Full Circle

REVIEW
UBUNTU 23.04

BOOK REVIEW

THIRD EDITION
PYTHON
CRASH COURSE
A HANDS-ON, PROJECT-BASED
INTRODUCTION TO PROGRAMMING
ERIC MATTHES
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Install Ubuntu 23.04

blendOS
DISTRO REVIEW

Full Circle

THE INDEPENDENT MAGAZINE FOR THE UBUNTU LINUX COMMUNITY

Welcome to the latest issue of Full Circle

Not only do we have some Python, Latex, FreeCAD, Inkscape and Stable Diffusion, but we have a special guest appearance from Micro This. We're just too good to you guys.

I'm sure by now, many of you will have upgraded to some flavor of 23.04. If not? Adam begins his series of reviews by taking a look at Ubuntu 23.04. He also takes a look at blendOS. Greg completes his treble by reviewing the Python Crash Course book. There can't be many left that he's not either reviewed, or written.

Elsewhere we have a game review, some of your questions answered, and a cry for help on the letters page.

Don't forget: we <u>need</u> YOUR articles. So don't be shy. Send your articles to: ronnie@fullcirclemagazine.org.

Don't forget: we have a Table of Contents which lists every article from every issue of FCM. Huge thanks to **Paul Romano** for maintaining: https://goo.gl/tpOKqm and, if you're looking for some help, advice, or just a chinwag: remember that we have a **Telegram** group: https://t.me/joinchat/24ec1oMFO1ZjZDc0. I hope to see you there. Come and say hello.

All the best!
Ronnie
ronnie@fullcirclemagazine.org

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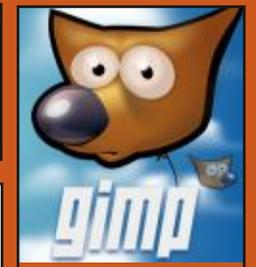
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LINUX KERNEL 6.3 RELEASE:
24/04/2023

After two months of development, Linus Torvalds released the Linux 6.3 kernel. Among the most notable changes are cleaning outdated ARM platforms and graphic drivers, continued integration of Rust language support, hwnoise utility, support for red-black tree structures in BPF, BIG TCP mode for IPv4, built-in Dhrystone performance test, the ability to ban execution in memfd, support for the creation of HID-drivers, using BPF, Btrfs have been adopted to change the blocks.

The new version accepted 15637 fixes from 2055 developers; patch size - 76 MB (changes affected 14296 files, added 1023183 lines of code, removed 883103 lines). For comparison, the last version offered 16843 fixes from 2178 developers; the size of the patch - 62 MB. About 39% of all changes in the kernel 6.3 are associated with device drivers, and about 15% of the changes have the ratio to updating code specific to hardware architectures, 10% is associated with a network stack, 5% with file systems and 3% with internal subsystems of the core.

https://lkml.org/lkml/2023/4/23/284

AUDACITY 3.3:
24/04/2023

The release of the free Audacity 3.3 sound editor, which provides audio editing tools (Ogg Vorbis, FLAC, MP3 and WAV), for recording and digitizing sound, changing the parameters of the sound file, overlaying tracks and applying effects (e.g. noise suppression, changing tempo and tone), was announced. Audacity 3.3 was the third major release formed after the project's transfer to the hands of Muse Group. The Audacity code is distributed under the GPLv3 license, binary builds are available for Linux, Windows and macOS

https://github.com/audacity/audacity/releases/tag/Audacity-3.3.0

VICTORY FOR BARSOOM:
25/04/2023

The results of the annual election of the Debian project leader have been announced. The victory was won by Jonathan Carter, who was re-elected for a fourth term. 274 developers took part in the vote, which is 28% of all participants who have the right to vote (last year, the turnout was 34%, in the previous year 44%, the historical maximum in 2000 - 62.25%, at least in 2016 - 27.56%). This year's election was notable for the fact that they were only one candidate, which reduced the vote to the choice between "for" and "against" (259 voted against - 15).

Since 2016, Jonathan Carter has been accompaniing more than 60 packages at Debian, has been involved in improving the quality of Live-images in the debian-live team and is one of the developers of AIMS Desktop, a Debian build used in a number of South African scientific and educational institutions.

https://lists.debian.org/debian-devel-announce/2023/04/msg00005.html

OPERA ONE, REPLACING THE CURRENT BROWSER:
25/04/2023

The testing of the new web-browser Opera One began, which after stabilization will replace the current Opera browser. Opera One continues to use the Chromium engine and features a completely redesigned modular architecture, multithreaded rendering organization, and new tab grouping capabilities. Builds of Opera One are prepared for Linux (deb, rpm, snap), Windows and MacOS.

The transition to a multithreaded drawing engine

made it possible to significantly increase the responsiveness of the interface and the efficiency of using visual effects and animation. For the interface, a separate stream is proposed, performing tasks related to drawing and output of animation. A separate drawing stream removes the load from the main flow responsible for the interface, which allows you to achieve a smoother output and avoid hanging due to locks in the main stream.

The side panel has been modernized, through which you can control working spaces with groups of tabs, place buttons for access to multimedia services (Spotify, Apple Music, Deezer, Tidal) and messengers (Facebook Messenger, WhatsApp, Telegram). In addition, the modular architecture allows you to integrate additional features into the browser, such as interactive assistants based on machine learning services, such as the ChatGPT and ChatSonic, which can also be integrated into the sidebar.

Solus 5 coming full circle:
26/04/2023

As part of the ongoing reorganization of the Solus distribution, in addition to the transition to a more transparent management model, concentrated in the hands of the community, it was announced that the decision to use the SerpentOS project technology, developed by the old team of developers of the Solus distribution, which includes the Ikey Doherty (Solus creator) and Joshua Strobl.

The SerpentOS distribution is not an offshoot from other projects and is based on its own package manager moss, which borrows many modern features developed in package managers such as eopkg/pisi, rpm, swupd and nix/guix, while maintaining a traditional view of package management and using the default assembly in stateless mode. The package manager uses an atomic system update model, in which the state of the root partition is fixed, and after updating the state switches to a new one.

To save disk space when storing several versions of packages, deduplication is used based on hard links and a shared cache. The contents of the installed packages are placed in the /os/store/installation/N directory where the N version number is. The project is also developing a system of containers moss-container, a system of dependence management system moss-deps, boulder assembly system, encapsulation system of avalanche services, vessel repository manager, summit control panel, moss-db database and reproducible bootstrap system.

Solus5 is expected to replace the build system (ypkg3 and solbuild) with boulder and avalanche, the use of a package manager, moss instead of solopkg, the use of summit development platforms and GitHub instead of solhub, the use of vessel for repository control instead of ferryd. The distribution will continue to be a rolling-release.

The developers of SerpentOS have already helped raise the new infrastructure for Solus, promised to update packages. They plan to create a bootable image for developers with an environment based on GNOME. When specific problems with moss-deps are solved, GTK3 will be packaged. In addition to the x86_64 architecture, they plan to start forming builds for AArch64 and RISC-V in the future.

At the moment, the SerpentOS toolkit will be developed independently of the Solus development team. We are not talking about the merger of the projects Solus5 and SerpentOS, most likely, SerpentOS will develop as an independent distribution from Solus.

https://getsol.us/2023/04/18/a-new-voyage/

Update of Budgie 10.7.2:
27/04/2023

The organization Buddies Of Budgie, which oversees the development of the project after its separation from the Solus distribution, published an update to the Budgie 10.7.2 desktop environment. Budgie 10.7.2 is the second minor release in the 10.7 series of our Budgie Desktop environment, primarily focused on bug fixes, additional compatibility with GNOME 44 stack, and various

quality-of-life improvements. The project code is distributed under the GPLv2 license. You can use distributions such as Ubuntu Budgie, Fedora Budgie, Solus, GeckoLinux and EndeavourOS to familiarize yourself with Budgie.

https://blog.buddiesofbudgie.org/budgie-10-7-2/

UPDATE OF MY FAVOURITE EDITOR:
28/04/2023

A new version of the cross-platform free code editor CudaText 1.192, written using Free Pascal and Lazarus, has been published. The editor supports Python extensions, and has a number of advantages over Sublime Text. You can even get some features of an integrated development environment implemented in the form of plugins. For programmers, there are more than 300 syntactic lexers. The code is distributed under the MPL 2.0 license. Builds are available for Linux, Windows, macOS, FreeBSD, OpenBSD, NetBSD, DragonflyBSD and Solaris platforms.

https://cudatext.github.io/download.html

UPDATE OF DEBIAN 11.7:
29/04/2023

The developers published the seventh corrective update of the Debian 11, which includes accumulated package updates and they also fixed the installer. The release includes 92 updates with the elimination of stability problems and 102 updates with the elimination of vulnerabilities.

From the changes, you can note the update to the fresh stable versions of clamav, dpdk, flatpak, flatpak, galera-3, intel-microcode, mariadb-10.5, nvidia-modprobe, postfix, postgresql-13, shim. Deleted packages include, bind-dyndb-dap, python-matrix-nio (has security problems and does not support current versions of servers), matrix weechat-matrix, matrix-mirage and pantalmonai.

Installation builds, as well as live iso-hybrid with Debian 11.7 will be prepared to download and install "from scratch". Systems with Debian installed will receive updates present in Debian 11.7 through the regular update system. Security fixes included in the new Debian releases are available to users as updates and are released via security.debian.org.

At the same time, the second candidate for the release of the installer of the next major release - Debian 12 ("Bookworm") was announced. Changes include, the addition of support for the luks2 partition encryption format to GRUB's digitally certified e-fi images, improving the operation of cryptsetup systems with a small amount of RAM, installing a shim-signed package into images for i386 and arm64 architectures, adding support for Lenovo Miix 630, Lenovo Yoga C630, StarFive VisionF, D1 C.FIELIMX6ULL eMMC, Raspberry Pi 3 Model B Plus Rev 1.3.

Debian 12 is scheduled to be released on June 10, 2023. Full freeze before the release is scheduled for May 24. There are currently 258 critical errors holding back the release.

https://www.debian.org/News/2023/20230429

DistroWatch.com
Put the fun back into computing. Use Linux, BSD.

Sculpt OS 23.04:
29/04/2023

A new release of the Sculpt 23.04 project is presented, where the Genode OS Framework develops a general-purpose operating system that can be used by ordinary users to perform everyday tasks. The original code of the project is distributed under the AGPLv3 license. A liveUSB image, measuring 28 MB, is available for download. It will work on systems with Intel processors and graphics subsystem with VT-d and VT-x extensions included, as well as on ARM systems with VMM extensions.

Sculpt OS 23.04 marks the first-time it has PinePhone support in addition to the PC the version. With this release, the system supports live upgrades of the boot image, rendering Sculpt updates and switching between versions a matter some easy steps. The new preset feature brings whole application scenarios to your screen after just one click/tap.

https://genode.org/news/sculpt-os-release-23.04

Fedora Onyx:
30/04/2023

Joshua Strobl, the key developer of the Budgie project, has published a proposal to include Fedora Onyx, an atomically updated version of Fedora Linux with a custom Budgie environment that complements the classic assembly of Fedora Budgie Spin and reminiscent of the Fedora Silverblue, Fedora Sericea and Fedora Kinoite, supplied with GNOME. The Fedora Onyx editorial board has offered to deliver starting with the release of Fedora Linux 39, but the offer has not yet been considered by the FESCo (Fedora Engineering Steering Committee), responsible for the technical part of the development of the Fedora distribution.

Fedora Onyx is based on Fedora Silverblue technology and is also supplied in the form of a monolithic image not divided into individual packages. The base environment is built from the official Fedora RPM packages with rpm-ostree tools and is mounted as read-only. Flatpak is used to install and update additional applications, in a way that applications are separated from the main system and launched in a separate container.

https://fedoraproject.org/wiki/Changes/Fedora_Onyx

Release of the Nitrux 2.8:
30/04/2023

The release of the Nitrux 2.8.0 distribution, built on Debian, KDE technologies and the OpenRC initialization system, has been published. The project offers its own NX Desktop desktop, which is an add-on over KDE Plasma. Based on the Maui library for the distribution, a set of typical user applications was developed, which can be used on both desktop and mobile devices. AppImages are being promoted to install additional applications. The full loading image is 3.3 GB. The project is distributed under free licenses.

The NX Desktop desktop offers a different design style, its own implementation of the system tray, notification output center and various plasmoids, such as a network connector and multimedia applet to control the volume and control the playback of multimedia content. Applications are created using the MauiKit framework, with the file manager; Index (you can also use Dolphin), text editor; Note, Station terminal emulator, VVave music player, Clip video player, NX Software Center application center and Pix image viewer.

https://nxos.org/changelog/release-announcement-nitrux-2-8-0/

VMware's Photon OS 5.0:
01/05/2023

Photon OS 5.0 aimed at providing a minimalist host environment to run applications in isolated containers has been published. The project is being developed by VMware and is portrayed as being usable for deploying industrial applications, including additional security enhancements and offering advanced optimisations for VMware vSphere, Microsoft Azure, Amazon Elastic Compute and Google Compute Engine. The original code of the components developed for Photon OS are supplied under the

GPLv2 license (except for the libtdnf library, which is opened under the LGPLv2.1 license). Ready-made ISO- and OVA-images are supplied for x86_64, ARM64, Raspberry systems and various cloud platforms under a separate user agreement (EULA).

The system allows you to run most container formats, including Docker, Rocket and Garden formats, and supports container orchestration platforms such as Mesos and Kubernetes. The pmd (Photon Management Daemon) and the pmnf in-house toolkit, compatible with YUM packet manager and offer a package-based distribution lifecycle management model, is used for software management and installation. The system also provides tools for simply transferring application containers from developers" environments (e.g. VMware Fusion and VMware Workstation) to working cloud environments.

Systemd is used to manage system services. The kernel is assembled with optimisations for the VMware hypervisor and includes the security enhancement settings recommended by the KSPP (Kernel Self-Protection Project)

project. When building packages, the compiler options that increase the security are forefront. The distribution is available in three editions: the minimum (538MB, includes only basic system packets and runtime to run containers), build for developers (4.3GB, includes additional packages for developing and testing programs supplied in containers) and assembly for real-time tasks (683MB, contains a core with PREEMPT_RT patches for launching real-time applications).

https://github.com/vmware/photon/releases/tag/5.0-GA

Cisco has released ClamAV 1.1.0:
01/05/2023

After five months of development, Cisco published the release of the free antivirus package ClamAV 1.1.0. The project came into the hands of Cisco in 2013 after the purchase of Sourcefire, who were developing ClamAV and Snort. The project code is distributed under the GPLv2 license. The 1.1.0 branch is classified as regular (not LTS), the

updates are published within at least 4 months after the release of the next branch. The ability to load the base signatures for non-LTS branches is also provided for at least another 4 months after the next branch is released.

https://blog.clamav.net/2023/05/clamav-110-released.html

Release of the OpenMoonRay 1.1 by Dreamworks studio:
02/05/2023

Animation studio, Dreamworks has published the first update of the open rendering system OpenMoonRay 1.0, using ray tracing based on numerical integration using the Monte Carlo method (MCRT). The focus of MoonRay is on providing high efficiency and scalability, supports multithreaded rendering, parallelization of operations, the use of vector instructions (SIMD), realistic lighting simulation, ray processing on the GPU or CPU side, realistic simulation of tracing lighting, rendering volume structures (fog, fire, clouds). The code was published under the

Apache 2.0 license.

The system is ready to create professional projects, like full-length films, for example. Before the opening of the code, MoonRay was used to render the animated films; "How to tame the dragon 3," "Family Kruds 2: Novosel," "Bad Boys," "Ball." World Tour, "Boss-milkoxos 2," "Everest" and " Puss in Boots 2: Last wish." For distributed rendering, Arras own framework is used, which allows you to disperse computing to several servers or cloud environments. The Intel Embree ray tracing library can be used to optimize the calculation of lighting in distributed environments, and Intel ISPC compiler for vectorization of shaders. It is possible to stop rendering at an arbitrary moment and resume operations from the interrupted position.

The package also includes a large library of materials based on physically correct rendering (PBR) tested in work projects, and a USD Hydra Render Delegates layer to integrate with the usual content creation systems that support the USD format. It is possible to use different modes of image generation, from photorealistic to

highly stylized. Thanks to distributed rendering, animators can track the result interactively and at the same time visualize several scene options with different lighting conditions, different properties of materials and from different points of view.

https://github.com/dreamworksanimation/openmoonray/discussions/102

X.Org project to stop supporting 20 outdated libraries and utilities:
03/05/2023

The developers of the X.Org project announced the termination of support of some libraries, drivers and utilities X Window System, for whom updates will no longer be released, even if vulnerabilities are detected. The packet repositories have been transferred to the archive status, implying the termination of corrections and error messages. Distributions can continue to supply these packages, but at their own risk. This is to stop support packages losing relevance, are inoperable with new versions of the

X-server or tied to outdated APIs. In fact, support for these packages have already been discontinued in previous years, but this was clearly not announced.

https://lists.x.org/archives/xorg-devel/2023-May/059018.html

Release of OBS Studio 29.1:
03/05/2023

OBS Studio 29.1, package for streaming, compositing and video recording, is ready for downloading. The code is written in C/C++ and is distributed under the GPLv2 license. The builds are made for Linux, Windows and macOS.

Support is provided for compositing with the construction of a scene, based on arbitrary video streams, data from web cameras, video capture maps, images, text content of applications or the entire screen. In the process of broadcasting, you can switch between several predefined scenes (for example, to switch performances with an emphasis on the content of the screen and an image from a web camera). The

program also provides tools for mixing sound, filtering with VST plugins, leveling volume and noise suppression.

https://obsproject.com/blog/obs-studio-29-release-notes

Project Pulse Browser:
04/05/2023

Pulse Browser, built on the Firefox code base and experimenting with ideas to improve the ease of operation and build a minimalist interface, is ready for testing. Builds are made for Linux, Windows and macOS platforms. The code is distributed under the license of MPL 2.0.

The browser is notable for cleaning the code from components associated with the collection and dispatch of telemetry, and the replacement of some typical features with third-party open analogues. For example, to counter tracking, they added an uBlock Origin ad blocker. The composition also included the addition of the QR Code Generator for the generation of QR codes with

a link to the sites and the Tabless addition with an alternative customizable implementation of the page shown when opening a new tab.

Pulse Browser uses the optimization of settings from the Betterfox project, aimed at improving privacy, security and performance. They disabled additional services, for example, Pocket, funds for people with disabilities, Firefox Sync and Firefox View. The interface uses a sidebar for quick access to tools and sections of interest to the user, such as settings, bookmarks and history. Under the address bar, the default panel with the most popular bookmarks is enabled. The panels are made of narrower and occupy less space on the screen.

https://github.com/pulse-browser/browser/releases/tag/1.0.0-a.64

Open 3D Engine 23.05, opened by Amazon:
05/05/2023

The non-profit organization Open 3D Foundation (O3DF) has unveiled the open 3D game

engine Open 3D Engine 23.05 (O3DE), suitable for the development of modern AAA-class games and high-precision simulators that can work in real time and provide quality cinematic level. The code is written in C++ and published under the Apache 2.0 license. It supports Linux, Windows, macOS, iOS and Android platforms.

The original code of the O3DE engine were opened in July 2021 by Amazon and are based on the code of the previously developed proprietary Amazon Lumberyard engine, built on CryEngine engine technology licensed from Crytek in 2015. After its opening, the development of the engine was supervised by the non-profit organization; the Open 3D Foundation, created under the auspices of the Linux Foundation. In addition to Amazon, companies such as Epic Games, Adobe, Huawei, Microsoft, Intel and Niantic joined work on the project.

The engine includes an integrated game development environment, a multithreaded Atom Renderer photoreal rendering system with Vulkan, Metal and DirectX 12 support, an extensible 3D model editor,

character animation system (Emotion FX), a semifab development system, a real-time physical process simulation engine and mathematical libraries that use SIMD instructions. Visual programming environment (Script Canvas) and Lua and Python languages can be used to define game logic.

The project is originally designed to adapt to your needs and has a modular architecture. In total, more than 30 modules are offered, supplied in the form of separate libraries suitable for replacement, integration into third-party projects and use separately. For example, thanks to modularity, developers can replace the render graphics, sound system, language support, network stack, physical engine and any other components.

https://www.o3de.org/blog/posts/23-05-release/

New DogLinux Release:
06/05/2023

The release of a specialized build of the DogLinux distribution (Debian LiveCD in the Puppy Linux

style), built on the Debian 12 "Bookworm" and designed to test and maintain PC's and laptops, has been published. It includes applications such as GPUTest, Unigine Heaven, CPU-X, GSmartControl, GParted, Partimage, Partclone, TestDisk, ddrescue, WHDD, DMDE. The distribution allows you to check the performance of equipment like, the load of the processor and video card, check the SMART HDD and NVMe SSD. The size of the Live image is loaded with USB drives, 1.3 GB (torrent).

https://gumanzoy.blogspot.com/2023/05/eng-liveusb-doglinux-debian-12-bookworm.html

SFTP server release SFTPGo 2.5.0:
06/05/2023

The release of the SFTPGo 2.5.0 server is published, allowing you remote access to files using SFTP, SCP/SSH, Rsync, HTTP and WebDav protocols, as well as to provide access to Git repositories using the SSH protocol. The data can be given from both the local file system and from external storage compatible

with Amazon S3, Google Cloud Storage and Azure Blob Storage. Data can be stored in encrypted form. To store the user base and metadata, SQL-enabled or key/value-free format is used, such as PostgreSQL, MySQL, SQLite, Cockroachb or bbolt, but it is also possible to store metadata in RAM that does not require the connection of an external database. The project code is written in Go and distributed under the GPLv3 license.

https://github.com/drakkan/sftpgo/releases/tag/v2.5.0

The seL4 project was awarded the ACM Software System Award:
06/05/2023

The project, that develops the open microkernel seL4, received the ACM Software System Award, annually awarded by the Association of Computing Technology (ACM), the most authoritative international organization in the field of computer systems. The prize was awarded for achievements in the field of mathematical proof of

reliability of work, which indicates full compliance with the specifications specified in a formal language and recognizes the readiness to be used in critical applications. The seL4 project showed that it is possible not only to carry out a completely formal verification of reliability and security for projects at the level of industrial operating systems, but also to achieve this without compromising performance and versatility.

The ACM Software System Award is awarded annually for the development of software systems that have a decisive impact on the industry, making new concepts or revealing new areas of commercial use. In the past years, the ACM awards were awarded to the GCC and LLVM projects, and their founders Richard Stallman and Chris Latner. The award also featured projects and technologies such as UNIX, Java, Apache, Mosaic, WWW, Smalltalk, PostScript, TeX, Tcl/Tk, RPC, Make, DNS, AFS, Eiffel, VMware, Wireshark, Jupyter Notebooks, Berkeley DB and Eclipse.

https://www.acm.org/media-center/2023/may/technical-awards-2022

CREATOR OF LLVM DEVELOPS A NEW PROGRAMMING LANGUAGE MOJO:
08/05/2023

Chris Lattner, founder and chief architect of LLVM, as well as the creator of the Swift programming language, and Tim Davis, a former head of Google's AI projects, such as Tensorflow and JAX, introduced the new Mojo programming language, combining ease of application for research and rapid production of prototypes with suitability for high-performance end products. The first is achieved through the use of the usual syntax of the Python language, and the second due to the possibility of compiling in machine code, mechanisms of memory safety and hardware acceleration of calculations.

The project focuses on developing for machine learning, but is presented as a general-purpose language that expands the capabilities of Python by system programming and suitable for a wide range of tasks. For example,

language is applicable to areas such as high-performance computing, data processing and conversion.

https://www.modular.com/blog/a-unified-extensible-platform-to-superpower-your-ai

LENNART POTTERING OFFERED TO ADD A SOFT REBOOT MODE TO SYSTEMD:
09/05/2023

Lennart Pottering spoke about the preparation for soft reboot mode ("systemctl soft-reboot") the addition to the systemd manager, which leads to the restart of only the components of the user's space, without touching the Linux kernel. It is assumed that, compared to a standard reboot, a soft reboot will reduce downtime during the update of environments using ready-made system images.

The new mode will allow you to complete the work of all processes in the user's space, then replace the image of the root FS with a new version and start the process of initialization of the system without rebooting the kernel. In addition, saving the state of the working core

when replacing the user environment will allow you to update some services in live mode, letting you transfer file descriptors and listening network sockets, for these services from the old environment to the new one. Thus, it will be possible to significantly reduce the time to replace one version of the system with another and provide seamless transfer of resources to the most important services that will continue to work without stopping.

Acceleration of the restart is achieved by excluding relatively long stages like equipment initialization, loader operation, kernel start, driver initialization, firmware loading and initrd processing. To update the kernel in combination with a soft reboot, they propose to use the livepatch mechanism to make corrections to the Linux kernel without a full reboot and without stopping the applications.

https://mastodon.social/@pid_eins/110272799283345055

RELEASE OF ALPINE LINUX 3.18:
10/05/2023

Alpine Linux 3.18, a minimalist distribution built on the Musl system library and a set of BusyBox utilities, is out. The distribution features increased security requirements and is assembled with SSP (Stack Smashing Protection). OpenRC is used as an initialization system, apk, its own packet manager is used to manage packages. Alpine is used to form official Docker container images and is used in the PostmarketOS project. Loading Iso-image (x86_64, x86, armhf, aarch64, armv7, ppc64le, s390x) are prepared in six versions: standard (189MB), with a core without patches (204 MB), extended (840 MB), for virtual machines (55 MB) and for the Xen hypervisor (221 MB).

https://alpinelinux.org/posts/Alpine-3.18.0-released.html

FREE 2D CAD CADZINHO 0.3:
10/05/2023

The production of the minimalist computer-aided design system CadZinho 0.3.0, which provides tools for creating simple two-dimensional technical drawings, has been published. The code is written in C with additions to Lua and is licensed under the MIT license. The output is generated using the SDL 2.0 and OpenGL API 3.2. The builds are prepared for Linux, Windows and macOS.

The program supports drawing shapes such as lines, polygonal grids, circles, arcs, ellipses, text, douching, splines, block inserts, attributes, broken lines and size arrangement. It supports files in DXF and SVG format and can be exported in PDF format.

In the new version, the user interface was finalized. They added an engine for localization.

https://github.com/zecruel/CadZinho/releases/tag/0.3.0

RELEASE OPENTOONZ 1.7:
10/05/2023

After a year of development, the release of the OpenToonz 1.7 project was published, which continues work on the original code of the professional 2D animation package Toonz. Toonz was used in the production of the animated series Futurama and some animated films nominated for the Academy Award. In 2016, the Toonz code was opened under the BSD license and has continued to evolve as a free project since then.

OpenToonz supports the connection of plugins with effects implemented using machine learning technologies. For example, using effects, you can automatically change the image style and simulate distorted falling light, as in cartoons taken using classic technologies used before the appearance of digital animation packages.

https://github.com/opentoonz/opentoonz/releases/tag/v1.7.0

THUNDERBIRD RELEASES 2022 FINANCIALS:
10/05/2023

The developers of the Thunderbird email client published a financial report for 2022. The project received donations in the amount of 6.4 million dollars (in 2019, $1.5 million was collected, in 2020 - $2.3 million, in 2021 - 2.8 million), which allows them to code better.

The project's expenditures amounted to $3,569 million (in 2020 - $1.5 million, in 2021 - $1.984 million) and almost all (79.8%) were associated with salaries. Currently, 24 hired employees are working on the project (in 2020, 15 were working, in 2021 - 20). 6.9% spent on administration, and 0.3% on marketing. The remaining costs are related to the payment of professional services (e.g., the human resources service), tax management and agreements with Mozilla (for example, payment for access to the build infrastructure).

According to available statistics, about 8-9 million active Thunderbird users per day and 17 million active users per month were recorded. 95% of users use Thunderbird on the Windows platform, 4% - macOS and 1% - Linux.

https://blog.thunderbird.net/2023/05/thunderbird-is-thriving-our-2022-financial-report/

RELEASE OF LIGHTTPD 1.4.70:
11/05/2023

The release of the lightweight http server, lighttpd 1.4.70, trying to combine high performance, security, compliance with standards and flexibility, was announced. Lighttpd is suitable for use on high-load systems and targets low memory and CPU resources. The project code is written in the C language and distributed under the BSD license

https://blog.lighttpd.net/articles/2023/05/10/lighttpd-1.4.70-released/

RELEASE OF RED HAT ENTERPRISE LINUX 9.2:
11/05/2023

Red Hat has released Red Hat Enterprise Linux 9.2. Ready-made installation images are available for registered users of Red Hat Customer Portal (you can also use iso-images CentOS Stream 9 and free RHEL builds for developers) for evaluation. The release is formed for x86_64, s390x (IBM System z), ppc64le and Aarch64 (ARM64). The original code of the red Hat Enterprise Linux 9 rpm packages are available in the Git repository of CentOS. At the same time, an update of the last branch of RHEL 8.8, the release of which is planned to be released in the coming days (currently available only in beta version).

The RHEL 9 branch uses a more open development process and uses the CentOS Stream 9 package base. CentOS Stream is positioned as a upstream project for RHEL, which allows third parties to monitor the preparation of packages for RHEL, offer their changes and influence the decisions.

https://www.redhat.com/en/about/press-releases/red-hat-delivers-latest-releases-red-hat-enterprise-linux

ALMALINUX 9.2:
11/05/2023

Following the official release of Red Hat Enterprise Linux 9.2, the release of AlmaLinux 9.2, synchronized with the new release of RHEL and containing all the changes proposed to this release, was announced. Installation images are prepared for x86_64, ARM64, ppc64le and s390x architectures in the form of a bootable (804 MB), minimum (1.7 GB) and full image (8.8 GB). Later, Live-images with GNOME, KDE, MATE and Xfce will be available for downloas, as well as images for Raspberry Pi boards, containers and cloud platforms.

The distribution is fully binary compatible with Red Hat Enterprise Linux and can be used as a replacement for RHEL 9.2 and CentOS 9 Stream. The changes are reduced to rebranding, removing RHEL-specific packages, such as redhat-*, insights-client, subscription-man-ager-migration*, kpatch*, kmod-redhat-*, rhc, spice* and virtio-win.

https://almalinux.org/blog/almalinux-92-now-available/

RELEASE OF MESA 23.1:
11/05/2023

The release of the free implementation of the OpenGL and Vulkan API - Mesa 23.1.0 has been announced. The first release of the Mesa 23.1.0 branch has an experimental status - after the final stabilization of the code, a stable version 23.1.1 should see the light.

Mesa 23.1 is able to support the Vulkan 1.3 graphics API in the anv drivers for Intel's GPU, radv for the GPU AMD, tu for the GPU Qualcomm and in emulator mode (vn). Support for Vulkan 1.1 is implemented in the software rasterizer lavapipe (lvp), and Vulkan 1.0 in the driver v3dv (GPU Broadcom VideoCore VI from Raspberry Pi 4).

Mesa also provides full support for OpenGL 4.6 for i965, iris (Intel), radeonsi (AMD), lvmpipe drivers. Support for OpenGL 4.5 is available for GPU AMD (r600), NVIDIA (nvc0) and Qualcomm Adreno (freedreno), OpenGL 4.3 for virgl (virgl virtual GPU Virgil3D for QEMU/KVM), and OpenGL 4.2 for driver d3d12 (a plumb for OpenGL on top of DirectX 12).

https://lists.freedesktop.org/archives/mesa-dev/2023-May/226007.html

SIMPLY LINUX RV:

12/05/2023

The release of the experimental build of the distribution Simply Linux RV (20230422) for the riscv64 architecture, is ready for testing. The distribution is a simple system with a classic Xfce-based desktop. The development distribution company "Basalt SPO" is part of the international community RISC-V and is working to support various RISC-V64 boards.

https://lists.altlinux.org/pipermail/riscv-devel/2023-May/000038.html

SYNTHSTROM AUDIBLE WILL OPEN THE FIRMWARE CODE OF DELUGE:

12/05/2023

Synthstrom Audible has announced the opening of the firmware for Deluge's music equipment, combining in one portable device, a sound synthesizer, sampler, gruv box and sequencer, designed to create electronic music and live performances with elements of improvisation. The code is scheduled to be published on GitHub on June 5 under the GPLv3 license.

After the opening of the code, Synthstrom Audible will provide support for the official code base. They will support it in the current form and publish new releases of the firmware. Separately, they plan to create a repository for the community with firmware for different variants of the synthesizer, where a fork of the official repository will develop, allowing for changes from third-party developers. The use of firmwares is not subject to any additional restrictions, except for the requirement of the GPLv3 license. For example, the code can be used in commercial projects, but the changes made to it will need to be opened under the same license.

https://synthstrom.com/open/

RELEASE OF GNU SHEPHERD 0.10:

13/05/2023

The GNU Shepherd 0.10 system manager is available, combining the initialization system and management toolkit. The project is being developed by GNU Guix System distribution developers as an alternative to the SysV-init initialization system that supports dependencies. The control daemon and utility Shepherd are written in Guile (one of the implementations of the Scheme language), which is also used to determine the settings of services. Shepherd is already used in the GNU Guix System distribution and also targets GNU/Hurd use, but it can work in any POSIX-compatible OS for which Guile is available.

Shepherd activates on the launch and stop of services, taking into account the relationship between services, dynamically identifying and running the services on which the selected service depends. Shepherd also supports the identification of conflicts between services and prevents them from being implemented simultaneously. The project can be used both as the main initialization system (init PID 1), and in a separate form to control the background processes of individual users (for example, to run tor, privoxy, mcron, etc.) with the implementation of the user data rights.

https://www.mail-archive.com/info-gnu@gnu.org/msg03181.html

AMAZON AND GOOGLE HAVE OPENED SNAPCHANGE AND BUZZER:

15/05/2023

Amazon has opened the source code of Snapchange tools implementing fuzzing testing memory cuts, which allows you verify executable files without modification and without the source code of the application. Snapchange allows you to download a physical memory dump with a derivative executable code and with the help of the KVM hypervisor, cyclic execution of the code present in the dump, going through various combinations of input data, tracking the resulting failures or anomalies and restarting the check after the next iteration, each time resetting the memory cut and CPU registers into the original state. The project code is written in Rust and distributed under the Apache 2.0 license.

At the same time, Google published their Buzzer toolkit, designed for fuzzing testing of the

eBPF subsystem, which allows you to run applications inside the Linux kernel in a special virtual machine with JIT. Buzzer generates random eBPF programs, tracks the reaction of the Linux kernel when performing them and detects anomalies that occur when verifying the generated eBPF programs. The project code is written in Go and distributed under the Apache 2.0 license.

https://aws.amazon.com/blogs/opensource/announcing-snapchange-an-open-source-kvm-backed-snapshot-fuzzing-framework/

A NEW PANEL WRITTEN IN RUST FOR COSMIC:
16/05/2023

System76, who are developing the Linux distribution Pop!_OS, has published a report on the development of a new version of the user environment, COSMIC, rewritten in Rust (not to be confused with the old COSMIC, which was based on GNOME Shell). The environment develops as a universal project, not tied to a specific distribution and

conforming to the specifications of Freedesktop. The project is also developing a composite server cosmic-comp based on Wayland.

To build the interface in COSMIC, the Iced library is used, which uses safe types, modular architecture and a reactive programming model, and also offers an architecture familiar to developers who know declarative construction of Elm interfaces. There are several render engines that support Vulkan, Metal, DX12, OpenGL 2.1+ and OpenGL ES 2.0+, as well as a window shell and engine for Web integration. Applications based on Iced for Windows, macOS, Linux can launch in a web browser. The developers offered a ready-made set of widgets, with the ability to create asynchronous handlers and use an adaptive layout of the interface elements depending on the size of the window and the screen. The code is distributed under the MIT license.

https://blog.system76.com/post/may-flowers-spring-cosmic-showers

RELEASE OF DIETPI 8.17:
16/05/2023

The specialized distribution DietPi 8.17, designed for use on single-board PC's based on ARM and RISC-V architectures, such as Raspberry Pi, Orange Pi, NanoPi, BananaPi, BeagleBone Black, Rock64, Rock, Quartz64, Pine64, Asus Tinker, Odroid and VisionFive 2, has a new release. The distribution is built on Debian and is available in builds for more than 50 boards. DietPi can also be used to create compact environments for virtual machines and conventional PCs based on x86_64 architecture. Builds for boards are compact (average 130 MB) and take up less space on the storage, compared to the Raspberry Pi OS and Armbian.

The new version has updated the builds based on the Debian 11 and Debian 12. The structure includes the openHAB smart home management system, the GameStream-client Moonlight and the Restic backup utility. Full support for NanoPi R6C boards, improved support for NanoPi R, ROCK Pi 4, Raspberry Pi and Quartz64 boards.

https://dietpi.com/docs/releases/v8_17/

RELEASE OF THE ROCKY LINUX 9.2:
17/05/2023

The release of Rocky Linux 9.2, aimed at creating a free build of RHEL, capable of taking the place of the classic CentOS, is out. The distribution is fully binary compatible with Red Hat Enterprise Linux and can be used as a replacement for RHEL 9.2 and CentOS 9 Stream. Support for the Rocky Linux 9 will be available until May 31, 2032. Installation of Rocky Linux iso-image is prepared for x86_64, aarch64, and s390x (IBM Z) architectures. The publication of builds for the ppc64le (POWER9) architecture has been postponed due to the detection of a serious problem with Python 3.9. Additionally, they offer live-builds with the following DE's; GNOME, KDE and Xfce, all for the x86_64 architecture.

https://rockylinux.org/news/rocky-linux-9-2-ga-release/

RELEASE OF TOR 12.0.6 AND TAILS 5.13:
17/05/2023

The release of the specialized distribution Tails 5.13 (The Amnesic Incognito Live System), based on Debian and designed for anonymous access to a network, was announced. Anonymous access is provided by the Tor system. All connections, except traffic over the Tor network, are blocked by the default packet filter. Encryption is used to store user data between launches. Go download a prepared iso-image, capable of working in Live mode, measuring 1.2 GB.

https://tails.boum.org/news/version_5.13/index.en.html

RELEASE OF LUTRIS 0.5.13:
17/05/2023

Lutris 0.5.13 gaming platform, which provides tools to simplify the installation, configuration and management of games in Linux, is out. The project code is written in Python and distributed under the GPLv3 license.

The project supports a catalog for quick search and installation of games and applications, allowing you to run games in one click through a single interface, without worrying about installing dependencies and settings. Runtime components for launching games are supplied by the project and are not linked to the distribution used. Runtime is a distribution-based library suite that includes components from SteamOS and Ubuntu, as well as various additional libraries.

You can to install games distributed through GOG, Steam, Epic Games Store, Battle.net, Amazon Games, Origin and Uplay services. At the same time, Lutris itself acts only as an intermediary and does not sell games, so for commercial games, the user must independently purchase the game in the corresponding service (free games can be run with one click from the Lutris graphical interface).

Each game in Lutris is tied to the download script and the handler describing the environment to run the game. Including ready-made profiles with optimal settings for the launch of games under the control of Wine. In addition to Wine, the games can be run using emulators of game consoles, such as RetroArch, Dosbox, FS-UAE, ScummVM, MESS/MAME and Dolphin.

https://github.com/lutris/lutris/releases/tag/v0.5.13

RELEASE OF PALE MOON 32.2:
18/05/2023

Pale Moon 32.2, which was forked from the Firefox code base to provide higher efficiency, protect a classical interface, minimize memory consumption and provide additional options, is out now. Pale Moon builds are available for Windows and Linux (x86_64). The project code is licensed under the MPLv2 (Mozilla Public License).

The project adheres to the classical layout of the interface, without the transition to Australis and Photon, and with the provision of wide customization options. Removed components include DRM, Social API, WebRTC, PDF viewer, Crash Reporter, code for collecting statistics, means for parental control and people with disabilities. Compared to Firefox, the browser returned support for extensions using XUL, and the possibility of using both full and lightweight themes.

https://forum.palemoon.org/viewtopic.php?t=29817&p=239377#p239377

RELEASE OF WESTON 12.0 COMPOSITE SERVER:
18/05/2023

After eight months of development, a stable release of the Weston 12.0 composite server, that develops technologies that contribute to the emergence of full support for the Wayland protocol in Enlightenment, GNOME, KDE and other user environments, has been published. Weston's development aims to provide a high-quality codebase and work examples for Wayland in desktop environments and embedded solutions such as platforms for car infotainment systems, smartphones, TVs and other consumer devices. The project code is distributed under the MIT license.

Changing the major version of Weston is due to changes in ABI,

breaking compatibility

RELEASE OF SQLITE 3.42:
19/05/2023

The release of SQLite 3.42, a lightweight DBMS, designed as a plug-in library, has been published. The SQLite code is distributed as a public domain, i.e. can be used without restrictions and free of charge for any purpose. The financial support for SQLite developers is provided by a specially created consortium, which includes companies such as Adobe, Oracle, Mozilla, Bentley and Bloomberg

RELEASE OF COREBOOT 4.20:
19/05/2023

The release of the project CoreBoot 4.20 is available, which develops a free alternative to proprietary firmware and BIOS. The project code is distributed under the GPLv2 license. More than 170 developers took part in the creation of the new version, which prepared 1,625 changes.

RELEASE OF NYXT 3.0.0:
20/05/2023

After two years of development, the Nyxt 3.0.0 web browser has been released, providing extensive opportunities to customize and change the behavior of any aspect of how it works. Conceptually, Nyxt resembles Emacs and Vim, and instead of a ready set of settings makes it possible to change the logic, using the Lisp language. The user can override or reconfigure any classes, methods, variables and functions. The project code is written in Lisp and distributed under a BSD license. The interface can be built with GTK or Qt. The finished builds are for Linux (Flatpak, Alpine, Arch, Guix, NixOS, Void), Windows and macOS.

To improve workflow efficiency, the browser is optimized for keyboard control and supports the typical keyboard combinations of Emacs, vi and CUA. The project is not tied to a particular browser engine and uses the minimum API to interact with web-movements. In this API, there are layers for connecting the WebKit and Blink engines (by default WebKitGTK is used), but if desired, the browser can be ported to other engines. It includes a built-in system for blocking advertising.

RELEASE OF RED HAT ENTERPRISE LINUX 8.8:
20/05/2023

Following the release of Red Hat Enterprise Linux 9.2, an update was made to the last branch of Red Hat Enterprise Linux 8.8, which is accompanied in parallel with the RHEL 9.x branch and will be supported until at least 2029. Installation builds are prepared for x86_64, s390x (IBM System), ppc64le and Aarch64 architectures, but are available for download only to registered Red Hat Customer Portal. The original code of the red Hat Enterprise Linux 8 rpm packages are distributed through the Git repository of CentOS.

Preparation of new releases is carried out in accordance with the development cycle, with releases every six months at a predetermined time. Until 2024, the 8.x branch will be at the full support stage, implying the inclusion of functional improvements, after that, it will go to the support stage, where priorities will shift to correct errors and patch security, with minor improvements related to the support of important hardware systems.

AVAILABLE DISTRIBUTION ALMALINUX 8.8:
20/05/2023

AlmaLinux 8.8, synchronized with the Red Hat Enterprise Linux 8.8 distribution and containing all the changes proposed in this release, is out. The builds are prepared for x86_64, ARM64, s390x and ppc64le

architectures in the form of a bootable (900 MB), minimum (1.9 GB) and full image (12 GB). Later, they plan to form Live builds with GNOME, KDE, Xfce and MATE, as well as images for Raspberry Pi, WSL, containers and cloud platforms.

The distribution is fully binary compatible with Red Hat Enterprise Linux 8.8 and can be used as a transparent replacement for CentOS 8. The changes are reduced to rebranding, removing RHEL-specific packages, such as redhat-*, insights-client and subscription-manager-migration*.

https://almalinux.org/blog/almalinux-88-now-available/

PayPal opened JunoDB code:
21/05/2023

PayPal has opened the source codes of the fault-tolerant JunoDB DBMS, which manipulates the key-to-meaning data. The system was originally designed with an eye on high safety, horizontal scalability, fault tolerance and the ability to handle hundreds of thousands of simultaneous connections with predictable delays. In PayPal, almost all services, from user login to processing financial transactions, are tied to JunoDB. The project code is written in Go (Java client library) and is distributed under the Apache 2.0 license. Corrections, improvements and changes from the community will be made in further development.

JunoDB's architecture is based on the use of a load balancer that receives requests from client applications and distributes them between proxy servers that simultaneously access the storage server group when executed. Each proxy server installs connections with all storage servers and redirects requests to a group of storage servers based on the section index, which is stored in a distributed configuration storage system etcd.

In PayPal, JunoDB-based serviers serve about 350 billion requests per day.

https://medium.com/paypal-tech/unlocking-the-power-of-junodb-paypals-key-value-store-goes-open-source-ee85f935bdc1

The VirtualBox Networking Primer
Connecting and Configuring Virtual Machines

The VirtualBox Networking Primer is a no-nonsense guide for the VirtualBox user taking their next steps into virtual networks.

While Oracle VM VirtualBox is a great free tool, the real power of virtualisation comes when you start connecting virtual machines to each other and to the wider world. Software development, sales, education and training are just some of the areas in which network access to virtual machines offers endless opportunities. But the world of computer networks is filled with complex technical jargon.

Complete with principles, practice, examples and glossary, The VirtualBox Networking Primer takes the frustration and confusion out of connecting real-world projects.

Author: **Robin Catling**
Publisher: Proactivity Press
ISBN13 : 9781916119482

Amazon US link:
https://www.amazon.com/dp/1916119484?ref_=pe_3052080_397514860

Amazon UK link:
https://www.amazon.co.uk/VirtualBox-Networking-Primer-Connecting-Configuring/dp/1916119484/ref=sr_1_1?dchild=1&keywords=virtualbox+networking+primer&qid=1600253699&s=books&sr=1-1

Kobo:
https://www.kobo.com/us/en/ebook/the-virtualbox-networking-primer

When you install Ubuntu, it covers a lot of bases for you that older Linux distros never used to. Oh, I recall trying to get my very first 3G dongle running in Aarvark, or the PCMCIA one in Warty Warthog. PPP was just not installed in Warty if I remember correctly. It took a moment to get me sorted, but the 'happy ever after' was that it worked! I recall trying to use a number of other distros, including Knoppix – the then defacto distro you used if you had odd hardware, and it just was not working with my no-name (ISP Branded) hardware. This was where my respect for Ubuntu started. Don't get me wrong, I used Ubuntu, before it was Ubuntu, and though it was great, it was still a bit sucky when it came to hardware support. Luckily, I was semi-salted with network knowledge, so things were not such a mystery to me. This is what I want to impart to Ubuntu n00bs in this issue. A few issues ago we looked at 'ip r'. Today, I want to take the next step in that direction as all you n00bs have obviously mastered ip r. So when I type ip r, I don't need to explain.

This time around, let us look at 'route'. Consider the screenshot bottom left.

Now this is a VM, but if I had metal with a modem, there would be another interface under 'Iface'

Note that 'ip r' and 'ip r list' will net you the same result.
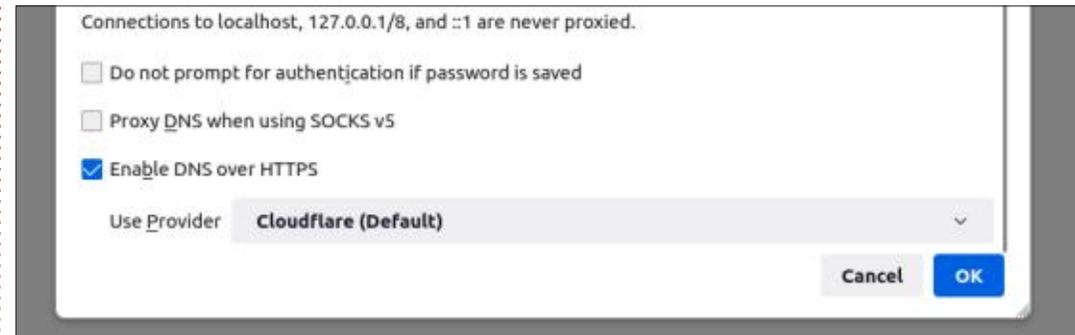
Here is a quick hands-on, please set your 'network' settings in Firefox to use Cloudflare for encrypted DNS (shown bottom right).

Once done, open a terminal and type: ip r get 1.1.1.1 and press enter. 1.1.1.1 is Cloudflare DNS, so you should get a result. What you just did is: you asked ip route to get you a packet going to 1.1.1.1 and tell you what route it was taking (shown top right).

In my case, we can see a packet going there via the 10.0.2.2 network on device enpos3, the source was 10.0.2.15 (my VM), and the uid was 1000. Just like roads, you cannot simply hop on say, the N1, and drive straight to the supermarket. The supermarket may be located in Cherry Lane. To get to Cherry Lane, you need to turn right at Trent Road (don't try, it is all fictitious). The same goes for your IP traffic. To get to 1.1.1.1 in Cherry Lane, I need to take a right at 10.0.2.2. This is the route that the
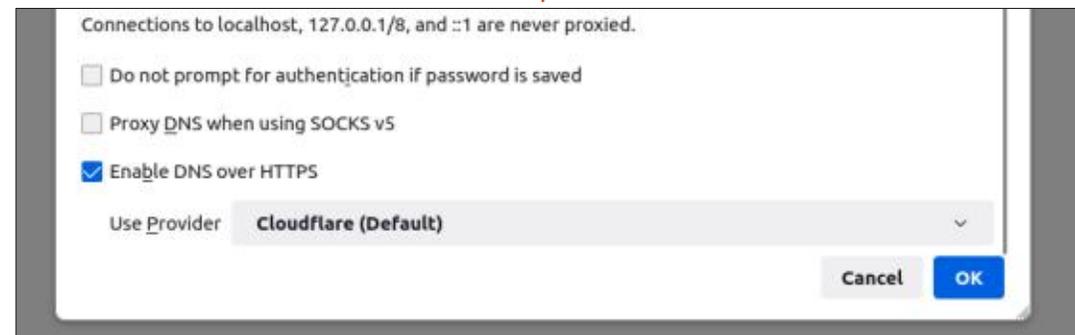
IP traffic will take. Should you have more than one network interface, you can play traffic cop and route traffic all on your lonesome. You could now add a way for all traffic going to the 1.1.1.0 network to use enp1s3 for instance, with a simple command: ip r add 1.1.1.0/24 dev enp1s3 (*don't do this, it is an example for you to understand the syntax, you will need to understand subnetting before attempting this). Anyway, once you do this, all traffic to 1.1.1.1 will now travel on enp1s3 instead of enp0s3. Typing ip route now, you will see that entry added. If you added this fake route to your machine, you can remove it with the same command, using del instead of add.

Consider the next replacement (bottom left).

In this case, the n's are not the same. In the newer ip command, n is the shortest I can make

neighbour. In the old way, the n stood for numeric. It is not needed for our example, but I wanted you to see the difference (just typing arp would imply –vn). Since the 'new' way is a lot like IOS, you could type ip ne, or ip nei, and the command will still work. The same syntax happens here, you can type ip nei add 192.168.1.250….. (you would need the MAC address or link-layer address aka lladdr, etc… too much detail for a n00b, just know it can be done). Because this is possible, it is also possible for an attacker to add their own 'neighbour' here, known as arp cache poisoning. These are reasons you never use root, unlike Windows – where people use Administrator and don't learn. And just like that, in two issues, your understanding of the ip command doubled.

To understand all the twists and turns your computer packets make, I wanted you to type traceroute

www.google.co.uk in your terminal, but that is also not available in 22.04, so I will cover that in another issue. :) The Linux landscape is changing, and you need to change with it, I suppose. I should have planned this better, but I see it as an opportunity to write about another funky tool soon!

As always, send recipes to misc@fullcirclemagazine.org
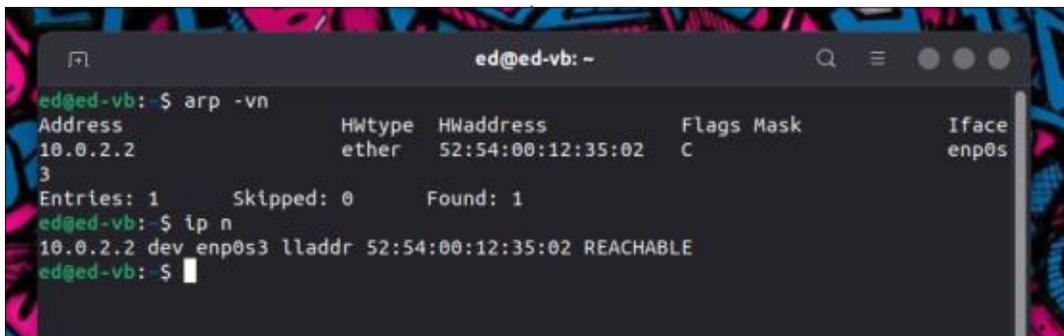

```
ed@ed-vb:~$ arp -vn
Address              HWtype  HWaddress           Flags Mask        Iface
10.0.2.2             ether   52:54:00:12:35:02   C                 enp0s
3
Entries: 1     Skipped: 0     Found: 1
ed@ed-vb:~$ ip n
10.0.2.2 dev enp0s3 lladdr 52:54:00:12:35:02 REACHABLE
ed@ed-vb:~$
```

Erik has been in IT for 30+ years. He has seen technology come and go. From repairing washing machine sized hard drives with multimeters and oscilloscopes, laying cable, to scaling 3G towers, he's done it.

Welcome back my friends. I hope that May finds you all healthy, wealthy and wise. Or at least healthy.

This month, I'm going to do another PAGE article, but what I present will be directly relatable to straight Python/Tkinter programming, so I think that it will be a good article for you all.

Anyway, let's get started.

I'll start off with a screenshot (below) of the program as it looks like in the PAGE designer. It's really nothing but the Toplevel form, a TButton, a TLabelframe holding 12 TRadiobuttons and a TNotebook widget. I've gone ahead and edited the TNotebook to have 4 tabs and set a fairly long label on each. And each of the tabs has at least one label (either Tk or ttk).

There is really nothing special about the program at this point. However, in the support module I play all kinds of games with everything there.

Bottom right is shown an idea of what you can expect from the finished code.

I hope that this is already giving you some ideas of how this might be useful to you in your own programs. It's actually very easy to do and, with the theme that I've created, you can customize the theme package to suit your moods. We'll go into the theme package more next month. For now, let's look at how to change the position of the Tabs on the TNotebook.

The TNotebook has a little known (well, probably little known to most Tkinter programmers anyway) option that allows the programmer to set the position of the Tab portion of the TNotebook widget. It's part of the ttk Style options. Unfortunately, the Tcl man page for the TNotebook widget mentions that only the ability to set the position is available. It says nothing about what the various "legal" settings are. So, we'll start with the actual function that does all the work (see next page, top right).
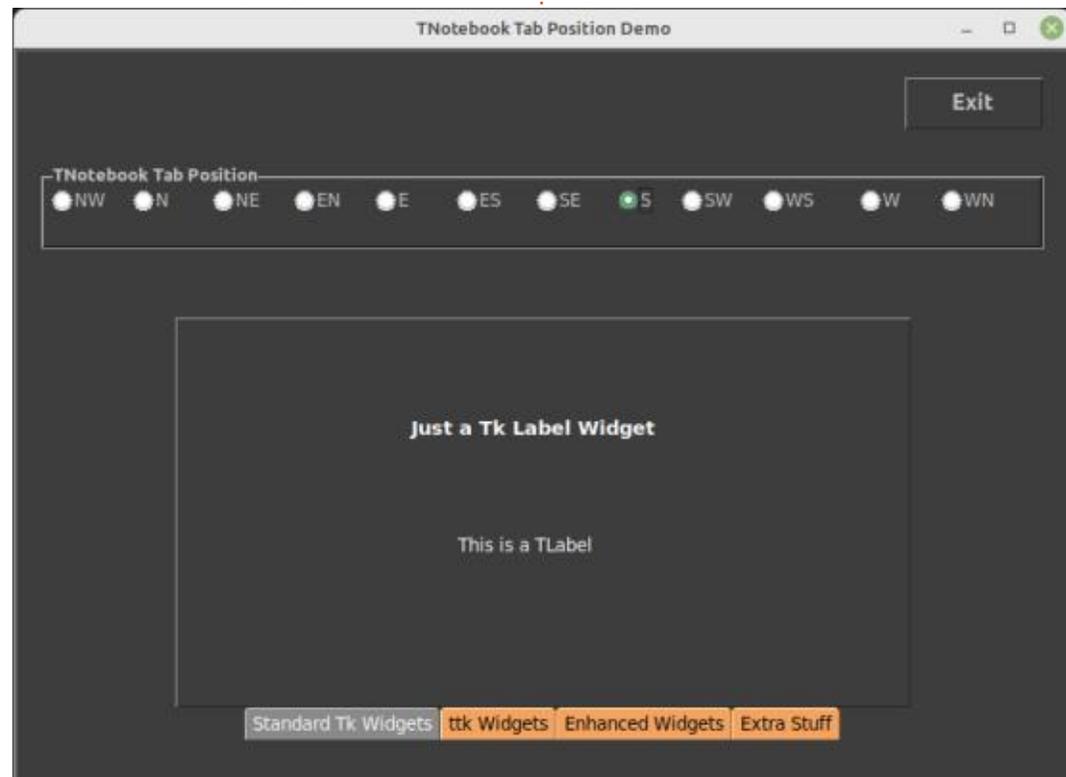
So the first thing that needs to happen is to create an object that inherits from the ttk.Style base object. After many hours of struggling to come up with a name for my version of the object, I finally settled on "style". Pretty cool, huh? Anyway, that joke probably fell flat, so we'll move on.

```python
def set_tab_position(which):
    style = ttk.Style()
    positions = ["nw", "n", "ne", "en", "e", "es", "sw", "s", "se", "wn", "w", "ws"]
    if which in positions:
        style.configure("TNotebook", tabposition=which)
    else:
        print(f"parameter {which} is not a valid position!")
        style.configure("TNotebook", tabposition="nw")
    _top1.update()
```

The next part of the function is probably not useful to this particular program, since all the decisions as to the position are provided by the TRadiobuttons. However, if you are going to add this function to one of your programs, you might want to keep it in, since mistakes are easy to make.

The positions list is provided to verify that the passed parameter is actually one of the "legal" positions. We check to see if it is a member of the positions list, and if so, we use the Style.configure command. The syntax is:

```python
style.configure(TWidget name,
StyleOption = Value, …)
```

Then, the elif catches a nonvalid setting, prints a message to the terminal and "resets" the TNotebook position setting back to the default (which is the North West corner of the widget) just in case there had been some valid changes previous to this call.

That's the entire magic that has rarely been documented.

The next function that we will take a look at is the callback function that is called whenever a TRadiobutton is clicked. Just so you know, all the TRadiobuttons have the same callback and the values of the TRadiobuttons are set 1 to 12. This makes it easy to use an if tree. It would be just as easy to use the switch case tree, but since that is available only from 3.10 forward, I decided to stick with the if tree (see code right).

I deleted many of the elif statements since they are pretty much all the same thing with the only thing changing is the position.

You might also notice that each of the if/elif statements has two set tab statements. The first is to set the position to either "e" or "n" before the actual final position is set. This is because when I was testing the program, if I went from a position on the top or bottom of the TNotebook directly to one on the right or left, the full tab set would not show up. The same if I went from the right or left to one on the right or left. I'm fairly certain that's a bug in the ttk code. I can understand why it might have been overlooked by the original programmers of the TNotebook widget. How often would ANYONE create a program to walk the tabs

```python
def on_TRB_Click(*args):
    # ===================================================
    # Callback function for all the TRadiobutton Widgets
    # ===================================================

    which = _w1.selectedButton.get()
    if which == 1:
        set_tab_position("e")
        set_tab_position("nw")
    elif which == 2:
        set_tab_position("e")
        set_tab_position("n")
    elif which == 3:
        set_tab_position("e")
        set_tab_position("ne")
…
    elif which == 11:
        set_tab_position("n")
        set_tab_position("w")
    elif which == 12:
        set_tab_position("n")
        set_tab_position("wn")
```

around the edges of the widget. Besides me, right?

Another thing you might have noticed is that the tabs are set to an interesting color set. I just put up a new post on my website (thedesignatedgeek.xyz) that explains the process, but I'll go over it quickly here. I use another function to take care of this and it uses more ttk Styling "magic". I called the function setup_base_style() (code shown top right).

Again, we create an instance of the ttk.style object and, this time, we apply a map which is used mostly when we want to deal with colors.

Basically, we assign a list of tuples to both the background and foreground colors. There are three states that we deal with here. They are selected, active, and !active (or not active). As you might suspect, the selected state is the tab that is currently selected and its page (actually a TFrame) is the one that is currently shown. The active state is triggered when the mouse cursor is hovering over that tab, and the ! active state is when any of the other tabs are not in one of the

```python
def setup_base_style():
    global debug
    # ====================================================
    # Sets up a base style for the TNotebook.
    #    I blatently stole this from Don and hacked it to make it work
    #    for me.  You can use this as a guide to make your own.
    # ====================================================
    style = ttk.Style()

    style.map(
        "TNotebook.Tab",
        background=[
            ("selected", "gray54"),
            ("active", "gray86"),
            ("!active", "sandybrown"),
        ],
        foreground=[("selected", "white"),
                    ("active", "black"),
                    ("!active", "black")],
    )
```

other two states.

So the actual selected tab is the

one in the darker gray, the active tab is the one in the light gray and the !active tabs are the ones in sandybrown color.

The setup_base_style is called from the startup menu. For those who don't remember what the startup function is or where it is being called from, this is a function that allows any variables or functions to be called before the program is actually shown to the user and the program goes into the Tkinter mainloop function.

The first few lines simply set up some general styling things (which we'll discuss next month) and calls an imported Python module that I created and named mystyles_dark. This was an experiment I played around with back in December 2022. The idea was to create a Python based Theme for Tkinter programs. If you remember, a ttk Theme is simply a collection of styles that apply to various ttk widgets. I never got around to finishing that project, since once I got the basics of getting the styles for various widgets going, I then put the Python file on the back burner and dived head first into

writing a true Tcl/Tk theme in Tcl. (That was an experience, let me tell you! Well, actually that story is going in a blog on my website.) Anyway, I digress. The Python style module has only one function, which is create_styles() which handles all of the stylings. It requires the style object (in this case sty (actually a better name than style, huh? Less to type!)). By calling it, all the widgets it has code for (most of the ttk library) is now styled to a fairly dark color. I then grab the background color from the Python styling library and assign that to a global variable (background1). Then I call the TNotebook Tab styling routine. The

frames that make up the "pages" of the TNotebook, are coloured by calling the function color_notebook_pages(). I then set the background through style.configure to be the same background as the rest of the project. All the labels, since I mix Tk Labels and ttk.TLabels on the pages of the TNotebook need to be set to proper background and foreground colors, which is what the function fix_labels() does. Finally, I make sure that the Tabs positions are set to the default position and set the title for the project and center it into the screen (code shown top right).

```python
def startup():
    global sty
    sty = ttk.Style()
    os_default_theme = sty.theme_use()
    last_style = os_default_theme
    mystyles_dark.create_styles(sty)
    # Get the background colour from the Python "theme" styles code
    global background1
    background1 = mystyles_dark.bgcolor
    setup_base_style()

    color_notebook_pages()

    sty.configure("TNotebook", background=background1)

    fix_labels()

    set_tab_position("nw")

    _top1.title("TNotebook Tab Position Demo")
    centre_screen(794, 644)
```

We'll talk about the Python styling module next month (actually I'm going to start it later this afternoon, but you won't get to see it until June). One note on the styling module, it requires an empty file named "shared.py" to share information between the modules and to provide the temporary global images for some graphic stuff. Again, more on that next month.

LATE NOTE:

After I wrote the article, I went back and looked at the mystyles.dark module. I said that pretty much as soon as I had gotten it to its current state, I pushed it onto the back burner in order to work on the tcl theme file. When I looked with a bit of a critical eye, I noticed that the module was missing many ttk widgets and what was there was so very minimal that it was pretty much useless outside of setting background/foreground for SOME widgets. So over the past few days, I've modified it pretty heavily. The version that I used in the sample program for the article was 2.04. The modifications are now up to 2.05.7   . I've replaced the original in the repository with the latest. There are a couple of additional functions in the module beyond the create_styles() function. In order to properly style the TCombo box (at least in my mind), the dropdown portion needs to have the same background and foreground as the entry field. To do that, however, there needs to be a couple of calls that require the options to know the root or Toplevel widget.
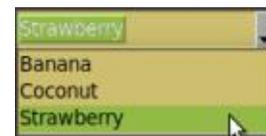
So, there is a new function that is called add_options(toplevel) and requires the toplevel name. For use with PAGE, simply send in _top1 or whatever your toplevel name is. The other is a simple function called get_version(), which just returns the version of the module.

As I usually do, I've created a repository on my GitHub page at https://github.com/gregwa1953/FCM193. It will contain the source code to create this month's project including the PAGE .tcl file, the PAGE python modules and the Python styling module (such as it is).

Until next time, as always; stay safe, healthy, positive and creative!

In part three of this introduction to using Stable Diffusion, the emphasis is on guiding the user on the Stable Diffusion (Easy Diffusion) interface using the 2.5.35 (Beta) version, with a focus on writing effective prompts. The previously noted issues with GPU settings have apparently been resolved with the more recent updates.

While it's easy to write a prompt for something you might imagine, getting it correct is obviously the big issue. You can think of it as an English sentence describing the image with more important words or phrases at the beginning and less important ones at the end. You can also emphasize text with parentheses and, to de-emphasize, use square brackets or add text to the negative prompt area. A general approach is to then create 10 or more images from which you can select the most applicable to then modify. You can do that in the Image settings area by selecting random for the seed. Then change the number of images to 10, or 4 in this case. Choosing a larger number of images allows those with less

capable graphics to start making images and walk away.
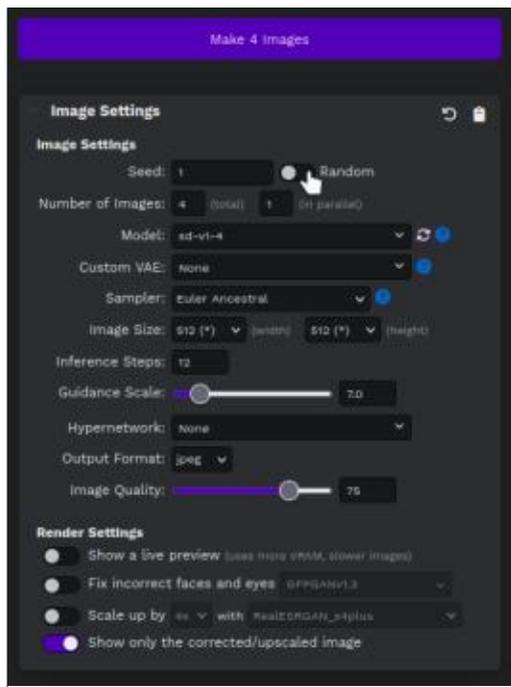
Having a general idea is important because, with that as a framework, there are many options built into the interface. They are grouped into types of Image Modifiers which account for an additional 207 options. This currently includes 8 Drawing Styles, 44 Visual Styles, 6 Pen Styles, 7 Carving and Etching Styles, 22 Camera styles, 10 Color styles, 15

Emotion Styles, 74 Artist Styles, 8 CGI Software Styles, and 13 CGI Rendering Styles.
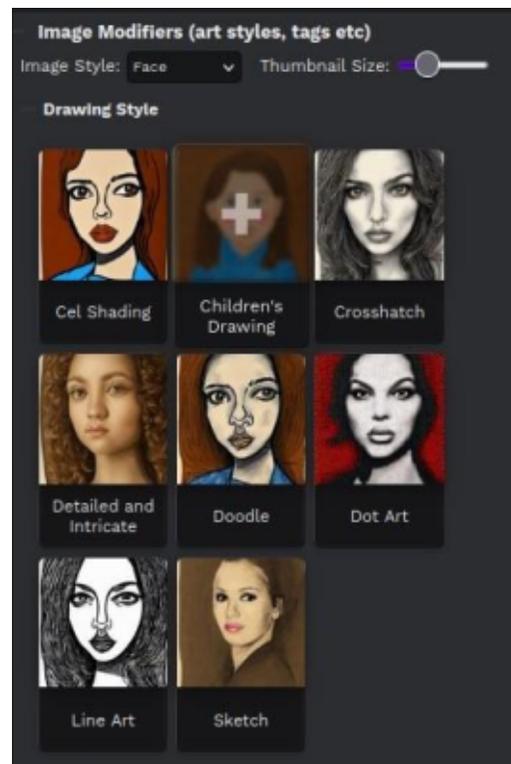
You can add any of these by expanding the Modifier styles if not open by selecting it with the mouse, Drawing Style for example. Then when hovering above a particular style thumbnail, it causes a Plus sign to appear. Once selected, that same thumbnail is added above the make image

button as opposed to written in the Prompt area. Hovering above either location brings up the Negative sign which allows you to remove it. Thus a few clicks allow you to add styles faster than typing the same information into the Prompt area – which is helpful when you are first learning those options. That number of options might seem like a lot but wait, we are just getting started!

Over three hundred prompts were noted at Stable Diffusion V1 Modifier Studies, expanding the imaging creation possibilities, and were added before November 2022. While there is some overlap, most of these styles were not available prior to the update in the Image Modifiers area. To test this, I simply tried typing in a style, in this case Atompunk, and made 10 images. (Atompunk is a colorful view of the future from the perspective of the 1950s and 60s.) The below is an example of what was created. You can also simply type in the name of an artist such as Adi Granov, a Bosnian comic book artist, and get an image reflecting

his style below. The ethical and legal question of incorporating artists' work style in the created database used to generate images is currently being tested in court.

Another option to consider depends on your purpose of the graphic that you wish to reflect. If your image is more landscape oriented, it's helpful to change that option. Changing the type image can be done under Image Modifiers (art styles, tags, etc) by clicking on the Image Style selector down-arrow. Each of the modifier example thumbnails then changes accordingly. Next time we will look at modifying some of the images created.
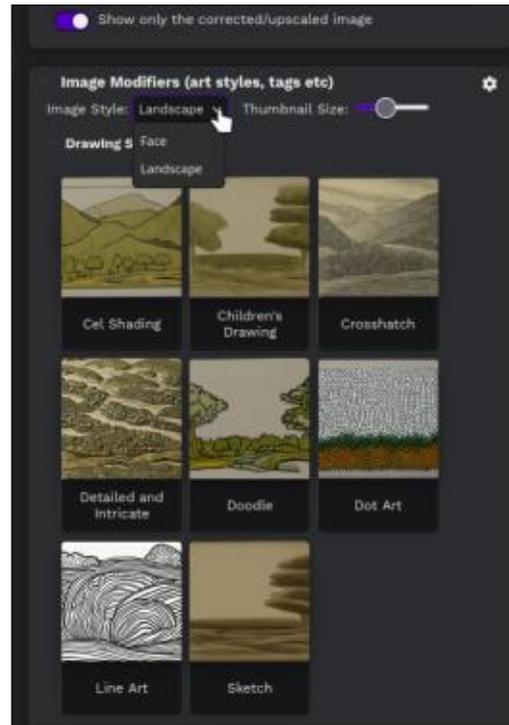
I was motivated to write this issue's column by Harold McGee's latest tome Nose Dive: A field guide to the world's smells (New York. Penguin Press: 2020. ISBN 978-0-14-311089-7). This book has 653 pages full of fascinating and enthusiastic information about scents, aromas, smells. Any of you who are cooks or chefs probably are familiar with McGee's other works about cooking. This field guide to the world of smells contains an enormous amount of organic chemistry including many structural diagrams. These diagrams are small line drawings of organic molecules. There is probably more than enough detail in them to satisfy an ordinary reader but not enough for someone with more in-depth knowledge of these molecules. I thought I would find out how Latex handles chemistry formulae.

If you are interested or required to use Latex to make chemical diagrams, please download the chemfig manual available at ctan.org. Simply search for chemfig and you will find it. Since chemfig is part of a standard Latex installation on Linux, you do not need to install it. The manual will be very helpful as you get used to the commands for this powerful set of chemical structure macros.

This column is not an introduction to organic chemistry. I am using a personal interest to show off more of the capabilities of Tex / Latex. If you have a personal interest that needs or uses printed or electronic PDF files, let me know. Perhaps Tex / Latex can make generating the files you need easier.

Let's start with a simple organic compound we are all familiar with: ethanol, more commonly known as ``alcohol'', even though it is only one of the family of alcohols. It is also the only alcohol that is safe for us to consume. Ethanol's formula is normally written as C_2H_5OH, although it can be written as C_2H_6O. The straight-line formula does not show how the atoms are joined together (the structure), it also does not show why this combination of atoms is an alcohol.

In order to show the complexities of molecules in a word processor, one has to use chemistry software to draw a compound, then export the drawing as an image (bmp, gif, jpeg, etc). Then import the image into the word processing document. In Latex, one simply uses the chemfig package and then uses the macros - syntax built into that package. (Note: There are other packages which are available for building chemical structures.)

C2H5OH becomes:

`\chemfig{C_2H_5OH}`

The Latex code using chemfig is much simpler than the Latex code using regular text commands. In the generated PDF, you will see no difference.

Now I will use chemfig to draw the structure that reveals the bonding.

`\chemfig{H_3C-[:30]CH_2-[:-30]O-H}`

Note: The [:30] and [:-30] indicate the degrees the angle of the next bond will deviate from the

C_2H_5OH using subscripts
C_2H_5OH using chemfig

H_3C — CH_2 — O —— H all atoms shown

OH simplified form

H_3C — C=O — OH Acetic acid (ethanoic acid)

H_3C — CH_2 — CH_2 — C=O — OH Butanoic acid - cheese smell
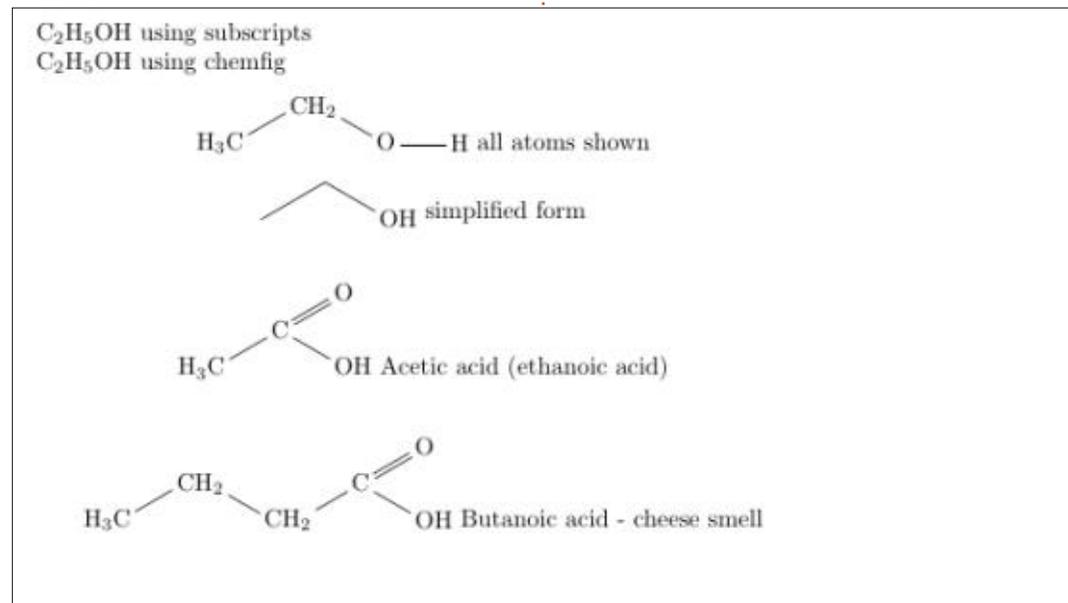
previous bond. Without the angling of bonds, the image would be a straight line with -OH stuck on the end. That would not be informative.

Now a conventional organic chemistry structural diagram for ethanol:

`\chemfig{-[:30]-[:-30]OH}`

For those not familiar with these diagrams, here is an explanation:

Every empty end point or where two lines meet indicates a carbon atom.

Carbon always has four bonds so any "invisible" (or "missing") bonds are always to hydrogen.

With these two conventions, I hope you can see this diagram is a simplified version of the previous one.

Chemical formulae which have only superscripts, subscripts, and basic symbols (equals, arrows, etc.) can usually be written using the tools in a word processor. Writing anything more complex requires a word processor and some specialized software, or Latex and the appropriate package. I used

chemfig but there are others available.

Let's take a look at another simple organic compound we are all familiar with: acetic acid, which is the active component in vinegar. Its formula is CH3COOH which does not tell you much about its structure unless you are familiar with organic acids. The -OH bonded to an end carbon is the distinguishing mark of the family of alcohols. Organic acids also have the -OH group on one end. Next to it, on the same carbon, is an oxygen atom with two bonds to that same carbon. The left-hand carbon is bonded to 3 hydrogen atoms. Its last bond links it to the second carbon. The second carbon has one bond to the first carbon, two bonds to one oxygen, and one bond to another oxygen. The second bond on the second oxygen is linked to a hydrogen. (Clear? If not, look at the acetic acid molecule in figure 1)

`\chemfig{H_3C-[:30]C(=[:30]O)(-[:-30]OH)}`

This could be simplified as I did with ethanol. I leave that up to you.

A slightly larger acid is butanoic acid with four carbons. It is

common in some cheeses. Its smell also reminds some people of sweat.

`\chemfig{H_3C-[:30]CH_2-[:-30]CH_2-[:30]C(=[:30]O)(-[:-30]OH)}`

Or in the conventional structural form:

`\chemfig{-[:30]-[:-30]-[:30](=[:30]O)(-[:-30]OH)}`

Even to me this article is starting to sound like a lecture in organic chemistry. So only one more brief example. Phenol is a chemical used in many disinfectants and cleaners. It is also part of the formula for a famous brand of mouthwash. If you had dental work done during COVID, your dentist or hygienist probably asked you to rinse your mouth carefully with something that had phenol in it. Phenol is a six-carbon ring, a benzene ring, with an OH group attached to one carbon. It is not easy to draw quickly or accurately - except in Latex.

`\chemfig{HO-[:180]**6(------)}`

I hope this article has convinced you of the flexibility and adaptability of Latex. To call it a typesetting system implies it was

designed for text. It is very useful for many other kinds of information than just text. I think of Latex as document production software. Granted it does not have the fancy, cluttered GUI that word processors have. However Latex is far more flexible and uses far fewer computer resources than word processors.

The chemfig package relies on the tikz package for drawing. The tikz package is automatically called whenever chemfig is used. There is no need to set up a usepackage for tikz, you can if you wish, but it is not necessary. Both chemfig and tikz are part of a standard Latex install in Linux.

Next time, I will return to processing text and start a project to make a cookbook. Now I have to figure out how to get all these chemical structures into LibreOffice so I can submit this article to the FCM editing team.

KILOBYTE
MAGAZINE

Kilobyte Magazine is a fanzine for 8bit enthusiasts. It covers consoles, computers, handhelds and more, as well as new games for old systems. If you grew up with Commodore, Atari, Sinclair or Amstrad, this magazine is for you.

https://retro.wtf/kilobytemagazine/

In the previous instalment, I looked at the new multi-page tool introduced in Inkscape 1.2. As I often delve into the guts of Inkscape's SVG files in this series, I thought it would be interesting to see exactly how multiple pages have been implemented. What I've found is a little disappointing, because I think the developers have made a slightly bad choice that limits the usefulness of multi-page mode more than was necessary. In this article, we'll take a look at exactly what that mistake was, and a couple of ways to work around it.

To investigate this, we'll be using a simple multi-page Inkscape file. Each page contains a colored rectangle that fills the whole page area (so it's easier to see the page boundary when loaded into a web browser), plus a random single object in the middle, as a placeholder for the real content you might put in your document.

The first thing to do is to load the SVG file directly into a web browser and see what appears. You don't win any prizes for guessing that only the first page is displayed. This is simply the same behaviour as a single-page Inkscape document. It could be argued that the main purpose of the multi-page tool is for importing and exporting PDFs, so it's hardly surprising that a web browser won't show the extra pages, but since SVG is a first-class format for the web, it does seem a shame that there's no easy way to view the other pages. But the key word there is "easy". If you're prepared to get a little technical, it is possible to work around this limitation.

First, let's take a look at what's going on inside the SVG file itself. You can simply open it in a text editor, but as this is an Inkscape column, I'm going to look at it via the Edit > XML Editor… option (below).

In the left pane, we can see the tree of XML elements that make up our file. At the top is the 'root' node, shown as <svg:svg …>, followed by a <sodipodi:namedview …>. If you're new to Inkscape, you may not realise it was forked from an older program named Sodipodi, the fingerprints of which are still present inside Inkscape's SVG files. In this case, we have a <namedview> element which is in the 'sodipodi' namespace. Namespaces are a means of mixing multiple different XML languages together in one file and ensuring they don't clash with each other. In the case of Inkscape, it means that anything in the 'sodipodi' or 'inkscape' namespaces are not part of the SVG standard, and will simply be ignored by most other programs.

As hinted by its Sodipodi heritage, the <namedview> element has been present in Inkscape files right from the start. It contains metadata about how the file should be displayed when loaded into Inkscape: this is where
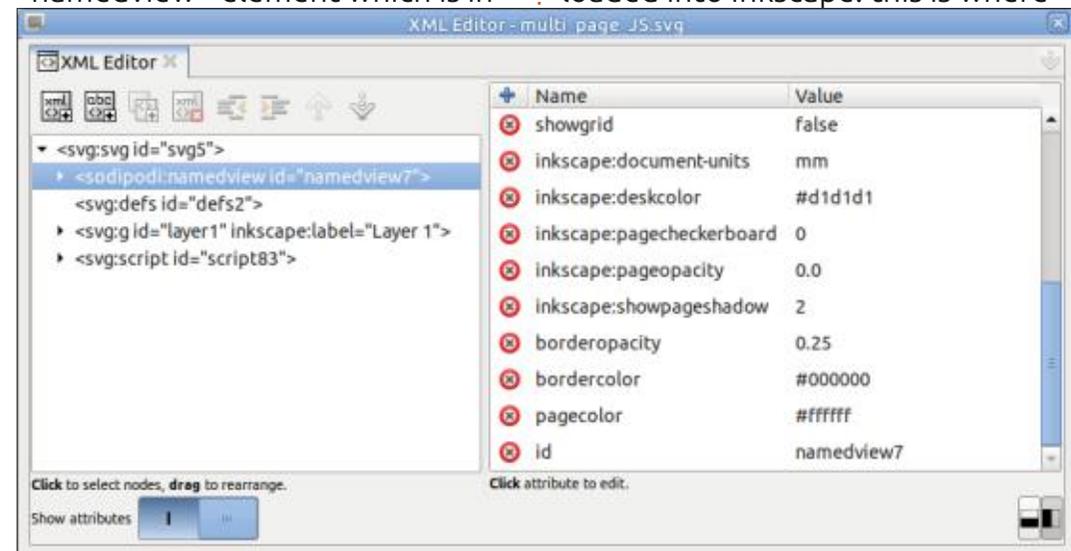
you'll find XML attributes that store the window size, zoom factor, and page color, amongst other things. But with a multi-page Inkscape document the <namedview> element has gained something else: children. Expanding the <namedview> entry in the XML editor reveals an <inkscape:page ...> element for each page in your document. To clarify, these are <page> elements in the 'inkscape' namespace, so other applications – including your web browser – have no idea what to do with them.

In this screenshot, I've selected the second page in the document. You can see the attributes of the <page> element in the right-hand pane. These consist of the width and height of the page, and the

coordinates of the top-left corner of the page (x and y). There's also an auto-generated ID, and an 'inkscape:label' attribute which holds any custom name you may have given to the page. If you're familiar with the internals of SVG files, then you may recognise the four dimension-related attributes as being the same as those used in an SVG viewBox definition. That fact gives us our first workaround for viewing pages in a browser.

When loading an SVG file into a web browser, there's a little-known trick that can be used to override the default viewBox definition from the main <svg> element. I covered this previously in part 79 of this series (FCM issue #139), but the summary is that you can use the

'fragment identifier' of the file's URL to specify the x, y, width and height values of the viewBox you wish to use. Let's look at this with an example: first, we'll load the SVG file directly into Firefox and, as expected, we see only the first page.
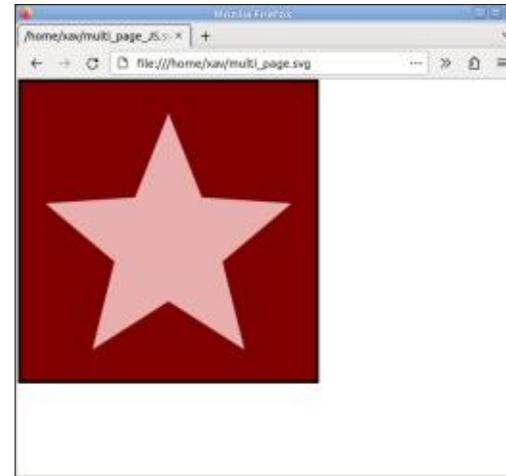
To access other pages, we first need to find the coordinates (x, y) and dimensions (width, height) from the relevant <inkscape:page> element. You can see from the screenshot of the XML editor that Inkscape stores these to quite a high precision but, in practice, you can usually truncate them to just a couple of decimal places – perhaps even less if there's a little free space between the edge of the page and the content. You then need to take these values, swap them into the following string, and

append the whole thing to the URL in your web browser:

```
#svgView(viewBox(x,y,width,he
ight))
```

In the case of this example, the filename is 'multi_page.svg', and the values for the second page are shown in the earlier screenshot of the XML editor. The URL for viewing the second page therefore becomes:

```
.../
multi_page.svg#svgView(viewBo
x(112.6,0,102.6,102.6))
```
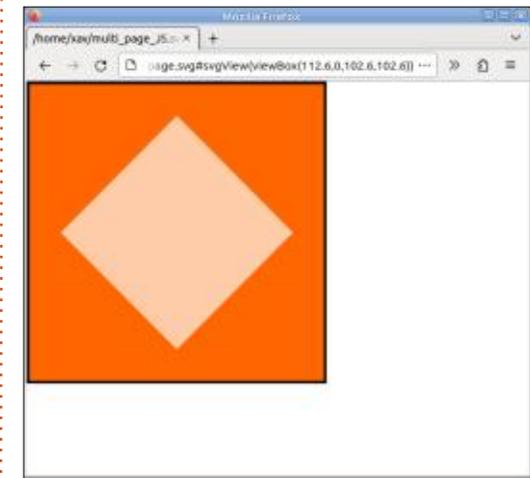
This syntax works wherever the browser expects an image URL, so web developers can also use it in <img> elements, and even in CSS url() values.
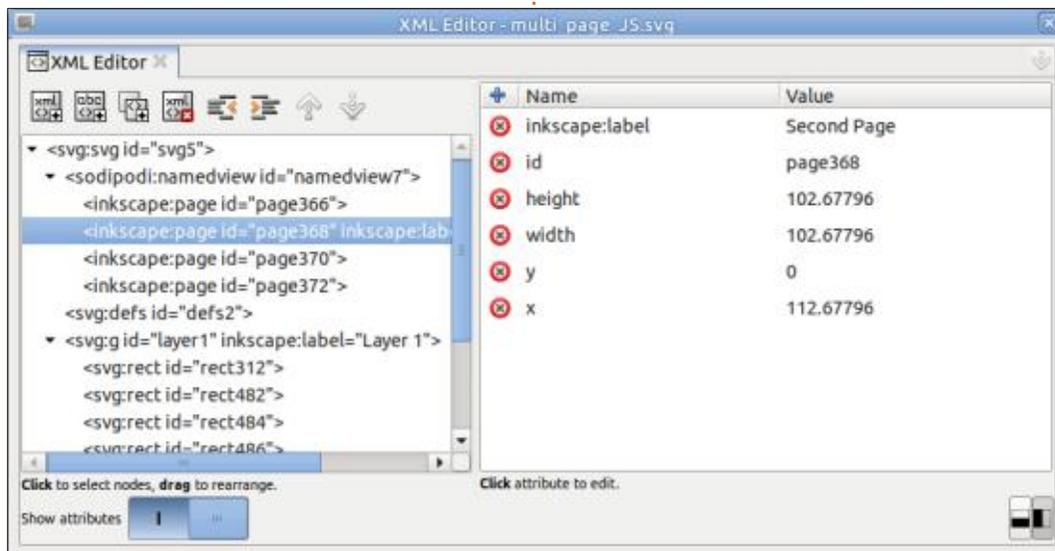
It's a clever trick, which gives you access to all the pages in a multi-page Inkscape file, but it's not without its limitations. The biggest of these, quite clearly, is the need to dig into the SVG file to find the page size and position, then copy those values into the URL directly. The resultant link also lacks semantics – that specific combination of numbers doesn't exactly scream 'page 2' to the uninitiated. However, SVG also allows us to add 'named views' to the file (not the same thing as the <sodipodi:namedView> element), which still requires digging out the magic numbers, but does at least allow us to map each viewBox to a more meaningful name. The downside of this approach is that we will need to edit the SVG file, either with a text editor or using Inkscape's XML editor.

If you're comfortable editing XML files in a text editor, that's probably the easiest method. Just make sure you don't have the file open in Inkscape at the same time, or you may find your hand-crafted edits are automatically replaced. That approach is also described in part 79 of this series, so this time I'm instead going to show you how to make the same edits within Inkscape.

Once again, you'll need the x, y, width and height parameters from the relevant <inkscape:page> element. This time, I'll use the values for page 3 in the file. Again, these were obtained by selecting the relevant <inkscape:page> element in the XML editor, and looking at the attributes in the second pane. Once again, we'll truncate these to 1 decimal place, giving this set of values:
x: 225.3
y: 0
width: 102.6
height: 102.6

Observant readers may have noticed that only the x value has changed compared with the values for page 2. This makes sense, as the third page is the same size as the others, and has only been displaced horizontally. If your multi-page documents all use the same page size, with the pages aligned in a single row, it will always be the case that only the x value differs between them.

Now we need to create a new element in the document, which we can do via the XML editor. This can actually go anywhere in the document, and I've previously advocated putting it in the <defs> section – but now I've changed my mind. To keep similar items grouped together, I'm actually going to create it as a child of the appropriate <inkscape:page> element. To achieve this, first select the <inkscape:page> element in the left-hand pane of the XML editor. While it's highlighted, you might want to note down those all-important dimensions that are shown in the second pane (which could actually be below rather than to the right, depending on the orientation buttons in the bottom-right of the dialog).

With the existing element selected, click the first button in the dialog's toolbar: "New element node". This will open a much smaller dialog with a single text field and a couple of buttons, where you should enter the name (including the namespace reference) of the new element you wish to create. In this case the string to type is "svg:view" – with no spaces, and without the quotes.
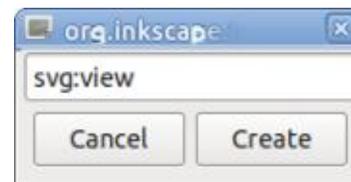
Click the 'Create' button, and you should find your new element appears in the first pane as a child of the <inkscape:page>. It should already be selected, with no attributes present in the second pane. We will need to add two attributes to this element. Let's start with the 'id', which you can create by clicking on the '+' button at the top of the second pane, and entering 'id' into the name field that appears in the list below. When you press enter, the value field will be focused, and it's here that you should put the more semantic name you wish to use for the page. Note that this is an XML ID, which means it can't contain any whitespace characters – so no 'Page 3' for example. In practice it's best to stick to alphanumeric characters, underscores and hyphens. The first character should be a letter, and I tend to stick to lowercase characters. In practice, therefore, something like 'page-3' is ideal.

Now repeat the process to add a second attribute, this time with a name of 'viewBox' (watch the capitalization), and a value of your four values, separated by space characters, in the order 'x y width height'. If all has gone well, the XML

editor should look something like that shown below.

Repeat the process for each page, using the appropriate values and different IDs before saving your file to commit the changes to disk. Then, to view a page in the browser, you simply have to use the base URL for your SVG file, and append a hash (#) followed by the ID of the page. In this example, therefore, the URL becomes '.../multi_page.svg#page-3':
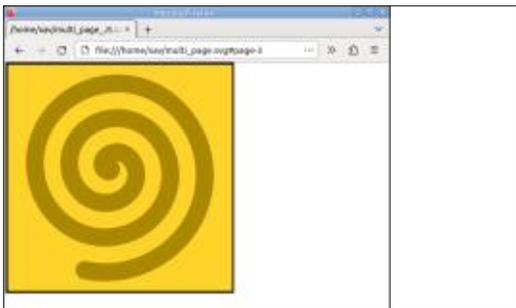
Once again, this trick works with any place that the browser expects a URL, including <img> tags and CSS. In practice, I suggest picking better semantic IDs than simply 'page-n' if you possibly can. Suppose we had used 'yellow-spiral' as my ID in this case: if we subsequently wanted to rearrange the pages within the SVG document we would only have to update the coordinates in the <svg:view> elements, but any website that referred to the page by that ID would still work without modification.

Perhaps you can now see why I think the Inkscape developers made a mistake when implementing multi-page support. The <inkscape:page> element has attributes for an ID, an optional label (in the 'inkscape' namespace), and the four dimension and position values. The SVG standard <view> element, on the other hand, has an ID and a viewBox (which consists of the four dimension and position values). It's lacking a label attribute, but this could legitimately be added within the 'inkscape' namespace, without breaking any XML or SVG rules. I fail to see, therefore, why the Inkscape developers chose to use a non-standard <page> element in their own namespace, rather than just use the existing SVG <view> element, adding custom attributes where required. Had they done so, every Inkscape page would automatically get a named view, and therefore be much easier to access via a web browser.
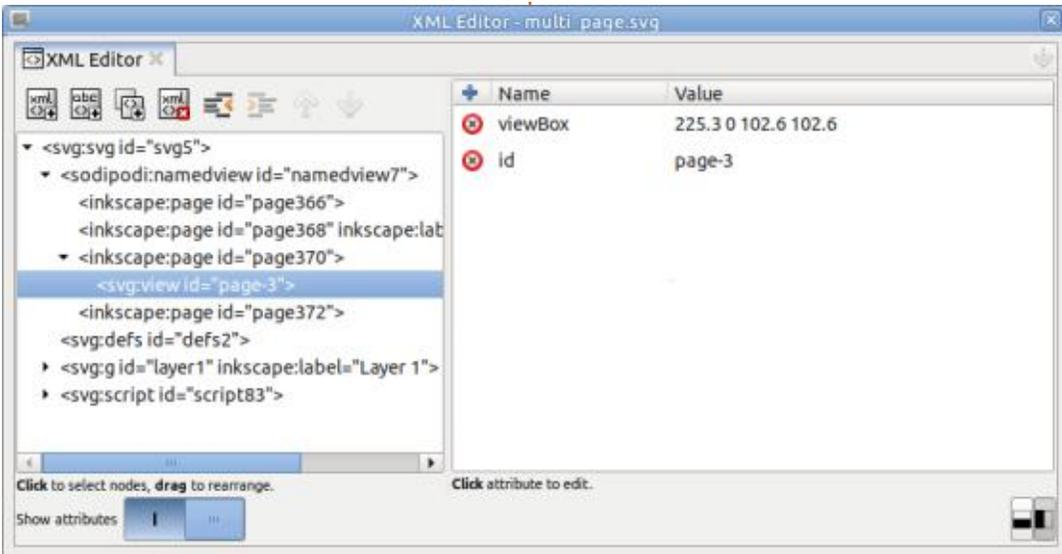
Sadly, this missed opportunity leaves users either having to extract the details of each page's viewbox in order to construct a suitable #svgView(...) fragment identifier, or manually creating their own <view> elements to achieve the same effect but with nicer URLs. Next month we'll look at a different approach to 'fixing' this problem – though one that unfortunately comes with its own set of limitations.

Mark uses Inkscape to create comics for the web (www.peppertop.com/) as well as for print. You can follow him on Twitter for more comic and Inkscape content: @PeppertopComics

Let's start anew. Click File > New and then create a new body. If you've just joined us and wonder how, then see part 1 of this series.

Create a new sketch on the YZ (right) plane.

What we want to do here is create a shape on one side of the vertical line. Do this using the Polyline tool

Create polyline

Create a polyline in the sketch. 'M' Key cycles behaviour
(Sketcher_CreatePolyline) (G, M)

Click somewhere on the vertical line to anchor our shape there. Click, click, click, until you get a shape something like this:
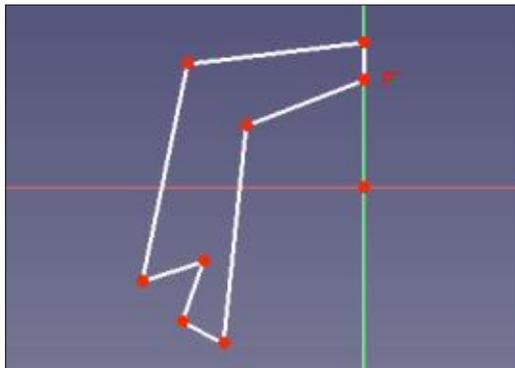
It doesn't have to be exact. Just something similar. But make sure you finish where you started. We want this to be a closed shape.

Now, my shape is purposely wonky so that I can show you a couple of new tools before we finish off this object.
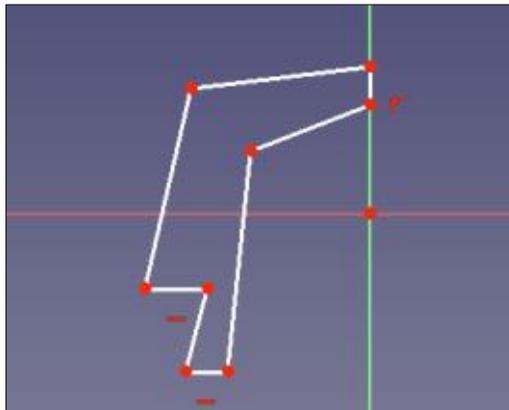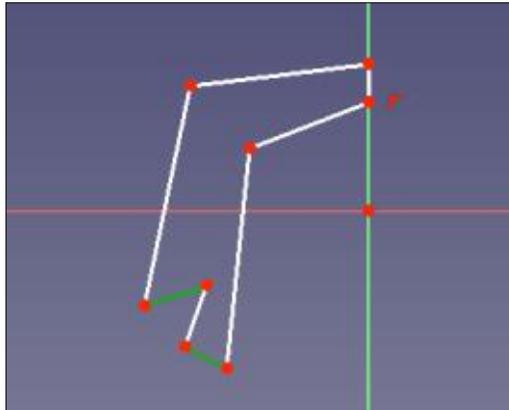
See those two lines in green? Ideally I'd like them to be exactly horizontal. Well, all I need to do is to (one at a time) select the line, then click the Horizontal constraint icon (that we used a couple of parts ago).

See how those two lines now have a red minus sign below them to show they're constrained to be horizontal. I set the line connecting them to vertical. You can still move those points around, but you'll see how they're locked to move only horizontally/vertically.
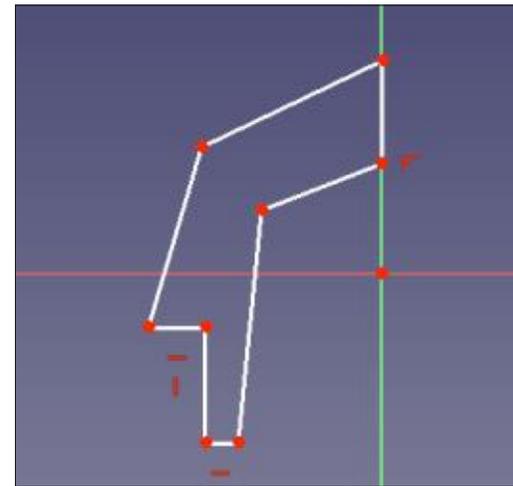
I've moved a couple of points to suit what we're about to do next.

Select the top angled line.
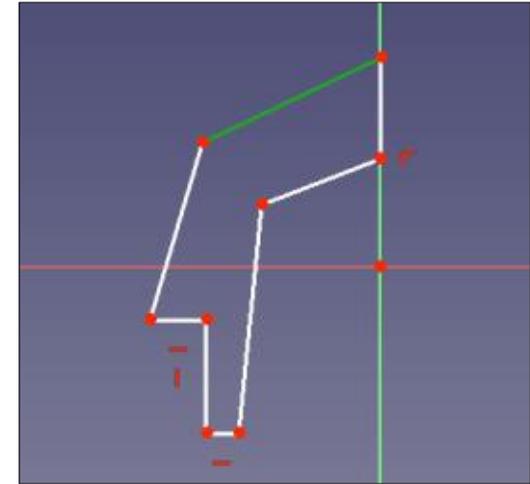
And press delete.
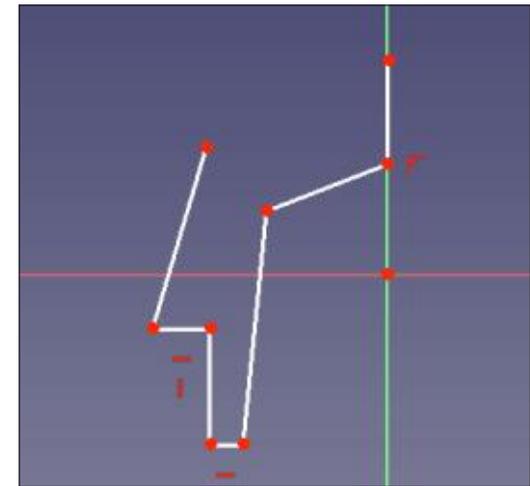
Let's use another new tool. The arc shape. You may need to click

contents ^

the down-arrow beside the arc icon to see the End points and rim point option.
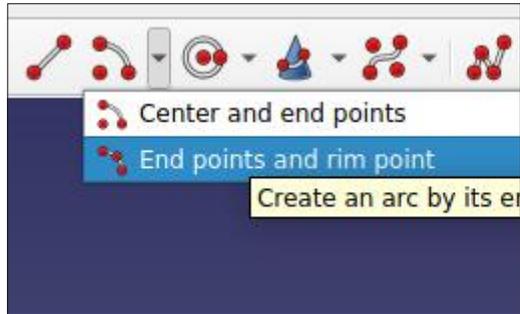
Click on one of the open points. You'll see a circle appear. Click the other point and you'll get an arc that you can adjust. Give our shape a nice arc.
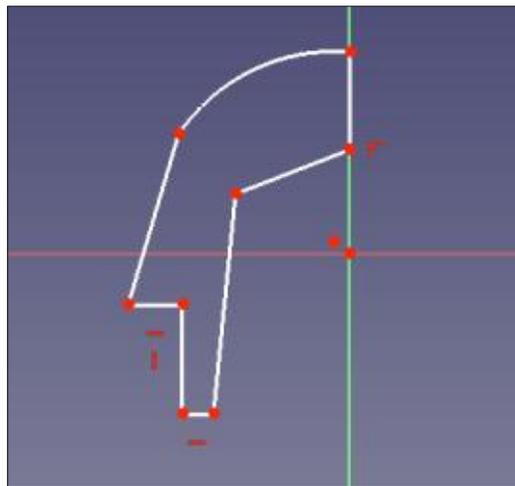
Feel free to do the same to the other diagonal line.
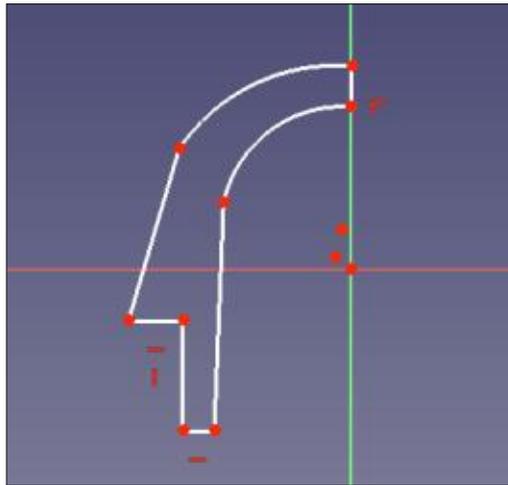
After I did my second arc, I moved one of my vertical points up a bit just to make it look better.

You could, of course, lock down all of those points but, for now, this will do us.

In the left panel, click Close to return back to the Part Design workbench.

Time to do a new thing. Click the Revolution button.
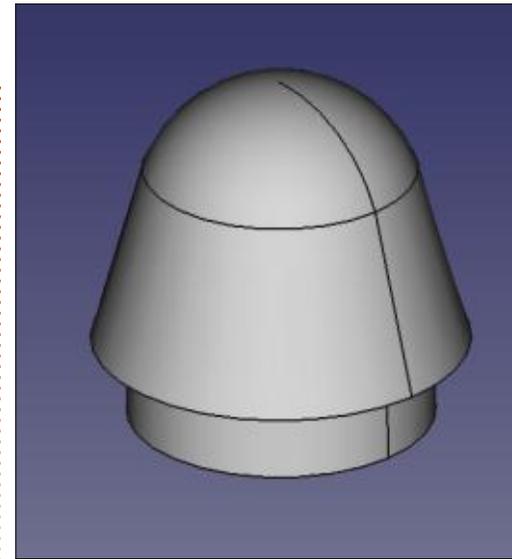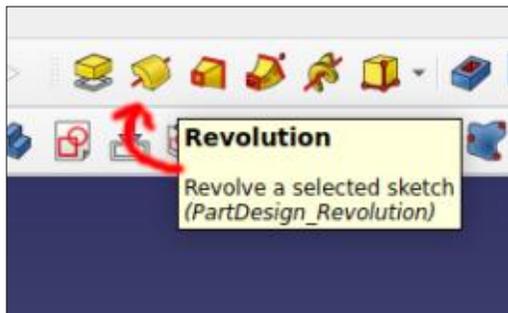
The line you see down the side is where the shape has rotated 360 degrees.
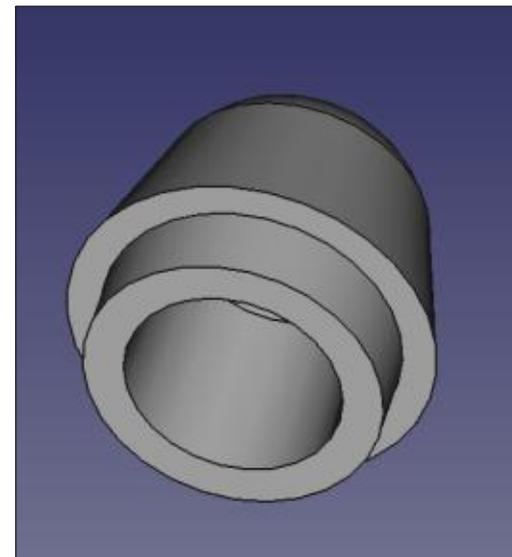
So, as you can imagine, this is an incredibly powerful tool. But what if

you need to make something that's not a perfect circle? We'll look into that next time.
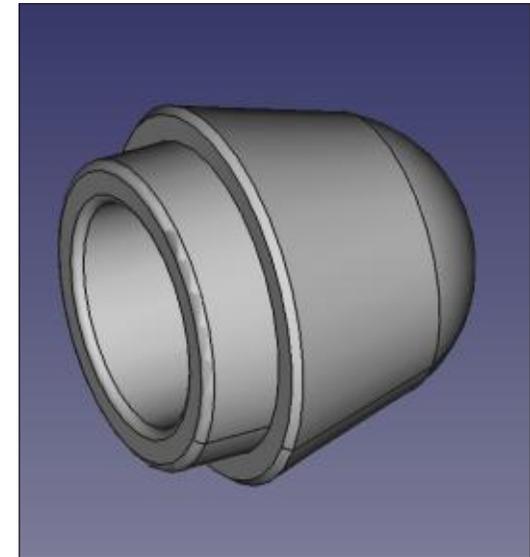
As ever, feel free to click edges and make it look pretty.

Ronnie is the founder of Full Circle and, somehow, still editing this thing. He also paints, draws and does woodcarving in his spare time.

BACK NEXT MONTH

Written by Greg W. Walters
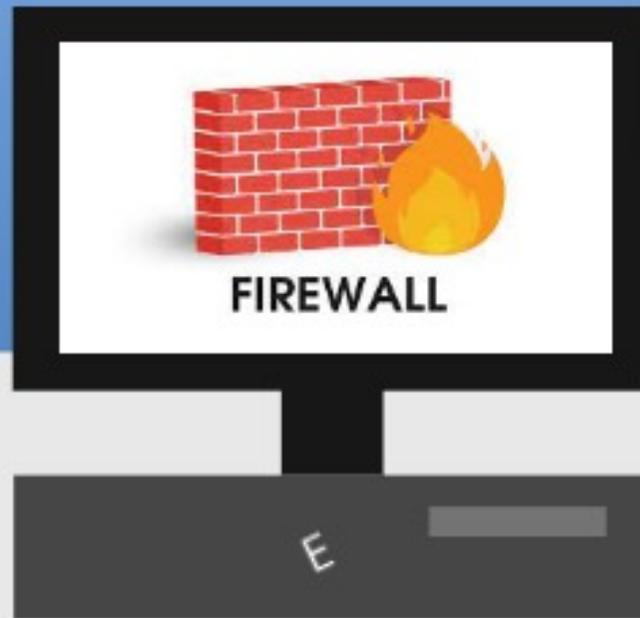
I'M BAAAAAACCKKKKK

Glenn Frey of the Eagles once said "*For the record, we never broke up, we just took a 14-year vacation.*"

I'm certainly not as famous as Glen Frey or the Eagles, but let's just consider that last 8 months a vacation from Micro This Micro That. However, I'm back at least for this month. Hopefully, life will be generous enough that I can continue to do this series of articles for a number of months again.

There has been a lot of movement in the Micropython/ MicroController world. A few weeks ago (April 2023) an announcement came out that "MicroPython 1.20 released with Raspberry Pi Pico W support, mip package manager, smaller footprint". That was the reason for me scraping to make room to write this updated special MTMT.

Yes, the Raspberry Pi Pico-W did

```
np = NeoPixel(pin, 8)    # create NeoPixel driver on GPIO pin 0 for 8 pixels
np[0] = (255, 255, 255)  # set the first pixel to white
np.write()               # write data to all pixels
r, g, b = np[0]          # get first pixel colour
```

get its own page in the Micropython.org downloads page. And YES, there are many new things in it.

The last version of Micropython for the Pico-W was 1.19 and it did provide network support on the Pico-W, and it did work pretty well.

Micropython 1.20 also is supposed to provide a native Neopixel driver (WS2812) that replaces the need for the older versions. According to the documentation, you should just be able to use

```
from neopixel import NeoPixel
```

for the "normal" Neopixel devices and

```
from apa106 import APA106
```

for dotstar devices.

I tried it and yes, you can use it;

however, everything you already have that works with the older drivers WILL NOT WORK with the new one. The new driver is really limited. Here is a quick snippet of how to use the neopixel driver

That's all you get. Define the R,G,B color and write it to a specific pixel.

It doesn't look like the new driver will support the newer RGBW devices, since there are only three values in the parameter.

The bottom line here is don't expect to use any of your cool LED Strip lighting effects like "fireflys" or "color wave" or "smooth rainbow" using the new integrated driver for MicroPython 1.20 anytime soon.

The other major disappointment seems to be in the I2C driver for both the RPi Pico and the RPi Pico-

W. There is an issue with the nightly build v1.20.0-50-g786013d46 released on 2023-05-04. A little bit of history is needed here to understand the reason for the frustration that is to come.

Back in January of 2021, when the RPi Pico first came out, the Raspberry Pi group released the Pico Python SDK document which was a great boon to anyone trying to get up to speed in learning MicroPython – especially for the brand new RPi Pico board. In section 3.6, it talks about how programs should talk to devices on the two I2C buses. The examples showed for Bus 0 you should use:

```
i2c = I2C(0, scl=Pin(9),
sda=Pin(8), freq=100000)
```

or for Bus #1:

```
i2c = I2C(1, scl=Pin(7),
sda=Pin(6), freq=100000)
```

MICRO THIS MICRO THAT

They went on to say that the defaults would be for I2C(0) SDA is on Pin 8 (GPIO) and SCL is on Pin 9 and for I2C(1) SDA is on Pin 6 and SCL is on Pin 7.

There is also a warning that says "There may be some bugs reading/ writing to device addresses that do not respond, the hardware seems to lock up in some cases."

So when I started programming for the Pico, I stuck with the defaults of pins 8 and 9 for Bus(0) and that's what I used in my demo programs that I published here.

Well, time passes, as we all know, and new versions of the MicroPython for RPi Pico came out and they all stuck to those standards. That is until MicroPython 1.20.

If you try to run a program that was working under MP 1.19 using the default I2C pins (8 and 9 for I2C(0) or 6 and 7 for I2C(1) wouldn't

work and an error message would be thrown saying that shown top right.

If you tried the i2cscan program that we've used many times, nothing would show up. Even running the program on an old RPi Pico without the wireless would fail. Yet if you flashed the MicroPython version back to 1.19, everything worked just as you remember.

I modified my "regular" i2cscan program to include a print line that includes the configuration information, like this (bottom right).

Returning to my original I2C program that used a temperature sensor and an OLED display, it worked just like before.

Not knowing how long it might take for the MicroPython group to get things working correctly, here is a small table showing the GPIO and Physical pin assignments for both I2C(0) and I2C(1) (see table below).

```
Traceback (most recent call last):
  File "<stdin>", line 16, in <module>
  File "ssd1306.py", line 110, in __init__
  File "ssd1306.py", line 36, in __init__
  File "ssd1306.py", line 71, in init_display
  File "ssd1306.py", line 117, in write_cmd
OSError: [Errno 5] EIO
```

Once the MicroPython group gets things straightened out, the following table should provide you with a quick reference for which

GPIO and Physical pins you can use for either bus (see table next page, top right).

So is it worth upgrading the

```
from machine import I2C

i2c=I2C(0)
devices = i2c.scan()
for device in devices:
    print(hex(device))

print("I2C Configuration: "+str(i2c))
```

The output was revealing…

```
I2C Configuration: I2C(0, freq=399361, scl=5, sda=4,
timeout=50000)
I2C Configuration: I2C(1, freq=399361, scl=7, sda=6,
timeout=50000)
```

Basically it was saying that I2C(0) was looking for devices on a lower pin set from the default.

Moving my device to pins 4 and 5 and running the i2cscan again, I got what I expected.

```
I2C Configuration: I2C(0, freq=399361, scl=5, sda=4,
timeout=50000)
0x39
0x77
I2C Configuration: I2C(1, freq=399361, scl=7, sda=6,
timeout=50000)
```

I2C(0)				I2C(1)			
SDA		SCL		SDA		SCL	
GPIO	Physical	GPIO	Physical	GPIO	Physical	GPIO	Physical
4	6	5	7	6	9	7	10

MICRO THIS MICRO THAT

MicroPython version from 1.19 to 1.20? At first glance, the answer is no. There are enough problems between the I2C issue and the fairly dumbed down NeoPixel driver that I'm really not willing to consider staying at 1.20 for "production and testing". I will monitor the MicroPython download page (https://micropython.org/download/rp2-pico-w/) for new nightly builds every few days, but I'm not really holding my breath on a great all-supporting release any time soon.

I'm going to try to leave on a positive note and say that, as time allows, I'll be working on more projects using the Pico and Pico-W and will try to provide more articles in the near future. And yes, that DOES include the Compass program.

LATE ADDITION:

As I was sitting back with a cold glass of water resting from making over 1.7 litres of (not) refried beans, I realized that even if I have the time to update things next month, it will be the end of June before any of you will see the updates.

So, I'm going to try to make sure that I update things on my blog at http://thedesignatedgeek.xyz so you can always get any updates. I hope to have a project for using the new NeoPixel in a realistic way and any updates to the I2C issue I raised in the article above. If you do visit, PLEASE drop me an email and let me know what you think. There is an easy email handler at the bottom of the main page.

Until then, as always; stay safe, healthy, positive and creative!

| I2C(0) | | | | I2C(1) | | | |
| SDA | | SCL | | SDA | | SCL | |
GPIO	Physical	GPIO	Physical	GPIO	Physical	GPIO	Physical
Þ	1	1	2	2	4	3	5
4	6	5	7	6	9	7	10
8	11	9	12	10	11	11	15
12	16	13	17	14	15	15	20
16	21	17	22	18	19	19	25
20	26	21	27	26	27	27	32

Greg Walters is a retired programmer living in Central Texas, USA. He has been a programmer since 1972 and in his spare time, he is an author, amateur photographer, luthier, fair musician and a pretty darn good cook. He still is the owner of RainyDaySolutions a consulting company and he spends most of his time writing articles for FCM and tutorials. His website is www.thedesignatedgeek.xyz .

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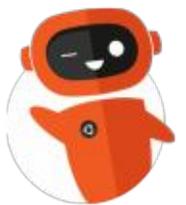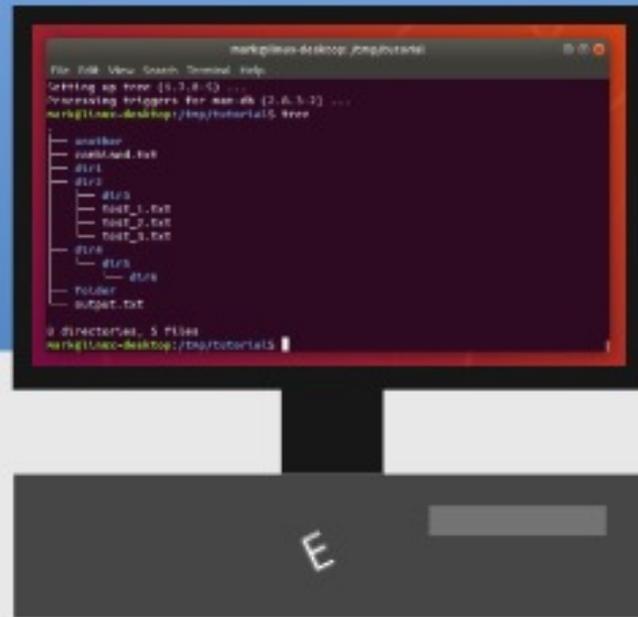
BACK NEXT MONTH?

Feel free to email over your opinions and stories to ronnie@fullcirclemagazine.org

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:** https://bit.ly/fcmwriting

• 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 <u>not</u> use tables or any type of **bold** or *italic* formatting.

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

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

TRANSLATIONS

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

REVIEWS

GAMES/APPLICATIONS
When reviewing games/applications please state clearly:

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

HARDWARE
When reviewing hardware please state clearly:

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

You <u>don't</u> need to be an expert to write an article - write about the games, applications and hardware that you use

This latest Ubuntu release arrives squarely in the middle of the development cycle. Ubuntu 23.04, released on 20 April, 2023, is the second of three planned interim releases leading to the next long term support version, Ubuntu 24.04 LTS, due out in April, 2024.

Being an interim release, Ubuntu 23.04 is supported for just nine months, until January, 2024. LTS versions are supported for five years so, if you do install this version, you will need to upgrade to the next release, Ubuntu 23.10, to carry through to the next LTS version.

Ubuntu 23.04 is the 38th version of Ubuntu, and the 12th with the modified Gnome 3 desktop, so the formula is pretty well established. Ubuntu has come a long way since that first release, Ubuntu 4.10 on 20 October, 2004.

Codenamed Lunar Lobster, this is the second Ubuntu release that has an "L" name, the previous one being Ubuntu 10.04 LTS Lucid Lynx which was released on 29 April, 2010, 13 years ago.

This new version builds on the small changes introduced in the last release and seems to point to an LTS that will have only some small refinements over the last LTS.

INSTALLATION

I downloaded a copy of the ISO file from the official source using BitTorrent. Once I had the file, an SHA256 sum check confirmed it was a good download.

At 4.9 GB, this release has unaccountably grown by 1.1 GB over the last release which is 22%! This is also a 30% bigger download than the last LTS version.

As usual, I dropped the ISO file onto a USB stick with Ventoy 1.0.91 on it and booted from there. Ventoy worked perfectly for testing purposes.

SYSTEM REQUIREMENTS

The recommended minimum system requirements for Ubuntu 23.04 have not changed since the 20.04 LTS and remain:


2 GHz dual-core processor
4 GB RAM
25 GB of hard-drive, USB stick, memory card, or external drive space
Screen capable of 1024x768 pixel screen resolution
Either a CD/DVD drive or a USB port for the installation media
Internet access is useful, but not essential

This means that Ubuntu 23.04 should run fine on hardware designed for Windows 7 or later, although I would suggest at least 8 GB of RAM as a working minimum.

NEW

There is a lot that is new in Ubuntu 23.04, but all the changes are fairly small ones.

For desktop users the biggest switch is to Gnome 44.0, the second major release using the GTK4 toolkit. This brings new versions of almost all the usual desktop applications.
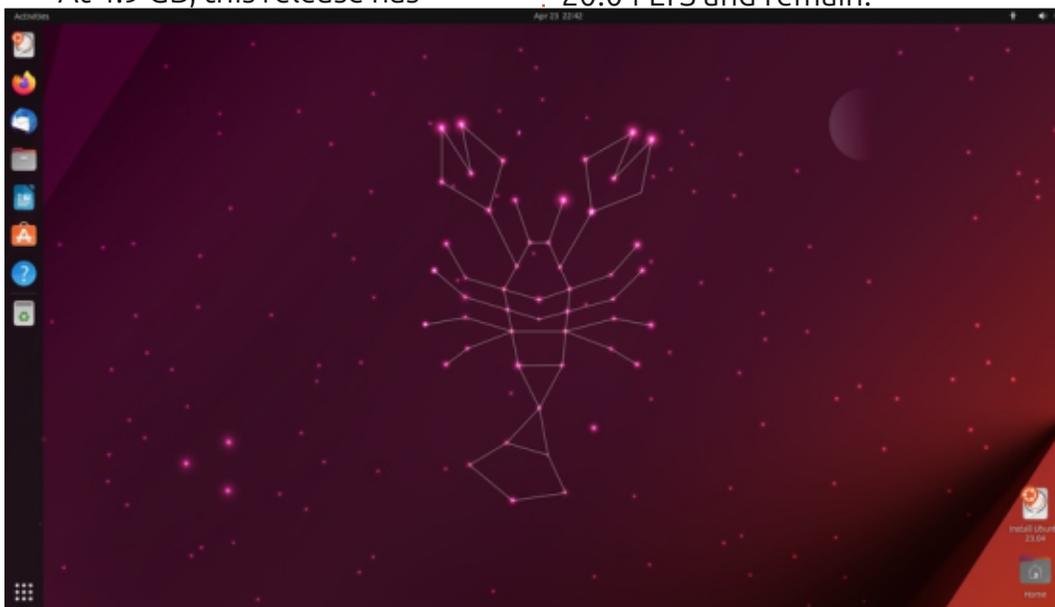
Users who do a fresh installation will notice that this release comes with a new Flutter-based installer that uses Subiquity. It even has an all-new slide show to watch while the installation is running. This new installer also means that a minimal installation is now faster than a full installation which was not previously the case.

This release uses Linux kernel 6.2, with the initialization system systemd 252.5. Systemd has now been the Ubuntu init system since 15.04, through eight years and 17 releases. Despite the occasional nay-saying, it works well and looks here to stay for now, at least.

Many tool packages have been updated including OpenJDK 17, .Net 7.0.105, Golang 1.20, Rust 1.67, Ruby 3.1, and Python 3.11.

Changes in how the dock works include indicating unread notifications for applications as a small number on the corresponding icon, plus a new set of LibreOffice Yaru-style icon designs.

Fonts have been improved too, with the Ubuntu font family now with thinner and sharper fonts that look quite nice.

Changes to Snap package management include downloading updates in the background to be applied when the application is next closed. As a bonus, this reduces those annoying Snap notifications that previously kept popping up, which is a welcome improvement. Snap downloads can also be paused if desired.

Ubuntu 23.04 is also the first Linux distribution that includes native user authentication for Microsoft Azure Active Directory. This enables users with Microsoft 365 Enterprise plans to authenticate their Ubuntu computer using the same M365 or Azure credentials for cloud service access.

SETTINGS

The top-right Quick Settings menu has been updated and now includes fast selection of Bluetooth devices. Flatpak packages are not by default installed, but if any are installed and are running in the background (ie, with no open window), then the Quick Settings menu will show them. The menu also allows quick access to select dark mode.

Since the code name for this release is "Lunar Lobster", it naturally comes with a default lobster-themed wallpaper. In fact, there are five lobster wallpapers to choose from, plus six other non-lobster ones included, just in case you are not a big Nephropidae fan.
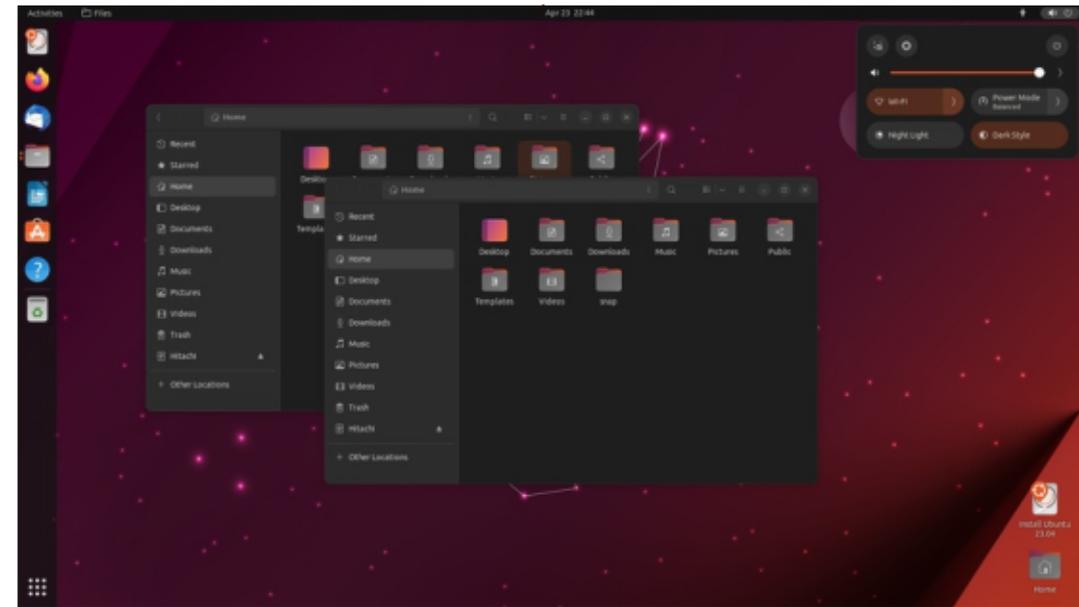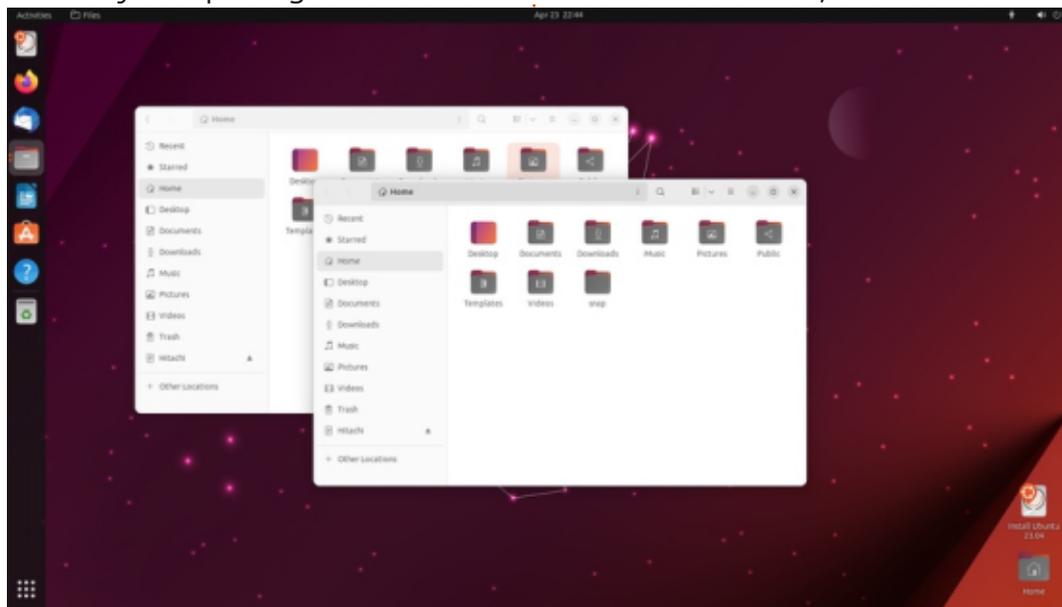
REVIEW

APPLICATIONS

Some of the applications included with Ubuntu 23.04 are:

Archive Manager (file-roller) 43.0 archiver*
Cheese 44.0 webcam application
CUPS 2.4.2 printing system*
Document Viewer (evince) 44.1 PDF viewer
Document Scanner (simple-scan) 44.0 optical scanner
Duplicity 0.8.22 file back-ups*
Files (nautilus) 44.0 file manager
Firefox 111.0.1 web browser**
Gnome Calendar 44.0 desktop calendar
Gnome Disks 44.0 disk manager
Gnome Terminal 3.48.0 terminal emulator

Gnome Text Editor 44.0 text editor
Gparted 1.3.1 partition editor***
Image Viewer (Eye of Gnome) 44.0 image viewer
LibreOffice 7.5.2 office suite
PipeWire 0.3.65 audio controller
Remmina 1.4.29 remote desktop client
Rhythmbox 3.4.6 music player*
Shotwell 0.30.18 photo manager
Startup Disk Creator 0.3.16 (usb-creator-gtk) USB ISO writer
Systemd 252.5 init system
Thunderbird 102.10.0 email client
Transmission 3.00 BitTorrent client*
Ubuntu Software (snap-store) 41.3 package management system**
Videos (totem) 43.0 movie player*
Wget 1.21.3 command line webpage downloader*

* indicates same application version as used in Ubuntu 22.10
** supplied as a snap, so version depends on the upstream package manager
*** indicates included on the ISO for boot-up, but not included in a full installation

The suite of applications included has not changed this time around. As can be seen from the list, almost all the core Gnome applications are now from Gnome 44, with only the Archive Manager and Videos as holdovers from Gnome 43.

The new GTK4 version of the Files file manager includes a few improvements, too. There are more icon sizes to choose from in icon view and pasting image files into the file manager directly from clipboard is now allowed, which is useful.

This release includes LibreOffice 7.5.2 which, as in the past, is complete except for LibreOffice Base, the database application. As always, it can be installed if desired.

Ubuntu 23.04 retains the Gnome Text Editor, this time upgraded to version 44.0. It replaced the gedit text editor starting in Ubuntu 22.10 and provides a very simple and clean application that has pretty much all of gedit's features but with better menus and accessibility. For those who miss it, gedit is still
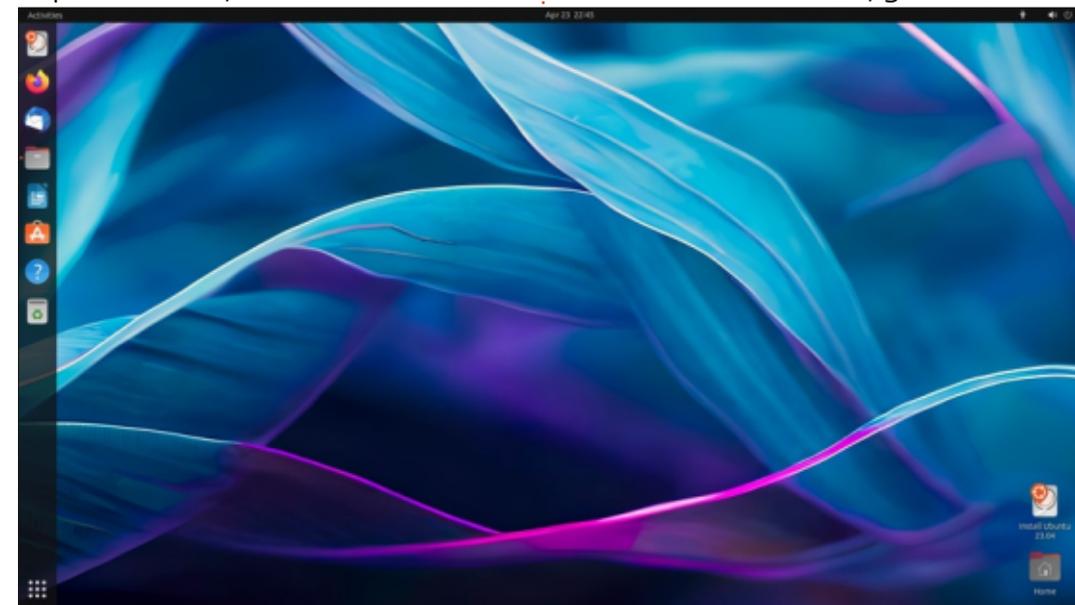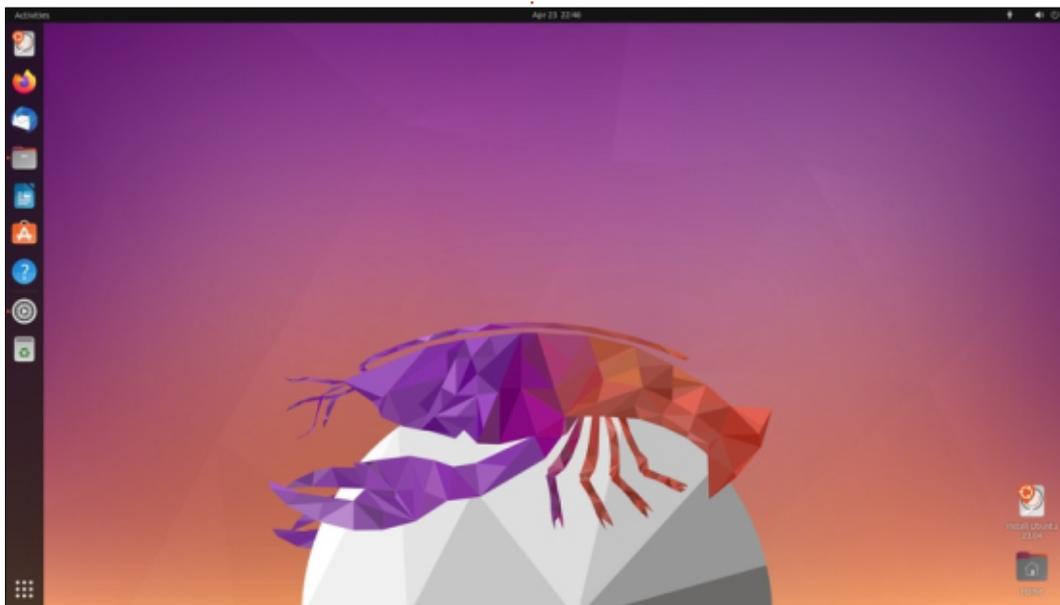
available for installation and has even been updated to version 44.0 in this release's repository. Many other text editors are also available to install, from FeatherPad to Kate, jEdit and Leafpad.

CONCLUSIONS

While just an interim release, Ubuntu 23.04 is well-designed, rock-solid and definitely ready for daily use. While it does have some worthwhile incremental changes, with only nine months support, most users will probably wait for the next LTS version to upgrade, due out in April 2024.

Meanwhile, we have one more interim release as the last stop on the road to the next LTS. Ubuntu 23.10 is scheduled for 12 October, 2023, and once out, we will have to look at that one and see what is new there.

EXTERNAL LINKS

Official website:
https://ubuntu.com/

Adam Hunt started using Ubuntu in 2007 and has used Lubuntu since 2010. He lives in Ottawa, Ontario, Canada, in a house with no Windows.
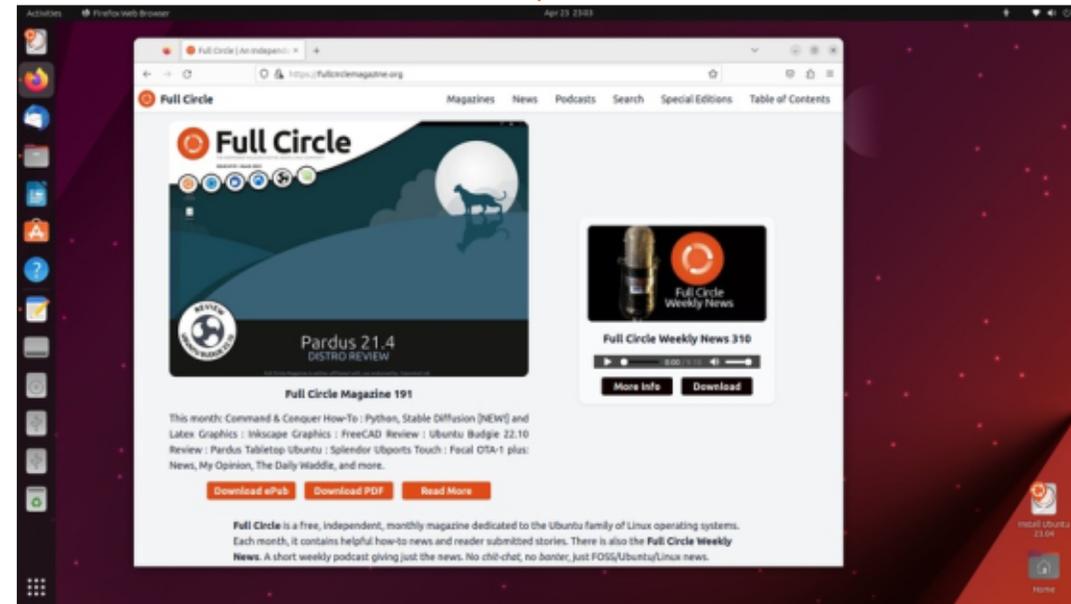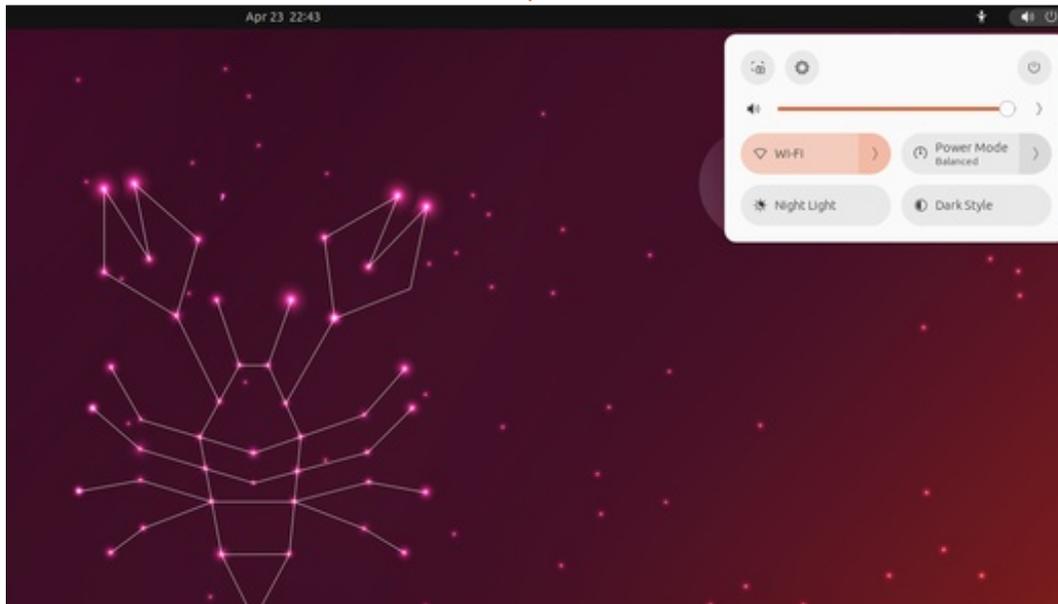
BlendOS is a new Linux distribution, with its first release on 26 January, 2023.

Conceived by young Indian Linux developer Rudra Saraswat, it is billed as "the only operating system you'll ever need. A seamless blend of all Linux distributions, Android apps and web apps." That is an ambitious claim, but no one in the Linux world can accuse Saraswat of lacking ambition, despite being only 13 years old.

If Saraswat's name seems familiar, that is because he is the motivating force behind a number of other Linux projects, including Ubuntu Unity, Ubuntu Web, and Unity X. I am not sure how he finds time to attend school!

BACKGROUND

So what is blendOS and why is it different?

This new distribution starts with Arch Linux, a well-established Linux distribution, as its base. There are downloads for your choice of two popular Linux desktops, Gnome or KDE. It should also be possible to install other desktop environments as well.

The core of blendOS is "immutable", meaning that it is protected against changes. This should make it unbreakable and resistant to corruption and malware. Of course, after installation, most users will want to change it, add applications, etc, and blendOS allows that, through an overlay system.

What sets blendOS apart from other immutable distributions, such as VanillaOS, is that users can install applications from the Arch repositories, but also from Fedora and Ubuntu. Eventually other repositories will be added, as well. There are also Android applications installed using Waydroid, and a collection of web applications, too. Even Flatpak is installed by default, allowing another source for applications. Multiple copies of the same applications from different sources can be installed, as each set of applications is isolated using a system of individual containers. Containers are easy to create from the blendOS Settings application, or automatically by just using the package manager for each one.
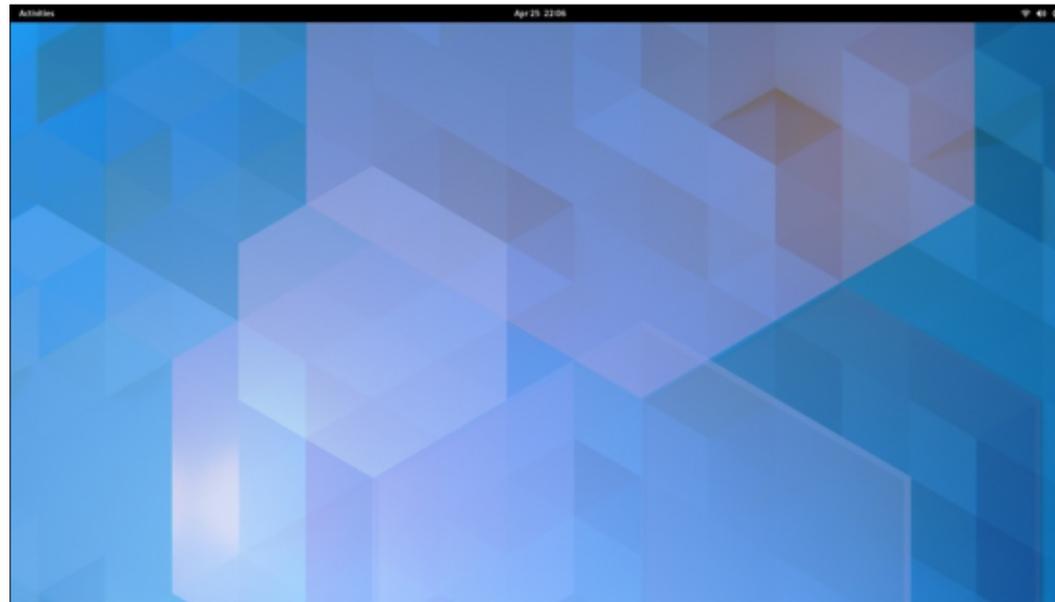
BlendOS has its own "blend" package manager, but other package managers can be used for each source and container. These include apt, dnf-3, pacman, and yay, all used in the same way as on their home distributions.

Because blendOS is based on Arch Linux, it uses systemd as its initialization system, and follows Arch's rolling release model for updates.

GETTING BLENDOS

Either of the two desktop versions of blendOS can be downloaded via HTTPS from the official website, with the ISO files actually linked from GitHub and hosted on SourceForge.

I downloaded the second release available, from 22 April, 2023, the blendOS 23.04 Gnome desktop version, and gave it a test run. The download size is 3.0 GB

which is significantly smaller than Ubuntu 23.04's 4.9 GB ISO file, with a similar Gnome desktop.

The download was via HTTPS as there are no BitTorrents available and also no checksums, such as SHA256 or even MD5 sums. This is a bit of an oversight, as it means that once you download the ISO there is no way to confirm that you have a good download. That kind of makes the "immutability" a bit moot. Hopefully future versions will have checksums available.

INSTALLING

BlendOS is not officially supported by Ventoy, but Arch Linux is. Dropping the ISO file onto a USB stick equipped with Ventoy 1.0.91 worked just fine, and BlendOS booted up to a nice blue desktop. Ventoy makes testing out multiple Linux distributions fast and easy.

BlendOS can be tested in a live session and then installed using the custom blendOS installer, a derivative of Crystal Linux's Jade installer. Crystal Linux is itself a derivative of Arch Linux, so it makes sense to use software from the same family.

SYSTEM REQUIREMENTS

There are no stated minimum system requirements for blendOS, but I would suggest at least a dual-core processor, and 8 GB of RAM, as a reasonable starting point.

TRYING OUT BLENDOS

When first booted up, you get a typical Gnome desktop, very clean and uncluttered. In fact, the installation is pretty close to pure, unmodified Gnome, with only application menu auto-grouping from the Gnome Dash Fix project added. So, if you like vanilla Gnome, you will love blendOS Gnome.

Applications are opened from the "Activities" menu or with the "Super" (Windows) key, which shows two workspaces, the search bar, and application favorites, on a stock horizontal dock. The rest of the applications installed are just one click away on the applications menu. The desktop itself has no dock or launcher, although this can be installed as part of Gnome Tweaks and its Dash to Dock extension, if desired.

Because this is pure Gnome, the application windows have no "maximize" or "minimize" buttons, just a "close" button. You can get "hide" and "maximize" from a right-click, though, for some reason this doesn't work with Firefox, unlike the other application windows tested.
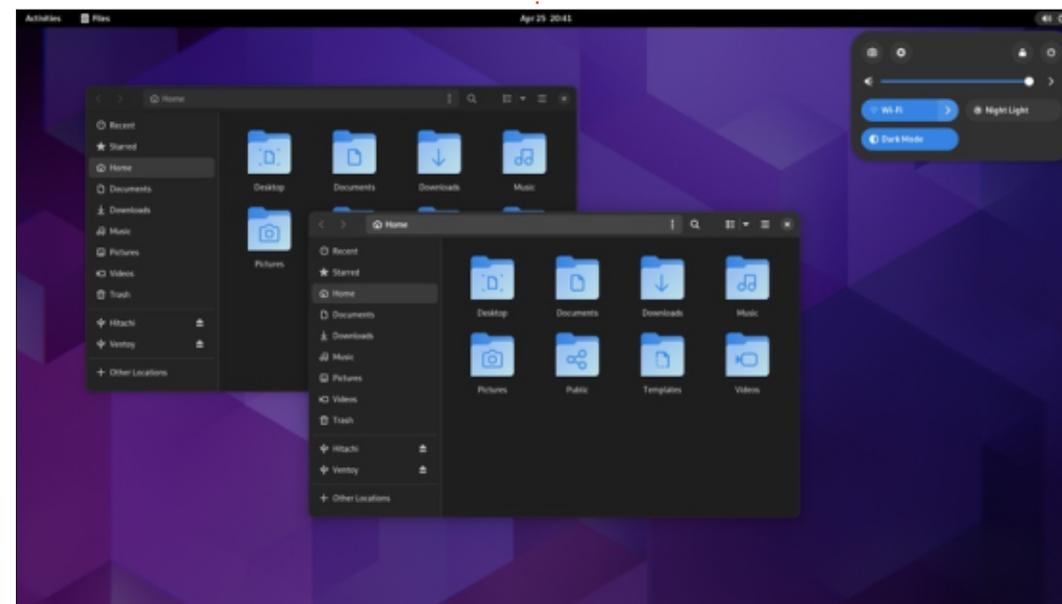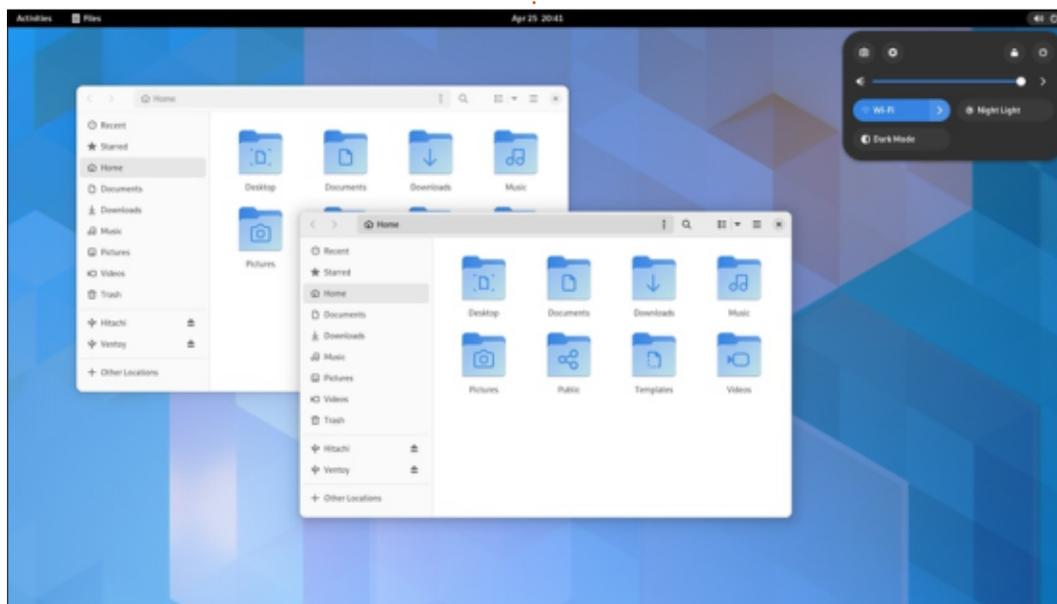
Settings

Like Ubuntu these days, BlendOS 23.04 Gnome gives a choice of just two window color themes, light and dark. The Quick Settings menu also allows selecting "night mode" which switches to the dark theme, and also, in most cases, a darker version of the wallpaper.

There are 13 wallpapers provided, all of which are basically abstract designs. Most are quite calm, like the default blue one, but a few are more cacophonic, which may appeal to some users.

APPLICATIONS

Some of the applications included with blendOS 23.04 Gnome are:
Archive Manager (file-roller) 43.0 archiver
Cheese 43.0 webcam
Document Viewer (evince) 43.1 PDF viewer
Files (nautilus) 43.3 file manager
Firefox 112.0.1 web browser
Gnome Calculator 43.0.1 calculator
Gnome Console 44.0 terminal emulator
Gnome Music 42.1 music player
Gnome Photos 44.0 photo manager
Gnome Software 43.5+ package manager
Gnome Text Editor 43.2 text editor
Gnome Videos (totem) 43.0 video player
Gnome Web (epiphany) 43.1 web browser
Gparted 1.5.0 partition editor
Image Viewer (Eye of Gnome) 44.0 image viewer
Systemd 253.3 init system
Waydroid 1.4.0 Android application installer

This list of applications included is fairly minimal and obviously lacking such things as an office suite, email client, or image editor. Personally, I like the approach of providing only a few basic applications, and letting the user decide what they need to add. This not only makes the initial download smaller but also reduces the number of unneeded applications to be removed to reduce excess clutter.

As noted, applications can be installed from the Arch repositories and from Fedora and Ubuntu as well, plus others will be able to be user-added in the future. Waydroid allows installing Android applications. There is a web application store, but it has only a few web applications currently, such as Google Maps. Perhaps this will be expanded over time. These web applications leverage Gnome Web's ability to create stand alone windows that have the same look and feel as local applications. Gnome Web has had this capability since September, 2011, though I am not aware that it has found wide acceptance among desktop users. Of course, these web applications
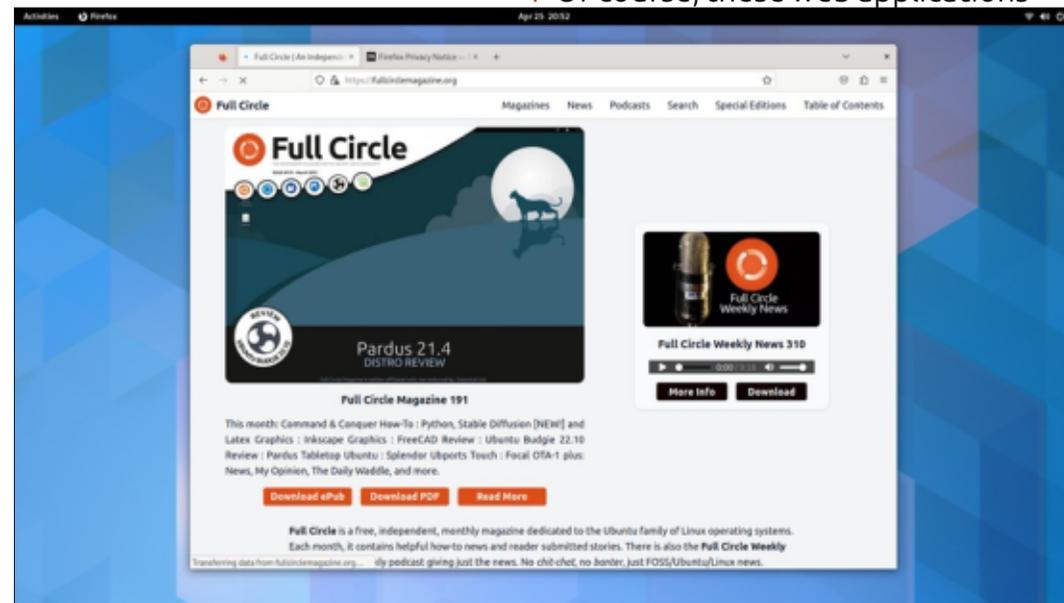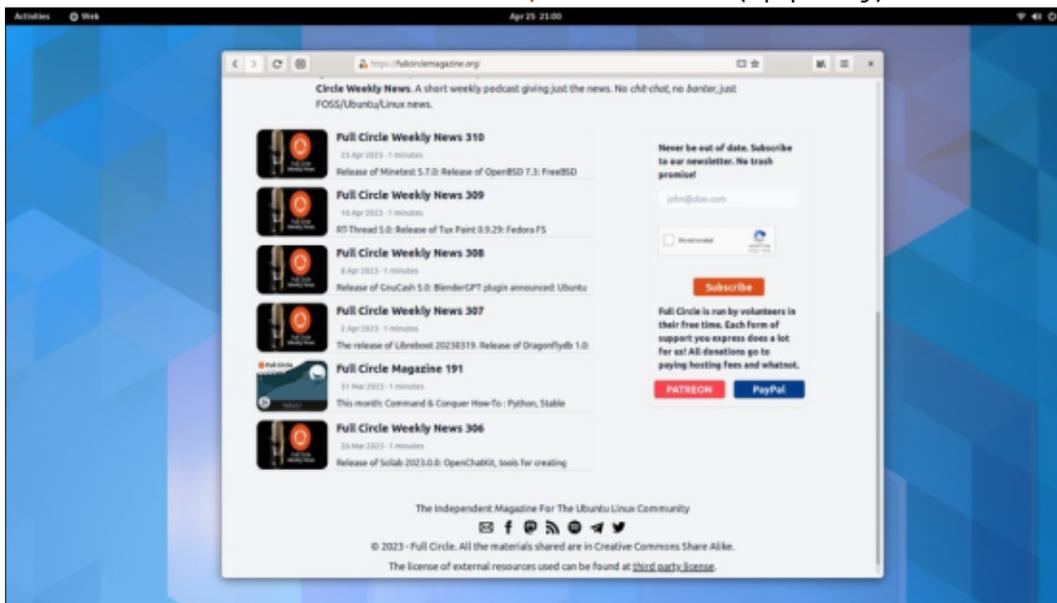
are essentially just a bookmark for existing websites, so you can always just bring them up in a tab in Firefox from the internet.

CONCLUSIONS

Right out-of-the-box, blendOS 23.04 Gnome gives a nice pure Gnome desktop experience which will certainly please Gnome fans. What sets this distribution apart from others is its ability to install applications from multiple sources, using isolated containers to keep them apart. I think the degree of success that it will achieve will hang on whether it turns out that it is something that Linux desktop users have been yearning for or not. It seems to me that most existing distributions are not lacking access to a large number of applications in their native repositories, especially when you add in FlatPak, AppImage, Snaps and Personal Package Archives (PPAs).

BlendOS has a lot of promise; it will be interesting to see over time whether it truly fills an identified user need that has been lacking in the Linux world and takes off.

EXTERNAL LINKS

Official website:
https://blendos.co/
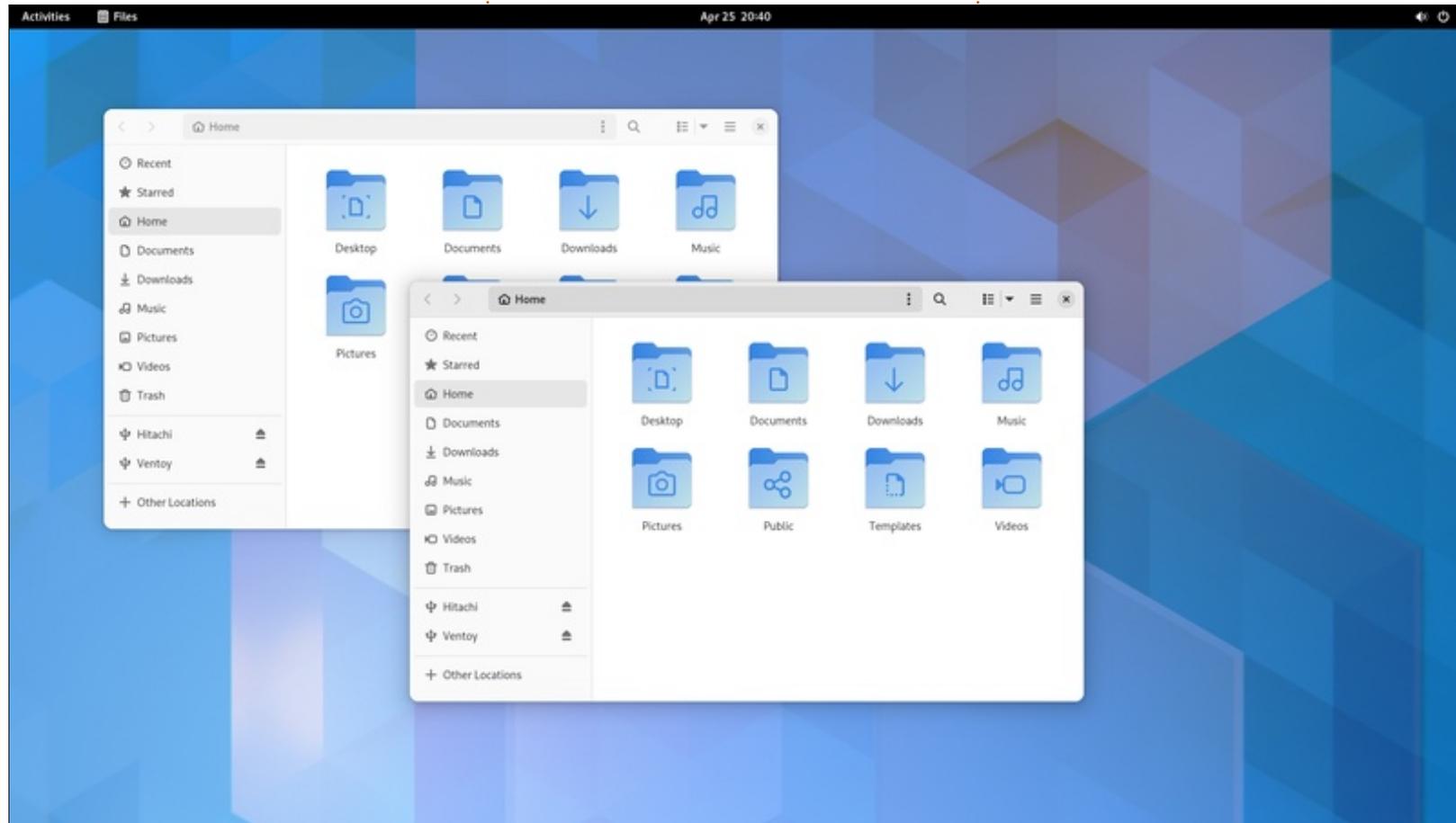
Adam Hunt started using Ubuntu in 2007 and has used Lubuntu since 2010. He lives in Ottawa, Ontario, Canada, in a house with no Windows.
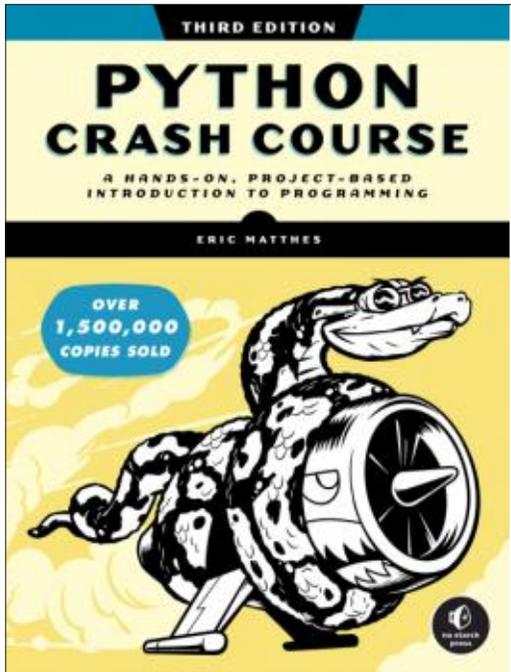
Python Crash Course, 3rd Edition
A Hands-on Project-Based Introduction to Programming

by Eric Matthes

Publisher: No Starch Press
Release date: December 2022
Pages: 552
ISBN-13: 9781718502703
Price: $44.99 USD
Level: introductory/Intermediate

Just looking at the fact that this is the 3rd Edition of Eric's book, you likely realize that there is something special about this book.

Eric starts off going through the basics of Python, from what variables are all the way to using pytest. That takes up the first 220 pages. Then he jumps to Pygame, and then to using Matplotlib, and on to GeoJson formatted Mapping Datasets, and finishes with Django. It's amazing that he gets all of that into 500+ pages and at the same time it's all understandable.

One of the things that I found most interesting was the GeoJson portion of Eric's book. I went to the website that he has as a repository for the code for the book, and I downloaded the code for that project. After updating a few libraries in my version of Python, I ran the program.

In 34 lines of code (including comments), the image showed up in my default browser.
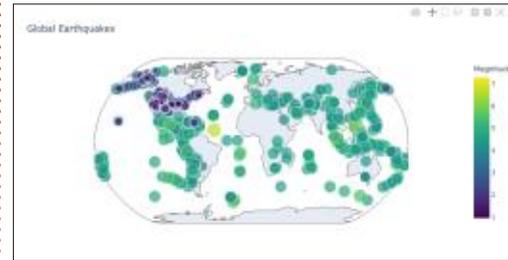
Some of the changes from the previous editions include:
- Information on using VS Code
- Using removeprefix() and removesuffix() methods
- Using pytest
- A mini crash course for using Git for version control
- MUCH MUCH MORE!!!

I don't have to say much more about the book, it's that good. This is going on my virtual bookshelf until I can get a copy for my real one!

⭐⭐⭐⭐⭐

LETTERS

PCB Software?

I develop (as a hobby) some printed circuit boards (PCBs). As I cannot find similar software for Linux in the repository, I continue to use my computer with Windows 11 using SPRINT LAYOUT as the software for this purpose. However, I would really like to be able to migrate to Linux permanently without giving up this tool. Any recommendations for PCB software under Linux?

Jossy

(Lack of) Notifications

The most recent issue for which I received a notice was FCM#189. Bummer.

Lou

Ronnie says: *Sorry about that. I completely forgot to send out the previous couple of mailing list announcements. Then, just this month, SendInBlue changed their name and branding which (for some reason) resulted in them deleting my account. I've since got it back and I hope it still works!*

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.

Q&A
Compiled by EriktheUnready

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

Welcome back to another edition of Questions and Answers! In this section we will endeavour to answer your Ubuntu questions. Be sure to add details of the version of your operating system and your hardware. I will try to remove any personally identifiable strings from questions, but it is best not to include things like serial numbers, UUIDs, or IP addresses. If your question does not appear immediately, it is just because there is such a lot, and I do them, first-come-first-served.

We went to a bird sanctuary to take some photos. It was one of those with the wooden walkways that took you ever higher into the treetops so you could get closer to the birds – that would obviously go as high as they could. There were some large tropical parrots, etc, that were not skittish and would sit on branches about two meters away from you, and while these made lovely pictures, they were not the only birds there and we wanted pictures with more variety. So the hunt was on for elusive birds. Quickly we learned that using other people was easier. If you saw someone really putting effort into taking a picture, you went there to see what they saw and hopefully get a nice picture too. This worked well enough. We got quite a few pictures, but no real close-ups. When we reached the end of the path, there was a restaurant of sorts. Most people just headed for the gate in a hurry, meaning the place wasn't busy and also not empty. We sat down and ordered milk shakes and fruit juice. We finished our fruit juice and sat chatting for a while. By the time the milkshakes arrived, we were calm and relaxed and accepted that we got mostly hidden bird photos. Sitting back discussing all the beautiful birds, a cockatiel landed on the table. As a joke, I offered him some milkshake via the straw. He actually came forward and took it. He flew off and returned with a friend also wanting milkshake. I obliged, and somehow made new friends. They came to sit on my shoulders and I fed them milkshake drops. Other birds, seeing this, wanted in on the action, and soon I was covered in birds. Some German tourists stopped and wanted to know if I worked there. The spectacle not only got my girlfriend some nice photos, but lots of tourists too. We filled the rest of our SD cards with dozens of nice close-up shots. Moral of the story; if you have a problem, keep at it, sure, but some time or other, take a break, have a coffee, think about something else, the solution may come to you.

————————————————

Q : How can I see how my network card is behaving? I have a router in my lounge and the bedroom is on the opposite side of the flat. On my Ubuntu laptop, I see full bars, but on my Windows laptop it shows only one bar. How do I check what is really happening in Ubuntu.

A : I use nethogs, it is very rudimentary, but you can see what apps are communicating and how fast. You can dig deeper if you like, systemctl status systemd-networkd will net you the status of your WiFi card and you can see if it disconnects. If you want a tutorial in FCM, please do email misc@fullcirclemagazine.org

Q : When I run apt-get update && apt get upgrade, it will not complete as there is an error 404 not found, with just an IP address. This is almost useless to me, I am not a long-time Ubuntu user. How do I troubleshoot?

A : Yes, developers sometimes forget normal people use the product. The secret is the 404, with an IP, meaning that the server is available, but the path or final destination of the URL is not found. This usually indicates that a URL has changed. I will bet it is a source that has been archived or moved. Just check it: by that I mean you can go to the URL in a browser, if it is not there, go a directory up and see. Rinse and repeat.

Q&A

Q: My Ubuntu 22.04 virtual machine freezes on boot. Is my data gone now? <removed>

A: I don't know the answer, but I can tell you how to see. Copy your hard drive image to another device and spin it up there. Simply click on the "ADD" button in virtualbox and select the vdi. On the Windows side, run a checkdisk, force it. Maybe do a full shut down by holding in shift before you do.

Q: I have a stability issue, my system restarts automatically at least 10 times in a day. What could be the cause? I have the lobster on a pretty beefy machine, so there is no lack of resources for anything.

A: Firstly, Lunar Lobster is not considered "stable"; it is a short-term release to test features. Secondly, even if you are sure your hardware is fine, test it again. Memtest, CPU test, like prime 95 or stress test, and do a hard drive test (yes even SSD). Something small, like dust getting clammy, could be causing it, clean out the PC. You could also have a bad installer image or thumb drive, did you verify it before installing? There are just so many variables here. Boot off an image and use it that way and see.

Q: I have a Dell Precision 5530 with a core i9 and 32GB of RAM, Quadro P2000. I recently upgraded it to 23.04, but now it gets stuck at Plymouth. <removed> What could be the issue, as I know Plymouth is fine.

A: I see Quadro and will put money on Nvidia drivers. Do the standard purge or remove with autoclean and install the nouveau open source driver and test. You can install the Nvidia drivers once the machine is running.

Q: I only recently jumped on the update bandwagon with Linux Lite 6.2, based on Ubuntu. I want to install wifi-radar as per here: https://howtoinstall.co/en/wifi-radar, but it is just not there. I checked my sources and they are pointing to the Ubuntu repositories. I am confused.

A: I wasn't sure about this, so I checked the man pages: https://manpages.ubuntu.com/manpages/focal/en/man1/wifi-radar.1.html When you click on the version you have, at the top, you will see it is no longer included. You may need to build it from source.

Q: I have an older version of Ubuntu Kai:zen that I installed some Kali tools on, but something is broken and I don't know how to revert to before adding the Kali tools. Can you help me out?

A: Sorry to disappoint, but Kai:zen and Kali are not based on Ubuntu.

Q: So I am learning Ubuntu and I need to know how come some commands are the same if I use sudo or not?

A: Do you mean the output? OK, here goes, commands are static (the same always) but the permissions are not. The command ls lists the output of a folder, regardless of who you are. Sudo is 'superuser do' if you like, so running ls on a folder that you do not have permission to access as a user, will net you nothing, but if you run ls as sudo, you are now the superuser, and have access to all; that is it; it does not change the command, it simply changes your permissions.

Q: I'm making space on my drive for Ubuntu to dual-boot as I am using Windows for gaming. The problem is that when I try to install Ubuntu, it says the drive is unclean? I just cleaned up 100GB for Ubuntu, what is this about?

A: The "clean" refers to a flag set on NTFS. To have that flag set, do a disk-check on Windows, let it complete, then hold shift and shut it down (see above). This actually shuts down Windows as opposed to some hybrid sleep thing. Now you should not have an issue installing Ubuntu.

Q: I made the mistake of going to Ubuntu 22.10 from 20.04, but now I want to go back to 20.04 without losing my data. What must I do?

A: "All your data" is in your home folder, is it not? Backup your home folder, install the desired version and copy the home folder back. There is no downgrade option.

Q&A

Q : When my Ubuntu 22.04 (tested this in 20.04 too) wakes up, my headphones (logitech USB) connected to my Dell dock (WD-15) are no longer the default sound in / output. So if I had my laptop playing a youtube video, and I closed the lid, the moment I opened it, the audio started coming through the laptop speakers instead of the headphones. This is especially annoying when I take a Skype call. Is this a bug?

A : No, it is not a bug. What is happening is that if your headphones were directly in your laptop USB, it would detect fine. The fact of the matter is that the dock is connected and that gets detected, but the dock is not pass-through, the Dell docks are a mini PC in themselves. Once the connection is established, then only things start happening. By the time it is established that there are USB devices connected, your laptop has already looked and saw no other USB devices, so it chose the best for you. You can test this by connecting a USB mouse and you will see it starts moving only once all the handshaking is done. If you want immediate action, consider a simple pass-through dock.

Q : Hi there, I have Ubuntu Kylin latest, not too sure what that is. The weather app just has Chinese cities. I have done the install in English, but I can't fix this. Also, it stays in the Chinese language, never becoming English. Even if I change the language options to Portuguese, nothing changes. I feel stupid now.

A : Don't. Ubuntu Kylin is for Chinese-speaking people specifically, as per their mission statement. The weather app probably has no translation. You may read it is an international project, but it is not, simply using international repos. Until there is an effort to make it accessible for all, your only choice for using it is to learn Chinese.

Erik has been in IT for 30+ years. He has seen technology come and go. From repairing washing machine sized hard drives with multimeters and oscilloscopes, laying cable, to scaling 3G towers, he's done it.

BACK NEXT MONTH

Josh Hertel is a husband, father, mathematics educator, tabletop gamer, techie, and geek.
https://twitter.com/herteljt

Price: Currently free on GOG.com

Blurb: '*Deep Sky Derelicts is an original combination of turn-based strategy and RPG, enriched with tactical card combat and popular roguelike elements. Explore derelict alien ships, fight, loot, and upgrade your gear, all in distinctive retro-futuristic comic book aesthetic style.*'

I 'll be honest, I passed this game over, many, many times. Deck building games is not my bag, baby. Since it was free on GOG, I thought, why not? I don't visit GOG a lot, I find the interface too clunky. There is some DLC here, some DLC there, this version with some DLC included, this version without, just confusing. I prefer having DRM-free games, do not doubt that fact!

The reason I avoid deck builders is because I never feel in control (maybe I'm a control freak?). It's a bunch of random cards that come into your hand every turn. Luck of the draw, sort of thing. Thus, I was unsure about starting the game, despite liking the sound of the premise.

I installed the game and was still perusing the comic-book graphics, when the music dropped. After Dredge, this is my favourite calming music soundtrack!!

Let's get to the meat and potatoes; you are a scavenger, you are tasked to find information on a "mothership" by collecting information on derelicts orbiting a black hole. You surround yourself with punching bags, erm, mercenary scum, erm, team mates, to help you in your mission. You start in a scavenger base, where you can heal up, charge up, skill up, sell stuff, hire mercs, etc, and head out on missions to the surrounding derelicts.

Each derelict is a fog of war covered squares. You explore, limited by your store of power. Movement costs power, combat costs power, scanning for more tiles costs power, I think you get the picture. You must make sure you've always enough power left to return to a ship's launch bay(s) – sometimes you can get lucky and find more. Once you are out of power you can only retreat, and
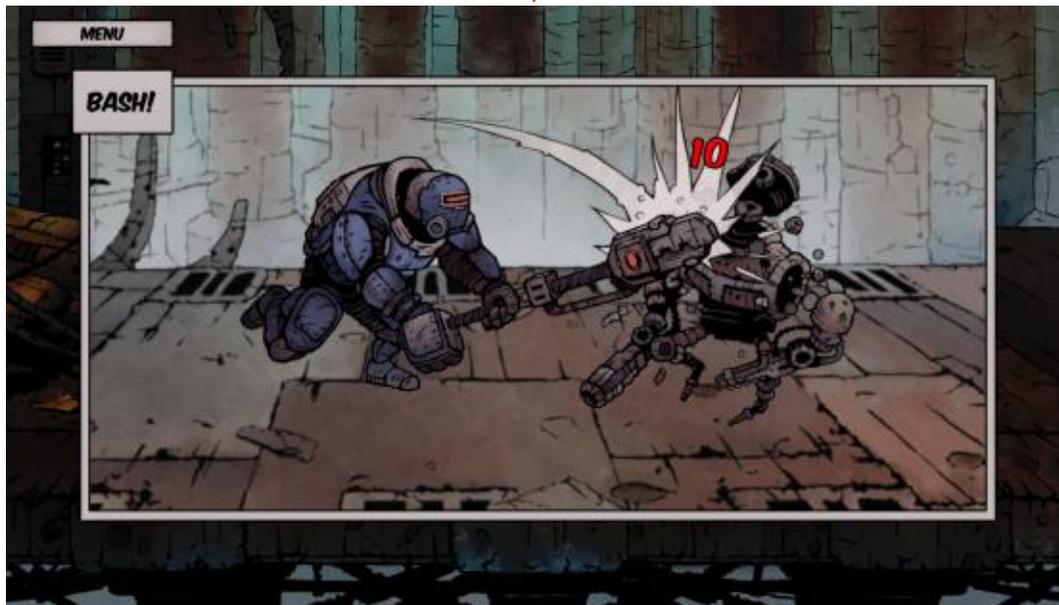
that costs life points!

You have space for three people in your party. Even though you (Kobayashi) do not have to be in the squad. Now this may all seem very rogue-like to you, but it has card combat with JRPG-type stand-off battles.

Like most card-based battlers, you have attack cards, buff cards, or defence cards. I don't like the RNG here; too many times I end up with no attack or defence cards, only buff cards, which I do not want to play as there seems to be a bug where, when I play a buff, I usually get crited. (The other part scores a critical hit on my character, doing double damage in the next round).

More and different cards are "bought". You buy a gun, and you get say, a card, or cards, that do less damage, but let you shoot more times, that now gets added to your deck. Other than this horrible RNG where you can get no fighting cards for two rounds, the game is solid. It runs like a dream on Ubuntu, even on my potato laptop, I see no difference from my top-end laptop.

This may be because the game is not demanding, the battles are

comic book panes. Though I took a quest to capture janitor robots, I could not find a way to subdue them, only bap them into scrap, which was satisfying in itself.

What I appreciated from this game is that my rogue does not start off naked and afraid. This is my biggest complaint with games like Shattered pixel dungeon – you start with a retard in rags with one sarmie in hand, entering a dungeon hoping to fist enough rats to death to find coins, just to starve on the second floor. You start off charged, and armed, and with money in the bank.

Since you are scavenging, your salvage can be sold, but I seemed to

make more dough from taking and completing quests. I would have liked to have the quest-giver's inventory of quests refresh when you hand in a completed quest, but I suppose they are but side-quests. I am contemplating buying the DLC as they are like 1-2 USD each, to see how it fills out the game, as there is a lot of potential here.

What felt a bit lazy, was the enemies. You will find these hostile lizards that will attack immediately, but they will team up with a bounty hunter, for instance. Why? It sort-of breaks the immersion of an otherwise OK game. You know, I want to stumble in on a fight with 2 groups and *maybe they team up and fight me, maybe they run away,

not just lump level one monsters together because they are level one. Also the victory dance after every battle is a fist-pump comic panel. Maybe have a few "death scenes" where the villain does the - I'll be back narrative, whilst skulking around a corner? I'm not saying I need fatalities and babalities here, but some variety.

Because it is free and fun, it gets a pass. My suggestion is to go get it now, while it is free. *And even if you miss the giveaway, I think the deluxe edition is $2.99 USD. For a game that works flawlessly on Ubuntu, it is worth the money spent. (I saw the game for $15.99 USD, in that case, no).

Erik has been in IT for 30+ years. He has seen technology come and go. From repairing washing machine sized hard drives with multimeters and oscilloscopes, laying cable, to scaling 3G towers, he's done it.

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