# FOSDEM Videobox 2.5

Somehow it works

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# What is this all about?

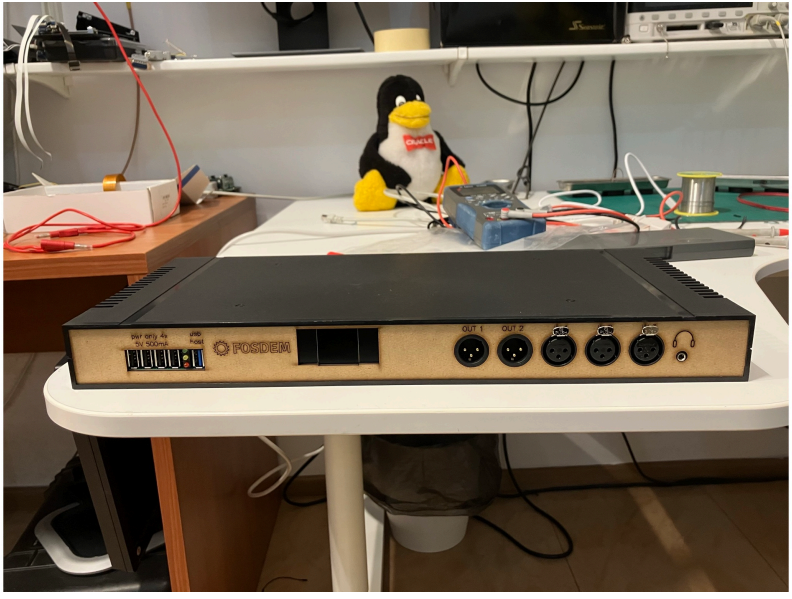



Figure 1: box1

# TL; DR

- https://github.com/FOSDEM/video
- https://github.com/FOSDEM/infrastructure

# It’s not rocket surgery!

- I have this slide also at the end
- I had this discussion with some people here, so:
- **This is not hard**
- We’re here, willing to show everyone the sources and how trivial most things are
- The box does not bite, and mostly doesn’t explode
  - (but don’t put your fingers in the fans)
- We’ve made it hackable, and it should be hacked.

# Don’t be afraid to experiment

Figure 2: contraption2

## Seriously, don't be afraid

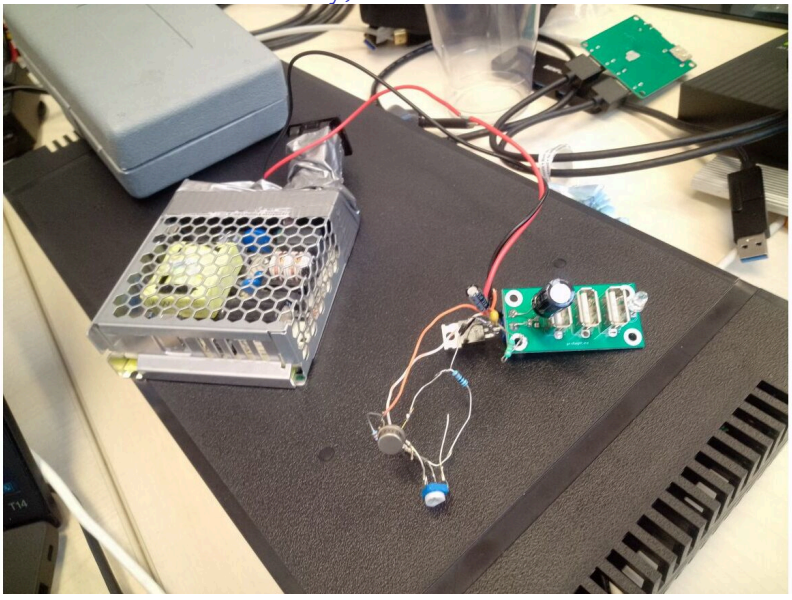


Figure 3: contraption

# What's FOSDEM

- Free and Open-source Developer's European Meeting
  - I am not resposible for the name, I'm just a volunteer :)
- 8000+ visitors
- 2 days
- 1100 talks
- 30 parallel tracks
- less than 30 video volunteers :)

# OK cool, but what's the problem?

- Remember the previous slide? 30 video volunteers and 30 tracks in parallel?
- tracks spread over an area of more than 160.000 square meters (1,8 million square feet)
- access to the venue only the day before, for about 10 hours
- on a shoestring budget

*So:*

- We needed something which can be set up at scale
- We need full remote control
- We need something we can plop down and Just Work
- We need something cheap

# How it looks from afar

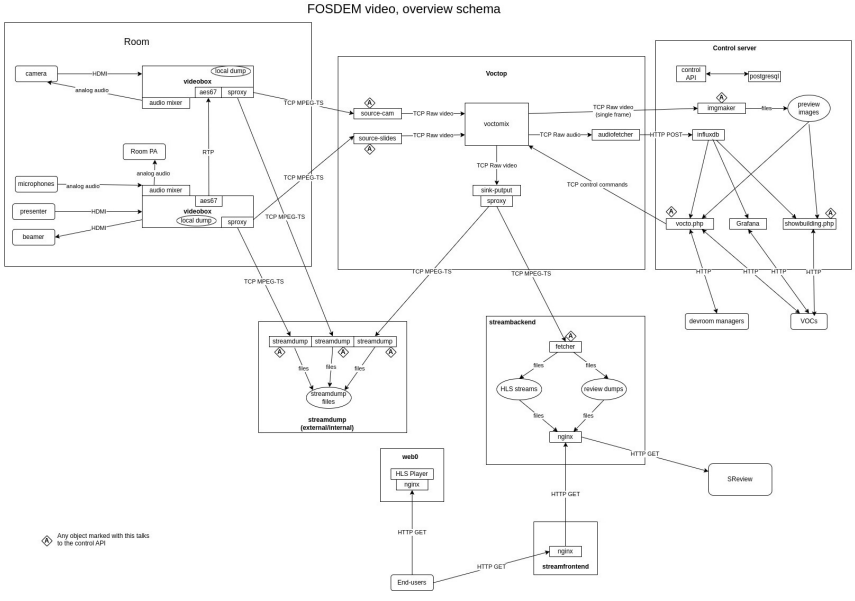



Figure 4: schema

# High performance video-mixing server room

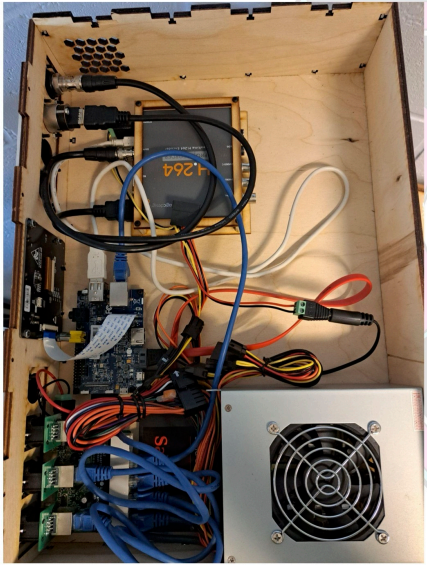
Figure 5: srvroom

# Size of code that runs most of this

```
Totals grouped by language (dominant language first):
sh:              546 (36.62%)
python:          372 (24.95%)
javascript:        294 (19.72%)
php:             229 (15.36%)
perl:             50 (3.35%)

Total Physical Source Lines of Code (SLOC)                = 1,491
```

# Short history - Videobox 1



Video Boxes

# Short history - Videobox 2

Figure 7: vbx2

# Short history - fun on the horizon

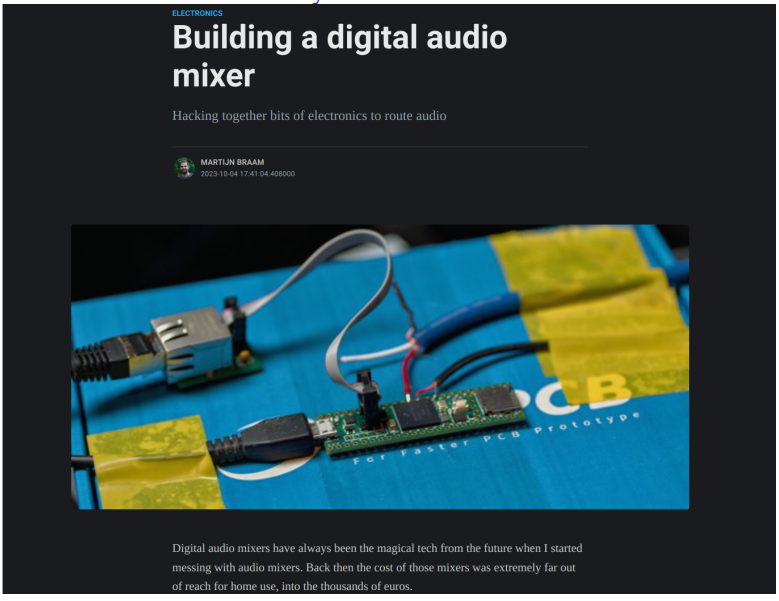



Figure 8: amixer

# Our senior staff

## And now, videobox 2.5

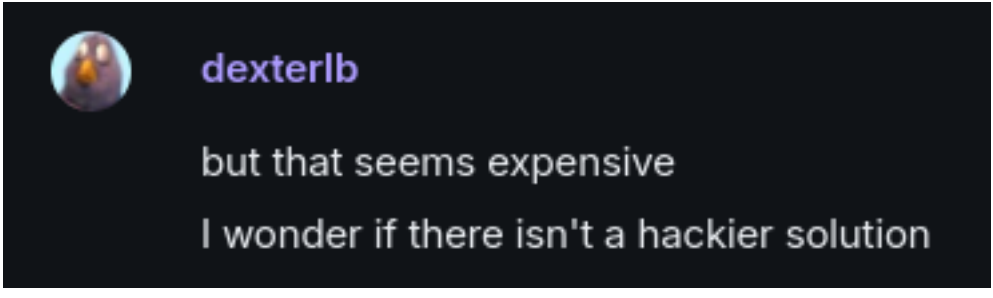



Figure 10: motto

# Let's make this be able to do everyting

- We need to power the boards inside - let's make a power board
- And while we're at it, can we overengineer it to have isolated power, too?
- We have some microphone receivers powered over usb - let's expose power ports
- Actually, can we reverse engineer the microphone receiver? It's just DECT, how hard can it be? Let's add provisions for a homemade receiver on a daughterboard
- We have this audio mixer. Why not use a screen that can separately display line levels, realtime?
- We need a 5-port switch, with one port in the back. It should be easy to make a network switch? :)
- While we're at it, can we also make it do VLANs and monitor the ports?
- If we could make the box walk to the room by itself and plug itself in, we would've done it
- Oh, and that HDMI receiver that's still an off-the-shelf product? Being reverse engineered as we speak

# We worked and worked and worked on it..

```
vasil@kvothe:~/fosdem/video$ git log --oneline hardware |wc -l
319
vasil@kvothe:~/fosdem/video$ git log --oneline hardware |sort -R |head
d4412f0 box_firmware: cleanup network switch-related code and naming
fab8318 baseplate: make it a bit shorter to fit in the case
0b5d2bd power_board: minor cosmetic fix
dee4c29 corrected mirroring of mirror screen bracket for easier printingin
659c217 power_board: BIGGER inductors
7d50816 power_board: finalise all footprints
0d2fc4d baseplate: some final touches
3cc7bd5 fix powerboard labels
fc97652 assembly: another experiment
6285a01 audio_board: extract display state
```

# We got it assembled ....

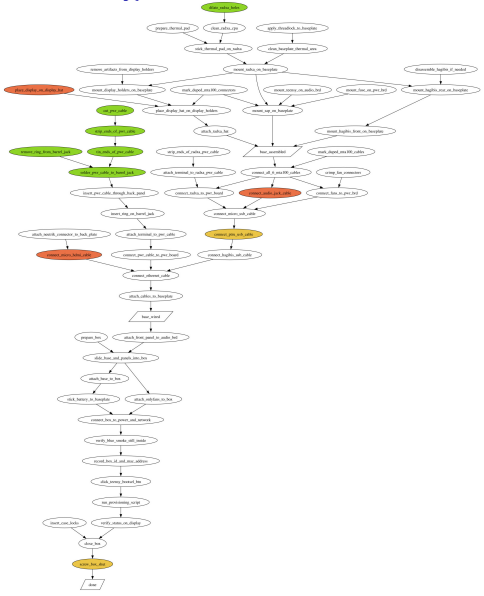


Figure 11: assembly

# We got it assembled ....

Figure 12: assembly2

## We streamed FOSDEM 2025 with it!

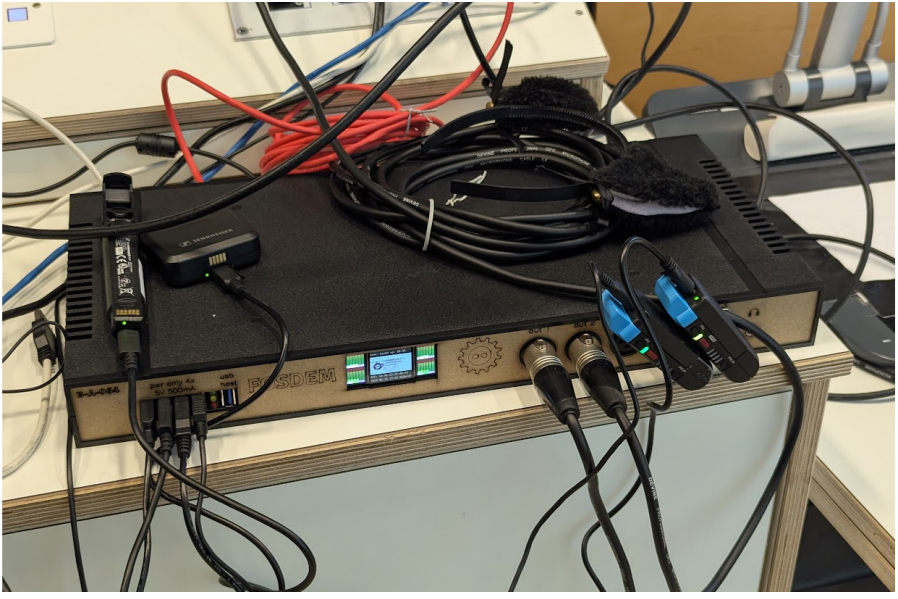



Figure 13: boxinaction

# Box internals

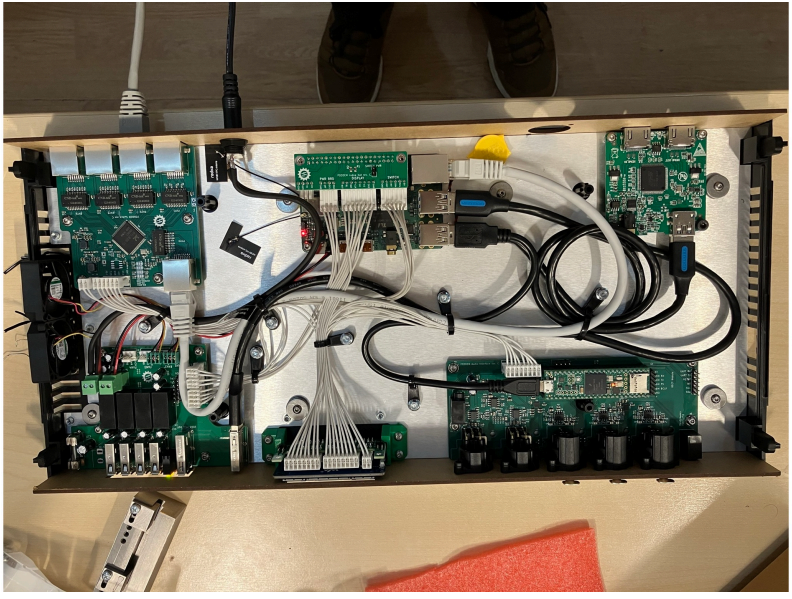


Figure 14: box-open

# Single-box modification for small deployments

- But, not everyone can have the same infrastructure and cameras
- What about smaller setups?
- USB camera, some sound input, PROFIT

# Other ideas we have

- running realtime, synchronised audio over the network (break out (or in) audio from anywhere)
  - we like cables, but less setup more better
- built-in wireless microphone receiver
  - “this sounds expensive, I wonder if there’s a hackier solution”
- overlay on the HDMI loop-out
  - cast a talk happening in room A to room B
  - emergency broadcast
  - intermezzo slideshow (schedule, status, countdown, …)
- automated audio gain control and noise suppression
- remote control over bluetooth or wifi
- a pony

# Patches welcome!

- The single-box modification could use an interface
- It could start with few scripts for some tasks :)

# Do you run a conference?

- We have built more boxes than we need for ourselves, on purpose
- We will happily lend out our stuff if you want to use it for your own event
- Want to contribute? Donations welcome, but patches even more!

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# Questions?

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