Enabling 5.1 Multichannel Opus in VacuumTube

A configuration guide for LibreELEC and Flatpak integration

By default, VacuumTube running as a Flatpak on LibreELEC will only output 2-channel stereo audio. This is caused by a double bottleneck: YouTube detects the desktop Chromium user-agent and refuses to serve 5.1 streams (as desktop Chromium lacks licensed Dolby decoders), and LibreELEC's Flatpak PulseAudio bridge defaults to a 2.0 stereo sink. This guide details how to spoof a certified Smart TV to unlock multichannel Opus streams and force the audio bridge to output 5.1 LPCM.

Step 1: Spoof the Sony Bravia User-Agent

YouTube restricts high-bitrate 5.1 Opus audio (itag 338) to certified TV environments. By changing VacuumTube's User-Agent to match a Sony BRAVIA 8K Android TV, we force YouTube's Leanback backend to expose the surround sound options.

Modify the source code in `src/ua.js` prior to building the add-on:

```
const userAgent = 'Mozilla/5.0 (Linux; Andr0id 9; BRAVIA 8K UR2) AppleWebKit/537.36
(KHTML, like Gecko) Chrome/84.0.4147.125 Safari/537.36 OPR/46.0.2207.0
OMI/4.21.0.273.DIA6.149 Model/Sony-BRAVIA-8K-UR2';
```

Ensure that the `applyToRequestHeaders(url, headers)` function strips conflicting Client Hints so the Bravia identity is maintained:

```
function applyToRequestHeaders(url, headers) {
    for (let key of Object.keys(headers)) {
        let lower = key.toLowerCase();
        if (lower === 'user-agent' || lower.startsWith('sec-ch-ua')) {
            delete headers[key];
        }
    }
    headers['User-Agent'] = userAgent;
}
```

Step 2: Configure Chromium for Multi-Channel Output

Chromium needs explicit instruction to request a 5.1 channel layout from the host audio server. This can be configured via VacuumTube's user data flags.

Create or edit the flags file located at `/storage/.var/app/rocks.shy.VacuumTube/config/VacuumTube/flags.txt` and add the following lines:

```
--try-supported-channel-layouts
--audio-output-channels=6
```

Step 3: Configure the Flatpak Audio Bridge for 6 Channels

When launching a Flatpak, LibreELEC creates an ephemeral PulseAudio-to-ALSA bridge that defaults to stereo. We must modify the launcher script to explicitly map 6 channels.

Edit the launcher script located at `/storage/.kodi/addons/tools.flatpak/bin/flatpak-run-wrapper`. Locate the `setup_pulse()` function and modify the `module-alsa-sink` load command:

```
PA_UNLOAD=$(pactl load-module module-alsa-sink device="${AUDIODEV}" name="flatpak"
channels=6 channel_map=front-left,front-right,rear-left,rear-right,front-
center,lfe)
```

> **Note:** To prevent PulseAudio from remixing channel assignments globally, you can enforce this mapping by creating a daemon override at `/storage/.config/pulse-daemon.conf.d/multi.conf` with the lines: `default-sample-channels = 6`, `default-channel-map = front-left,front-right,rear-left,rear-right,front-center,lfe`, and `enable-remixing = no`.

The Resulting Audio Pipeline

1. **YouTube Verification:** YouTube identifies the client as a Sony Bravia TV and delivers the 5.1 multichannel Opus stream (~773 kbps).
2. **VacuumTube Capabilities:** `media-capabilities.js` accepts the 6-channel stream parameters and forwards the Opus chunks to Chromium.
3. **Chromium Decoding:** The browser natively decodes the Opus stream into 6 uncompressed LPCM channels and feeds them to the PulseAudio server.
4. **PulseAudio Routing:** The modified `module-alsa-sink` carries all 6 channels transparently to the ALSA HDMI device without downmixing.
5. **AVR Delivery:** The AV Receiver receives a native 5.1 Multichannel LPCM signal over the direct HDMI connection.