WebRTC voice chat with pkgsrc/www/firefox-66.0

2019-03-21
Ryo ONODERA
<ryo@tetera.org>
<ryoon@NetBSD.org>
AsiaBSDCon 2019 NetBSD BoF
At IIJ room Opera 2, Tokyo, Japan
About me (1/2)

- Name: Ryo ONODERA (ryoon@NetBSD.org)
- pkgsrc developer since 2010

- I need fresh packages for my NetBSD/amd64-current laptop including:
  - Mozilla Firefox (pkgsrc/www/firefox)
  - LibreOffice (pkgsrc/misc/libreoffice)

  and so on. See: https://github.com/ryoon/pkgsrc_meta-pkgs_env-ryoon
About me (2/2)

• I am living in Microsoft Windows world in day time. There is no non-Windows servers/PCs except my FreeBSD server.

• I specialize:
  – Environmental Science
  – Waste Management
  – Mineral Processing
  – Extractive Metallurgy
For 4K display users

- I recommend the following environmental variables.
- `GDK_DPI_SCALE=1.4`
- `QT_FONT_DPI=140`

- `Xft.dpi: 140 in ~/.Xresources is not flexible for me. It requires restart of X in my cases.`
WebRTC voice chat: motivation

- Ishihara-san tweeted that he uses appear.in for conference. (12 January, 2019)
- As far as I understand correctly, Video4Linux2 API of NetBSD-current is incomplete and Firefox cannot get video stream from video(4) devices.
- Ishihara-san said that voice-only chat is useful for his conference.
- I was interested in Video chat only... It is bad.
- The voice chat should work with the current www/firefox.
www/pkgsrc has 3 audio backends:
  - OSS (Open Sound System; enabled by default)
  - ALSA (Advanced Linux Sound Architecture; Do not confuse with ALSA in Linux kernel)
  - PulseAudio (not portable for exotic architectures; default backend by upstream)

I use PulseAudio backend for my laptop.

PulseAudio is Mozilla’s primary backend and it should work on NetBSD too.
1st tests: enable single backend

- I have tested OSS, ALSA (enable PulseAudio plugin) and PulseAudio backends sololy.

- For example, in PulseAudio case:

  # cd /usr/pkgsrc/www/firefox
  # make PKG_OPTIONS.firefox="webrtc -oss pulseaudio" install

- However 3 tests failed. Even with:

  $ mixerctl -w inputs.reclvl.mute=off
  $ mixerctl -w record.source=ADC02

- I should test the backends itself first.
2nd tests: simple cases (OSS)

- For OSS, NetBSD has simple play/record programs:
  - audioplay(1) for playing
  - audiorecord(1) for recording
- I have found that audiorecord(1) command cannot increase a output .wav file size longer than 58 bytes.
- Something may go wrong in OSS audio recording.
- This problem should be tested with another machine/environment.
- Anyway, the voice chat with OSS will not work.
2nd tests: simple cases (PulseAudio)

- PulseAudio package, audio/pulseaudio has parecord(1) command to record audio.
- My PulseAudio provides input from monitor input and /dev/audio.
  - $ parecord -d oss_output.audio.monitor test.wav
  - $ parecord -d oss_input.audio test.wav
- Former generates a sane .wav file.
- Later generates a silent .wav file (no audio at all).
2nd tests: simple cases (ALSA)

- ALSA backend of Firefox causes a crash.
- ALSA utilities package, audio/alsa-utils has arecord(1) command to record audio.
- My ALSA setup uses PulseAudio as backend. So my audio stream is:
  microphone → OSS → PulseAudio → ALSA
- I can get my voice in a .wav file finally.

- I have no idea about this phenomenon...
3rd tests: back to Firefox

- I have enabled 3 backends simultaneously.

  # make PKG_OPTIONS.firefox="webrtc oss pulseaudio alsa" install

- about:support page of Firefox shows ‘pulse-rust’ audio backend is used.

- With this PKG_OPTIONS, you can send your voice and receive someone’s voice on pkgsrc/www/firefox on NetBSD/amd64-current.
3rd tests: back to Firefox

- And I found that ‘oss’ option is not required to enable WebRTC voice conferencing via appr.tc web service.

  # make PKG_OPTIONS.firefox=""webrtc -oss pulseaudio alsa" install
Conclusion

- If you use PulseAudio as Firefox audio backend, ‘alsa’ option of www/firefox will enable WebRTC voice conferencing.
- The following audio mixer settings are required:
  
  $ mixerctl -w inputs.reclvl.mute=off
  
  $ mixerctl -w record.source=ADC02
Additional information

- On NetBSD/amd64-current:
  - Text chat works fine.
  - Full screen sharing works.
  - Per windows screen sharing does not work.
  - Video chat does not work.
  - File transfer is not tested yet. However it should work.
Fin.

- Any questions?
- Any suggestions?