

A  
beginners  
introduction to  
**Pro Audio**  
on  
**Linux!**

in 2022

**Sam Thursfield**



# Goals

- Wider understanding of Pro Audio use case within Linux apps community
- Share some good news
- More music!

# Who does “Pro Audio”?



- Recording / live sound engineers
- Composers (film music, game music, songs, ...)
- Performing musicians
- Radio broadcasters
- ... anyone who is not a 'consumer'

# What software do they use?

1. Digital Audio Workstation
2. Software instruments and effects
3. Hardware/software bridge (MIDI, ADC/DAC, ...)



[Request new password](#)

Get the latest release using an Invoice ID (found near the bottom of the email you received when you last paid for Ardour).

15h

Apr 21 \$25.00



Vox

Active

Channel All 1

P. Bend PB → Expression -2 2

De-Esser removal removing random stuff! rve

Chorus EQ Presswerk Uhbk-Q 1-NTS-2-3git

Uhbk-A AUTO PRE POST

Resound AUTO PRE POST

ODC Frosty AUTO PRE POST

ODC Careful b... AUTO PRE POST

Twangstrom AUTO PRE POST

No input Master -9.7 dB

VOX + DE-ESSER + REMOVAL + CHORUS EQ + PRESSWERK + UHBK-Q

Amount 3.38 kHz

Shift 0.00 st Gain -0.0 dB Range ±10 ±20 ±30

Low-cut 6° 156 Hz -6.2 dB 1.13

5 - Bell 1.21 kHz +1.6 dB 3.37

Threshold 1 -24.54

Threshold 1 -24.54

Threshold 2 -24.54

Ratio 1 3.91

Ratio 2 3.91

Soft Knee 1 25.76

1 Bottom 1 Gain 1 Freq 1 Gain

2 Freq 2 Gain Output

Git main

CHOWTapeModel On/Off

Chorus EQ On/Off

GUITAR L RUST L... S M

GUITAR R RUST L... S M

GUITAR R TOMA 2 S M

Extra git pick S M

Extra git slide S M

Mixer Resound

Vox S M

Presswerk Output Gain 1

Mixer ODC Frosty

OP1 organ S M

OP1 organ #1 OP1 organ #2 OP1 organ #3 OP1 organ #4

Bitwig

GUITAR L RUST IN PEACE

GUITAR R RUST IN PEACE

GUITAR R TOMA 2

GUITAR L F

GUITAR R LUST IN PEACE


GUITAR R RUST IN PEACE

GUITAR R TOMA 2

OP1 organ #1 OP1 organ #2 OP1 organ #3 OP1 organ #4



FLATHUB




# Bitwig Studio

Modern music production and performance

INSTALL

Make sure to follow the [setup guide](#) before installing




Bitwig Studio is a digital audio workstation (DAW) that inspires you to take greater control of your music, giving you access to every aspect of your production. Streamline your creative process and quickly evolve your ideas into complete songs, tracks, and compositions. Record and arrange, improvise and perform, or do it all at once. Design sounds. Build instruments.

Make music

Search

Buy Local

elow.



## Bitwig Studio

Get the complete Bitwig Studio package with 130+ instruments, effects and modulators, The Grid with 150+ modules, and other creative tools.

**399 USD / 399 EUR**

Buy

# Digital Audio Workstation

It's a big and complicated app that does everything.

“Big name” DAWs:

- Ableton Live, [Ardour](#) (Harrison Mixbus), [Bitwig Studio](#), Cubase, Logic, Pro Tools, REAPER,...

Open source DAWs: Ardour, Zrhythm, ...

Other cool audio apps: [bespoke.synth](#), [ossia](#), [Pure Data](#), [VCV Rack](#), ...

A DAW can host **plugins**...

# Instruments and effects



ZynAddSubFx

U-he Zebra.



Simple interface! MIDI/audio in, audio out; UI toolkit, disk access.  
(No network access, no printing, no /dev, no privileged operations, ...)

# Effect plugins running in Ardour



# Instruments and effects

Some open source plugin developers:

[Calf Studio Gear](#), [Chowdury DSP](#), [Dexed](#), [Guitarix](#), [x42](#),...

- Packaged in mainstream distros as packages.

Some proprietary plugin devs supporting Linux:

[Audio Damage](#), [Loomer](#), [Overtone DSP](#), [Pianoteq](#), [u-he](#)

- Distributed as binaries, to install in \$HOME
- Occasional ABI breakage issues – “libcurl-gnutls.so.4 missing” a common theme



# Instruments and effects

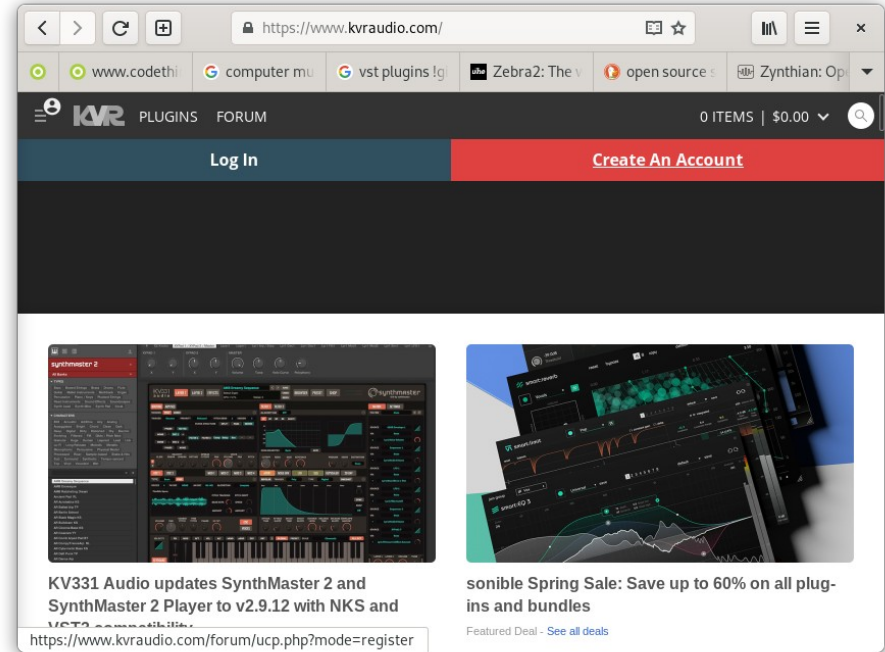
KVR Audio database:

- **10,000 plugins** (4.5K instruments, 6.5K effects)
- 3.4K are “free” (zero-cost)
- **500** are available on Linux\*

*\*This is an underestimate*

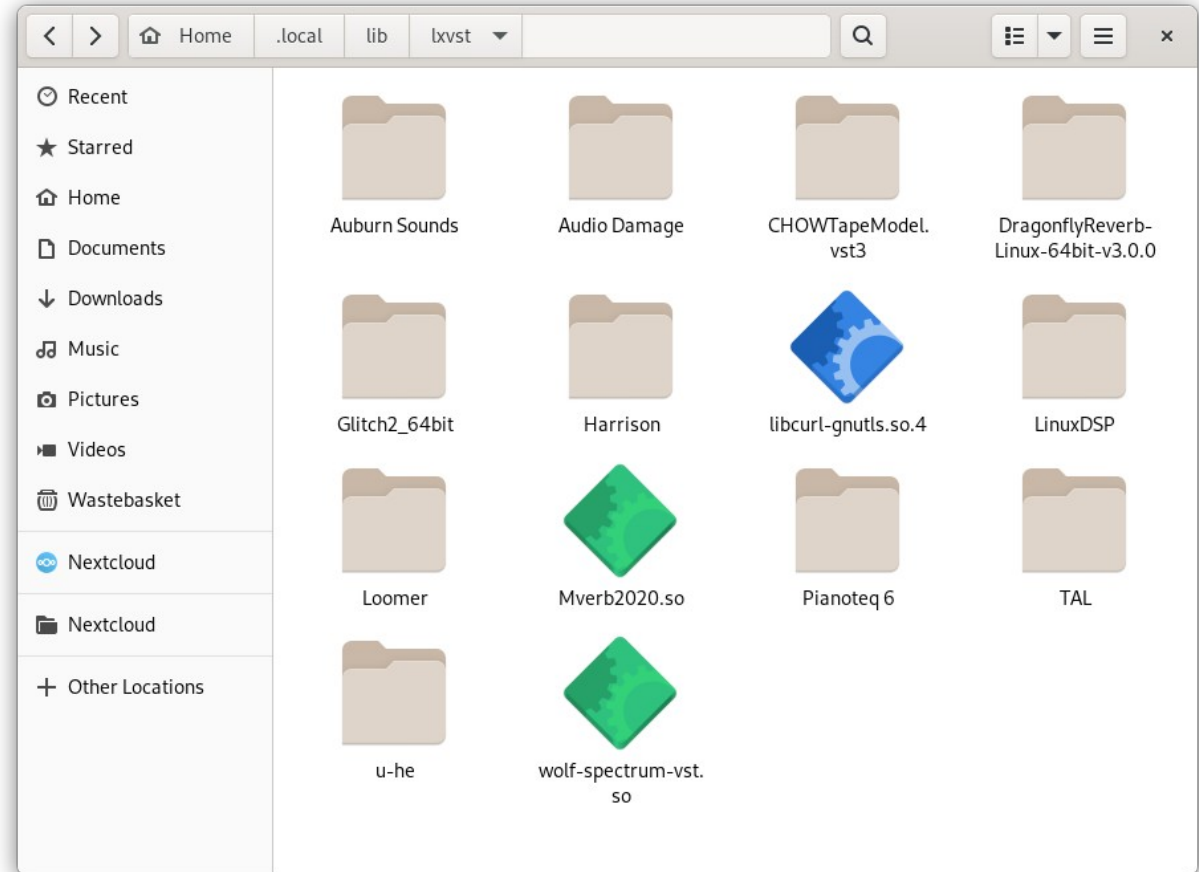
Distributed as **binary plugins**

- **VST** (Win,Mac,Linux)
- LADSPA, LV2 (common on Linux only)
- Clap (???)



# State of the art of plugin distribution:

- download as a .zip
- unpack into ~/.vst

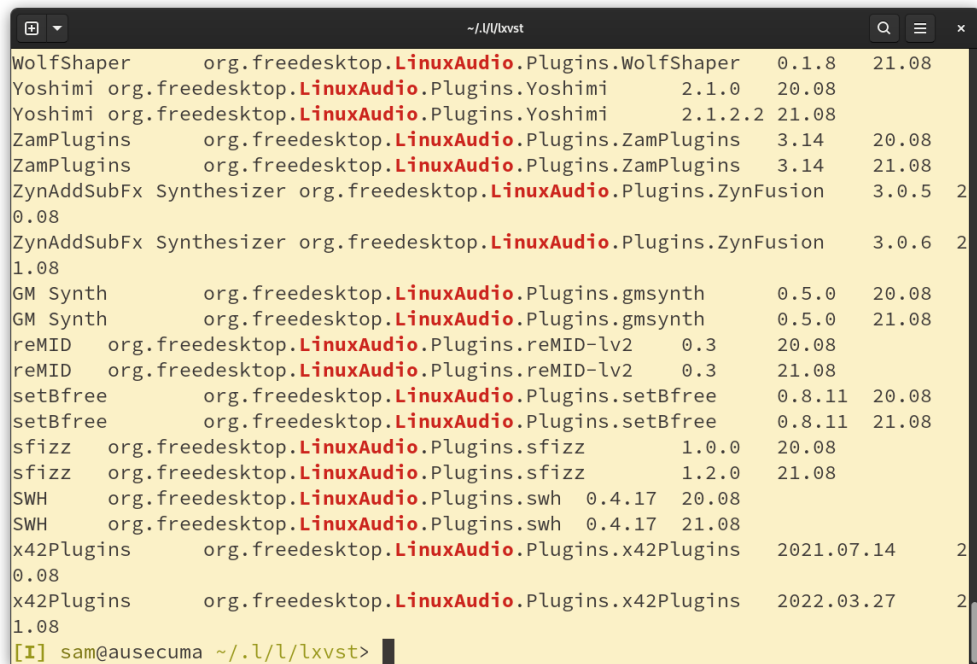




# Packaging plugins as Flatpak extensions

- `org.freedesktop.LinuxAudio.Plugins.*` namespace - ~38 plugins.
- Plugins must use same runtime as the plugin host (DAW) – `org.freedesktop.Platform`
- Installed via CLI - **invisible in Flathub frontend**

Hubert Figuiere doing basically all the work here



```
~/.l/l/vst
WolfShaper      org.freedesktop.LinuxAudio.Plugins.WolfShaper  0.1.8  21.08
Yoshimi org.freedesktop.LinuxAudio.Plugins.Yoshimi  2.1.0  20.08
Yoshimi org.freedesktop.LinuxAudio.Plugins.Yoshimi  2.1.2.2 21.08
ZamPlugins      org.freedesktop.LinuxAudio.Plugins.ZamPlugins  3.14   20.08
ZamPlugins      org.freedesktop.LinuxAudio.Plugins.ZamPlugins  3.14   21.08
ZynAddSubFx Synthesizer org.freedesktop.LinuxAudio.Plugins.ZynFusion  3.0.5  2
0.08
ZynAddSubFx Synthesizer org.freedesktop.LinuxAudio.Plugins.ZynFusion  3.0.6  2
1.08
GM Synth        org.freedesktop.LinuxAudio.Plugins.gmsynth  0.5.0  20.08
GM Synth        org.freedesktop.LinuxAudio.Plugins.gmsynth  0.5.0  21.08
reMID org.freedesktop.LinuxAudio.Plugins.reMID-lv2  0.3    20.08
reMID org.freedesktop.LinuxAudio.Plugins.reMID-lv2  0.3    21.08
setBfree        org.freedesktop.LinuxAudio.Plugins.setBfree  0.8.11 20.08
setBfree        org.freedesktop.LinuxAudio.Plugins.setBfree  0.8.11 21.08
sfizz org.freedesktop.LinuxAudio.Plugins.sfizz  1.0.0  20.08
sfizz org.freedesktop.LinuxAudio.Plugins.sfizz  1.2.0  21.08
SWH org.freedesktop.LinuxAudio.Plugins.swh  0.4.17 20.08
SWH org.freedesktop.LinuxAudio.Plugins.swh  0.4.17 21.08
x42Plugins      org.freedesktop.LinuxAudio.Plugins.x42Plugins  2021.07.14 2
0.08
x42Plugins      org.freedesktop.LinuxAudio.Plugins.x42Plugins  2022.03.27 2
1.08
[I] sam@ausecuma ~/.l/l/vst>
```

# Bringing more plugins to Linux...

Most plugin users care about:

- Price
- Does it sound good (and look cool)
- CPU usage.

Most plugin developers care about:

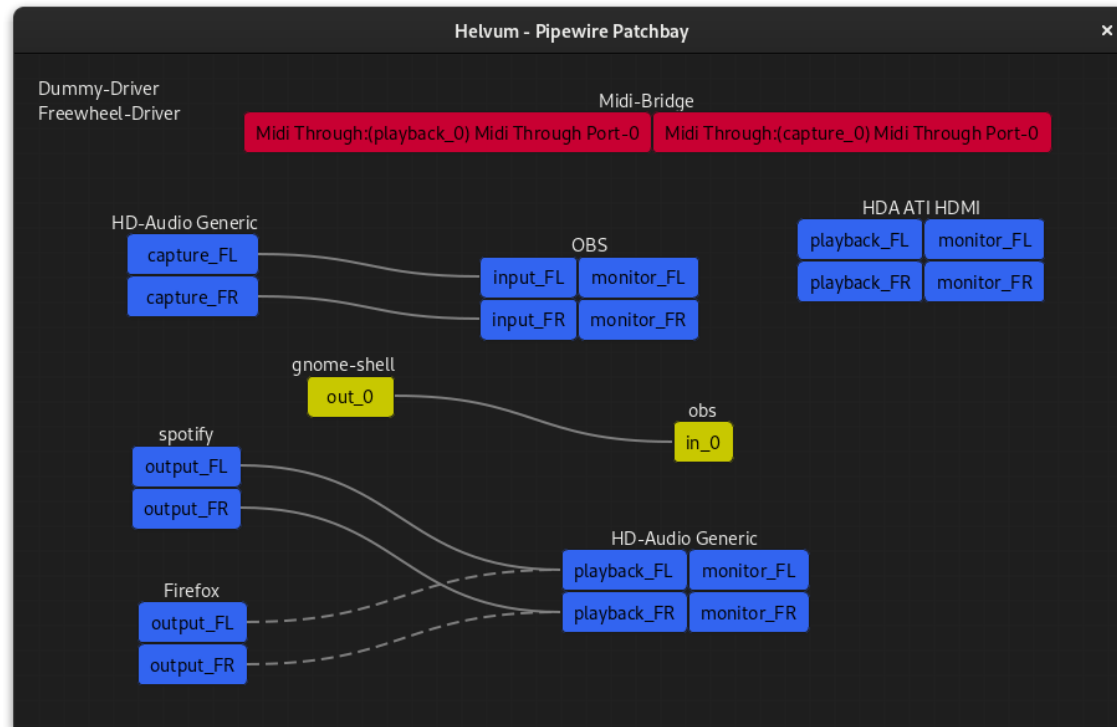
- Getting **paid**, avoiding piracy
- Ongoing support costs
- Binary that works everywhere (*looking at you, libcurl-gnutls.so.4*)
- Protecting their **special DSP algorithm that makes it sound so good**.

Almost nobody cares about:

- Inspecting and modifying the source code

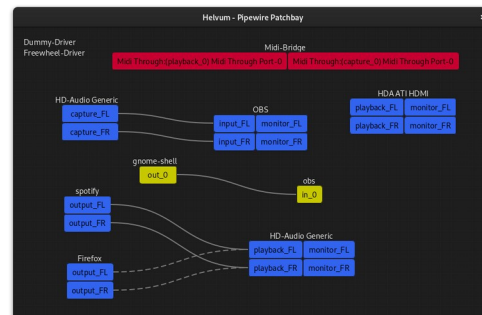
# Getting audio out of the computer

Pipewire is amazing.



# Getting audio out of the computer

- PipeWire taking over role of JACK server.
- Stable Flatpak-safe API
- Pro audio apps continue use JACK API via libpw-jack to talk to PipeWire. ([ref](#))
- Many routing options – ‘helvum’ tool useful to visualize.



# In closing...

- Keep up the great work!
- Celebrate the existing success stories:
  - ISVs are here on Linux, making great software and earning a living.
  - Pro audio users are no longer tied to Mac & Windows.
- Flathub thoughts...
  - Separate “Audio/video production” and “Audio/video player” categories?
  - Display plugins

**Thanks!**

**Sam Thursfield**

