



**KDE Linux: what we've learned,
and how it can help you**

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WHAT?

- KDE Linux: “The KDE OS”
- Image-based, hard to break
- KDE software compiled with kde-builder
- Arch package base

<https://linux.kde.org/>



WHEN?

- First prototyped in 2023
- First public announcement at Akademy 2024
- Alpha release at Akademy 2025

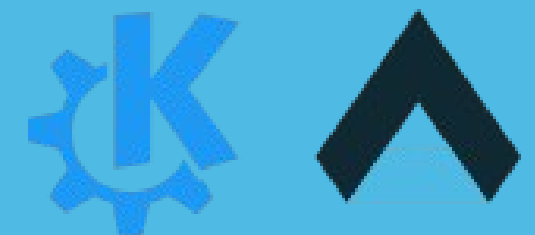
<https://linux.kde.org/docs/background/>

WHY?

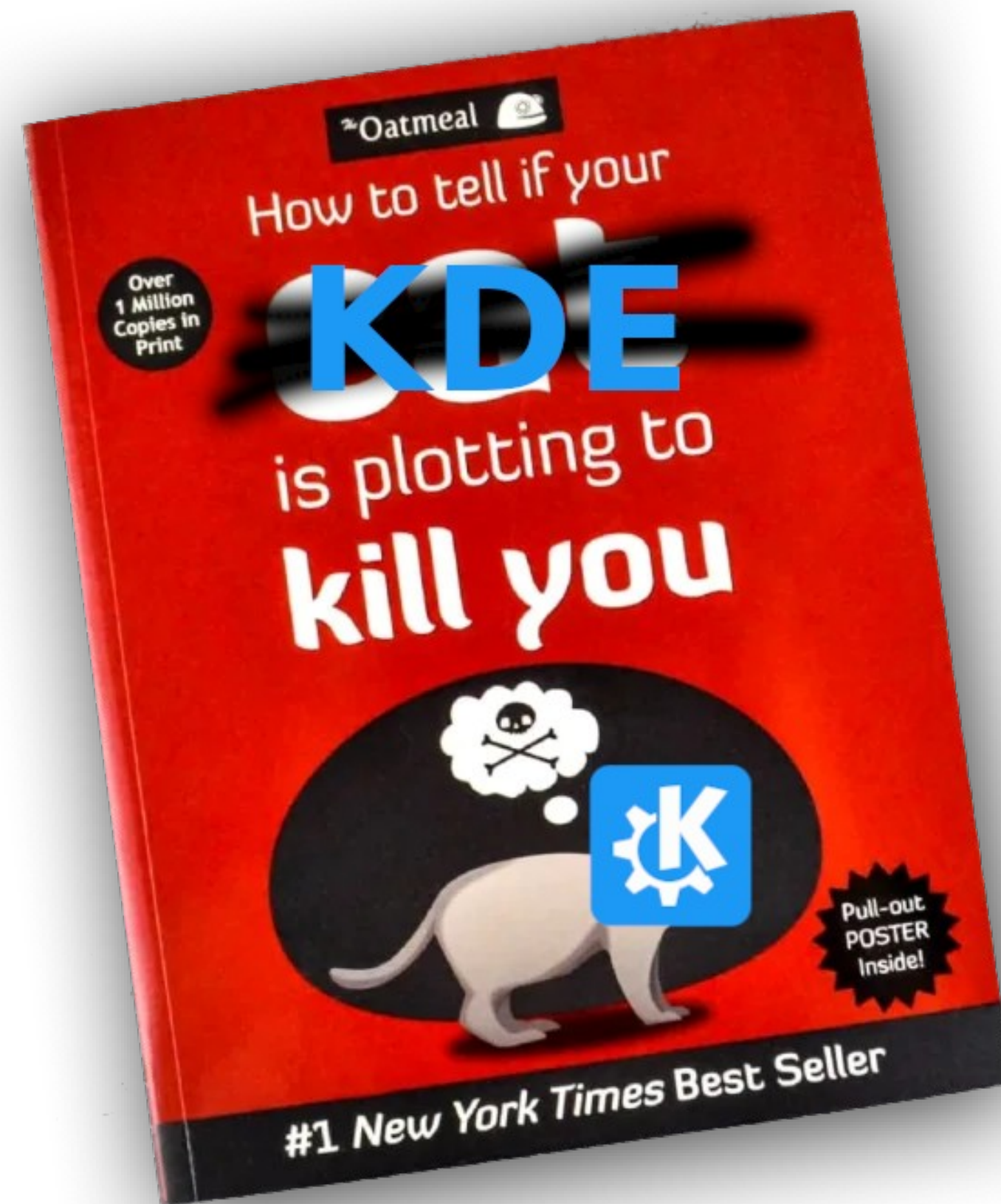
- Direct relationship with users
- Great vanilla Plasma experience
- Great platform for developing KDE software
- Integration testing for Plasma et al.
- Improve KDE software for Flatpak, Snap, etc.
- Can recommend it without picking favorites
- Raises the bar for all KDE-aligned distros

<https://linux.kde.org/docs/background/>

THE ELEPHANT IN THE ROOM



Is KDE LINUX OUT TO GET ALL THE OTHER DISTROS?

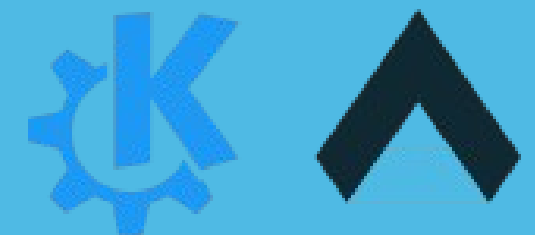


ABSOLUTELY NOT!

- Y'all are doing amazing work
- We've learned from you
- We want to share what we've learned
- To raise the bar for everyone
- So your distros can become even more amazing

TL;DW check out [https://community.kde.org/Distributions/
Packaging_Recommendations](https://community.kde.org/Distributions/Packaging_Recommendations)

THINGS OUR USERS LOVE



OS ROLLBACK

- Update fearlessly!
- No more "will it boot?"
- Huge peace of mind booster

FAST AND SAFE SYSTEM UPGRADES

- Much faster than offline PackageKit updates
- Atomic! ☢ Breaks in a failsafe manner
- Much safer than online updates
- No package conflicts or stale repos... ever

BTRFS SNAPSHOTS ON BY DEFAULT

- Homedirs and /etc
- Nice rollback UI
- Can back up a snapshot, rather than a moving target
- There are some quirks and gotchas
 - They'll stick around forever if the system isn't on by default

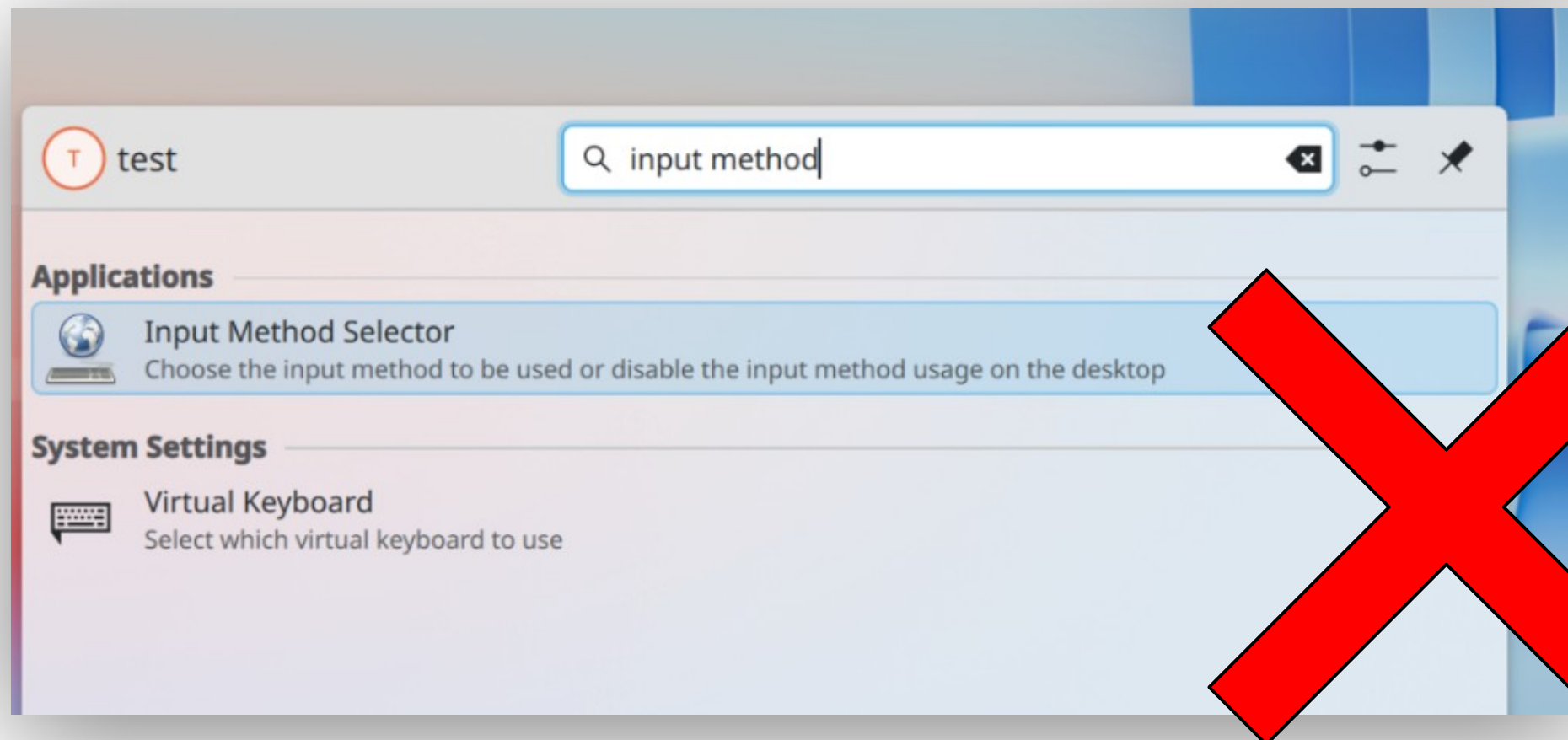
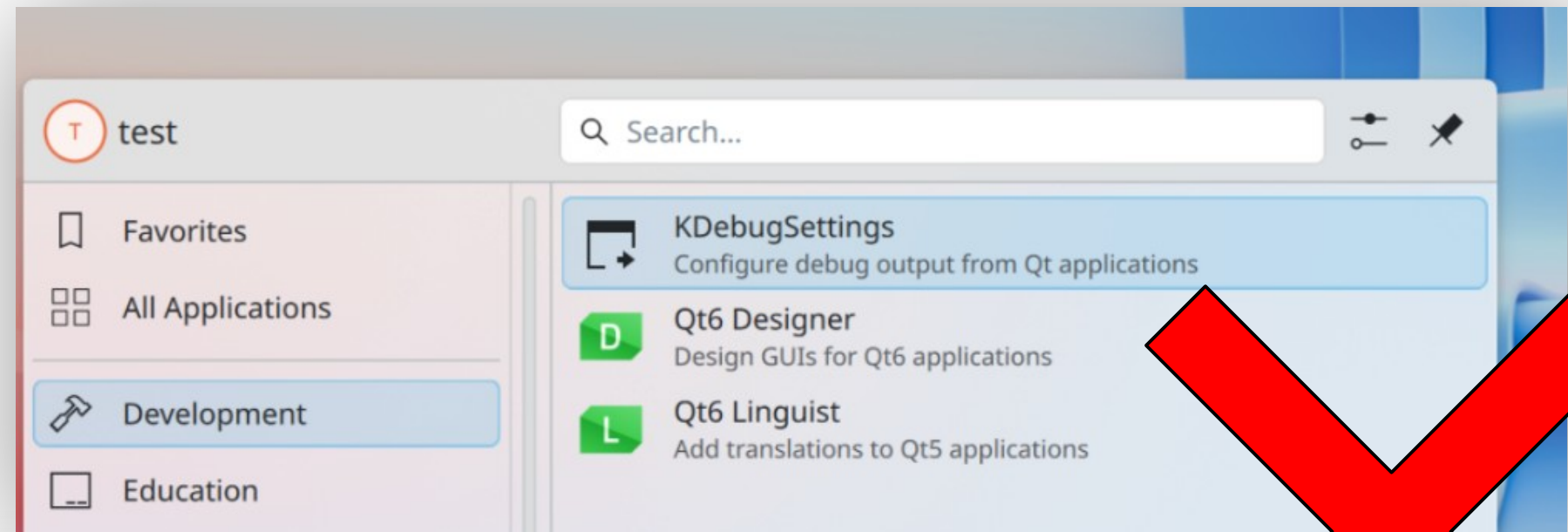
FLATPAK APPS OFFER A REALLY NICE UX

No, really!

- Fearless/danger-free app installation & removal
 - No “installing Steam bricks the OS”
 - No “removing K Mines removes Plasma because they share a meta-package”
- Easy settings/state/data cleanup
- Almost all use the KDE file dialog
- Always have the latest version
- Can have multiple versions installed
- Cross-distro tooling to build them

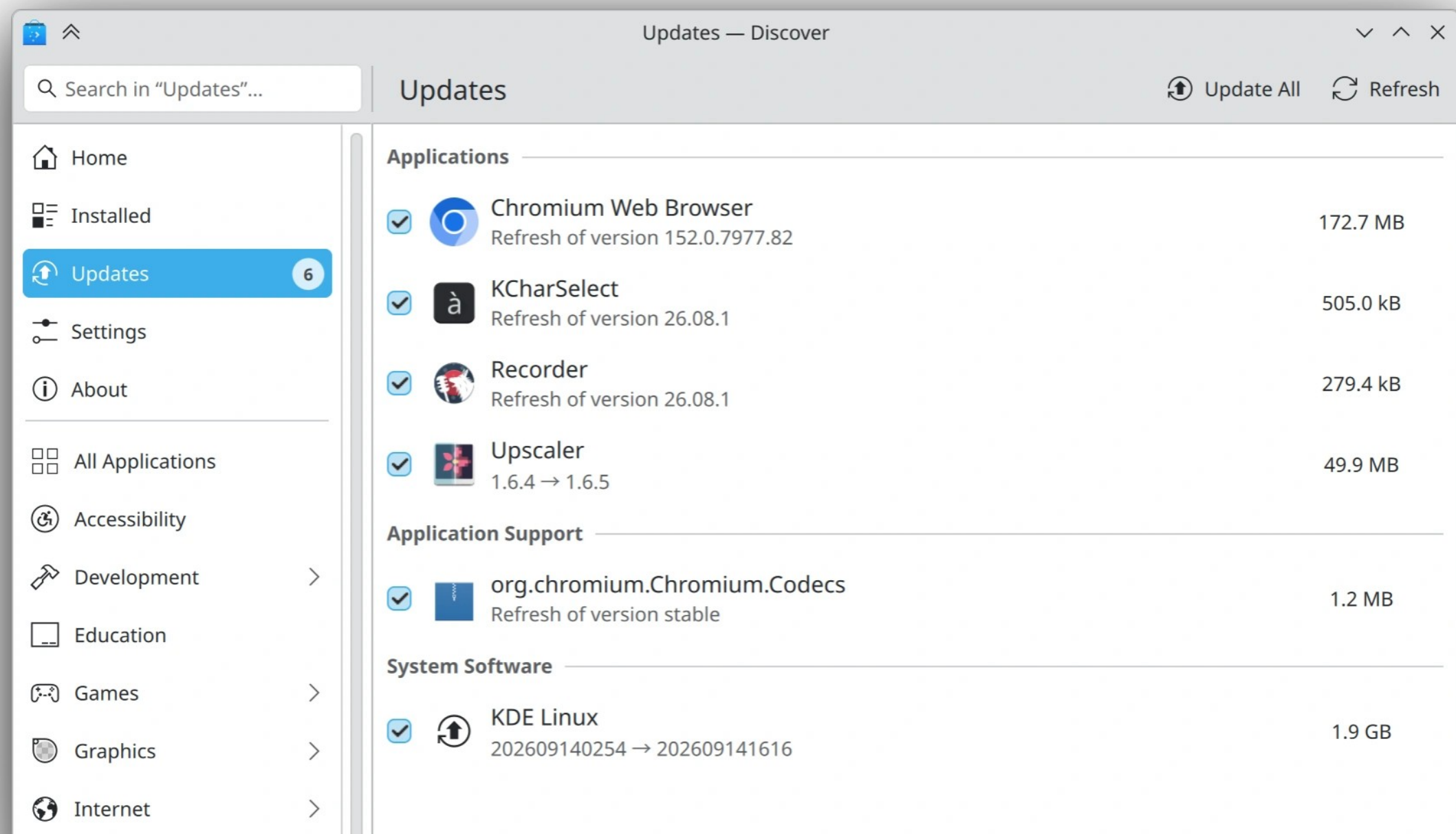
VANILLA KDE EXPERIENCE

- Clean and simple UX
- Beautiful wallpaper
- Just what you need:
 - no random apps
 - no overlapping features



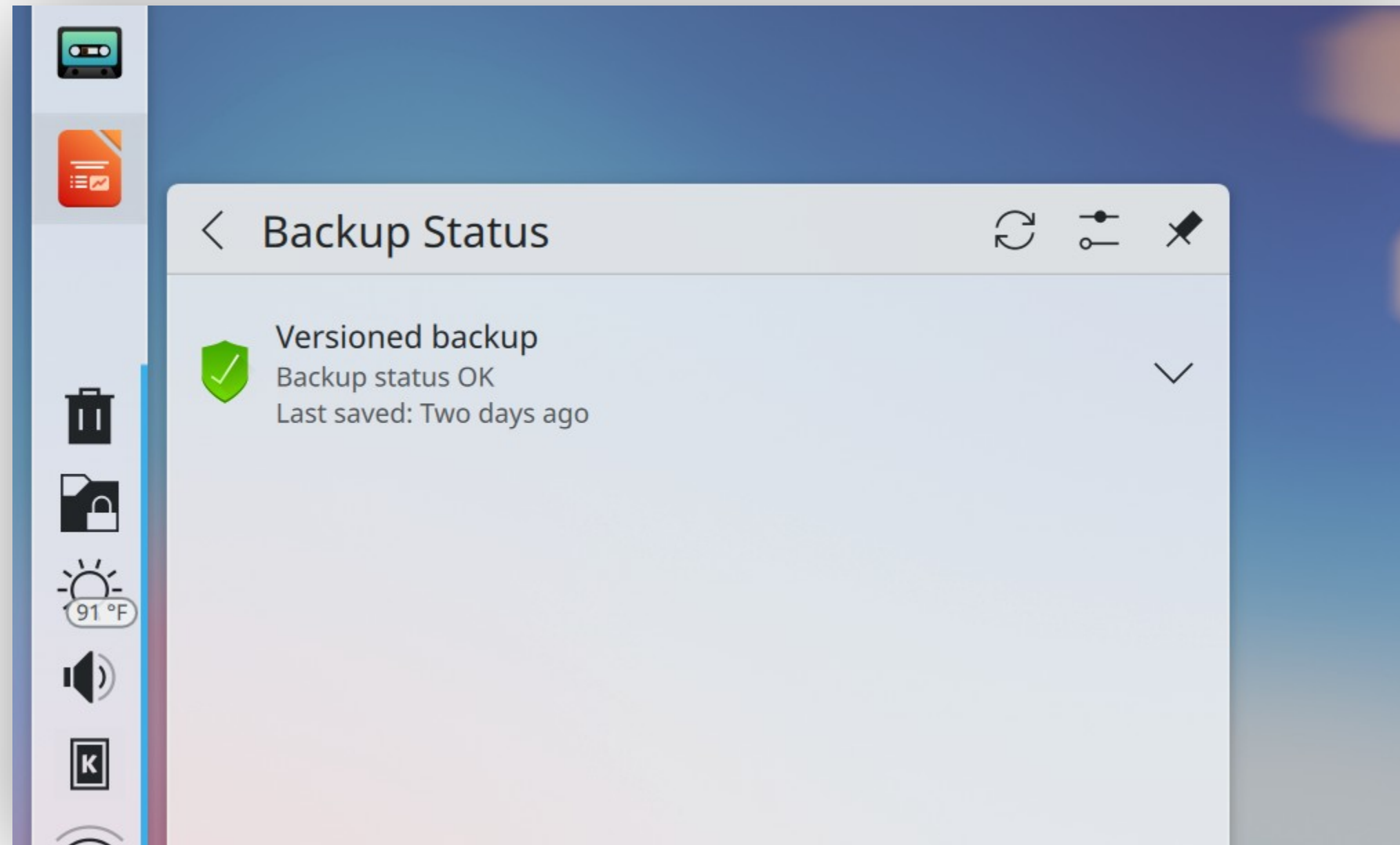
COHERENT PRESENTATION IN DISCOVER

- One source = simplicity & reliability
- Complete metadata
- Good screenshots
- Readable version numbers

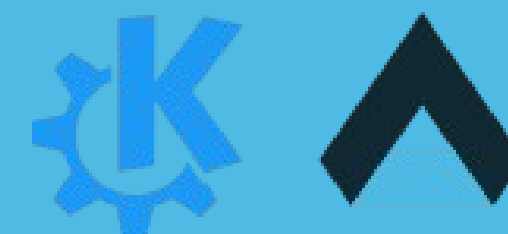


PRE-INSTALLED BACKUP SYSTEM

- Kup! It's great



THINGS OUR USERS DON'T LOVE



No PACKAGE MANAGER INCLUDED

- Nerds love package managers!
- “I just need [random CLI thing or build dependency]”
 - Homebrew
 - Distrobox
 - Nix
 - Cargo
 - Pip + virtualenv
 - Download binary from website
 - What a mess
- Pain point drives away experts who could develop the project

“WHERE'S VIRTUALBOX?”

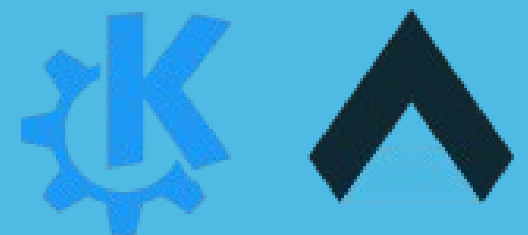
- Some GUI apps aren't on Flathub yet
- No official support for software that needs out-of-tree kernel modules

~~FLATPAK APPS OFFER A REALLY NICE UX~~

PAPERCUTS IN FLATPAK APPS

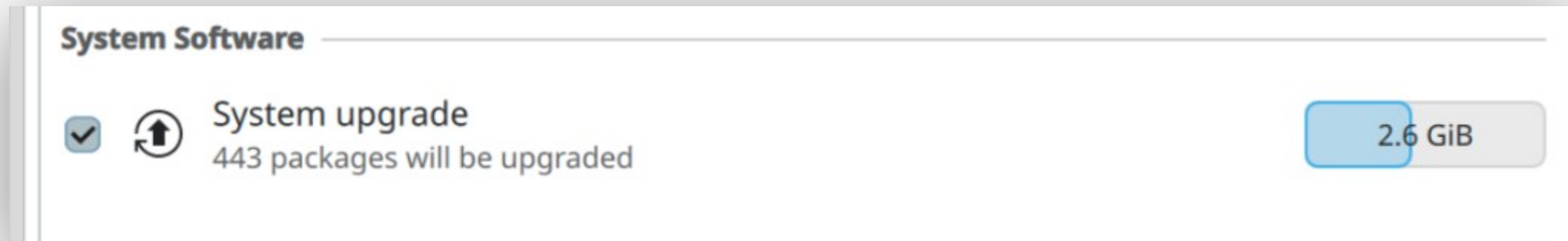
- Mandatory sandboxing = can't do some things at all
- Default permissions can be too tight, breaking features
- Theming pain
- Running them in a terminal is awkward
- FlatpakV2 will fix it™

**THINGS WE THOUGHT
WOULD MATTER,
BUT DIDN'T**



HUGE SYSTEM UPGRADES

- Delta updates help
 - 8 GB → 2 GB
- People have fast internet connections
- Traditional distro updates aren't that small either



PRINTERS

- Driverless printers are common now
- People don't print that much
- Painful mostly for bomb-proof antique business printers

OLD NVIDIA GPUS

- No proprietary drivers or userspace tools for them yet
- It doesn't matter:
 - NVIDIA's KDE market share for all GPUs is 19%
 - If you care about perf, you already have a newer one
 - If you don't, Nouveau drivers are good enough
- Will eventually matter for CUDA etc., but not just yet

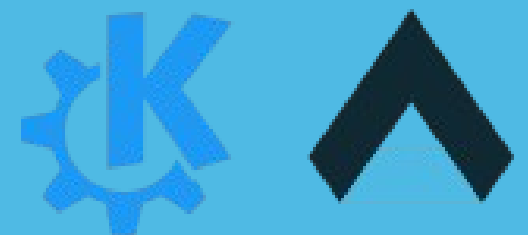
ZRAM

- Not as good as zswap + swapfile
- Good enough if you optimize it properly
- TL;DR: *do 100% of physical RAM w/ Zstd compression*
- It's fine for most people

OVERALL LESSON LEARNED:

You don't need to invest massive resources into micro-optimizations for a small minority of users

TECHNOBABBLE



ARCHITECTURE

- Base OS (Arch/Buildstream)
- Btrfs
- EROFS
- mkosi
- systemd-repart
- systemd-boot
- systemd-sysupdate
- systemd-sysext
- systemd-coredump
- You get the idea

BTRFS

- Copy-on-write
- Snapshots
- Quotas
- Compression

EROFS

- Read-only
- Fast and small
- Compression
- Maybe the future of Flatpak?

MKOSI

- Makes OS images
- Used to build initrd and prepare the system image resources

SYSTEMD

- Many components
- Backbone of the whole thing
- sd-repart, boot, sysupdate, sysext, coredump, udev, ...

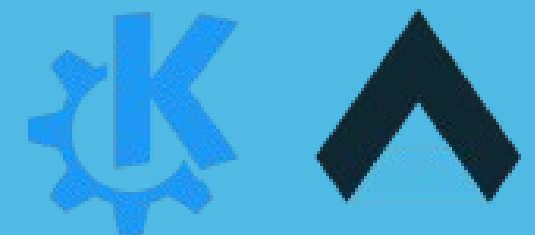
DESYNC

- Like casync
 - “Content addressable store”
- Splits image into chunks
- Backbone of delta updates (only changed chunks get downloaded)

KDE-LINUX-SYSTEMD-SYSUPDATE

- Shim between systemd and desync store (for now!)
- Smart downloads
- Mirror-aware

WHAT'S COMING?



BETA RELEASE

- About 85% done
- Something we can feel proud to advertise to mainstream Linux users
- Coming Soon™

CHANGING THE BASE!

- Building everything ourselves with BuildStream
- Moving away from Arch packages

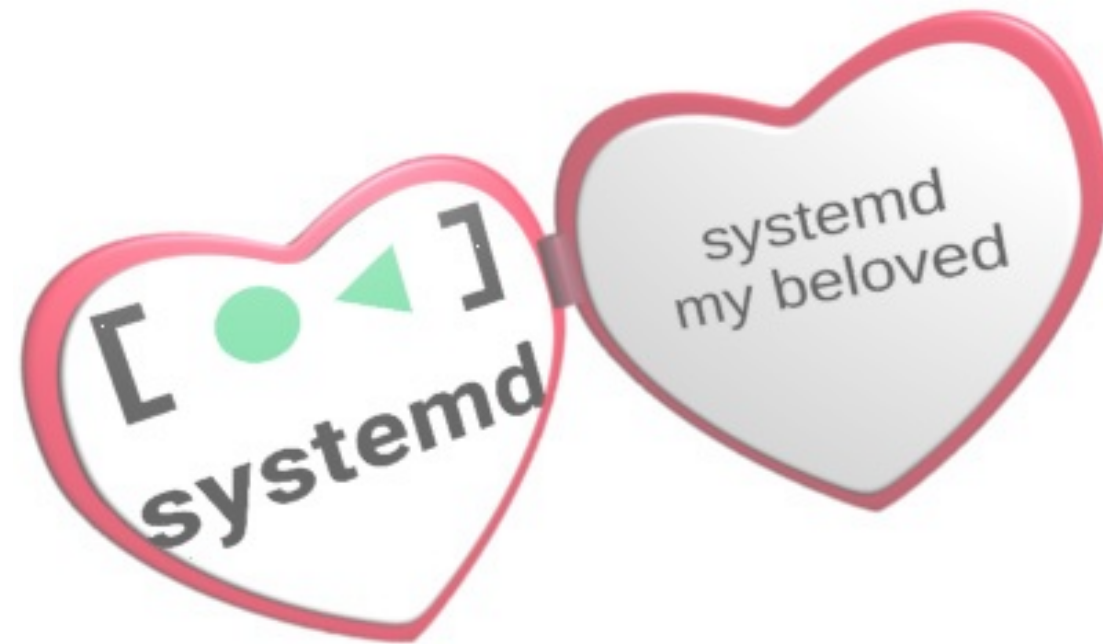
WHY?

- Full control over the base system (good for Secure Boot)
- No risk of creating expectations because of \$distro base
- Similar/familiar infrastructure to Flatpak
- Shared maintenance with Flatpak and GNOME OS
- SBOM generation
- Fewer distro opinions
- Testbed for “editions”
- Hopefully enough to make it seem worth all the effort

DOESN'T CHANGE THAT MUCH

Arch variant

- Arch packages
- mkinitcpio
- systemd
- systemd
- systemd
- syestmd
- systmed
- sytesmd
- ssytemb
- ...



Buildstream variant

- Flatpak runtimes
- systemd
- systemd
- systemd
- systemd
- syestmd
- systmed
- sytesmd
- ssytemb
- ...

ARM/RISC-V BUILDS

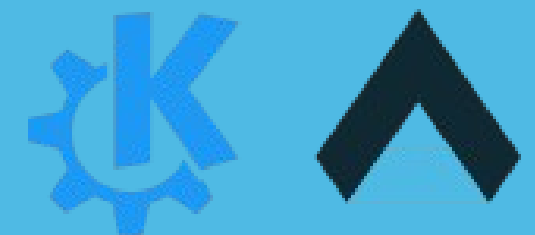
- Unlocked by the BuildStream work
- For future Plasma Mobile and RaspberryPi images
- And potentially more
- Cooperate with PostmarketOS?
- Pretty horrible boot infrastructure

FACTORY RESET

- Don't re-install; reset
- It's faster
- Data can be moved out of the way (and kept around)
- Advantage of an image-based OS
- Makes tinkering with the system nicer

KDE LINUX NEEDS YOU!

<https://linux.kde.org/docs/kde-linux-dev/>





THANK YOU!

QUESTIONS?

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