

# LIBHEIF INSTALL

I wanted this tool for HEIC image conversions on my own system. Once I got started trying to figure it all out, I found a whole world out there doing cool stuff with it. I also found that my Rocky 8 load was gunna give me some challenges. Here is a install process that I hope overcomes those challenges, for you.

**NEGATIVO17:** <https://negativo17.org>

**REPO:** <https://negativo17.org/repos>

```
# ----- FIND A NICE PLACE TO WORK -----
```

```
cd /opt
```

```
# ----- ADD NEGATIVO17 REPO -----
```

```
dnf config-manager --add-repo=https://negativo17.org/repos/epel-multimedia.repo
```

```
dnf -y update
```

```
# ----- INSTALL LIBRARIES AND TOOLS -----
```

```
dnf -y install \
```

```
binutils-x86_64-linux-gnu brotli brotli-devel cmake cmake-data cmake-doc cmake-filesystem cmake-rpm-macros \
```

```
doxygen ffmpeg ffmpeg-devel ffmpeg-libs fontconfig-devel freglut-devel freetype-devel fribidi-devel \
```

```
gcc-c++-x86_64-linux-gnu gcc-gfortran gcc-go gcc-objc gcc-objc++ gcc-x86_64-linux-gnu gdk-pixbuf2-devel \
```

```
giflib giflib-devel git git-core git-core-doc glibc-static gmp-c++ graphviz graphviz-devel harfbuzz-devel \
```

```
ilmbase-devel iso-codes jbigkit-devel kvazaar kvazaar-devel kvazaar-libs libaom-devel libavcodec-devel \
```

```
libavfilter-devel libavformat-devel libavif libavutil-devel libdav1d-devel libgs-devel libjpeg libjpeg-devel \
```

```
libjpeg-turbo-utils libjxl-devel libopenjph-devel libpng libpng-devel libsvg2-devel libswscale \
```

```
libswscale-devel libtiff libtiff-devel libwebp-devel libwmf libwmf-devel libwmf-lite libXext libXext-devel \
```

```
meson nasm ninja-build OpenEXR-devel openh264-devel openh264-libs pango-devel perl-devel pixman-devel \
```

```
qt5-qtbase-gui qtsinglecoreapplication-qt5 qtsinglecoreapplication-qt5-devel SDL2 SDL2-devel svt-vp9-devel \
```

```
turbojpeg turbojpeg-devel vvdec vvdec-devel vvdec-libs vvenc vvenc-devel vvenc-libs x264-devel x264-libs \
```

```
x265-devel x265-libs yasm
```

```
# ----- INSTALL CARGO/RUSTUP -----
```

```

curl --proto '=https' --tlsv1.2 -sSf https://sh.rustup.rs -o rustup.sh
chmod +x rustup.sh
./rustup.sh --no-modify-path -y -q
rm -f rustup.sh

# ----- PRE-CREATE, CREATE, AND EXPORT MISSING PATHS -----

cat > /etc/ld.so.conf.d/local-lib.conf << "EOF"
/usr/local/lib
/usr/local/lib64
EOF

mkdir -p {/usr/local/lib64/pkgconfig,/usr/local/share/pkgconfig}
cat >> /root/.bashrc << "EOF"

PKGPATH=$(pkg-config --variable pc_path pkg-config);
PKG_CONFIG_PATH="$PKGPATH:/usr/local/lib64/pkgconfig:/usr/local/share/pkgconfig"
export PKG_CONFIG_PATH

PREPATH=$(echo $PATH);
CARPATH="$HOME/.cargo/bin"
PATH="$PREPATH:$CARPATH"
export PATH

EOF

# ----- CHECK YOUR BASHRC AND MAKE SURE THE NEW PATHS ARE GTG -----

cat /root/.bashrc

# ----- IF ALL IS GOOD, SOURCE AND LOAD -----

source /root/.bashrc
ldconfig
rustup update

```

The environment should be pretty well setup now. This next part is the meat and potatoes. I am going to keep these builds around for awhile so I created scripts for each one, and will locate them inside a `codecs` directory. This is a bit out of the norm if you're reading the "libheif" documentation as well. But you're here, so here it goes...

```
# ----- CREATE CODECS DIRECTORY -----
```

```
mkdir -p /opt/codecs && cd /opt/codecs
```

```
# ----- CLEAN INSTALL OF GCC 11 COMPILER, CLANG, AND ALL ITS TOOLS -----
```

```
dnf -y remove clang* gcc-toolset*
```

```
dnf -y install gcc-toolset-11* clang
```

```
# ----- GENERATE THE SCRIPTS -----
```

```
cat > libde265.sh << "EOF"
```

```
#!/usr/bin/env bash
```

```
git clone https://github.com/strukturag/libde265.git
```

```
cd libde265
```

```
./autogen.sh && ./configure --enable-encoder
```

```
make
```

```
make install
```

```
ldconfig
```

```
EOF
```

```
cat > openjpeg2.sh << "EOF"
```

```
#!/usr/bin/env bash
```

```
git clone -b v2.5.3 --depth 1 https://github.com/uclouvain/openjpeg.git
```

```
mkdir -p openjpeg/build
```

```
cd openjpeg/build
```

```
cmake .. -DCMAKE_BUILD_TYPE=Release -DBUILD_THIRDPARTY:BOOL=ON -DBUILD_CODEC:bool=on
```

```
make
```

```
make install
```

```
ldconfig
```

```
EOF
```

```
cat > aom.sh << "EOF"
```

```
#!/usr/bin/env bash
git clone -b v3.12.0 --depth 1 https://aomedia.googlesource.com/aom

cd aom
cmake -S . -B build.libavif -G Ninja \
-DMAKE_INSTALL_PREFIX="$(pwd)/dist" \
-DMAKE_BUILD_TYPE=Release \
-DENABLE_DOCS=0 \
-DENABLE_EXAMPLES=0 \
-DENABLE_TESTDATA=0 \
-DENABLE_TESTS=0 \
-DENABLE_TOOLS=0 \
-DMAKE_POSITION_INDEPENDENT_CODE=ON

ninja -C build.libavif
ninja -C build.libavif install

cd ..

A='#!/usr/bin/env bash'
B="PKG_CONFIG_PATH=\$PKG_CONFIG_PATH:\$PWD/aom/dist/lib64/pkgconfig"
C='PKGCONFPATH'

sed -i "s%$A%$A\n$B%" $C

EOF

cat > dav1d.sh << "EOF"
#!/usr/bin/env bash
git clone -b 1.5.0 --depth 1 https://code.videolan.org/videolan/dav1d.git

cd dav1d
meson build --default-library=static --buildtype release --prefix "$(pwd)/dist" $@
ninja -C build
ninja -C build install

cd ..

A='#!/usr/bin/env bash'
B="PKG_CONFIG_PATH=\$PKG_CONFIG_PATH:\$PWD/dav1d/dist/lib64/pkgconfig"
```

```
C='PKGCONFPATH'
```

```
sed -i "s%$A%$A\n$B%" $C
```

```
EOF
```

```
cat > libwebp.sh << "EOF"
```

```
#!/usr/bin/env bash
```

```
git clone --single-branch https://chromium.googlesource.com/webm/libwebp
```

```
mkdir -p ./libwebp/build
```

```
cd ./libwebp/build
```

```
cmake -G Ninja -DCMAKE_INSTALL_PREFIX="$(pwd)/dist" -DBUILD_SHARED_LIBS=OFF -
```

```
DCMAKE_BUILD_TYPE=Release ..
```

```
ninja sharpvuv
```

```
ninja install
```

```
cd ../..
```

```
A='#!/usr/bin/env bash'
```

```
B="PKG_CONFIG_PATH=\$PKG_CONFIG_PATH:$PWD/libwebp/build/dist/lib64/pkgconfig"
```

```
C='PKGCONFPATH'
```

```
sed -i "s%$A%$A\n$B%" $C
```

```
EOF
```

```
cat > rav1e.sh << "EOF"
```

```
#!/usr/bin/env bash
```

```
git clone -b v0.7.1 --depth 1 https://github.com/xiph/rav1e.git
```

```
cd rav1e
```

```
cargo update
```

```
cargo install cargo-c
```

```
cargo cinstall --crt-static --release --prefix="$(pwd)/dist" --library-type=staticlib
```

```
cd ..
```

```
A='#!/usr/bin/env bash'
B="PKG_CONFIG_PATH=\$PKG_CONFIG_PATH:$PWD/rav1e/dist/lib64/pkgconfig"
C='PKGCONFPATH'

sed -i "s%$A%$A\n$B%" $C

EOF

cat > svt.sh << "EOF"
#!/usr/bin/env bash
git clone -b v3.0.0 --depth 1 https://gitlab.com/AOMediaCodec/SVT-AV1.git

cd SVT-AV1/Build/linux

./build.sh release static no-apps disable-lto prefix=$(pwd)/install install

cd ../../..

A='#!/usr/bin/env bash'
B="PKG_CONFIG_PATH=\$PKG_CONFIG_PATH:$PWD/SVT-AV1/Build/linux/install/lib64/pkgconfig"
C='PKGCONFPATH'

sed -i "s%$A%$A\n$B%" $C

EOF

cat > ultrahdr.sh << "EOF"
#!/usr/bin/env bash
git clone -b v1.4.0 --depth 1 https://github.com/google/libultrahdr.git ultrahdr

mkdir -p ./ultrahdr/build && cd ./ultrahdr/build

cmake -G Ninja -DCMAKE_BUILD_TYPE=Release -DCMAKE_INSTALL_PREFIX="$(pwd)/dist" -
DUHDR_BUILD_EXAMPLES=ON -DCMAKE_C_COMPILER=clang -DCMAKE_CXX_COMPILER=clang++ ..
ninja
ninja install

cd ../../..

A='#!/usr/bin/env bash'
```

```
B="PKG_CONFIG_PATH=\$PKG_CONFIG_PATH:$PWD/ultrahdr/build/dist/lib64/pkgconfig"
```

```
C='PKGCONFPATH'
```

```
sed -i "s%$A%$A\n$B%" $C
```

```
EOF
```

```
# ----- QUICK SCRIPT TO RUN ALL THE SCRIPTS -----
```

```
cat > allofum.sh << "EOF"
```

```
#!/usr/bin/env bash
```

```
# ----- RUN THESE TWO SCRIPTS FIRST SO THEY ARE INSTALLED TO THE SYSTEM -----
```

```
cd /opt/codecs && source libde265.sh
```

```
cd /opt/codecs && source openjpg2.sh
```

```
# ----- NOW RUN THROUGH THE REST -----
```

```
cd /opt/codecs && source aom.sh
```

```
cd /opt/codecs && source dav1d.sh
```

```
cd /opt/codecs && source libwebp.sh
```

```
cd /opt/codecs && source rav1e.sh
```

```
cd /opt/codecs && source svt.sh
```

```
cd /opt/codecs && source ultrahdr.sh
```

```
exit
```

```
EOF
```

```
chmod +x *.sh
```

```
# ----- PRE-CREATE A "PKGCONFPATH" FILE -----
```

```
cat > PKGCONFPATH << "EOF"
```

```
#!/usr/bin/env bash
```

```
export PKG_CONFIG_PATH
```

```
EOF
```

```
# ----- RUN ALL OF UM -----
```

```
cd /opt/codecs && source allofum.sh
```

At this point all dependencies are in place. Moving on to "libheif"! This will require jumping into a newer GCC toolset as Rocky 8 rolls with GCC 8.5. We will use version 11 which we loaded earlier.

```
# ----- GRAB LIBHEIF -----
```

```
cd /opt
git clone https://github.com/strukturag/libheif.git
cd libheif
```

```
# ----- SWITCH TO THE GCC 11 ENVIRONMENT -----
```

```
scl enable gcc-toolset-11 bash      # HAD CASES WHERE THIS COMMAND WOULD NOT SWITCH OVER, SOOO...
source /opt/rh/gcc-toolset-11/enable # THROWING THIS ONE IN THE MIX AS WELL.
```

```
# ----- MAKE SURE YOUR GCC IS VERSION 11 -----
```

```
gcc --version
```

```
# ----- SOURCE AND LOAD OUR PATHS -----
```

```
source ~/.bashrc
source /opt/codecs/PKGCONFPATH
ldconfig
```

```
# ----- YOU CAN MIX AND MATCH OPTIONS - HERE ARE A COUPLE THAT I BUILT SUCCESSFULLY -----
```

```
## OPTION 1 ## ----- BUILD LIBHEIF RELEASE (SHARED) -----
```

```
mkdir build && cd build
cmake .. --preset=release \
-DWITH_UVG266=OFF \
-DENABLE_MULTITHREADING_SUPPORT=ON \
-DENABLE_PARALLEL_TILE_DECODING=ON
doxygen -u
make -j$(nproc)
```

```
## OPTION 2 ## ----- BUILD LIBHEIF FUZZING (STATIC) -----
```



```
mkdir build && cd build
cmake .. --preset=fuzzing \
-DWITH_UVG266=OFF \
-DENABLE_MULTITHREADING_SUPPORT=ON \
-DENABLE_PARALLEL_TILE_DECODING=ON
doxygen -u
make -j$(nproc)

# ----- I WILL BE USING THE "RELEASE" OPTION IN SOME OTHER WORK, SO I WILL INSTALL THAT ONE -----

make install

# ----- EXIT GCC TOOLKIT -----

exit
```

You should now have a monster libheif built on your system. It's a powerful app. Some of the tools to use it can be found in */usr/local/bin* (such as `heif-enc` and `heif-dec`).

I hope this helps! ;)

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