Building for Linux

An unofficial PKGBUILD of Citra is available for Arch Linux on the AUR (https://aur.archlinux.org/packages/citra-git/).

Dependencies:

You'll need to download and install the following to build Citra:

- SDL2 (https://www.libsdl.org/download-2.0.php)

    - Deb: `sudo apt install libsdl2-dev`
    - Arch: `pacman -S sdl2`
    - Fedora: `sudo dnf install SDL2-devel`
    - OpenSUSE: `zypper in libSDL2-devel`
- OpenSSL (https://www.openssl.org/source/) (optional)

    - Deb: `sudo apt install libssl-dev`
    - Arch: `pacman -S openssl-1.0`
    - Fedora: `sudo dnf install openssl-devel`
    - OpenSUSE: `zypper in openssl-devel`
- Qt (http://qt-project.org/downloads) 6.2+

    - Only 6.2+ versions are tested. Lower version might or might not work. See the section **Install new Qt version** below if your distro does not provide a sufficient version of Qt
    - Deb: `sudo apt install qt6-base-dev qt6-base-private-dev qt6-multimedia-dev`
        - You may also need `apt install qt6-l10n-tools qt6-tools-dev qt6-tools-dev-tools` to build with translation support
        - You may also need `apt install libgl-dev` if you run into WrapOpenGL issues while configuring with CMake.
    - Arch: `pacman -S qt6-base qt6-multimedia qt6-multimedia-ffmpeg`
        - You will also need to install a multimedia backend, either `qt6-multimedia-ffmpeg` or `qt6-multimedia-gstreamer`.
    - Fedora: `sudo dnf install qt6-qtbase-devel qt6-qtbase-private-devel qt6-qtmultimedia-devel`
    - OpenSUSE: `zypper in qt6-base qt6-multimedia`
- PORTAUDIO (http://www.portaudio.com/)

    - Deb: `sudo apt install libasound-dev`
    - Fedora: `sudo dnf install portaudio-devel`
    - OpenSUSE Leap 15: `zypper in portaudio-devel`
    - OpenSUSE Tumbleweed: `zypper in portaudio-devel`
- XORG (https://www.x.org/)

    - Deb: `sudo apt install xorg-dev libx11-dev libxext-dev`
    - Fedora: `sudo dnf install xorg-x11-server-devel libX11-devel libXext-devel`
    - OpenSUSE Leap 15: `zypper in xorg-x11-util-devel libX11-devel libXext-devel`

- OpenSUSE Tumbleweed: `zypper in xorg-x11-util-devel libX11-devel libXext-devel`
- JACK Audio Connection Kit (https://jackaudio.org)

  - Deb: `sudo apt install jackd`
  - Fedora: `sudo dnf install jack-audio-connection-kit-devel`
  - OpenSUSE Leap 15: `zypper in libjack-devel`
  - OpenSUSE Tumbleweed: `zypper in libjack-devel`
- PipeWire (https://pipewire.org)

  - Deb: `sudo apt install libpipewire-0.3-dev`
  - Fedora: `sudo dnf install pipewire-devel`
  - OpenSUSE Leap 15: `zypper in pipewire-devel`
  - OpenSUSE Tumbleweed: `zypper in pipewire-devel`
- **Optional dependencies**
- sndio (https://sndio.org/)

  - Deb: `sudo apt install libsndio-dev`
  - Fedora: `sudo dnf -y copr enable andykimpe/shadow && sudo dnf -y install sndio`
  - OpenSUSE Leap 15: `zypper in sndio-devel`
  - OpenSUSE Tumbleweed: `zypper in sndio-devel`
- **Optional dependencies**
- Gnome esound (https://download.gnome.org/sources/esound/)

  - Deb: `echo "esound require build use source code https://download.gnome.org/sources/esound/"`
  - Fedora: `sudo dnf install esound-devel`
  - OpenSUSE Leap 15: `zypper in libesd0-devel`
  - OpenSUSE Tumbleweed: `zypper in libesd0-devel`
- Compiler: GCC or Clang. You only need one of these two:

  - GCC 11.0+.
    - Deb: `apt install build-essential`
    - Arch: `pacman -S base-devel`
    - Fedora: `dnf install gcc-c++`
    - OpenSUSE: `zypper in gcc-c++`
  - Clang (https://github.com/llvm-mirror/clang) 15.0+
    - Deb: `apt install clang clang-format libc++-dev`
      - Note for Ubuntu users: Clang 15 is available only from 22.10 onward. For earlier distro versions, see: https://apt.llvm.org/ (https://apt.llvm.org/)
    - Arch: `pacman -S clang`, `libc++` is in the AUR. Use pacaur or yaourt to install it.
    - Fedora: `dnf install clang libcxx-devel`
    - OpenSUSE: `zypper in clang`
- CMake (http://www.cmake.org/) 3.20+

  - Deb: `apt install cmake`
  - Arch: `pacman -S cmake`
  - Fedora: `dnf install cmake`
  - OpenSUSE: `zypper in cmake extra-cmake-modules`
- Note on Boost library: you don't need to install Boost library on your system, because citra provides a bundled trimmed Boost library. However, if you already have Boost library installed on your system, please make sure its version is at least 1.66 (which contains a bug fix for GCC 7), otherwise compilation

would fail.

Cloning Citra in Git:

```
git clone --recursive https://github.com/citra-emu/citra
cd citra
```

The `--recursive` option automatically clones the required Git submodules too.

Building Citra in Debug Mode (Slow):

Using gcc:

```
mkdir build
cd build
cmake ../
cmake --build . -- -j"$(nproc)"
sudo make install (optional)
```

Optionally, you can use "cmake -i .." to adjust various options (e.g. disable the Qt GUI).

Using clang:

Note: It is important you use libc++, otherwise your build will likely fail:

```
mkdir build
cd build
cmake .. -DCMAKE_CXX_COMPILER=clang++-5.0 \
        -DCMAKE_C_COMPILER=clang-5.0 \
        -DCMAKE_CXX_FLAGS="-O2 -g -stdlib=libc++"
cmake --build . -- -j"$(nproc)"
sudo make install (optional)
```

If you get a weird compile error related to `std::span` conversions, make sure you are using clang and libc++ 15 or up. This is an issue with libc++ 14.

Building Citra in Release Mode (Optimized):

```
mkdir build
cd build
cmake .. -DCMAKE_BUILD_TYPE=Release
cmake --build . -- -j"$(nproc)"
sudo make install (optional)
```

Building with debug symbols:

```
mkdir build
cd build
cmake .. -DCMAKE_BUILD_TYPE=RelWithDebInfo
cmake --build . -- -j"$(nproc)"
sudo make install (optional)
```

Running without installing:

After building, the binaries `citra`, `citra-qt` and `citra-room` (depending on your build options) will end up in `build/bin/`.

```
# SDL
cd build/bin/
./citra

# Qt
cd build/bin/
./citra-qt

# Dedicated room
cd build/bin/
./citra-room
```

Debugging:

```
cd data
gdb ../build/bin/citra-qt
(gdb) run

(gdb) bt
```

Install new Qt version

If your distribution's version of Qt is too old, there are a few places you may be able to find newer versions.

- This Ubuntu PPA contains backports of Qt 6 to various older versions: https://launchpad.net/~savoury1/+archive/ubuntu/qt-6-2 (https://launchpad.net/~savoury1/+archive/ubuntu/qt-6-2)

- This unofficial CLI installer allows downloading and installing the latest first-party builds of Qt to your system (whether it works against your distribution may vary): https://github.com/miurahr/aqtinstall (https://github.com/miurahr/aqtinstall)

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GitHub / Source (https://github.com/citra-emu/citra)

Issues (https://github.com/citra-emu/citra/issues)

Pull Requests (https://github.com/citra-emu/citra/pulls)