

# **Liquidshop 3**

## **The State of the Liq**

**Romain Beauxis, May 29, 2023**

# Le Programme

# Le Programme

- General Updates

# Le Programme

- General Updates
- Liquidsoap 2.2.x technical review

# Le Programme

- General Updates
- Liquidsoap 2.2.x technical review
- Liquidsoap 2.3.x roadmap

# Le Programme

- General Updates
- Liquidsoap 2.2.x technical review
- Liquidsoap 2.3.x roadmap
- Questions?

# FODSEM 2023

FOSDEM'23



[About](#)

[News](#)

[Schedule](#)

[Stands](#)

[Volunteer](#)

[Practical](#)

Brussels / 4 & 5 February 2023

[schedule](#)

[News](#)

[Sponsors](#)

[Contact](#)

[FOSDEM 2023](#) / [Schedule](#) / [Events](#) / [Developer rooms](#) / [Open Media](#) / [Advanced programmable use of Liquidsoap with FFmpeg](#)

## Advanced programmable use of Liquidsoap with FFmpeg

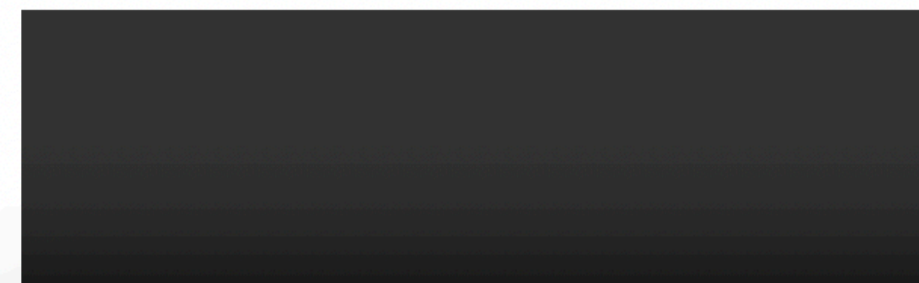
### Explore how the liquidsoap language can be used in new, safe ways for building media pipelines and leverage FFmpeg functionalities

- [Track: Open Media devroom](#)
- [Room: K.3.401](#)
- [Day: Saturday](#)
- [Start: 12:00](#)
- [End: 12:25](#)
- [Video only: k3401](#)
- [Chat: Join the conversation!](#)

In the three years that have passed since the last Liquidsoap presentation, much change has happened! During this walk we will: \* Give an update on the community growth during the pandemic and recap what we learned during our two liquidshop events that mixed technical presentations with actual user projects presentations! \* Present some the recent advanced in the Liquidsoap language and how they can be be used to leverage awesome programming language ideas to create powerful, rich and safe media project scripts \* Showcase the new integration with FFmpeg and how Liquidsoap provides flexible and advanced usage of the excellent FFmpeg features and APIs.

This talk should be of interest for anyone with interest in community radio, media broadcasting and anything related to audio and video handling in general, including integration with online APIs and websites and more!

We would also love to present and discuss our implementation of media APIs and the new abstractions that could be emerging in future implementations.

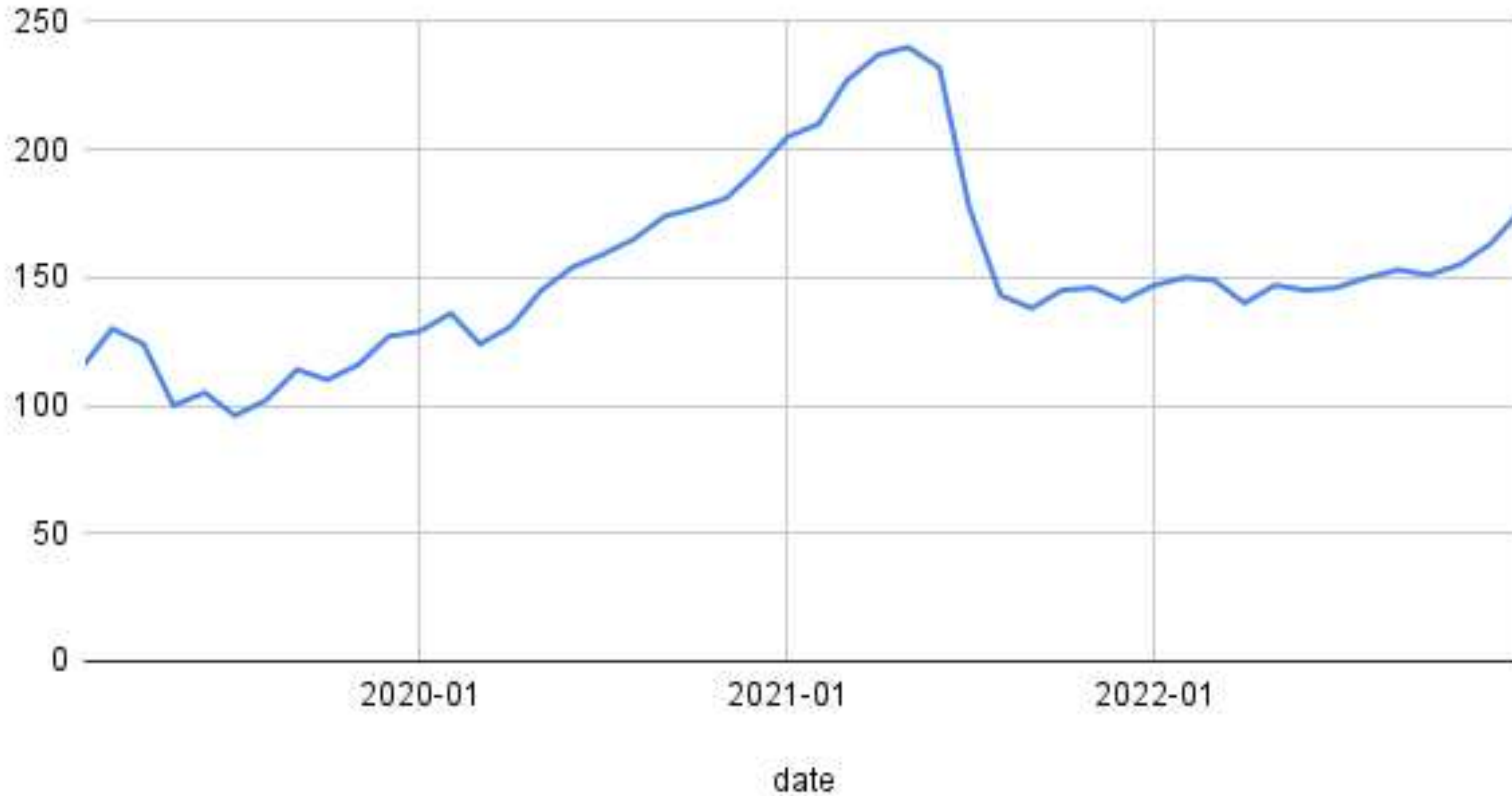


# Community Growth



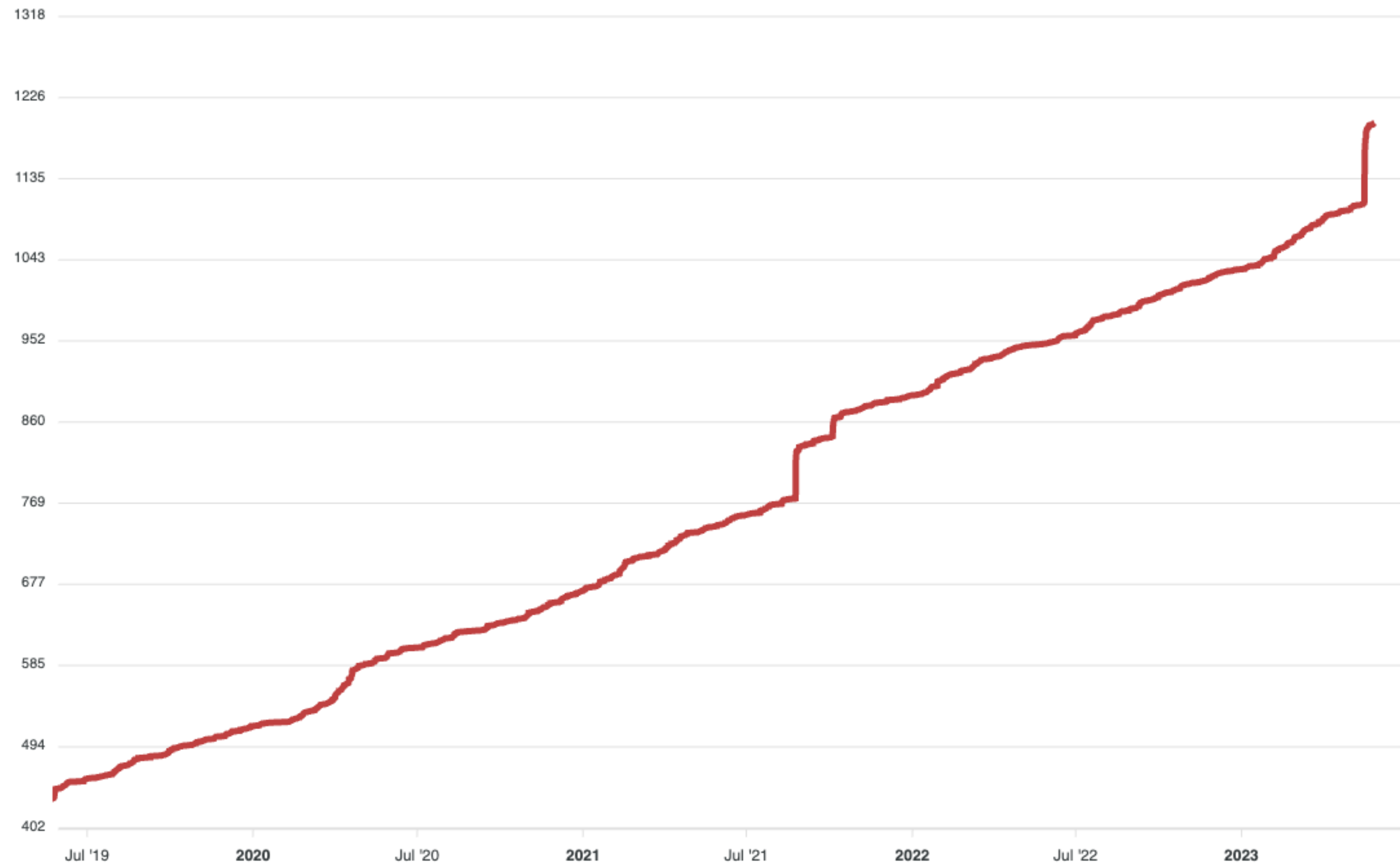
# Community Growth

Github Issues



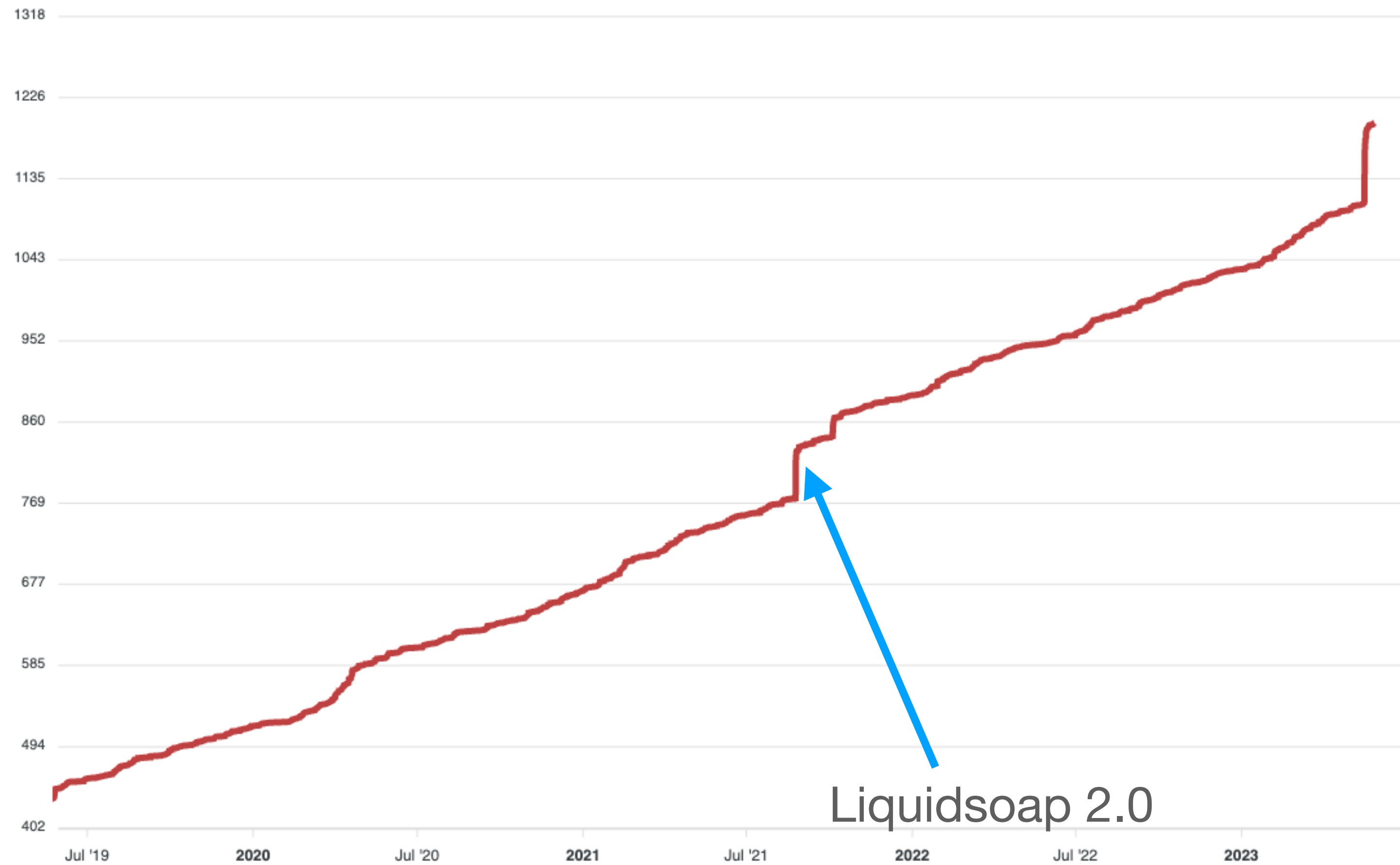
# Community Growth

## Github Stars



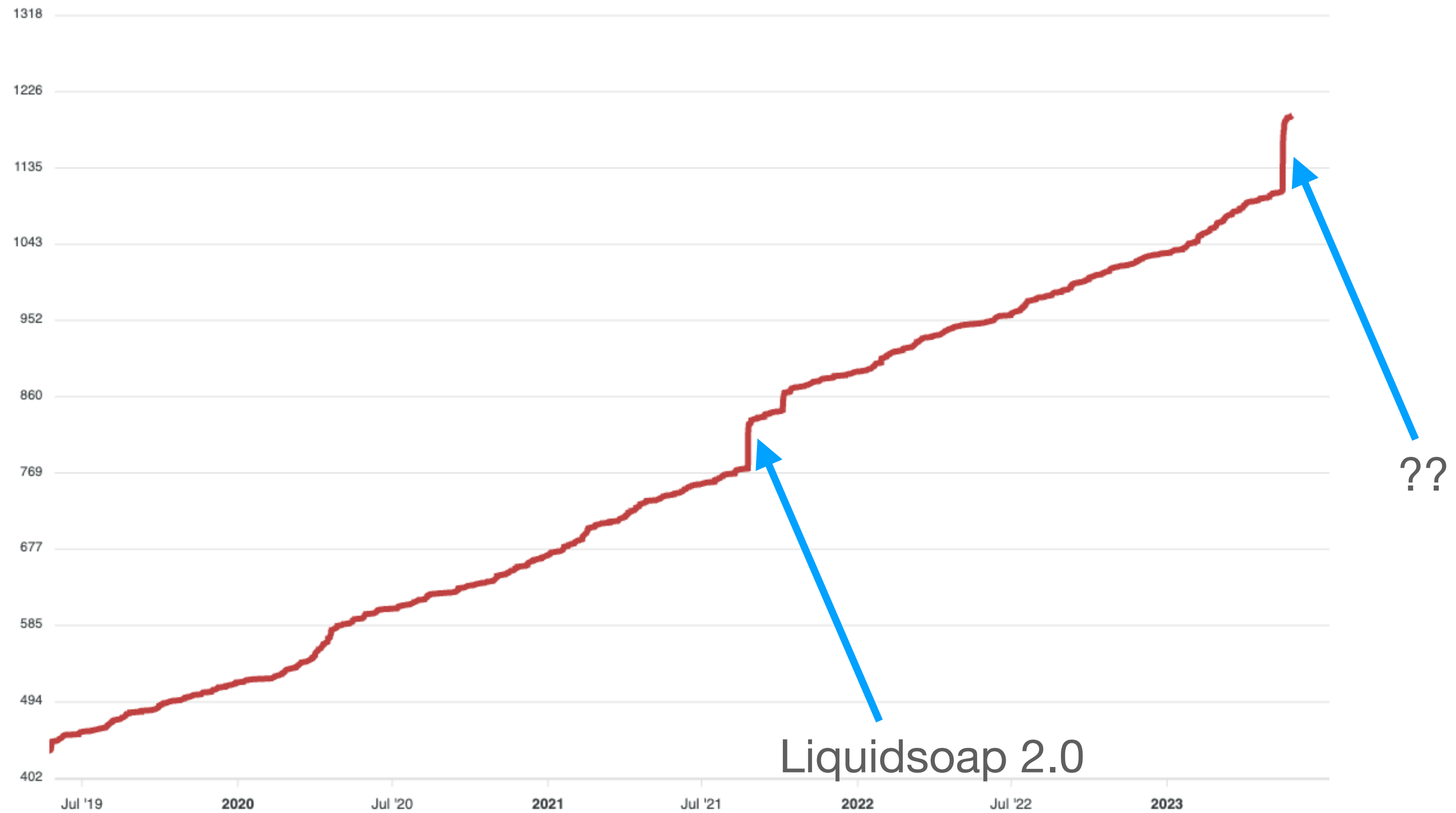
# Community Growth

## Github Stars



# Community Growth

## Github Stars



# Community Growth



Referring sites			
Site		Views	Unique visitors
<a href="#">rekt.network</a>		3,349	2,752
Google		882	297
github.com		410	39
<a href="#">liquidsoap.info</a>		343	89
DuckDuckGo		138	10
<a href="#">ocamlverse.net</a>		47	3
<a href="#">norfipc.com</a>		30	4
<a href="#">yandex.ru</a>		23	5
Bing		13	9
<a href="#">discuss.ocaml.org</a>		3	2

# Community Growth

**REKT.NETWORK** 00:00:39 Vosto - Vosto's Sound Exploration's 03:50:47

EQ Milkdrop Station Chat Archive Releases

Heart Beat Hero	Rue Jules Verne
The Microgram	Metro Holografix
us3r	Date 2018
CYBERTHING!	Label Nightride.FM
Vosto	Genres Electronic, Synthwave, Outrun
Coral Candle	Buy
Inexedra	01 A World Within
TORLEY	02 In Zbor
Liuos	03 Sunset of Synths
Offfish	04 Arpeggion Crystals
Moonraccoon	05 Trails of Freedom
HEIFEHEN	06 Night Drive Wanderers
Turbo Knight	07 Metro Holografix
SVENS	08 Nano Fire Flies Feat. Kashmir11
Death Sworn	09 Forgotten Robots
Noclue	10 Home (Vosto Remix)
	11 Jacked In

# Community Growth

- Still in dire need of help!
- Code development
- User support (shoutout to [@vitoyucepi!](#))
- User experience feedback
- Knowledge spread

# Community Growth

## Fix content length calculation in blit. #3110

 Open toots wants to merge 4 commits into `main` from `fix-blit-conversion` 

 Conversation 0

 Commits 4

 Checks 19

 Files changed 4



toots commented 3 hours ago · edited ▾

Member ...

This PR fixes blit length calculation.

Here's an illustration of the problem. Let's say a frame is 1794 ticks and contains 1 single video image. If we are trying to consolidate a video content that has one chunk with offset = 0 and length 512 and one with offset 512 and length 1192 we would:

1. Initialize a full video content of length 1794
2. Do a first blit of length `Frame.video_of_main 512 = 512 / 1794 = 0`
3. Do a second blit of length `Frame.video_of_main 1192 = 1192 / 1794 = 0`

Annd we have nothing..

Morally, what we want is the following:

1. Video frame are placed at the *end* of their chunk, i.e.

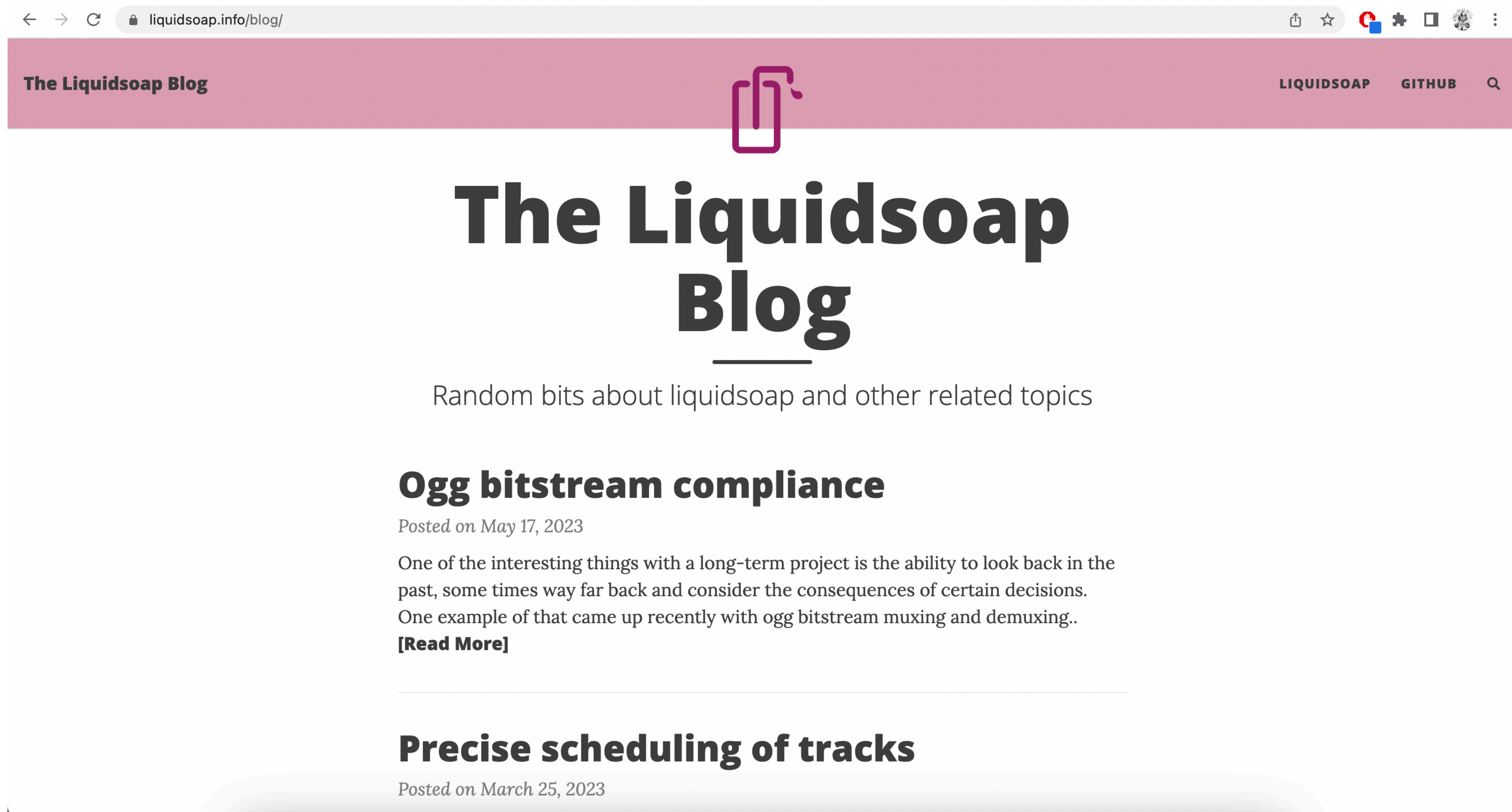
```
0 ..... 512 ..... 1794
|           |           f |
```

In this case, the last chunk would transfer its frame. But this requires that we are sure that this chunk contains at least one frame, which leads us to our second assumption:

2. Video chunks contain a number of video frame rounded up to the nearest integer



# Community Growth



The screenshot shows a web browser window with the address bar displaying "liquidsoap.info/blog/". The browser's address bar includes navigation icons (back, forward, refresh) and a lock icon. The page header is a dark red bar with "The Liquidsoap Blog" on the left, a purple logo in the center, and "LIQUIDSOAP", "GITHUB", and a search icon on the right. The main content area features a large heading "The Liquidsoap Blog" with a horizontal line underneath. Below the heading is a subtitle: "Random bits about liquidsoap and other related topics". The first article is titled "Ogg bitstream compliance" and is dated "Posted on May 17, 2023". The article text reads: "One of the interesting things with a long-term project is the ability to look back in the past, some times way far back and consider the consequences of certain decisions. One example of that came up recently with ogg bitstream muxing and demuxing.. [Read More]". The second article is titled "Precise scheduling of tracks" and is dated "Posted on March 25, 2023".

liquidsoap.info/blog/

The Liquidsoap Blog

LIQUIDSOAP GITHUB

## The Liquidsoap Blog

Random bits about liquidsoap and other related topics

### Ogg bitstream compliance

Posted on May 17, 2023

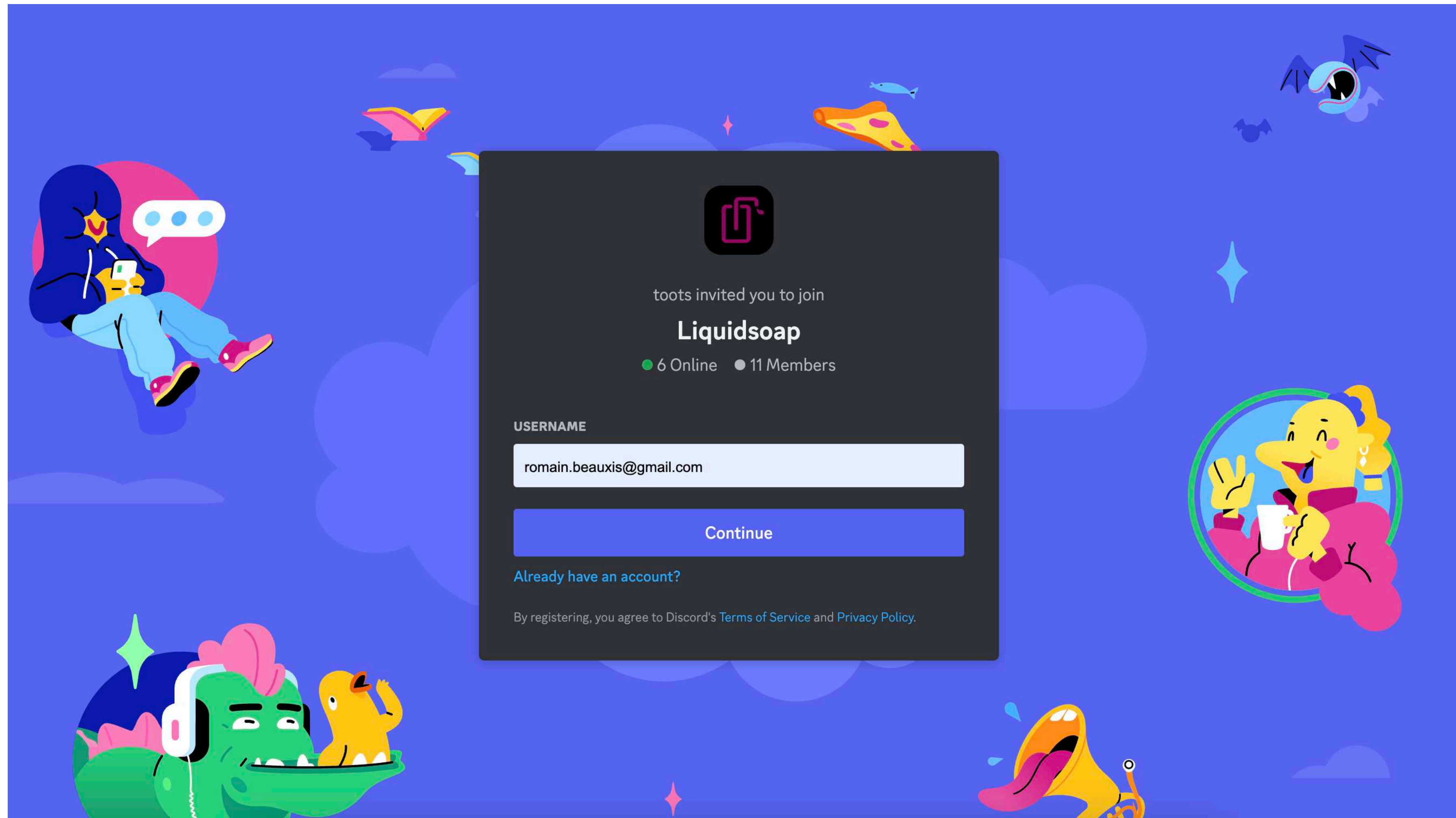
One of the interesting things with a long-term project is the ability to look back in the past, some times way far back and consider the consequences of certain decisions. One example of that came up recently with ogg bitstream muxing and demuxing..

[\[Read More\]](#)

### Precise scheduling of tracks

Posted on March 25, 2023

# Moving to Discord!



# Moving to Discord!

- Open-source friendly

# Moving to Discord!

- Open-source friendly
- Chat history as documentation

# Moving to Discord!

- Open-source friendly
- Chat history as documentation
- Accessible?

# Liquidsoap 2.2.x

# Liquidsoap 2.2.x

- Switched to dune/opam

# Liquidsoap 2.2.x

- Switched to dune/opam
- Separate language core and standard library



# Liquidsoap 2.2.x

- Switched to dune/opam
- Separate language core and standard library
- Rolling releases

# Liquidsoap 2.2.x

- Switched to dune/opam
- Separate language core and standard library
- Rolling releases
- Reworked HTTP server and SSL/TLS support

# Liquidsoap 2.2.x

- Switched to dune/opam
- Separate language core and standard library
- Rolling releases
- Reworked HTTP server and SSL/TLS support
- Stereotool native support

# Liquidsoap 2.2.x

- Switched to dune/opam
- Separate language core and standard library
- Rolling releases
- Reworked HTTP server and SSL/TLS support
- Stereotool native support
- Multitrack support

# Dune/Opam

## Pros:

- OCaml main compilation framework (dune & opam)
- Modular and abstract (dune)
- Support for external dependencies (opam)
- Great support for cross-compilation (opam, windows build)

## Cons:

- Compiles into a local path (opam, ~/.opam/4.14.0/bin)
- Hard to integrate system-wide

**Separate language core**

# Separate language core



The screenshot shows a web browser window with the address bar displaying `liquidsoap.info/try/`. The main content area contains a code editor with the following text:

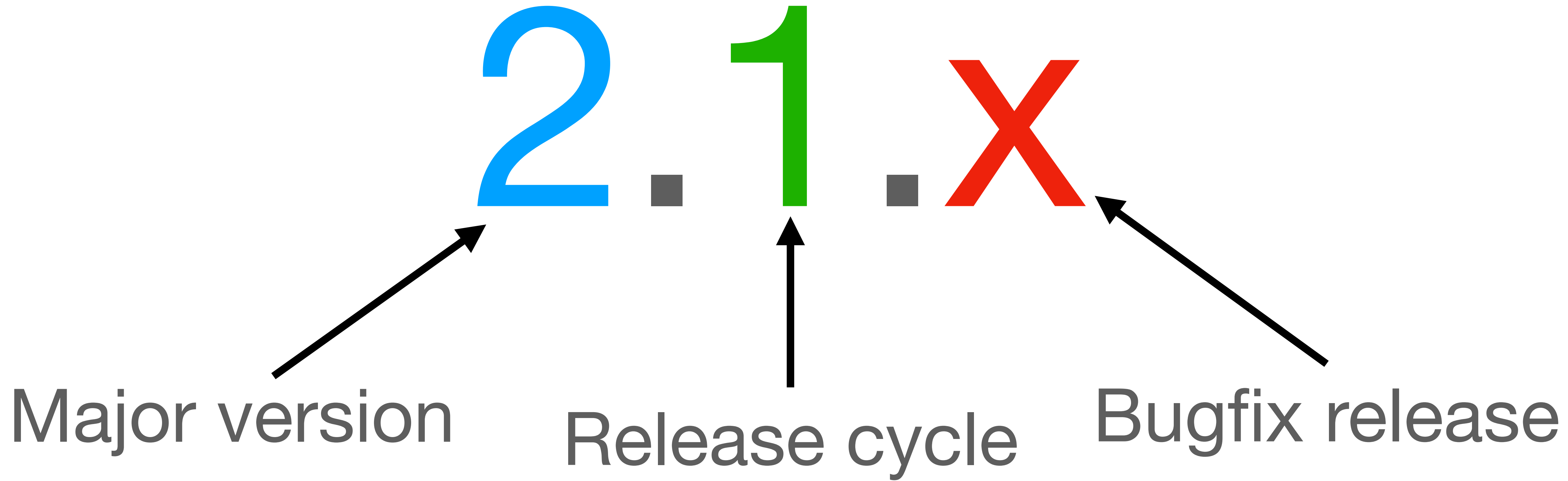
```
# Welcome to liquidsoap's online interpreter!  
# Language version: 2.2.0+git@8b3c820a8  
  
let json.parse ({ foo }:{foo:int}) = '{"foo": 1}'  
- : unit = ()  
  
foo  
- : int = 1
```

Below the code editor is a large, empty white rectangular area, likely for the output of the code execution. At the bottom left of the interface is a button labeled "Execute".

# Rolling Release



# Rolling Release



# Rolling Release

- Provide early builds for testing and rollout planning


# Rolling Release

- Provide early builds for testing and rollout planning
- Change download links while keeping previous release assets

# Rolling Release

Mar 3

 github-actions

 rolling-releases...

 cdb94a1

Compare ▾

## Liquidsoap Rolling Release 2.2.x Pre-release



This release provides liquidsoap assets before they are published as a new versioned release.

You can use it to install the latest stable code before it is published and test/prepare your production environment for it.

Rolling releases can also be useful for us to quickly detect and report bugs before the final published release!

### ⚠ Warning ⚠

Assets in this release will be deleted. If you are looking for permanent links to release assets, please head over to <https://github.com/savonet/liquidsoap-release-assets/releases>

For more details about our release process, please checkout <https://github.com/savonet/liquidsoap#release-details>

## 2.2.0 (unreleased)




















---

New:

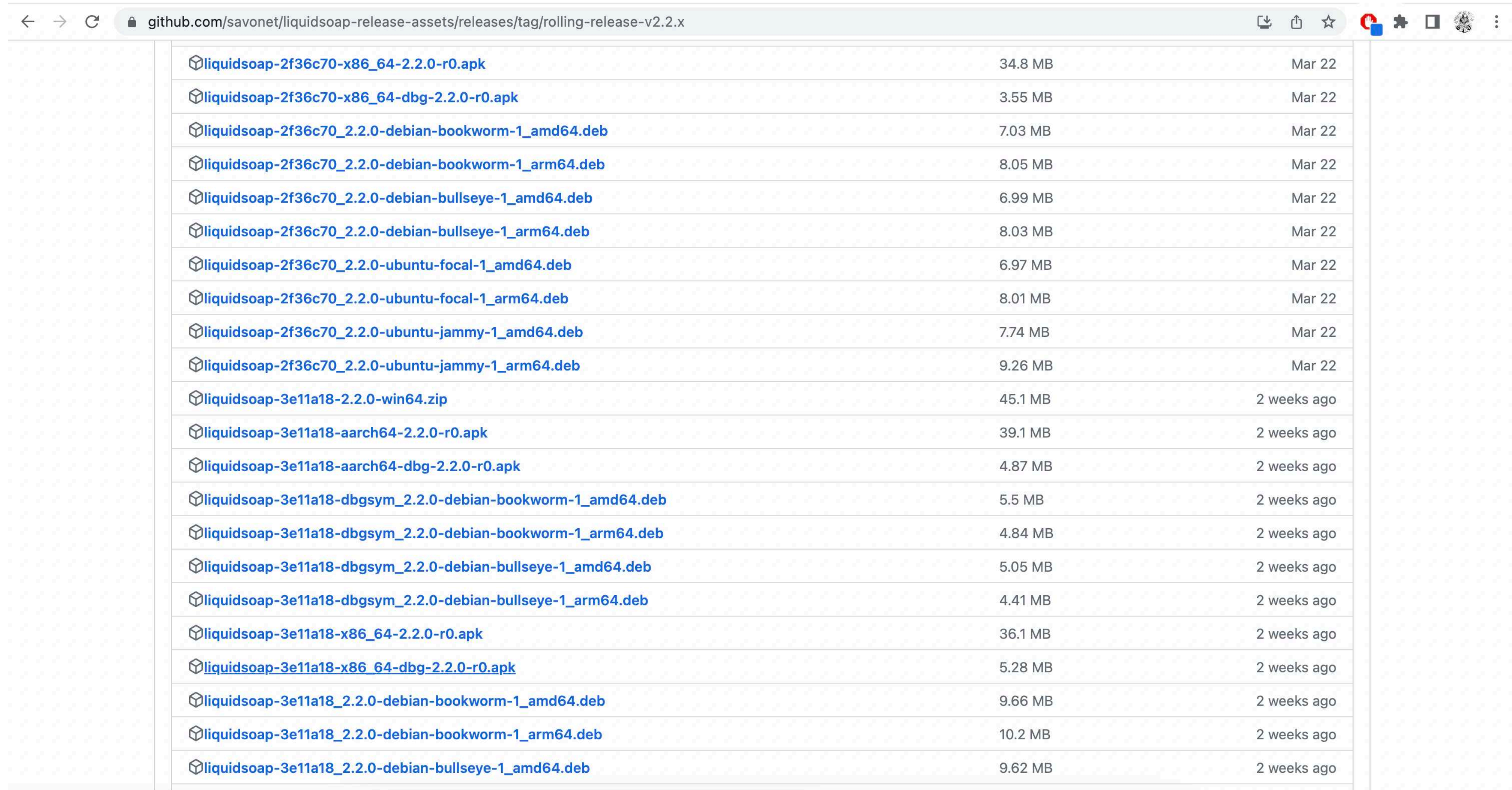
# Rolling Release

## ▼ Assets

19

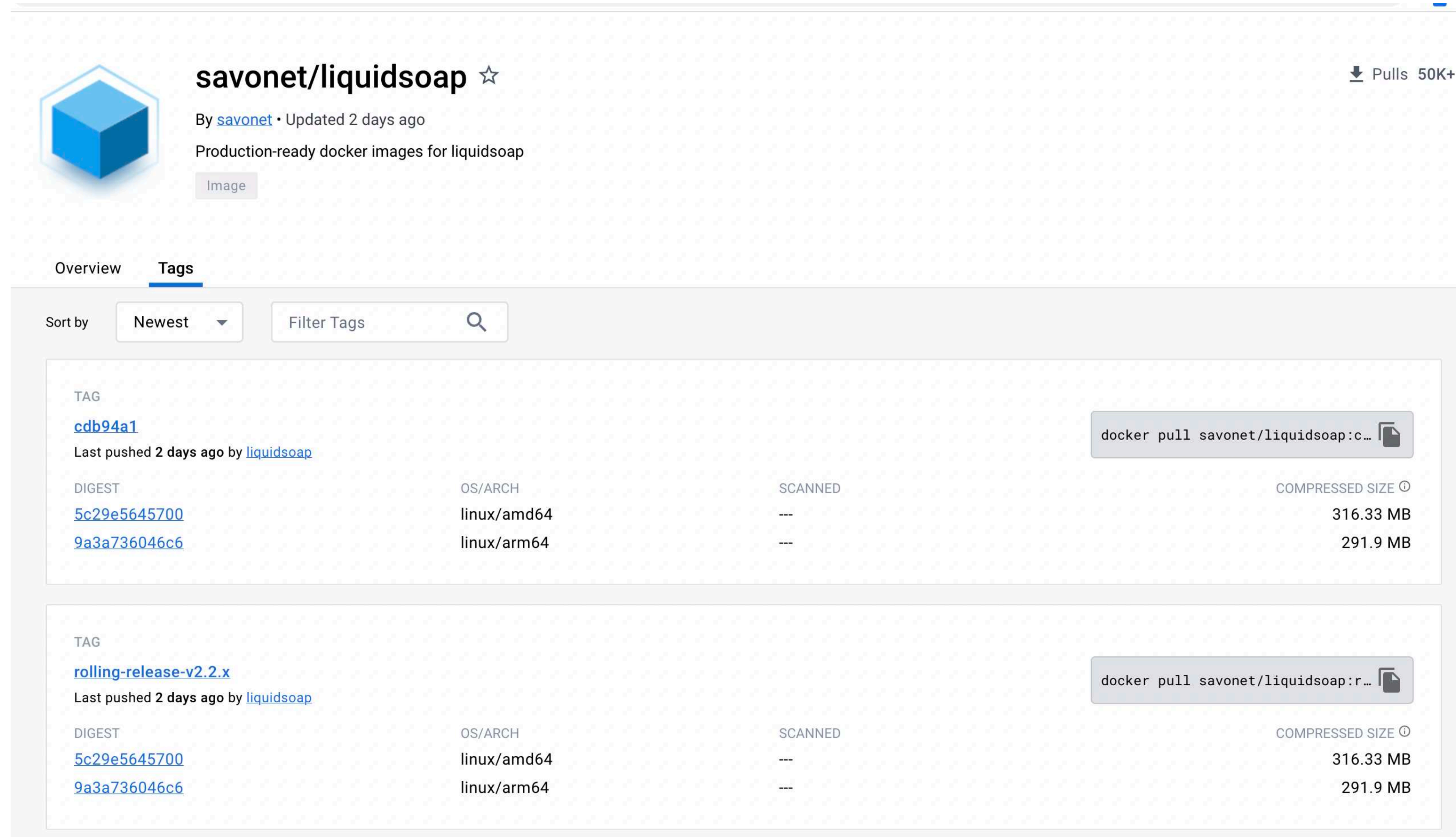
 <a href="#">liquidsoap-cdb94a1-2.2.0-win64.zip</a>	45.1 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1-aarch64-2.2.0-r0.apk</a>	38.6 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1-aarch64-dbg-2.2.0-r0.apk</a>	4.87 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1-dbgSYM_2.2.0-debian-bookworm-1_amd64.deb</a>	5.51 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1-dbgSYM_2.2.0-debian-bookworm-1_arm64.deb</a>	4.84 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1-dbgSYM_2.2.0-debian-bullseye-1_amd64.deb</a>	5.04 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1-dbgSYM_2.2.0-debian-bullseye-1_arm64.deb</a>	4.4 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1-x86_64-2.2.0-r0.apk</a>	35.5 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1-x86_64-dbg-2.2.0-r0.apk</a>	5.27 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1_2.2.0-debian-bookworm-1_amd64.deb</a>	9.64 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1_2.2.0-debian-bookworm-1_arm64.deb</a>	10.2 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1_2.2.0-debian-bullseye-1_amd64.deb</a>	9.6 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1_2.2.0-debian-bullseye-1_arm64.deb</a>	10.1 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1_2.2.0-ubuntu-focal-1_amd64.deb</a>	9.58 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1_2.2.0-ubuntu-focal-1_arm64.deb</a>	10.1 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1_2.2.0-ubuntu-jammy-1_amd64.deb</a>	10.8 MB	2 days ago
 <a href="#">liquidsoap-cdb94a1_2.2.0-ubuntu-jammy-1_arm64.deb</a>	11.7 MB	2 days ago
 <a href="#">Source code (zip)</a>		2 days ago
 <a href="#">Source code (tar.gz)</a>		2 days ago

# Rolling Release




Asset Name	Size	Release Date
<a href="#">liquidsoap-2f36c70-x86_64-2.2.0-r0.apk</a>	34.8 MB	Mar 22
<a href="#">liquidsoap-2f36c70-x86_64-dbg-2.2.0-r0.apk</a>	3.55 MB	Mar 22
<a href="#">liquidsoap-2f36c70_2.2.0-debian-bookworm-1_amd64.deb</a>	7.03 MB	Mar 22
<a href="#">liquidsoap-2f36c70_2.2.0-debian-bookworm-1_arm64.deb</a>	8.05 MB	Mar 22
<a href="#">liquidsoap-2f36c70_2.2.0-debian-bullseye-1_amd64.deb</a>	6.99 MB	Mar 22
<a href="#">liquidsoap-2f36c70_2.2.0-debian-bullseye-1_arm64.deb</a>	8.03 MB	Mar 22
<a href="#">liquidsoap-2f36c70_2.2.0-ubuntu-focal-1_amd64.deb</a>	6.97 MB	Mar 22
<a href="#">liquidsoap-2f36c70_2.2.0-ubuntu-focal-1_arm64.deb</a>	8.01 MB	Mar 22
<a href="#">liquidsoap-2f36c70_2.2.0-ubuntu-jammy-1_amd64.deb</a>	7.74 MB	Mar 22
<a href="#">liquidsoap-2f36c70_2.2.0-ubuntu-jammy-1_arm64.deb</a>	9.26 MB	Mar 22
<a href="#">liquidsoap-3e11a18-2.2.0-win64.zip</a>	45.1 MB	2 weeks ago
<a href="#">liquidsoap-3e11a18-aarch64-2.2.0-r0.apk</a>	39.1 MB	2 weeks ago
<a href="#">liquidsoap-3e11a18-aarch64-dbg-2.2.0-r0.apk</a>	4.87 MB	2 weeks ago
<a href="#">liquidsoap-3e11a18-dbgSYM_2.2.0-debian-bookworm-1_amd64.deb</a>	5.5 MB	2 weeks ago
<a href="#">liquidsoap-3e11a18-dbgSYM_2.2.0-debian-bookworm-1_arm64.deb</a>	4.84 MB	2 weeks ago
<a href="#">liquidsoap-3e11a18-dbgSYM_2.2.0-debian-bullseye-1_amd64.deb</a>	5.05 MB	2 weeks ago
<a href="#">liquidsoap-3e11a18-dbgSYM_2.2.0-debian-bullseye-1_arm64.deb</a>	4.41 MB	2 weeks ago
<a href="#">liquidsoap-3e11a18-x86_64-2.2.0-r0.apk</a>	36.1 MB	2 weeks ago
<a href="#">liquidsoap-3e11a18-x86_64-dbg-2.2.0-r0.apk</a>	5.28 MB	2 weeks ago
<a href="#">liquidsoap-3e11a18_2.2.0-debian-bookworm-1_amd64.deb</a>	9.66 MB	2 weeks ago
<a href="#">liquidsoap-3e11a18_2.2.0-debian-bookworm-1_arm64.deb</a>	10.2 MB	2 weeks ago
<a href="#">liquidsoap-3e11a18_2.2.0-debian-bullseye-1_amd64.deb</a>	9.62 MB	2 weeks ago

# Rolling Release



The image shows a Docker Hub repository page for 'savonet/liquidsoap'. The repository is owned by 'savonet' and was updated 2 days ago. It contains production-ready Docker images for liquidsoap. The page is currently on the 'Tags' tab, showing a list of tags sorted by 'Newest'. Two tags are visible: 'cdb94a1' and 'rolling-release-v2.2.x'. Both tags were last pushed 2 days ago by 'liquidsoap'. The 'cdb94a1' tag has two variants: 'linux/amd64' (316.33 MB) and 'linux/arm64' (291.9 MB). The 'rolling-release-v2.2.x' tag also has two variants: 'linux/amd64' (316.33 MB) and 'linux/arm64' (291.9 MB). The page includes a search bar for tags, a 'Filter Tags' button, and a 'docker pull' command for each tag.

 **savonet/liquidsoap** ☆ ↓ Pulls 50K+

By [savonet](#) • Updated 2 days ago  
Production-ready docker images for liquidsoap

[Image](#)

Overview **Tags**

Sort by **Newest** Filter Tags

TAG	DIGEST	OS/ARCH	SCANNED	COMPRESSED SIZE
<a href="#">cdb94a1</a> Last pushed 2 days ago by <a href="#">liquidsoap</a>	<a href="#">5c29e5645700</a>	linux/amd64	---	316.33 MB
	<a href="#">9a3a736046c6</a>	linux/arm64	---	291.9 MB
<a href="#">rolling-release-v2.2.x</a> Last pushed 2 days ago by <a href="#">liquidsoap</a>	<a href="#">5c29e5645700</a>	linux/amd64	---	316.33 MB
	<a href="#">9a3a736046c6</a>	linux/arm64	---	291.9 MB

`docker pull savonet/liquidsoap:cdb94a1`

`docker pull savonet/liquidsoap:rolling-release-v2.2.x`

# **New HTTP Stack**



# New HTTP Stack

```
def handler(request, response) =  
  log("Got a request on path #{request.path}, protocol version: #{request.http_version}, \  
    method: #{request.method}, headers: #{request.headers}, query: #{request.query}, \  
    body: #{request.body()}")  
  
  # Sets content-type to json and data to `json.stringify({foo = "bla"})`  
  response.json({foo = "bla"})  
  
  # Sets content-type to html and data to `"<p>It works!</p>"`  
  response.html("<p>It works!</p>")  
end  
  
harbor.http.register(port=8080, method="POST", path, handler)
```

# New HTTP Stack

```
transport = http.transport.ssl(  
    # Server mode: required,  
    # client mode: optional, add certificate to trusted pool  
    certificate="/path/to/certificate/file",  
  
    # Server mode: required, client mode: ignored  
    key="/path/to/secret/key/file",  
  
    # Required if key file requires one.  
    # TLS does not support password encrypted keys!  
    password="optional password"  
)  
  
harbor.http.register(transport=transport, port=8000, ...)  
  
input.harbor(transport=..., port=8000, ...)  
  
output.harbor(transport=..., port=8000, ...)  
  
output.icecast(transport=..., port=8000, ...)
```

# New HTTP Stack

The screenshot shows a web browser window with the address bar containing the URL `liquidsoap.info/doc-dev/harbor_http.html#nodeexpress-api`. The page has a purple header with the Liquidsoap logo, a "DEV" dropdown menu, and GitHub and Twitter icons. A left sidebar contains a navigation menu with sections: "Install" (Migrating from previous versions), "Starters" (The book, Video Presentations, How to find help, Frequently Asked Questions, Quickstart, Complete case analysis, Cookbook), and "Reference" (Script language, Core API, Extra API, Deprecated API, Multitrack, Protocols, Settings, FFmpeg support, Encoding formats). The main content area is titled "Node/express API" and contains a paragraph explaining the `harbor.http.register` function. Below the text is a code block showing a JavaScript function definition for a handler, with comments in blue and code in red and black.

```
def handler(request, response) =  
  log("Got a request on path #{request.path}, protocol version: #{request.http_version}, \  
    method: #{request.method}, headers: #{request.headers}, query: #{request.query}, \  
    body: #{request.body()}")  
  
  # Set response code. Defaults to 200  
  response.status_code(201)  
  
  # Set response status message. Uses `status_code` if not specified  
  response.status_message("Created")  
  
  # Replaces response headers  
  response.headers(["X-Foo", "bar"])  
  
  # Set a single header  
  response.header("X-Foo", "bar")  
  
  # Set http protocol version  
  response.http_version("1.1")  
  
  # Same as setting the "Content-Type" header  
  response.content_type("application/liquidsoap")
```

# Multitrack support

# Multitrack support

- Provide access to individual media tracks, e.g. audio 1, audio 2, video etc.

# Multitrack support

- Provide access to individual media tracks, e.g. audio 1, audio 2, video etc.
- Create an abstraction for manipulating metadata and track marks

# Multitrack support

- Provide access to individual media tracks, e.g. audio 1, audio 2, video etc.
- Create an abstraction for manipulating metadata and track marks
- Unify typing and expected runtime content

# Multitrack support

## Encoder set expected content-type

```
s = single("/path/to/movie.mkv")

# Copy first audio track and video:
output.file(
    %ffmpeg(
        %audio.copy,
        %video.copy
    ),
    "/path/to/copy.mkv",
    s
)
```



# Multitrack support

## Encoder set expected content-type

```
2023/05/29 14:44:45 [decoder:4] Available decoders: ffmpeg (priority: 10), image (priority: 1)
2023/05/29 14:44:45 [decoder:4] Trying decoder "ffmpeg"
2023/05/29 14:44:45 [decoder.ffmpeg:3] Requested content-type for "/tmp/rt/vid/12 - I'm The Zydeco Man - Clifton Chenier.mp4": {audio=ffmpeg.copy,video=ffmpeg.copy}
2023/05/29 14:44:45 [decoder.ffmpeg:3] FFmpeg recognizes "/tmp/rt/vid/12 - I'm The Zydeco Man - Clifton Chenier.mp4" as video: {codec: h264, 640x640, yuv420p}, audio: {codec: aac, 48000Hz, 2 channel(s)}
2023/05/29 14:44:45 [decoder.ffmpeg:3] Decoded content-type for "/tmp/rt/vid/12 - I'm The Zydeco Man - Clifton Chenier.mp4": {audio=ffmpeg.copy(codec="aac",channel_layout="stereo",sample_format=fltp,sample_rate=48000),video=ffmpeg.copy(codec="h264",width=640,height=640,aspect_ratio=4/3,pixel_format=yuv420p)}
2023/05/29 14:44:45 [decoder:4] Selected decoder ffmpeg for file "/tmp/rt/vid/12 - I'm The Zydeco Man - Clifton Chenier.mp4" with expected kind {audio=ffmpeg.copy(codec="aac",channel_layout="stereo",sample_format=fltp,sample_rate=48000),video=ffmpeg.copy(codec="h264",width=640,height=640,aspect_ratio=4/3,pixel_format=yuv420p)} and detected content {audio=ffmpeg.copy(codec="aac",channel_layout="stereo",sample_format=fltp,sample_rate=48000),video=ffmpeg.copy(codec="h264",width=640,height=640,aspect_ratio=4/3,pixel_format=yuv420p)}
```

# Multitrack support

## Encoder set expected content-type

```
s = playlist("/path/to/playlist")

# Copy first audio track and video track
# and re-encode second audio track:
output.file(
  fallible=true,
  %ffmpeg(
    %audio.copy,
    %audio_2(
      channels=2,
      codec="aac"
    ),
    %video.copy
  ),
  "/path/to/copy.mkv",
  s
)
```

# Multitrack support

Muxer/demuxer

# Multitrack support

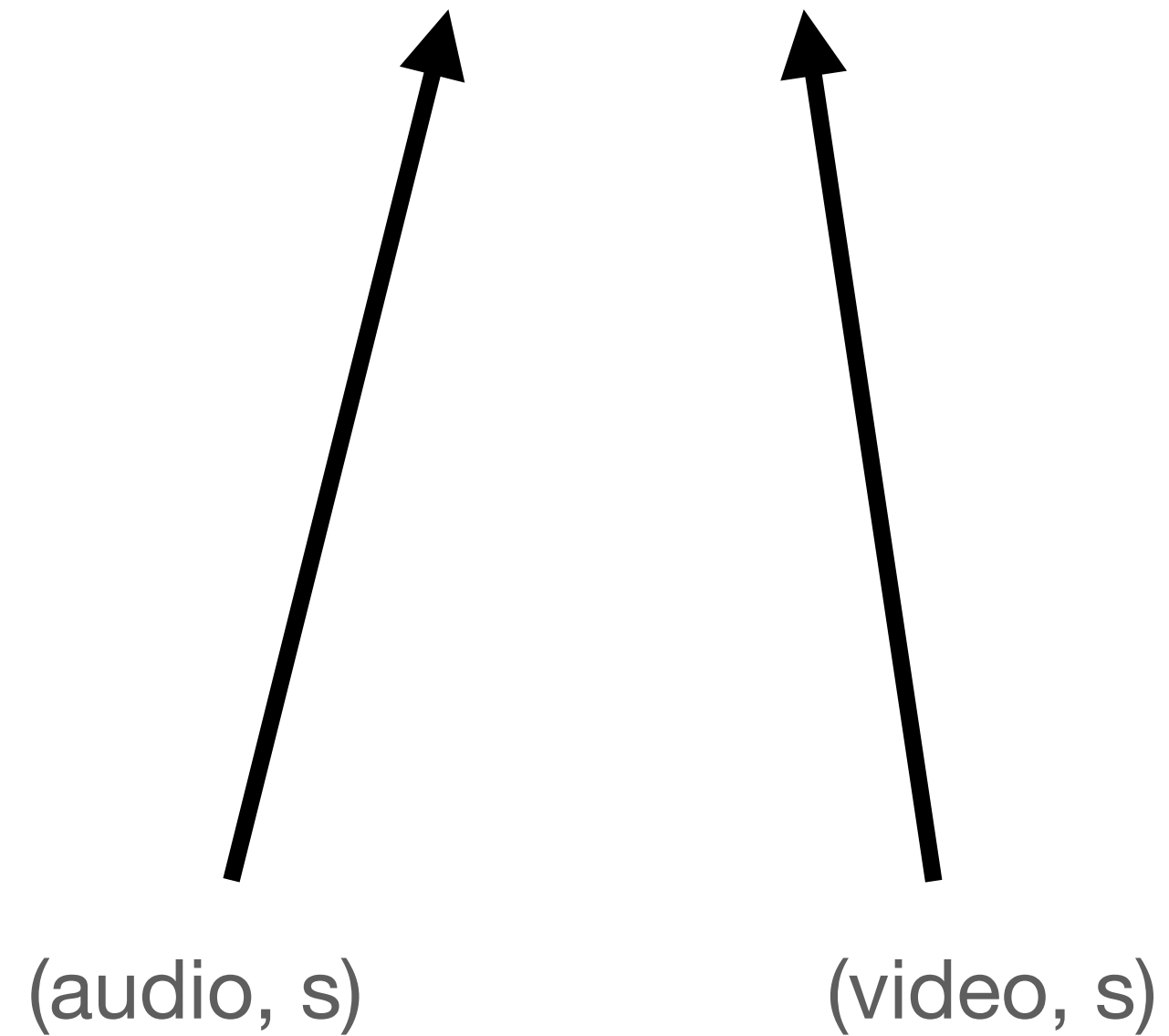
## Muxer/demuxer

```
let {audio, video, metadata, track_marks} = source.tracks(s)
```

# Multitrack support

## Muxer/demuxer

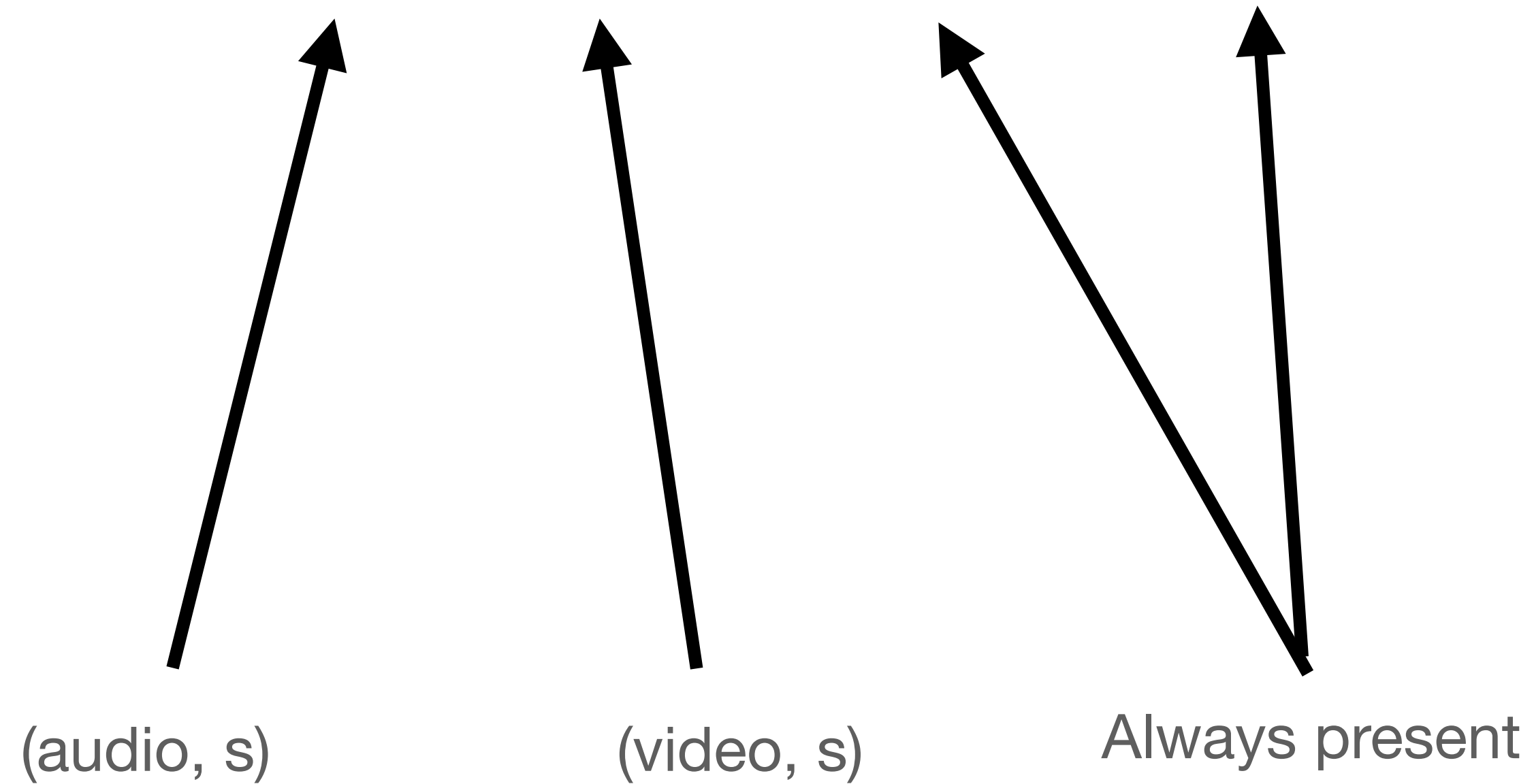
```
let {audio, video, metadata, track_marks} = source.tracks(s)
```



# Multitrack support

## Muxer/demuxer

```
let {audio, video, metadata, track_marks} = source.tracks(s)
```



# Multitrack support

## Muxer/demuxer

```
# A playlist of audio files
s = playlist(...)

# A static image
image = single("/path/to/image.png")

# Get the playlist's audio track, metadata and track marks
let {audio = playlist_audio, metadata, track_marks} = source.track(s)

# Get the video track from our static image
let {video = image_video} = source.tracks(s)

# Mux the audio tracks with the image
s = source({
  audio=playlist_audio,
  video=image_video,
  metadata=metadata,
  track_marks=track_marks
})
```

# Multitrack support

## Muxer/demuxer

```
s = playlist(...)  
  
# Extract all tracks except track_marks:  
let {track_marks=_, ...tracks} = source.tracks(s)  
  
s = source(tracks)
```



# Multitrack support

## Muxer/demuxer

```
s = playlist("...")

let { audio, metadata } = source.tracks(s)

audio_aac = track.ffmpeg.encode.audio(%ffmpeg(%audio(codec="aac")), track.audio.mean(audio))
audio_mp3 = track.ffmpeg.encode.audio(%ffmpeg(%audio(codec="mp3")), audio)

source({
  audio_aac=audio_aac,
  audio_mp3=audio_mp3,
  metadata
})
```

# Multitrack support

## Muxer/demuxer

```
s = playlist("...")

let { audio, metadata } = source.tracks(s)

audio_aac = track.ffmpeg.encode.audio(%ffmpeg(%audio(codec="aac")), track.audio.mean(audio))
audio_mp3 = track.ffmpeg.encode.audio(%ffmpeg(%audio(codec="mp3")), audio)

source({
  audio_aac=audio_aac,
  audio_mp3=audio_mp3,
  metadata
})
```

# Multitrack support

## Muxer/demuxer

```
s = playlist("...")

let { audio, metadata } = source.tracks(s)

audio_aac = track.ffmpeg.encode.audio(%ffmpeg(%audio(codec="aac")), track.audio.mean(audio))
audio_mp3 = track.ffmpeg.encode.audio(%ffmpeg(%audio(codec="mp3")), audio)
metadata = track.metadata(audio_aac)

source({
  audio_aac=audio_aac,
  audio_mp3=audio_mp3,
  metadata
})
```

# **Multitrack support**

## **Conventions**

# Multitrack support

## Conventions

```
output.file(  
    %ffmpeg(  
        %en(codec="aac"),  
        %fr(codec="aac"),  
        %director_cut(codec="libx264")  
    ),  
    "/path/to/copy.mkv",  
    s  
)
```

# Multitrack support

## Conventions

```
output.file(  
    %ffmpeg(  
        %audio_en(codec=audio_codec),  
        %audio_fr(codec="aac"),  
        %director_cut_video(codec=video_codec)  
    ),  
    "/path/to/copy.mkv",  
    s  
)
```

# Multitrack support

## Conventions

1. A **copy** track is any track named `%<track_name>.copy`. We do not need to know the track's content in this case.
2. If a track has **audio\_content** or **video\_content** as parameter (for instance `%foo(audio_content, ...)`) then it is considered, resp., **audio** or **video**.
3. If the track name has **audio** or **video** in it (for instance `%dolby_audio_fr`) then it is considered, resp., **audio** or **video**.
4. If the track codec is hardcoded (for instance `(%foo(codec="aac", ...))`) then the codec is used to detect the content.

# **Multitrack support**

**Future work**



# Multitrack support

## Future work

- Dynamically add a video track?

# Multitrack support

## Future work

- Dynamically add a video track?

```
let { video = default_video } = source.tracks(single("..."))

def next() =
  url = get_url()
  s = single(url)
  tracks = source.tracks(s)

  source(tracks.{
    video = tracks.video ?? default_video
  })
end

s = source.dynamic(next)
```

# Multitrack support

## Future work

- Dynamically add a video track?

```
let { video = default_video } = source.tracks(
  single("...")
)

def mk_source(url) =
  r = request.create(url)
  request.queue(queue=[r])
end

def next() =
  url = get_url()
  source_with_video = mk_source(url)

  source_without_video = (mk_source(url):source(audio=pcm))

  source_with_default_video = source(
    source.tracks(source_without_video){
      video = default_video
    }
  )

  fallback(track_sensitive=true,[
    source_with_video,
    source_with_default_video
  ])
end

s = source.dynamic(
  id="next",
  track_sensitive=true,
  next)
```

**Liquidsoap 2.2.x release?**

**Liquidsoap 2.2.x release?**

**Soon!**



# Liquidsoap 2.2.x release?

# Soon!



- Mostly doing bug fix
- Performance and regression
- Please test, prepare your systems and report!

# Liquidsoap 2.3.x roadmap

# Liquidsoap 2.3.x roadmap

- Update the liquidsoap book



# Liquidsoap 2.3.x roadmap

- Update the liquidsoap book
- Rewrite the streaming loop

# Liquidsoap 2.3.x roadmap

- Update the liquidsoap book
- Rewrite the streaming loop
- Rewrite the clock implementation

# Liquidsoap 2.3.x roadmap

- Update the liquidsoap book
- Rewrite the streaming loop
- Rewrite the clock implementation
- Take advantage of OCaml 5 concurrency

# Liquidsoap 2.3.x roadmap

- Update the liquidsoap book
- Rewrite the streaming loop
- Rewrite the clock implementation
- Take advantage of OCaml 5 concurrency
- Proper module support

# Liquidsoap 2.3.x roadmap

- Update the liquidsoap book
- Rewrite the streaming loop
- Rewrite the clock implementation
- Take advantage of OCaml 5 concurrency
- Proper module support

```
%include "foo.liq"
```

# Liquidsoap 2.3.x roadmap

- Update the liquidsoap book
- Rewrite the streaming loop
- Rewrite the clock implementation
- Take advantage of OCaml 5 concurrency
- Proper module support

```
%import { foo } from "foo.liq"
```

```
def bla() =
```

```
  foo(123)
```

```
end
```

```
%export bla
```

# Liquidsoap 2.3.x roadmap

- Update the liquidsoap book
- Rewrite the streaming loop
- Rewrite the clock implementation
- Take advantage of OCaml 5 concurrency
- Proper module support
- Address standard library performance issues

# Liquidsoap 2.3.x roadmap

- Update the liquidsoap book
- Rewrite the streaming loop
- Rewrite the clock implementation
- Take advantage of OCaml 5 concurrency
- Proper module support
- Address standard library performance issues
- Add developer tooling: linter/prettier, syntax highlighting, etc.



**Questions?**