FFmpeg for Owncast

Tom Ryder
tom@sanctum.geek.nz
https://sanctum.geek.nz/

Streaming

- Playing a video—live—for others to enjoy and discuss/interact, as it happens!
  - Gaming
  - Software demos (desktop recording)
  - Lectures
  - Political commentary
  - Media reviews

OBS Studio

- Free software has the production side of things covered, because
OBS (Open Broadcaster Software) Studio has decisively won the war.

- Supports many codecs and formats

- Very flexible and efficient

- Respects user freedom (GPLv2 licensed)

FFmpeg

- People called Perl the "Swiss Army Chainsaw" of programming. **FFmpeg** is the Swiss Army Chainsaw of *media formats*.

- A more automated or fine-tuned approach than OBS.

- Convert and encode pretty much anything to pretty much anything else.

- Resample, resize, splice, chop, change, filter, process…

- Play media directly to streaming services…

Proprietary distribution

- The *playing* side of streaming things, however, is *not* so well-covered by free software.

- YouTube and Twitch are both proprietary software-as-services.

  - You can't "run your own" YouTube or Twitch.
  - You're subject to their rules and censorship.
  - You're contributing to Google and Amazon's hegemony…

Owncast—1/2

- **Owncast**: Free and open source live video and web chat server

- Free software (MIT License), implemented in Go, runs nicely on GNU/Linux

- Chat and moderation tools

- Stream performance metrics

Owncast—2/2

- Web interface for playing **H.264+AAC (FLV) RTMP** streams
  - Well-supported in modern browsers
- Uses FFmpeg under the hood
- Relay RTMP streams directly (passthrough)
  - Or, re-encode basically anything FFmpeg can chew on, on the fly

Installation—1/3

- I've never liked this `curl | bash` business…

  ```
  $ curl -s https://owncast.online/install.sh | bash
  ```

Installation—2/3

- I've never liked this `curl | bash` business…

  `$ curl -s https://owncast.online/install.sh | bash`

- …but I can't deny that the installation step of Owncast is *really* easy.
  - (Especially for a web service!)
- However—change your streaming key *immediately*.
  - "abc123" is, uh, not very secure…

Installation—3/3

- Mind, that quick install method installs FFmpeg for you if it can't find it on your system.

- You might prefer to `apt install ffmpeg` or similar instead, *before* you run the install.

- It also might be wise to give it a **dedicated system user** to run the daemon:

```
$ sudo adduser --group --home /var/lib/owncast --system owncast
$ sudo -s -u owncast
$ cd
$ curl -s https://owncast.online/install.sh | bash
```

HTTPS

- This being 2022, you're going to want HTTPS as well.
- Use a reverse HTTP proxy:
  - Apache HTTPD (Tom's recommendation)
  - Nginx
  - Caddy (shockingly easy)
- Get a free Let's Encrypt cert.
- *Don't* write your own config. Follow their instructions.
  - Ask me how I know…

There have been no communications
from the colony for over 12 hours.

Stream is online. 02:42

1 viewer

stupefied-swanson is now known as **Tom Ryder**.

Tom Ryder

Hello, world!

Message

OWNCAST ADMIN

- 🏠 Home
- 📈 Viewers
- 💬 Chat & Users ⌄
- ⚙️ Configuration ⌄
- 🔧 Utilities ⌄
- ⚗️ Integrations ⌄
- ❓ Help

What are you streaming now

ONLINE 03:45 ▶

Stream started today at 12:21 AM

🕐 4 minutes

Viewers

👤 1

Peak viewer count

👤 1

Healthy Stream

⊘ Yes

Playback Health

100 %

Outbound Stream Details

Outbound Video Stream

488 kbps, 23.975609 fps 850 x 640

Outbound Audio Stream

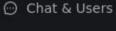AAC, 62 kbps

Inbound Stream Details

What are you streaming now

- ⌂ Home
- ∼ Viewers
- ⊙ Chat & Users ⌄
- ⚙ Configuration ⌃
  - General
  - Server Setup
  - Video
  - Chat
  - Social
  - Notifications
  - S3 Storage

Chat Settings

Chat: `ON ⬤`

Turn the chat functionality on/off on your Owncast server.

Join Messages: `ON ⬤`

Show when a viewer joins the chat.

Established users only: `⬤ OFF`

Only users who have previously been established for some time may chat.

Welcome Message:

A system chat message sent to viewers when they first connect to chat. Leave blank to disable.

Demo

- Tom will play a short video and demonstrate chat on an Owncast instance on his server.

- Feel free to follow along! Should work on mobile, too.

https://cast.sanctum.geek.nz/

Tom's Owncast tips—1/4

- Follow FFmpeg's streaming guide recommendations.

- If you're playing recorded media, encode it ahead of time, and play it directly from the server itself, using passthrough mode.

  - *Way* less error-prone
  - **Encode** on a beefy personal computer with `-preset veryslow`, in two passes
  - **Play** on a cheap VPS, directly from the .flv file

Tom's Owncast tips—2/4

- Use the highest quality source media you can.

- Use two-pass encoding for prepared media.
    - This allows setting an average bitrate reliably.

- Once you find commands and processes that work, save them and document them.

    - Better yet, script and automate them!

    - (You won't remember what you did.)

Tom's Owncast tips—3/4

Choose conservative average and maximum bitrates.
(FFmpeg: `-b:v`, `-maxrate`, `-bufsize`)

- Lately I've been using 600kbit H.264 480p video.
- No, you are *not* too good for 600kbit H.264 480p video.
- Viewers on slow connections and computers will thank you.

Tom's Owncast tips—4/4

- Consider viewers with hearing difficulties (or no headphones!)
- "**Hardsub**" anything with subtitles.
  - FLV does support subs, but it's sporadic.
  - This avoids player incompatibilities.
  - It tends to look nicer, too. Pick a legible font.

Questions?

- FFmpeg documentation

- FFmpeg Trac:

  - StreamingGuide

  - EncodingForStreamingSites

  - Encode/H.264

Email: tom@sanctum.geek.nz
Website: https://sanctum.geek.nz/
Fediverse: @tejr@mastodon.sdf.org