

Networking PulseAudio

(with a Windows server)

Intro

PulseAudio has often been a pain to have around, complicating audio setups on Linux systems. And disabling or uninstalling it was common. Fortunately, those problems seem to now be gone and for most Linux installs, PulseAudio just works and can be ignored unless you need to adjust it to do something extra for you.

And it has always been very capable software, offering lots of useful features. But until recently, I had never used it much beyond using its GUI to adjust volumes.

My PCs

I run my two main desktop PCs (Windows and Ubuntu) on a KVM switch so they use the same monitor, keyboard and mouse. And the same speakers. The speakers are cabled to the Line Out socket on the Windows PC (savaidh).

The audio from the Ubuntu PC (lith) was cabled from the Line Out socket of lith to the Line In socket of savaidh. This worked fairly well, but the long audio cable between the PCs (3 m) meant that if it was unplugged, the cable would pick up a tremendous 50 Hz hum. And I had to be careful with the earthing between the PCs so as not to get ground loop hum.

My Problem

Nearly a year ago, I finally upgraded lith to a modern PC with a Ryzen 7 3700X CPU on an Asus ROG STRIX X570-E Gaming motherboard with 32 Gibytes of RAM. This is a fairly high end motherboard and has decent audio hardware. Initially, I tried using the same audio cable setup, but the new audio hardware has a new trick – when the line out output is not actually in use, the software sets it to a high impedance mode, effectively disconnecting it completely (except not the earth connection). And that means the tremendous 50 Hz hum happens. On each reboot, the hum started again during shutdown and only stopped once the GUI was loaded and I opened the Settings on the Sound tab. I had to keep the Sound tab open in the background to prevent the hum.

A Solution?

I hate 50 Hz hum, so I tried lots of things to get rid of it, and finally just unplugged the audio cable while I searched for a better solution. Every so often I would try various things, but none worked very well. Then I happened to put “Windows PulseAudio” into Google and found this:

<https://www.freedesktop.org/wiki/Software/PulseAudio/Ports/Windows/Support/>

That was promising – if I could get PulseAudio to run on Windows, then I was already aware that PulseAudio had network capability, so could that work?

PulseAudio For Windows

The freedesktop.org page for PulseAudio On Windows provides two links. One goes to an auto-build page, which is long defunct. The other goes to a download for prebuilt PulseAudio binaries for Windows. They are 32-bit and for PulseAudio 1.1, which is very old (2012), but I was desperate, so I tried installing them. I found a page that tells how to set them up:

<https://superuser.com/questions/377978/centralized-pulseaudio-setup/378000#378000>

And the setup worked! Mostly – it was not completely reliable. A bit more searching turned up the recommendation to add a “record=0” option, and then it was reliable.

Installing PulseAudio For Windows

- Download <http://bosmans.ch/pulseaudio/pulseaudio-1.1.zip> and unzip it in a suitable place on Windows. I put mine in:
C:\Program Files (x86)\pulseaudio
- Go to the etc\pulse subdirectory and:
copy default.pa default.pa.original
- Edit default.pa. Change this line:
load-module module-waveout sink_name=output
source_name=input
to add “record=0” on the end of the line.

- Add these two lines at the end of the file:

```
load-module module-native-protocol-tcp listen=0.0.0.0
auth-anonymous=1
set-default-sink output
```

- Create a `pulseaudio.cmd` file somewhere it can be run from at startup. Put these lines in it:

```
C:
cd "C:\Program Files (x86)\pulseaudio\"
:loop
bin\pulseaudio.exe
goto loop
```


Follow these instructions to make the batch file run at startup:

<https://www.computerhope.com/issues/ch000322.htm>

If you do not want to reboot Windows to get PulseAudio running, you can use Windows Explorer to find your `pulseaudio.cmd` batch file and right click it and “Run as Administrator”.

Configuring PulseAudio on Ubuntu

- As root, do the following commands:

```
cd /etc/pulse/client.conf.d
```

```
echo "default-server = savaidhg.jsw.gen.nz" >savaidh.conf
```

(Change the names as appropriate for your network; use an IP address if you do not have local DNS)

```
chown root:root savaidh.conf
```

```
chmod u=rw,go=r savaidh.conf
```

- As your usual GUI login, do these commands:

```
systemctl --user restart pulseaudio
```

```
systemctl --user status pulseaudio
```

You should see something like this:

```
● pulseaudio.service - Sound Service
   Loaded: loaded (/usr/lib/systemd/user/pulseaudio.service; enabled;
vendor preset: enabled)
   Active: active (running) since Sun 2022-02-20 21:43:24 NZDT; 2s ago
TriggeredBy: ● pulseaudio.socket
   Main PID: 714743 (pulseaudio)
   Memory: 5.5M
   Cgroup:
/user.slice/user-1000.slice/user@1000.service/pulseaudio.service
└─714743 /usr/bin/pulseaudio --daemonize=no --log-target=journal
```

If so, then PulseAudio should now be set up for networking to your Windows PC.

Test Network Audio

To test the new PulseAudio setup in Ubuntu, open the Settings window and go to the Sound page. In the Output section, the Output Device should now be set to the device provided by your Windows PulseAudio. Mine is called:

WaveOut on Microsoft Sound Mapper

You should be able to use the Test button to produce sound on the Windows PC.

Limitations of Network PulseAudio

The only problem I have found with this network audio setup is that the Windows box needs to be running with PulseAudio running if I start my VirtualBox OS/2 VM. If it is not all working, the OS/2 VM gives an error about the sound device not being available and will need to be restarted for sound to work.

For sound from Ubuntu itself, if the Windows PulseAudio is not available at boot, or goes away at some point, PulseAudio on Ubuntu discards sound output until it is able to reconnect, which it does automatically.

Using Other PulseAudio Servers

Any PulseAudio running on other Linux systems should be able to be configured as a TCP server in the same manner as Windows, although the location of the config file to edit may be in a different place, and may not be default.pa. I have not tried this as my speakers are connected to my Windows PC.