Embedded System Design Lab4 Document

第八組

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操作步驟：

1. 準備壓縮檔

alsa-lib-1.0.26.tar.bz2

alsa-utils-1.0.26.tar.bz2

libid3tag-0.15.1b.tar.gz

libmad-0.15.1b.tar.gz

madplay-0.15.2b.tar.gz

zlib-1.2.3.tar.gz

並將其移到某個資料夾，後續用$WORK\_DIR稱呼此資料夾

1. 使用su指令進入root來操作
2. Compile alsa-lib

tar -xvf alsa-lib-1.0.26.tar.bz2

cd alsa-lib-1.0.26

mkdir –p “$WORK\_DIR/madplay”

CC=arm-linux-gnueabihf-gcc ./configure \

--host=arm-linux-gnueabihf \

--prefix="$WORK\_DIR/madplay"

make -j$(nproc) && make -j$(nproc) install

cd ..

1. Compile alsa-utils

tar -xvf alsa-utils-1.0.26.tar.bz2

cd alsa-utils-1.0.26

CC=arm-linux-gnueabihf-gcc ./configure \

--prefix="$WORK\_DIR/madplay" \

--host=arm-linux-gnueabihf \

--with-alsa-inc-prefix="$WORK\_DIR/madplay/include" \

--with-alsa-prefix="$WORK\_DIR/madplay/lib" \

--disable-alsamixer \

--disable-xmlto \

--disable-nls

make -j$(nproc)

cd ..

1. Compile zlib

tar -zxvf zlib-1.2.3.tar.gz

cd zlib-1.2.3

./configure --prefix="$WORK\_DIR/madplay"

修改Makefile

sed -e 's/^CC \*=.\*/CC=arm-linux-gnueabihf-gcc/' \

-e 's/^AR \*=.\*/AR=arm-linux-gnueabihf-ar rc/' \

-e 's/^RANLIB \*=.\*/RANLIB=arm-linux-gnueabihf-ranlib/'\

-e 's/^CFLAGS=-O3 -DUSE\_MMAP/CFLAGS=-O3 -fPIC/' \

./Makefile > Makefile1

cp -f Makefile1 Makefile

make -j$(nproc) && make -j$(nproc) install

cd ..

1. Compile libid3tag

tar -zxvf libid3tag-0.15.1b.tar.gz

cd libid3tag-0.15.1b

./configure --host=arm-linux-gnueabihf \

--disable-debugging \

--prefix="$WORK\_DIR/madplay" \

CPPFLAGS=-I"$WORK\_DIR/madplay/include" \

LDFLAGS=-L"$WORK\_DIR/madplay/lib"

make -j$(nproc) && make -j$(nproc) install

cd ..

1. Compile libmad

tar -zxvf libmad-0.15.1b.tar.gz

cd libmad-0.15.1b

./configure --host=arm-linux-gnueabihf \

--disable-debugging \

--prefix="$WORK\_DIR/madplay" \

CPPFLAGS=-I"$WORK\_DIR/madplay/include" \

LDFLAGS=-L"$WORK\_DIR/madplay/lib"

make -j$(nproc)

這裡會失敗，要更改Makefile，是因為gcc將-fforce-mem刪除了

sed '/-fforce-mem/d' ./configure > ./configure1

cp -f configure1 configure

chmod u+x configure

./configure --host=arm-linux-gnueabihf \

--prefix=/usr/local/libmad\_arm \

--enable-shared \

--enable-static \

--enable-fpm=arm \

--with-gnu-ld=arm-linux-gnueabihf-ld \

--build=arm

這裡又會報錯：

Error:

/tmp/ccf2FxyW.s:1299: Error: selected processor does not support Thumb mode `rscr0,r0,#0'……

修改fixed.h

將

# define MAD\_F\_MLN(hi, lo) \

asm ("rsbs %0, %2, #0\n\t" \

"rsc %1, %3, #0" \

: "=r" (lo), "=r" (hi) \

: "0" (lo), "1" (hi) \

: "cc")

改成

#ifdef \_\_thumb\_\_

# define MAD\_F\_MLN(hi, lo) \

asm ("rsbs %0, %0, #0\n\t" \

" sbc %1, %1, %1\n\t" \

"sub %1, %1, %2" \

: "+&r" (lo), "=&r" (hi) \

: "r" (hi) \

: "cc")

#else /\* ! \_\_thumb\_\_ \*/

# define MAD\_F\_MLN(hi, lo) \

asm ("rsbs %0, %2, #0\n\t" \

"rsc %1, %3, #0" \

: "=r" (lo), "=r" (hi) \

: "=&r" (lo), "=r" (hi) \

: "0" (lo), "1" (hi) \

: "cc")

#endif /\* \_\_thumb\_\_ \*/

make -j$(nproc)

make -j$(nproc) install

cd ..

1. Compile madplay

tar -zxvf madplay-0.15.2b.tar.gz

cd madplay-0.15.2b

./configure --host=arm-linux-gnueabihf \

CC=arm-linux-gnueabihf-gcc \

--disable-debugging \

--with-alsa \

CPPFLAGS="-I$WORK\_DIR/madplay/include I/usr/local/libmad\_arm/include" \

LDFLAGS="-L$WORK\_DIR/madplay/lib L/usr/local/libmad\_arm/lib"

make -j$(nproc)

make -j$(nproc) install

1. 放入madplay以及aplay
2. 將執行所需檔案放入SD卡，並將symbolic link換成reallink

madplay

aplay

libasound.so.2

libid3tag.so.0

libmad.so.0

$WORK\_DIR/madplay/share

music.mp3

1. 執行LD\_LIBRARY\_PATH=. ./madplay -o wav:-music.mp3 | ./aplay
2. ln -s ./aplay ./arecord
3. ./arecord -d 5 -f record.wav

Reference:

<https://cloud.tencent.com/developer/article/1673901>

<https://blog.csdn.net/junjun5156/article/details/70307863>

<https://blog.csdn.net/qq_31811537/article/details/104842097>

<https://blog.csdn.net/qq_28643619/article/details/108944064>

<https://www.linode.com/docs/guides/linux-symlinks/>