Serena" Cinnamon and MATE editions, the Xfce flavor of the recently unveiled Linux Mint 18.1 distribution is based on Canonical's Ubuntu 16.04 LTS (Xenial Xerus) operating system and built upon the lightweight Xfce 4.12 desktop environment.

Under the hood, it's powered by the long-term supported Linux 4.4 kernel with linux-firmware 1.157.5, just like Ubuntu 16.04 LTS is, includes the MDM (Mint Display Manager) 2.0 login manager, as well as all the in-house built applications distributed as part of the X-Apps initiative. These include Xviewer, Xreader, Xplayer, and Xed.

Source:

<http://news.softpedia.com/news/linux-mint-18-1-xfce-edition-enters-beta-based-on-ubuntu-16-04-and-xfce-4-12-511556.shtml>

FIREFOX DEVELOPER EDITION NOW AVAILABLE AS A FLATPAK FOR FEDORA 25, UBUNTU 16.10

According to the developer, whose team is responsible for the RPM packages of Mozilla Firefox for Fedora and Red Hat Enterprise Linux operating systems, the most requested thing by users was a Flatpak package, which is a universal binary format allowing application developers to distribute their apps across multiple Linux OSes.

While currently ditching the standard Firefox web browser as a Flatpak because it doesn't bring a lot of benefit at the moment, they created a testing, unofficial Flatpak for the Developer Edition, which is not all that accessible to most Fedora Linux users. The Flatpak is built on Red Hat's internal build cluster.

The Firefox Developer Edition was successfully tested on the Fedora 25, Ubuntu 16.10, and openSUSE Tumbleweed distributions. However, before getting excited and installing it, you should be aware of the fact that it's currently not sandboxed.

This means that the web browser will have full access to your Home directory, which might compromise your system's integrity. If you want to test it, you'll need Flatpak 0.6.13 or later installed on your distribution.

Source:

<http://news.softpedia.com/news/firefox-developer-edition-now-available-as-a-flatpak-for-fedora-25-ubuntu-16-10-511573.shtml>

UBUNTU-BASED ULTIMATE EDITION 5.0 GAMERS DISTRIBUTION IS OUT FOR LINUX GAMING

The goal of the Ultimate Edition project is to offer users a complete, out-of-the-box Ubuntu-based computer operating system for desktops, which is easy to install or upgrade with the click of a button. It usually ships with 3D effects, support for the latest Wi-Fi and Bluetooth devices, and a huge collection of open-source applications.

There are several editions of Ultimate Edition that are maintained even to this day, and while Ultimate Edition 5.0 shipped last year in September, based on Ubuntu 16.04 LTS (Xenial Xerus), it's time for the Ultimate Edition Gamers to get a new release. As such, we'd like to tell you all about Ultimate Edition 5.0 Gamers.

Using the latest Xfce 4.12 desktop environment, which offers users a lightweight interface perfectly engineered for playing games, Ultimate Edition 5.0 Gamers is also based on Canonical's Ubuntu 16.04

LTS (Xenial Xerus) operating system, meaning that it ships with the long-term supported Linux 4.4 kernel.

While you won't find an office suite and any of the usual software applications that are included in the Ultimate Edition flavor, Ultimate Edition 5.0 Gamers is bundled with over 50 Linux games for all ages and genres, including the popular 0 A.D., Armagetron Advanced, Capitalism, Crack Attack, Defendguin, LBreakout2, and Pax Britannica.

But users will also find Steam, Valve's digital gaming distribution platform, allowing you to play all the awesome games you've purchased on Steam for Linux until this day. As a bonus, Ultimate Edition 5.0 Gamers includes various emulators, such as DOSBox, the ScummVM interpreter, as well as Wine, which lets you play Windows games.

Source:

<http://news.softpedia.com/news/ubuntu-based-ultimate-edition-5-0-gamers-distribution-is-out-for-linux-gaming-511680.shtml>

DELL'S NEW PRECISION MOBILE WORKSTATION PCs AVAILABLE WITH UBUNTU OR WINDOWS

Dell is updating its Precision mobile workstation line of powerful laptop computers with new models sporting Intel Kaby Lake processors, optional NVIDIA graphics, and a choice of Windows or Ubuntu software.

You can already purchase the 15.6 inch Dell Precision 3520 for \$828 and up, and several additional models are coming soon.

The Precision 3520 is available with 35 watt, quad-core Intel Core i5, Core i7, and Xeon E3 CPU options, up to 32GB of RAM, up to 2TB of storage, and 1366 x 728 pixel and 1920 x 1080 pixel display options.

The notebook is available with a 68 Wh or 92 Wh battery and includes three USB 3.0 ports, a Thunderbolt 3/USB Type-C port, VGA and HDMI ports, an Ethernet jack, headphone jack, and SIM card slot.

It weighs 4.6 pounds and measures

about an inch thick.

Dell will also offer a Precision 5520 model soon, with support for 15.6 inch, 1080p and 3840 x 2160 pixel display options. And the upcoming Precision 7520 has a 15.6 inch 1080p or 4K display, up to 64GB of RAM, up to 3TB of storage, and NVIDIA Quadro or AMD Radeon Pro graphics.

There's also a 17.4 inch model with support for up to 64GB of RAM and 4TB of storage.

Source:

<https://liliputing.com/2017/01/dell-s-new-precision-mobile-workstation-pcs-available-ubuntu-windows.html>

EXLIGHT LETS YOU CREATE YOUR OWN UBUNTU WITH ENLIGHTENMENT 0.20 AND LINUX 4.9

Based on Ubuntu 16.10 (Yakkety Yak) and borrowing various components from both the Debian Stable and Testing repositories, ExLight Build 170105 is now the most advanced version

of the GNU/Linux distribution, shipping with a custom Linux 4.9 kernel injected with support for all the modern hardware and the Enlightenment 0.20.99.0 desktop.

These days, almost all of Arne Exton's GNU/Linux distributions come pre-installed with the Refracta tools, an open-source utility that lets users create their own live system with few mouse clicks, and ExLight Build 170105 is no different. It allows you to build your own Ubuntu live system in minutes.

Besides Linux kernel 4.9 and Enlightenment 0.20.99.0, ExLight Build 170105 also introduces a new boot option that allows users to use the live session directly from RAM, ejecting the bootable medium. Also, it replaces Ubuntu's Ubiquity live installer with the Refracta Installer, which is a lot easier to use if you want to install the OS.

Source:

<http://news.softpedia.com/news/exlight-lets-you-create-your-own-ubuntu-with-enlightenment-0-20-and-linux-4-9-511720.shtml>

CANONICAL PATCHES 4 LINUX KERNEL VULNERABILITIES IN ALL SUPPORTED UBUNTU OSES

On January 11, Canonical released the first security patches of 2017 to address up to four Linux kernel vulnerabilities in all supported Ubuntu Linux operating systems.

These days, Canonical only releases security fixes as a pack, for all Ubuntu releases, and the first one for the new year isn't even all that big. There are two security issues affecting Ubuntu 16.10 (Yakkety Yak) and Ubuntu 12.04 LTS (Precise Pangolin), three flaws affecting Ubuntu 16.04 LTS (Xenial Xerus), and four affecting Ubuntu 14.04 LTS (Trusty Tahr).

There's no remote escalation this time, so these security flaws aren't all that bad. However, this doesn't mean that you shouldn't update your Ubuntu Linux installation right now. The new kernel versions are linux-image 3.2.0-120.163 for Ubuntu 12.04 LTS, linux-image 3.13.0-107.154~precise1 for Ubuntu 12.04 LTS Trusty HWE,

linux-image 3.13.0-107.154 for Ubuntu 14.04 LTS, and linux-image 4.4.0-59.80~14.04.1 for Ubuntu 14.04 LTS Xenial HWE.

On the other hand, Ubuntu 16.04 LTS users need to update their systems to the linux-image 4.4.0-59.80 kernel, as well as linux-image-4.4.0-1040-raspi2 4.4.0-1040.47 if they're using the Raspberry Pi 2 kernel, and Ubuntu 16.10 users need to update their installations to linux-image 4.8.0-34.36, and linux-image-4.8.0-1022-raspi2 4.8.0-1022.25 if they're using the Raspberry Pi 2 port.

Source:
<http://news.softpedia.com/news/canonical-patches-4-linux-kernel-vulnerabilities-in-all-supported-ubuntu-os-es-511750.shtml>

MANY IT PROS ASK FOR LINUX AND CLOUD TRAINING

A significant share of technology professionals said they encounter barriers in getting necessary, regular training on Linux and cloud systems, according to a recent survey from the Linux Academy. Very few reported that their IT department has such an

advanced grasp of these topics that it requires little training. Many, in fact, would like to get up to speed on Linux, DevOps and the Amazon Web Services (AWS). However, time constraints, budget limitations and inadequate employer support are keeping these workers from getting the training they need. It doesn't help that, thanks to the shortage of available talent, it's taking two months or longer to fill open job vacancies that demand Linux or cloud skills. "The advancement of [open source and cloud] technologies is clearly outpacing the pool of professionals who are able to service and manage them," said Anthony James, founder of the Linux Academy. "By the time professionals receive the training they need, the technologies have progressed, making their training obsolete. This underscores not only the need for access to timely and affordable training, but also for companies to further invest in their employees' skills." Nearly 890 IT professionals took part in the research.

Source:
<http://www.baselinemag.com/careers/slideshows/many-it-pros-ask-for-linux-and-cloud-training.html>

MESA 13.1.0 BRANCH IS NO MORE, MESA 17.0.0 TO LAND IN THE FIRST WEEK OF FEBRUARY

Collabora's Emil Velikov announced that the upcoming Mesa 13.1.0 branch of the widely-used 3D graphics stack will change its versioning scheme to Mesa 17.0.0.

Those of you bleeding-edgers who are using the Mesa 3D Graphics Library from Git, a.k.a. the development (unstable) branch of the graphics stack used in numerous GNU/Linux distributions to provide various open-source drivers for Intel, AMD, and Nvidia graphics cards, should have already noticed the major change.

Mesa 13.1.0 is now known as Mesa 17.0.0 if you pull the latest code from Git, which the Padoka and Oibaf PPA do for Ubuntu 16.04 LTS (Xenial Xerus) and Ubuntu 16.10 (Yakkety Yak) platforms. It appears that the Mesa people decided to change the versioning scheme at the beginning of a new year, so now being 2017, here comes Mesa

17.0.0.

The release plan is already in place, and it looks like Mesa 17.0.0 will enter Feature Freeze in only two days from the moment of writing this article, on January 13, 2017, when you should also be able to get your hands on the first Release Candidate (RC) development build.

Source:
<http://news.softpedia.com/news/mesa-13-1-0-branch-is-no-more-mesa-17-0-0-to-land-in-the-first-week-of-february-511751.shtml>

AMDOCS AIDS LINUX FOUNDATION IN OPEN SOURCE ECOMP

Amdocs, provider of digital customer experience solutions, today announced that it will partner with the Linux Foundation to accelerate the global adoption of the open source Enhanced Control, Orchestration, Management and Policy (ECOMP) platform. Hosted by the Linux Foundation, this new project will make ECOMP open source available to service providers and cloud developers in 2017.

AT&T have previously announced their plan to build a global community around ECOMP and said it was working with the Linux Foundation as the host for this open source initiative. Since this announcement, both Bell Canada and Orange have released endorsements of the standard. Amdocs will play a role of key contributing member in the new Linux Foundation project, bringing significant software development capabilities and industry expertise to drive industry adoption of OpenECOMP.

Source:
<http://www.lightreading.com/nfv/nfv-mano/amdocs-aids-linux-foundation-in-open-source-ecomp/d/d-id/729579>

OPENSUSE LINUX ARRIVES ON WINDOWS 10

In its Anniversary Update, Microsoft launched Windows Subsystem for Linux (WSL). This allowed the Windows 10 users to run Bash on Ubuntu on Windows 10. The upcoming Creators Update will improve this experience. But,

the openSUSE developers don't agree with Microsoft's choice.

Now, openSUSE has given the users an option to run openSUSE inside your Windows 10 installation. This way, you can run most openSUSE tools within Windows 10.

In a blog post, Sr. Product Manager SUSE Linux Enterprise SUSE, Hannes Kühnemund, has said that SUSE is in the business since 1992, thus, they're very dependable.

Kühnemund has also described how to install a SUSE Linux distribution in WSL. Currently, the users have two options — openSUSE Leap 42.2 and SUSE Linux Enterprise Server 12 SP2.

Source:
<https://fossbytes.com/opensuse-linux-on-windows-10/>

SKYPE FOR LINUX ALPHA 1.15 RELEASED WITH SUPPORT FOR AUTOSTART AND MORE

Microsoft yesterday released a new update of Skype for Linux users. Skype for Linux Alpha 1.15 now comes with support for autostart and option to launch minimized. This update also includes a few other improvements, like updated to Electron 1.4.10, enabled context menu with copy/paste commands in the message input area, added the option to autostart, added the option to launch minimized (Tools->Launch Minimized), many smaller improvements and bugfixes.

Source:
<https://mspoweruser.com/skype-for-linux-alpha-1-15-released-with-option-to-autostart-and-more/>

LINUX KERNEL 4.4.41 LTS UPDATE COMES WITH IMPROVED RADEON, NOUVEAU AND POWER PC

Greg Kroah-Hartman, the Linux kernel maintainer for the stable branch gives us the impression that he doesn't need any sleeps whatsoever as he is delivering update after updates at a timely interval. The latest update

is the Linux 4.4.41 kernel and has brought Linux OS users a wide array of interesting features.

Linux 4.4 is one of the longest term supported branches which has been serving distributions which include the likes of Canonical's Ubuntu 16.04 LTS, Alpine Linux and Arch Linux. Some bad news came from the Ubuntu 16.04 LTS as developers have announced that it will be completely replaced by Linux 4.8 due to the fact that January the 19th will be the date when Ubuntu 16.04.2 LTS will make its appearance.

Being released just a week after Linux 4.4.40 LTS maintenance update, Linux kernel 4.4.41 LTS came in rather quickly as it consists of just a minor update patch. The attached shortlog states that only 78 files were subject to change, 187 deletions were accommodated and 605 new insertions have been delivered.

Source:
<http://neurogadget.net/2017/01/14/linux-kernel-4-4-41-lts-update-comes-improved-radeon-nouveau-power-pc/52436>

DEBIAN GNU/LINUX 8.7 RELEASED (UPDATE: ISOs NOW AVAILABLE)

Back in early 2015, Debian 8.0 Jessie was released after spending two years in development. This release switched back to GNOME as the default desktop environment choice. Now, the Debian Project is here with the latest update to this long-standing Linux distribution.

The seventh update of Debian 8, i.e. Debian GNU/Linux 8.7, has just been released. As expected, this release fixes tons of existing security issues. Notably, many of the included security advisories were already published and referenced.

Long time Linux users must be knowing that security is one of the primary concern of the Debian Project. The project handles all security-related issues brought to their attention and ensures their fixes in a reasonable time limit.

The release notes for Debian 8.7 include many bug fixes and

security updates. The release has 80+ bugfixes and 80+ security patches.

One should also note that Debian GNU/Linux 8.7 isn't a new version of Debian. Instead, it includes security updates and updated packages. So, if you're already running Debian 8 Jessie, you don't need to perform a fresh install. Just update via an updated Debian mirror to get all the new packages.

Source:

<https://fossbytes.com/debian-8-7-released-download-features/>

INTEL HASWELL GPUS NOW SUPPORT OPENGL 4.2 FOR UBUNTU GAMERS IN PADOKA/OIBAF PPAS

Ubuntu gamers relying upon their Intel Haswell graphics card series to play various games that support these GPUs will be happy to learn that the open-source Intel drivers now support OpenGL 4.2.

Until today, the Intel i965 graphics drivers offered by the well-known

Padoka and Oibaf PPAs for Ubuntu 16.04 LTS (Xenial Xerus) and Ubuntu 16.10 (Yakkety Yak) operating systems exposed only OpenGL 4.0 for Intel Haswell GPUs, thus support for some demanding games just wasn't there. Last week, we told you that the Mesa team decided to change the versioning scheme of the devel branch to Mesa 17.0.0 from 13.1.0, a change that, apparently, will happen at the beginning of every year, and that developer Juan A. Suarez Romero announced new patches that implement support for Intel Haswell 64-bit vertex attributes.

Since then, we've been monitoring the Padoka and Oibaf PPAs, and only today, January 14, 2017, are these patches available in both of them for the Intel i965 open-source graphics drivers, along with the latest Mesa 17.0.0-devel series, of course.

Source:

<http://news.softpedia.com/news/intel-haswell-gpus-now-support-opengl-4-2-for-ubuntu-gamers-in-padoka-oibaf-ppas-511848.shtml>

LINUS TORVALDS ANNOUNCES FOURTH LINUX 4.10 KERNEL RELEASE CANDIDATE, GET IT NOW

One more week has passed in our lives, but the development of the Linux kernel never stops, and we're now seeing the release of fourth RC (Release Candidate) build of Linux kernel 4.10, which appears to be fairly normal, yet again, bringing only a collection of assorted bug fixes and improvements compared to last week's release.

Not surprising at all, but the patch consists of mostly drivers; this time GPU, USB, sound, and networking ones stand out. The rest are the usual x86 architecture updates, multiple fixes for the Btrfs, XFS, and VFS filesystems, some tooling (mostly perf) changes, and the usual core kernel and mm changes.

It's too early to tell if the Linux 4.10 kernel will be a normal release with seven Release Candidate builds pushed during its development cycle or one of those large ones that also get the eighth RC. As such, if Linux kernel 4.10

will get seven RCs, it will be out the door on February 12, 2017, if not, it's hitting the streets a week later, on the 19th.

Source:

<http://news.softpedia.com/news/linux-torvalds-announces-fourth-linux-4-10-kernel-release-candidate-get-it-now-511858.shtml>

ZEROPHONE — AN OPEN SOURCE, DIRT CHEAP, LINUX-POWERED SMARTPHONE IS HERE

Raspberry Pi is often listed as one of the most accessible and helpful innovations in the computer hardware industry. It has helped children learn programming and allowed the makers to develop powerful and cheap DIY projects. In the past, we have told you about different Raspberry Pi DIYs like a pocket-size Linux computer, Wi-Fi Drone killer, temperature controller etc.

Recently, I found an interesting project listed on Hackaday. Named ZeroPhone, this smartphone uses a Raspberry Pi Zero. It's as open source as possible, making it dirt

cheap. Fortunately, all the parts are easily available on eBay and Amazon, and they cost about \$50.

ZeroPhone is made using a Raspberry Pi Zero. Special care has been taken to choose the parts. That's why, there are no proprietary connectors or difficult-to-get parts that are hard to solder. In the phone, you get a numeric keypad, 128×64 OLED screen, 2G modem, WiFi, GPIO expansion header, etc. Python, often called an easy-to-learn programming language, is used for developing the apps. The OS used is Raspbian Linux, based on Debian Jessie.

Source:

<https://fossbytes.com/make-zerophone-open-source-linux-powered-smartphone/>

ULTIMATE EDITION 5.1 LINUX OS IS OUT, BASED ON UBUNTU 16.04 LTS AND KERNEL 4.4

Ultimate Edition 5.1 is the flagship edition of this GNU/Linux distribution, on which

the rest of the official flavors are based, and it was built upon Canonical's long-term supported Ubuntu 16.04 LTS (Xenial Xerus) operating system, thus shipping with the Linux 4.4 LTS kernel and all of its internals.

The GNU/Linux distribution has been created using Tmosb (TheeMahn's Operating System Builder) 1.9.7, which anyone can use to create his or her own Ubuntu-based flavor, and being based on Ubuntu 16.04 LTS, it is supported with security fixes and updated packages for two years, until 2019.

However, the default desktop environment used in Ultimate Edition 5.1 is KDE Plasma 5.5.5, along with the KDE Applications 15.12.3 and KDE Frameworks 5.18.0 technologies, which are pretty old considering the fact that KDE Plasma 5.8 LTS, KDE Applications 16.08.3, and latest KDE Frameworks are available in the Kubuntu Backports PPA.

Source:

<http://news.softpedia.com/news/ultimate-edition-5-1-linux-os-is-out-based-on-ubuntu-16-04-lts-and-kernel-4-4-511850.shtml>

WHY LINUX USERS SHOULD WORRY ABOUT MALWARE AND WHAT THEY CAN DO ABOUT IT

Preventing the spread of malware and/or dealing with the consequences of infection are a fact of life when using computers. If you've migrated to Linux or Mac seeking refuge from the never-ending stream of threats that seems to target Windows, you can breath a lungful of fresh air—just don't let your guard down.

Though UNIX-like systems such as Mac OS X and Linux can claim fewer threats due to their smaller user bases, threats do still exist. Viruses can be the least of your problem too. Ransomware, like the recent version of KillDisk, attacks your data and asks you to pay, well, a king's ransom to save your files.

Linux is a rock-solid computing platform, but it's not indestructible or impervious to attack. By keeping an eye on your system and using appropriate defensive measures when

warranted, you can ensure that your Linux PC (and the Windows PCs you share files with) stays squeaky clean of digital creepy crawlies.

Source:

<http://www.pcworld.com/article/3156931/linux/why-malware-should-be-a-concern-for-all-linux-users-and-what-to-do-about-it.html>

LINUX MINT 18.1 "SERENA" KDE GETS A BETA RELEASE, SHIPS WITH KDE PLASMA 5.8 LTS

The KDE Edition is the last in the new Linux Mint 18.1 "Serena" stable series to be published, and it was delayed a little bit because Clement Lefebvre and his team wanted it to ship with the latest KDE Plasma 5.8 LTS desktop environment from the Kubuntu Backports PPA repository.

Just like all the other official flavors from the Linux Mint 18 "Sarah" and Linux Mint 18.1 "Serena" series, the KDE Edition is based on Canonical's Ubuntu 16.04

LTS (Xenial Xerus) operating system, using the long-term supported Linux 4.4 kernel. This Beta release also ships with linux-firmware 1.157.5 and numerous other updated components.

With the exception of the fact that Linux Mint 18.1 "Serena" KDE is using the KDE Plasma 5.8 LTS desktop environment by default, which was ported from the Kubuntu 16.04 LTS backport repositories, the distro only brings various enhancements to the in-house built Software Sources and Update Manager utilities.

Clement Lefebvre confirms in the release notes that Linux Mint 18.1 "Serena" will be a long-term supported release, which will receive security patches and software updates for four more years, until 2021.

Source:

<http://news.softpedia.com/news/linux-mint-18-1-serena-kde-gets-a-beta-release-ships-with-kde-plasma-5-8-lts-511888.shtml>

ANTI-X 16.1 LINUX OS IS BASED ON DEBIAN GNU/LINUX 8.7 "JESSIE," WITHOUT SYSTEMD

Besides the fact that antiX 16.1 comes with all 173 bug fixes and security patches implemented by the Debian Project in the new Debian GNU/Linux 8.7 "Jessie" release, but without the systemd init system, the distribution is using the long-term supported Linux 4.4.10 kernel customized with a fbconddecor splash.

Additionally, the new antiX version includes two applications, namely live-usb-maker and live-kernel-updater, which allow users to create a Live USB disk of antiX that you can use to run the operating system without having to install it on your personal computer, and update the kernel without the need to reboot the PC.

antiX 16.1 "Berta Cáceres" is distributed with the usual flavors, antiX-full featuring IceWM as default windows manager, along with Fluxbox, JWM (Joe's Window Manager) and Herbstluftwm, antiX-base featuring Fluxbox window

manager by default, as well as JWM and Herbstluftwm, and antiX-core-libre without X11.

Source:

<http://news.softpedia.com/news/antiX-16-1-linux-os-is-based-on-debian-gnu-linux-8-7-jessie-without-systemd-511933.shtml>

ORACLE CONTINUES TO IMPROVE LINUX 4.10 KERNEL SUPPORT IN NEW VIRTUALBOX RELEASES

Both VirtualBox 5.1.14 and VirtualBox 5.0.32 are bugfix releases that only add various improvements to the virtual machine manager, graphical user interface, VBoxSVC process, OVF and NVMe support, as well as platform specific changes, such as better support for the upcoming Linux 4.10 kernel for Linux hosts.

The Linux Additions have been improved as well in both VirtualBox releases, fixing a protocol error that occurred during certain operations on shared folders, and it looks like the VirtualBox 5.0 series now compiles against the Linux 4.9 and Linux

2.6.28 kernels for both Linux hosts and guests.

The VirtualBox 5.1 series being the "big brother," it gets the most advanced features, and Oracle added a sanity check to the "vboxmanage modifymedium --resize" command, preventing users from resizing their disk drives from 1GB to 1PB. Additionally, the new version allows cloning of snapshots when the virtual machine is running.

For Linux hosts, VirtualBox 5.0.32 now automatically disables asynchronous I/O on operating systems running a kernel from the Linux 2.6.18 branch because high I/O load could have triggered "kernel oopses" on these kernel series if the feature were enabled by default.

Source:

<http://news.softpedia.com/news/oracle-continues-to-improve-linux-4-10-kernel-support-in-new-virtualbox-releases-511934.shtml>

CANONICAL IMPROVES CLASSIC CONFINEMENT AND ALIASES SUPPORT IN SNAPD 2.21 DAEMON

Marked as the first point release to the major Snapd 2.2 series, which introduced classic confinement support, Snapd 2.21's highlights include the new physical-memory-* and io-ports-control interfaces, enablement of the getsockopt interface by default everywhere, and support for installing classic confined Snaps from the Snappy Store.

Snapd 2.21 also improves alias handling with a new "snap aliases" command that would allow users to list available aliases and their current status, as well as auto-alias enhancements. Moreover, it improves the output of the "snap find" command when nothing is found and switches to a pure, Go-based gettext implementation.

The output of the "snap info" command was improved as well in the new Snapd version, with fixes for remote sizes and the tracked channel output, and users will now be able to use the Snapd Snappy

daemon from the Core Snap. Other than that, the upower-observer interface received some minor improvements.

Source:

<http://news.softpedia.com/news/canonical-improves-classic-confinement-and-aliases-support-in-snapd-2-21-daemon-511935.shtml>

CANONICAL TO REMOVE OLD UNITY 7 SCOPES FROM UBUNTU BECAUSE THEY'RE NOT SECURE

April will see the release of Ubuntu 17.04 (Zesty Zapus) operating system, but it also marks the fifth year of Unity user interface's implementation, which was first introduced as part of the Ubuntu 11.04 (Natty Narwhal) release.

While Canonical's engineers are concentrating all of their efforts on bringing us the next-generation Unity 8 user interface, current Ubuntu Linux releases are still successfully using Unity 7, and so will Ubuntu 17.04.

However, it would appear that the Ubuntu repositories still include some old, unmaintained Scopes that have security issues open, posing a threat to the entire system if installed and used.

Most of these are related to some popular music playback apps and include unity-scope-audacious, unity-scope-clementine, unity-scope-gmusicbrowser, unity-scope-guayadeque, unity-scope-musique, and unity-scope-gourmet.

Because of that, Canonical is planning on removing these and many other unmaintained Unity 7 Scopes from the official repositories, if their maintainers don't step up to patch any of the existing security issues, and also because Unity 8 won't support them.

Source:

<http://news.softpedia.com/news/canonical-to-remove-old-unity-7-scopes-from-ubuntu-because-they-re-not-secure-511938.shtml>

FORGET ABOUT OpenGL 4.2, INTEL HASWELL GPUS NOW SUPPORT OpenGL 4.5 IN UBUNTU

Paulo Miguel Dias updated his Padoka PPA (Personal Package Archive) for Ubuntu 16.04 LTS and Ubuntu 16.10 operating systems to the latest Mesa 17.0.0-git, bringing us OpenGL 4.5 support for Intel Haswell GPUs.

Yes, we're aware of the fact that just last week we told you Intel Haswell graphics cards supported OpenGL 4.2 for better gaming, thanks to a set of recent patches submitted by developer Juan A. Suarez Romero to implement support for 64-bit vertex attributes, which enabled OpenGL 4.2 for Intel Haswell.

Think that was big news for Intel Haswell users? Think again, because Intel's senior graphics software engineer Kenneth Graunke published a new patch for the open-source Intel i965 graphics driver to enable OpenGL 4.5 on Intel Haswell GPUs, and since it soon landed in Mesa Git, you can have it on Ubuntu.

How? It's simple, by installing either the Padoka or Oibaf PPAs, which are well known among the Ubuntu gaming community for providing up-to-date open-source graphics drivers for Intel, AMD Radeon, and Nvidia GPUs. These PPAs offer frequent updates of the latest Mesa 17.0.0-git 3D Graphics Library.

Source:

<http://news.softpedia.com/news/forget-about-opengl-4-2-intel-haswell-gpus-now-support-opengl-4-5-in-ubuntu-511979.shtml>

HOW TO SIMPLIFY YOUR DEBIAN/UBUNTU SYSTEM UPDATES WITH UCARESYSTEM

If you're like me, you prefer to keep your Linux systems as up to date as possible. After all, vulnerabilities are patched, new features are added, and a server or desktop can be made to run more smoothly and securely by keeping them as "in the now" as possible.

To that end, most will open up a terminal window and run the tried-and-true `sudo apt-get update &&`

`sudo apt-get upgrade` command to catch anything available for their system. Thing is, those two commands either may not catch everything or they leave behind outdated files that can lead to problems down the road. Of course you could add to your list of commands the likes of `sudo apt-get autoremove` and `apt-get clean`. Would that we had a single command to take care of everything.

Oh wait, we do. That command comes in the form of an easy to use piece of software called uCareSystem.

Source:

<http://www.techrepublic.com/article/how-to-simplify-debian-ubuntu-system-updates-with-ucaressystem/>



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



Correction: Last month, I wrote about ImageMagick and referred to a process for removing known backgrounds. Unfortunately, the link didn't end up in the actual article. This is the link:

http://www.imagemagick.org/Usage/masking/#known_bgnd

A new year has started. As such, it was necessary for me to plan out some things I wanted to achieve this year. That includes making a plan for topics I need to study and learn to stay relevant in my field, and to generally keep my programming sharp and knowledge up-to-date. In this month's article, I'd like to run through my own plan, and make some suggestions for how to find inspiration for yourselves.

MY PLAN

I spend most of my work doing web development, and as such, this area is the focus for improvement. My other work tasks are generally repairs, new device

setups, automation, or devops. As there were fewer jumps forward in technology in these areas (except devops), my plan has, for the moment, skipped these topics.

There are basically three areas I broke my list up into:

- Backend (such as administrator areas, or other scripts that do something not immediately visible to every visitor),
- Frontend (HTML, CSS, and JS that deal directly with what visitors see), and
- Performance (databases, caching, servers, and so on).

FRONTEND

I'm focusing on expanding on things I already know this year, as opposed to jumping into something completely new, starting with ES6/ES2015. ES6 has brought with it a lot of new options and features for writing JavaScript quickly, and helps automate some of what I would consider hacks (meaning it transpiles into the hacks, but as a programmer, you no longer need

to take the time). It's an official standard as of June 2016, and support is pretty good. Combined with webpack, there's no reason not to use it.

As I do every year, I will also be setting up a test area with the newest versions of Bootstrap and Zurb Foundation, just in case I need to use it for a project. Things don't tend to change much between versions, but it's easy enough to spend an hour or two checking it out.

Now comes the big one. React. I've used it a little here and there, but this year I will put a real focus on it, simply because it's gaining in popularity, and offers some benefits for things I'm frequently asked to do (I recently created a filterable gallery using very basic React). I'll be covering React with mobx, Flux and Redux (for small, normal, and data heavy projects, respectively). You can also cover Angular, Ember or Vue, though my main focus is on React, which I will focus on first.

I also want to get at least a bit of familiarity with Elm and/or ClojureScript, as they're new, and (Elm especially) have different approaches.

BACKEND

I split this into three sections as well - scripting, functional and high performance.

Scripting is focused only on Node.JS, as I've previously been using Python and PHP, and want to simply round out my knowledge.

My functional language to focus on is Haskell - I started learning it years ago, but haven't ever really given it enough time to say I'm comfortable with it. And lastly, I want to do more with Go (the language, not the board game), and possible try out Rust as well. These are compiled languages, and, therefore, offer some good performance, and are a different approach and utility to things like Node.JS.

PERFORMANCE

This is a bit of a mishmash of items. My main goal is simply to learn and try them out as needed in my projects. That being said, there are some I want to learn the theories on, but lack the need (or servers) to truly test out and learn.

Starting with databases, I want to learn more about Redis and ElasticSearch, as I've never used them before, and want to see if there's any reason to integrate them into my work projects.

It also ties into the caching items I want to work on - such as database caching with Redis.

Lastly, Devops. This is by far the newest field I'm really getting into, and have spent the last 4 or 5 months familiarising myself with Docker - both locally, on my test server, and on some deployments. To continue on, I want to check into some options for managing docker containers - such as Kubernetes, Docker Swarm, or Rancher.

An area for study (but less hands-on testing) is continuous

testing and deployment using things like Jenkins or SemaphoreCI. As I work alone, and my projects are relatively small, I haven't ever had the need for something like this (as I tend to deliver a project once, and stop there). That being said, learning about this is something useful and interesting to add to my CV.

NON-WORK

All the above applies directly to my work. As for personal languages, I want to work more deeply with machine learning and Python 3, as I often use it, but in small applications. This year, I want to work on at least one larger project using Python, and hopefully implement some machine learning.

I realize this can sound like a lot, especially considering what you need to know in order to feel proficient in a language or topic. However, some of the items mesh well together, and as such may overlap in areas. I've set aside some time every weekend to work through the list, and will hopefully have made some decent progress by March. If I need to rethink the

list, I'm not going to shy away from doing it.

ORGANISATION

I tend to use a mixture of Google Calendar goals, Wunderlist, and Google Inbox reminders to keep track of what I need to do. If, however, you prefer handwritten notes, or physical journals, I would recommend looking into the Bullet Journaling approach (see the links at the end). I used this approach for a few months, and quite liked the way they were laid out. I just, unfortunately, couldn't get into the habit of checking my journal regularly enough. I highly recommend getting any sort of dotted notebook (or, if you want, just order a journal off the site - though it's not required). The ideas can be applied in a multitude of ways.

I hope this has inspired some people to continue learning. Do you have any recommendations for me? Or just want to share some of your own goals? Then feel free to email me at lswest34+fc@gmail.com. The same goes if you have any unrelated questions or article

ideas.

FURTHER READING

This entire list and plan was inspired by the following videos and mindmaps:
<https://youtu.be/sBzRwzY7G-k>
<https://coggle.it/diagram/Vz9LvW8byvN0I38x>

Bullet journal:
<http://bulletjournal.com/get-started/>



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.



HOW-TO

Written by Greg D. Walters

Python In The Real World - Pt 74

Welcome back or, if you are new to the series, welcome. This month we will be doing three projects driving up to nine LEDs.

- They are:
- Two blinking LEDs
 - Cylon Lights
 - Bar Graph

The original project (bar graph) is from a book that I reviewed a few months ago: Arduino Project Handbook by Mark Geddes (No Starch Press). I really enjoyed the book so I wanted to use at least one of his projects.

Let's get started by laying out the parts list and looking at the hardware layout.

THE PARTS LIST

For the projects this time, you will need:

- An Arduino Uno or Mega
- 9 x LEDs (preferably 3 red, 3 yellow and 3 green)
- 9 x 220 Ohm resistors
- 10K Potentiometer
- Breadboard

- Jumpers

THE HARDWARE LAYOUT

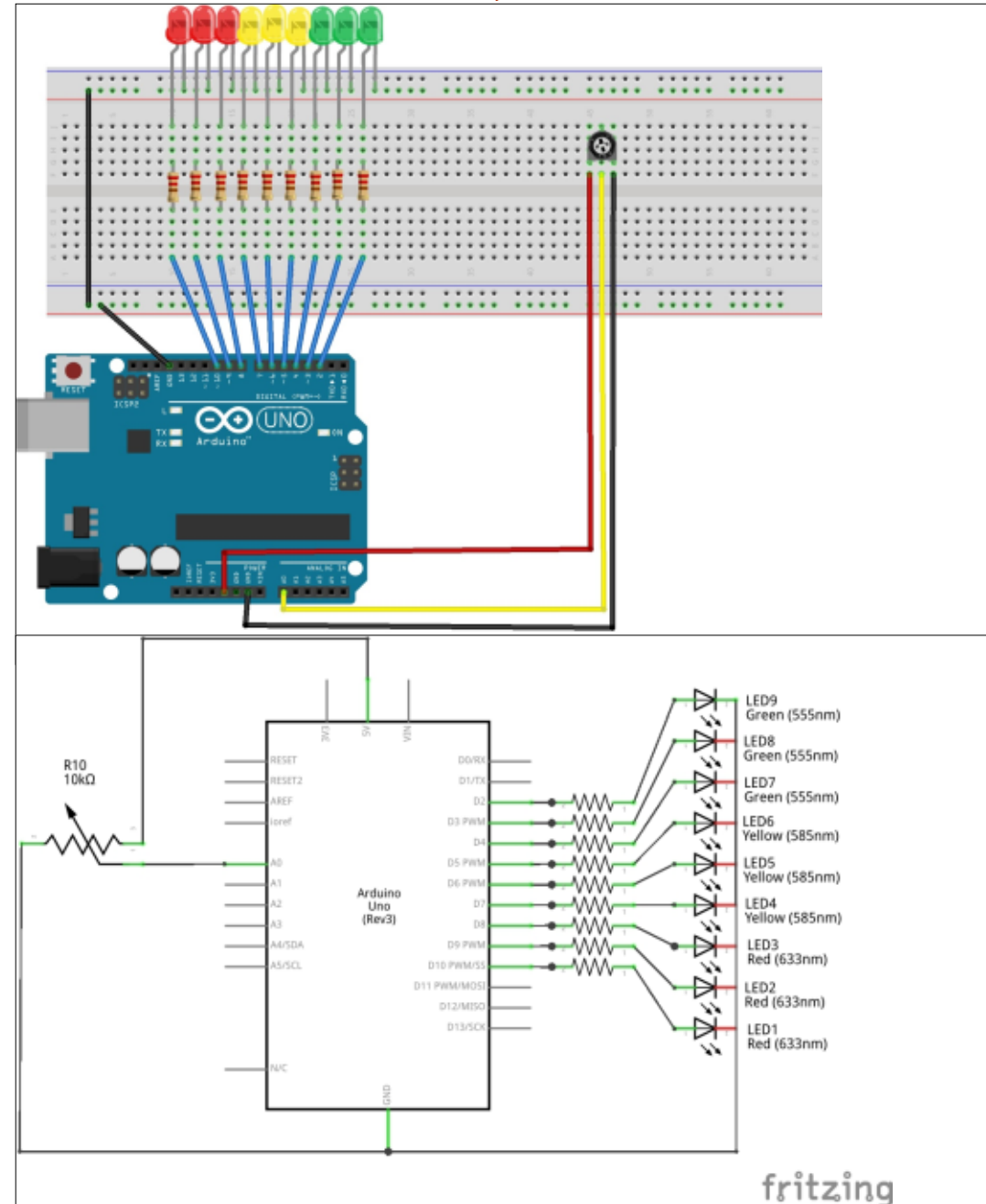
Shown right is the Fritzing breadboard layout (I am also including the schematic, shown bottom right, for those who like to see that sort of thing.) for the Bargraph project. We can use the same component layout for all three projects, since our code will ignore any extra components.

Notice that the long Anode LED leads are connected to the 220 ohm resistors which are then connected to the Arduino pins 2-10 (positive LED pins), and the short Cathode LED leads (negative LED pins) are all connected to ground.

We'll go through the various components when we discuss each project.

PROJECT 1 - TWO BLINKING LEDs

This first project is really simple in both logic and implementation.



fritzing

HOWTO - PYTHON

The idea is to alternately turn on and off two LEDs. In this case the LEDs are the ones connected to Arduino pins 2 and 3. We'll use the potentiometer to send a value between 0 and 1023 for the delay through Arduino analogue pin A0. The higher the value the longer the delay. Since a delay value below 30 can cause the LEDs to blink so fast that you can't tell they are blinking, we will check the value and if it is less than 30, we'll force it to 30.

THE CODE

```
const int ledPin1 = 2;
const int ledPin2 = 3;
const int analogPin = A0;
```

In the first three lines, we are setting the constants that we'll need.

```
void setup() {
  Serial.begin(9600);
  pinMode(ledPin1, OUTPUT);
  pinMode(ledPin2, OUTPUT);
}
```

In the setup routine, we start the serial monitor to transmit at 9600 baud and the two digital pins as OUTPUT pins.

```
void loop() {
  int speedReading =
```

```
  analogRead(analogPin);
  if (speedReading < 30) {
    speedReading = 30;
  }
```

Now we read, using the analogRead function call, the value of the potentiometer, and if the value is less than 30, force it up to 30.

```
  Serial.println(speedReading);
  digitalWrite(ledPin1, HIGH);
  delay(speedReading);
  digitalWrite(ledPin1, LOW);
  digitalWrite(ledPin2, HIGH);
  delay(speedReading);
  digitalWrite(ledPin2, LOW);
}
```

Finally, we print to the Serial Monitor the value of the pot, turn on the first LED, delay however many milliseconds the pot value is, turn off the led, then turn on the next one, delay and turn if off and then repeat the entire process.

See how simple that was?

PROJECT 2 - CYLON LIGHTS

In this project, we will light the

```
void setup() {
  for (int thisLed = 0; thisLed < ledCount; thisLed++) {
    pinMode(ledPins[thisLed], OUTPUT); // Set the LED pins as Output
  }
}
```

LEDs in a sweep motion (0 to 8 and 8 to 0), right and left, reminiscent of the Cylons from the original 1978 Battlestar Galactica television show. (I showed the running project to a friend and his response was that it looks like the lights on a police car. I guess it's just a matter of perspective.) Again, it is a VERY simple project. We will be using all 9 of the LEDs in this project. Since I worked with the bargraph project first, I simply modified the code to create this one.

We use two simple for loops to switch the LEDs on and off in order, starting with the Arduino pin 2, going up to pin 10, and then back down to pin 2.

THE CODE

```
const int ledCount = 9;
const int delayTime = 90;

int ledPins[] =
{2, 3, 4, 5, 6, 7, 8, 9, 10};
```

Here we set up the various variables we will be using. The first two are defined as constants and the third is set up as an array which holds the Arduino pin numbers that are connected to our LEDs.

In the setup routine (below), we use a for loop to define each of the pins in the array as OUTPUT pins.

The loop routine (next page) is where the "magic" happens. Again, we use a simple for loop to sweep the LED on in order for 90 milliseconds, then turn it off before we move to the next pin. Once we have gone through the first 9 LEDs, we do another loop, this time moving backwards through the list of the LEDs. Notice, however, that we skip the ninth led on the count down.

As you can see (next page, top right), the for loop in C works like this...

```
for (counter value low,
     counter value high, amount to
     increment or decrement)
```

By this time, it should be simple for you to figure it all out.

PROJECT 3 - BAR GRAPH

As I said earlier, this project is from the book Arduino Project Handbook by Mark Geddes. It's a very easy project code wise.

We will be using all the hardware in this one. The idea is to give a "graphical" representation of the voltage value of the potentiometer using the nine LEDs. The lower the voltage going into the A0 pin, the fewer LEDs are lit. The higher the voltage, more are lit. The Arduino C language gives us a wonderful function called MAP that makes this a breeze. However, it can be a bit confusing at first.

THE MAP FUNCTION

The map function takes a value, a low and high range of the input, and a low and high range that the output should be mapped to. Our code is as follows...

```
int ledLevel =  
map(sensorReading, 0, 1023,  
0, ledCount);
```

```
void loop() {  
  for (int thisLed = 0; thisLed < ledCount; thisLed++) {  
    digitalWrite(ledPins[thisLed], HIGH);  
    if (thisLed < ledCount-1){  
      delay(delayTime);  
    }  
    digitalWrite(ledPins[thisLed], LOW);  
  }  
  for (int thisLed=ledCount-1; thisLed > 0; thisLed--) {  
    digitalWrite(ledPins[thisLed], HIGH);  
    delay(delayTime);  
    digitalWrite(ledPins[thisLed], LOW);  
  }  
}
```

Low Value	High Value	Output
0	113	0
114	227	1
228	340	2
341	454	3
455	568	4
569	681	5
682	795	6
796	909	7
910	1022	8
1023		9

- ledLevel is the mapped output.
- sensorReading is the input level from the analogue input pin.
- The values 0 and 1023 are the range that can be expected from the analogue pin.
- The values 0 to 9 (ledCount) are the values that can be expected as the output. There is some math magic being done in the function that produces the output map. The following table shows the Input v.s. Output values.

So you can see that anytime that the voltage value into pin A0 is, for example, between 455 and 568, the output will be a 4, and in this case, the first four LEDs will be lit.

```
const int analogPin = A0;
const int ledCount = 9;
int ledPins[] = {2,3,4,5,6,7,8,9,10};
void setup() {
  for (int thisLed = 0; thisLed < ledCount; thisLed++) {
    pinMode(ledPins[thisLed], OUTPUT); // Set the LED pins as Output
  }
}
void loop() {
  int sensorReading = analogRead(analogPin); //Analog input
  int ledLevel = map(sensorReading, 0, 1023, 0, ledCount);
```

In these two lines (above), we read the analog pin (pin A0), getting its value between 0 and 1023, then applying it to the map function to define a value of 0 to 9 as we previously discussed. The rest of the routine is simply a for loop that either turns off or on the LEDs based on the value of ledLevel.

```
for (int thisLed = 0; thisLed < ledCount; thisLed++) {
  if (thisLed < ledLevel) { // Turn on LEDs in sequence
    digitalWrite(ledPins[thisLed], HIGH);
  }
  else { //turn off LEDs in sequence
    digitalWrite(ledPins[thisLed], LOW);
  }
}
}
```

THE CODE

You have seen the first three lines and the setup routine already, so we'll just skip over the discussion.

That's it. You now have learned a lot about the Arduino language and controlling LEDs.

Next time, we will be working with some of the motors that we

used when we were learning the RPi, so dust them off and be ready. Until then, have fun!



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.



FCM POLL

I've set up a poll which I hope you'll fill in. It's located at:
<https://goo.gl/Q8Jm4S>.

We're interested in what you like/dislike about FCM. What I can change/add, and anything else you want to add.

We'll publish the results in a future issue.

LINK: <https://goo.gl/Q8Jm4S>



Internet Of Things (IoT) is now ubiquitous. Your car may be connected to the Internet, your baby surveillance system surely is and, any day now, so will your (LED-based) light bulbs. From what can often be seen in the technology section of the news, factory configuration of some of these devices can be found lacking. Carrying a Linux kernel and base GNU system may not be enough for a device that is continuously connected to the Internet, if the complete package is shoddily set up. For this reason alone (who would want to become exposed because of their hackable devices?), some users choose to build their own devices, configuring them their own way from a regular Ubuntu distribution. This is quite easy nowadays, with many platforms such as the Raspberry Pi available for hobbyists.

However, repurposing a rather old laptop or notebook may also be a fun option, and economically advantageous.

Equipped with a Pentium-III-derived Intel Celeron M processor clocked at 900 MHz, ye olde Asus eeePC notebook is now a venerable piece of hardware. In fact, it is no secret that most modern Ubuntu desktop distributions will have a hard time fitting within the constraints of the 1 GByte RAM or 4 GByte onboard hard drive - though some ways of getting around these limits can be found, as I have had the occasion to point out previously in these pages.

However, these hardware specifications are quite similar to those of many modern devices designed for the IoT platforms, such as the Raspberry Pi version 3. The main differences can be found in two regards:

- The eeePC is a derivative of a mainstream Intel processor. As such, it is less power-efficient than the ARM family of CPUs, which were designed with operation off batteries prominent on the requirements list. We will need to run this one off AC power, though the onboard notebook battery may

help us get over a (short) break in power supply, depending on its physical condition.

- The eeePC packs some onboard peripherals that a more modern board may not, such as a VGA port, a modem, and a full-size SD card reader. These may come in handy, in addition to the screen that is naturally included in any laptop. There is an inbuilt WiFi card, and further peripherals may easily be connected over USB.

It is worthwhile noting that since the eeePC is powered from an AC transformer or a notebook battery, the onboard USB ports are capable of delivering more power to peripherals than most hobbyist IoT devices. An external USB hard drive can be directly connected and powered, unlike with an RPi, for instance, where an external power source such as a second transformer will be necessary for the disk.

So, if we make abstraction of the graphical environment and its increased hardware requirements, the eeePC can still be a platform

sufficient for the needs of an IoT device - since most of these will run off wall power in any case.

In my case, I took advantage of the recent announcement of version 16 of Ubuntu Snappy being available. This is based on Ubuntu 16.04, instead of 15.04 as were the previous releases. Since 16.04 is Long Term Support (LTS), this may be advantageous going forward. However, several things have changed on setting it up for the first time. Perhaps due to its beta status, and the relatively short period of time it has been made available (at the time of writing), precise instructions on setting it up are unfortunately still hard to find.

GETTING SNAPPY AND CREATING A PENDRIVE

I downloaded the 32-bit (i386) version of the disk image for Ubuntu Snappy (also known in places as Ubuntu Core) from: <http://cdimage.ubuntu.com/ubuntu-snappy/16.04/current/>. Once

downloaded, the image can be uncompressed into a disk image file by a regular user, with the command:

```
unxz ubuntu-core-16-i386.img.xz
```

If the unxz compression utility is not present on your system, it can be installed by:

```
sudo apt install xz-utils
```

This uncompressed image file - with the IMG extension - is a byte-for-byte copy of the contents of the hard drive of a device running Snappy. It is exactly 4,000,000,000 bytes long, or 4 GBytes. When using traditional notation with base-2, this converts into 3,725 GiBytes or $3,725 \times 2^{30}$ Bytes. This is precisely the size of the eeePC's internal hard disk, so we should have no problems in fitting the image on the eeePC's disk.

Once the image has been uncompressed, our problem is how to copy it over from our main computer to the eeePC. We will need to boot this machine off an external medium, such as a USB pendrive or an SD card. We could use a lightweight Ubuntu-based

distribution, such as a Xubuntu 32-bit, for this purpose. Once the eeePC is up and running from a Live CD, the Snappy image can be transferred over the network from a mounted volume and installed on the eeePC's internal hard drive.

However, we do have a simpler means of performing the transfer, which is to use the Ubuntu Snappy image itself. To use it, I used an USB pendrive of the appropriate size, 4 GBytes. Using an SD card of the same capacity is also an option, since the eeePC can also boot off this type of medium. This would probably be identified by your kernel as `/dev/mmcblk0` or something similar.

Starting on the main computer on which I had downloaded Ubuntu Snappy, I copied the image onto the pendrive. In my case, this was identified as `/dev/sdc` - though much care should be exerted to make sure this is in fact the unit identification your pendrive has

been assigned. Consulting the output of:

```
dmesg | grep sd
```

may be of help to make sure you are actually overwriting the pendrive and not, for instance, one of your computer's hard drives. I then made sure the pendrive was not mounted, before using the `dd` command to copy the image byte-for-byte, in blocks of 1 MBytes.

```
sudo umount /dev/sdc*
```

```
sudo dd if=ubuntu-core-16-i386.img of=/dev/sdc bs=1M
```

Using a different block-length may raise an error, since the image may not be an exact multiple of the number of bytes within a block. 1 MByte is a safe value, however, and the errors should probably be ignored if they occur.

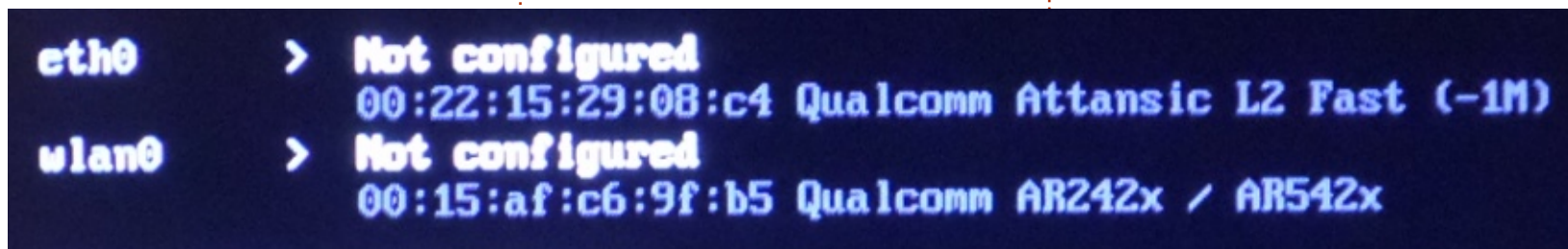
The pendrive is now a bootable image of Ubuntu Snappy. It can be extracted from the main computer,

and used to boot the eeePC.

CONFIGURING THE NEW SYSTEM ON THE PENDRIVE

The escape key (Esc) will need to be pressed during bootup on the eeePC, to choose the appropriate boot device from a list. This is the one prefixed by USB, if a USB pendrive is used. You should then see the GRUB bootloader list, with a single entry: "Ubuntu Core 16". After some time, and several pages full of messages from the kernel and system, you should obtain a blank screen with the message "Press enter to configure."

Configuring the initial system is a rather straightforward process, though using only a text-based interface may seem strange for those of use more accustomed to graphical applications. Use the keyboard arrows to maneuver



from field to field, and configure at the very least one interface to connect to the Internet.

In many cases, we will be using the device to connect both wirelessly and with the Ethernet port. I used the dialogs to connect the Ethernet port (eth0) to my home network using DHCP over a network cable. This is the easiest option to complete the configuration, since configuring the WiFi to connect to a wireless access point does not seem to be an option at this point. Ubuntu Snappy does recognize the physical interface, but does not provide an interface to identify the network to connect to using an SSID, nor a means to provide the network passphrase. This is probably a sign of work-in-progress, and may be

corrected in later versions.

You will also need an account on the Ubuntu Snappy store to continue. This can be created from the Ubuntu One initial page at <https://login.ubuntu.com/>, a point which could be made more clear on Canonical's servers. I am thinking specifically about new users who have not yet had the occasion to log in to Ubuntu's services. While you are doing it, remember to create a public/private RSA key-pair on your computer, and upload the public key (.pub file extension) to the Ubuntu server. If needed, instructions to create a key-pair may be found in any good tutorial on using SSH without a password, such as this one <http://www.linuxproblem.org/art9.html> by Mathias Kettner (you will

just need the first part concerning key-pair creation).

Open the id_rsa.pub file, from directory ~/.ssh, in a text editor, and simply copy and paste the text into the field in the Ubuntu One web page. Make sure you are NOT copying from the file without the .pub extension: this is your private key, and should be shared with nobody else.

Once the Snappy device has been set up, we cannot log in directly as a local user. Instead, we must connect to it over the network using SSH. I am user alanward on a certain mail server, and this is the account I used to register on Ubuntu's service. So I am also user alanward on my new Snappy instance. Let us log in,

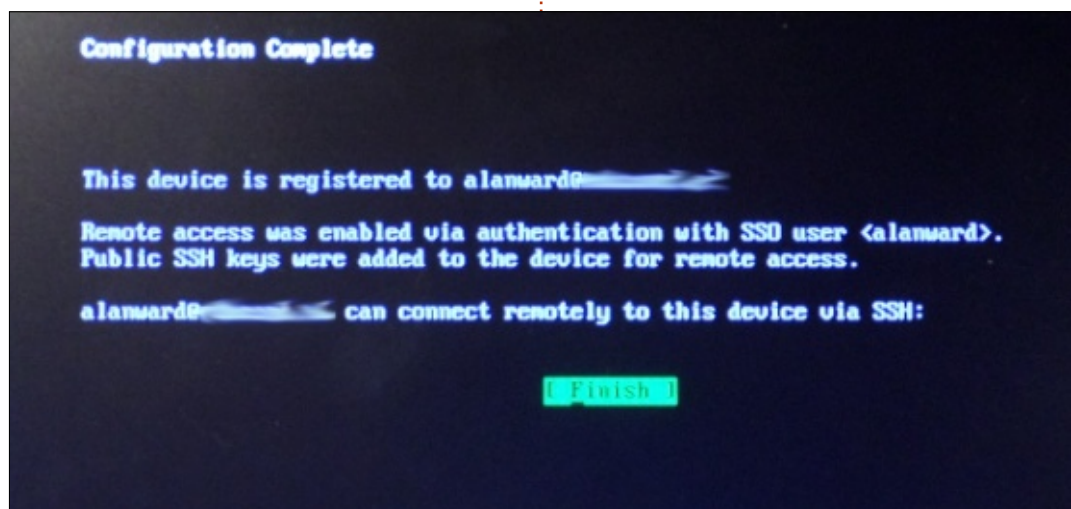
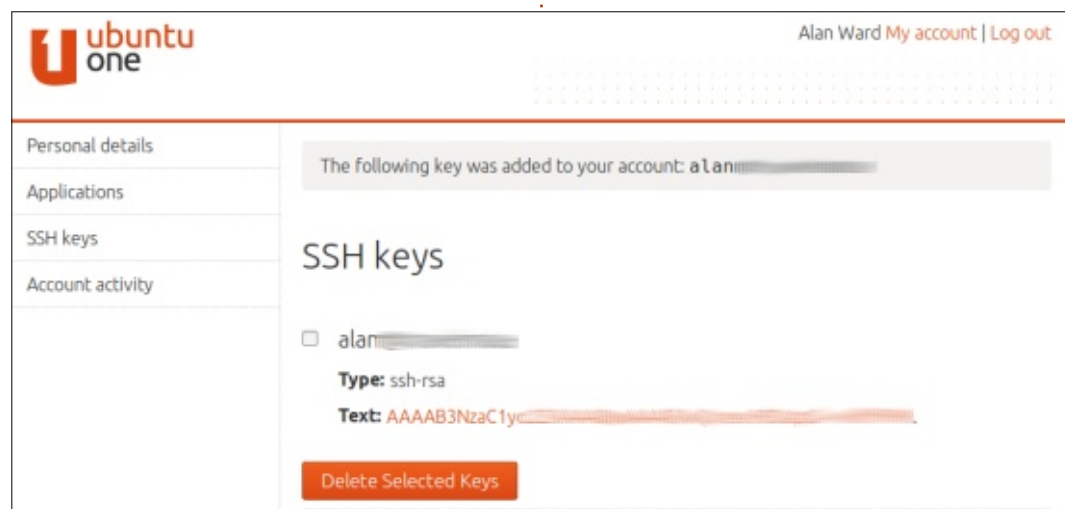
using command:

```
ssh <username>@<Snappy's local IP address>
```

We may need to consult our router to determine the new Snappy machine's local IP address. Otherwise, a few judicious pings should also allow us to determine the address assigned through the router's DHCP.

No passwords are required to log in, since our public key is enough to identify us. In actual fact, our new user on the device has no password, in a similar way to root on most Ubuntu systems.

We can become root on Snappy in the same way as on a regular Ubuntu, using the sudo command:




```
alan@alan-vaio:~$ ssh alanward@192.168.0.104
Welcome to Ubuntu 16.04.1 LTS (GNU/Linux 4.4.0-36-generic i686)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

Welcome to Snappy Ubuntu Core, a transactionally updated Ubuntu.

 * See https://ubuntu.com/snappy

It's a brave new world here in Snappy Ubuntu Core! This machine
does not use apt-get or deb packages. Please see 'snap --help'
for app installation and transactional updates.

alanward@localhost:~$
```

```
sudo bash
```

```
root@localhost:~#
```

It may be useful to make root access over SSH available. We can use the `.ssh` directory created by the installer script, and simply copy it over to the root user's home directory:

```
cp -r .ssh /root/
```

We can now exit our SSH session using the `exit` command twice. From our main computer, we can log in as root using `ssh` by reusing the same SSH credentials we used to log in previously:

```
ssh root@192.168.0.104
```

```
Welcome to Ubuntu 16.04.1 LTS
(GNU/Linux 4.4.0-36-generic
i686)
...
```

At this point, we have a fully working system, albeit on the USB pendrive. We can now copy it over onto the eeePC's internal hard drive, if we so wish. Performance from the pendrive is adequate for simple tasks. However, using the internal hard drive would allow us to dispense with having a pendrive hanging off our device, thus freeing up a USB port. Speeds are also slightly better, even though the internal drive on the eeePC is

not fast with about 32 MBytes/s bandwidth.

Copy the contents of the USB over to the hard drive with the `dd` command. The eeePC's internal drive should be `/dev/sda`. If the USB has been detected as `/dev/sdb`, we could issue:

```
sudo bash
```

```
dd if=/dev/sdb of=/dev/sda
bs=1M
```

We are replicating the procedure used to copy the original disk image file over to the USB. At this point, however, the USB contains a fully configured system and this is what we are installing on the eeePC's hard drive. Once the copy has completed, we can shut down the eeePC:

```
shutdown -h now
```

Remember to remove the USB pendrive when the computer is completely off, before restarting once more. If everything has gone according to plan, the eeePC should boot off its internal drive using GRUB in exactly the same way as the USB drive. It should be accessible over SSH as before, with

no further configuration necessary.

This procedure would also work with a pendrive of a larger size. However, in this case there will be an error message as `dd` goes over the 4 GByte limit. If the file system on the USB pendrive has not been resized, this should not be of concern.

ADMINISTERING YOUR NEW IOT DEVICE

Let us finish with a quick note on system administration. Ubuntu Snappy is quite different from a regular Ubuntu distribution such as Ubuntu Server or one of the desktop variants. The 4 GByte image we have been transferring contains two separate partitions. One is write-only, and holds the base kernel and system image. The second is writable, containing user data and changes made to the system over time. Having a large part of the operating system on a read-only file system gives rise to some complications, though it can be useful as regards system security.

The first major change when

coming from working with a standard Ubuntu distribution is that the apt way of installing software no longer works. Instead, administrators will use the snap command to query the Ubuntu store and manage software packages from there. There is some documentation out there on the Internet, and the command itself has a fair amount of documentation inbuilt. Some examples of snap usage should be self-explanatory:

```
sudo bash
snap help
snap list
snap install hello-world
hello-world
Hello World!
```

The other feature that may surprise administrators is how to alter environment variables. For instance, using the apt commands with a web proxy is a simple matter of exporting the appropriate environment variable before commencing. For instance:

```
sudo bash
export
http_proxy="http://my_web_proxy:3128"
apt update
...
```

However, the snap command does not seem to honor shell environment variables. For this reason, we will now need to alter the configuration of the snapd service itself. Unfortunately (or not, depending on your standpoint), this is a systemd service that needs to be configured with the corresponding commands. So:

```
sudo bash
systemctl edit snapd.service
```

This will launch the vi editor, with which we can insert the details of the proxy server into systemd's snapd configuration file. For example:

```
[Service]
Environment="HTTP_PROXY=http://my_web_proxy:3128"
Environment="HTTPS_PROXY=http://my_web_proxy:3128"
```

Please note the use of CAPITALS for environment variable names. Once out of vi, we will restart the snapd service, and can proceed to install our snaps:

```
systemctl stop snapd
systemctl start snapd
snap install hello-world
...
```

SOME FINAL THOUGHTS

Experienced users and administrators of the standard Ubuntu distributions may feel things are becoming rather more restrictive with Ubuntu Snappy. In some ways, this is certainly true. On the other hand, a case may be made that the final system is more secure as a result. Speaking of devices that will very often be set up by non-specialists, but remain connected to the Internet during their useful life, it may be best that basic system security is high by default.

However, Snappy does bring some benefits. Application sandboxing is one of them, as is ease of installation - as documented in the examples shown here. Making clones of an operating system from USB pendrive to hard drive, or back again from the eeePC's hard drive to a second USB drive, is not only possible but also simple in the extreme.

Converting an elderly device such as the eeePC into a Snappy

device has several benefits. There is the obvious making use of a device that, otherwise, would probably end up on the scrap heap. But, from the user's standpoint, getting accustomed to handling Ubuntu Snappy on such a platform will make things easier for us when we need to understand mobile devices with Ubuntu Touch. This is, in essence, built upon the base of Snappy, with the adjunction of the graphical user interface and other applications. For this reason, understanding Snappy can certainly be seen as an investment of time for those interested in dealing with Touch, for instance by designing and packaging applications for this platform.



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



HOW-TO

Written by Alan Ward

Programming With FreePascal - Pt7

In the previous part of this series, we saw various ways in which our application can run on a Raspberry Pi, turning it either into a lightweight terminal or an equally lightweight application server. In this part, we will focus on what makes the Raspberry Pi unique, and will build a Free Vision interface to make use of the General Purpose I/O (GPIO) port on this small board computer.

Our test scenario will be to turn the RPi into a lighting manager, that controls three separate lighting circuits from a Free Vision interface. Each circuit will be controlled by a simple On/Off press button.

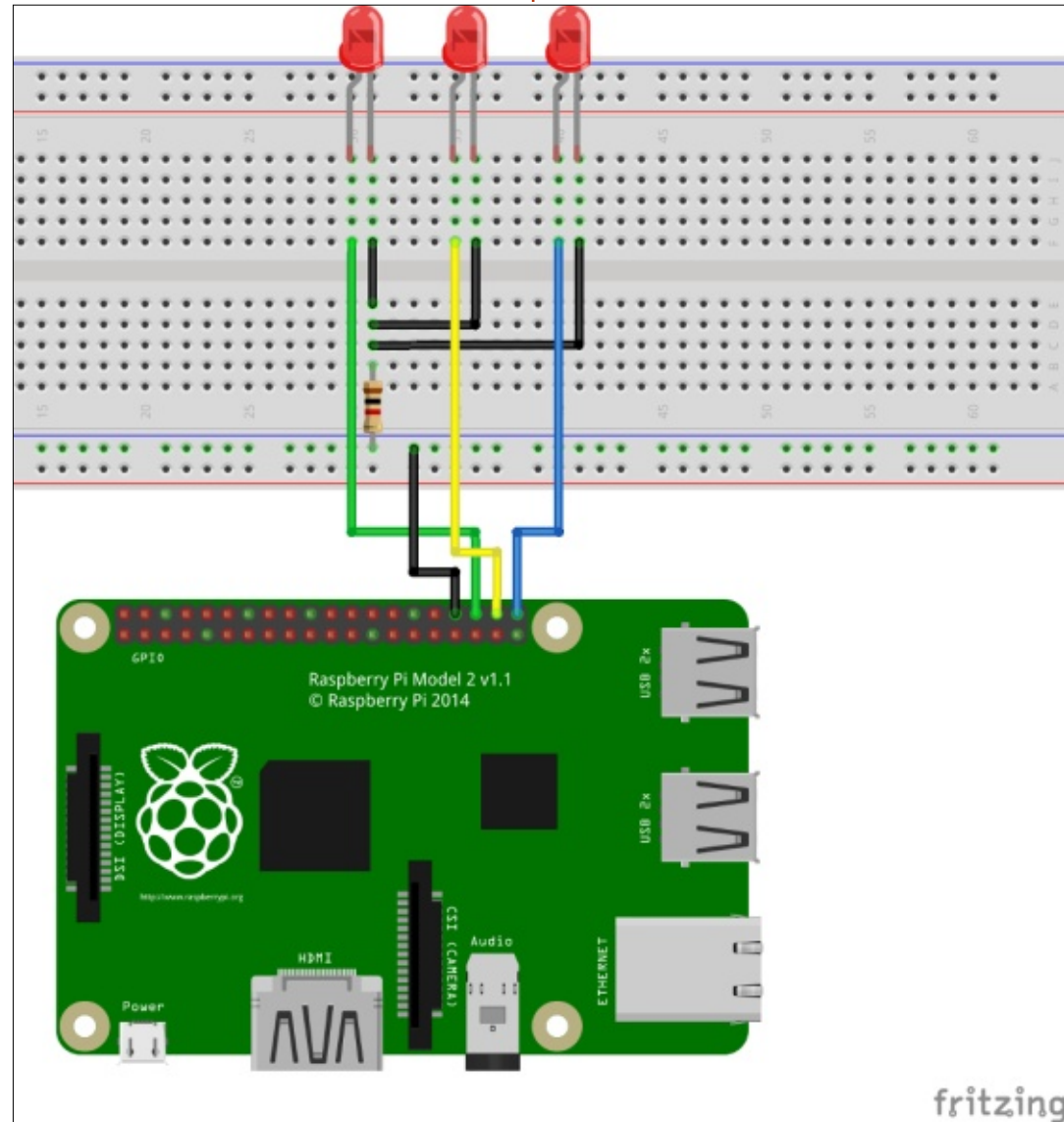
THE PHYSICAL CIRCUIT

Both the Raspberry Pi models 2 and 3 retain a similar GPIO pin assignment to the earlier B+ models. The 40-pin header has two parallel rows of pins, with the odd numbers inboard and the even closer to the card's edge. I tend to use the last (right-hand) pins of the

outboard row, specifically pins 34, 36, 38 and 40 that are attached to Ground, GPIO ports 16, 20 and 21, respectively.

The circuits we will be connecting to the RPi to get the software working will be simple LEDs, though in a real circuit these would be replaced by a high-impedance adapter (probably an optical isolator and a relay or a triac) that would allow us to control normal AC electric circuits. For the time being, we will be connecting the three GPIO ports to one LED's positive leg each, while the negative legs get connected to a common ground on pin 34.

LEDs need to avoid high current values, with about 15 mA being a safe limit for most robust parts. On the other hand, the RPi's GPIO ports have even lower working values (2 to 12 mA) both as a source (providing current to drive an external circuit) or as a sink (ground return). This means we need to insert some way of limiting current in series with the LEDs - or risk overloading both the LEDs and

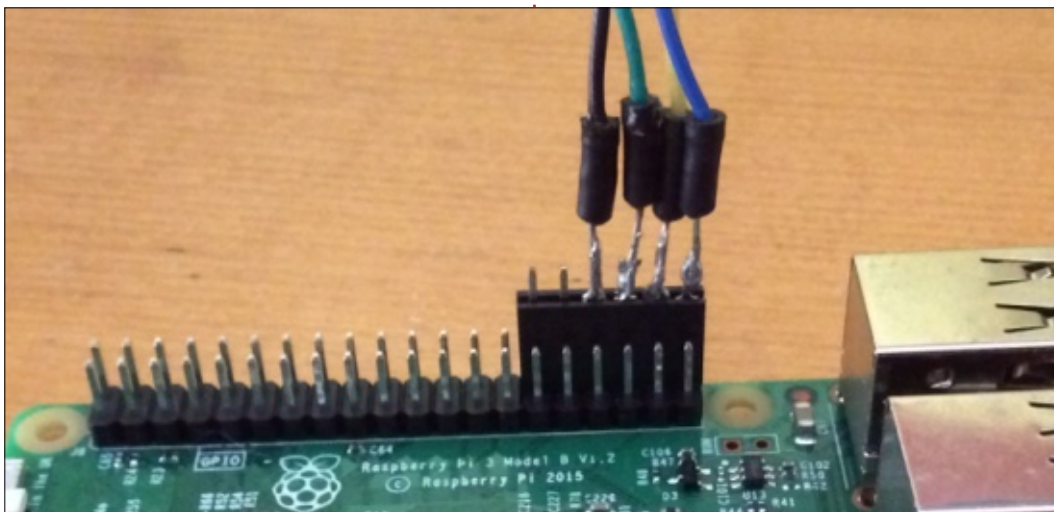


the Raspberry Pi itself. A simple way of doing this is to insert a simple resistor into the common

ground. We will be using a 1kΩ part here, though 2.2 kΩ would probably be safer.

On this diagram drawn with Fritzing, green, yellow and blue will be used respectively for circuits 1, 2 and 3. Fritzing had only a representation of the RPi 2 in its library, but this is for all practical purposes interchangeable with the RPi 3.

To make connections to the RPi, we would need electric cords with female connectors to slip over the RPi's male pins. However, a typical breadboard will need cords with male pins at their ends. I had no cords with male connectors so, instead of soldering normal cords directly to the Raspberry Pi, I connected several to a short strip of header that can then be placed and removed at will from the computer.



CONTROLLING THE GPIO FROM FREE PASCAL

There are several projects to build a Pascal unit that controls the GPIO. However, just to make things more interesting, I thought it would be fun to write our own. It is actually quite simple - under Ubuntu as under Raspbian - to control the GPIO pins on a RPi, since the Linux kernel has been patched to give access through the /sys filesystem. We could actually do it with the command-line - though we will need root access to do so. To set up GPIO port 16 for output, for example, we need to:

```
echo 16 >
/sys/class/gpio/export
echo out >
```

```
unit gpio;
interface
procedure setup_input(port : string);
procedure setup_output(port : string);
procedure port_write(port : string; value : string);
function port_read(port : string) : string;
procedure release(port : string);
```

```
/sys/class/gpio/gpio16/direction
```

We can actually see which ports are activated at a point in time by listing the contents of directory /sys/class/gpio/gpio* - each time a port is activated, a corresponding link appears here.

Now, to turn on GPIO 16 (switch it to 5V output), or turn it back off (0V):

```
echo 1 >
/sys/class/gpio/gpio16/value
echo 0 >
/sys/class/gpio/gpio16/value
```

Finally, to release the port:

```
echo 16 >
/sys/class/gpio/unexport
```

As can be seen, the /sys interface really helps gain access to the ports, in a way that can easily be ported to any programming language that has access to the file system. Let us do

so for Pascal, in a unit appropriately called Gpio (above).

It is easier to reference port numbers and values as strings; if they are passed as integers, each value would need to be converted into a string when building file names. The first two routines are to set up a port, either for digital input (setup_input), or output (setup_output). It will both export the port and write its direction: 'in' or 'out' respectively. Within the implementation section of our unit, we can start by writing a short procedure that serves to append a string to a given file, thus packaging this functionality away from the main procedures (next page, top right).

Finally, procedure release will unexport the port. All of these are rather simple to code, and the complete unit is available at this link: <http://pastebin.com/Vnj6ZCqP>.

A simple program to test this

HOWTO - PROGRAMMING WITH FREEPASCAL

unit could be as follows:

Pi's three LEDs. We do not need a

```
program test10;

uses
  crt, gpio;

begin
  Writeln ('Setting up GPIO 16');
  setup_output('16');
  Writeln ('Setting GPIO 16 up');
  port_write('16', '1');
  Writeln ('GPIO 16 is ' + port_read('16'));
  Writeln ('Waiting 3 seconds');
  Delay (3000);
  Writeln ('Setting GPIO 16 down');
  port_write('16', '0');
  Writeln ('GPIO 16 is ' + port_read('16'));
  Writeln ('Releasing GPIO 16');
  release('16');
end.
```

To compile and execute this program, we will need to compile both the unit and the program itself, and then execute the binary file as root:

```
fpc gpio.pas
```

```
fpc test10.pas
```

```
sudo ./test10
```

CREATING A FREE VISION INTERFACE

Let us Integrate our new Gpio unit into a short Free Vision application to control the Raspberry

complete interface, so let us dispense with creating a menu bar and simply load a Dialog box with four buttons: three to control each circuit on GPIO 16, 20 and 21; and a last button to quit the application.

Our program will need to access Gpio, and the standard Free Vision units:

```
uses
  gpio,
  App, Objects, Menus,
  Drivers, Views, Dialogs,
  MsgBox, StdDlg;
```

The application itself will need only a bespoke constructor, that creates and launches our

implementation

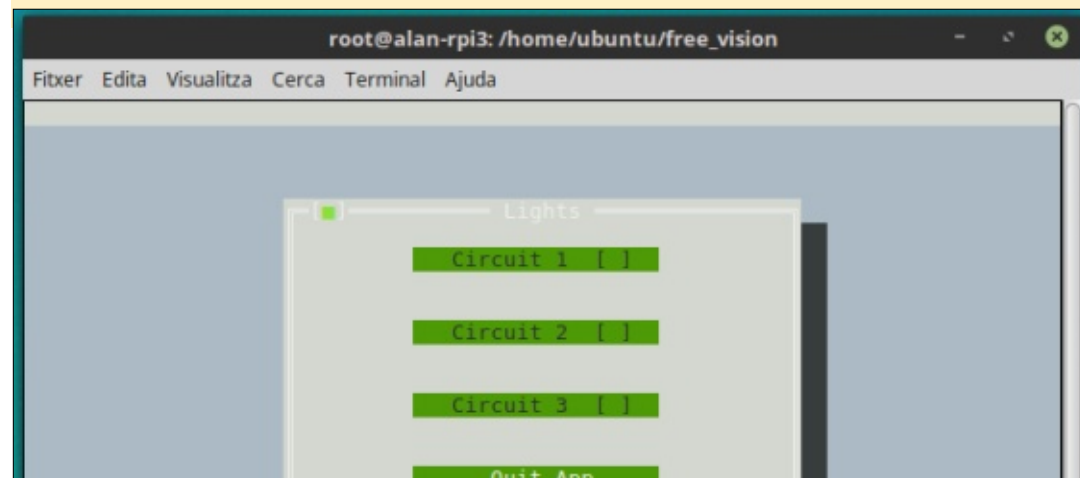
```
procedure write_to_file(filename : string; msg : string);
var
  f : text;
begin
  Assign(f, filename);
  Append(f);
  Writeln(f, msg);
  Close(f);
end;
```

The complete code to set up a port for writing is rather simple:

```
procedure setup_output(port : string);
begin
  write_to_file ('/sys/class/gpio/export', port);
  write_to_file ('/sys/class/gpio/gpio' + port +
'/direction', 'out');
end;
```

Other procedures used are port_write to write to a GPIO port, and function port_read to read from a port that has been configured in the 'in' direction:

```
function port_read(port : string) : string;
begin
  port_read := read_from_file ('/sys/class/gpio/gpio' +
port + '/value');
end;
```



LightsDialog:

```
type
  TMyApp = object(TApplication)
    constructor Init;
  end;

constructor TMyApp.Init;
var
  pLights : PLightsDialog;
begin
  inherited Init;

  pLights := New (PLightsDialog, Init);
  ExecuteDialog (pLights, nil);
end;
```

The LightsDialog type will need a few more elements to work. We will need to keep track of the state of each circuit (True for on, False for off). If we wish to be able to change the caption on each button to reflect the state of the circuit, we will also need to access these buttons from the main Dialog object, so include buttons 1, 2 and 3 in its declaration:

```
TLightsDialog = object(TDialog)
  state1, state2, state3 : boolean;
  button1, button2, button3 : PButton;

  constructor Init;
  procedure HandleEvent(var Event: TEvent); virtual;
end;
PLightsDialog = ^TLightsDialog;
```

We will also need several constants, both to identify which GPIO ports will be used to control each circuit, and to store the command identification codes that each button will emit when pressed:

```
const
  circuit1 = '16';
  circuit2 = '20';
  circuit3 = '21';
  cmCircuit1 = 1001;
  cmCircuit2 = 1002;
  cmCircuit3 = 1003;
```

The LightsDialog can be initialized in a very simple manner. All we need to do is set up the buttons, and then add some code at the end of this constructor to initialize button states for the software, and set up the hardware correctly:

```
constructor TLightsDialog.Init;
var
  R : TRect;
begin
  R.Assign(20, 3, 60, 17);
  inherited Init (R, 'Lights');

  R.Assign(10, 2, 30, 3);
  button1 := New(PButton, Init(R, 'Circuit 1 [ ]',
cmCircuit1, 0));
  Insert(button1);
  R.Assign(10, 5, 30, 6);
  button2 := New(PButton, Init(R, 'Circuit 2 [ ]',
cmCircuit2, 0));
  Insert(button2);
  R.Assign(10, 8, 30, 9);
  button3 := New(PButton, Init(R, 'Circuit 3 [ ]',
cmCircuit3, 0));
  Insert(button3);
  R.Assign(10, 11, 30, 12);
  Insert (New(PButton, Init(R, 'Quit App', cmQuit, 0)));
  state1 := false;
  state2 := false;
  state3 := false;
  gpio.setup_output (circuit1);
  gpio.setup_output (circuit2);
  gpio.setup_output (circuit3);
end;
```

Finally, the LightsDialog will need a HandleEvent procedure to respond to button presses. This is a tad tedious, since we will need to detect a button press for each button, and for each of those determine if we are going from an On state to Off, or vice-versa. It

begins in this way (next page).

The complete code for this program is available here: <http://pastebin.com/KdGuJexk>.

In this seventh part of our series on Free Pascal, we saw how

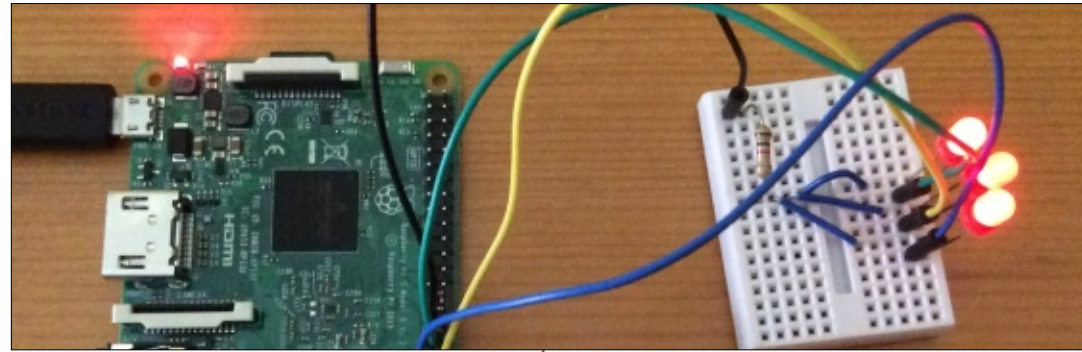
```
procedure TLightDialog.HandleEvent (var Event: TEvent);
begin
  inherited HandleEvent (Event);
  if Event.What = evCommand then
  begin
    case Event.Command of
      cmCircuit1:
        begin
          if state1 then begin
            gpio.port_write (circuit1, '0');
            state1 := false;
            button1^.Title := NewStr ('Circuit 1 [
]');
            DrawView;
          end else ...
```

Some attention also needs to be given to the cmQuit command emitted by the fourth button to quit the application. When pressed, we need to close down our hardware gracefully, before quitting the application itself:

```
cmQuit:
  begin
    gpio.port_write (circuit1, '0');
    gpio.port_write (circuit2, '0');
    gpio.port_write (circuit3, '0');
    gpio.release (circuit1);
    gpio.release (circuit2);
    gpio.release (circuit3);
    TApplication.Done;
  end;
```

the Raspberry Pi can be wired up to control several LEDs. We then wrote a simple unit in Pascal to access the GPIO port, and finally used the unit inside a Free Vision application to produce a text-based user interface that, quite frankly, is elegant and functional. As an exercise, this project has been quite complete since it

combines elements at a very low level close to the hardware, with a very clean object-oriented style of programming. The end result is actually quite practical, since the application can be accessed directly through the Raspberry Pi if it is connected to a screen and keyboard, or over an SSH connection either wired or wireless



(if a model 3 is used).

To go further, the interested reader could modify the application so that the second circuit switches on at the press of a button, and then turns off when a set time-period has elapsed. A slider could be provided to fine tune the delay time. The third circuit could also be set up to turn on and off at specific times during the day.

From the hardware's standpoint, our three trusty LEDs may be replaced with something more substantial. However, going on to an AC circuit with voltage levels of 110 to 250 V should really not be attempted unless one is a qualified electrical installer - much caution needs to be exercised when using AC since it can quite readily kill you, either directly or by causing a fire. This is also true even

with the 12 VDC used in cars. Proceed at your own risk, and please do your homework first. Having someone who is qualified stand by and check your work - before switching it on - is surely a smart move.

It is also wise to remember that any current over 10 to 15 mA going in or coming out can seriously damage the Raspberry Pi, so an optical isolator or some equivalent means of disconnecting the RPi from the load's level of current will be a must.



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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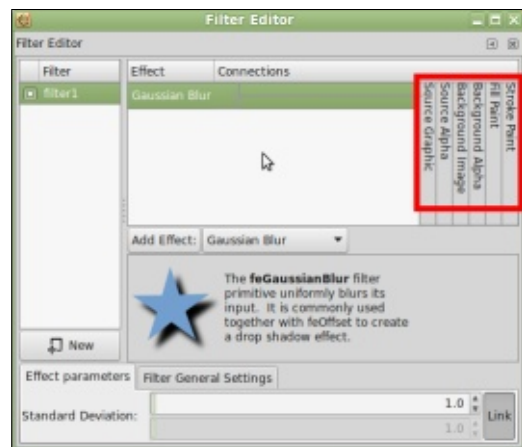


HOW-TO

Written by Mark Crutch

Inkscape - Part 57

Filters are an important topic for making the most out of Inkscape – at least for artistic endeavours. There's always a danger with vector graphics that they can end up looking too precise and sterile for some uses, and filters offer a way to add back in some of the subtle (and not so subtle) variations in texture and color that are often a hallmark of bitmap graphics. At least that's my justification for having spent the previous nine instalments of this series discussing filters but, having described each primitive in some detail and shown a few filter chains along the way, this article is the last on the topic, and I'll move on to something else next month.



Way back in part 48, I briefly mentioned the source input columns at the right of the filter dialog (outlined in red). We've spent a little time with "Source Alpha", and a lot more with "Source Graphic", but that still leaves four other options that have, so far, been completely ignored. There's a good reason for that: quoting from part 48, I wrote "of the six inputs shown in the UI, two of them require special treatment... and another two don't work at all!"

Let's first of all rule out the two that don't work. "Fill Paint" and "Stroke Paint", according to the SVG specification, should do exactly what their names suggest. They should act in a similar way to the Flood primitive, by filling the filter area with a color, but rather than specifying the value within the filter primitive itself, it is taken from the selected object's Fill or Stroke color. This sounds like a great way of pulling a couple of colors into your filter chain, and allowing you to create filters that can adapt to the colors of the

objects they're applied to. Except it doesn't work at all in Inkscape.

There's one obvious technical issue with these input sources: a fill or stroke in SVG can be more than a simple flat color. This doesn't really affect their use in a filter chain – a pattern can be repeated to fill the filter region, as can a gradient if the definition allows it – but it does significantly complicate the rendering process for Inkscape, and has not (yet) been tackled by the developers. Nevertheless, even just being able to use solid colored fills and strokes would be a useful addition. If there are no plans to add even that much, it's long past the time when these couple of columns should be removed from the UI to avoid further confusion.

The remaining source inputs, "Background Image" and "Background Alpha" can be used within Inkscape, but only after a little preparation. These inputs represent an "image snapshot of the canvas under the filter region at the time that the 'filter' element

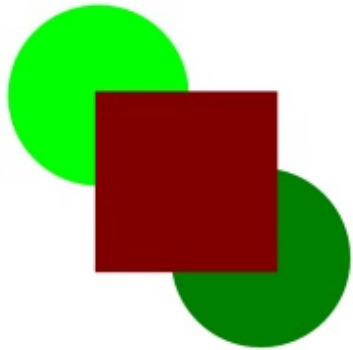
is invoked" (according to the SVG spec). In other words, they pull in a flattened bitmap version of the drawing behind the filter region (or just the alpha channel of the same area), and make it available inside the filter chain, much like a bitmap pulled in via the Image primitive. The spec also points out, however, that holding a copy of the background image in memory "can take up significant system resources", so the SVG content must "explicitly indicate" to the application that the document needs access to the background before these two input sources will have any effect. It then goes on to define how a document should specify that it needs access to the background by putting an attribute called "enable-background" onto an ancestor container element, giving it a value of "new". You can fiddle around with the XML editor, or even modify your file's source code in a text editor, to achieve this, but there is a much easier way.

Before explaining the simpler method, I'll use a very basic test

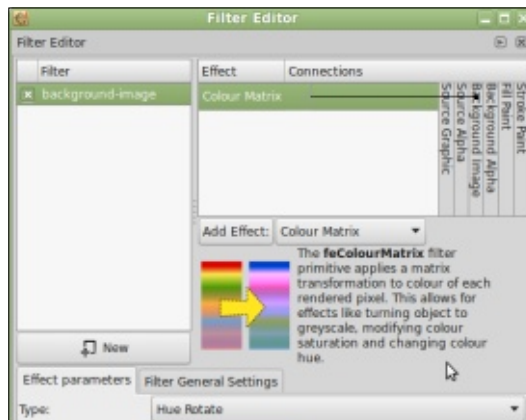


HOWTO - INKSCAPE

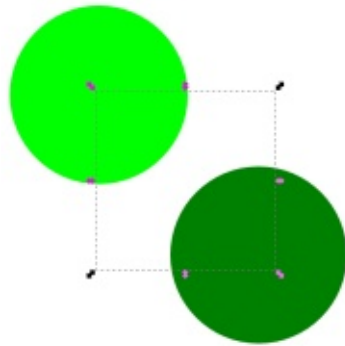
file to clarify exactly what I'm talking about. Here I have a pair of green circles as my background objects. The background consists of any content below the filtered object in the z-order, so could just as easily have been a single shape or an entire drawing. In front of the circles is a red square, the object I'll be applying the filter to.



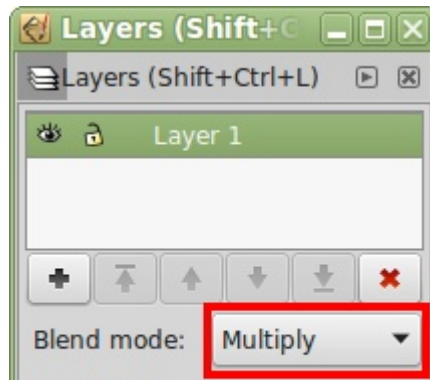
The filter itself is quite simple – just a Color Matrix primitive set to Hue Rotate mode, using Background Image as the source.



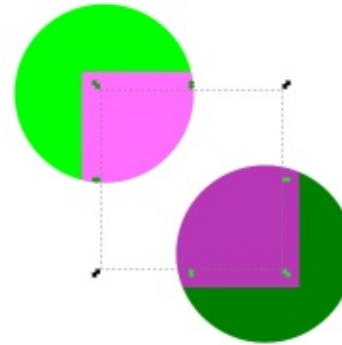
The result, at this point, is rather disappointing. The square simply becomes transparent, with no effect on the background circles at all.



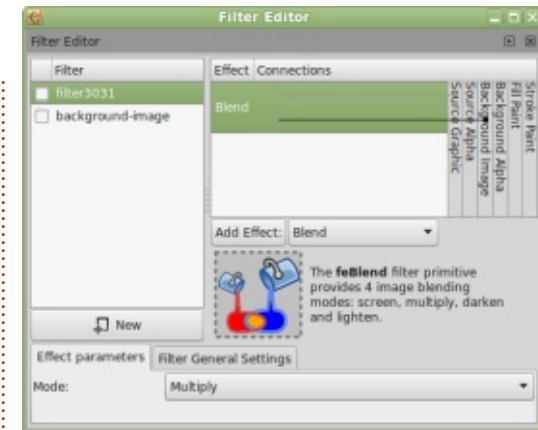
Now to add the “enable-background” attribute. Just open the Layers dialog and change the blend mode for one of the layers to something other than “Normal” (see Part 9 of this series if necessary). Don't panic if it has an unexpected effect on your image, as you can immediately change it back to “Normal” once again. The magic will already have been done.



My test image now looks like this, with the background colors rotated within the area covered by the square's filter region. By default the filter region extends beyond the selected object, which is why the color shift is present outside the dotted outline of the selection box. The square itself has disappeared, because there's nothing in the filter chain that pulls in the “Source Graphic” input.

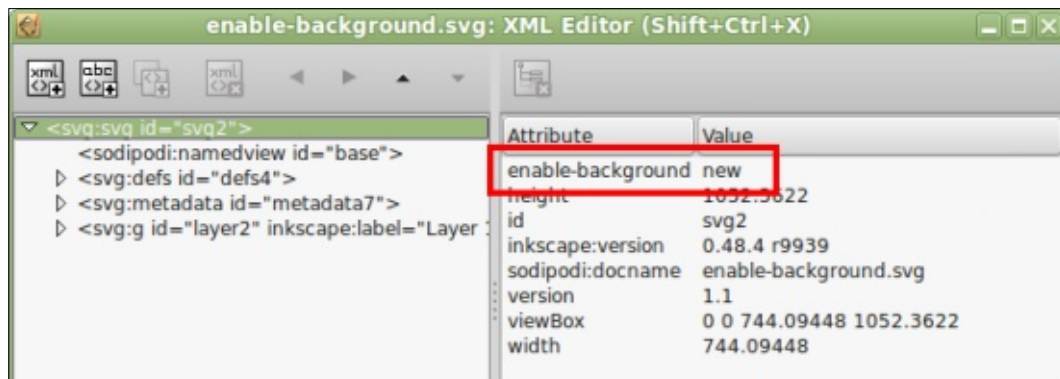


So what happened? What was the black arts and voodoo that made the filter work just by changing a blend mode, then immediately changing it back again? It's actually quite simple: the blend mode popup in the layers dialog is just a shorthand way to add a filter with a Blend primitive to the document. You can even see it appear in the filter editor.



Although it appears in the dialog, the filter isn't attached to any objects that you can select on the canvas. Rather it is linked to the layer itself. Remember that layers are just a group with some Inkscape-specific attributes added, so it's not really any different to having a filter applied to a group of objects. When the filter is created, Inkscape automatically connects the inputs of the Blend primitive to the Source Graphic (i.e. the layer that's actually a group), and to the Background Image. At the same time, it adds the “enable-background” attribute to the root node of the SVG document, visible here in Inkscape's XML editor.

The key thing is that switching the Blend Mode back to “Normal” leaves this attribute intact, although it does remove the filter.



From that point on, however, you are free to use the Background Image and Background Alpha inputs in your own filter chains.

That concludes our detailed examination of the mysterious art of creating your own filter chain. But, if you've been experimenting, you've doubtlessly noticed that Inkscape already supplies an extensive list of ready-made filters, grouped by type, that make up the bulk of the Filters menu. Whilst there are those gallant masochists who dare to brave the shortcomings of Inkscape's UI to create their own complex filters from scratch, many more users simply work with the default set provided. But with the knowledge you've gained over the past few months you can do better than that: you can start with a standard filter, but then dive into its guts to edit and tweak it to suit your

needs.

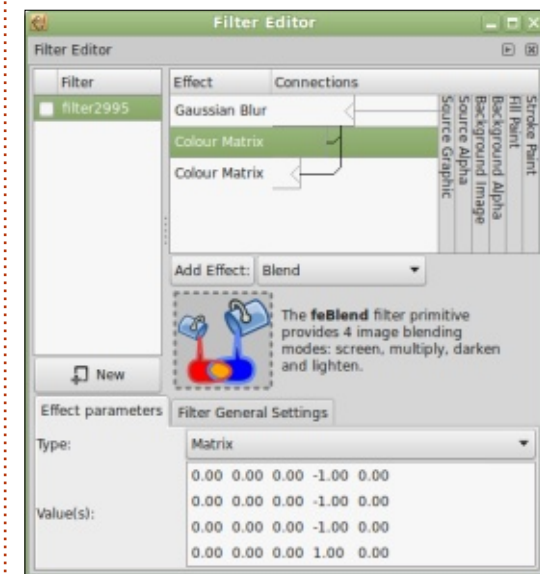
I shan't spend any time going exhaustively through the list of default filters, but instead encourage you to explore them on your own. Try creating a test sheet with some different objects and groups to work on: some of the filters work best on small objects, others on large ones; some require colorful content, others work just as well with a monochrome shape; some are wasted on intricate outlines, whilst others fail just as easily on featureless blocks of color.

A useful ability of Inkscape is that, when you copy and paste an object from one document to another any attached filters are copied with it. Why not start a "filter library" – a document into which you copy any particularly useful or impressive filters? Each

time you create or find a great filter, just apply it to a suitable object, then copy and paste it into your library file. Similarly, when you want to use a filter from the library, just copy the object from the library file and paste it into your current creation. The filter will appear in the filters dialog, and, once you've applied it to something else in your image, you can safely delete the object you pasted in. Other users have already posted their own filter collections online – search for "Inkscape filter pack", for example – so you might find that someone else has already created just the filter you need, and it's only a copy and paste away from being used in your drawings.

When constructing your own filter chains from scratch, there's never really a question about what happens when you combine two primitives. You want a blurring and desaturating filter? No problem, just chain a Gaussian Blur primitive with a Color Matrix primitive (in Saturate mode). But what happens when you want to do the same with the default filters? There's an ABCs > Simple Blur (which consists of just a Gaussian Blur primitive) and also a Color > Desaturate filter in the menu (which provides a

single Color Matrix primitive). What happens when you add both of them to an object? If you try it, you'll see that you get a blurred, desaturated result, so it is possible to combine the default filters in this way. But there's something odd going on in the filter chain. We don't have just the two primitives we might anticipate, but also a third one: an additional Color Matrix between the two primitives we expected.



If you look closely you'll see that it's not even connected to the last primitive, so plays no active role in this chain. You can delete it entirely and it won't have any effect. So why is it there?

It turns out that this is actually a rather nice addition on the part of the Inkscape developers. Let's suppose you want to add another filter to this chain, but it's one that would normally use Source Alpha as an input. To prevent any unexpected results, you need it to use the alpha from the previous filter output, which will usually not be the same as the Source Alpha at all. These extra Color Matrix primitives act as intermediate alpha outputs within the chain. So with the addition of these, you can not only link any new primitives into the image output of each filter, but also to its alpha output as well.

It's impressive that you can combine filters in this way and have them work as expected, but it can quickly lead to long, complex and hard to manage filter chains. Often a better approach is to apply one filter, then group your object before applying the next filter to the group. You can repeat this as often as necessary, creating ever deeper nesting of groups, each with its own filter applied. This certainly makes it easier to manage them in the filters dialog, as there's far less confusion about which filter you're modifying,

especially if you name them well.

One final thing to note is that, in 0.91 (and the just released 0.92!), many of the default filters now have an ellipsis (three dots, "...") after their name. Choosing one of these opens a dialog which lets you enter parameters for the filter, and even see a live preview. Of course this is just a shortcut to setting parameters in the individual filter primitives, but is a welcome addition that can expose the most important parameters from across a number of primitives, whilst hiding all the other options and settings that aren't relevant in most cases. Unfortunately, there's no way to get this simplified UI back once you've dismissed it, so any subsequent tweaks will mean diving into all the gory details of the individual primitives again. Some of the separate filters from 0.48 have also been dropped, since the new parameterized filters can achieve the same effects and more. If you can't find an old favourite filter in the newer releases, look for a similar name with an ellipsis, and start tweaking the parameters!



FCM POLL

I've set up a poll which I hope you'll fill in. It's located at:
<https://goo.gl/Q8Jm4S>.

We're interested in what you like/dislike about FCM. What I can change/add, and anything else you want to add.

We'll publish the results in a future issue.

LINK: <https://goo.gl/Q8Jm4S>



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



HOW-TO

Written by Ronnie Tucker



Kdenlive - Part 1

Why Kdenlive? Well, I've tried most of the video editing applications in Linux, and Kdenlive is, in my opinion, the most full-featured of them all. Yes, it's (technically) a KDE application, but it will run equally well in any non-KDE *buntu. Since it now uses more modern compilation methods, Kdenlive won't pull in a huge pile of KDE libraries. Yes, it'll pull some. But nowhere near as many as it used to!

Anyway, in this series of articles, we'll start from the basics and work our way up to the more

complicated stuff. I'm no video editing master, so this won't show every facet of Kdenlive, but I'll show you everything I know, and use.

INSTALL

You may already have Kdenlive in your package manager. Have a look. If not, you can add a PPA and install Kdenlive with these commands:

```
sudo add-apt-repository
ppa:kdenlive/kdenlive-stable
sudo apt-get update
```

```
sudo apt-get install kdenlive
```

That will add the PPA, update your sources, then install Kdenlive.

NOTE: As of writing this article (Jan 2017), I'm using 16.08.2. There is, for me, a bug in Kdenlive that if I render a video of about an hour I get a crash error message at the end of the render, referencing the melt library. If you also get this, don't worry. The video is rendered and it will work just fine.

LAYOUT

For this first part of the series, let's look at the layout of Kdenlive. Obviously when you load up Kdenlive, it'll be mostly blank. I've added a couple of pieces to show how it looks 'in action'.

1. This is where you add the audio and video that you'll need for this edit. I've added one video file (shown with thumbnail) and one audio file (shown with a musical note icon).
2. This is the properties window for whatever is currently selected. In

this case the video portion shown in section 6 with the red outline. Note the two tabs at the bottom to switch between effects and video properties.

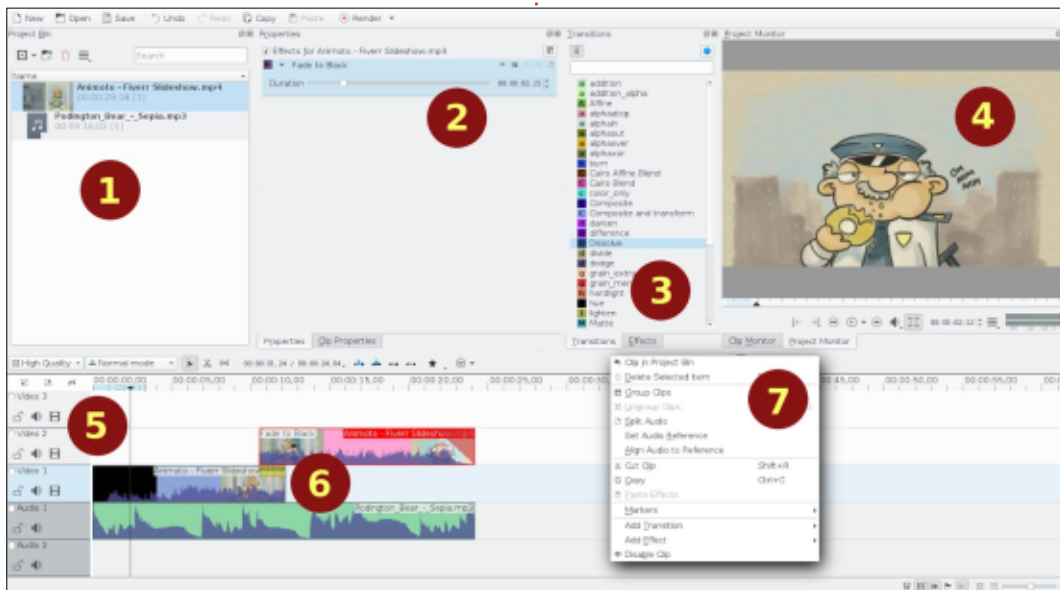
3. The list shows the transitions and effects that are available (via, again, the two tabs at the bottom of the window):

- a. Transitions are used when two audios/videos overlap (more on this in later parts), and
- b. Effects change the audio/video.
- c. You can filter this list using the icons at the top of this window.

4. This is your preview window for whatever is selected. Select a video in section 1 and you can play it here to see it as it currently is. Select a time in the timeline (section 5) and you'll get a preview of your edit(s).

5. This is your timeline showing three video lines, and two audio lines. You have icons there to lock/unlock the line, enable/disable audio, and (in video lines only) enable/disable video. Above the lines are icons for cutting and splicing, but more on them in later articles.

6. This is where you'll do all the



HOWTO - KDENLIVE

fancy stuff. Notice that one video is on line 1 and one is on line 2, and there's an overlap. See the yellow box on the overlap? That's a transition. See the pink triangle at the end of the video on line 2? That's a fade-out effect. The fade-out can be altered using the properties in section 2. Audio is on a separate line and is edited in a similar manner.

7. This is the right-click menu when you right-click over an audio/video segment. I've shown it separate from them just to keep things clearer. This lets you right-click an audio/video segment and quickly assign an effect/transition to it,

copy/paste, add markers, and so on.

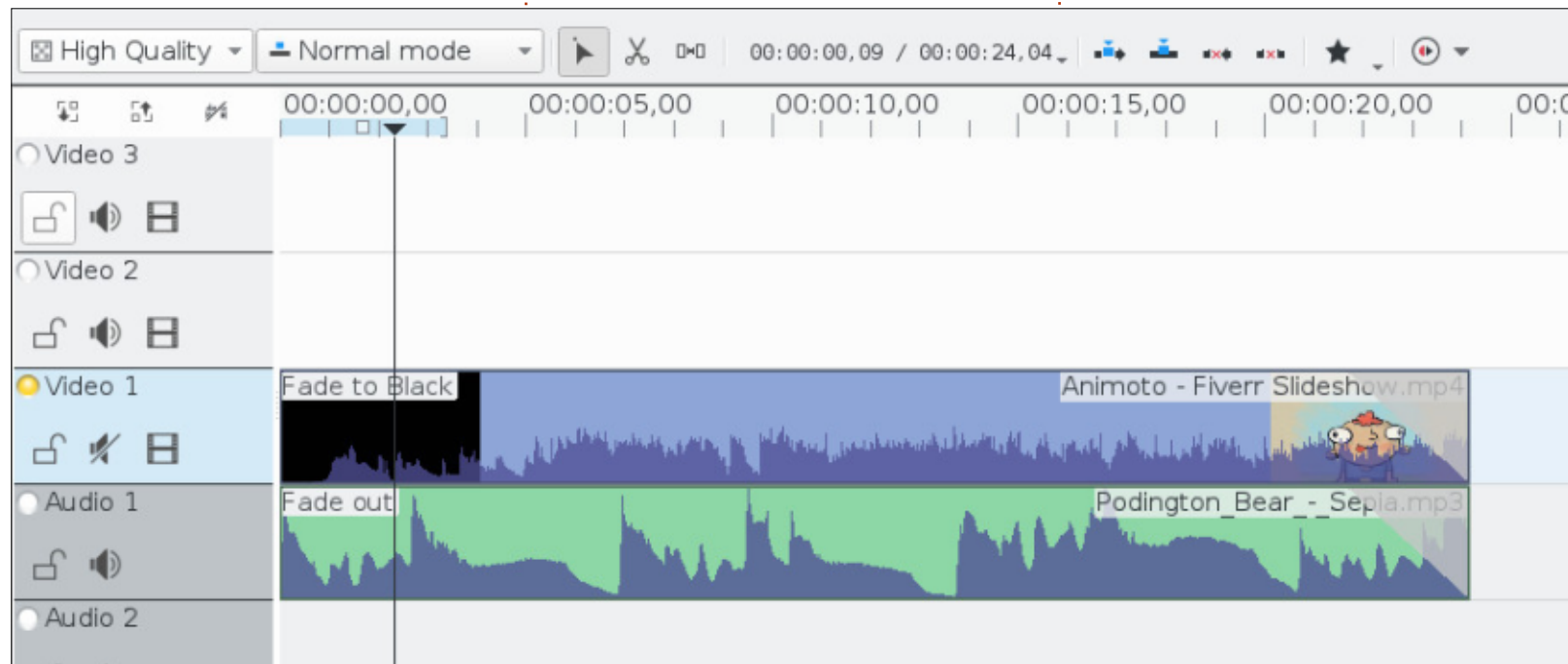
QUICK EXAMPLE

Let's finish this first part with a quick example. Let's say you wanted to replace all the audio in a video with audio you have (maybe a voiceover, or music). You'd drag your audio and video pieces to the top left window. Drag your video to video line 1, and your audio to audio line 1. Click the icon to disable the audio in the video line 1. Want a nice fade out to the final video? Right-click the video line 1 and choose add effect > fade >

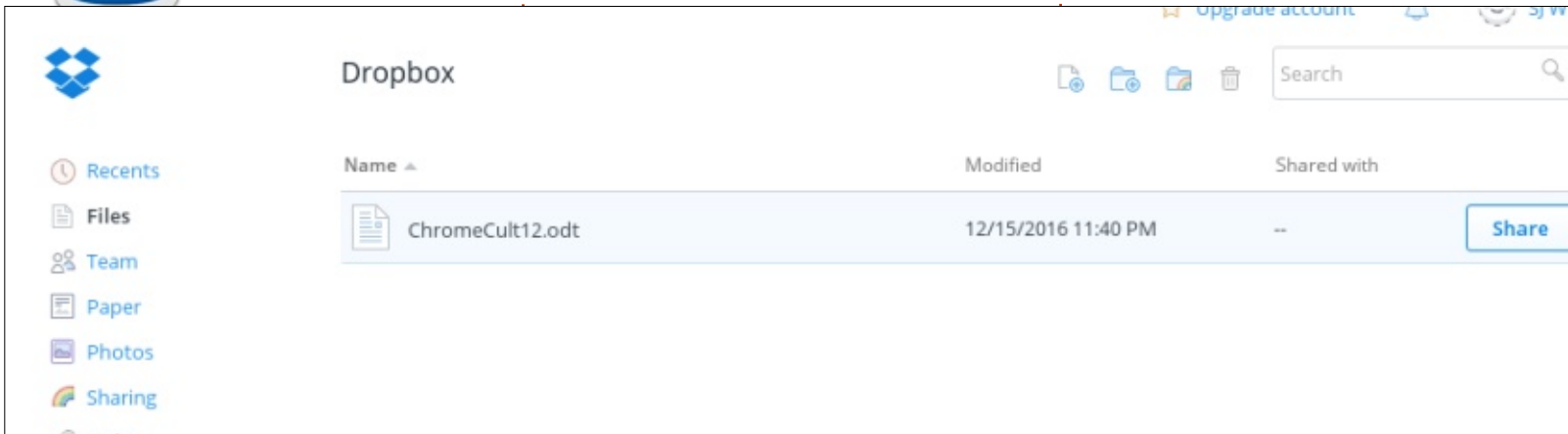
fade to black. Right-click the audio line 1 and right-click. Choose add effect > fade > fade out. Done! You'd have something like that shown in the image.

See? It's not that difficult after all.

In the next part of this series, we'll look at cutting, and throw in some overlaps and transitions.



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



attempts to incorporate other valid file formats. If you have Dropbox, you can open Paper by entering paper.dropbox.com. You do have the option of saving docs to the Dropbox Cloud. It has a layout similar to Google Drive with the same functions of cloud document sharing.

Dropbox is a first or second choice when using the cloud. Dropbox is a slimmed down Google Drive. Historically, you can drop and share files in the Dropbox cloud with friends, family, or co-workers. A new option that is currently in Beta stages is Dropbox Paper. This is Dropbox's answer to Google Docs and, to a lesser degree, Zoho Writer.

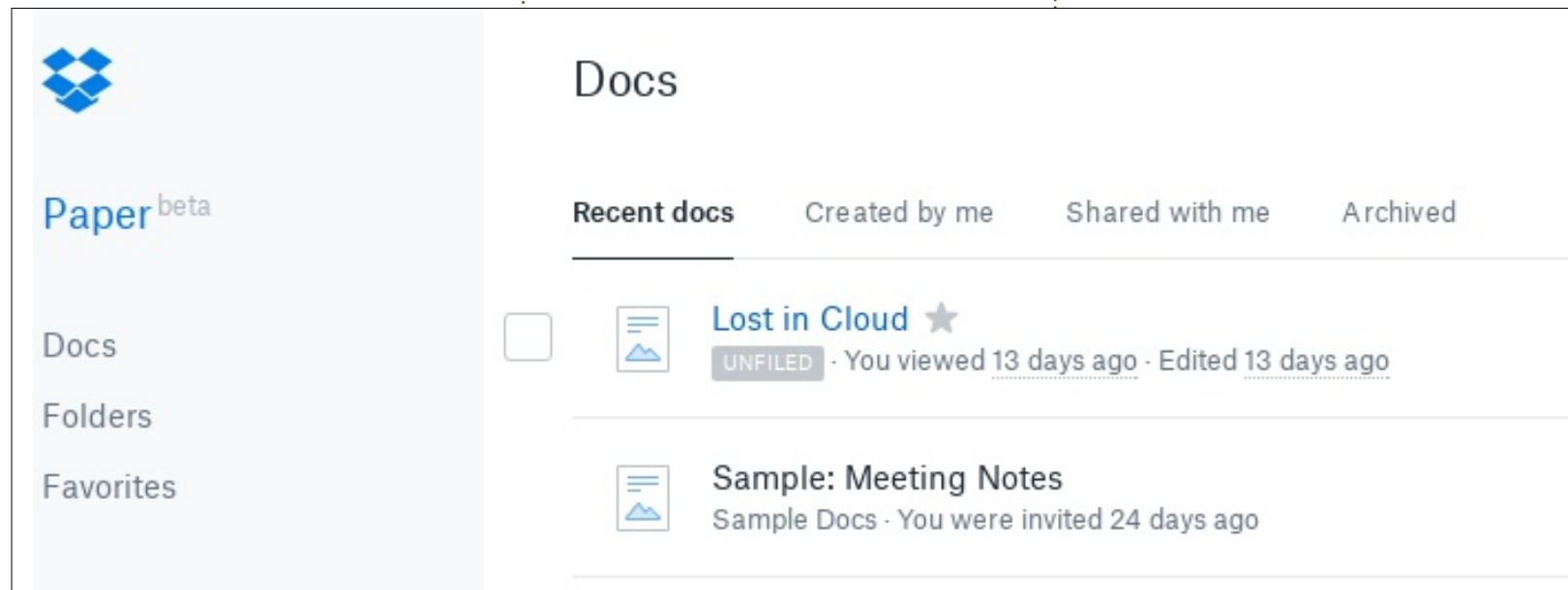
Mobile platforms.

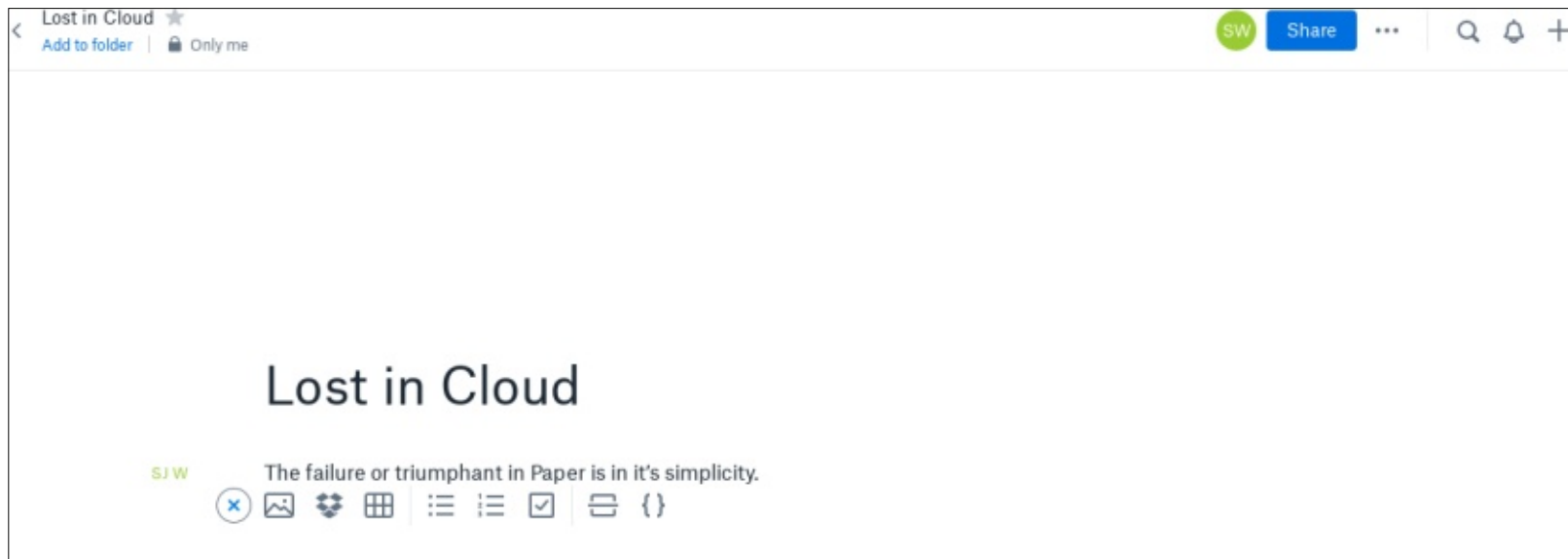
Paper is a partnership project between Microsoft and Dropbox. This partnership makes sense due

to Microsoft's dominance. Paper is able to open MS Word, Excel, and Powerpoint files, and save work in those formats only. Collaborative editing is available. There are no

Paper lacks the Editing, Format, and other word processing menus. When you open Paper, you are given a white screen. It asks you to enter a title and to write in the white space. This is an extremely minimalist and simple interface.

What market is Dropbox going for using Paper? Google Docs is going for education and daily Internet users, while Zoho is attempting to corner the business niche. In circumspect, I believe Paper is trying for the business market niche. The Paper App is available on iOS and Android





The author has their initials appear to the left tab. Below the words, the author can import other Dropbox Files, images, tables, three list types, text divider, and code.

So after using Paper, I am not impressed by the partnership between Microsoft and Dropbox. The entire experience felt like a poorly implemented version of Google Docs and Google Drive.

In an attempt to be an universal MS Office Productivity app for Dropbox, there are missing core functions that erode the end user's capability. Google and Zoho do not have a universal app for its spreadsheets, presentations, and

word processing. These two companies clearly understand that today's office worker prefers dedicated apps that perform well.

In comparing the three cloud word processors, (Google Docs, Zoho Docs, and Paper), Paper is an utter failure due to lack of functionality. Google and Zoho bring a polished product from their cloud to you. If you are looking for a free cloud word processor, I suggest sticking with Google Docs and Zoho Docs. I would give Paper one star out of four. If Dropbox added greater basic functions such as spell check or grammar, then Paper could effectively compete against Google Docs.



FCM POLL

I've set up a poll which I hope you'll fill in. It's located at:

<https://goo.gl/Q8Jm4S>.

We're interested in what you like/dislike about FCM. What I can change/add, and anything else you want to add.

We'll publish the results in a future issue.

LINK: <https://goo.gl/Q8Jm4S>



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.



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 :

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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.





[This article was dictated, not written. Mistakes are noted in brackets.]

Several months ago I was approached by one of the staff (last?) if I could find a solution for a participant who needed to dictate a novel. The participant didn't have a lot of resources so we needed to find a cost effective way of doing this. Of course when it comes to low-cost computers Linux is always a great choice(,) since we don't

have to deal with licensing costs. We started by looking at commercial solutions that ran on Windows and even though there was some money available for these solutions there really wasn't money to test the solutions(,) so we needed something that we could try before we purchased it to make sure that it actually worked.

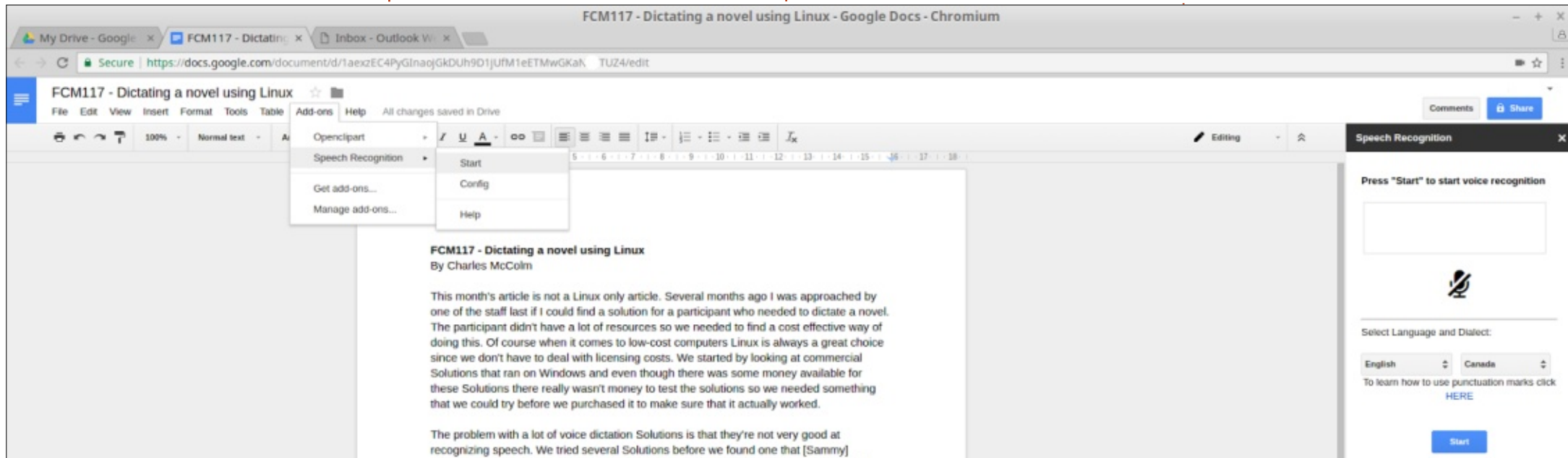
The problem with a lot of voice dictation solutions is that they're not very good at recognizing speech. We tried several solutions before we found one that [Sammy]

semi-accurately recognize our speech. We also needed something that was very simple to use. Unfortunately some of the solutions were quite (L)imited in their use. One program [when] we used would only let us create a single document. This wasn't a great solution since the person wanted to create several stories in addition to their novel.

The solution we came up with was to use Google Docs in addition to the speech recognition add-on. To enable the add-on first go to

the add-ons menu in Google Docs word application and click get add-ons. Next search for the speech recognition text by efv-solutions.com. Unfortunately this add-on won't work (with in) Firefox so you'll need either Google Chrome or the Chromium open source web browser.

To enable speech within a document click on the add-ons menu then click on speech recognition and click on the start sub menu. Chrome or Chromium will ask you if you want to allow



Chrome or Chromium to access the microphone - click yes. On the right hand side a window will appear where you can choose the language and dialect. In our case we selected English Canada. Then click the blue Start button on the left hand side of the screen and start dictating.

The speech recognition add-on

has a limited amount of configurability. To configure the add-on, click Add-ons, Speech Recognition and Configure. This will bring up a pop-up window where you can configure the number of spaces after a period, the [work] word for period, the word for a new line, the word for a comma, the word for a semi-colon, and the word for a colon. While it's

a very limited configuration, it seems to be just enough to cover most of the basics.

So just how accurate is the speech recognition add-on well most of this document was created using the speech recognition at all I simply corrected a few things which you'll see by the brackets around different words. The most difficult thing was actually my grammar and dictating what was on my mind with a rambling on too much. The speech recognition plug-in has a fairly High rating in the Google app Store and there's a good reason for this it's actually a fairly decent plug-in despite its simplicity. It does the job it's not a great job I'm sure I can type faster and more accurately but it's accurate enough and surprisingly accurate enough that I decided I would actually use it for most of this document.

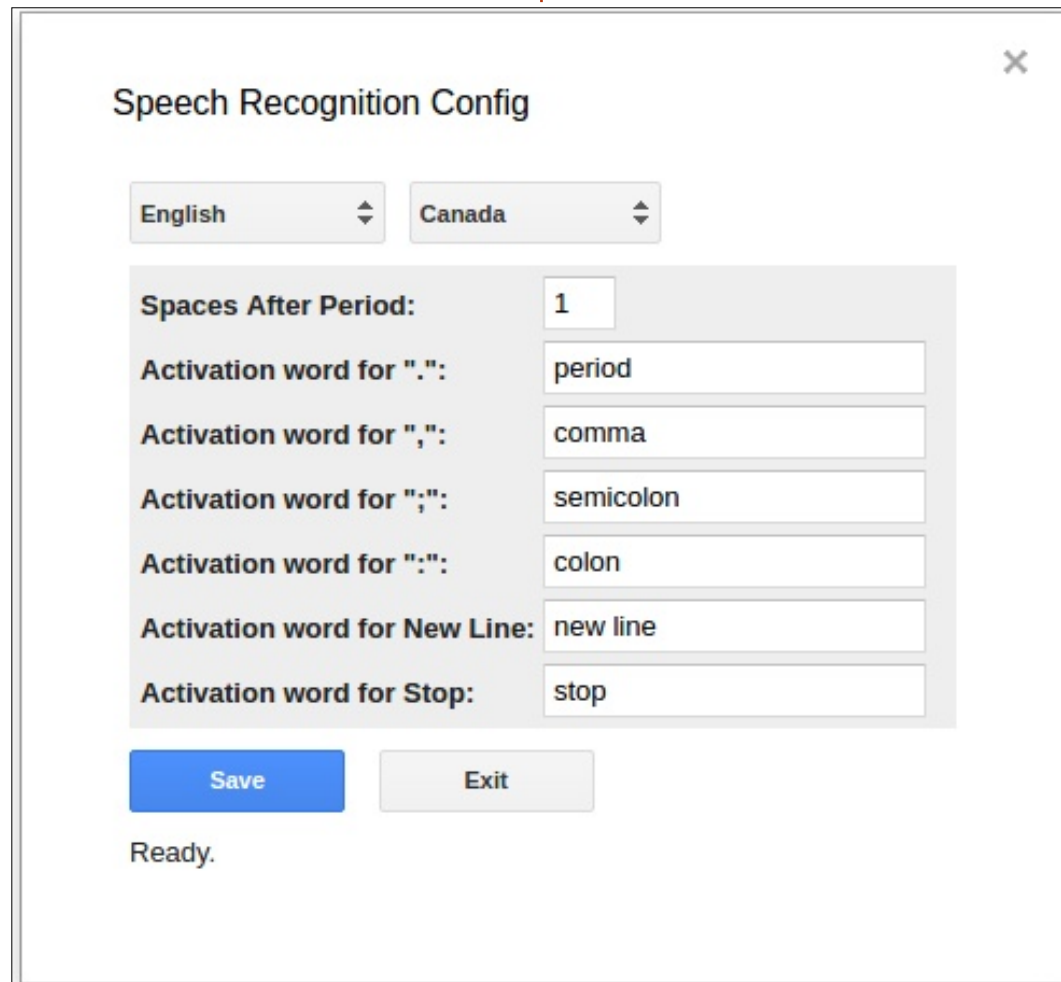
If you don't say anything for about 30 seconds this speech recognition turns itself off and you have to click start again. I found it was fairly good at detecting rapid speech as well as normal speech and slow speech. This add-on was created by [elizardo] Elisardo Felix and to date has no donations on

[pleasure.com] pledgie.com but it's certainly deserves it given the level of accuracy.

RESOURCES:

EFV Solutions:

<http://efv-solutions.com/>



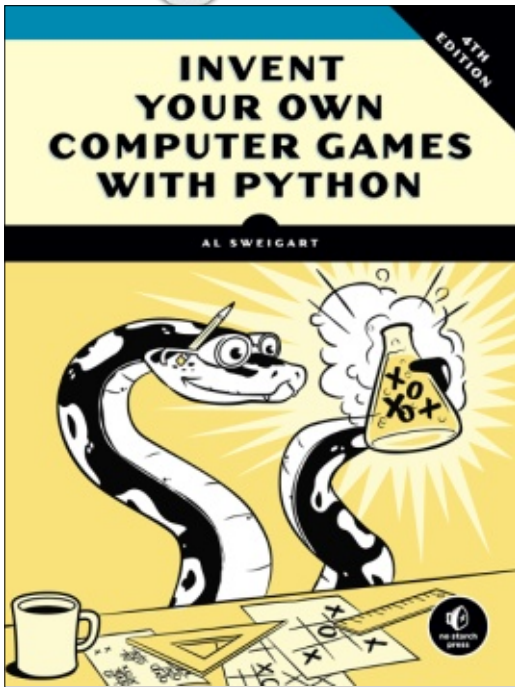
Charles is the author of Instant XBMC, and the project manager of a not-for-profit computer reuse project. When not building PCs, removing malware, and encouraging people to use GNU/Linux, Charles works on reinventing his blog at <http://www.charlesmccolm.com/>.



BOOK REVIEW

Written by Greg Walters

Invent Your Own Computer Games



Invent Your Own Computer Games With Python (4th Edition)

By Al Sweigart

December 2016, 376 pp.

Publisher: No Starch Press

ISBN: 978-1-59327-795-6

I must say that I really enjoyed this book. This well written book is designed for:

- Complete beginners
- Kids and Teenagers
- Adults and teachers
- Anyone who wants to learn to program

I have to agree that AI has really been able to explain the complex subjects in such a way that a beginner can, assuming they work the chapters in order, understand things such as using the debugger for Python, Cartesian coordinates, and using Pygame. Chapters 1 through 16 teach you console-based programming of games in a very easy-to-deal-with manner without getting so simple that the reader just drops the subject. While the games that are presented are simple, they are relevant enough that the reader's attention is held and made to want to drive forward. The projects are also well explained from a programmer's standpoint.

Once you get to chapter 17, the focus of the book is on programming with Pygame, a library that provides game/graphics support. These projects are again, simple enough, but AI has made them interesting enough to keep the attention focused.

Unfortunately, the author does not offer any information about installing Pygame on Python 3.x on Linux, only Windows and Mac, and those are only on the book's website. (I am running Python version 3.5.2 (Debian's default version), and there were no major problems... see below.) Here is a website link that should help... <http://www.pygame.org/wiki/CompileUbuntu>

Most of the examples that were loaded during the install of Pygame, worked fine. There was a problem with freetype dependencies and the opengl cube test program.

After getting pygame installed, the sample games in the book ran as expected.

Normally, I would have given this book a 4.5 out of 5 star review, if it had not been for the lack of support for instructions on loading Pygame on a Linux box. So, because of this, I have to drop it down to a 3.5 out of 5 rating.

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Way back in 1984, I was preparing an important sales proposal using an early PC that used notoriously unreliable floppy diskettes for both software and data. When I tried to open and print the 8-page proposal, the diskette could not be read. I tried the diskette on a different PC; no luck. Cleaning attempts were futile. The customer came to pick up the proposal a few hours later, but he could not wait until the next day when the proposal could be re-created. The loss of that \$6,000 sale taught me how vital backups can be.

Over the next three decades, I made backups on diskettes, digital audio tape (DAT), CDs, DVDs, flash drives, and external hard drives. These backups used a variety of backup software under DOS, OS/2, Windows, and Linux. Those experiences taught valuable lessons in what “thou shalt” and “thou shalt not” do. I gladly share my lessons learned to save you the “tuition” in the College of Hard Knocks or the University of Adversity.

1. Have more than one backup. Murphy’s Law is more reliable than any backup. When you need them most, your backup file(s) may be unreadable... damaged medium, interrupted backup, infected file, etc. Grandfather or archive your backups to provide additional protection; more on grandfathering later.

2. Keep your backups somewhere other than on the top of your PC tower. A burglar, fire, or natural disaster (flood, tropical storm, earthquake, etc.) may condemn your backups to the same fate as your PC. Have at least one or two backups off-site so you will have something to retrieve after almost any disaster. Off-site locations include your office, attorney’s office, a friend’s or employee’s home, or a bank safe-deposit box.

3. Do not assume that if the backup worked fine, you will be able to restore without any problem. Test the restore before it is needed. I prefer to avoid backup utilities to reduce possible points of failure. A good alternative is to

use rsync (Remote Sync), which is included in Linux distros. Rsync can copy and synchronizes files and directories both locally and remotely. When rsync is used to make backups, there is no need to keep a copy of a restore program with your backups.

4. Match the backup medium to the size and frequency of backups. Factors to consider when choosing what medium to use for storing your backups include capacity, speed, durability, reusability and cost. For backups of only a few GB of data, DVD-R discs are a great option. If the backups will contain large databases or media files (many GB), then an external USB hard drive may be a better option.

5. Base both the type and frequency of backups on the number of file additions/modifications and on how difficult/expensive it would be to recreate lost files if they are not available from a backup. People use computers in many different ways. To illustrate a solid backup strategy, let’s use the files

on my PC as an example. The files on my PC can be classified in three groups:

A. System files and Apps – This includes Ubuntu, Firefox, LibreOffice, Thunderbird and other software (24 GB). These files change only when applications are installed or removed, when software updates are applied, or when some configuration changes are made.

B. Photos, audio files, video files – These are usually large files that are added or edited only rarely – typically a few times a month (88 GB). These files are in subdirectories under the /home directory).

C. Non-media data files – Scanned files, downloads, word processing, spreadsheet, and database files, financial records and correspondence (19 GB). These files are in the /home directory and its subdirectories). Typically, a few hours each day may be spent adding or updating files in this group.

To keep life simple, no differential or incremental backups are used. All backups are "full," but filters are used to determine which files will be backed up. There are three types of backups:

Daily – Group C only

Weekly – Group B and Group C

Monthly – Groups A, B and C

Despite their names, any one of those backups can be created whenever desired.

I use 2 TB external hard drives for these backups, regardless of backup type; more about backup drives later. This is based on my situation. Your style of PC usage will likely be different and you may make adjustments to these guidelines to better suit your needs.

6. When looking for a particular backup, the search is made easier when the backup name indicates whether it is a daily, weekly, or monthly backup and when the backup name includes a datestamp.

7. Separate scripts are used to

create each type of backup. Give each script a descriptive name to indicate what type of backup it will produce: e.g. BackUp-Monly.sh (here, Monly means 'Monthly').

SCRIPTS

Let's look at what the scripts do, then the actual code will follow.

The first line of each script sets a variable named BUDATE for use in naming the backup directory.

The second line makes a directory on an external hard drive. My external hard drive is named SUNbackup---Ext4 The directory, for a backup at 2:15 AM on Dec. 5 2016 would use BUDATE to create a file name similar to this: Monly

BU of 2016.12.05 02:15:00

The third line provides a three-second pause to allow completing the creation of the backup directory.

The fourth (very long) line uses rsync to copy the files. This fourth line should be entered in the script as one line without wrapping. Here are the five actions that the rsync line performs (a – e below):

a) Since this script requires super-user (su) privileges to perform the backup, echo is used to send the su password to avoid the need to enter a password manually when performing backups. Replace the supasswordhere with a valid su password. Likewise, in this example script, replace all

occurrences of SomeUserName with the username of the directory (under /home) to be backed up. Finally, replace SUNbackup---Ext4 with the name of the drive that will hold the backup files.

b) Some of the rsync options in these three bash backup scripts are obvious, but to help you understand the options that may not be obvious, below is a list of the options used in these scripts.

For a comprehensive list of rsync options and a more complete understanding of how rsync works, in a Terminal window, type man rsync <Enter> and scroll down to the heading OPTIONS SUMMARY.

c) A list of all the files backed up, and some backup summary data,

```
--delete-after receiver deletes after transfer, not during
--delete-excluded also delete excluded files from dest dirs
-D --devices preserve device files (super-user only)
--exclude=PATTERN exclude files matching PATTERN
-h, --human-readable output numbers in a human-readable format
--progress show progress during transfer
-l, --links copy symlinks as symlinks
--log-file=FILE log what we're doing to the specified FILE
-p, --perms preserve permissions
-r, --recursive recurse into subdirectories
--stats give some file-transfer stats
-t, --times preserve modification times
-u, --update skip files that are newer on the receiver
-v, --verbose increase verbosity
```

are written to a log file named `/home/SomeUserName/Documents/BU-log.txt`. The entries in this plain-text log file are cumulative from multiple backups. So periodically you should delete the `BU-log.txt` file (it will be created again during the next backup), block mark and delete the old entries in that file that you no longer need, or simply delete the `rsync -log` option from this script to cancel logging.

d) Notice that the scripts below use the `-exclude` option to filter out several file types that you would not want to restore (such as caches, trash, lost+found, and others). The `-exclude` command is used in the Daily script to exclude media files (Group B above) from the daily backups.

e) Before running/executing the scripts, in their File Properties dialog boxes, on the Permissions tab, set the Access permission to Execute for anyone permitted to make backups – Owner, Group or Others. The scripts can be executed manually or they can also be executed automatically at desired times by using a utility such as Cron or Gnome-schedule.

Monthly backup script:

```
BUDATE=$(date +"%Y.%m.%d %H:%M:%S")
mkdir "/media/SomeUserName/SUNbackup---Ext4/Monly BU of $BUDATE"
sleep 3

echo 'supasswordhere' | sudo -S rsync -h --progress --stats -r -tgo -p -l -D --update --
delete-after --delete-excluded --log-file=/home/SomeUserName/Documents/BU-log.txt --
exclude=**/*tmp*/ --exclude=**/*cache*/ --exclude=**/*Cache*/ --exclude=**~ --
exclude=/mnt/** --exclude=/media/** --exclude=**/lost+found*/ --exclude=/var/run/**
--exclude=/run/** --exclude=/proc/** --exclude=/dev/** --exclude=/sys/** --
exclude=**/*Trash*/ --exclude=**/*trash*/ --exclude=**/.gvfs/ /
"/media/SomeUserName/SUNbackup---Ext4/Monly BU of $BUDATE"
#                               E N D   O F   B A C K U P   S C R I P T                               #
```

Weekly backup script:

```
BUDATE=$(date +"%Y.%m.%d %H:%M:%S")
mkdir "/media/SomeUserName/SUNbackup---Ext4/Wkly BU of $BUDATE"
sleep 3

echo 'supasswordhere' | sudo -S rsync -h --progress --stats -r -tgo -p -l -D --update --
delete-after --delete-excluded --log-file=/home/SomeUserName/Documents/BU-log.txt --
exclude=**/*tmp*/ --exclude=**/*cache*/ --exclude=**/*Cache*/ --exclude=**~ --
exclude=/mnt/** --exclude=/media/** --exclude=**/lost+found*/ --exclude=/var/run/**
--exclude=/run/** --exclude=/proc/** --exclude=/dev/** --exclude=/sys/** --
exclude=**/*Trash*/ --exclude=**/*trash*/ --exclude=**/.gvfs/ /home/SomeUserName/
"/media/SomeUserName/SUNbackup---Ext4/Wkly BU of $BUDATE"
#                               E N D   O F   B A C K U P   S C R I P T                               #
```

Daily backup script:

```
BUDATE=$(date +"%Y.%m.%d %H:%M:%S")
mkdir "/SomeUserName/SUNbackup---Ext4/Daily BU of $BUDATE"
sleep 3

echo 'supasswordhere' | sudo -S rsync -h --progress --stats -r -tgo -p -l -D --update --
delete-after --delete-excluded --log-file=/home/SomeUserName/Documents/BU-log.txt --
exclude=*.avi --exclude=*.flv --exclude=*.iso --exclude=*.mp3* --exclude=*.m4b* --
exclude=*.m4v --exclude=*.mlv --exclude=*.mp4 --exclude=*.MP4 --exclude=*.mpe --
exclude=*.mpg --exclude=*.MTS --exclude=*.ogg --exclude=*.vob --exclude=*.wav --
exclude=*.webm --exclude=*.WMV --exclude=*.wmv --exclude=*.tmp --exclude=*cache* --
exclude=*Cache* --exclude=**~ --exclude=/mnt/** --exclude=/media/** --
exclude=**/lost+found*/ --exclude=/var/run/** --exclude=/run/** --exclude=/proc/** --
exclude=/dev/** --exclude=/sys/** --exclude=**/*Trash*/ --exclude=**/*trash*/ --
exclude=**/.gvfs/ /home/SomeUserName/ "/media/SomeUserName/SUNbackup---Ext4/Daily BU of
$BUDATE"
#                               E N D   O F   B A C K U P   S C R I P T                               #
```

THE BACKUP DRIVES

The number of backup drives and the frequency of various backup types may be customized for each system being backed up to provide adequate protection from various risks. Costs and time to perform backups are also factors to consider when choosing the medium for backups.

Here is a real-life plan that is used to back up the files described under item 5 above. This plan may be modified to suit your needs. For example, a five-day-per-week PC user would make five, not six or seven, backups each week. Or you may decide to use your existing flash drives rather than external hard drives.

Start with three fast (USB3) external 2-TB hard disks if your PC supports USB3. Each drive costs about £65-UK or \$90-US. If your PC does not support USB3, choose a hard disk type or other medium that your PC does support.

On day 1, back up files to disk 1
On day 2, back up files to disk 2
On day 3, back up files to disk 3
On day 4, back up files to disk 1

On day 5, back up files to disk 2
On day 6, back up files to disk 3

Continue this process day-by-day (or whatever interval you prefer), remembering to switch from Daily backups to a Weekly backup at the end of each week and a monthly backup at the end of each month. When backing up files like those described under item 5 above:

- my Daily backups of Group C would be about 20 GB
- the Weekly backups of Groups B and C, about 90 GB
- the Monthly backups of Groups A, B and C, about 115 GB.

A recent backup hard disk should be stored off-site in case an event occurs that destroys the backup hard disks along with the PC. When one of the three disks is stored off-site, the above rotation will involve only two hard disks instead of three.

After about six or seven weeks of daily backups, a backup hard disk will be nearly filled. When that happens, the disk should be reformatted as you would a new disk and then returned to use until it is filled again.

GRANDFATHERING BACKUPS

Grandfathering backups provides even greater protection, especially against zero-day threats, ransomware, remote access Trojans, and files damaged or deleted in error but not discovered until months afterwards. To implement grandfathering, one additional external hard disk is required. On a regular basis (such as quarterly or semiannually) make a Monthly backup to this additional drive. A 2TB hard drive will hold about 16 such backups (four years of quarterly backups).

Sometime in year four, delete the first three quarterly backups from the first year, leaving the fourth quarterly backup. That fourth quarterly backup becomes the sole (annual) backup for the first year.

When the available space on the external hard disk will allow adding only one more quarterly backup, delete the first three quarterly backups from the second year, leaving the fourth quarterly backup. That fourth quarterly backup becomes the sole (annual) backup for the second year.

Repeat this process each year until the disk is nearly full. Then you can either add another hard drive or develop a new backup strategy. By then, the technology and options will be very different than they are today.

RESTORING FROM A BACKUP

Restoring is simple. Use `cp` (copy) from the command-line interface or use your favorite file manager to drag-and-drop from the backup directory to the destination directory. Remember, some files or directories may have restricted permissions that require super-user privileges to restore by copying.

Happy, dependable backups and peaceful dreams!

The following are comments by Michael Kennedy, and not part of Randy's original article.

Additional observations by Michael Kennedy:

For backups of Databases, Financial records, etc, note that

new versions of the software may be unable to process the backup files from older versions of the software. In that case, either:

- Retain the old software versions in a usable state, or
- Ensure you can convert the old files, should you need to restore them, or
- If you're happy to do so, you can treat the old backups as useless, and discard them.

For Grandfathering, another rotation system could be adopted (I call it a Binary system but perhaps the "professionals" have a better title!). This approach might not be suitable in Randy's situation - which has three separate file Groups - but it might be very relevant if a backup script simply backs up ALL important changed files - on every run. It's more relevant where full backup ets are being held, rather than incremental or differential backups.

Basically:

- Disk-1 is used for every SECOND backup run.
- Disk-2 is used for every FOURTH run.
- Disk-3 is used for every EIGHTH run.

- And so on.

Eg: on successive backups, use Disk #1, #2, #1, #3, #1, #2, #1, #4, #1, #2, #1, #3, #1, #2, #1, etc.

As Randy says, some backups should be held off-site.

There are some advantages... The exact same procedure is always used, for all backups. Extra backups can be run at any time (eg, working weekends), or skipped (eg, national holidays). If backups are usually run daily, then about 8 disks will reach back about 6 months, 9 disks will cover about 1 year, 10 disks about 2 years, etc.

The main downside is that someone has to initially PLAN the overall approach, eg: the exact rotation, who-does-what-when logs, how to verify backups, how to initialise all disks initially, how to replace a faulty/lost disk, how to introduce another disk into the rotation, the off-site procedures, etc.

Also, some media are used very frequently, and some very rarely, and this aspect should be considered - eg, wear-and-tear on tapes.



FCM POLL

I've set up a poll which I hope you'll fill in. It's located at:

<https://goo.gl/Q8Jm4S>.

We're interested in what you like/dislike about FCM. What I can change/add, and anything else you want to add.

We'll publish the results in a future issue.

LINK: <https://goo.gl/Q8Jm4S>



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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.



If you're running "stock" KODI 16.x on any Ubuntu derivative you're probably use to the default skin: Confluence. Confluence has been the default skin for several versions of KODI. I like Confluence because it has a number of nice features:

- Recently viewed Movies and TV Shows appear on the main screen when select Movies or TV Shows.
- It packs a lot of features into a minimalist menu structure. For example: when you click Videos a flyout appears below the Videos text so you can also select Files,

Library or Add-ons.
• You can customize the menus to show a selection of add-ons below most of the menus.

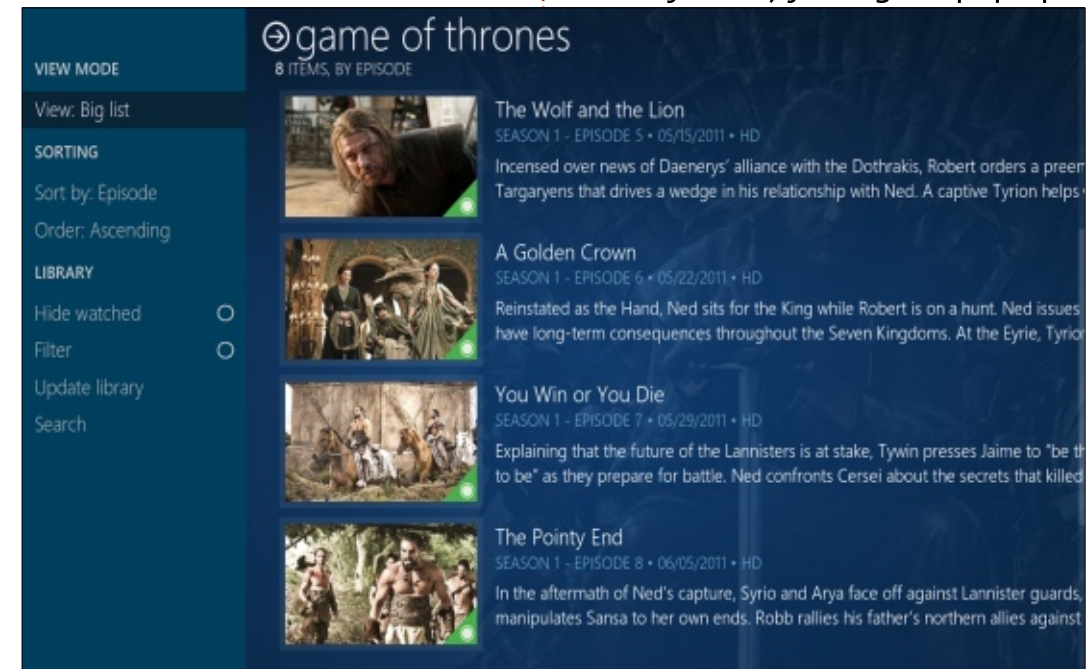
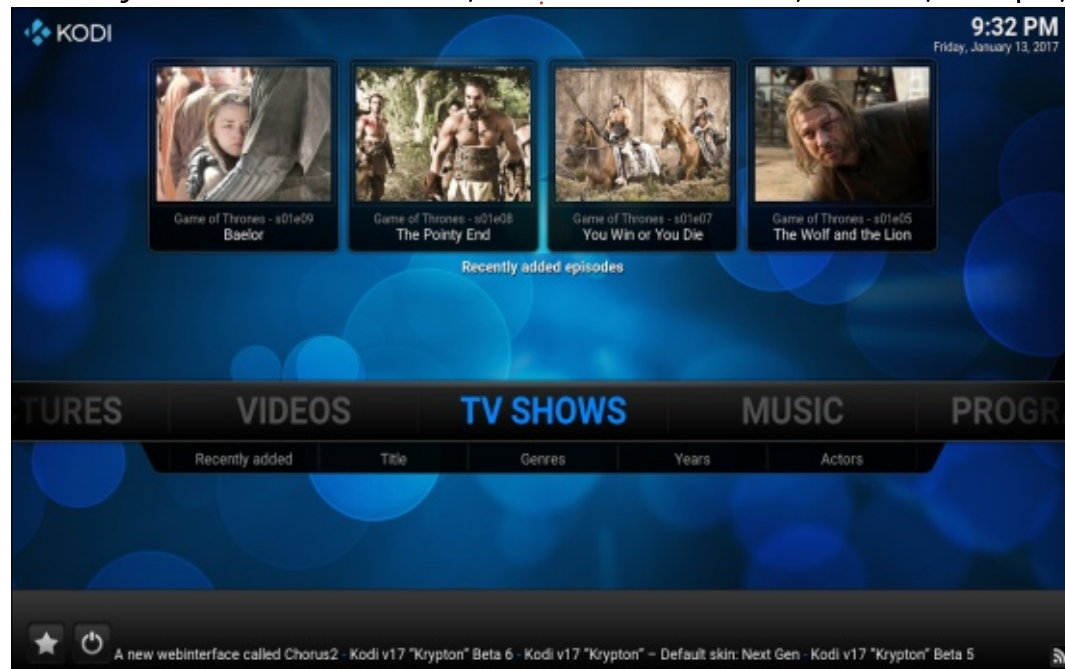
As great as Confluence is the number of other skins available for KODI seems to indicate that not everyone is enamoured with the default skin. The following skins are available in KODI 16.1 by clicking System > Appearance > Skin > Skin > Confluence > Get More : Aeon Nox, Amber, App TV (Apple TV), Black Glass Nova, Box, Cirrus Extended, Chroma, Eunique,

KOver, Metropolis, Mimic, Nebula, Phenomenal, Rapier, Refocus, Retouched, Revolve, Titan, Transparency, Unity, XPerience1080.

Skins are not just for show, some provide more menu options while others include add-on functionality within the main menu options. When you first install and activate the XPerience1080 skin it downloads an XKCD add-on which when you hover over the Pictures menu displays an XKCD comic.

Confluence, the default skin, doesn't have a Favourites text menu option, instead opting to use a star in the bottom left. The Cirrus Extended skin includes Favourites as a text menu option, making it much more obvious to new KODI users. I think I used Confluence for at least a year before I even knew about Favourites because it's not totally obvious where it is or exactly what they're for.

Briefly, if you hover over a show and activate the context menu (c on a keyboard) you'll get a pop-up



menu that will let you add that show/movie/media to the Favourites menu. To bring up all the items you added to Favourites on the Confluence skin use your remote or the arrow keys on a keyboard to navigate to the Star on the bottom right, then click it to open up the list of Favourites. On Cirrus Extended you just navigate through the menu as you normally would until you get to the Favourites option.

Other skins often also can display media different ways. Confluence can display movies and TV shows using a number of "views": List, Big List, Thumbnail,

Poster Wrap, Fan Art, Media Info, Media Info 2, Media Info 3, and Wide.

The Aeon Nox skin has other ways to display/view the same content:

List, Low List, Tri Panel, Big List, Icons, Wall, Info Wall, Banner Wall, Logo, Posters, Shift, Landscape and Showcase.

To change views on Confluence first navigate to your content then hit the right arrow (or the right button on your remote) to activate the Views side panel. Within the side panel there are a slew of

options for Changing the View, Sorting, Filtering, Hiding Watched material, or just updating your library.

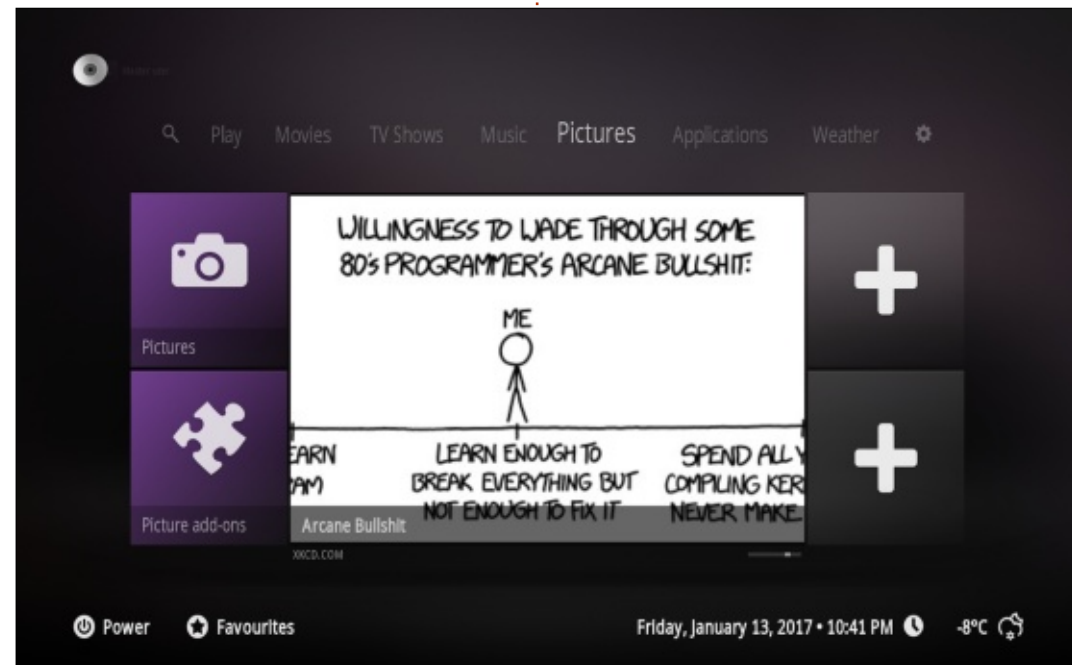
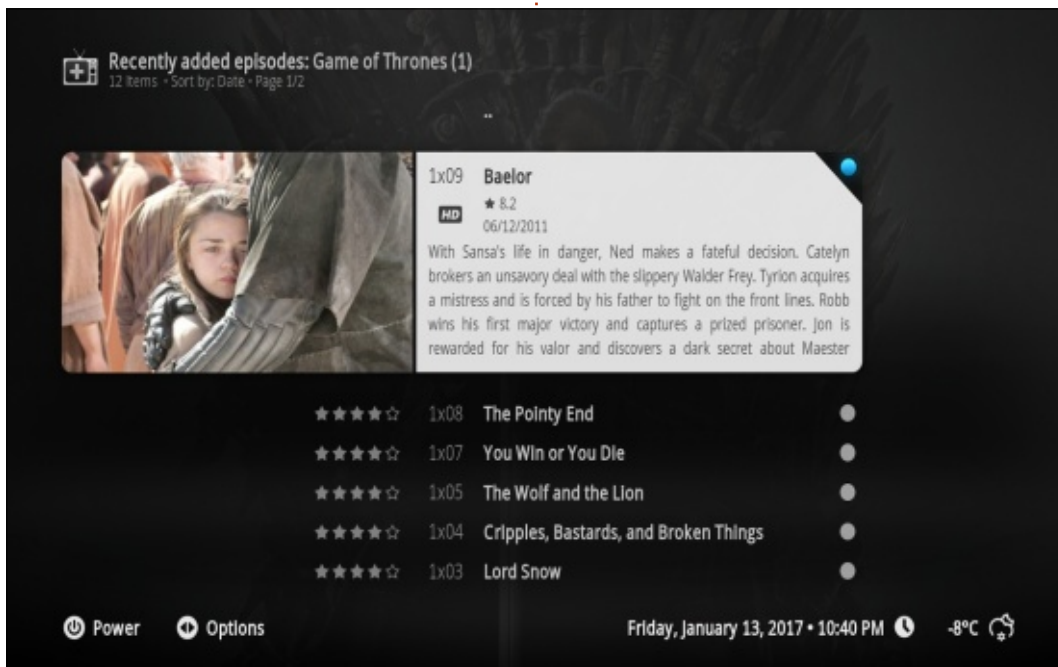
The amount of information for each movie or show on the screen depends on the View. Views can include information such as whether the movie is 1080p, has 5.1 Surround Sound, or which codec has been used to encode the video. But Views can also be something as simple as an image grabbed from the show or movie.

Confluence is a great skin that hides a lot of options, but I'd encourage you to check out other

skins and other views - it's a bit like checking out a new Linux distribution, sometimes you find out about features you didn't know your distribution had, just by checking out something else.



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 What consequences are there if I run Dolphin or GwenView (both are designed for KDE and are provided in Kubuntu), on the standard Ubuntu with the Unity desktop?

A (Thanks to *SeijiSensei* in the Ubuntu Forums) Installing the first KDE program will bring in a lot of additional libraries because KDE relies on a different toolset, Qt. That said, on any reasonably modern computer, you'll have sufficient disk space to store those libraries, and performance should be on a par with running a full KDE system like Kubuntu.

Q Is there a simple software that can make audio sound files (like a 20Hz sine wave)? I need to create tones to test speakers.

A (Thanks to *Autodave* in the Ubuntu Forums) Audacity can do that. Go to Generate and then Tone. You can input the frequencies that you want into the box. It defaults to a 30-second recording, but you can also change

that.

Q In order to install VLC, I need an Ubuntu One Account, which I have. But, Software doesn't recognize my account at all.

A (Thanks to *howefield* in the Ubuntu Forums) If this is the screen (see image) that you are getting, then it is the snap version that you are trying to install. The difference between this and the .deb package version is that the snap version is a "daily" snapshot of the software, while the deb

package is the version released with 16.04 last year.

Please note in the screenshot that there are 2 icons for VLC. Revealing the details for each would show one marked as the "daily" version, in other words the snap package. It won't install without an SSO account, which, in any event, will fail due to a current bug regarding installing snaps from the Software Centre. You can use the command line:

```
sudo snap login
xxxxxxxx@xxxxxx.com
```

```
[sudo] password for you:
Password: (This is the SSO password)
Login successful
snap install vlc
vlc (stable) daily from 'videolan' installed
```

Q I'm looking for a wireless keyboard and mouse for use with a home theater PC running Ubuntu 16.04 that will work from a distance of ten to fifteen feet.

A (Thanks to *mgarrett682* in the Ubuntu Forums) I ended up going with the Logitech MK235 keyboard/mouse combo. It works exceptionally well from twice as far as the old Microsoft keyboard/mouse combo did with the old Microsoft 10 htpc.

TOP QUESTIONS AT ASKUBUNTU

If you are nervous about clicking on a short goo.gl URL, you can get information about it quite



easily. Copy the URL, paste it into your browser's address bar, and add a plus-sign. Now `goo.gl` will tell you where it goes, as well as statistics about its use. (Thanks to `askleo.com` for the tip.)

* Script or function to return how many days from now until a given date

<https://goo.gl/Vax50k>

* Is an internal HDD with Ubuntu automatically bootable from an external USB case?

<https://goo.gl/cKjaOl>

* How do I install old programs saved from Windows?

<https://goo.gl/3jCvpY>

* Open Ubuntu Browser from Terminal

<https://goo.gl/M4nR2G>

* Will Ubuntu automatically adjust to the leap second at the end of the year (2016)?

<https://goo.gl/UyRMnU>

* How do I install Python 3.6 using `apt-get`?

<https://goo.gl/JTDoik>

* Why doesn't my Wi-Fi adapter show up as `wlan0` in 16.04?

<https://goo.gl/20WGFQ>

* Can I access the originating `$USER` variable from within a script run with ``sudo``?

<https://goo.gl/t5v14V>

* Why are desktop folders suddenly showing file dates?

<https://goo.gl/mqsGew>

TIPS AND TECHNIQUES

CUTTING THE CORD

For some time, I have been thinking that my satellite TV subscription costs more than it's worth. Then they told me about a further price increase!

Therefore, my current project is "cutting the cord," which is only slightly related to Linux.

My TV viewing includes news, business news, sports, political satire, and kids' shows for my ward. I don't watch any scripted comedy or drama, so I have no interest in Netflix, for example.

News, business news and kids' shows are widely available on the

Internet. The political satire I enjoy is carried on channels which broadcast "over the air" (OTA) in my area. Sports are broadcast on radio. I seldom sit and watch sports; mostly I turn up the sound and do something on my computer while the game is playing.

So "cutting the cord" required a few steps:

- I contacted my ISP to get a faster Internet connection,
- I used some Amazon gift certificates to buy a Sennheiser wireless headset, model RS 135, to use with my radio receiver,
- I built an antenna to receive OTA broadcasts,
- I bought an "Android TV Stick," specifically a Sunvell T95K Pro Android 6.0 TV Box. It has not yet arrived, but I'm very hopeful about its performance,
- I cancelled my TV subscription.

I seriously considered getting the latest Raspberry Pi rather than the Android TV Stick. However, a fully-functional version of the Pi actually costs more, and offers lower performance. The Stick has Kodi for playing my existing videos, and Youtube for new content.

It's still a work-in-progress, so I will give a future update. Can I actually save money without losing anything significant? Stay tuned.



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.



Life is Strange is a single-player game, developed by Dontnod Entertainment (Indie developers with only one other title before this), and published by Square Enix. It is best described as a single-player, third-person, episodic, graphic, adventure game. The game is considered an episodic game because it consists of five episodes which were originally released one episode at a time back in 2015 on Windows PC, PlayStation 3, PlayStation 4, Xbox 360 & Xbox One. During Summer 2016, Feral Interactive released a port for Linux and OS X. Life is Strange is available for \$19.99 through Steam as well as the Life is Strange website, or the game's Square Enix page, all of these places will ask for your age since the game is Rated M for Mature.

Life is Strange is played from a third-person point of view, and is quite unique in its core gameplay, which I assume is why it quickly became a success among gamers and critics alike. As seen on its Steam Store page, the game has won a number of awards, including

Game Informer's Silver & GamePro's Gold among others. It currently has an "Overwhelmingly Positive" rating from Steam players.

The game takes place in Arcadia Bay and you play as Max (short for Maxine), a photography student with a very unique gift. Right off the bat, you know that you're in for a wild ride as the game begins with Max walking toward a lighthouse in the middle of a raging storm. Suddenly, as a huge tornado is destroying everything in its path, including the lighthouse, and

you're about to be devoured and become the tornado's next victim, Maxine awakes in photography class in the middle of a nice, sunny day. Mr. Jefferson goes on with his lecture while Max regains her composure and this is where things get pretty bizarre as Max figures out that she somehow has the power to reverse time.

This is the main game-play mechanism that truly distinguishes the game from other titles.

Tripping out over her newly discovered gift, Max goes to the

school restroom – where she witnesses a murder while hiding in one of the stalls. Knowing she's got the power to change the outcome of this event by reversing time, Max goes back in time to Mr. Jefferson's lecture where she then sets out on a similar path but which will afford her the opportunity to prevent the murder from taking place.

Without giving too much away from this point on, now would be a good time to point out that preventing the murder is pretty much half of the first episode's story. The first episode is currently available as a free download from Steam, so if you're interested in playing this game, all you've got to do is download it from Steam and try out the first episode for free. If, like me, you happen to enjoy the first episode and would like to find out more about Maxine's powers, and are curious about the happenings around the fictitious town of Arcadia, Oregon, then you can purchase the game and play the next four episodes. Each episode can be played in about 1-3



hours – depending on how much you like to explore. Replaying an episode but making different decisions can also be rather rewarding as the storyline can have mild changes, or be dramatically different, depending on which choices you've changed from your original play. I particularly like how the game allows you to replay individual episodes again if you so desire.

The game is a true delight to play. At first, I was playing the game with mouse/keyboard, but, after finishing Episode One, I noticed during the opening sequence that the game itself recommends you play with a game-pad controller – so I went ahead and tried that as well. This game is very well suited for both styles of playing, so whether you prefer mouse/keyboard or game-pad controller, both feel right at home with Life is Strange.

Moving about and performing most actions is done very much like your typical third-person game, the main difference is the rewind-time feature. After a while, you get used to this mechanism and everything that it brings to the table such as the options to skip

parts you've already played (in an alternate time), and the awkward experience of what the game calls "tele-porting" through the use of time. Once you get accustomed to the mechanics of the game, you will be immersed in the storyline, the characters, and the town of Arcadia – with all of its secrets and surprising reveals.

Although its graphics are not quite as impressive as other recent Square Enix titles (such as Tomb Raider, reviewed back in Full Circle Magazine issue 111), Life is Strange still manages to photograph a pretty picture. It's visually impressive when you're moving back in time, which is



indicated on the screen by a spiral on the upper left corner, and various scenes you've previously seen are overlapping & rewinding in a very blurry fashion. The voice acting, the soundtrack, and overall sound, are often multi-layered and best experienced with either headphones or with a full surround-sound system. Inarguably, the game stands out most in the way it incorporates "social issues and everyday problems and how we see everyday life in a small town, the problems of unemployment, alcoholism, social bullying, violence," as stated by its co-director Raoul Barbet. The game's story will suck you in until you get

to live through its full week – which should take you anywhere between 12-20 hours of dedicated playing time.

I strongly recommend Life is Strange and honestly, I've struggled to find anything I don't like about this game so it gets a solid rating from me.



MINIMUM REQUIREMENTS

OS: Ubuntu 16.04 / Steam OS 2.0 (64 bit)
Processor: Intel i3 / AMD FX6300
RAM: 4GB
Hard Disk: 16GB
Graphics: 1GB NVIDIA 640, AMD R9 270, Intel Iris Pro 6200 or better



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



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

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

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

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



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