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FFmpeg的库函数源代码分析文章列表：

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【H.264】

FFmpeg 的 H.264 解码器源代码简单分析：概述

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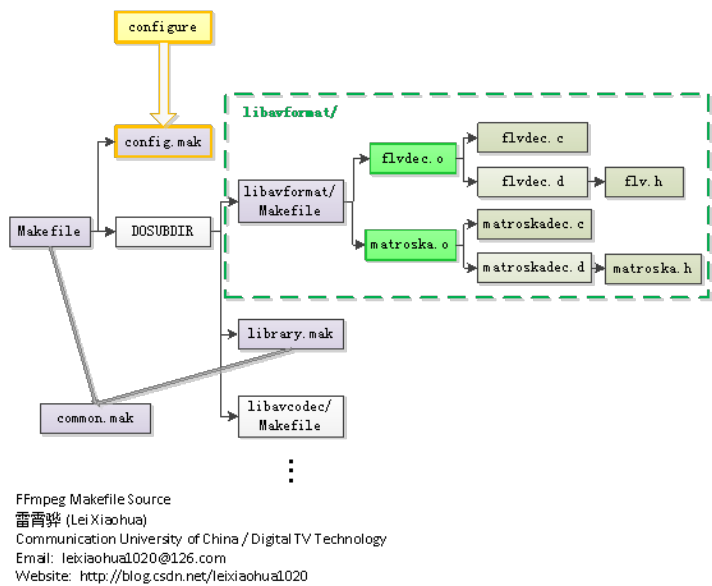
本文记录FFmpeg的Makefile的源代码。Makefile用于编译FFmpeg的源代码。通过分析Makefile文件，可以了解FFmpeg的源代码生成的流程。有关Makefile这部分我本身基础不算很牢，很多地方还在慢慢摸索，所以分析的内容不能保证完全准确。以后有时间和其他朋友多交流再慢慢完善这篇文章。

PS：make有一个很有用的命令：“make -n”。该选项会显示命令，但不会执行命令，十分有助于分析Makefile

FFmpeg中与Makefile相关的文件

- FFmpeg中与Makefile相关的文件主要有以下几个：
- 根目录Makefile：最基本的Makefile；
 - config.mak：由configure生成的Makefile，保存了Configure的设置信息；
 - libavXXXX/Makefile：每个类库的Makefile（仅仅设置了几个变量）；
 - library.mak：编译类库的Makefile（和libavXXXX/Makefile配合使用）；
 - common.mak：包含一些通用代码的Makefile；

它们之间的关系如下图所示。

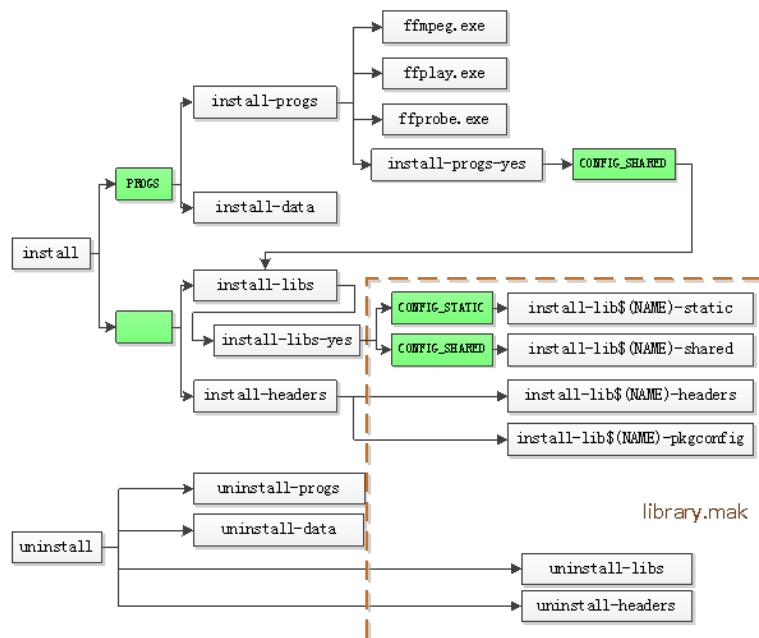


图中除了画出了Makefile之外，还画出了和Makefile有关的一些文件：

- XXX.c：C语言文件；
- XXX.h：C语言文件用到的头文件；
- XXX.o：C语言文件对应的目标文件；
- XXX.d：C语言文件对应的依赖关系文件；

Make Install 之间的关系

简单分析一下Makefile中的make install之间的关系，如下图所示（使用的是MinGW编译器）。



FFmpeg Makefile Source: install
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 Website: <http://blog.csdn.net/leixiaohua1020>

从图中可以看出，install伪目标依赖于4个伪目标：

- install-progs：安装应用程序ffmpeg.exe，ffplay.exe，ffprobe.exe；
- install-data：安装数据（*.ffpreset之类的文件，没研究过）
- install-libs：安装类库（libavcodec.dll等文件）
- install-headers：安装头文件（libavcodec/avcodec.h等文件）

install-progs依赖于ffmpeg.exe，ffplay.exe，ffprobe.exe以及install-progs-yes伪目标。在CONFIG_SHARED取值为yes的情况下，install-progs-yes依赖于install-libs。

install-libs依赖于伪目标install-libs-yes。install-libs-yes的依赖关系位于library.mak文件中。如果CONFIG_STATIC取值为yes，install-libs-yes依赖于install-lib\$(NAME)-static（其中\$(NAME)为类库文件名，例如avformat）；如果CONFIG_SHARED取值为yes，install-libs-yes依赖于install-lib\$(NAME)-shared。install-headers依赖于伪目标install-lib\$(NAME)-headers和install-lib\$(NAME)-pkgconfig。

和install相对应，uninstall伪目标依赖于4个伪目标：

- uninstall-progs：卸载应用程序；
- uninstall-data：卸载数据；
- uninstall-libs：卸载类库；
- uninstall-headers：卸载头文件；

其中uninstall-libs和uninstall-headers的依赖关系位于library.mak中。

根目录Makefile

根目录Makefile是最重要的。简单注释过的Makefile如下所示。

```
[python]
1. # FFmpeg Main Makefile
2. #
3. # 注释：雷霄骅
4. # leixiaohua1020@126.com
5. # http://blog.csdn.net/leixiaohua1020
6. #
7. # FFmpeg的 Main Makefile。最重要。
8.
9. MAIN_MAKEFILE=1
10. #重要：包含了configure信息
11. include config.mak
12.
13. #config.mak中：
14. #SRC_PATH=.
15. #在SRC_PATH搜索各种类型的文件
16. vpath %.c $(SRC_PATH)
17. vpath %.cpp $(SRC_PATH)
18. vpath %.h $(SRC_PATH)
19. vpath %.S $(SRC_PATH)
20. vpath %.asm $(SRC_PATH)
```

```

21. vpath %.v      $(SRC_PATH)
22. vpath %.texi  $(SRC_PATH)
23. vpath %/fate_config.sh.template $(SRC_PATH)
24.
25. #CONFIG_XXX取值为yes
26. #PROGS=yes= ffmpeg ffplay ffprobe
27. PROGS-$(CONFIG_FFMPEG) += ffmpeg
28. PROGS-$(CONFIG_FFPLAY) += ffplay
29. PROGS-$(CONFIG_FFPROBE) += ffprobe
30. PROGS-$(CONFIG_FFSERVER) += ffserver
31.
32. #config.mak中：
33. #EXESUF=.exe
34. #PROGSSUF=
35. #$(var:%.c=%.o)意思是把.c 为结尾的变量替换成.o。
36. #没有".c"的时候，代表匹配所有
37. PROGS      := $(PROGS-yes:%=%$(EXESUF))
38. INSTPROGS  = $(PROGS-yes:%=%$(PROGSSUF)$(EXESUF))
39. OBJS       = $(PROGS-yes:%=%.o) cmdutils.o
40. TESTTOOLS  = audiogen videogen rotozoom tiny_psnr base64
41. HOSTPROGS  := $(TESTTOOLS:%=tests/%)
42. TOOLS      = qt-faststart trasher
43. TOOLS-$(CONFIG_ZLIB) += cws2fws
44.
45. #PROGS= ffmpeg.exe ffplay.exe ffprobe.exe
46. #INSTPROGS= ffmpeg.exe ffplay.exe ffprobe.exe
47. #OBJS= ffmpeg.o ffplay.o ffprobe.o
48.
49. BASENAMES  = ffmpeg ffplay ffprobe ffserver
50. ALLPROGS   = $(BASENAMES:%=%$(PROGSSUF)$(EXESUF))
51. ALLPROGS_G = $(BASENAMES:%=%$(PROGSSUF)_g$(EXESUF))
52. ALLMANPAGES = $(BASENAMES:%=%.1)
53.
54. #ALLPROGS= ffmpeg.exe ffplay.exe ffprobe.exe ffserver.exe
55. #ALLPROGS_G= ffmpeg_g.exe ffplay_g.exe ffprobe_g.exe ffserver_g.exe
56. #ALLMANPAGES=ffmpeg.1 ffplay.1 ffprobe.1 ffserver.1
57. FFLIBS-$(CONFIG_AVDEVICE) += avdevice
58. FFLIBS-$(CONFIG_AVFILTER) += avfilter
59. FFLIBS-$(CONFIG_AVFORMAT) += avformat
60. FFLIBS-$(CONFIG_AVCODEC) += avcodec
61. FFLIBS-$(CONFIG_POSTPROC) += postproc
62. FFLIBS-$(CONFIG_SWRESAMPLE) += swresample
63. FFLIBS-$(CONFIG_SWSSCALE) += swscale
64.
65. #FFLIBS=yes= avdevice avfilter avformat avcodec postproc swresample swscale
66. #一定需要libavutil
67. FFLIBS := avutil
68. #让通配符在变量中展开，需要使用wildcard关键字
69. DATA_FILES := $(wildcard $(SRC_PATH)/presets/*.ffpreset) $(SRC_PATH)/doc/ffprobe.xsd
70.
71. SKIPHEADERS = cmdutils_common_opts.h
72. #重要
73. include $(SRC_PATH)/common.mak
74. #依赖的类库
75. FF_EXTRALIBS := $(FFEXTRALIBS)
76. FF_DEP_LIBS := $(DEP_LIBS)
77.
78. #伪目标
79. #all是最关键的，生成最后的程序
80. all: ffmpeg.exe ffplay.exe ffprobe.exe
81. #
82. all: $(PROGS)
83. #config.mak中：
84. #EXESUF=.exe
85. #PROGSSUF=
86. #$$是一个自动化变量。可以简单理解为目标的集合。
87. #$$<是一个自动化变量。可以简单理解为依赖目标的集合。
88. #%是通配符
89. #两个冒号，“静态模式规则”。
90. #ffmpeg_g.exe生成ffmpeg.exe；ffplay_g.exe生成ffplay.exe；ffprobe_g.exe生成ffprobe.exe
91. #strip经常用来去除目标文件中的一些符号表、调试符号表信息，以减小程序的大小
92. $(PROGS): %$(EXESUF): %$(PROGSSUF)_g$(EXESUF)
93.     $(CP) %< %$(PROGSSUF)
94.     $(STRIP) %$(PROGSSUF)
95.
96. $(TOOLS): %$(EXESUF): %.o
97.     $(LD) $(LDLAGS) -o %< %< $(ELIBS)
98.
99. tools/cws2fws$(EXESUF): ELIBS = -lz
100.
101. config.h: .config
102. .config: $(wildcard $(FFLIBS:%=$(SRC_PATH)/lib%/all*.c))
103.     @-tput bold 2>/dev/null
104.     @-printf '\nWARNING: $(?F) newer than config.h, rerun configure\n\n'
105.     @-tput sgr0 2>/dev/null
106. #给子目录中的Makefile使用的变量
107. SUBDIR_VARS := OBJS FFLIBS CLEANFILES DIRS TESTPROGS EXAMPLES SKIPHEADERS \
108.     ALTIVEC-OBJS MMX-OBJS NEON-OBJS X86-OBJS YASM-OBJS-FFT YASM-OBJS \
109.     HOSTPROGS BUILT_HEADERS TESTOBJ ARCH_HEADERS ARMV6-OBJS TOOLS
110.
111. define RESET

```

```

112. $(1) :=
113. $(1)-yes :=
114. endif
115.
116. #$(call <expression>,<parm1>,<parm2>,<parm3>...)
117. #当make执行这个函数时,<expression>参数中的变量,如$(1),$(2),$(3)等,会被参数
118. #<parm1>,<parm2>,<parm3>依次取代。而<expression>的返回值就是call函数的返回值。
119.
120. #命令包=====
121. #用于编译每个库
122. #$(1)取值为libavcodec, libavcodec等等
123. define DOSUBDIR
124. $(foreach V,$(SUBDIR_VARS),$(eval $(call RESET,$(V))))
125. SUBDIR := $(1)/
126. #每个库目录下的Makefile
127. include $(SRC_PATH)/$(1)/Makefile
128. #注:make一般情况下如果在中途检测到有执行出错的情况(返回非 0 状态),那么就会放弃对当前规则后续命令的执行。
129. #在命令前面加上“-”号之后,就算执行错误了,也会继续执行下去
130. -include $(SRC_PATH)/$(1)/$(ARCH)/Makefile
131. #编译类库
132. include $(SRC_PATH)/library.mak
133. endif
134. #=====
135.
136. #$(foreach <var>,<list>,<text>)
137. #把参数<list>中的单词逐一取出放到参数<var>所指定的变量中,
138. #然后再执行<text>所包含的表达式。
139. #$(eval text)
140. #text的内容将作为makefile的一部分而被make解析和执行
141. #
142. #循环调用DOSUBDIR命令包
143. #这一步会将libavcodec, libavformat等文件夹下的Makefile包含进来。
144. $(foreach D,$(FFLIBS),$(eval $(call DOSUBDIR,lib$(D))))
145. #ffmpeg需要SDL
146. ffmpeg.o: CFLAGS += $(SDL_CFLAGS)
147. ffmpeg_g$(EXESUF): FF_EXTRALIBS += $(SDL_LIBS)
148. ffmpegserver_g$(EXESUF): LDFLAGS += $(FFSERVERLDLDFLAGS)
149. #链接生成ffmpeg_g.exe等等
150. #FF_DEP_LIBS= libavcodec/libavcodec.a libavutil/libavutil.a ....
151. $(PROGSSUF)_g$(EXESUF): %.o cmdutils.o $(FF_DEP_LIBS)
152. $(LD) $(LDFLAGS) -o $@ $< cmdutils.o $(FF_EXTRALIBS)
153.
154. OBJDIRS += tools
155.
156. -include $(wildcard tools/*.d)
157.
158. VERSION_SH = $(SRC_PATH)/version.sh
159. GIT_LOG = $(SRC_PATH)/.git/logs/HEAD
160.
161. .version: $(wildcard $(GIT_LOG)) $(VERSION_SH) config.mak
162. .version: M=@
163.
164. version.h .version:
165. $(M)$(VERSION_SH) $(SRC_PATH) version.h $(EXTRA_VERSION)
166. $(Q)touch .version
167.
168. # force version.sh to run whenever version might have changed
169. -include .version
170. #安装install
171. #安装程序
172. ifdef PROGS
173. install: install-progs install-data
174. endif
175. #安装类库和头文件
176. install: install-libs install-headers
177. #install-libs-yes位于library.mak
178. install-libs: install-libs-yes
179.
180. install-progs-yes:
181. install-progs-$(CONFIG_SHARED): install-libs
182.
183. #config.mak中:
184. #BINDIR=$(DESTDIR){prefix}/bin
185. #INSTALL=install
186. #cp与install区别:
187. #cp会先清空文件后往里写入新文件,而install则会先删除掉原先的文件然后写入新文件。
188. install-progs: install-progs-yes $(PROGS)
189. $(Q)mkdir -p "$(BINDIR)"
190. $(INSTALL) -c -m 755 $(INSTPROGS) "$(BINDIR)"
191.
192. install-data: $(DATA_FILES)
193. $(Q)mkdir -p "$(DATADIR)"
194. $(INSTALL) -m 644 $(DATA_FILES) "$(DATADIR)"
195. #卸载
196. uninstall: uninstall-libs uninstall-headers uninstall-progs uninstall-data
197. #addprefix()用于加前缀
198. #在这里获取ffmpeg.exe等的完整路径(用于删除)
199. uninstall-progs:
200. $(RM) $(addprefix "$(BINDIR)/", $(ALLPROGS))
201.
202. uninstall-data:

```

```

203.     $(RM) -r "$(DATADIR)"
204. #清空
205. clean::
206.     $(RM) $(ALLPROGS) $(ALLPROGS_G)
207.     $(RM) $(CLEANSUFFIXES)
208.     $(RM) $(TOOLS)
209.     $(RM) $(CLEANSUFFIXES:%=tools/%)
210.     $(RM) coverage.info
211.     $(RM) -r coverage-html
212.
213. distclean::
214.     $(RM) $(DISTCLEANSUFFIXES)
215.     $(RM) config.* .version version.h libavutil/avconfig.h
216.
217. config:
218.     $(SRC_PATH)/configure $(value FFMPEG_CONFIGURATION)
219.
220. # Without the sed genhtml thinks "libavutil" and "./libavutil" are two different things
221. coverage.info: $(wildcard *.gcda *.gcno */*.gcda */*.gcno */*/*.gcda */*/*.gcno)
222.     $(Q)lcov -c -d . -b . | sed -e 's#/#/#g' > $@
223.
224. coverage-html: coverage.info
225.     $(Q)mkdir -p $@
226.     $(Q)genhtml -o $@ $<
227.     $(Q)touch $@
228.
229. include $(SRC_PATH)/doc/Makefile
230. include $(SRC_PATH)/tests/Makefile
231.
232. $(sort $(OBJDIRS)):
233.     $(Q)mkdir -p $@
234.
235. # Dummy rule to stop make trying to rebuild removed or renamed headers
236. %.h:
237.     @:
238.
239. # Disable suffix rules. Most of the builtin rules are suffix rules,
240. # so this saves some time on slow systems.
241. .SUFFIXES:
242. #显示地指明一个目标是“伪目标”
243. .PHONY: all all-yes alltools *clean config examples install*
244. .PHONY: testprogs uninstall*

```

根目录Makefile代码一开始的时候包含了config.mak文件。这个文件是运行./configure的后生成的配置文件，包含了所有的配置信息。

随后代码定义了ffplay.exe, ffmpeg.exe, ffprobe.exe与ffplay_g.exe, ffmpeg_g.exe, ffprobe_g.exe的依赖关系。然后定义了ffplay_g.exe, ffmpeg_g.exe, ffprobe_g.exe与libavformat, libavcodec等这些类库的依赖关系。

根目录Makefile中也定义了all, install, uninstall, clean等等一系列的伪目标，这样可以通过给Makefile指定不同的目标来完成不同的事。

此外根目录的Makefile中有一个很重要的命令包DOSUBDIR。在该命令包通过包含libavXXX/Makefile和library.mak等文件，定义了FFmpeg类库（例如libavformat, libavcodec, libavutil等）的依赖关系。

config.mak

config.mak文件是运行./configure的后生成的配置文件，包含了所有的配置信息。简单注释过的config.mak的代码如下所示。

```

[python]
1. # FFmpeg config.mak
2. #
3. # 注释：雷霄骅
4. # leixiaohua1020@126.com
5. # http://blog.csdn.net/leixiaohua1020
6. #
7. # Configure脚本生成的Makefile，包含了各种配置信息。
8. #
9. # Automatically generated by configure - do not modify!
10. #基本信息
11. ifndef FFMPEG_CONFIG_MAK
12. FFMPEG_CONFIG_MAK=1
13. FFMPEG_CONFIGURATION=
14. #各种路径=====
15. prefix=/usr/local
16. LIBDIR=$(DESTDIR){prefix}/lib
17. SHLIBDIR=$(DESTDIR){prefix}/bin
18. INCDIR=$(DESTDIR){prefix}/include
19. BINDIR=$(DESTDIR){prefix}/bin
20. DATADIR=$(DESTDIR){prefix}/share/ffmpeg
21. MANDIR=$(DESTDIR){prefix}/share/man
22. #是个相对路径
23. SRC_PATH=.
24. ifndef MAIN_MAKEFILE
25. SRC_PATH:=$(SRC_PATH:.%=..)
26. endif
27. #工具集=====

```

```

28. CC_IDENT=gcc 4.6.2 (GCC)
29. #架构
30. ARCH=x86
31. #编译器
32. CC=gcc
33. CXX=g++
34. AS=gcc
35. #链接器
36. LD=gcc
37. DEPCC=gcc
38. #汇编器
39. YASM=yasm
40. YASMDPE=yasm
41. #生成静态库.a工具
42. AR=ar
43. RANLIB=ranlib
44. CP=cp -p
45. LN_S=ln -sf
46. STRIP=strip
47. #参数集=====
48. #编译器的参数
49. CPPFLAGS= -D_ISO9899_SOURCE -D_FILE_OFFSET_BITS=64 -D_LARGEFILE_SOURCE -U_STRICT_ANSI_
50. CFLAGS= -std=c99 -fno-common -fomit-frame-pointer -I/include/SDL -D_GNU_SOURCE=1 -Dmain=SDL_main -g -Wdeclaration-after-statement
-Wall -Wno-parentheses -Wno-switch -Wno-format-zero-length -Wdisabled-optimization -Wpointer-arith -Wredundant-decls -Wno-pointer-si
gn -Wcast-qual -Wwrite-strings -Wtype-limits -Wundef -Wmissing-prototypes -Wno-pointer-to-int-cast -Wstrict-prototypes -O3 -fno-math
-errno -fno-signed-zeros -fno-tree-vectorize -Werror=implicit-function-declaration -Werror=missing-prototypes
51. CXXFLAGS= -D__STDC_CONSTANT_MACROS
52. ASFLAGS= -g
53. #目标文件有关的参数
54. AS_0=-o $@
55. CC_0=-o $@
56. CXX_0=-o $@
57. #链接器有关的参数
58. LDFLAGS= -Wl,--as-needed -Wl,--warn-common -Wl,-rpath-
link=libpostproc:libswresample:libswscale:libavfilter:libavdevice:libavformat:libavcodec:libavutil
59. FFSERVERLDFLAGS=-Wl,-E
60. SHFLAGS=-shared -Wl,--output-def,$$(@:$$(SLIBSUF)=.def) -Wl,--out-implib,$(SUBDIR)lib$(SLIBNAME:$$(SLIBSUF)=.dll.a) -Wl,--enable-runti
me-pseudo-reloc -Wl,--enable-auto-image-base -Wl,-Bsymbolic -Wl,--version-script,$(SUBDIR)lib$(NAME).ver
61. YASMFflags=-f win32 -DPREFIX
62. #前缀后缀=====
63. BUILDSUF=
64. PROGSUF=
65. #${NAME}位于每个liavXXX/Makefile中, 例如avformat
66. FULLNAME=$(NAME)$(BUILDSUF)
67. LIBPREF=lib
68. LIBSUF=.a
69. #例如libavformat.a
70. LIBNAME=$(LIBPREF)$(FULLNAME)$(LIBSUF)
71. SLIBPREF=
72. SLIBSUF=.dll
73. EXESUF=.exe
74. EXTRA_VERSION=
75. DEPFLAGS=$(CPPFLAGS) $(CFLAGS) -MM
76. CCDEP=
77. CXXDEP=$(DEPCC) $(DEPFLAGS) $< | sed -e "/^#\./d" -e "s,^[[:space:]]*$(F)\.o,$(D)/$(F).o," > $(@:.o=.d)
78. ASDEP=
79. CC_DEPFLAGS=-MMD -MF $(@:.o=.d) -MT $@
80. AS_DEPFLAGS=-MMD -MF $(@:.o=.d) -MT $@
81. HOSTCC=gcc
82. HOSTCFLAGS=-D_ISO9899_SOURCE -O3 -g -std=c99 -Wall
83. HOSTEXESUF=.exe
84. HOSTLDFLAGS=
85. HOSTLIBS=-lm
86. TARGET_EXEC=
87. TARGET_PATH=$(CURDIR)
88. #SDL
89. SDL_LIBS=-L/lib -lmingw32 -lSDLmain -lSDL -lwindows
90. SDL_CFLAGS=-I/include/SDL -D_GNU_SOURCE=1 -Dmain=SDL_main
91. LIB_INSTALL_EXTRA_CMD=$(RANLIB) "$(LIBDIR)/$(LIBNAME)"
92. #链接
93. EXTRALIBS=-lavicap32 -lws2_32 -L/lib -lmingw32 -lSDLmain -lSDL -lwindows -lm -lz -lpapi
94. INSTALL=install
95. LIBTARGET=i386
96. #例如libavformat.dll
97. SLIBNAME=$(SLIBPREF)$(FULLNAME)$(SLIBSUF)
98. #LIBVERSION变量位于library.mak
99. #例如libavformat-53.dll
100. #生成的DLL似乎就是这个版本的
101. SLIBNAME_WITH_VERSION=$(SLIBPREF)$(FULLNAME)$(LIBVERSION)$(SLIBSUF)
102. #例如libavformat-53.31.100.dll
103. SLIBNAME_WITH_MAJOR=$(SLIBPREF)$(FULLNAME)$(LIBMAJOR)$(SLIBSUF)
104. SLIB_CREATE_DEF_CMD=
105. #生成导出库lib, 会调用lib.exe
106. SLIB_EXTRA_CMD=-lib.exe /machine:$(LIBTARGET) /def:$$(@:$$(SLIBSUF)=.def) /out:$(SUBDIR)$(SLIBNAME:$$(SLIBSUF)=.lib)
107. SLIB_INSTALL_NAME=$(SLIBNAME_WITH_MAJOR)
108. SLIB_INSTALL_LINKS=
109. SLIB_INSTALL_EXTRA_LIB=lib$(SLIBNAME:$$(SLIBSUF)=.dll.a) $(SLIBNAME_WITH_MAJOR:$$(SLIBSUF)=.def)
110. SLIB_INSTALL_EXTRA_SHLIB=$(SLIBNAME:$$(SLIBSUF)=.lib)
111. SAMPLES=$(FATE_SAMPLES)
112. NOREDZONE_FLAGS=-mno-red-zone
113. #版本信息=====

```

```
114. libavcodec_VERSION=53.60.100
115. libavcodec_VERSION_MAJOR=53
116. libavdevice_VERSION=53.4.100
117. libavdevice_VERSION_MAJOR=53
118. libavfilter_VERSION=2.60.100
119. libavfilter_VERSION_MAJOR=2
120. libavformat_VERSION=53.31.100
121. libavformat_VERSION_MAJOR=53
122. libavutil_VERSION=51.34.101
123. libavutil_VERSION_MAJOR=51
124. libpostproc_VERSION=52.0.100
125. libpostproc_VERSION_MAJOR=52
126. libswresample_VERSION=0.6.100
127. libswresample_VERSION_MAJOR=0
128. libswscale_VERSION=2.1.100
129. libswscale_VERSION_MAJOR=2
130. #组件配置=====
131. #ARCH
132. !ARCH_ALPHA=yes
133. !ARCH_ARM=yes
134. !ARCH_AVR32=yes
135. !ARCH_AVR32_AP=yes
136. !ARCH_AVR32_UC=yes
137. !ARCH_BFIN=yes
138. !ARCH_IA64=yes
139. !ARCH_M68K=yes
140. !ARCH_MIPS=yes
141. !ARCH_MIPS64=yes
142. !ARCH_PARISC=yes
143. !ARCH_PPC=yes
144. !ARCH_PPC64=yes
145. !ARCH_S390=yes
146. !ARCH_SH4=yes
147. !ARCH_SPARC=yes
148. !ARCH_SPARC64=yes
149. !ARCH_TOMI=yes
150. ARCH_X86=yes
151. ARCH_X86_32=yes
152. !ARCH_X86_64=yes
153. #HAVE_
154. !HAVE_ALTIVEC=yes
155. HAVE_AMD3DNOW=yes
156. HAVE_AMD3DNOWEXT=yes
157. !HAVE_ARMV5TE=yes
158. !HAVE_ARMV6=yes
159. !HAVE_ARMV6T2=yes
160. !HAVE_ARMVFP=yes
161. HAVE_AVX=yes
162. !HAVE_IWMMXT=yes
163. !HAVE_MMI=yes
164. HAVE_MMX=yes
165. HAVE_MMX2=yes
166. !HAVE_NEON=yes
167. !HAVE_PPC4XX=yes
168. HAVE_SSE=yes
169. HAVE_SSSE3=yes
170. !HAVE_VFPV3=yes
171. !HAVE_VIS=yes
172. !HAVE_BIGENDIAN=yes
173. HAVE_FAST_UNALIGNED=yes
174. !HAVE_PTHREADS=yes
175. HAVE_W32THREADS=yes
176. !HAVE_OS2THREADS=yes
177. HAVE_ALIGNED_STACK=yes
178. !HAVE_ALSA_ASOONDLIB_H=yes
179. !HAVE_ALTIVEC_H=yes
180. !HAVE_ARPA_INET_H=yes
181. !HAVE_ASM_MOD_Y=yes
182. !HAVE_ASM_TYPES_H=yes
183. HAVE_ATTRIBUTE_MAY_ALIAS=yes
184. HAVE_ATTRIBUTE_PACKED=yes
185. HAVE_CBRTF=yes
186. HAVE_CLOSESOCKET=yes
187. !HAVE_CMOV=yes
188. !HAVE_DCBZL=yes
189. !HAVE_DEV_BKTR_IOCTL_BT848_H=yes
190. !HAVE_DEV_BKTR_IOCTL_MTEOR_H=yes
191. !HAVE_DEV_IC_BT8XX_H=yes
192. !HAVE_DEV_VIDEO_BKTR_IOCTL_BT848_H=yes
193. !HAVE_DEV_VIDEO_MTEOR_IOCTL_MTEOR_H=yes
194. !HAVE_DLFCN_H=yes
195. !HAVE_DLOPEN=yes
196. HAVE_DOS_PATHS=yes
197. HAVE_EBP_AVAILABLE=yes
198. HAVE_EBX_AVAILABLE=yes
199. HAVE_EXP2=yes
200. HAVE_EXP2F=yes
201. !HAVE_FAST_64BIT=yes
202. HAVE_FAST_CLZ=yes
203. !HAVE_FAST_CMOV=yes
204. !HAVE_FCNTL=yes
```



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205. !HAVE_FORK=yes
206. !HAVE_GETADDRINFO=yes
207. !HAVE_GETHRTIME=yes
208. HAVE_GETPROCESSAFFINITYMASK=yes
209. HAVE_GETPROCESSMEMORYINFO=yes
210. HAVE_GETPROCESSTIMES=yes
211. !HAVE_GETRUSAGE=yes
212. HAVE_GNU_AS=yes
213. !HAVE_IBM_ASM=yes
214. !HAVE_INET_ATON=yes
215. HAVE_INLINE_ASM=yes
216. HAVE_ISATTY=yes
217. HAVE_KBHIT=yes
218. !HAVE_LDBRX=yes
219. HAVE_LLRINT=yes
220. HAVE_LLINTF=yes
221. HAVE_LOCAL_ALIGNED_16=yes
222. HAVE_LOCAL_ALIGNED_8=yes
223. !HAVE_LOCALTIME_R=yes
224. HAVE_LOG2=yes
225. HAVE_LOG2F=yes
226. !HAVE_LOONGSON=yes
227. HAVE_LRINT=yes
228. HAVE_LRINTF=yes
229. !HAVE_LZ01X_999_COMPRESS=yes
230. !HAVE_MACHINE_IOCTL_BT848_H=yes
231. !HAVE_MACHINE_IOCTL_METEOR_H=yes
232. HAVE_MAKEINFO=yes
233. HAVE_MALLOC_H=yes
234. HAVE_MAPVIEWOFFILE=yes
235. !HAVE_MEMALIGN=yes
236. !HAVE_MKSTEMP=yes
237. !HAVE_MMAP=yes
238. HAVE_PEEKNAMEDPIPE=yes
239. !HAVE_POLL_H=yes
240. !HAVE_POSIX_MEMALIGN=yes
241. HAVE_ROUND=yes
242. HAVE_ROUNDf=yes
243. !HAVE_SCHED_GETAFFINITY=yes
244. HAVE_SDL=yes
245. HAVE_SDL_VIDEO_SIZE=yes
246. HAVE_SETMODE=yes
247. !HAVE_SETRLIMIT=yes
248. !HAVE_SNDIO_H=yes
249. HAVE_SOCKETLEN_T=yes
250. !HAVE_SOUNDCARD_H=yes
251. !HAVE_STRERROR_R=yes
252. !HAVE_STRPTIME=yes
253. HAVE_STRUCT_ADDRINFO=yes
254. HAVE_STRUCT_IPV6_MREQ=yes
255. !HAVE_STRUCT_RUSAGE_RU_MAXRSS=yes
256. HAVE_STRUCT_SOCKADDR_IN6=yes
257. !HAVE_STRUCT_SOCKADDR_SA_LEN=yes
258. HAVE_STRUCT_SOCKADDR_STORAGE=yes
259. !HAVE_STRUCT_V4L2_FRMIVALENUM_DISCRETE=yes
260. HAVE_SYMVER=yes
261. HAVE_SYMVER_ASM_LABEL=yes
262. !HAVE_SYMVER_GNU_ASM=yes
263. !HAVE_SYSCONF=yes
264. !HAVE_SYSCTL=yes
265. !HAVE_SYS_MMAN_H=yes
266. HAVE_SYS_PARAM_H=yes
267. !HAVE_SYS_RESOURCE_H=yes
268. !HAVE_SYS_SELECT_H=yes
269. !HAVE_SYS_SOUNDCARD_H=yes
270. !HAVE_SYS_VIDEOIO_H=yes
271. !HAVE_TERMIOS_H=yes
272. HAVE_THREADS=yes
273. HAVE_TRUNC=yes
274. HAVE_TRUNCf=yes
275. !HAVE_VFP_ARGS=yes
276. HAVE_VIRTUALALLOC=yes
277. HAVE_WINSOCK2_H=yes
278. !HAVE_XFORM_ASM=yes
279. !HAVE_XMM_CLOBBERS=yes
280. HAVE_YASM=yes
281. #CONFIG_
282. CONFIG_BSFS=yes
283. CONFIG_DECODERS=yes
284. CONFIG_DEMUXERS=yes
285. CONFIG_ENCODERS=yes
286. CONFIG_FILTERS=yes
287. !CONFIG_HWACCELS=yes
288. CONFIG_INDEVS=yes
289. CONFIG_MUXERS=yes
290. CONFIG_OUTDEVS=yes
291. CONFIG_PARSERS=yes
292. CONFIG_PROTOCOLS=yes
293. CONFIG_FFPLAY=yes
294. CONFIG_FFPROBE=yes
295. !CONFIG_FFSERVER=yes
296. CONFIG_FFMPEG=yes
```

```
290. CONFIG_FFMPEG=yes
297. !CONFIG_AVPLAY=yes
298. !CONFIG_AVPROBE=yes
299. !CONFIG_AVSERVER=yes
300. CONFIG_AANDCT=yes
301. CONFIG_AC3DSP=yes
302. CONFIG_AVCODEC=yes
303. CONFIG_AVDEVICE=yes
304. CONFIG_AVFILTER=yes
305. CONFIG_AVFORMAT=yes
306. !CONFIG_AVISYNTH=yes
307. !CONFIG_BZLIB=yes
308. !CONFIG_CRYSTALHD=yes
309. CONFIG_DCT=yes
310. !CONFIG_DDC=yes
311. CONFIG_DWT=yes
312. !CONFIG_DXVA2=yes
313. CONFIG_FASTDIV=yes
314. CONFIG_FFT=yes
315. !CONFIG_FREI0R=yes
316. !CONFIG_GNUTLS=yes
317. CONFIG_GOLOMB=yes
318. !CONFIG_GPL=yes
319. !CONFIG_GRAY=yes
320. CONFIG_H264CHROMA=yes
321. CONFIG_H264DSP=yes
322. CONFIG_H264PRED=yes
323. !CONFIG_HARDCODED_TABLES=yes
324. CONFIG_HUFFMAN=yes
325. !CONFIG_LIBAACPLUS=yes
326. !CONFIG_LIBASS=yes
327. !CONFIG_LIBCDIO=yes
328. !CONFIG_LIBCELT=yes
329. !CONFIG_LIBDC1394=yes
330. !CONFIG_LIBDIRAC=yes
331. !CONFIG_LIBFAAC=yes
332. !CONFIG_LIBFREETYPE=yes
333. !CONFIG_LIBGSM=yes
334. !CONFIG_LIBMODPLUG=yes
335. !CONFIG_LIBMP3LAME=yes
336. !CONFIG_LIBNUT=yes
337. !CONFIG_LIBOPENCORE_AMRNB=yes
338. !CONFIG_LIBOPENCORE_AMRWB=yes
339. !CONFIG_LIBOPENCV=yes
340. !CONFIG_LIBOPENJPEG=yes
341. !CONFIG_LIBPULSE=yes
342. !CONFIG_LIBRTMP=yes
343. !CONFIG_LIBSCHROEDINGER=yes
344. !CONFIG_LIBSPEEX=yes
345. !CONFIG_LIBSTAGEFRIGHT_H264=yes
346. !CONFIG_LIBTHEORA=yes
347. !CONFIG_LIBUTVIDE0=yes
348. !CONFIG_LIBV4L2=yes
349. !CONFIG_LIBVO_AACENC=yes
350. !CONFIG_LIBVO_AMRWBENC=yes
351. !CONFIG_LIBVORBIS=yes
352. !CONFIG_LIBVPX=yes
353. !CONFIG_LIBX264=yes
354. !CONFIG_LIBXAVS=yes
355. !CONFIG_LIBXVID=yes
356. CONFIG_LPC=yes
357. CONFIG_LSP=yes
358. CONFIG_MDCT=yes
359. CONFIG_MEMALIGN_HACK=yes
360. !CONFIG_MLIB=yes
361. CONFIG_MPEGAUDIODSP=yes
362. CONFIG_NETWORK=yes
363. !CONFIG_NONFREE=yes
364. !CONFIG_OPENAL=yes
365. !CONFIG_OPENSSL=yes
366. !CONFIG_PIC=yes
367. !CONFIG_POSTPROC=yes
368. CONFIG_RDFT=yes
369. CONFIG_RTPDEC=yes
370. !CONFIG_RUNTIME_CPUDETECT=yes
371. CONFIG_SAFE_BITSTREAM_READER=yes
372. !CONFIG_SHARED=yes
373. CONFIG_SINEMIN=yes
374. !CONFIG_SMALL=yes
375. !CONFIG_SRAM=yes
376. CONFIG_STATIC=yes
377. CONFIG_SWRESAMPLE=yes
378. CONFIG_SWSCALE=yes
379. CONFIG_SWSCALE_ALPHA=yes
380. !CONFIG_THUMB=yes
381. !CONFIG_VAAPI=yes
382. !CONFIG_VDA=yes
383. !CONFIG_VDPAU=yes
384. !CONFIG_VERSION3=yes
385. !CONFIG_X11GRAB=yes
386. CONFIG_ZLIB=yes
387. CONFIG_AVHIT=yes
```

```

388. !CONFIG_GPLV3=yes
389. !CONFIG_LGPLV3=yes
390. CONFIG_AAC_ADTSTOASC_BSF=yes
391. CONFIG_CHOMP_BSF=yes
392. CONFIG_DUMP_EXTRADATA_BSF=yes
393. CONFIG_H264_MP4TOANNEXB_BSF=yes
394. CONFIG_IMX_DUMP_HEADER_BSF=yes
395. CONFIG_MJPEG2JPEG_BSF=yes
396. CONFIG_MJPEGA_DUMP_HEADER_BSF=yes
397. CONFIG_MP3_HEADER_COMPRESS_BSF=yes
398. CONFIG_MP3_HEADER_DECOMPRESS_BSF=yes
399. CONFIG_MOV2TEXTSUB_BSF=yes
400. CONFIG_NOISE_BSF=yes
401. CONFIG_REMOVE_EXTRADATA_BSF=yes
402. CONFIG_TEXT2MOVSUB_BSF=yes
403. CONFIG_AASC_DECODER=yes
404. CONFIG_AMV_DECODER=yes
405. CONFIG_ANM_DECODER=yes
406. CONFIG_ANSI_DECODER=yes
407. CONFIG_ASV1_DECODER=yes
408. CONFIG_ASV2_DECODER=yes
409. CONFIG_AURA_DECODER=yes
410. CONFIG_AURA2_DECODER=yes
411. CONFIG_AVRP_DECODER=yes
412. CONFIG_AVS_DECODER=yes
413. CONFIG_BETHSOFTVID_DECODER=yes
414. CONFIG_BFI_DECODER=yes
415. CONFIG_BINK_DECODER=yes
416. CONFIG_BMP_DECODER=yes
417. CONFIG_BMV_VIDEO_DECODER=yes
418. CONFIG_C93_DECODER=yes
419. CONFIG_CAVS_DECODER=yes
420. CONFIG_CDGRAPHICS_DECODER=yes
421. CONFIG_CINEPAK_DECODER=yes
422. CONFIG_CLJR_DECODER=yes
423. CONFIG_CSCD_DECODER=yes
424. CONFIG_CYUV_DECODER=yes
425. CONFIG_DFA_DECODER=yes
426. CONFIG_DIRAC_DECODER=yes
427. CONFIG_DNXHD_DECODER=yes
428. CONFIG_DPX_DECODER=yes
429. CONFIG_DSICINVIDEO_DECODER=yes
430. CONFIG_DVVIDEO_DECODER=yes
431. CONFIG_DXA_DECODER=yes
432. CONFIG_DXTORY_DECODER=yes
433. CONFIG_EACMV_DECODER=yes
434. CONFIG_EAMAD_DECODER=yes
435. CONFIG_EATGQ_DECODER=yes
436. CONFIG_EATGV_DECODER=yes
437. CONFIG_EATQI_DECODER=yes
438. CONFIG_EIGHTBPS_DECODER=yes
439. CONFIG_EIGHTSVX_EXP_DECODER=yes
440. CONFIG_EIGHTSVX_FIB_DECODER=yes
441. CONFIG_ESCAPE124_DECODER=yes
442. CONFIG_ESCAPE130_DECODER=yes
443. CONFIG_FFV1_DECODER=yes
444. CONFIG_FFVHUFF_DECODER=yes
445. CONFIG_FLASHSV_DECODER=yes
446. CONFIG_FLASHSV2_DECODER=yes
447. CONFIG_FLIC_DECODER=yes
448. CONFIG_FLV_DECODER=yes
449. CONFIG_FOURXM_DECODER=yes
450. CONFIG_FRAPS_DECODER=yes
451. CONFIG_FRWU_DECODER=yes
452. CONFIG_GIF_DECODER=yes
453. CONFIG_H261_DECODER=yes
454. CONFIG_H263_DECODER=yes
455. CONFIG_H263I_DECODER=yes
456. CONFIG_H264_DECODER=yes
457. #此处省略若干条...
458. CONFIG_RTMP_PROTOCOL=yes
459. CONFIG_RTMP_PROTOCOL=yes
460. CONFIG_RTMP_PROTOCOL=yes
461. CONFIG_RTMP_PROTOCOL=yes
462. CONFIG_RTMP_PROTOCOL=yes
463. CONFIG_RTP_PROTOCOL=yes
464. CONFIG_TCP_PROTOCOL=yes
465. !CONFIG_TLS_PROTOCOL=yes
466. CONFIG_UDP_PROTOCOL=yes
467. #Test
468. ACODEC_TESTS=ac3.fixed adpcm_adx adpcm_ima_qt adpcm_ima_wav adpcm_ms adpcm_swf adpcm_yam alac aref flac g722 g723_1 g726 mp2 pcm_alaw
m_f32be pcm_f32le pcm_f64be pcm_f64le pcm_mulaw pcm_s16be pcm_s16le pcm_s24be pcm_s24daud pcm_s24le pcm_s32be pcm_s32le pcm_s8 pcm_u8
av1 wmvav2
469. VCODEC_TESTS=amv asv1 asv2 cljr dnxhd_1080i dnxhd_720p dnxhd_720p_10bit dnxhd_720p_rd dv dv50 dv_411 error ffv1 flashsv flashsv2 flv
1 h263 h263p huffyuv jpeg2000 jpegls jpeg mjpeg mpeg mpeg1b mpeg2 mpeg2_422 mpeg2_idct_int mpeg2_ilace mpeg2_ivlc qprd mpeg2thread m
2thread_ilace mpeg4 mpeg4_adap mpeg4_qpel mpeg4_qprd mpeg4adv mpeg4nr mpeg4thread mpng msmpeg4 msmpeg4v2 msvideo1 prores qtrle qtrleg
rc rgb roq rv10 rv20 snow snowll svq1 v210 vref wmv1 wmv2 yuv zlib zmbv
470. LAVF_TESTS=aiff alaw asf au avi bmp caf dpx dv_fmt flv_fmt gif gxf jpg mkv mmf mov mpg mulaw mxv mxv_d10 nut ogg pbmpipe pcx pgm
pipe pixfmt png ppm pppipe rm rso sgi sox swf tga tiff ts voc voc_s16 wav wtv yuv4mpeg
471. LAVFI_TESTS=crop crop_scale crop_vflip crop_vflip null pixdesc pixfmts_copy pixfmts_crop pixfmts_hflip pixfmts_null pixfmts_pad
xfmts scale pixfmts vflip scale200 scale500 vflip vflip crop vflip vflip

```

```
472.  SEEK_TESTS=seek_ac3_rm seek_adpcm_ima_wav seek_adpcm_ms_wav seek_adpcm_qt_aiff seek_adpcm_swf_flv seek_adpcm_yam_wav seek_alac_m4a se
asv1_avi seek_asv2_avi seek_dnxhd_1080i_mov seek_dnxhd_720p_dnxhd seek_dnxhd_720p_rd_dnxhd seek_dv411_dv seek_dv50_dv seek_dv_dv seek
ror_mpeg4_adv_avi seek_ffv1_avi seek_flac_flac seek_flashsv_flv seek_flv_flv seek_g726_wav seek_h261_avi seek_h263_avi seek_h263p_avi
ek_huffyuv_avi seek_image_bmp seek_image_jpg seek_image_pcx seek_image_pgm seek_image_ppm seek_image_sgi seek_image_tga seek_image_ti
seek_jpegls_avi seek_lavf_aif seek_lavf_al seek_lavf_asf seek_lavf_au seek_lavf_avi seek_lavf_dv seek_lavf_ffm seek_lavf_flv seek_lav
if seek_lavf_gxf seek_lavf_mkv seek_lavf_mmf seek_lavf_mov seek_lavf_mpg seek_lavf_mxf seek_lavf_mxf_d10 seek_lavf_nut seek_lavf_ogg
k_lavf_rm seek_lavf_swf seek_lavf_ts seek_lavf_ul seek_lavf_voc seek_lavf_wav seek_lavf_wtv seek_lavf_y4m seek_ljpeg_avi seek_mjpeg_a
seek_mp2_mp2 seek_mpeg1_mpg seek_mpeg1b_mpg seek_mpeg2_422_mpg seek_mpeg2_idct_int_mpg seek_mpeg2i_mpg seek_mpeg2ivlc_qprd_mpg seek_m
2reuse_mpg seek_mpeg2thread_mpg seek_mpeg2threadivlc_mpg seek_mpeg4_adap_avi seek_mpeg4_adv_avi seek_mpeg4_nr_avi seek_mpeg4_qprd_avi
ek_mpeg4_rc_avi seek_mpeg4_thread_avi seek_msmpeg4_avi seek_msmpeg4v2_avi seek_odivx_mp4 seek_pbmpipe_pbm seek_pcm_alaw_wav seek_pcm_
be_au seek_pcm_f32le_wav seek_pcm_f64be_au seek_pcm_f64le_wav seek_pcm_mulaw_wav seek_pcm_s16be_mov seek_pcm_s16le_wav seek_pcm_s24be
v seek_pcm_s24daud_302 seek_pcm_s24le_wav seek_pcm_s32be_mov seek_pcm_s32le_wav seek_pcm_s8_mov seek_pcm_u8_wav seek_pgmpipe_pgm seek
mpipe_ppm seek_rgb_avi seek_roqav_roq seek_rv10_rm seek_rv20_rm seek_snow53_avi seek_snow_avi seek_svq1_mov seek_wmv1_asf seek_wmv2
f seek_wmv1_avi seek_wmv2_avi seek_yuv_avi
473.  endif # FFMPEG_CONFIG_MAK
```

config.mak代码大致可以分为以下几类信息：

- (1) 各种路径（prefix等）
- (2) 工具集（arch、cc、ld、yasm等）
- (3) 参数集（cppflag、cflag、ldflag等）
- (4) 前缀后缀（.a、.dll、.exe等）
- (5) 类库版本（libavXXX_version信息）
- (6) 组件配置。这一部分信息使用{组件名}=yes的方式进行书写。对于不支持的组件，则在该组件所在行的前面标记上“！”号（感叹号似乎在Makefile语法中并没有什么特殊的用意，此处可能仅仅是作为一种标记？）。这一部分可以分为3类信息：
 - a) ARCH_信息
 - b) HAVE_信息
 - c) CONFIG_信息。这一部分内容最多，将近有1000行。
- (7) Test信息（测试组件的结果？还没研究）

libavXXXX/Makefile

libavXXXX/Makefile指的是FFmpeg类库（libavformat、libavcodec、libavutil等）所在的文件夹下的Makefile。例如libavformat文件夹下的Makefile代码如下所示。

```
[python]
1.  # FFMpeg Libavformat Makefile
2.  #
3.  # 注释：雷霄骅
4.  # leixiaohua1020@126.com
5.  # http://blog.csdn.net/leixiaohua1020
6.  #
7.  # FFMpeg中libavformat的Makefile。
8.  # 注意该Makefile并没有定义类库的编译规则（这一部分统一在library.mak中完成）。
9.  # 该Makefile中只是赋值了几个重要的字符串：
10. #     NAME, FFLIBS, HEADERS, OBJS, OBJS-yes
11.
12. #重要：包含了configure信息，位于上一级目录
13. include $(SUBDIR)../config.mak
14. #名称
15. NAME = avformat
16. #用到的库？
17. FFLIBS = avcodec avutil
18. #SDK中的头文件
19. HEADERS = avformat.h avio.h version.h
20.
21. #OBJS存储的是必须的目标文件
22. OBJS = allformats.o \
23.       cutils.o \
24.       id3v1.o \
25.       id3v2.o \
26.       metadata.o \
27.       options.o \
28.       os_support.o \
29.       sdp.o \
30.       seek.o \
31.       utils.o \
32.
33. #OBJS-yes存储的是可选的目标文件
34. OBJS-$(CONFIG_NETWORK) += network.o
35.
36. # muxers/demuxers
37. OBJS-$(CONFIG_A64_MUXER) += a64.o
38. OBJS-$(CONFIG_AAC_DEMUXER) += aacdec.o rawdec.o
39. OBJS-$(CONFIG_AC3_DEMUXER) += ac3dec.o rawdec.o
40. OBJS-$(CONFIG_AC3_MUXER) += rawenc.o
41. OBJS-$(CONFIG_ACT_DEMUXER) += act.o
42. OBJS-$(CONFIG_ADF_DEMUXER) += bintext.o sauce.o
43. OBJS-$(CONFIG_ADX_DEMUXER) += adxdec.o
```

```

44. OBJS-$(CONFIG_ADX_MUXER) += rawenc.o
45. OBJS-$(CONFIG_ADTS_MUXER) += adtsenc.o
46. OBJS-$(CONFIG_AEA_DEMUXER) += aea.o pcm.o
47. OBJS-$(CONFIG_AIFF_DEMUXER) += aiffdec.o riff.o pcm.o isom.o
48. OBJS-$(CONFIG_AIFF_MUXER) += aiffenc.o riff.o isom.o
49. OBJS-$(CONFIG_AMR_DEMUXER) += amr.o
50. OBJS-$(CONFIG_AMR_MUXER) += amr.o
51. OBJS-$(CONFIG_ANM_DEMUXER) += anm.o
52. OBJS-$(CONFIG_APC_DEMUXER) += apc.o
53. OBJS-$(CONFIG_APE_DEMUXER) += ape.o apetag.o
54. OBJS-$(CONFIG_APPLEHTTP_DEMUXER) += applehttp.o
55. OBJS-$(CONFIG_ASF_DEMUXER) += asfdec.o asf.o asfcrypt.o \
56. riff.o avlanguage.o
57. OBJS-$(CONFIG_ASF_MUXER) += asfenc.o asf.o riff.o
58. OBJS-$(CONFIG_ASS_DEMUXER) += assdec.o
59. OBJS-$(CONFIG_ASS_MUXER) += assenc.o
60. OBJS-$(CONFIG_AU_DEMUXER) += au.o pcm.o
61. OBJS-$(CONFIG_AU_MUXER) += au.o
62. OBJS-$(CONFIG_AVI_DEMUXER) += avidec.o riff.o
63. OBJS-$(CONFIG_AVI_MUXER) += avienc.o riff.o
64. OBJS-$(CONFIG_AVISYNTH) += avisynth.o
65. OBJS-$(CONFIG_AVM2_MUXER) += swfenc.o
66. OBJS-$(CONFIG_AVS_DEMUXER) += avs.o vocdec.o voc.o
67. OBJS-$(CONFIG_BETHSOFTVID_DEMUXER) += bethsoftvid.o
68. OBJS-$(CONFIG_BFI_DEMUXER) += bfi.o
69. OBJS-$(CONFIG_BINK_DEMUXER) += bink.o
70. OBJS-$(CONFIG_BINTEXT_DEMUXER) += bintext.o sauce.o
71. OBJS-$(CONFIG_BIT_DEMUXER) += bit.o
72. OBJS-$(CONFIG_BIT_MUXER) += bit.o
73. OBJS-$(CONFIG_BMV_DEMUXER) += bmv.o
74. OBJS-$(CONFIG_C93_DEMUXER) += c93.o vocdec.o voc.o
75. OBJS-$(CONFIG_CAF_DEMUXER) += cafdec.o caf.o mov.o mov_chan.o \
76. riff.o isom.o
77. OBJS-$(CONFIG_CAF_MUXER) += cafenc.o caf.o riff.o isom.o
78. OBJS-$(CONFIG_CAVSVIDEO_DEMUXER) += cavsvideodec.o rawdec.o
79. OBJS-$(CONFIG_CAVSVIDEO_MUXER) += rawenc.o
80. OBJS-$(CONFIG_CDG_DEMUXER) += cdg.o
81. OBJS-$(CONFIG_CRC_MUXER) += crcenc.o
82. OBJS-$(CONFIG_DAUD_DEMUXER) += daud.o
83. OBJS-$(CONFIG_DAUD_MUXER) += daud.o
84. OBJS-$(CONFIG_DFA_DEMUXER) += dfa.o
85. OBJS-$(CONFIG_DIRAC_DEMUXER) += diracdec.o rawdec.o
86. OBJS-$(CONFIG_DIRAC_MUXER) += rawenc.o
87. OBJS-$(CONFIG_DNXHD_DEMUXER) += dnxhddec.o rawdec.o
88. OBJS-$(CONFIG_DNXHD_MUXER) += rawenc.o
89. OBJS-$(CONFIG_DSICIN_DEMUXER) += dsicin.o
90. OBJS-$(CONFIG_DTS_DEMUXER) += dtsdec.o rawdec.o
91. OBJS-$(CONFIG_DTS_MUXER) += rawenc.o
92. OBJS-$(CONFIG_DV_DEMUXER) += dv.o
93. OBJS-$(CONFIG_DV_MUXER) += dvenc.o
94. OBJS-$(CONFIG_DXA_DEMUXER) += dxa.o riff.o
95. OBJS-$(CONFIG_EA_CDATA_DEMUXER) += eacdata.o
96. OBJS-$(CONFIG_EA_DEMUXER) += electronicarts.o
97. OBJS-$(CONFIG_EAC3_DEMUXER) += ac3dec.o rawdec.o
98. OBJS-$(CONFIG_EAC3_MUXER) += rawenc.o
99. OBJS-$(CONFIG_FFM_DEMUXER) += ffmdec.o
100. OBJS-$(CONFIG_FFM_MUXER) += ffmenc.o
101. OBJS-$(CONFIG_FFMETADATA_DEMUXER) += ffmetaaec.o
102. OBJS-$(CONFIG_FFMETADATA_MUXER) += ffmetaenc.o
103. OBJS-$(CONFIG_FILMSTRIP_DEMUXER) += filmstripdec.o
104. OBJS-$(CONFIG_FILMSTRIP_MUXER) += filmstripenc.o
105. OBJS-$(CONFIG_FLAC_DEMUXER) += flacdec.o rawdec.o \
106. oggparsevorbis.o \
107. vorbiscomment.o
108. OBJS-$(CONFIG_FLAC_MUXER) += flacenc.o flacenc_header.o \
109. vorbiscomment.o
110. OBJS-$(CONFIG_FLIC_DEMUXER) += flic.o
111. OBJS-$(CONFIG_FLV_DEMUXER) += flvdec.o
112. OBJS-$(CONFIG_FLV_MUXER) += flvenc.o avc.o
113. OBJS-$(CONFIG_FOURXM_DEMUXER) += 4xm.o
114. OBJS-$(CONFIG_FRAMECRC_MUXER) += framecrcenc.o
115. OBJS-$(CONFIG_FRAMEMD5_MUXER) += md5enc.o
116. OBJS-$(CONFIG_GIF_MUXER) += gif.o
117. OBJS-$(CONFIG_GSM_DEMUXER) += gsmdec.o
118. OBJS-$(CONFIG_GXF_DEMUXER) += gxf.o
119. OBJS-$(CONFIG_GXF_MUXER) += gxenc.o audiointerleave.o
120. OBJS-$(CONFIG_G722_DEMUXER) += rawdec.o
121. OBJS-$(CONFIG_G722_MUXER) += rawenc.o
122. OBJS-$(CONFIG_G723_1_DEMUXER) += g723_1.o
123. OBJS-$(CONFIG_G723_1_MUXER) += rawenc.o
124. OBJS-$(CONFIG_G729_DEMUXER) += g729dec.o
125. OBJS-$(CONFIG_H261_DEMUXER) += h261dec.o rawdec.o
126. OBJS-$(CONFIG_H261_MUXER) += rawenc.o
127. OBJS-$(CONFIG_H263_DEMUXER) += h263dec.o rawdec.o
128. OBJS-$(CONFIG_H263_MUXER) += rawenc.o
129. OBJS-$(CONFIG_H264_DEMUXER) += h264dec.o rawdec.o
130. OBJS-$(CONFIG_H264_MUXER) += rawenc.o
131. OBJS-$(CONFIG_ICO_DEMUXER) += icodec.o
132. OBJS-$(CONFIG_IDCIN_DEMUXER) += idcin.o
133. OBJS-$(CONFIG_IDF_DEMUXER) += bintext.o
134. OBJS-$(CONFIG_IFF_DEMUXER) += iff.o

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135. OBJS-$(CONFIG_IMAGE2_DEMUXER) += img2.o
136. OBJS-$(CONFIG_IMAGE2_MUXER) += img2.o
137. OBJS-$(CONFIG_IMAGE2PIPE_DEMUXER) += img2.o
138. OBJS-$(CONFIG_IMAGE2PIPE_MUXER) += img2.o
139. OBJS-$(CONFIG_INGENIENT_DEMUXER) += ingenientdec.o rawdec.o
140. OBJS-$(CONFIG_IPMOVIE_DEMUXER) += ipmovie.o
141. OBJS-$(CONFIG_ISS_DEMUXER) += iss.o
142. OBJS-$(CONFIG_IV8_DEMUXER) += iv8.o
143. OBJS-$(CONFIG_IVF_DEMUXER) += ivfdec.o riff.o
144. OBJS-$(CONFIG_IVF_MUXER) += ivfenc.o
145. OBJS-$(CONFIG_JV_DEMUXER) += jvdec.o
146. OBJS-$(CONFIG_LATM_DEMUXER) += rawdec.o
147. OBJS-$(CONFIG_LATM_MUXER) += latmenc.o
148. OBJS-$(CONFIG_LMLM4_DEMUXER) += lmlm4.o
149. OBJS-$(CONFIG_LOAS_DEMUXER) += loasdec.o
150. OBJS-$(CONFIG_LXF_DEMUXER) += lxfdec.o
151. OBJS-$(CONFIG_M4V_DEMUXER) += m4vdec.o rawdec.o
152. OBJS-$(CONFIG_M4V_MUXER) += rawenc.o
153. OBJS-$(CONFIG_MATROSKA_DEMUXER) += matroskadec.o matroska.o \
154. riff.o isom.o rmdec.o rm.o
155. OBJS-$(CONFIG_MATROSKA_MUXER) += matroskaenc.o matroska.o \
156. riff.o isom.o avc.o \
157. flacenc_header.o avlanguage.o
158. OBJS-$(CONFIG_MD5_MUXER) += md5enc.o
159. OBJS-$(CONFIG_MICRODVD_DEMUXER) += microdvddec.o
160. OBJS-$(CONFIG_MICRODVD_MUXER) += microdvdec.o rawenc.o
161. OBJS-$(CONFIG_MJPEG_DEMUXER) += rawdec.o
162. OBJS-$(CONFIG_MJPEG_MUXER) += rawenc.o
163. OBJS-$(CONFIG_MLP_DEMUXER) += rawdec.o
164. OBJS-$(CONFIG_MLP_MUXER) += rawenc.o
165. OBJS-$(CONFIG_MM_DEMUXER) += mm.o
166. OBJS-$(CONFIG_MMF_DEMUXER) += mmf.o pcm.o
167. OBJS-$(CONFIG_MMF_MUXER) += mmf.o riff.o
168. OBJS-$(CONFIG_MOV_DEMUXER) += mov.o riff.o isom.o mov_chan.o
169. OBJS-$(CONFIG_MOV_MUXER) += movenc.o riff.o isom.o avc.o \
170. movenchint.o rtpenc_chain.o \
171. mov_chan.o
172. OBJS-$(CONFIG_MP2_MUXER) += mp3enc.o rawenc.o
173. OBJS-$(CONFIG_MP3_DEMUXER) += mp3dec.o
174. OBJS-$(CONFIG_MP3_MUXER) += mp3enc.o rawenc.o id3v2enc.o
175. OBJS-$(CONFIG_MPC_DEMUXER) += mpc.o apetag.o
176. OBJS-$(CONFIG_MPC8_DEMUXER) += mpc8.o
177. OBJS-$(CONFIG_MPEG1SYSTEM_MUXER) += mpegenc.o
178. OBJS-$(CONFIG_MPEG1VCD_MUXER) += mpegenc.o
179. OBJS-$(CONFIG_MPEG2DVD_MUXER) += mpegenc.o
180. OBJS-$(CONFIG_MPEG2VOB_MUXER) += mpegenc.o
181. OBJS-$(CONFIG_MPEG2SVCD_MUXER) += mpegenc.o
182. OBJS-$(CONFIG_MPEG1VIDEO_MUXER) += rawenc.o
183. OBJS-$(CONFIG_MPEG2VIDEO_MUXER) += rawenc.o
184. OBJS-$(CONFIG_MPEGPS_DEMUXER) += mpeg.o
185. OBJS-$(CONFIG_MPEGTS_DEMUXER) += mpegts.o isom.o
186. OBJS-$(CONFIG_MPEGTS_MUXER) += mpegtsenc.o adtsenc.o
187. OBJS-$(CONFIG_MPEGVIDEO_DEMUXER) += mpegvideodec.o rawdec.o
188. OBJS-$(CONFIG_MPJPEG_MUXER) += mpjpeg.o
189. OBJS-$(CONFIG_MSNEW_TCP_DEMUXER) += msnwc_tcp.o
190. OBJS-$(CONFIG_MTV_DEMUXER) += mtv.o
191. OBJS-$(CONFIG_MVI_DEMUXER) += mvi.o
192. OBJS-$(CONFIG_MXF_DEMUXER) += mxfddec.o mxf.o
193. OBJS-$(CONFIG_MXF_MUXER) += mxfenc.o mxf.o audiointerleave.o
194. OBJS-$(CONFIG_MXG_DEMUXER) += mxg.o
195. OBJS-$(CONFIG_NC_DEMUXER) += ncdec.o
196. OBJS-$(CONFIG_NSV_DEMUXER) += nsvdec.o
197. OBJS-$(CONFIG_NULL_MUXER) += nullenc.o
198. OBJS-$(CONFIG_NUT_DEMUXER) += nutdec.o nut.o riff.o
199. OBJS-$(CONFIG_NUT_MUXER) += nutenc.o nut.o riff.o
200. OBJS-$(CONFIG_NUV_DEMUXER) += nuv.o riff.o
201. OBJS-$(CONFIG_OGG_DEMUXER) += oggdec.o \
202. oggparsecelt.o \
203. oggparsedirac.o \
204. oggparseflac.o \
205. oggparseogg.o \
206. oggparsekeleton.o \
207. oggparseespeex.o \
208. oggparsetheora.o \
209. oggparsevorbis.o \
210. riff.o \
211. vorbiscomment.o
212. OBJS-$(CONFIG_OGG_MUXER) += oggenc.o \
213. vorbiscomment.o
214. OBJS-$(CONFIG_OMA_DEMUXER) += omadec.o pcm.o oma.o
215. OBJS-$(CONFIG_OMA_MUXER) += omaenc.o rawenc.o oma.o id3v2enc.o
216. OBJS-$(CONFIG_PCM_ALAW_DEMUXER) += pcmdec.o pcm.o rawdec.o
217. OBJS-$(CONFIG_PCM_ALAW_MUXER) += pcmenc.o rawenc.o
218. OBJS-$(CONFIG_PCM_F32BE_DEMUXER) += pcmdec.o pcm.o rawdec.o
219. OBJS-$(CONFIG_PCM_F32BE_MUXER) += pcmenc.o rawenc.o
220. OBJS-$(CONFIG_PCM_F32LE_DEMUXER) += pcmdec.o pcm.o rawdec.o
221. OBJS-$(CONFIG_PCM_F32LE_MUXER) += pcmenc.o rawenc.o
222. OBJS-$(CONFIG_PCM_F64BE_DEMUXER) += pcmdec.o pcm.o rawdec.o
223. OBJS-$(CONFIG_PCM_F64BE_MUXER) += pcmenc.o rawenc.o
224. OBJS-$(CONFIG_PCM_F64LE_DEMUXER) += pcmdec.o pcm.o rawdec.o
225. OBJS-$(CONFIG_PCM_F64LE_MUXER) += pcmenc.o rawenc.o
226. OBJS-$(CONFIG_PCM_MUXER) += pcmdec.o pcm.o rawdec.o

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220. OBJS=$(CONFIG_PCM_MULAW_DEMUXER) += pcmdec.o pcm.o rawdec.o
227. OBJS=$(CONFIG_PCM_MULAW_MUXER) += pcmenc.o rawenc.o
228. OBJS=$(CONFIG_PCM_S16BE_DEMUXER) += pcmdec.o pcm.o rawdec.o
229. OBJS=$(CONFIG_PCM_S16BE_MUXER) += pcmenc.o rawenc.o
230. OBJS=$(CONFIG_PCM_S16LE_DEMUXER) += pcmdec.o pcm.o rawdec.o
231. OBJS=$(CONFIG_PCM_S16LE_MUXER) += pcmenc.o rawenc.o
232. OBJS=$(CONFIG_PCM_S24BE_DEMUXER) += pcmdec.o pcm.o rawdec.o
233. OBJS=$(CONFIG_PCM_S24BE_MUXER) += pcmenc.o rawenc.o
234. OBJS=$(CONFIG_PCM_S24LE_DEMUXER) += pcmdec.o pcm.o rawdec.o
235. OBJS=$(CONFIG_PCM_S24LE_MUXER) += pcmenc.o rawenc.o
236. OBJS=$(CONFIG_PCM_S32BE_DEMUXER) += pcmdec.o pcm.o rawdec.o
237. OBJS=$(CONFIG_PCM_S32BE_MUXER) += pcmenc.o rawenc.o
238. OBJS=$(CONFIG_PCM_S32LE_DEMUXER) += pcmdec.o pcm.o rawdec.o
239. OBJS=$(CONFIG_PCM_S32LE_MUXER) += pcmenc.o rawenc.o
240. OBJS=$(CONFIG_PCM_S8_DEMUXER) += pcmdec.o pcm.o rawdec.o
241. OBJS=$(CONFIG_PCM_S8_MUXER) += pcmenc.o rawenc.o
242. OBJS=$(CONFIG_PCM_U16BE_DEMUXER) += pcmdec.o pcm.o rawdec.o
243. OBJS=$(CONFIG_PCM_U16BE_MUXER) += pcmenc.o rawenc.o
244. OBJS=$(CONFIG_PCM_U16LE_DEMUXER) += pcmdec.o pcm.o rawdec.o
245. OBJS=$(CONFIG_PCM_U16LE_MUXER) += pcmenc.o rawenc.o
246. OBJS=$(CONFIG_PCM_U24BE_DEMUXER) += pcmdec.o pcm.o rawdec.o
247. OBJS=$(CONFIG_PCM_U24BE_MUXER) += pcmenc.o rawenc.o
248. OBJS=$(CONFIG_PCM_U24LE_DEMUXER) += pcmdec.o pcm.o rawdec.o
249. OBJS=$(CONFIG_PCM_U24LE_MUXER) += pcmenc.o rawenc.o
250. OBJS=$(CONFIG_PCM_U32BE_DEMUXER) += pcmdec.o pcm.o rawdec.o
251. OBJS=$(CONFIG_PCM_U32BE_MUXER) += pcmenc.o rawenc.o
252. OBJS=$(CONFIG_PCM_U32LE_DEMUXER) += pcmdec.o pcm.o rawdec.o
253. OBJS=$(CONFIG_PCM_U32LE_MUXER) += pcmenc.o rawenc.o
254. OBJS=$(CONFIG_PCM_U8_DEMUXER) += pcmdec.o pcm.o rawdec.o
255. OBJS=$(CONFIG_PCM_U8_MUXER) += pcmenc.o rawenc.o
256. OBJS=$(CONFIG_PMP_DEMUXER) += pmpdec.o
257. OBJS=$(CONFIG_PVA_DEMUXER) += pva.o
258. OBJS=$(CONFIG_QCP_DEMUXER) += qcp.o
259. OBJS=$(CONFIG_R3D_DEMUXER) += r3d.o
260. OBJS=$(CONFIG_RAWVIDEO_DEMUXER) += rawvideodec.o rawdec.o
261. OBJS=$(CONFIG_RAWVIDEO_MUXER) += rawenc.o
262. OBJS=$(CONFIG_RL2_DEMUXER) += rl2.o
263. OBJS=$(CONFIG_RM_DEMUXER) += rmdec.o rm.o
264. OBJS=$(CONFIG_RM_MUXER) += rmenc.o rm.o
265. OBJS=$(CONFIG_ROQ_DEMUXER) += idroqdec.o
266. OBJS=$(CONFIG_ROQ_MUXER) += idroqenc.o rawenc.o
267. OBJS=$(CONFIG_RSO_DEMUXER) += rsodec.o rso.o pcm.o
268. OBJS=$(CONFIG_RSO_MUXER) += rsoenc.o rso.o
269. OBJS=$(CONFIG_RPL_DEMUXER) += rpl.o
270. OBJS=$(CONFIG_RTP_MUXER) += rtp.o \
271. rtpenc_aac.o \
272. rtpenc_latm.o \
273. rtpenc_amr.o \
274. rtpenc_h263.o \
275. rtpenc_mpv.o \
276. rtpenc.o \
277. rtpenc_h264.o \
278. rtpenc_vp8.o \
279. rtpenc_xiph.o \
280. avc.o
281. OBJS=$(CONFIG_RTPDEC) += rdt.o \
282. rtp.o \
283. rtpdec.o \
284. rtpdec_amr.o \
285. rtpdec_asf.o \
286. rtpdec_g726.o \
287. rtpdec_h263.o \
288. rtpdec_h264.o \
289. rtpdec_latm.o \
290. rtpdec_mpeg4.o \
291. rtpdec_qcelp.o \
292. rtpdec_qdm2.o \
293. rtpdec_gt.o \
294. rtpdec_svq3.o \
295. rtpdec_vp8.o \
296. rtpdec_xiph.o
297. OBJS=$(CONFIG_RTSP_DEMUXER) += rtsp.o rtspdec.o httpauth.o
298. OBJS=$(CONFIG_RTSP_MUXER) += rtsp.o rtspenc.o httpauth.o \
299. rtpenc_chain.o
300. OBJS=$(CONFIG_SAP_DEMUXER) += sapdec.o
301. OBJS=$(CONFIG_SAP_MUXER) += sapenc.o rtpenc_chain.o
302. OBJS=$(CONFIG_SBG_DEMUXER) += sbgdec.o
303. OBJS=$(CONFIG_SDP_DEMUXER) += rtsp.o
304. OBJS=$(CONFIG_SEGAFILM_DEMUXER) += segafilm.o
305. OBJS=$(CONFIG_SEGMENT_MUXER) += segment.o
306. OBJS=$(CONFIG_SHORTEN_DEMUXER) += rawdec.o
307. OBJS=$(CONFIG_SIFF_DEMUXER) += siff.o
308. OBJS=$(CONFIG_SMACKER_DEMUXER) += smacker.o
309. OBJS=$(CONFIG_SMJPEG_DEMUXER) += smjpegdec.o smjpeg.o
310. OBJS=$(CONFIG_SMJPEG_MUXER) += smjpegenc.o smjpeg.o
311. OBJS=$(CONFIG_SOL_DEMUXER) += sol.o pcm.o
312. OBJS=$(CONFIG_SOX_DEMUXER) += soxdec.o pcm.o
313. OBJS=$(CONFIG_SOX_MUXER) += soxenc.o
314. OBJS=$(CONFIG_SPDIF_DEMUXER) += spdif.o spdifdec.o
315. OBJS=$(CONFIG_SPDIF_MUXER) += spdif.o spdifenc.o
316. OBJS=$(CONFIG_SRT_DEMUXER) += srtdec.o
317. OBJS=$(CONFIG_SRT_MUXER) += rawenc.o

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318. OBJS=$(CONFIG_STR_DEMUXER) += psxstr.o
319. OBJS=$(CONFIG_SWF_DEMUXER) += swfdec.o
320. OBJS=$(CONFIG_SWF_MUXER) += swfenc.o
321. OBJS=$(CONFIG_THP_DEMUXER) += thp.o
322. OBJS=$(CONFIG_TIERTEXSEQ_DEMUXER) += tiertexseq.o
323. OBJS=$(CONFIG_MKVTIMESTAMP_V2_MUXER) += mkvtimestamp_v2.o
324. OBJS=$(CONFIG_TMV_DEMUXER) += tmv.o
325. OBJS=$(CONFIG_TRUEHD_DEMUXER) += rawdec.o
326. OBJS=$(CONFIG_TRUEHD_MUXER) += rawenc.o
327. OBJS=$(CONFIG_TTA_DEMUXER) += tta.o
328. OBJS=$(CONFIG_TTY_DEMUXER) += tty.o sauce.o
329. OBJS=$(CONFIG_TXD_DEMUXER) += txd.o
330. OBJS=$(CONFIG_VC1_DEMUXER) += rawdec.o
331. OBJS=$(CONFIG_VC1T_DEMUXER) += vc1test.o
332. OBJS=$(CONFIG_VC1T_MUXER) += vc1testenc.o
333. OBJS=$(CONFIG_VMD_DEMUXER) += sierravmd.o
334. OBJS=$(CONFIG_VOC_DEMUXER) += vocdec.o voc.o
335. OBJS=$(CONFIG_VOC_MUXER) += vocenc.o voc.o
336. OBJS=$(CONFIG_VQF_DEMUXER) += vqf.o
337. OBJS=$(CONFIG_W64_DEMUXER) += wav.o riff.o pcm.o
338. OBJS=$(CONFIG_WAV_DEMUXER) += wav.o riff.o pcm.o
339. OBJS=$(CONFIG_WAV_MUXER) += wav.o riff.o
340. OBJS=$(CONFIG_WC3_DEMUXER) += wc3movie.o
341. OBJS=$(CONFIG_WEBM_MUXER) += matroskaenc.o matroska.o \
342. riff.o isom.o avc.o \
343. flacenc_header.o avlanguage.o
344. OBJS=$(CONFIG_WSAUD_DEMUXER) += westwood_aud.o
345. OBJS=$(CONFIG_WSVQA_DEMUXER) += westwood_vqa.o
346. OBJS=$(CONFIG_WTV_DEMUXER) += wtvdec.o wtv.o asfdec.o asf.o asfcrypt.o \
347. avlanguage.o mpegts.o isom.o riff.o
348. OBJS=$(CONFIG_WTV_MUXER) += wtvenc.o wtv.o asf.o asfenc.o riff.o
349. OBJS=$(CONFIG_WV_DEMUXER) += wv.o apetag.o
350. OBJS=$(CONFIG_XA_DEMUXER) += xa.o
351. OBJS=$(CONFIG_XBIN_DEMUXER) += bintext.o sauce.o
352. OBJS=$(CONFIG_XMV_DEMUXER) += xmv.o riff.o
353. OBJS=$(CONFIG_XWMA_DEMUXER) += xwma.o riff.o
354. OBJS=$(CONFIG_YOP_DEMUXER) += yop.o
355. OBJS=$(CONFIG_YUV4MPEGPIPE_MUXER) += yuv4mpeg.o
356. OBJS=$(CONFIG_YUV4MPEGPIPE_DEMUXER) += yuv4mpeg.o
357.
358. # external libraries
359. OBJS=$(CONFIG_LIBMODPLUG_DEMUXER) += libmodplug.o
360. OBJS=$(CONFIG_LIBNUT_DEMUXER) += libnut.o riff.o
361. OBJS=$(CONFIG_LIBNUT_MUXER) += libnut.o riff.o
362.
363. # protocols I/O
364. OBJS+= avio.o aviobuf.o
365.
366. OBJS=$(CONFIG_APPLEHTTP_PROTOCOL) += applehttpproto.o
367. OBJS=$(CONFIG_CACHE_PROTOCOL) += cache.o
368. OBJS=$(CONFIG_CONCAT_PROTOCOL) += concat.o
369. OBJS=$(CONFIG_CRYPTOPROTOCOL) += crypto.o
370. OBJS=$(CONFIG_FILE_PROTOCOL) += file.o
371. OBJS=$(CONFIG_GOPHER_PROTOCOL) += gopher.o
372. OBJS=$(CONFIG_HTTP_PROTOCOL) += http.o httpauth.o
373. OBJS=$(CONFIG_HTTPPROXY_PROTOCOL) += http.o httpauth.o
374. OBJS=$(CONFIG_HTTPS_PROTOCOL) += http.o httpauth.o
375. OBJS=$(CONFIG_MMSH_PROTOCOL) += mms.o mms.o asf.o
376. OBJS=$(CONFIG_MMST_PROTOCOL) += mmst.o mms.o asf.o
377. OBJS=$(CONFIG_MD5_PROTOCOL) += md5proto.o
378. OBJS=$(CONFIG_PIPE_PROTOCOL) += file.o
379.
380. # external or internal rtmp
381. RTMP-OBJS=$(CONFIG_LIBRTMP) = librtmp.o
382. RTMP-OBJS=$(!CONFIG_LIBRTMP) = rtmpproto.o rtmppkt.o
383. OBJS=$(CONFIG_RTMP_PROTOCOL) += $(RTMP-OBJS-yes)
384.
385. OBJS=$(CONFIG_RTP_PROTOCOL) += rtpproto.o
386. OBJS=$(CONFIG_TCP_PROTOCOL) += tcp.o
387. OBJS=$(CONFIG_TLS_PROTOCOL) += tls.o
388. OBJS=$(CONFIG_UDP_PROTOCOL) += udp.o
389.
390. SKIPHEADERS=$(CONFIG_NETWORK) += network.h rtsp.h
391. TESTPROGS = seek
392. TOOLS = aviocat isindex pktddumper probetest

```

从代码可以看出，libavformat文件下的Makefile的规则十分简单，并不包含文件之间的依赖关系（依赖关系位于library.mak中），仅仅是设置了几个变量的值：

NAME：类库名称。注意不包含类库前面的“lib”以及类库的后缀。在这里是“avformat”。

FFLIBS：该类库依赖的类库名称。在这里用到了“avcodec”和“avutil”。



HEADERS：该类库导出的头文件。在这里是“avformat.h”，“avio.h”，“version.h”。

OBJS：该类库依赖的目标文件（必须的）。在这里是“utils.o”等等。

OBJS-yes：该类库依赖的目标文件（可选的）。在这里是“flvdec.o”、“flvenc.o”等等。

library.mak

library.mak专门用于存储编译类库的规则，是和libavXXX/Makefile配合使用的。它的源代码如下所示。

```
[python]  

1. # Ffmpeg library.mak
2. #
3. # 注释：雷霄骅
4. # leixiaohua1020@126.com
5. # http://blog.csdn.net/leixiaohua1020
6. #
7. # 编译类库(libavformat等)专用的Makefile，其中包含了编译类库的规则。
8.
9. # 【NAME位于每个类库的Makefile】，可以取avcodec, avformat等等
10. SRC_DIR := $(SRC_PATH)/lib$(NAME)
11.
12. include $(SRC_PATH)/common.mak
13.
14. #这些信息都位于config.mak中
15. #例如：
16. # libavformat_VERSION=53.31.100
17. # libavformat_VERSION_MAJOR=53
18.
19. LIBVERSION := $(lib$(NAME)_VERSION)
20. LIBMAJOR := $(lib$(NAME)_VERSION_MAJOR)
21. INCINSTDIR := $(INCDIR)/lib$(NAME)
22. THIS_LIB := $(SUBDIR)$(CONFIG_SHARED:yes=5)LIBNAME)
23.
24. all-$(CONFIG_STATIC): $(SUBDIR)$(LIBNAME)
25. all-$(CONFIG_SHARED): $(SUBDIR)$(SLIBNAME)
26.
27.
28. $(SUBDIR)%-test.o: $(SUBDIR)%-test.c
29.     $(COMPILE_C)
30.
31. $(SUBDIR)%-test.o: $(SUBDIR)%-c
32.     $(COMPILE_C)
33. #汇编？
34. $(SUBDIR)x86%.o: $(SUBDIR)x86%.asm
35.     $(YASMDEP) $(YASMFLAGS) -I $(<D)/ -M -o $@ $< > $(@:.o=.d)
36.     $(YASM) $(YASMFLAGS) -I $(<D)/ -o $@ $<
37.
38. $(OBSJS) $(OBSJS:.o=.s) $(SUBDIR)%-ho $(TESTOBSJS): CPPFLAGS += -DHAVE_AV_CONFIG_H
39. $(TESTOBSJS): CPPFLAGS += -DTEST
40.
41. # 【OBSJS来自于每个类库的Makefile】
42. # $@ 表示规则中的目标文件集
43. # $^ 所有的依赖目标的集合。
44. #生成静态库？
45. $(SUBDIR)$(LIBNAME): $(OBSJS)
46.     $(RM) $@
47.     $(AR) rc $@ $^ $(EXTRAOBSJS)
48.     $(RANLIB) $@
49. #安转头文件，根目录的Makefile调用
50. install-headers: install-lib$(NAME)-headers install-lib$(NAME)-pkgconfig
51. #install-libs=yes被install-libs (位于根目录Makefile) 调用
52. install-libs-$(CONFIG_STATIC): install-lib$(NAME)-static
53. install-libs-$(CONFIG_SHARED): install-lib$(NAME)-shared
54.
55. define RULES
56. $(EXAMPLES) $(TESTPROGS) $(TOOLS): %$(EXESUF): %.o
57.     $(LD) $(LDFLAGS) -o $$@ $^ -l$(FULLNAME) $(FFEXTRALIBS) $(ELIBS)
58.
59. $(SUBDIR)$(SLIBNAME): $(SUBDIR)$(SLIBNAME_WITH_MAJOR)
60.     $(Q)cd ./$(SUBDIR) && $(LN_S) $(SLIBNAME_WITH_MAJOR) $(SLIBNAME)
61.
62. $(SUBDIR)$(SLIBNAME_WITH_MAJOR): $(OBSJS) $(SUBDIR)lib$(NAME).ver
63.     $(SLIB_CREATE_DEF_CMD)
64.     $(LD) $(SHFLAGS) $(LDFLAGS) -o $$@ $(filter %.o,$$^) $(FFEXTRALIBS) $(EXTRAOBSJS)
65.     $(SLIB_EXTRA_CMD)
66.
67. #SLIBNAME_WITH_MAJOR包含了Major版本号。例如：libavformat-53.dll
68. ifdef SUBDIR
69. $(SUBDIR)$(SLIBNAME_WITH_MAJOR): $(DEP_LIBS)
70. endif
71. #清空
72. clean::
73.     $(RM) $(addprefix $(SUBDIR),*-example$(EXESUF) *-test$(EXESUF) $(CLEANFILES) $(CLEANSUFFIXES) $(LIBSUFFIXES)) \
74.         $(foreach dir,$(DIRS),$(CLEANSUFFIXES:%=$(SUBDIR)$(dir)/%)) \
75.         $(HOSTOBSJS) $(HOSTPROGS)
76.
77. distclean:: clean
78.     $(RM) $(DISTCLEANSUFFIXES:%=$(SUBDIR)%) \
79.         $(foreach dir,$(DIRS),$(DISTCLEANSUFFIXES:%=$(SUBDIR)$(dir)/%))
80. #安装库文件=====
81. install-lib$(NAME)-shared: $(SUBDIR)$(SLIBNAME)
82.     $(Q)mkdir -p "$$(SHLIBDIR)"
83.     $$$(INSTALL) -m 755 $$< "$$(SHLIBDIR)/$(SLIB_INSTALL_NAME)"
84.     $$$(STRIP) "$$(SHLIBDIR)/$(SLIB_INSTALL_NAME)"
85.     $(Q)$(foreach F,$(SLIB_INSTALL_LINKS),cd "$$(SHLIBDIR)" && $(LN_S) $(SLIB_INSTALL_NAME) $(F);)
86.     $(if $(SLIB_INSTALL_EXTRA_SHLIB),$$$(INSTALL) -m 644 $(SLIB_INSTALL_EXTRA_SHLIB:%=$(SUBDIR)%) "$$(SHLIBDIR)")
87.     $(if $(SLIB_INSTALL_EXTRA_LIB),$(Q)mkdir -p "$$(LIBDIR)")
88.     $(if $(SLIB_INSTALL_EXTRA_LIB),$(Q)$(foreach F,$(SLIB_INSTALL_LINKS),cd "$$(LIBDIR)" && $(LN_S) $(SLIB_INSTALL_NAME) $(F);))
```

```

88.     $(1t $(SLIB_INSTALL_EXTRA_LIB),$(INSTALL) -m 644 $(SLIB_INSTALL_EXTRA_LIB:%=$(SUBDIR)%) "$$(LIBDIR)")
89.
90. install-lib$(NAME)-static: $(SUBDIR)$(LIBNAME)
91.     $(Q)mkdir -p "$$(LIBDIR)"
92.     $$$(INSTALL) -m 644 $$< "$$(LIBDIR)"
93.     $(LIB_INSTALL_EXTRA_CMD)
94. #安装头文件=====
95. #-m
96. #权限：644,755,777
97. #644 rw-r--r--
98. #755 rwxr-xr-x
99. #777 rwxrwxrwx
100. #从左至右，1-3位数字代表文件所有者的权限，4-6位数字代表同组用户的权限，7-9数字代表其他用户的权限。
101. #通过4、2、1的组合，得到以下几种权限：0（没有权限）；4（读取权限）；5（4+1 | 读取+执行）；6（4+2 | 读取+写入）；7（4+2+1 | 读取+写入+执行）
102. #addprefix()
103. #$(addprefix src/,foo bar)返回值是“src/foo src/bar”。
104.
105. #【HEADERS来自于每个类库的Makefile】
106. #例如libavformat中HEADERS = avformat.h avio.h version.h
107. install-lib$(NAME)-headers: $(addprefix $(SUBDIR),$(HEADERS) $(BUILT_HEADERS))
108.     $(Q)mkdir -p "$$(INCINSTDIR)"
109.     $$$(INSTALL) -m 644 $$^ "$$(INCINSTDIR)"
110.
111. install-lib$(NAME)-pkgconfig: $(SUBDIR)lib$(NAME).pc
112.     $(Q)mkdir -p "$$(LIBDIR)/pkgconfig"
113.     $$$(INSTALL) -m 644 $$^ "$$(LIBDIR)/pkgconfig"
114.
115. #卸载
116. uninstall-libs::
117.     -$(RM) "$$(SHLIBDIR)/$(SLIBNAME_WITH_MAJOR)" \
118.         "$$(SHLIBDIR)/$(SLIBNAME)" \
119.         "$$(SHLIBDIR)/$(SLIBNAME_WITH_VERSION)"
120.     -$(RM) $(SLIB_INSTALL_EXTRA_SHLIB:%="$$(SHLIBDIR)"/%)
121.     -$(RM) $(SLIB_INSTALL_EXTRA_LIB:%="$$(LIBDIR)"/%)
122.     -$(RM) "$$(LIBDIR)/$(LIBNAME)"
123.
124. uninstall-headers::
125.     $(RM) $(addprefix "$$(INCINSTDIR)/",$(HEADERS)) $(addprefix "$$(INCINSTDIR)/",$(BUILT_HEADERS))
126.     $(RM) "$$(LIBDIR)/pkgconfig/lib$(NAME).pc"
127.     -rmdir "$$(INCINSTDIR)"
128.
129.
130. $(eval $(RULES))
131.
132. $(EXAMPLES) $(TESTPROGS) $(TOOLS): $(THIS_LIB) $(DEP_LIBS)
133. $(TESTPROGS): $(SUBDIR)$(LIBNAME)
134.
135. examples: $(EXAMPLES)
136. testprogs: $(TESTPROGS)

```

library.mak代码中首先包含了common.mak文件。这个文件定义了通用的一些编译规则。然后定义了类库的依赖关系。

此外library.mak中也定义了install-headers，install-lib\$(NAME)-shared，install-lib\$(NAME)-static，install-lib\$(NAME)-headers，clean等等一系列的伪目标（NAME取值avformat、avcodec等）。这些目标主要配合根目录的Makefile使用。

common.mak

common.mak文件定义了通用的一些编译规则。代码如下所示。

```

[python]
1. # FFmpeg common.mak
2. #
3. # 注释：雷霄骅
4. # leixiaohua1020@126.com
5. # http://blog.csdn.net/leixiaohua1020
6. #
7. # 通用的Makefile，其中包含了通用的编译规则。
8. #
9. # common bits used by all libraries
10. #
11.
12. # first so "all" becomes default target
13. all: all-yes
14.
15. ifndef SUBDIR
16. #在控制台打印信息
17. ifndef V
18. Q      = @
19. #输出
20. ECHO   = printf "%1)\t%s\n" $(2)
21. BRIEF  = CC CXX AS YASM AR LD HOSTCC STRIP CP
22. SILENT = DEPCC YASMDEP RM RANLIB
23. MSG    = @$
24. M      = @$(call ECHO,$(TAG),$@);
25. $(foreach VAR,$(BRIEF), \
26.     $(eval override $(VAR) = @$(call ECHO,$(VAR),$(MSG)); $($(VAR))))
27. $(foreach VAR,$(SILENT),$(eval override $(VAR) = @$($(VAR))))
28. $(eval INSTALL = @$(call ECHO,INSTALL,$$(^:$(SRC_DIR)/%=)); $(INSTALL))

```

```

29. endif
30. #所有的lib
31. ALLFFLIBS = avcodec avdevice avfilter avformat avutil postproc swscale swresample
32.
33. # NASM requires -I path terminated with /
34. #各种Flag
35. #SRC_PATH=.
36. IFLAGS := -I. -I$(SRC_PATH)/
37. CPPFLAGS := $(IFLAGS) $(CPPFLAGS)
38. CFLAGS += $(ECFLAGS)
39. CCFLAGS = $(CFLAGS)
40. CXXFLAGS := $(CFLAGS) $(CXXFLAGS)
41. YASMFLAGS += $(IFLAGS) -I$(SRC_PATH)/libavutil/x86/ -Pconfig.asm
42. HOSTCFLAGS += $(IFLAGS)
43. #avcodec处理后成为-Llibavcodec
44. #config.mak文件中：
45. #LDFLAGS= -Wl,--as-needed -Wl,--warn-common -Wl,
46. #-rpath-link=libpostproc:libswresample:libswscale:libavfilter:libavdevice:libavformat:libavcodec:libavutil
47. LDFLAGS := $(ALLFFLIBS:%=-Llib%) $(LDFLAGS)
48.
49. #命令包
50. #具体编译命令
51. #
52. #$(1)可以取CC、CXX等
53. #例如取$(1)取CC
54. #config.mak文件中：
55. #SRC_PATH=.
56. #CC=gcc
57. #
58. #CCFLAGS=$(CFLAGS)
59. #CFLAGS= -std=c99 -fno-common -fomit-frame-pointer -I/include/SDL -D_GNU_SOURCE=1 -Dmain=SDL_main
60. # -g -Wdeclaration-after-statement -Wall -Wno-parentheses -Wno-switch -Wno-format-zero-length
61. # -Wdisabled-optimization -Wpointer-arith -Wredundant-decls -Wno-pointer-sign -Wcast-qual -Wwrite-strings
62. # -Wtype-limits -Wundef -Wmissing-prototypes -Wno-pointer-to-int-cast -Wstrict-prototypes
63. # -O3 -fno-math-errno -fno-signed-zeros -fno-tree-vectorize -Werror=implicit-function-declaration -Werror=missing-prototypes
64. #
65. #CPPFLAGS= -D_ISOC99_SOURCE -D_FILE_OFFSET_BITS=64 -D_LARGEFILE_SOURCE -U__STRICT_ANSI__
66. #CC_O=-o $@
67. #CC_DEPFLAGS=-MMD -MF $(@:.o=.d) -MT $@
68. #举例：
69. #gcc -I. -Itest/ -c -o $@ $<
70. #再例如$(1)取CXX
71. #CXXFLAGS= -D__STDC_CONSTANT_MACROS
72.
73. define COMPILER
74.     $(1)$(1)DEP)
75.     $(1)$(1) $(CPPFLAGS) $(1)FLAGS $(1)DEPFLAGS) -c $(1)$(1)_O) $<
76. endef
77.
78. #编译命令
79. #$(call <expression>,<parm1>,<parm2>,<parm3>...)
80. #当make执行这个函数时,<expression>参数中的变量,如$(1),$(2),$(3)等,会被参数
81. #<parm1>,<parm2>,<parm3>依次取代。而<expression>的返回值就是call函数的返回值。
82. COMPILER_C = $(call COMPILER,C)
83. COMPILER_CXX = $(call COMPILER,CXX)
84. COMPILER_S = $(call COMPILER,S)
85.
86. #COMPILER_C为：
87. #$(CC DEP)
88. #$(1)$(CC) $(CPPFLAGS) $(1)FLAGS $(1)DEPFLAGS) -c $(1)$(1)_O) $<
89.
90. #依赖关系
91. #C语言
92. %.o: %.c
93. #编译
94.     $(COMPILER_C)
95.
96. #C++
97. %.o: %.cpp
98.     $(COMPILER_CXX)
99.
100. %.s: %.c
101.     $(CC) $(CPPFLAGS) $(CFLAGS) -S -o $@ $<
102.
103. %.o: %.S
104.     $(COMPILER_S)
105.
106. %.ho: %.h
107.     $(CC) $(CPPFLAGS) $(CFLAGS) -Wno-unused -c -o $@ -x c $<
108.
109. %.ver: %.v
110.     $(Q)sed 's/$$MAJOR/$$(basename $(@F))_VERSION_MAJOR)/' $^ > $@
111.
112. %.c %.h: TAG = GEN
113.
114. # Dummy rule to stop make trying to rebuild removed or renamed headers
115. %.h:
116.     @:
117.
118. # Disable suffix rules. Most of the builtin rules are suffix rules,
119. # so this saves some time on slow systems.

```

```

120. .SUFFIXES:
121.
122. # Do not delete intermediate files from chains of implicit rules
123. $(OBJJS):
124. endif
125.
126. OBJJS-$(HAVE_MMX) += $(MMX-OBJJS-yes)
127.
128. #源自Makefile
129. #OBJJS: 该类库必须的目标文件
130. #OBJJS-yes: 该类库可配置的目标文件
131. OBJJS += $(OBJJS-yes)
132. #FFLIBS: 必须的类库
133. #FFLIBS-yes: 可选的类库
134. #FFLIBS = avcodec avutil ....
135. FFLIBS := $(FFLIBS-yes) $(FFLIBS)
136. TESTPROGS += $(TESTPROGS-yes)
137.
138. FFXEXTRALIBS := $(FFLIBS:%=-l%$(BUILDSUF)) $(EXTRALIBS)
139.
140. EXAMPLES := $(EXAMPLES:%=$(SUBDIR)%-example$(EXESUF))
141. #排序?
142. OBJJS := $(sort $(OBJJS:%=$(SUBDIR)%))
143. TESTOBJJS := $(TESTOBJJS:%=$(SUBDIR)% $(TESTPROGS:%=$(SUBDIR)%-test.o)
144. TESTPROGS := $(TESTPROGS:%=$(SUBDIR)%-test$(EXESUF))
145. HOSTOBJJS := $(HOSTPROGS:%=$(SUBDIR)% .o)
146. HOSTPROGS := $(HOSTPROGS:%=$(SUBDIR)%$(HOSTEXESUF))
147. TOOLS += $(TOOLS-yes)
148. TOOLOBJJS := $(TOOLS:%=tools/%.o)
149. TOOLS := $(TOOLS:%=tools/%$(EXESUF))
150.
151. #DEP_LIBS= libavcodec/libavcodec.a libavutil/libavutil.a ....
152. DEP_LIBS := $(foreach NAME,$(FFLIBS),lib$(NAME)/$(CONFIG_SHARED:yes=S)LIBNAME))
153.
154. ALLHEADERS := $(subst $(SRC_DIR)/,$(SUBDIR),$(wildcard $(SRC_DIR)/*.h $(SRC_DIR)/$(ARCH)/*.h))
155. SKIPHEADERS += $(ARCH_HEADERS:%=$(ARCH)/%) $(SKIPHEADERS-)
156. SKIPHEADERS := $(SKIPHEADERS:%=$(SUBDIR)%)
157. checkheaders: $(filter-out $(SKIPHEADERS:.h=.ho),$(ALLHEADERS:.h=.ho))
158.
159. alltools: $(TOOLS)
160.
161. $(HOSTOBJJS): %.o: %.c
162.     $(HOSTCC) $(HOSTCFLAGS) -c -o $@ $<
163.
164. $(HOSTPROGS): %$(HOSTEXESUF): %.o
165.     $(HOSTCC) $(HOSTLDFLAGS) -o $@ $< $(HOSTLIBS)
166.
167. $(OBJJS): | $(sort $(dir $(OBJJS)))
168. $(HOSTOBJJS): | $(sort $(dir $(HOSTOBJJS)))
169. $(TESTOBJJS): | $(sort $(dir $(TESTOBJJS)))
170. $(TOOLOBJJS): | tools
171.
172. OBJDIRS := $(OBJDIRS) $(dir $(OBJJS) $(HOSTOBJJS) $(TESTOBJJS))
173.
174. CLEANSUFFIXES = *.d *.o *~ *.ho *.map *.ver *.gcno *.gcda
175. DISTCLEANSUFFIXES = *.pc
176. LIBSUFFIXES = *.a *.lib *.so *.so.* *.dylib *.dll *.def *.dll.a *.exp
177.
178. #依赖文件.d (dependence)
179. -include $(wildcard $(OBJJS:.o=.d) $(TESTOBJJS:.o=.d))

```

从代码中可以看出，common.mak定义了一些通用的编译规则，例如编译时候的控制台输出格式，编译命令COMPILE_C、COMPILE_CXX、COMPILE_S，以及c、.o等文件之间的依赖关系等。

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