Collabora LibreOffice The Document Foundation SUSE

Can MicroOS Desktop Be Your "Daily Driver" ?

(SPOILER ALERT: Probably YES!)

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2020

MySQL LINUX MAGAZINE datto ADMIN Network & Security fedora TUXEDO COMPUTERS .riss applications

Can It Really Be ?

Proof that it ~~can~~ is:

```
dario@Wayrath:~> cat /etc/os-release
NAME="openSUSE MicroOS"
# VERSION="20201009"
ID="opensuse-microos"
ID_LIKE="suse opensuse opensuse-tumbleweed"
VERSION_ID="20201009"
PRETTY_NAME="openSUSE MicroOS"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:opensuse:microos:20201009"
BUG_REPORT_URL="https://bugs.opensuse.org"
HOME_URL="https://www.opensuse.org/"
DOCUMENTATION_URL="https://en.opensuse.org/Portal:MicroOS"
LOGO="distributor-logo"
```

- The first part of this talk is also covered by this blog post

About ~~Me~~ What I do

- Virtualization Specialist Sw. Eng. @ SUSE since 2018, working on Xen, KVM, QEMU, mostly about performance related stuff

- Daily activities ⇒ how and what for I use my workstation
  - Read and send emails (Evolution, git-send-email, stg mail, ...)
  - Write, build & test code (Xen, KVM, Libvirt, QEMU)
  - Work with the Open Build Service (OBS)
  - Browse Web
  - Meetings / Video calls / Online conferences
  - Chat, work and personal
  - Occasionally play games
  - Occasional video-editing
  - Maybe scan / print some document

- Can all of the above be done with MicroOS <u>already</u> ?

What is MicroOS

- Immutable single purpose OS, based on Tumbleweed, born as container host but not limited to that use case
  - https://microos.opensuse.org/
  - https://en.opensuse.org/Portal:MicroOS
  - Richard's and Ish's talks!

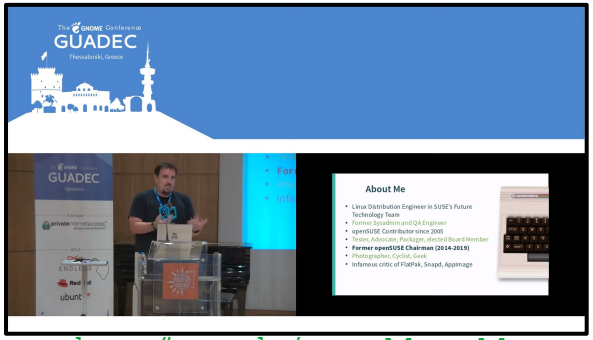
https://youtu.be/nIwqzGbX-oc

https://youtu.be/8gGjcKdOWIc

What is MicroOS as a Desktop

- MicroOS ⇒ Single purpose immutable OS
- Each install does only one thing:
  - One thing == Hosting containers
  - One thing == Hosting VMs
  - One thing == Set Top Box
  - <u>One thing == Your Desktop</u>
    - More talks from Richard
    - The latest one, yesterday!

https://youtu.be/ASSkQH9kNa0



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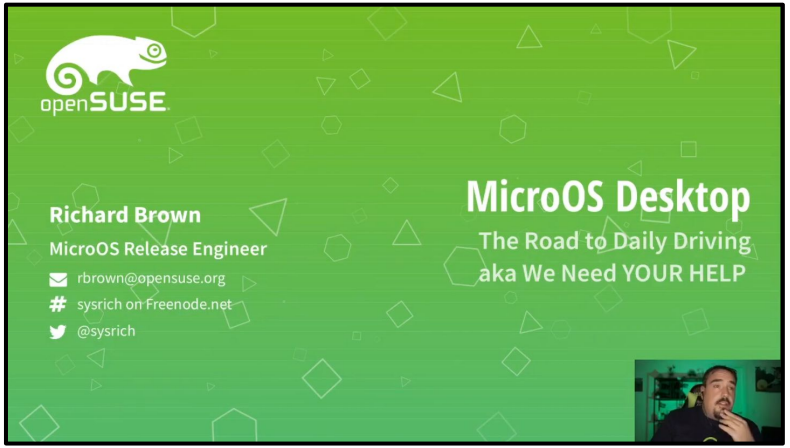
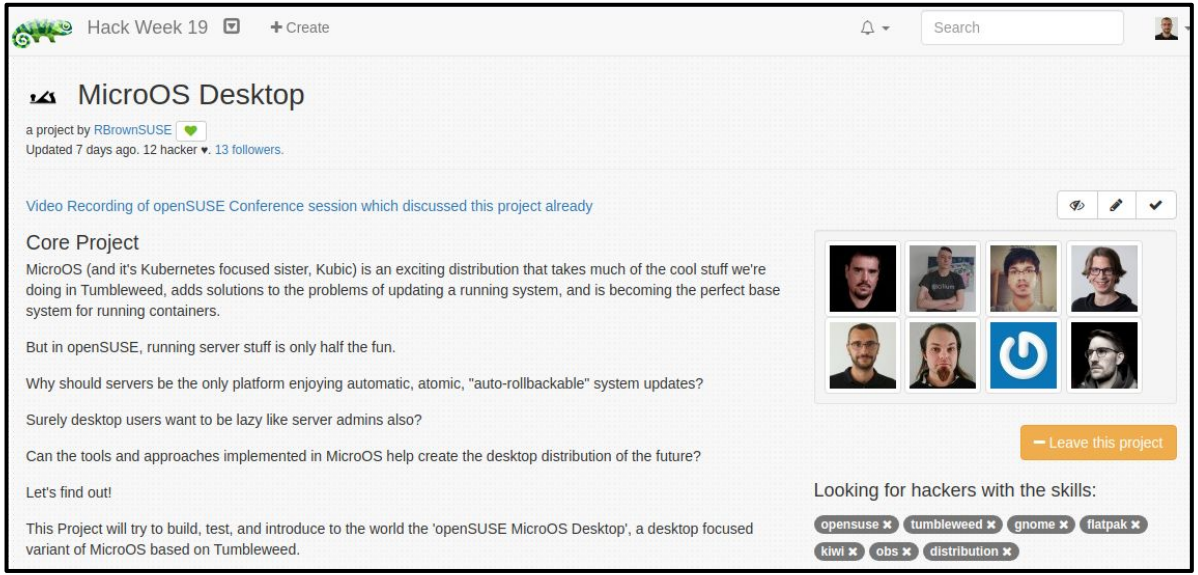


https://youtu.be/cZLckDUDYjw

How I Got Involved

- SUSE Hack Week 19 (which happened in 2020)
  - Chance for SUSE employees to ~~work on~~ do whatever they find cool
- MicroOS as a Desktop
  - Immutable, taking advantage of BTRFS
  - Base OS from distro, apps from other (proper?) sources
  - Rolling base, as based on Tumbleweed
  - Rolling but reliable... as based on Tumbleweed
- I found it cool! :-)
  - Tried and tested it
  - Started hacking on `toolbox` (see later)



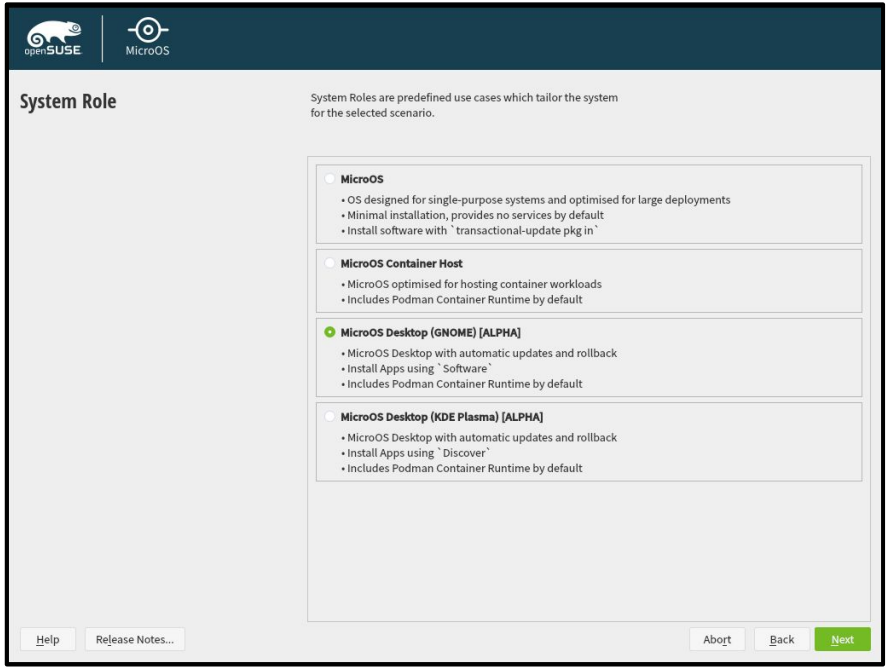
(https://hackweek.suse.com/projects/microos-desktop)

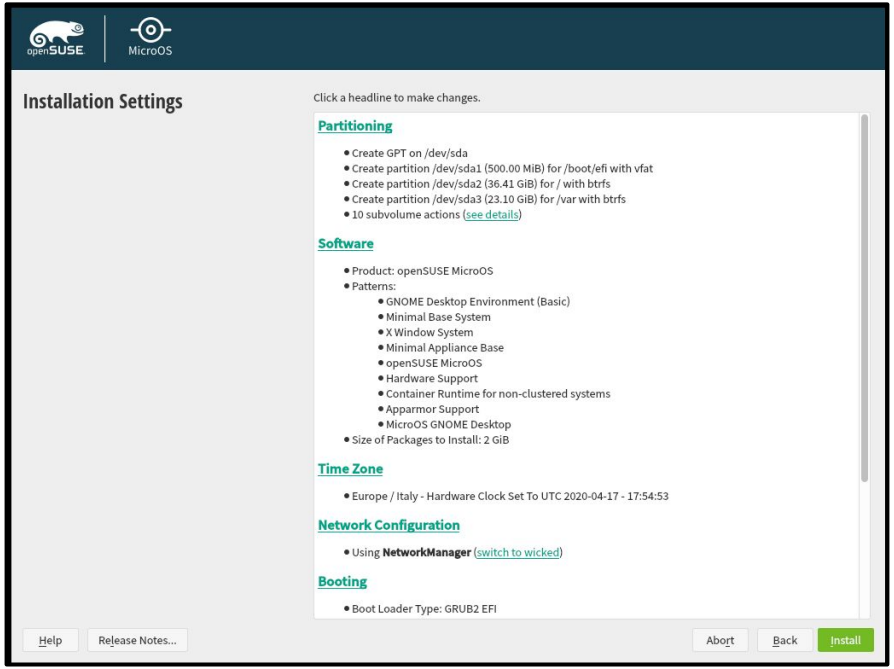
Why I Tried and Why I'm Liking it

- A relatively small and immutable base OS
  - Stable and reliable
  - Immutable ⇒ much more difficult to mess-up
- Issues with package dependencies:
  <<Oh, no!! X can't be installed/upgraded because libY needed by Z is too old>>
  - Fewer packages ⇒ a lot less likely to happen (in fact, never happened in months...)
- BTRFS at its finest:
  - Updates in non-running snapshots. Automatic rollback with health-check
- Apps from Flatpak/Flathub
  - Contributed to Flathub directly from upstream app developers
    - ⇒ Effort done once, multiple (all?) distro can profit from that
    - ⇒ Distro/OS developers can focus on OS, app developers can focus on apps
- Tumbleweed is rock solid, thanks to OpenQA, etc
  - As soon as you add an additional repository, this may change ...
    - Technically you're not using the distro that has been developed & tested any longer
    - (In practice, fine, especially for Packman, etc. But, still.)
  - Here you don't need **any** additional repository !

Installing

- Just grab it: https://microos.opensuse.org/ , and install it!
- Choose "MicroOS Desktop [GNOME] [ALPHA]"
- Choose "KDE Plasma" if you want, but I've never tested it. No idea if/how it works!





Immediately After Installing

- Add FlatHub as flatpak remote
  - `$  flatpak remote-add --user flathub https://flathub.org/repo/flathub.flatpakrepo`

- Some GNOME Software (black) magic:
  -
```
$ gsettings set org.gnome.software install-bundles-system-wide false
$ gsettings set org.gnome.software allow-updates false
$ gsettings set org.gnome.software download-updates false
$ gsettings set org.gnome.software enable-repos-dialog false
$ gsettings set org.gnome.software first-run true
```

- Some zypper (black) magic:
  -
```
$ sudo rm -Rf /var/cache/app-info
$ sudo transactional-update shell
  # rpm -e --nodeps libzypp-plugin-appdata
  # zypper al libzypp-plugin-appdata
  # exit
$ sudo reboot
```

- Shouldn't this should all be done automatically?
  - Indeed ! Patches / SRs welcome :-P

Some More Customization

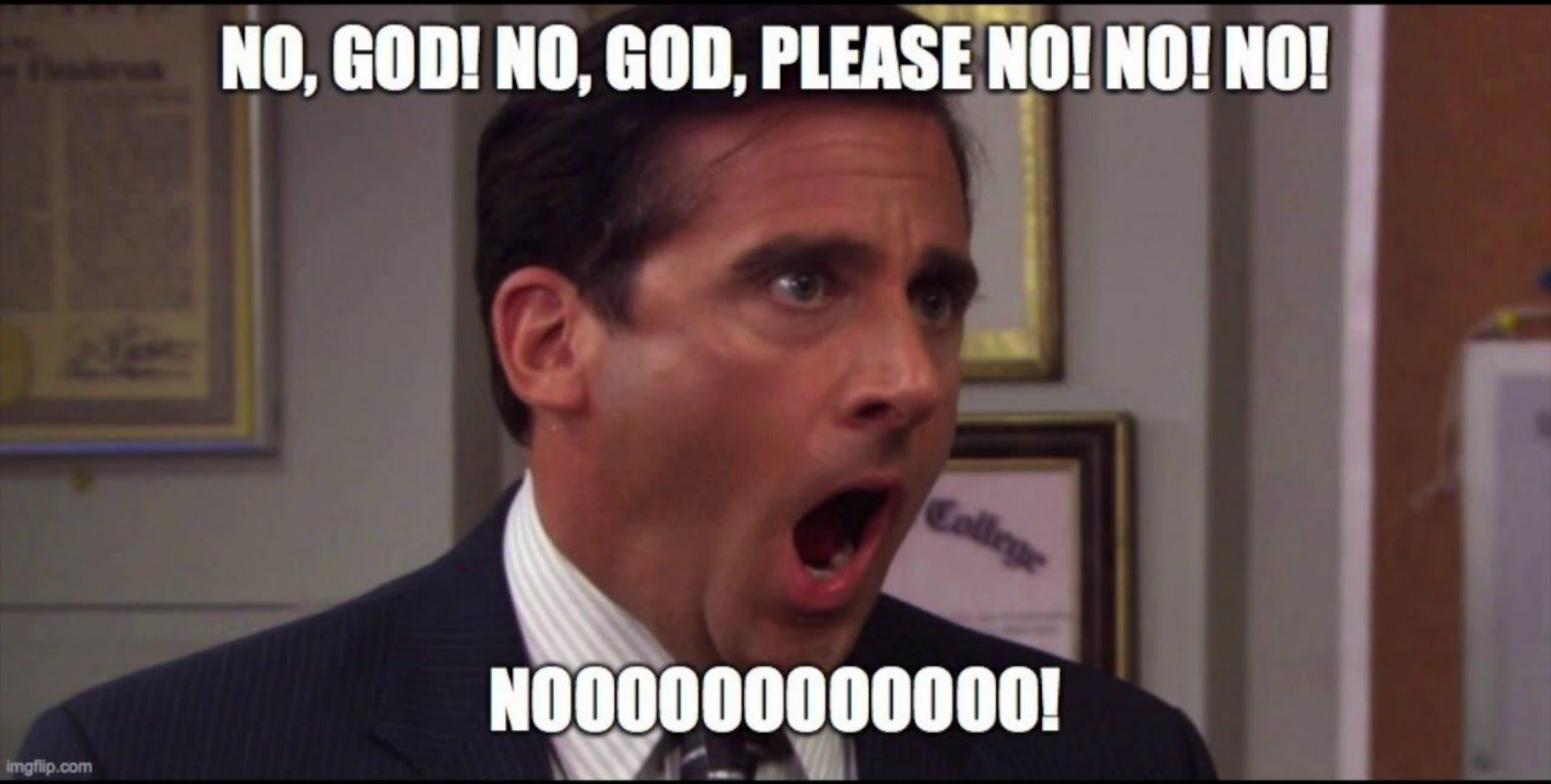
Should be done automatically too, IMO.
Again, contributions welcome!

- For toolbox (see later)
  - ```
    # echo "<yourusername>:100000:65536" > /etc/subuid
    # echo "<yourusername>:100000:65536" > /etc/subgid
    ```
- I want passwordless `sudo`
  - ```
    # usermod -a -G wheel <yourusername>
    # echo "%wheel  ALL = (root) NOPASSWD:ALL" > /etc/sudoers.d/wheel
    ```
- I want to disable automatic updating <u>and rebooting</u>
  - I will deal with updating (and rebooting) manually
    - ```
      $ sudo systemctl disable --now transactional-update.timer
      $ sudo systemctl disable --now rebootmgr.service
      ```
  - Let's check:
    - ```
      $ sudo rebootmgrctl is-active
      RebootMgr is dead
      $ sudo rebootmgrctl status
      Error: The name org.opensuse.RebootMgr was not provided by any .service
      files
      ```

Additional Repositories & Packages

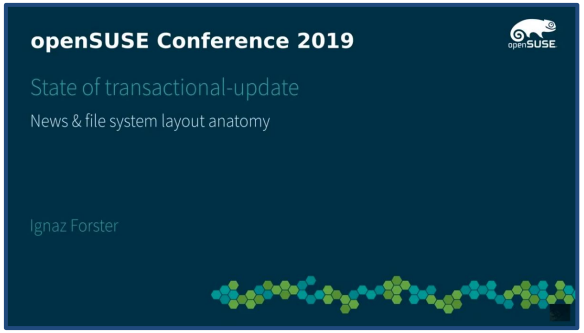
- Add repositories, e.g. Packman:
  - openSUSE Wiki: Additional package repositories
  - All of Packman:
    - `zypper ar -cfp 90 http://ftp.gwdg.de/pub/linux/misc/packman/suse/openSUSE_Tumbleweed/ packman`
  - Install codecs
- Add *<more repositories>*
- Install *<a lot of packages for whatever I need>*

Right?


NO, GOD! NO, GOD, PLEASE NO! NO! NO!
NOOOOOOOOOOOO!
imgflip.com

Installing Packages

- No zypper (well, it's there but it's locked ⇒ try it, it won't work!)
- `Transactional-update` , directly:
  -
```
$ sudo transactional update pkg install wget unzip
$ sudo reboot
```
- `transactional-update` , via shell:
  -
```
$ sudo transactional-update shell
  # zypper ref
  # zypper in wget unzip
  # exit
$ sudo reboot
```
- Multiple sessions:
  -
```
$ sudo transactional -update pkg install wget
[...]
$ sudo transactional-update shell --continue
  # zypper in unzip
  # exit
$ sudo reboot
```
- Reboot always necessary, for seeing and using new packages: The Transactional Update Guide



https://youtu.be/e3_X7v7aoHk

Are We Constantly Rebooting ?

- Nah!
  - For instance, I haven't rebooted this workstation since 3 days and 16 hours (and counting!)

```
dario@Wayrath:~> uptime
 08:51:42  up 3 days 16:33,
dario@Wayrath:~>
```

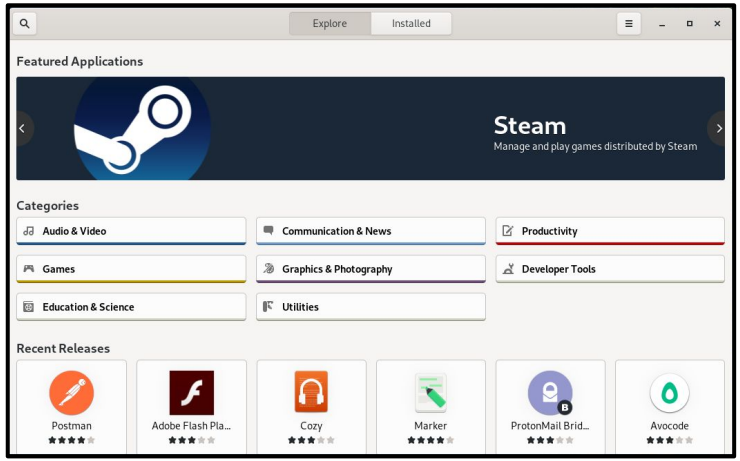
- How so?
  - For apps:
    - Flatpak (from Flathub, https://flathub.org/)
  - For troubleshooting / debugging:
    - `toolbox`
  - For development
    - `toolbox`
  - For "development & apps":
    - `toolbox`

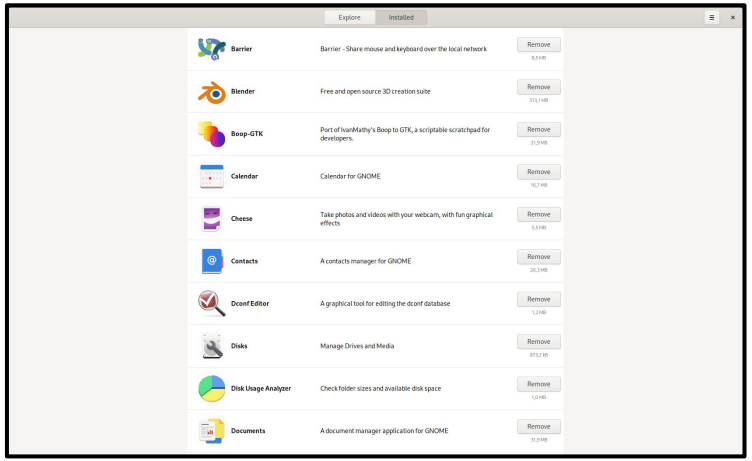
- Installing/removing activities RPMs on the base OS tends to zero

Flatpak

- It will be our main install source, for all applications
- Via GNOME Software
  - Once configured as shown
- Via cli
  - `flatpak install org.gnome.gedit`
    `alias gedit='flatpak run org.gnome.gedit'`

```
dario@Wayrath:~> flatpak ps
Instance    PID   Application                 Runtime
2416651609  17472 org.vim.Vim                 org.freedesktop.Platform
4132321407  17296 org.libreoffice.LibreOffice org.freedesktop.Platform
1453829993  16762 org.mozilla.firefox         org.freedesktop.Platform
588396198   16391 chat.rocket.RocketChat      org.freedesktop.Platform
729209139   16107 org.gnome.Evolution         org.gnome.Platform
2888792739  3792  org.gnome.gedit             org.gnome.Platform
4074027177  2547  org.telegram.desktop        org.kde.Platform
1538198007  2541  com.github.debauchee.barrier org.kde.Platform
3656091025  2542  im.pidgin.Pidgin            org.gnome.Platform
3380805255  2545  me.kozec.syncthingtk        org.gnome.Platform
```





Toolbox

- A shell script that launches a privileged container
  - Check: https://kubic.opensuse.org/blog/2019-10-22-toolbox/
  - Most other immutable OSes has something similar (e.g., Silverblue)
  - The host file system will be visible/accessible while inside the container (bind mounts, etc)
- The container can run:
  - As root
    - You may or may not have your regular user in the toolbox container
    - When you are root in the toolbox container run as root, you're kind of root on the host
  - As your regular user
    - Thanks to "rootless podman"
    - You have your regular user in the toolbox container
    - Even when you are root in the toolbox container, you are not root on the host
- BEWARE: "privileged container" & "can run as root"
  - It's **not** a security enhancing tool
  - I.e.: <<I can do whatever I want, I'm in a container, I won't affect or disrupt the base OS, right?>>
    - No, this is not the right mindset
  - You're not less secure or safe than when you're working directly on the base OS
  - You're not more secure or safe either!

Different Kind of Toolbox-es

- Creating and entering a toolbox that <u>runs as your user</u>, and <u>be your own user while inside it</u>:
  - Useful for using toolbox as your user / developer environment
  -
```
$ toolbox -u          # -u ⇒ you will have your user, your /home, etc
 >                    # you're inside the toolbox already!
$ toolbox -u -t foo   # -t ⇒ to give this toolbox a name ('t' for 'tag')
 >                    # you're now inside the toolbox tagged 'foo'
 > sudo su            # you're becoming root in container. But, e.g., you still
 #>                   # won't be able to touch files owned by root on the host!
```

- Creating and entering a toolbox that <u>runs as your user</u>, but has <u>only root user inside it</u>:
  - Useful for using toolbox as a debugging and troubleshooting environment
  -
```
$ toolbox   # no -u ⇒ no user except root, nothing in /home
 #>         # your are root already. But root in toolbox
 #>         # does not map on root on the host
```

Different Kind of Toolbox-es

- Creating and entering a toolbox that <u>run as root</u>, and be <u>your own user while inside it</u>:
  - Useful for using toolbox as your user / developer environment (that needs "special powers")
  -
```
$ toolbox -r -u          # -u ⇒ you will have your user, your /home, etc
 >                       # -r ⇒ the toolbox run as root on the host
$ toolbox -r -u -t foo   # -t ⇒ to give this toolbox a name ('t' for 'tag')
 >                       # you're now inside the toolbox tagged 'foo'
 > sudo su               # you're becoming root in container and that maps with
 #>                      # root on the hosr (you'll be able to touch files owned
 #>                      # by root on the host, etc)
```

- Creating and entering a toolbox that <u>runs as root</u>, and has <u>only root user root inside it</u>:
  - Useful for using toolbox as a debugging/troubleshooting environment (with "special powers")
  -
```
$ toolbox -r  # -r ⇒ the toolbox run as root on the host
 #>          # no -u ⇒ no user except root, nothing in /home. Also,
 #>          # your are root already, and that does map with root on the host
```

Managing Your Toolbox-es

- Toolbox is **stateful**:
  - Yesterday you created a toolbox, and you install stuff, change configs, etc
  - Today you stop the toolbox, you turn off the PC and take the day off
  - Tomorrow toolbox will still have all the software and all the config changes you made
- Listing toolbox-es running as user:
  -
```
$ podman ps
CONTAINER ID  IMAGE                COMMAND    CREATED     STATUS         NAMES
5cb19ade1fb1  [...]toolbox:latest sleep +Inf 3 weeks ago Up 3 hours ago toolbox-dario-user
```
- Listing all toolbox-es created as user (running ot not):
  - $ posman ps --all
```
CONTAINER ID  IMAGE                COMMAND    CREATED     STATUS     NAMES
5cb19ade1fb1  [...]toolbox:latest sleep +Inf 3 weeks ago Up 3 hours toolbox-dario-user
502722d98390  [...]toolbox:latest sleep +Inf 3 weeks ago Exited     toolbox-dario-user-dev
```
- For toolbox-es created as root:
  - `$ sudo podman ps  # list the running ones`
  - `Sudo podman ps --all  # list all of them`
- Removing toolbox-es:
  - `$ podman rm <toolbox_name/ID>  # for a toolbox running as user`
  - `$ sudo podman rm <toolbox_name/ID>  # for a toolbox running as root`

Toolbox For TroubleShooting

Toolbox is super handy for debugging and troubleshooting

- Example: you need to do a `strace ls`
  - You can try... but `strace` is not installed!
  - Install it with `transactional-update pkg in`and then reboot ?!?
  - No!
    -
```
$ toolbox                # runs as your user on the host (no -r )
 #> zypper in strace      # you're root in toolbox, but that
                          # does not map to root on the host
 #> strace ls             # here you go your strace!
```

- Example, you need to `nmap` some host
  - Again, `nmap` is not there, and you don't want to reboot!
  - Nmap needs "real root", to scan low ports
    -
```
$ toolbox -r                # runs as root on the host ( -r )
 #> zypper install nmap      # we can add packages, no problem
 #> nmap -sS 192.168.0.2     # you're root in toolbox and that
    <...>                    # does map to root on the host
```

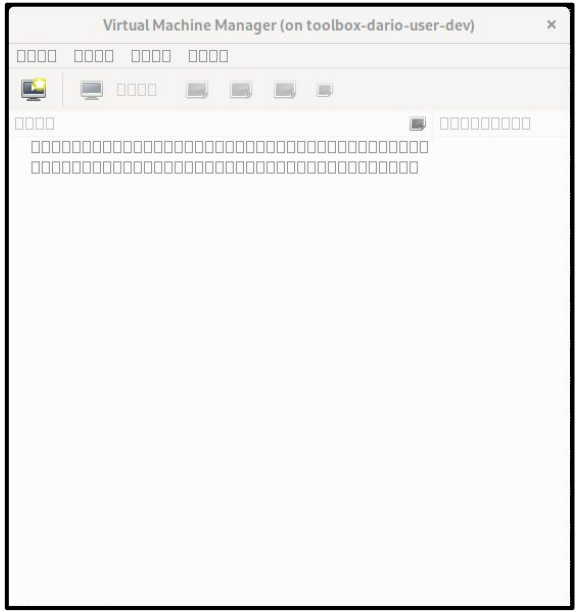
Toolbox Config File

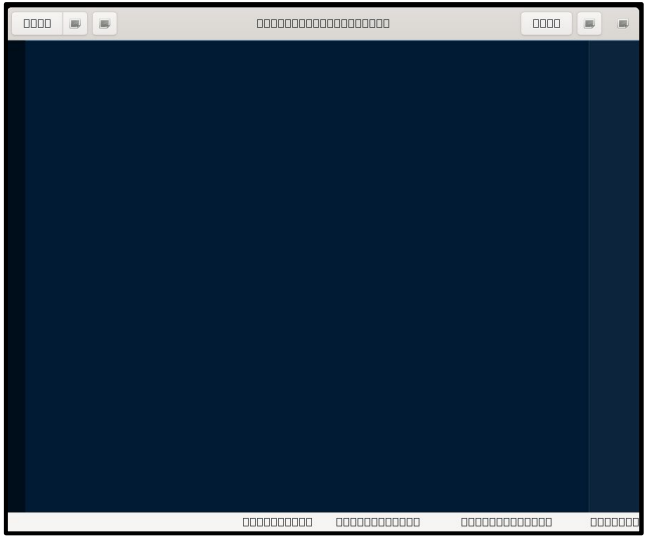
- Some tweaking possible (and more possibilities of tweaking being worked on ;-P)
- Config file:
  - ```
    $ cat ~/.toolboxrc
    REGISTRY=registry.opensuse.org
    IMAGE=opensuse/toolbox:latest
    TOOLBOX_NAME=special-debug-container
    TOOLBOX_SHELL="/bin/bash"
    ```
-
- `TOOLBOX_NAME`: allows to tweak the basename of the toolbox-es
- `REGISTRY + IMAGE`: allows to use a different image for your toolbox-es
  - `toolbox/latest` is based on Tumbleweed
  - You can have Leap toolbox-es
  - You can make toolbox-es from your (Kiwi / OBS built) images
  - You can have toolbox-es based on different distros!
    - (possible already, but needs a little more work for dealing well with `-u`)
    ```

Toolbox for Graphical Apps

- They work too! ⇒ No need installing them in base OS
- `$ toolbot -u`
  `> sudo zypper in gedit virt-manager`
  `> gedit`
  `> virt-manager`

Errr... What?





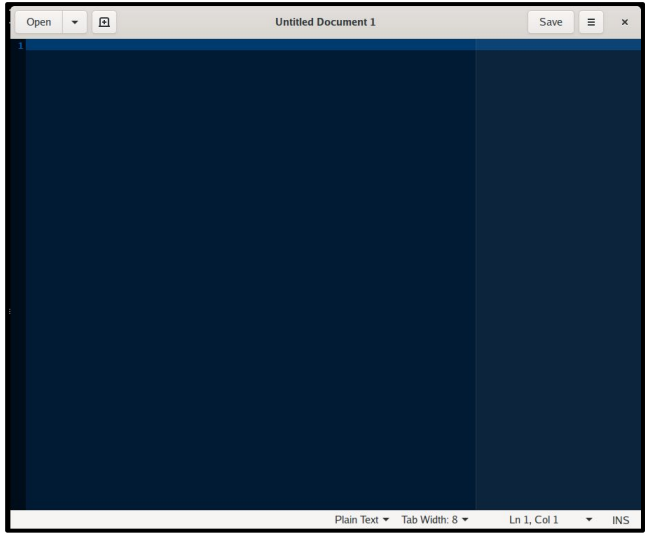
Toolbox for Graphical Apps

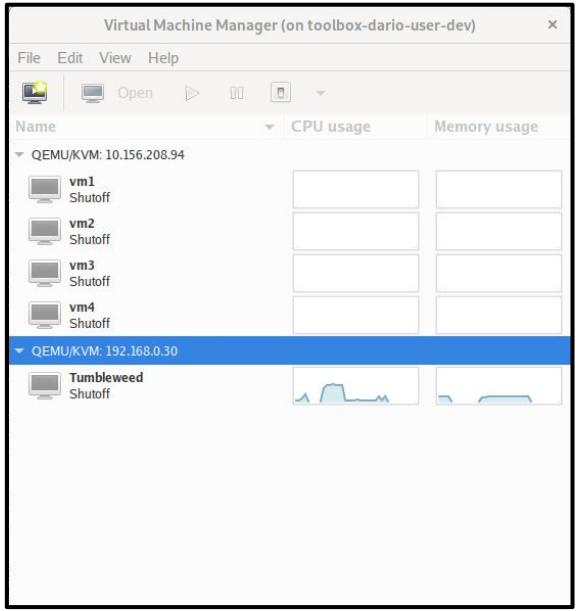
- They work too! ⇒ No need installing them in base OS
- $ toolbot -u

```
> sudo zypper in gedit virt-manager
> sudo zypper in xorg-x11-fonts-core
> sudo zypper in adwaita-icon-theme
> gedit
> virt-manager
```

Ok, now we're Talking

(are we missing some deps somewhere, maybe?)

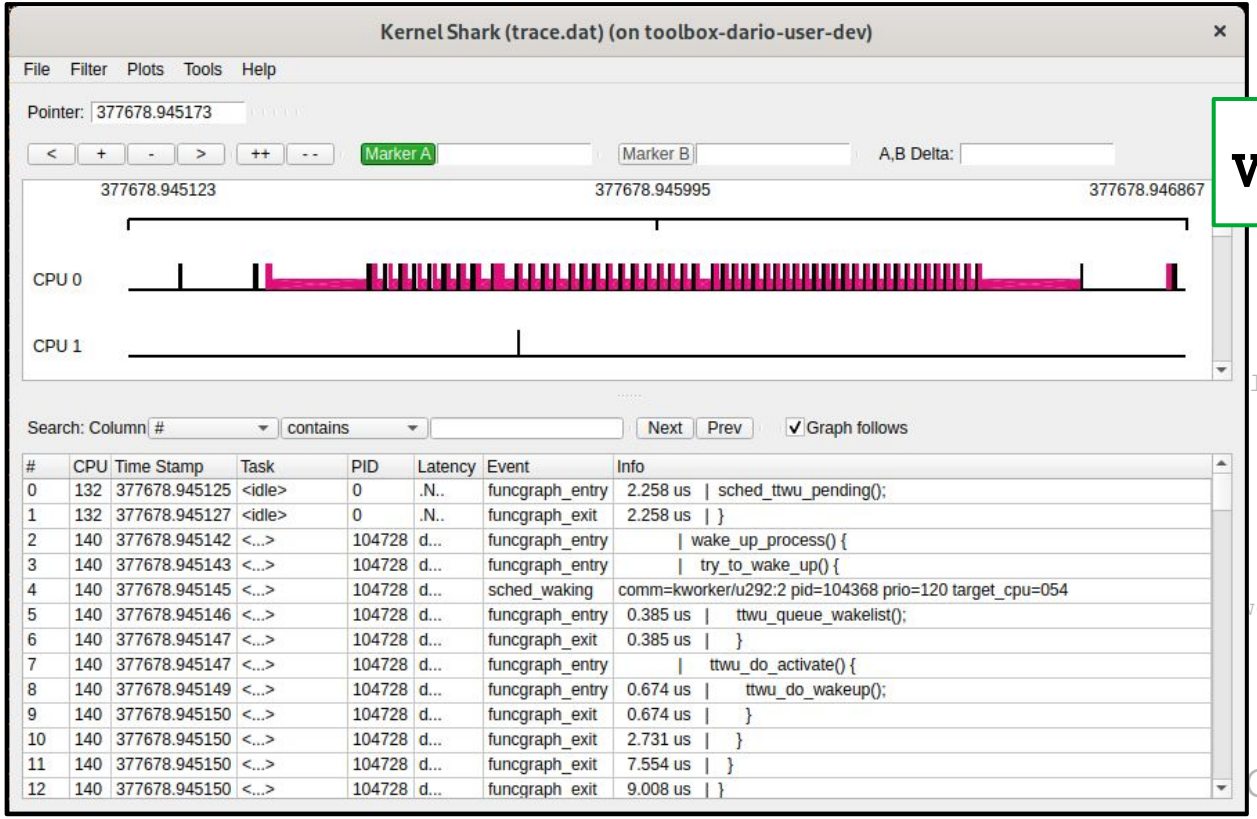




Toolbox for "GL" Graphical Apps

- Kernelshark as an example:
  - ```
    $ toolbox -u
    > kernelshark
    libGL error: No matching fbConfigs or visuals found
    libGL error: failed to load driver: swrast
    QOpenGLWidget: Failed to create context
    QOpenGLWidget: Failed to create context
    qt.qpa.backingstore: composeAndFlush: QOpenGLContext creation failed
    qt.qpa.backingstore: composeAndFlush: makeCurrent() failed
    ...
    ```
- I have NVIDIA with proprietary drivers here. What if…
  - ```
    $ toolbox
    > sudo zypper addrepo https://download.nvidia.com/opensuse/tumbleweed NVIDIA
    > sudo zypper ref
    > sudo zypper in x11-video-nvidiaG05
    ```
- It installs stuff like:
  - `kernel-default-devel`, `nvidia-gfxG05-kmp-default`, `nvidia-glG05` …
  - … Inside the container ?

Toolbox for "GL" Graphical Apps



Well, it works!

led

eedNVIDIA

G05 ...

- ... Inside the container ?

Remember this?

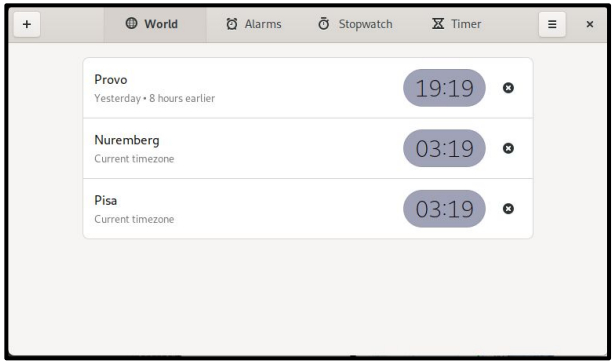
- Virtualization Specialist Sw. Eng. @ SUSE since 2018, working on Xen, KVM, QEMU, mostly about performance related stuff

- Daily activities ⇒ how and what for I use my workstation
  - Read and send emails (Evolution, git-send-email, stg mail, ...)
  - Write, build & test code (Xen, KVM, Libvirt, QEMU)
  - Work with the Open Build Service (OBS)
  - Browse Web
  - Meetings / Video calls / Online conferences
  - Chat, work and personal
  - Occasionally play games
  - Occasional video-editing
  - Maybe scan / print some document

- Can all of the above be done with MicroOS already ?

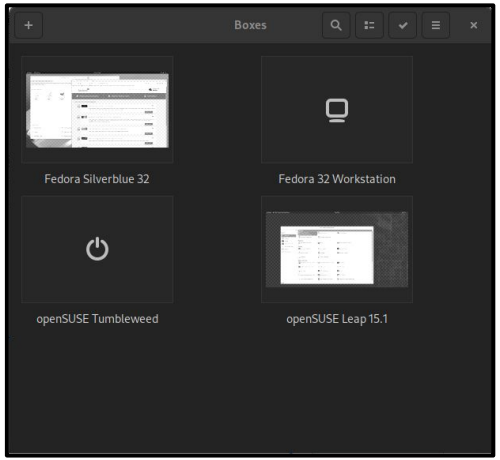
Email, Calendaring, IM & Office Apps

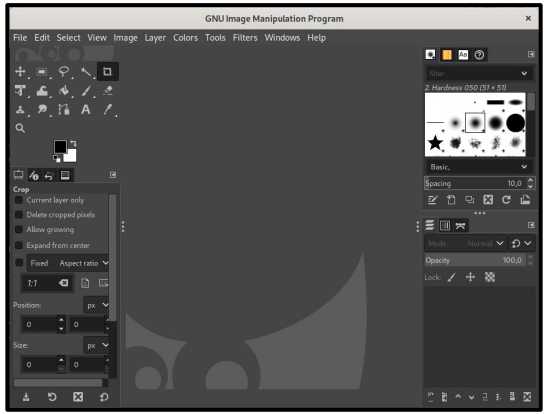
- Mail, calendaring, contacts, ...
  - Evolution, org.gnome.Evolution
  - Calendar, org.gnome.Calendar
  - Contacts, org.gnome.Contacts
  - GNOME Clocks, org.gnome.clocks
  - Weather, org.gnome.Weather
- Documents
  - Evince, org.gnome.Evince
  - GNOME Documents, org.gnome.Documents
  - LibreOffice, org.libreoffice.LibreOffice
- Messaging
  - RocketChat, chat.rocket.RocketChat
  - Pidgin, im.pidgin.Pidgin
  - Telegram, org.telegram.desktop
  - Signal, org.signal.Signal



Editors, Tools, Graphics

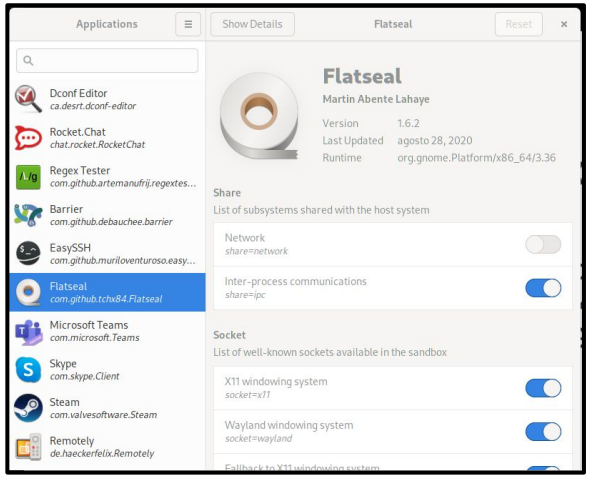
- Editors:
  - Vim, org.vim.Vim
  - Gedit, org.gnome.gedit
  - Setzer, org.cvfosammmm.Setzer
  - Eclipse, org.eclipse.Java
- Graphics
  - GIMP, org.gimp.GIMP
  - Krita, org.kde.krita
  - Blender, org.blender.Blender
- VMs:
  - GNOME Boxes, org.gnome.Boxes
- Tools:
  - Regex Tester,com.github.artemanufrij.regextester
  - Meld, org.gnome.meld
  - Boop-GTK,uk.co.mrbenshef.Boop-GTK

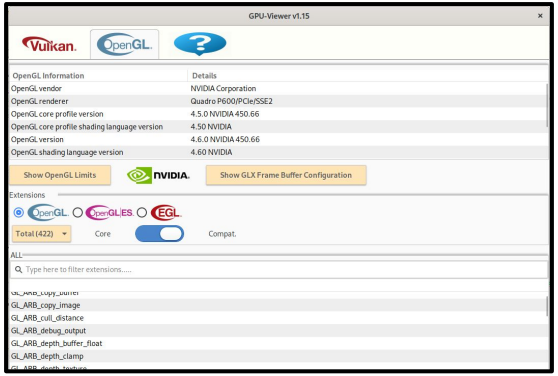


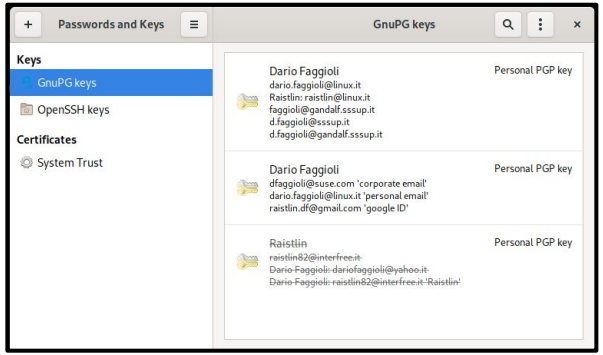


Utilities, Configuration

- Misc utilities:
  - SyncThing, me.kozec.syncthingtk
  - Barrier, com.github.debauchee.barrier
  - Seahorse, org.gnome.seahorse.Application
- Config:
  - Dconf Editor, ca.desrt.dconf-editor
  - Flatseal, com.github.tchx84.Flatseal
  - GPU-Viewer, io.github.arunsivaramanneo.GPUViewer



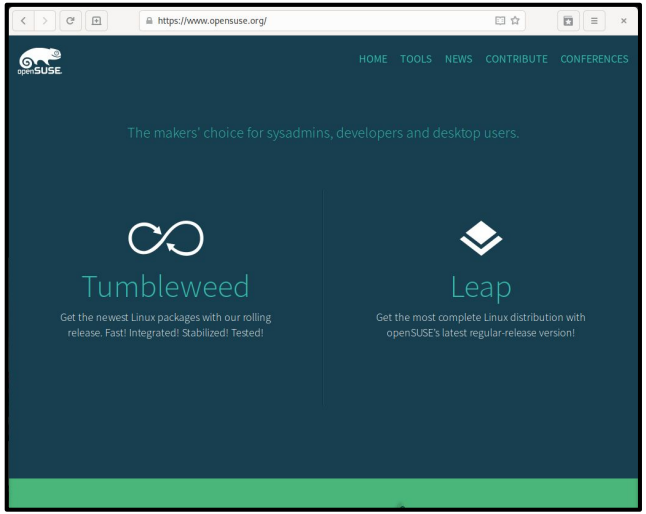


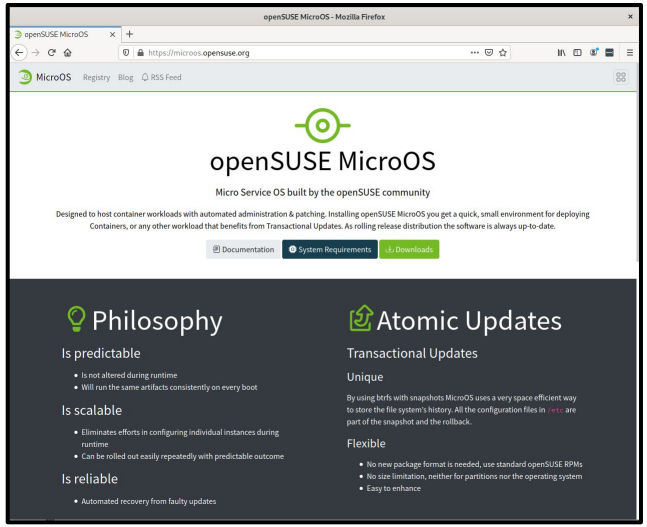


Browsing

- Firefox, from the Flatpak (org.mozilla.firefox)
  - Works great, including video codecs (and without having to add Packman repos)
- Epiphany (GNOME Web, org.gnome.Epiphany)
- Chrome[ium]
  - There is no Flatpak for that yes (but no, but it's being worked on)
  - Installed in the base OS, with `Transactional-update`(and reboot)

- *NB:* GNOME Shell Extension can't be installed from a "Flatpak-ed" browser yet
  - You probably need at least one browser in the base OS (I have Chrome)





Gaming

- Steam, com.valvesoftware.Steam
  - Works great, even SteamPlay/Proton

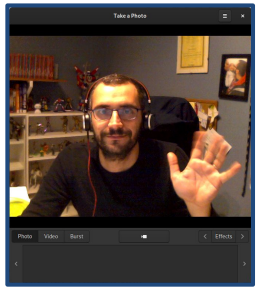
- NVIDIA Drivers
  -
```
$ sudo transactional-update shell
 # zypper ar --refresh https://download.nvidia.com/opensuse/tumbleweed NVIDIA
 # zypper in nvidia-glG05 x11-video-nvidiaG05
 # exit
$ sudo reboot
```
  - Brings in gcc and some development packages (not ideal... Thanks NVIDIA, I guess :-/)

- NB flatpak picked up automatically:
  `org.freedesktop.Platform.GL.nvidia-450-66`
  `org.freedesktop.Platform.GL32.nvidia-450-66`

Video: Viewing, Editing & Codecs

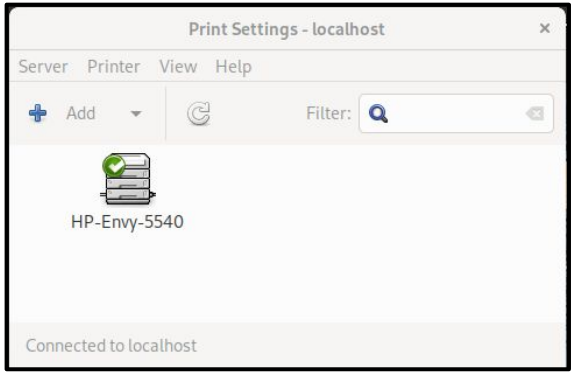
- Remember: we did not add Packman

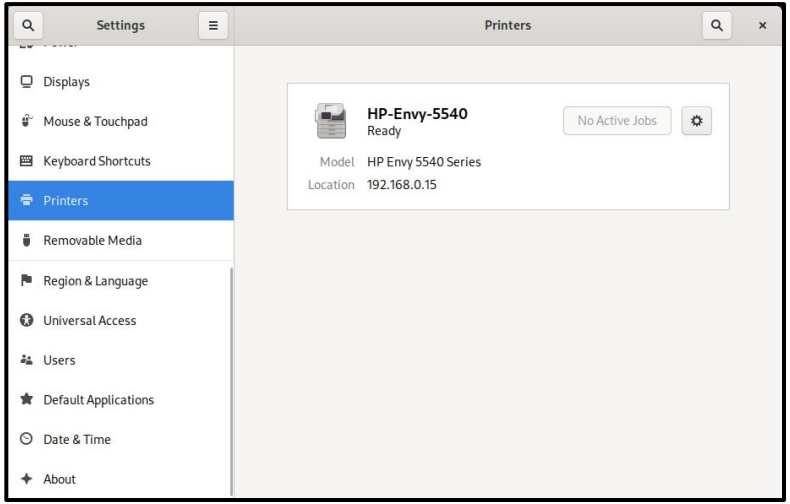
- VLC, org.videolan.VLC
  - Has the proper codecs
- Pitivi, org.pitivi.Pitivi
  - Has the proper codecs
- Openshot, org.openshot.OpenShot
  - Has the proper codecs
- Cheese, org.gnome.Cheese
  - Works well with my webcam



Printing & Scanning

- Printing
  - By default: no cups, no PPDs, …
  - Tried installing (`transactional-update`)
  - It works!
  - OBS request 840921
  - Should just work for everyone now
- Scanning
  - By default: no sane packages
  - Tried installing (`transactional-update`)
  - Flatpak apps (e.g., Paper) don't work yet
  - Still working on it
  - (yeah, most scanners, e.g., from all-in-one printers, have Web-ish interface. But still)





Remember this?^2

- Virtualization Specialist Sw. Eng. @ SUSE since 2018, working on Xen, KVM, QEMU, mostly about performance related stuff

- Daily activities ⇒ how and what for I use my workstation
  - Read and send emails (Evolution, git-send-email, stg mail, ...) **Check**
  - Write, build & test code (Xen, KVM, Libvirt, QEMU)
  - Work with the Open Build Service (OBS)
  - Browse Web **Check**
  - Meetings / Video calls / Online conferences **Check**
  - Chat, work and personal **Check**
  - Occasionally play games **Check**
  - Occasional video-editing **Check**
  - Maybe scan / print some document **Check**

- Can all of the above be done with MicroOS already ?

Hacking On, E.g., QEMU

- Dependencies for building QEMU from sources:
  - `bc bison bluez-devel brlapi-devel bzip2 ccache clang cyrus-sasl-devel flex gcc gcc-c++ gettext-tools git glib2-devel glusterfs-devel gtk3-devel gtkglext-devel gzip hostname libSDL2-devel libaio-devel libasan4 libcap-devel libcap-ng-devel libcurl-devel libfdt-devel libgcrypt-devel libgnutls-devel libjpeg62-devel libnettle-devel libnuma-devel libpixman-1-0-devel libpng16-devel librbd-devel libseccomp-devel libspice-server-devel libssh-devel libssh2-devel libtasn1-devel libudev-devel libxml2-devel lzo-devel make makeinfo multipath-tools-devel ncurses-devel perl pkg-config python3 python3-PyYAML python3-Sphinx rdma-core-devel snappy-devel sparse tar usbredir-devel virglrenderer-devel vte-devel which xen-devel zlib-devel`
  - You don't want to install them with `transactional-update` and reboot
  - Oh, you forgot one / there is a new one needed:
    - Install with `transactional-update` and reboot <u>again</u>?
  - Do try! I promise that it **won't** be funny :-/
- Toolbox to the rescue:
  - `$ toolbox -u -t dev  # -r may or may not be needed. Generally not for building`

    > sudo zypper in *<all_the_dependencies_above>*
    > cd *<your QEMU sources directory in your home (it's there in the toolbox!)>*
    > *<do your changes>*
    > *<build it>*

Working With OBS

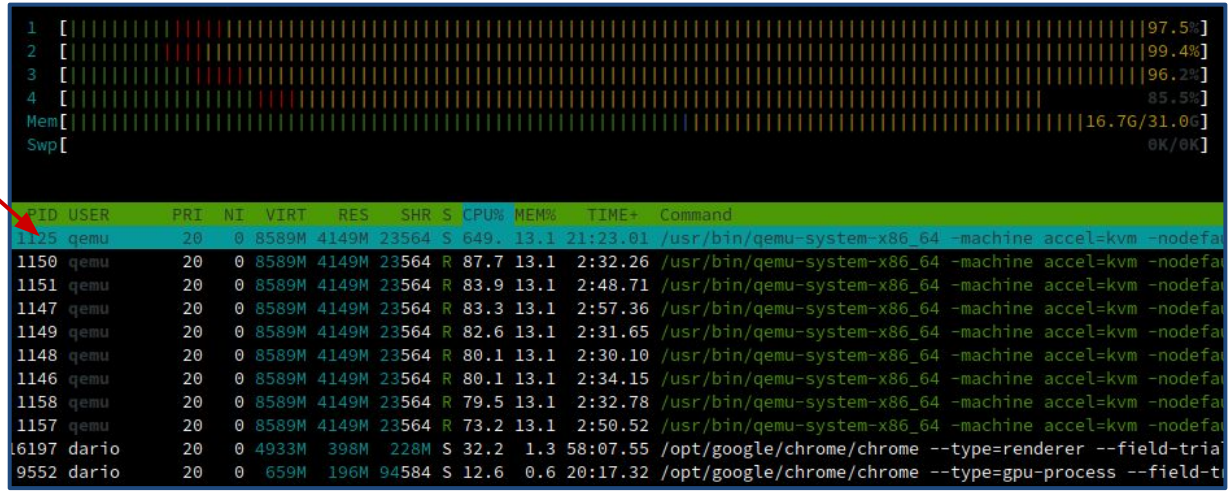
Requires installing packages, using VMs for building, etc.

- `toolbox`, what else ?!
- I need a `-r` one, for mounting filesystems in the build VM (I think)

```
$ toolbox -u -r -t dev
 > zypper ar https://download.opensuse.org/[...]/openSUSE_Tumbleweed/openSUSE:Tools.repo
 > zypper in cpio osc build [...]
 > osc mkpac / co / vc
 > [...]
 > osc vc
 > osc build --vm-type=kvm
 > osc commit
```

Building outside of VMs currently not working

- (but it's better to build In VMs anyway...)



Working on Libvirt and QEMU

Real scenario:

- I make a change in QEMU
- I make a change in Libvirt
- I want to build **and also test** my changes

How it works for me:

1. I work on the changes themselves inside my development toolbox
2. Still in there, I start my modified `libvirtd`, make it listed on TCP (no socket activation)
   -
     ```
     $ toolbox -r -u -t dev
      $> <work on QEMU> && <build QEMU> && <install my QEMU>
      $> <work on libvirt> && <build libvirt> && <install my libvirt>
      $> sudo ./build/src/virtlogd &
      $> sudo ./build/src/libvirtd -v -l
     ```
3. From (either the same or a different) toolbox I start `virsh` and/or `virt-manager` and connect to my modified libvirtd
   -
     ```
     $ toolbox -u        # this is my user/dev apps toolbox
      $> virsh --connect=qemu+tcp://localhost/system
      $> virsh # list --all
      Id   Name         State
      ----------------------------
       -    Tumbleweed   shut off
     ```

Working on Libvirt and QEMU

VM started by `virt-manager` in the `toolbox -u`. It's actually running inside `toolbox -r -u -t dev`, using my modified Libvirt and QEMU

Virt-manager running in my `toolbox -u` and connecting to `libvirtd` in the other toolbox

`libvirtd` running in a tmux session running inside my `toolbox -r -u -t dev`

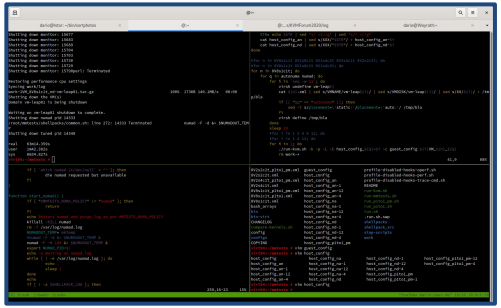
A Day in the Life of a Developer who Uses MicroOS as Workstation...

- I hacked on `toolbox` in such a way that:
  - With `toolbox -u` and/or `toolbox -r -u`:
    - You have your user inside the `toolbox`
    - You have your home, in its usual place
    - Your files have the proper owner, group, permissions
    - You reach your SSH agent (running on the host)
    - You can launch graphical apps
    - You have `sudo`
- Also:
  - With `-t`, you can have multiple toolbox-es, e.g.:
    - One per each project you're working on?
    - One for work projects and one for home projects?
    - One for ... ...
- IOW: It's a quite cool development environment
  - I adopted it even on Tumbleweed, <u>before</u> moving to MicroOS!

A Day in the Life of a Developer who Uses MicroOS as Workstation...

My morning routine:

1. Wake-up / wake-up the kids / have breakfast with them / bring them to school ;-P
2. Brew some more coffee
3. Open `gnome-terminal`
4. Enter a `toolbox -r -u -t dev` (brings me inside `toolbox-dario-user-dev`)
5. Start `tmux` inside that toolbox
   a. all panes will be inside the toolbox already!
   b. Stay in there until end of day
6. Maybe, enter my `toolbox -u` (brings me inside `toolbox-dario-user`)
   a. Use some apps from there that I need but don't want to install in the base OS
7. <<Hey network to the office seems slow!>>
   a. $ toolbox -r
      #> zypper in traceroute
      #> traceroute www.suse.com
8. ... ...



Some Stats

- RPM Packages
  - On my MicroOS Desktop: ~1000
    - But I've done a few experiments, added stuff, ...
  - In a development toolbox on my MicroOS Desktop: ~1300
    - No Desktop Environment packages
    - But with some GUI apps & libs
  - On a stock Fedora Silverblue: ~1200
  - On a Tumbleweed box I also have: ~3500
    - Not used for development (so no -devel pkgs)
    - A few apps as flatpak there as well
- Flatpaks
  - Apps installed: 68
  - All flatpaks (including runtimes): 110
  - Disk space: 12 GB

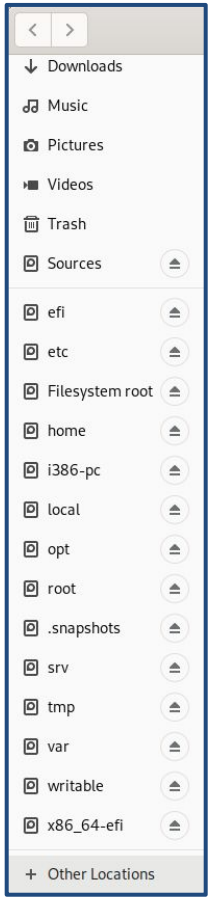
Example: Nautilus, Trash, USB Keys, From "not working" to "it works!"

Problem:

- Nautilus was looking weird (showing all BTRFS subvolumes, etc)
- Trash was not working
  - Files going in `.local/share/Trash`
  - Not being shown when clicking on "Trash" icon
- USB keys not being (auto)mounted, `/run/media/<user>`not appearing

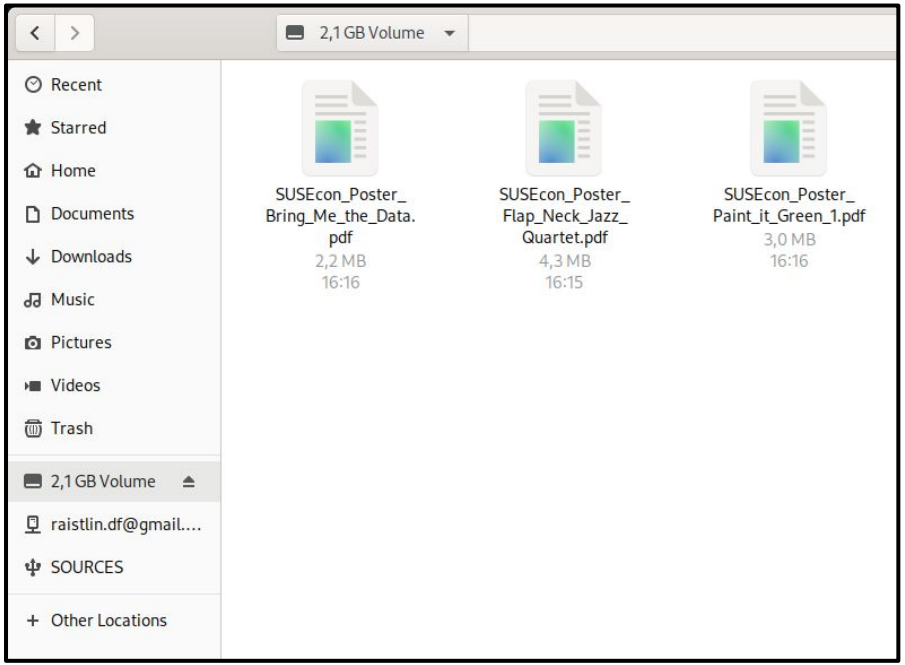
Let's try something...

- Mounting USB keys in `/run/<user>/<volume>`⇒ it's udisks2
- On a Tumbleweed:
  - `ps aux | grep udisk` ⇒
    `/usr/libexec/gvfs/gvfs-udisks2-volume-monitor`
    `/usr/libexec/udisks2/udisksd`
  - `rpm -qf` ⇒
    `gvfs-backends-1.44.1-2.4.x86_64`
    `udisks2-2.8.4-1.3.x86_64`



Example: Nautilus, Trash, USB Keys

- Let's fix it!
  - `$ sudo transactional-update pkg in gvfs-backends udisks2`
    `$ sudo reboot`
- It works!
- OBS request 840921
- Should just work for everyone now



Conclusions

- Using MicroOS as a Desktop / Workstation is already possible, IME
  - Requires some manual fiddling with configurations, but it's mostly something done right after install and then forgotten
- It's pretty comfortable to use
  - In fact, I started using it just as an experiment. But I'm definitely staying!
- It pushes you to do things properly
  - No quick-&-dirty hacks, like symlinking that library to make that other app work
  - Results is a much cleaner and stable system
- It's not perfect yet:
- It asks for a password too many times, post install manual config steps should be done automatically, we may want to have a GUI way for updating the base OS (like Silverblue does), etc.
- **It needs you!** As a user, as a tester, as a contributor, as an "evangelist", as...
  Well, <u>whatever you want to do, you're welcome</u>!

About Myself

- Ph.D on Real-Time Scheduling, SCHED_DEADLINE
- 2011, Sr. Software Engineer @ Citrix
  The Xen-Project, hypervisor internals,
  NUMA-aware scheduler, Credit2 scheduler,
  Xen scheduler maintainer
- 2018, Virtualization Software Engineer @ SUSE
  Still Xen, but also KVM, QEMU, Libvirt;
  Scheduling, VM's virtual topology,
  performance evaluation & tuning

Thank You