Containerized Desktop

fedora

Silverblue

Matthias Clasen, Josh Berkus
SCALE 2019
Building Container Desktops

- Docker
- RancherOS
- Atomic Workstation
- CoreOS desktop
What we have now: Silverblue

- An established project
- A new name and logo
- An image-based OS
- Trusted Fedora content
Cool OS, but what about the apps?

- Flatpak - Containers for desktop apps
- Independent from the OS
- Sandboxed
- Flathub - An app store for flatpaks
Apps are fine, but I need tools!

- Toolbox - Friendly pet containers
- Provides a shell prompt “with dnf”
- Uses podman underneath
- Shared with CoreOS
Use Cases

fedora

Silverblue
Why is this cool for Developers?

- Isolation and decoupling
- Security & Privacy
- Fearless Updates
- Rollbacks!
- Container Tools
Isolation & Decoupling

No more clobbering your dependencies!

- pyGame
  - requests 2.10.2

- pyCharm
  - requests 2.20.1

- Host OS
  - requests 2.21.1
$ flatpak install visual
Looking for matches...
Found similar ref(s) for ‘visual’ in remote ‘flathub’ (user).
Use this remote? [Y/n]: y
Similar refs found for ‘visual’ in remote ‘flathub’ (user):

1) app/com.visualstudio.code/x86_64/stable
2) runtime/com.visualstudio.code.oss.Tools/x86_64/stable
3) app/com.visualstudio.code.oss/x86_64/stable

Which do you want to use (0 to abort)? [0-3]: 1

com.visualstudio.code permissions:
  ipc network pulseaudio ssh-auth
  x11 dri devel file access [1]

[1] host, xdg-config/kdeglobals:ro
[3] proprietary

<table>
<thead>
<tr>
<th>ID</th>
<th>Arch</th>
<th>Branch</th>
<th>Remote</th>
<th>Download</th>
</tr>
</thead>
<tbody>
<tr>
<td>com.visualstudio.code</td>
<td>x86_64</td>
<td>stable</td>
<td>flathub</td>
<td>&lt; 1.6 MB</td>
</tr>
</tbody>
</table>

Proceed with these changes to the user installation? [Y/n]: 
darktable manages your digital negatives in a database and lets you view them through a lighttable. It also enables you to develop raw images and enhance them in a darkroom.

Other modes besides lighttable and darkroom are a map for geotagging, tethering, print and a slideshow.

darktable supports most modern cameras’ raw formats, and does not require a plugin.

Permissions

Network
Can communicate over the network

Devices
Can access system device files

File system
Can view, edit and create files

Settings
Can view and change any settings

Legacy display system
Uses an old, insecure display system

Details

Localized in your Language
Documentation
Release Activity
System Integration
Sandboxed
Supporting developers

- Container tools: docker / podman / buildah / skopeo
- Mini-openshift / oc / flatpak-builder
- Tools for ‘pet’ containers: toolbox (soon)
- Terminal support for containers (eventually)
Advantages for Admins

- Faster installs and updates
- Automating Updates
- Locking down installability
- Customized images (in the future)
walk-through
fedora
Silverblue
First impressions

$ dnf install gtk3-devel
bash: dnf: command not found

$ mount | grep /usr
/dev/mapper/fedora on /usr type ext4 (ro,relatime,seclabel)

$ rpm -q kernel
kernel-4.18.0-0.rc1.git4.1.fc29.x86_64
Learning to walk

$ rpm-ostree status
State: idle; auto updates enabled (check; timer inactive)
Deployments:
● ostree://onerepo.fedora/rawhide/x86_64/workstation
   Version: Rawhide.20180623.n.0 (2018-06-23 09:14:16)
   Commit: 942d0fa0d62ed7f260b6e9a833c02a7f5d9bcdd...
...

$ rpm-ostree upgrade
1 metadata, 0 content objects fetched; 569 B transferred in 1 seconds
No upgrade available.
Learning to walk

$ rpm-ostree install gdb

$ systemctl reboot

Can still install rpms → package layering
Learning to walk

```bash
$ buildah from fedora
$ buildah run fedora-working-container bash

$ dnf install /usr/bin/gtk3-demo

$ gtk3-demo
(gtk3-demo:23022): Gtk-WARNING **: cannot open display:
```
Taking flight

A ready-made ‘toolbox’ container:

$ toolbox create

toolbox: creating container fedora-toolbox-mclasen:29 [==> ]

$ toolbox enter

▶[mclasen@toolbox ~]$

$ gtk3-demo --run theming_style_classes
Other alternatives

- flatpak-builder
- GNOME Builder

$ flatpak install flathub org.gnome.Builder
Not all roses

Rawhide is still rawhide:

- broken composes
- failing boots

Booting the previous image is easy → **fearless updates**
Not all roses

gnome-shell[2934]: Failed to create backend: Failed to initialize renderer: Missing extension for GBM renderer: EGL_KHR_platform_gbm

Asked to provide eglinfo output, I booted into runlevel 3 and:

```bash
$ rpm-ostree install egl-utils

$ systemctl reboot
```
Not all roses

Now, at the boot prompt, I was faced with the choice between

- the broken image
- the broken image + egl-utils

🤔
Recovery

$ ostree log fedora/rawhide/x86_64/workstation
commit fa09fd6d2551a501bcd3670c84123a22e4c704ac30d9cb421fa76...
...
<< History beyond this commit not fetched >>

# ostree pull --depth=5 onerepo fedora/rawhide/x86_64/workstation

# ostree admin deploy 76723f34b8591434fd9ec0
Future plans

- Nvidia driver support
- Support for rpm-ostree, flatpak in GNOME Software
- A first toolbox release
- Flatpaks available out of the box
- Much faster downloads

⇒ Coming with Fedora 30 in May ⇐
Future plans

- Terminal integration for toolbox
- Ready-made toolboxes, e.g. TensorFlow
- Containerized IDEs
- Containerize ‘difficult’ apps: chrome, virtualbox
References

Silverblue website: silverblue.fedoraproject.org

Forum: discussion.fedoraproject.org

Flathub: www.flathub.org

mclasen@redhat.com    josh@berkus.org
questions?

fedora

Silverblue
Privacy & Security

Installing in system:
org.freedesktop.Sdk/x86_64/18.08        flathub 33a601fe2c6b
org.freedesktop.Sdk.Locale/x86_64/18.08 flathub 804c56ea7c0b
io.atom.Atom/x86_64/stable              flathub 34f8ce7e4577
permissions: ipc, network, pulseaudio, ssh-auth, x11, devices
file access: host, xdg-config/kdeglobals:ro
dbus access: com.canonical.AppMenu.Registrar,
com.canonical.AppMenu.Registrar.*, org.freedesktop.Flatpak,
Is this ok [y/n]: n