

Radios, broadcast and liquidsoap
Let's get our hands dirty, and build a radio
Level up!
Radio station work
Going further, with or without liq

Actual radio work with Liquidsoap

Liquidshop 1.0

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Who am I ?

What does a radio station want
Automation, reliability
Scheduling
Live broadcast
Station identity
Player and integration
Let's talk

Who am I ?

Gilles Pietri, IT consultant, musician, radio enthusiast

- CEO of Wolface IT, IT Consulting, DevOps, multimedia
- Special annoying contributor to Liquidsoap and Icecast
- Occasional radio host and/or producer on Fréquence3 and JetFM



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What does a radio station want

Careful, there be dragons... It's often not as simple as it sounds! But let's get down to basic needs at first.

- Automation, reliability
- Scheduling
- Live broadcasts
- Station identity: jingles, audio theme, sound processing
- Player and integration



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Automation, reliability

- Liquidsoap is based on OCaml, and is usually insanely stable.
- The basics are usually covered, and not too hard to grasp (see you at the workshop part)
- Combined with icecast's fallback, awesome tooling overall
- Yet, not always production friendly



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Production setups

- Targetting a version featureful and bugless
- Integrate with services / monitoring usually through a home-made solution
- Communication with sockets sometimes a bit sketchy
- Not so obvious settings for daemon or automated setups



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Scheduling

- Nice tooling for most stuff: switch, rotate, random
- Requests and crossfading
- Yet: avoid repetition? setup playout rules? -> use an external solution, you have to.



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Live broadcast

- Easy enough usually, because of input.* and ffmpeg's inclusion
- Mix in nicely
- Harbour is great



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Station identity

- Jingles blending is easy enough, though if you need rules, external scheduling again!
- Sound processing: liq can do the basics on its own
- Usually, you need more than ladspa, but StereoTool works nowadays ;)
- If you get a serious, you'll need to work on the library



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Player and integration

- liq outputs to many things, icecast is essential, HLS seems to get some craze (hm.)
- liq encodes in most formats usually expected, and can again use ffmpeg if not
- titles and metadata: no real secret there, clean library or heavy tools
- multiple “themed” output: not so easy, but maybe with 2.0 ;)



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What do you guys think?

What could be done to make liq more than a tool in the corner?



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Generic environment : streaming to Icecast
Liquidsoap as a stream client
Example using opam
Streaming files, playlists using Liq

Generic environment : streaming to Icecast

We'll assume for this workshop a simple setup to build a hopefully featureful environment:

- Server based on a Linux VPS
- Icecast server
- Liquidsoap client(s)

Technically, for this, we'll use icecast compiled from source and hosted at stream.wolface.net, liquidsoap compiled from opam (yay, bugs), on a Ubuntu 20.04 VPS running on top of Proxmox



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Workshop setup

- Get a linux box running somewhere, you could use Vagrant/Virtualbox for this:
`vagrant init bento/ubuntu-20.04 ; vagrant up`
- We can share the icecast server, or you can setup one yourself
- I'll give us some time to make things work



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Liquidsoap as a stream client

Different way of installations:

- from packages: OK, but beware. . .
- opam: harder, but often a safer bet
- from source: don't ;)



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Example using opam

- Package management/OCaml
- Required dependencies for our example, from system and opam
- Let's do it



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So, liquidsoap as a client

- Liquidsoap scripting
- Command-line start
- .liq files (maybe a word about production setups?)
- Organization for the workshop, media files, environment



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Streaming files, playlists using Liq

- Simply loop over a file: `single('file')`
- Generic directory playout: `playlist('directory')`
- Let's do it!



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Wrapping it up

- Coding our simple .liq file
- Testing, debug
- Streaming, and verifying



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Simple scheduling, style playlists, switch
Fallbacks
Style mixes with rotate and random
Add jingles in the mix

Level up!

- Simple scheduling, style playlists, switch
- Fallbacks
- Style mixes with rotate and random
- Add jingles in the mix



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Simple scheduling, style playlists, switch

Let's break it down: we have three styles there (3 directories, classical, indie, jazz), let's build a playlist for each. Generally play any file, but: from 8 to 11, jazz from 11 to 15, classical from 15 to 18.

Code!



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Fallbacks

What happens when the main playlist ends or something goes wrong with the files?

What is all that “fallible” stuff?



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Style mixes with rotate and random

- from 8 to 11, we want 2 indies for 1 jazzy track
- from 11 to 15 we want something like 1 classical song, 2 indies, 2 jazzy tracks
- from 15 to 18 we want 2 classical, 1 jazzy
- from 16 to 8, a random mix of all lists

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Add jingles in the mix

Let's add a jingle directory, that has a few station identifiers, we can use random if we want to let them blend, or add if you want them played at given time.

(Let's not do it, I didn't prepare those in time)



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So, we did a very simple radio

Let's hear it all for a bit?

What can we do to make it better, as is? Maybe think about playlist() ?

Other ideas may come later ;)



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Live input
Player, titles, and metadata

Radio station work

- Live input
- Player, titles, and metadata
- Sound processing using liq and ladspa



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Live input
Player, titles, and metadata

Live input

Let's allow a live setup through harbour, for DJs or live talks to happen.

We can simulate another feed with liq



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Live input
Player, titles, and metadata

Player, titles, and metadata

That is not necessarily related to liq, but you'd need at least:

- proper file tagging
- maybe use of `map_metadata` to add in stream metadata
- covers for CDs/Albums or tracks, and a way to link them (or have them in the metadata)

Then you need a player, on your website, but you could just use with a MP3 stream...



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External scheduling, and media classification!
Web interfaces!
Sound processing

External scheduling, and media classification!

- beets as a media library
- funkwhale ?
- outside playlist tooling from other radio software?



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Web interfaces!

- libretime / airtime
- azuracast
- showergel ? ;)



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Sound processing

Well, that's sometimes "obvious", but you usually need: - normalization - blank detection - limiter, compressor, maybe gates



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What can you do about it in liq?

- `normalize()` / `amplify()` (and `ReplayGain`)
- `skip_blank` / `eat_blank`
- `compress()` `limit()`



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Moar?

All the LADSPA plugins collection greatness: `ladspa.plugin()`

- `swh`
- `zam`
- `lsp`
- which ones do you know?



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Example maybe of multiband compression



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Of course, StereoTool

StereoTool is a standard in the radio industry, providing all the tools with a simple GUI.
It is neither free, nor opensource, but it's a killer sound processor.

And you can use it... with pipe() !

