Building a global internet radio station with liquidsoap

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17 Jan, 2021
Dane Streeter

A little about me...

Experience

First listened to online only broadcast in 2004 - ASOT.

In the audio streaming industry since 2007

Experienced in Windows Media, Real, Flash, Shoutcast / Icecast and more.

Use liquidsoap in large scale architectures within SharpStream

note. I am not a full time dev!

Dane Streeter | Digit3

Co-Founder & Managing Director @ SharpStream | *11Years*

Co-Founder & DJ @ TheThursdayNightShow | *8Years*

Audio Streaming Nerd @ School of Streaming | *13Years*

Keen global adventurer @ Planet Earth | *From standing*

So, TTNS?

A little about TheThursdayNightShow...

"The Thursday Night Show is a live Internet show combining Internet Radio and Artist Expos"

- Founded in 2012 by Dom Robinson & Dane Streeter.
- Our first broadcast 26 July 2012
- For anyone with an open mind and a love for music, radio and online communities.
- Thriving global community of 100+ fantastic hobbyists, community radio presenters, dj's, nerds and many wonderful fans around the globe.
- Live each week 18:00 GMT around the globe @ ttns.co.uk
- Reached over 60,000 individuals so far!

Startup Mission

DJs and performers from around the world.

Broadcast between 19:00 - 00:00 every Thursday in the UK.

A 'lean back' audio experience. No screen required for minimum participation. Cook and dance!

Open Source / Free platforms where logistically sensible sensible

Easy to set up and support for new DJs and performers.
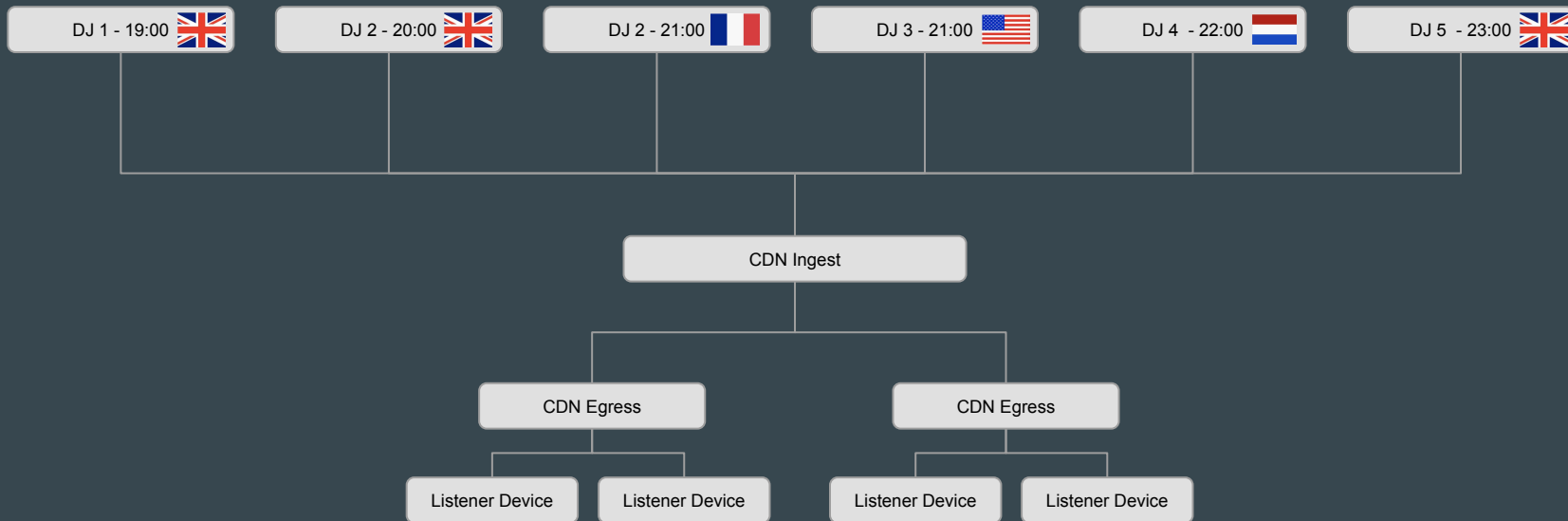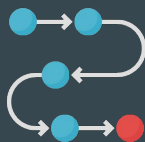
Licenced appropriately

Have fun!

Long term mission: Can we organise weekly broadcasts between 19:00 - 00:00 in each major time zone around the world?!

So, TTNS…

Live Broadcast Design

DJ 1 - 19:00

DJ 2 - 20:00

DJ 2 - 21:00

DJ 3 - 21:00

DJ 4 - 22:00

DJ 5 - 23:00

CDN Ingest

CDN Egress

CDN Egress

Listener Device

Listener Device

Listener Device

Listener Device

Requirements...

Reliable 'Handover'

A graceful transition of the audience from one DJ to the next

No need to for the audience to reconnect after each performance

Protocol and codec support

Accept many codecs

Output to many protocols (ICY, RTMP, HLS)

Expandable as the market and technologies evolve

Performance

Input from external scheduling sources

In built SOS scheduling

24/7 operation

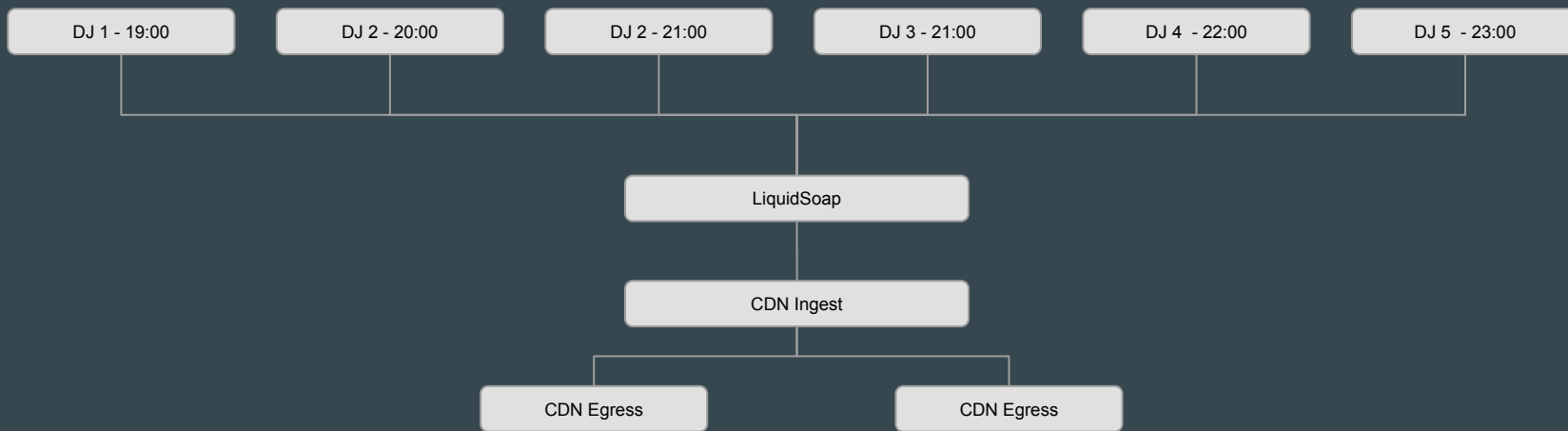Flawless fault tolerance to cope with global public internet conditions

Easily to scale as demand and features increase over time

TTNS - Why we chose liquidsoap

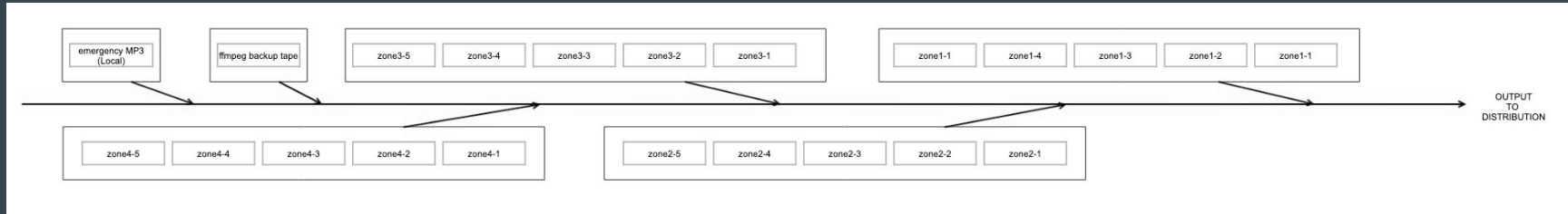Why liquidsoap was a good option to drive TTNS

- Solved all of our requirements in one package
- Very little custom functions needed to get started
- Expandable into new areas of our ecosystem over time
- New technology to the market
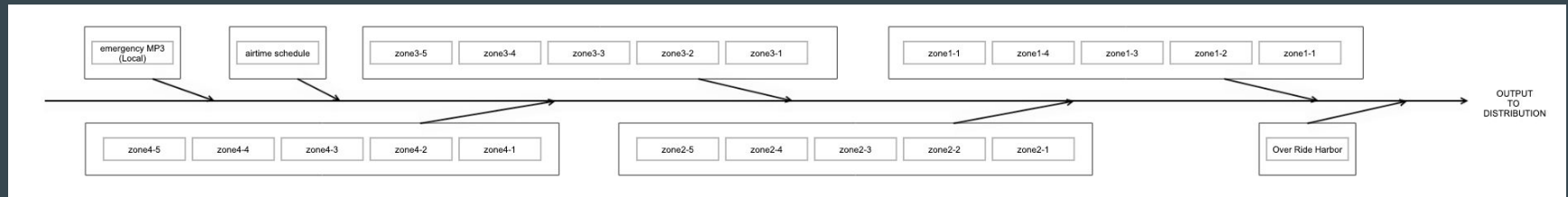
Live Broadcasting Design

Initial Liquidsoap Designs

Version 1

Version 2

Key Functions

Harbor

Using basic configuration options

Using event based functions to trigger external monitoring actions

```
zone1_1 = audio_to_stereo(input.harbor
                ("zone1_1",
                buffer=harbor.buffer,
                port=harbor.port,
                password="xxxxx",
                on_connect=fun (_) -> incident(Z1_1, "connected"),
                on_disconnect=fun () -> incident(Z1_1, "disconnected"),
                id="zone1_1"))
```

Key Functions

<u>Output Icecast</u>

Using basic configuration options

Using event based functions to trigger external monitoring actions

MP3 only output

```
###### Mainoutput  ######
output.icecast(%mp3(bitrate=128),
    icy_metadata="true",
    host=ice.host,
    port=ice.port,
    user=ice.user,
    password=ice.pass,
    mount="xxxxx",
    mainoutput)
```

Key Functions

Switch

Added hourly switch to control listener experience for intermittent DJ / Performer connectivity during the set
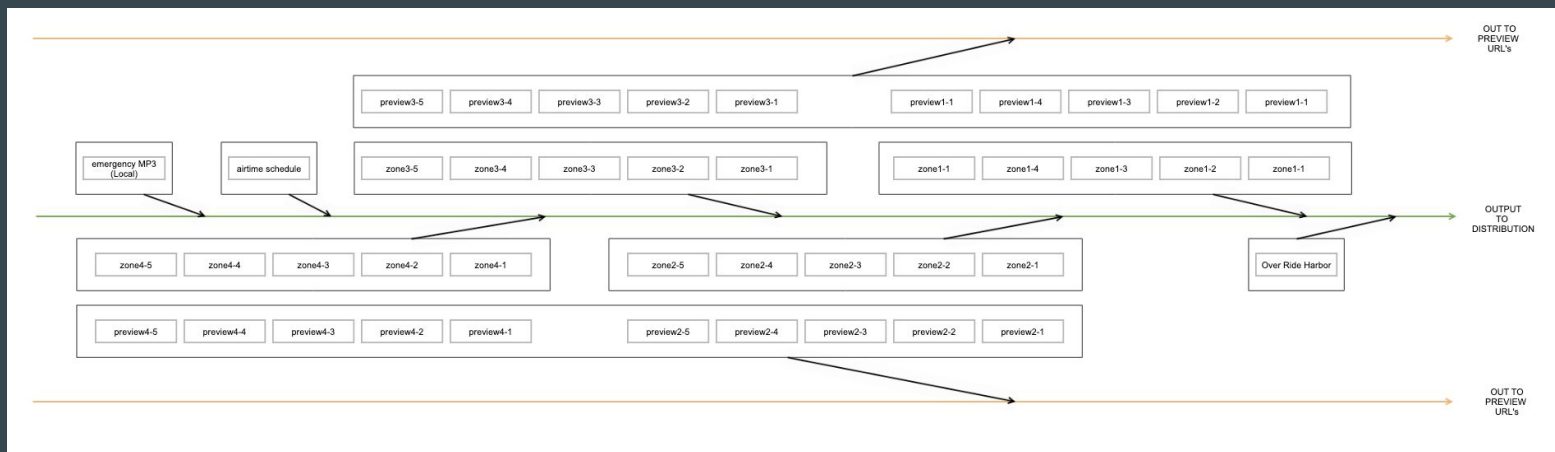
Added weekly main output switch for airtime input throughout the week

```
####### HOURLY SWITCHING. SWITCH TO STINGS LOOP FOR BROADCAST HANDOVERS. SWITCH TO BROADCAST STATIC DURING SETS######
hourly_switch = switch([({05m-55m}, static_loop),({55m-05m}, stings_loop)])

####### WEEKLY SWITCHING. SWITCH TO STATIC FOR WEEKLY BROADCAST. SWITCH BACK TO AIRTIME SCHEDULE AFTER WEEKLY BROADCAST  ######
mainoutput_switch = switch([({4w17h58m-5w03h}, hourly_switch),({5w03h-4w17h58m}, airtime_loop)])
```
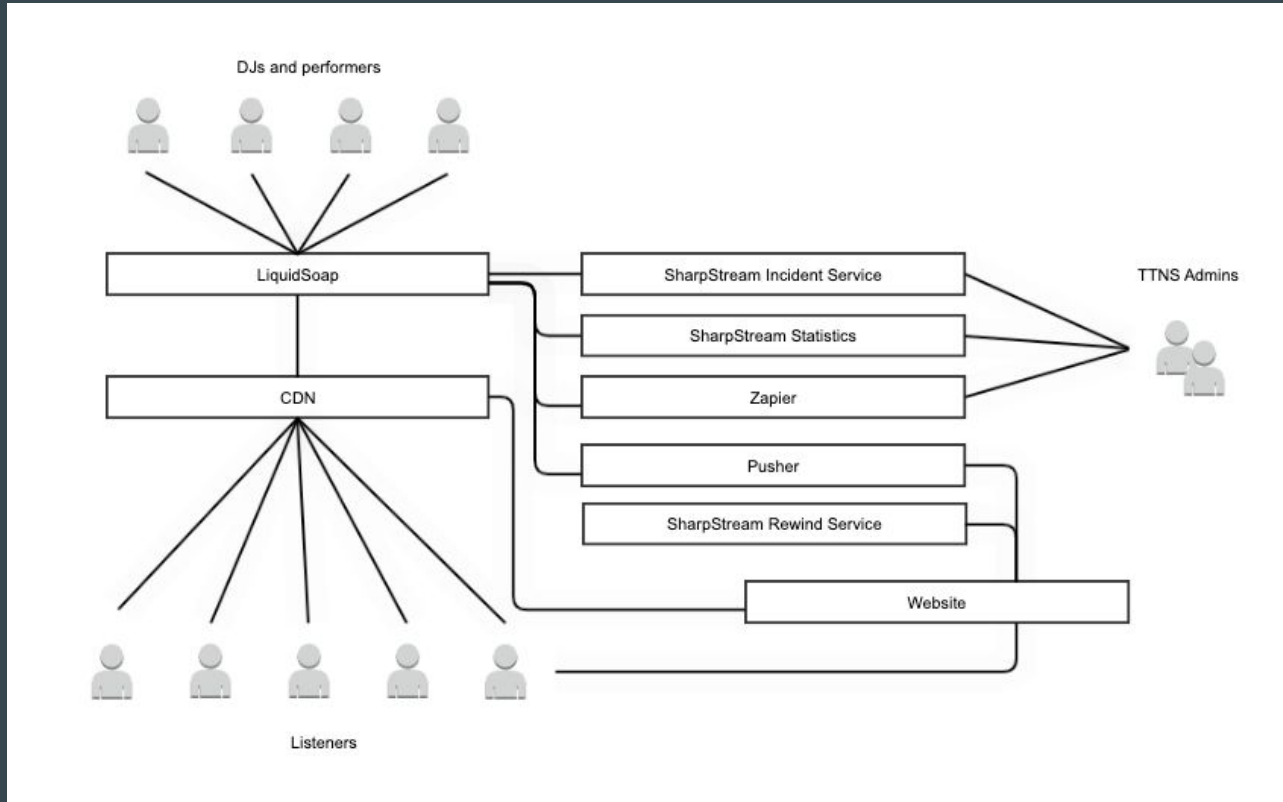
Current Design

Features added since initial designs

-Added custom functions to external monitoring integrations

-Added hourly and weekly switching for better listening experience

Current Design Simplified

Learning Experience

Initial Challenges

Not being a full time experience developer

Steep learning curve / Understanding the documentation

Converting inputs

Dummy outputs for consuming unused sources

Learning Experience

What I enjoy about LiquidSoap

Many possibilities to get creative

Simple and complex depending on approach

Feature rich and continually updated

Great support from the dev team

Growing community

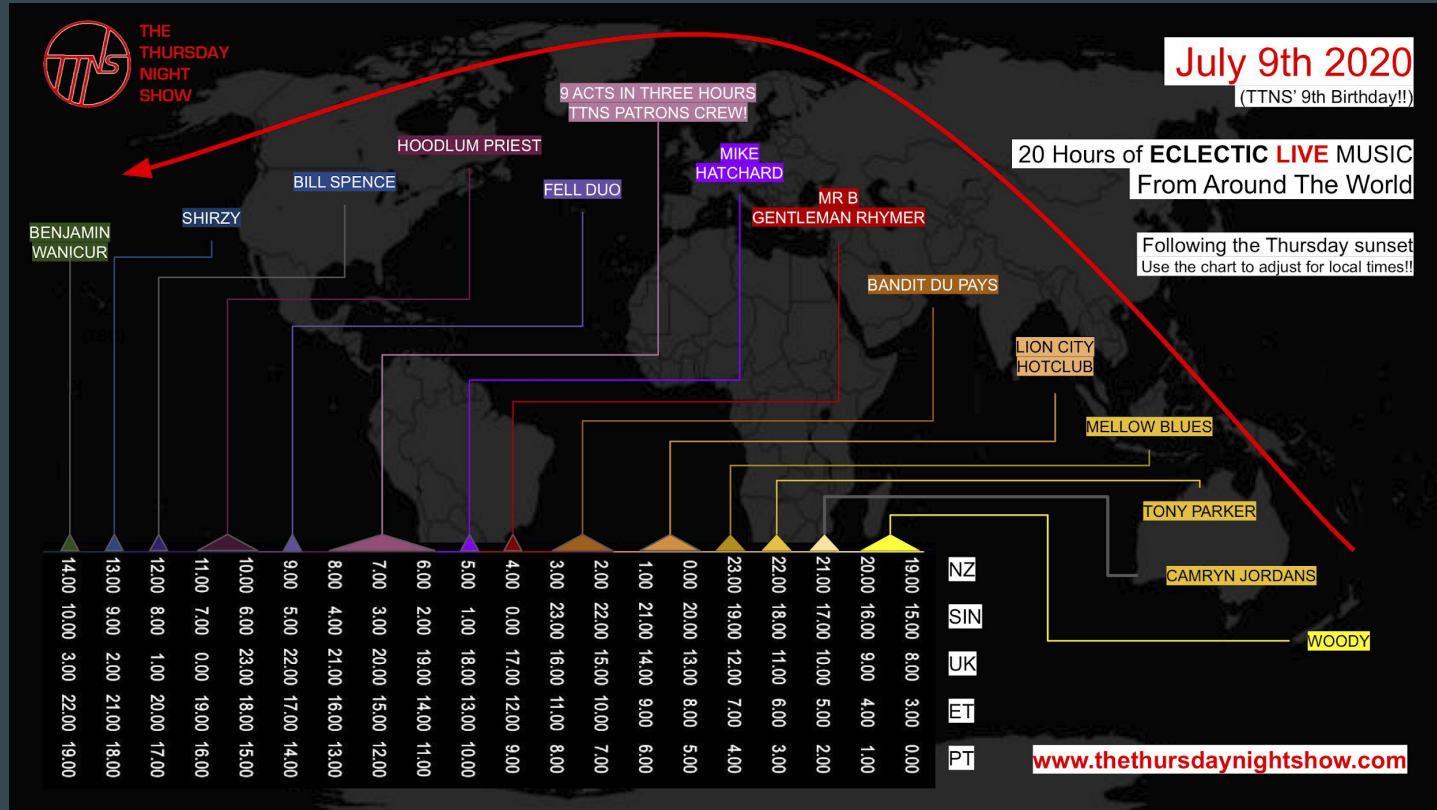# 2021 plans

Fixed DJ 'harbor' profiles

Pusher integration for DJ statuses

Now Playing API integration (something like arccloud)

HLS Wider adoption

Twitch Channel Output Trials
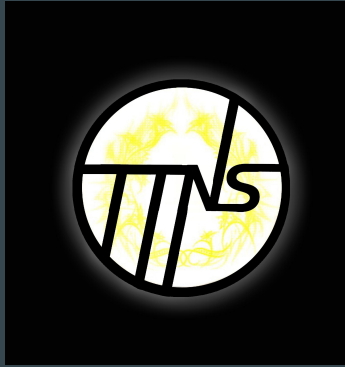
Reaching our goal!

Helping the community through difficult times...

Celebrated by BBC news

Hosted the 'Social Distancing Dance Party' (SDDP)

Over 600 local and global community members danced together during UK Lockdown #1

- Live each week 18:00 till late GMT
  around the globe @ ttns.co.uk

Thanks for listening!