WebRTC voice chat with pkgsrc/www/firefox-66.0

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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 recommends 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 Janurary, 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/firefox's audio backends

- 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).

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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?