whoami

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Agenda

• What is Distrobox
• Use cases and Aeon
• Developing inside Distrobox
  – Custom dev environments
  – GPUs
  – Libvirt/KVM
  – Docker
  – Vim/Neovim
  – VSCode Integration
• Future & Conclusions
Distrobox

- Simple POSIX shell
- Inspired by containers/toolbx and opensuse-microos/toolbox
- Wraps Podman, Docker or Lilipod
  - Abstracts much of the command length and complexity
  - Seamless integration with host environment
- Leverages high volume of curated container images
- Sane defaults, easy to use
- Powerful and customizable for advanced uses
Distrobox

• Host integration:
  – Wayland and X programs
  – Audio (Pipewire/Pulse)
  – SSH and GPG Agent
  – User D-Bus

  – User Systemd
  – Removable devices
Distrobox

• Extra features:
  – System containers
  – Declarative manifests
  – Update all containers
  – Application and binaries exports
Use Cases – What it is

- Rootless setups
- Software Compatibility
- Separation of environments
- Atomic Distributions
  - Aeon
  - Steam OS
  - Ublue/Bazzite
  - Vanilla OS
  - Fedora Silverblue/Kinoite (Available in repos)
Use Cases – What is not

- This is not a security enhancing tool
  - You’re not less secure than when on base OS
  - You’re not much more safe either

- If you want proper isolation, use directly podman/docker

- Rootless podman and lilipod:
  - Even when you are root in the container, you are not root on the host
  - You have your regular user

- Rootful docker or Rootful podman:
  - You’re root both in the host and in the container, as the command to run them runs as root
Aeon

- Reliable, predictable, immutable
- “ChromeOS-like” experience
- Focus on strong end-user “out of the box” experience
- Minimal yet functional
- Focus on Flatpaks and Containers
Aeon - Philosophy

- All GUI and CLI apps should be independent from the base system
- GUI apps should come from Flathub
- CLI apps and GUI apps without a Flatpak should be primarily installed in Distrobox
- Keep base system clean and rolling
Developing with Distrobox

- **Mutable environments**
- **Multiple environments**
  - High compatibility
  - Use any userland you like/need
- **Highly customizable**
  - Custom images
  - Assemble files
Mutable Environments

- We will need to install stuff
  - SDKs
  - Libraries
  - Debuggers
  - Editors/IDEs
- Encapsulate the environment
- Make it reproducible and portable
- Make it transparent to use
Mutable Environments

```bash
luca-linux@xps13:~ /bin/sh /var/home/luca-linux/.local/bin/distrobox enter wolfi...
```

```bash
luca-linux@wolfi_distrobox:~$ sudo apk add nano
(1/1) Installing nano (7.2-r2)
OK: 2574 M 6B in 203 packages
luca-linux@wolfi_distrobox:~$ nano --version
GNU nano, version 7.2
(C) 2023 the Free Software Foundation and various contributors
Compiled options: --disable-libmagic --enable-utf8
luca-linux@wolfi_distrobox:~$
```

```bash
luca-linux@xps13:~ /bin/sh /var/home/luca-linux/.local/bin/distrobox enter utilsi...
```

```bash
luca-linux@utils_distrobox:~$ sudo zypper in htop strace
Retrieving repository 'openSUSE-Tumbleweed-Non-Oss' metadata ..................[done]
Building repository 'openSUSE-Tumbleweed-Non-Oss' cache .......................[done]
Retrieving repository 'openSUSE-Tumbleweed-Oss' metadata .....................[done]
Building repository 'openSUSE-Tumbleweed-Oss' cache ...........................[done]
Loading repository data...
Reading installed packages...
Resolving package dependencies...
The following recommended package was automatically selected:

```
   strace
```

The following 2 NEW packages are going to be installed:

```
   htop strace
```

2 new packages to install.
Overall download size: 760.4 KiB. Already cached: 0 B. After the operation, additional 2.5 MiB will be used.

Backend: classic_rpmtrans
Continue? [y/n/v/...? shows all options] (y): y
Retrieving: strace-6.9-1.1.x86_64 (openSUSE-Tumbleweed-Oss) (1/2), 566.8 KiB
Retrieving: strace-6.9-1.1.x86_64.rpm ........................................[done (257.3 KiB/s)]
Retrieving: htop-3.3.0-1.3.x86_64 (openSUSE-Tumbleweed-Oss) (2/2), 193.5 KiB
```
Multiple Environments

- 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
  - apt/apt-get
  - dnf/microdnf/yum
  - Pacman
  - slackpkg
  - swupd
  - xbps
  - zypper

- A package manager is needed to install base dependencies for distrobox’s entrypoint to work
Multiple Environments
```
FROM opensuse/distrobox:latest

RUN zypper --non-interactive install --no-recommends git \\
    osc \\
    build \\
    vim \\
    vim-data \\
    scout-command-not-found \\
    obs-service-download_files \\
    obs-service-tar \\
    obs-service-tar_scm \\
    obs-service-obs_scm \\
    obs-service-set_version \\
    obs-service-recompress \\
    obs-service-go.modules \\
    obs-service-product_converter \\
    obs-service-format_spec_file \\
    osc-plugin-cycle \\
    osc-plugin-origin \\
    osc-plugin-staging \\
    opensUSE-release-tools-pkglistgen \\
    opensUSE-release-tools \\
    opensUSE-release \\
    && zypper clean
```
- distrobox assemble create
- distrobox assemble create --name foo
- distrobox assemble create --replace
- distrobox assemble create --file /path/to/file.ini
Development Tools - Compatibility

• Sometimes distro specific:
  - Build environments
  - Build instructions and dependencies
  - Niche tool, not ported on other distros
  - Specific IDEs with no flatpak support

• Distrobox export
  - Transparently execute binaries
  - Transparently export GUI apps
Development Tools - GPUs

- **Fundamental for AI/ML workloads**
- **Encapsulate dev environment and dependencies**
- **Support all GPU vendors:**
  - Intel and AMD ootb support (OSS drivers)
    - Mesa, OpenGL, Vulkan
  - AMD ROCm support (just install in container)
  - NVidia support (reuse host’s driver/libs)
    - Cuda, OpenGL, Vulkan
Development Tools - Libvirt/KVM

```bash
[libvirt]
image=registry.opensuse.org/opensuse/distrobox:latest
pull=true
init=true
root=true
entry=true
start_now=true
unshare_ipc=false
unshare_netns=False
unshare_process=true
unshare_devsys=false
pre_init_hooks="zypper addlock kernel-*"
additional_packages="patterns-server-kvm_server patterns-server-kvm_tools
qemu-arm qemu-ppc qemu-s390x qemu-extra qemu-linux
qemu-hw-display-virtio-gpu qemu-hw-display-virtio-""}
init_hooks="systemctl enable virtqemud.socket virtnetworkd.socket virttx
init_hooks="usermod -aG libvirt $USER"
```
[docker]
image=registry.opensuse.org/opensuse/distrobox:latest
pull=true
init=true
root=true
entry=false
start_now=true
unshare_ipc=false
unshare_netns=false
unshare_process=true
unshare_devsys=false
additional_packages="docker socat"
init_hooks="systemctl enable docker"
Development Tools - Vim/Neovim

- Native to terminal
- Fast no overhead
- Custom environment
  - Assembly
  - Include dotfiles setup
  - Include system dependencies
  - Ready to use
Development Tools - VSCode

- Widely used
- Flatpak
  - Native container support
  - Custom podman/docker wrapper to connect to distrobox
- Install in distrobox and Export
- https://distrobox.it/posts/integrate_vscode_distrobox/
What’s Next

- Improve documentation
- Improve code readability
- Improve pkg manager handling
- Support other container managers (Incus, systemd-nspawn, bwrap, MicroVMs …)
- Improve tests
Special Thanks!
- Aeon Team
- VanillaOS Team
- Ublue Team
- All of you contributors!

Contribute!
- github.com/89luca89/distrobox
- #distrobox:matrix.org
- discord.com/invite/fKJWr6mC