DISTROBOX run any app on any distro

Luca Di Maio

luca.dimaio1@gmail.com | GitHub (89luca89) | LinkedIn (Luca Di Maio)

Whoami

- Luca Di Maio 89luca89
- DevOps Engineer
- Open Source Enthusiast
- G github.com/89uca89
- 🈏 @LucaDiMaio11
- ⊠ luca.dimaio1@gmail.com



What is distrobox?

- Simple POSIX shell
- Wraps Podman or Docker
 - Abstracts much of the command lenght and complexity
 - Seamless integration with host environment
- Leverages high volume of curated container images



Why was it born?

- Inspired by the great work of Containers Toolbx:
 - https://github.com/containers/toolbox
- Needed a solution that would work with both
 - Podman
 - Docker
 - Others? (containerd/nerdctl, cri-o...)
- Needed a solution that would
 - be distro-agnostic
 - make software not yet packaged as Flatpak easier to use

Why was it born?

 Flaptak: your favourite **apps**, unbound from the base operating system

 Distrobox: your entire **userspace** unbound from the base operating system





- Simpler to use
- Battle-tested container engines
- Easy to use image management
- Healthy ecosystem of container images ready to use

- Host integration:
 - Wayland and X programs
 - Audio
 - SSH and GPG Agent
 - User D-Bus
 - User Systemd
 - Removable devices
 - Optionally isolated systemd instance

- Container Manager
 - Podman (rootless)
 - Docker (rootful)

Ubuntu	Fedora	OpenSUSE	••••	Distro N		
Container Runtime						
	Host O	perating System				

- Faster and Lighter than Vms
 - Pet-Containers, integrated and persistent

• This is not a security enhancing tool

- You're not less secure than when on base OS
- You're not much more safe either
- Rootless podman:
 - Even when you are root in the container, you are not root on the host
 - You have your regular user
- Rootful docker:
 - You're root both in the host and in the container, as the docker daemon runs as root
- Future sandboxed mode:
- Minimal privileges and sharing needed to use graphical applications





- Tested host compatibility with all the major distributions
- Tested container compatibility with over 50 combinations of distributions and major versions
 - From Debian 7, Centos 7, Ubuntu 14.04
 - To latest ArchLinux, Fedora Rawhide, OpenSUSE Tumbleweed, Ubuntu or Debian Unstable
- You can build your own curated image to use

Diversity

- What container images are compatible?
 - Hard dependency for distrobox to work are:
 - the presence of a POSIX compliant /bin/sh
 - a supported package manager
 - Supported package managers:
 - apk
 slackpkg
 - apt/apt-get
 swupd
 - dnf/yum
 xbps
 - pacman
 zypper
 - A package manager is needed to install base dependencies for distrobox's entrypoint to work

Diversity

- Custom images
 - The image you want to use is too old and the package manager mirrors are down
 - The image you want to use has not a supported package manager or no package manager at all
- Requirements
 - findutils
 sudo
 - ncurses
 libvte
 - procps
- util-linux (that provides the mount command)
- shadow



If a container image or host distro is not supported:

- Open a Feature Request
- Open a Pull Request

<u>Contributions of any sort are always welcome!</u>



Run any app on any distro

- Some apps are specific to some distributions
 - No Flatpak available
 - They are not tested nor supported in other systems
 - They may or may not work
 - Their dependencies can cause system breakage

Run any app on any distro

Proprietary applications

- Bitwig studio
 - Runs only on Ubuntu 18.04 or later

```
luca-linux@thinkpad-l14:~$ distrobox create -i ubuntu:18.04 -n bitwig-distrobox
63ec3b18653f2f22d0bf7b9d24f5d79bdb3b2da6918f4f0687ca44b79f41c612
Distrobox 'bitwig-distrobox' successfully created.
To enter, run:
        distrobox-enter bitwig-distrobox
luca-linux@thinkpad-l14:~$
luca-linux@thinkpad-l14:~$ distrobox enter bitwig-distrobox
Starting container bitwig-distrobox
run this command to follow along:
        podman logs -f bitwig-distrobox
. . .
done!
luca-linux@bitwig-distrobox:~$ sudo dpkg --add-architecture i386; sudo apt update
luca-linux@bitwig-distrobox:~/Desktop$ sudo apt install ./bitwig-studio-4.2.3.deb
Reading package lists... Done
Building dependency tree
Reading state information... Done
```

System Requirements

Linux

Ubuntu 18.04 or later

64-bit dual-core or better x86 CPU with SSE4.1 support

Demo

• •

luca-linux@test1:~

Preparing to unpack .../libxcb1 1.13-2~ubuntu18.04 amd64.deb ... Unpacking libxch1:amd64 (1.13-2~ubuntu18.04) ... Selecting previously unselected package libxcb-randr0:amd64. Preparing to unpack .../libxcb-randr0 1.13-2~ubuntu18.04 amd64.deb ... Unpacking libxcb-randr0:amd64 (1.13-2~ubuntu18.04) ... Setting up libbsd0:amd64 (0.8.7-lubuntu0.1) ... Setting up libxdmcp6:amd64 (1:1.1.2-3) ... Setting up libxau6:amd64 (1:1.0.8-lubuntul) ... Setting up libxcb1:amd64 (1.13-2~ubuntu18.04) ... Setting up libxcb-randr0:amd64 (1.13-2~ubuntu18.04) ... Processing triggers for libc-bin (2.27-3ubuntu1.5) ... luca-linux@bitwig-distrobox:~/Desktop\$ sudo apt install -v ./bitwig-studio-4.2.3.deb Reading package lists... Done Building dependency tree Reading state information... Done Note, selecting 'bitwig-studio' instead of './bitwig-studio-4.2.3.deb' The following additional packages will be installed: ca-certificates cpp cpp-7 dbus fontconfig-config fonts-dejavu-core gcc-7-base gcc-8-base:i386 libapparmor1 libasound2 libasound2-data libauthen-sasl-perl libbsd0:i386 libc6:i386 libcairo2 libcairo2:i386 libdata-dump-perl libdbus-1-3 libdrm-amdgpul libdrm-common libdrm-intell libdrm-nouveau2 libdrm-radeon1 libdrmlibedit2 libelf1 libencode-locale-perl libexpat1 libexpat1:i386 libfile-basedir-perl libfile-desktopentry-perl libfile-listing-perl libfile-mimeinfo-perl libfont-afm-perl libfontconfig1 libfontconfig1:i386 libfontenc1 libfreetvpe6 libfreetvpe6:i386 libgct1:i386 libgdbm-compat4 libgdbm5 libgl1 libgl1-mesa-dri

libgl-mess-glx ligglapi-mess libglib2.0-d libglib2.0-data libglvnd0 libglx-mess0 libglx0 libhtml-form=perl libhtml-form=perl libhtml-preser-perl
libhtml-tagset-perl libhtg-recookies-perl libhttp-cookies-perl libhttp-dateo-perl libhttp-message-perl libhttp-negotiate-perl libico6
libio-html-perl libio-socket-ssl-perl libhtg-system-simple-perl libil1] libjack-jackd2-0 liblum10 liblup-mediatypes-perl libhtg-protocol-https-perl
libino-thtp-perl libipg16-16 libsl36 libsamlperate0 libsesors4 libsel11 libtstt-iconv-perl libit1-xcb1 libx11-xcb1:386 libxml=format-perl libitg-protocol-https-perl
libuc-brigg16-16 libpg16-16 libsl36 libsamlperate0 libsesors4 libsel11 libtext-iconv-perl libit1-xcb1:386 libxau6:i386 libxau7
libxcb-dr12-0 libxcb-dr13-0 libxcb-ewmb2 libxcb-glw0 libxcb-isoecom4:336 libxcb-present0 libxcb-render0:i386 libxcb-wink1:386 libxcb-trise30 libxcb-shm0
libxcb-shm0:i386 libxcb-util1 libxcb-util1:386 libxext6:i386 libxrefixe80 libxcb-xinput0 libxcb-shubLibxcb-xkb1:i386 libxcb-kb1:i386 libxcb-shm0
libxcbsmm0:i386 libxcb-util1 libxcb-util1:386 libxext6:i386 libxrefixe80 libxf2 libxf2 libxf2 libxcb-shm0
libxkbcommon0:i386 libxcb-util1 libxdb-util2:i386 libxet6:i386 libxrefixe80 libxf2 libxf366 libxcb-render0:i386 libxcb-render0

lib32stdc++6 cpp-doc gcc-7-locales default-dbus-session-bus | dbus-session-bus libasound2-plugins alsa-utils libdigest-hmac-perl libgssapi-perl glibc-doc:i386 locales:i386 gdbm-ll0n jackd2 libcrypt-ssleay-perl pciutils lm-sensors libauthen-ntlm-perl libunicode-map8-perl libunicode-string-perl xml-twig-tools perl-doc libterm-readline-gnu-perl | libterm-readline-perl-perl make mesa-utils nickle cairo-5c xorg-docs-core

Q ≣

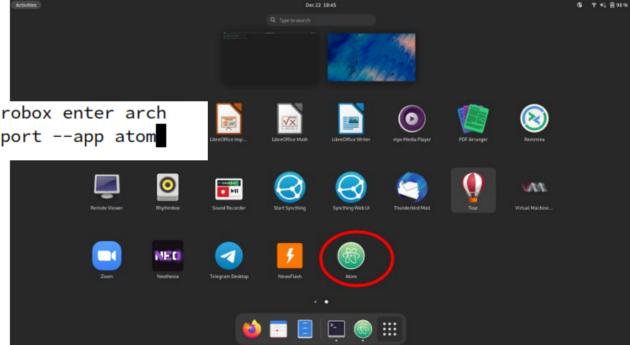
Run any app on any distro

- Old applications
 - Distrobox ensures compatibility up to Debian 7, almost 10 years back in time
- New applications
 - You're on an LTS release, or you're stuck with older software
- Non packaged applications
 - You can access any package from any repo
 - AUR
 - Copr
 - OBS
 - PPA

Integrate Distrobox

- Export apps, binaries or services installed in a container
- Execute transparently from the host
- distrobox-export

luca-linux@thinkpad-l14:~\$ distrobox enter arch
luca-linux@arch:~\$ distrobox-export --app atom



Demo – app export

Activities				Dec 22	18:45				a,	¥ 41 ₿ 98%
				Q Type to search						
					- hora	202				
	LibreOffice Calc	LibreOffice Draw	LibreOffice Imp	LibreOffice Math	LibreOffice Writer	rigo: Media Player	PDF Arranger	Reveina		
	Remete Viewer	Rivetenber	Scund Recorder	Start Syncthing	Syncthing Web UT	Thunderbird Mail	Tour	Virtual Machine		
	Zosm	MEO Nethesia	Telegram Desktop	F NewsFlash	Contraction of the second seco					

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Demo – bin and service export

÷ -Q = × Terminal luca-linux@thinkpad-l14:~\$ ls -1 --color ~/.local/bin-distro box/ 7z 7za acpi bc cabextract git mpv nmap sensors sensors-detect syncthing tig tree unzip wl-copy wl-paste wmctrl xclip xdotool xlsclients zstd luca-linux@thinkpad-l14:~\$

•	Terminal	Q = ×
Loaded: Active:	<pre>syncthing.service - Syncthing - Open So loaded (/home/luca-linux/.config/syste active (running) since Tue 2022-04-26 man:syncthing(1)</pre>	md/user/>
Tasks: Memory:		
CPU: CGroup:	<pre>1min 4.562s /user.slice/user-1000.slice/user@1000. -2220 /bin/sh /home/luca-linux/.local -2538 /usr/bin/fuse-overlayfs -o ",lo -2564 /usr/bin/conmonapi-version 1 -3309 podman execinteractiveuse -3388 /usr/bin/conmonapi-version 1</pre>	/bin/dis> werdir=/> -c d5ef> r=luca-l>
Apr 26 16:31 Apr 26 16:31 Apr 26 16:32 Apr 26 17:34 Apr 26 17:34 Apr 26 17:41 Apr 26 18:42 Apr 26 18:42	<pre>:16 thinkpad-l14 distrobox-enter[3309]: :16 thinkpad-l14 distrobox-enter[3309]: :16 thinkpad-l14 distrobox-enter[3309]: :20 thinkpad-l14 distrobox-enter[3309]: :58 thinkpad-l14 distrobox-enter[3309]: :52 thinkpad-l14 distrobox-enter[3309]: :08 thinkpad-l14 distrobox-enter[3309]: :08 thinkpad-l14 distrobox-enter[3309]: :08 thinkpad-l14 distrobox-enter[3309]: :08 thinkpad-l14 distrobox-enter[3309]: :08 thinkpad-l14 distrobox-enter[3309]:</pre>	<pre>[V6KH2]> [V6KH2]> [V6KH2]> [V6KH2]> [V6KH2]> [V6KH2]> [V6KH2]> [V6KH2]> [V6KH2]> [V6KH2]> [V6KH2]></pre>

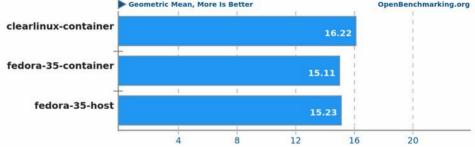
Performance

- No noticeable overhead
- Newer components matter
- Optimized components matter

Geometric Mean Of All Test Results

Result Composite - clearlinux-container, fedora-container, fedora-host





Number Of First Place Finishes

Wins - 19 Tests



fedora-35-container 2 [10.5%]

Links:

https://www.phoronix.com/scan.php?page=news_item&px=Distrobox-Clear-Linux https://www.phoronix.com/scan.php?page=news_item&px=Clear-Containers-2022 https://openbenchmarking.org/result/2201215-NE-CLEARLINU53

OpenBenchmarking.org

Use cases

- Sudoless setups
 - You only have podman without root on the machine and you need software!
- Stuck on old distro
 - Custom kernel for abandoned hardware stuck on ancient Ubuntu or Debian
 - Want to run LTS distro for stability, but want access to latest software
 - Want to run on bleeding edge distro, but want access to ancient software
- Immutable distro
 - Endless OS (https://endlessos.com/)
 - Fedora Silverblue/Kinoite (https://getfedora.org/it/silverblue/, https://kinoite.fedoraproject.org/)
 - OpenSUSE MicroOS (https://microos.opensuse.org/)
 - SteamOS 3

Conclusions

Distorbox enables both **backward** and **forward compatibility** with software, and freedom to use **whatever distribution** you're more comfortable with

Next steps

- containerd/nerdctl support
 - Still some blockers ahead
 - Enables completely rootless setup (can be installed in \$HOME)
- rootless docker support
 - Still some blockers ahead
- sandboxing mode
 - Bare minimum needed to run a graphical application
- Root mode
 - Useful on immutable OSes where you might need to be actual root on the system also
- More tests!
- Better CLI UX
- Better access to host's command from inside the container

Contribute

- https://github.com/89luca89/distrobox
 - Please read:

https://github.com/89luca89/distrobox/blob/main/CONTRIBUTING.md

- Report bugs
- Report typos (there are always typso!)
- Suggest improvements
- Whatever you feel like contributing, you're welcome!

Useful links

- Distrobox Docs
- Run Distrobox on Fedora Linux Fedora Magazine
- Using Distrobox To Augment The Package Selection On Clear Linux Phoronix
- Benchmark: benefits of Clear Linux containers (distrobox) Phoronix
- Day-to-day differences between Fedora Silverblue and Ubuntu Jorge Castro
- How I use distrobox on Fedora Silverblue Jorge Castro

Thank you!



Questions?



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