

APPLICATION NOTE



ATBM WIFI 连接 WPA3 加密路由器的使用方法

ATBM603X

1x1 802.11b/g/n
Wi-Fi 芯片

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作者	版本	说明
Yuzhihuang	V1.0	init
Yuzhihuang	V2.0	增加 hostapd 配置支持 WPA3 方法
Yuzhihuang	V2.1	增加编译遇到的问题说明& 解决章节
Yuzhihuang	V2.2	增加编译遇到的问题说明

1 编译 openssl

openssl-1.1.1 版本

1.1 编译为动态库或者静态库

(1) 动态库配置方式

```
./Configure linux-armv4 enable-ec -fPIC no-async shared no-md2 no-mdc2  
no-poly1305 no-blake2 no-siphhash no-sm3 no-rc2 no-rc4 no-rc5 no-idea no-aria no-bf  
no-cast no-camellia no-seed no-sm4 no-chacha no-dsa no-sm2 no-dso no-engine  
no-err no-comp no-ocsp no-cms no-ts no-srp no-cmac no-ct  
--prefix=/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/third_  
app/libssl3.0  
CROSS_COMPILE=/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/t  
ools/arm-anykav500-linux-uclibcgnueabi/bin/arm-anykav500-linux-uclibcgnueabi-
```

(2) 静态库配置方式

```
./Configure linux-armv4 enable-ec no-shared -fPIC no-async  
--prefix=/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/third_  
app/libssl3.0  
CROSS_COMPILE=/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/t  
ools/arm-anykav500-linux-uclibcgnueabi/bin/arm-anykav500-linux-uclibcgnueabi-
```

(3) 裁剪配置需要增加如下配置

```
shared no-md2 no-mdc2 no-poly1305 no-blake2 no-siphhash no-sm3 no-rc2 no-rc4 no-rc5  
no-idea no-aria no-bf no-cast no-camellia no-seed no-sm4 no-chacha no-dsa no-sm2  
no-dso no-engine no-err no-comp no-ocsp no-cms no-ts no-srp no-cmac no-ct
```

(4) 注意平台配置

其中 linux-armv4 是需要使用 libssl 库的平台,目前的版本支持如下选择,可根据需要选择合适的:

```
pick os/compiler from:
BS2000-OSD BSD-generic32 BSD-generic64 BSD-ia64 BSD-sparc64 BSD-sparcv8
BSD-x86 BSD-x86-elf BSD-x86_64 Cygwin Cygwin-i386 Cygwin-i486 Cygwin-i586
Cygwin-i686 Cygwin-x86 Cygwin-x86_64 DJGPP MPE/iX-gcc UEFI UWIN VC-CE VC-WIN32
VC-WIN32-ARM VC-WIN32-ONECORE VC-WIN64-ARM VC-WIN64A VC-WIN64A-ONECORE
VC-WIN64A-masm VC-WIN64I aix-cc aix-gcc aix64-cc aix64-gcc android-arm
android-arm64 android-armeabi android-mips android-mips64 android-x86
android-x86_64 android64 android64-aarch64 android64-mips64 android64-x86_64
bsdi-elf-gcc cc darwin-i386-cc darwin-ppc-cc darwin64-ppc-cc
darwin64-x86_64-cc dist gcc haiku-x86 haiku-x86_64 hpux-ia64-cc hpux-ia64-gcc
hpux-parisc-cc hpux-parisc-gcc hpux-parisc1_1-cc hpux-parisc1_1-gcc
hpux64-ia64-cc hpux64-ia64-gcc hpux64-parisc2-cc hpux64-parisc2-gcc hurd-x86
ios-cross ios64-cross iphoneos-cross irix-mips3-cc irix-mips3-gcc
irix64-mips4-cc irix64-mips4-gcc linux-aarch64 linux-alpha-gcc linux-aout
linux-arm64ilp32 linux-armv4 linux-c64xplus linux-elf linux-generic32
linux-generic64 linux-ia64 linux-mips32 linux-mips64 linux-ppc linux-ppc64
linux-ppc64le linux-sparcv8 linux-sparcv9 linux-x32 linux-x86 linux-x86-clang
linux-x86_64 linux-x86_64-clang linux32-s390x linux64-mips64 linux64-s390x
linux64-sparcv9 mingw mingw64 nextstep nextstep3.3 sco5-cc sco5-gcc
solaris-sparcv7-cc solaris-sparcv7-gcc solaris-sparcv8-cc solaris-sparcv8-gcc
solaris-sparcv9-cc solaris-sparcv9-gcc solaris-x86-gcc solaris64-sparcv9-cc
solaris64-sparcv9-gcc solaris64-x86_64-cc solaris64-x86_64-gcc tru64-alpha-cc
tru64-alpha-gcc uClinux-dist uClinux-dist64 unixware-2.0 unixware-2.1
unixware-7 unixware-7-gcc vms-alpha vms-alpha-p32 vms-alpha-p64 vms-ia64
vms-ia64-p32 vms-ia64-p64 vos-gcc vxworks-mips vxworks-ppc405 vxworks-ppc60x
vxworks-ppc750 vxworks-ppc750-debug vxworks-ppc860 vxworks-ppcgen
vxworks-simlinux
```

1.2 编译&安装

```
make
make install
```

```
yuzhihuang@ubuntu_s2_2nd Lib$ ls -la
total 4184
drwxr-xr-x 4 yuzhihuang software 4096 10月 10 16:54 .
drwxr-xr-x 7 yuzhihuang software 4096 10月 10 16:54 ..
drwxr-xr-x 2 yuzhihuang software 4096 10月 10 16:54 engines-1.1
-rw-r--r-- 1 yuzhihuang software 3587384 10月 10 16:54 libcrypto.a
-rw-r--r-- 1 yuzhihuang software 676496 10月 10 16:54 libssl.a
drwxr-xr-x 2 yuzhihuang software 4096 10月 10 16:54 pkgconfig
yuzhihuang@ubuntu_s2_2nd Lib$ pwd
/usr/lchome/yuzhihuang/wpa_hostapd/openssl_complate/openssl_325/lib
yuzhihuang@ubuntu_s2_2nd Lib$
```

2 编译 libnl3.2.5

2.1 配置

```
./configure --host=arm-anykav500-linux-uclibcgnueabi
CC=/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/tools/arm-anykav500
-linux-uclibcgnueabi/bin/arm-anykav500-linux-uclibcgnueabi-gcc
--prefix=/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/third_app/lib
nl3
```

2.2 编译&安装

```
Make -j8;make install
```

```
libnl-3.a libnl-ctl-3.a libnl-genl-3.a libnl-idiag-3.a libnl-nf-3.a
[yuzhihuang@ubuntu_sz_2nd lib]$ ls -lh
total 3.9M
drwxr-xr-x 3 yuzhihuang software 4.0K 10月 10 15:50 libnl
-rw-r--r-- 1 yuzhihuang software 540K 10月 10 15:50 libnl-3.a
-rwxr-xr-x 1 yuzhihuang software 932 10月 10 15:50 libnl-3.la
-rw-r--r-- 1 yuzhihuang software 133K 10月 10 15:50 libnl-cli-3.a
-rwxr-xr-x 1 yuzhihuang software 1.3K 10月 10 15:50 libnl-cli-3.la
-rw-r--r-- 1 yuzhihuang software 116K 10月 10 15:50 libnl-genl-3.a
-rwxr-xr-x 1 yuzhihuang software 1023 10月 10 15:50 libnl-genl-3.la
-rw-r--r-- 1 yuzhihuang software 141K 10月 10 15:50 libnl-idiag-3.a
-rwxr-xr-x 1 yuzhihuang software 1.1K 10月 10 15:50 libnl-idiag-3.la
-rw-r--r-- 1 yuzhihuang software 497K 10月 10 15:50 libnl-nf-3.a
-rwxr-xr-x 1 yuzhihuang software 1.1K 10月 10 15:50 libnl-nf-3.la
-rw-r--r-- 1 yuzhihuang software 2.5M 10月 10 15:50 libnl-route-3.a
-rwxr-xr-x 1 yuzhihuang software 1.1K 10月 10 15:50 libnl-route-3.la
drwxr-xr-x 2 yuzhihuang software 4.0K 10月 10 15:58 pkgconfig
[yuzhihuang@ubuntu_sz_2nd lib]$ pwd
/usr/lchome/yuzhihuang/wpa_hostapd/libnl_compile/libnl_325/lib
[yuzhihuang@ubuntu_sz_2nd lib]$
```

3 编译 wpa_supplicant 2.9 支持 wpa3(SAE)

3.1 设置 libnl3.0 的环境变量

```
export
```

```
PKG_CONFIG_PATH=/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1
/third_app/libnl3/lib/pkgconfig:$PKG_CONFIG_PATH
```

3.2 配置 wpa_supplicant 功能

```
mv deconfig .config
```

.config 设置编译配置项:

动态编译:

```
CC=/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/tools/a
rm-anykav500-linux-uclibcgnueabi/bin/arm-anykav500-linux-uclibcgnueabi-gcc
```

静态编译:

```
CC=/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/tools/a
rm-anykav500-linux-uclibcgnueabi/bin/arm-anykav500-linux-uclibcgnueabi-gcc
-static
```

```
CONFIG_DRIVER_NL80211=y
```

```
CONFIG_LIBNL32=y
```

```
CFLAGS                                                    +=
-I/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/third_app/lib
nl3/include/libnl3
LIBS                                                       +=
-L/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/third_app/lib
nl3/lib/

CFLAGS                                                    +=
-I/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/third_app/lib
ssl/include/
LIBS                                                       +=
-L/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/third_app/lib
ssl/lib/

CONFIG_CTRL_IFACE=y
CONFIG_WPA_CLI_EDIT=y
CONFIG_SAE=y
CONFIG_IEEE80211W=y
CONFIG_TLS=openssl
```

3.3 编译

```
make -j8
```

3.4 Strip

由于是静态编译的所以 wpa_supplicant 体积会比较大

```
/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/tools/arm-anyka
v500-linux-uclibcgnueabi/bin/arm-anykav500-linux-uclibcgnueabi-strip
wpa_supplicant
```

```
yuzhihuang@ubuntu_s2_2nd wpa_supplicant$ /usr/lchome/yuzhihuang/Mstar/325/arm-buildroot-linux-uclicgmeabihf-4.9.4/bin/arm-buildroot-linux-uclicgmeabihf-strip wpa_supplicant
yuzhihuang@ubuntu_s2_2nd wpa_supplicant$ /usr/lchome/yuzhihuang/Mstar/325/arm-buildroot-linux-uclicgmeabihf-4.9.4/bin/arm-buildroot-linux-uclicgmeabihf-strip wpa_cli
yuzhihuang@ubuntu_s2_2nd wpa_supplicant$
yuzhihuang@ubuntu_s2_2nd wpa_supplicant$
yuzhihuang@ubuntu_s2_2nd wpa_supplicant$ ls -lh wpa*
-rwxr-xr-x 1 yuzhihuang software 74K 10月 11 16:18 wpa_cli
-rw-r--r-- 1 yuzhihuang software 122K 8月 7 2019 wpa_cli.c
-rw-r--r-- 1 yuzhihuang software 1.0K 10月 11 16:18 wpa_cli.d
-rw-r--r-- 1 yuzhihuang software 196K 10月 11 16:18 wpa_cli.o
-rwxr-xr-x 1 yuzhihuang software 2.1M 10月 11 16:18 wpa_passphrase
-rw-r--r-- 1 yuzhihuang software 1.5K 8月 7 2019 wpa_passphrase.c
-rw-r--r-- 1 yuzhihuang software 573 10月 11 16:18 wpa_passphrase.d
-rw-r--r-- 1 yuzhihuang software 8.7K 10月 11 16:18 wpa_passphrase.o
-rw-r--r-- 1 yuzhihuang software 30K 8月 7 2019 wpa_priv.c
-rw-r--r-- 1 yuzhihuang software 34K 8月 7 2019 wpas_glue.c
-rw-r--r-- 1 yuzhihuang software 2.7K 10月 11 16:18 wpas_glue.d
-rw-r--r-- 1 yuzhihuang software 888 8月 7 2019 wpas_glue.h
-rw-r--r-- 1 yuzhihuang software 93K 10月 11 16:18 wpas_glue.o
-rw-r--r-- 1 yuzhihuang software 10K 8月 7 2019 wpas_kay.c
-rw-r--r-- 1 yuzhihuang software 1.2K 8月 7 2019 wpas_kay.h
-rw-r--r-- 1 yuzhihuang software 2.6K 8月 7 2019 wpas_module_tests.c
-rwxr-xr-x 1 yuzhihuang software 2.1M 10月 11 16:18 wpa_supplicant
-rw-r--r-- 1 yuzhihuang software 286K 8月 7 2019 wpa_supplicant.c
-rw-r--r-- 1 yuzhihuang software 76K 8月 7 2019 wpa_supplicant.conf
-rw-r--r-- 1 yuzhihuang software 1.3K 8月 7 2019 wpa_supplicant.conf.mk
-rwxr-xr-x 1 yuzhihuang software 458 8月 7 2019 wpa_supplicant.conf.sh
-rw-r--r-- 1 yuzhihuang software 3.8K 10月 11 16:18 wpa_supplicant.d
-rw-r--r-- 1 yuzhihuang software 47K 8月 7 2019 wpa_supplicant.i.h
-rw-r--r-- 1 yuzhihuang software 270K 10月 11 16:18 wpa_supplicant.o
-rw-r--r-- 1 yuzhihuang software 136 8月 7 2019 wpa_supplicant_template.conf
```

3.5 连接 WPA3 加密的路由器

(1) 强制以 WPA3 加密方式连接:

Wpa_supplicant.conf 配置:

```
ctrl_interface=/var/run/wpa_supplicant

pmf=2

network={
    ssid="wpa3_test"
    psk="12345678"
    key_mgmt=SAE
}
```

(2) 支持 WPA3 加密方式连接(WPA/WPA2/WPA3)

Wpa_supplicant.conf 配置:

```
ctrl_interface=/var/run/wpa_supplicant

pmf=1

network={
    ssid="wpa3_test"
    psk="12345678"
    key_mgmt=SAE WPA-PSK
}
```


4 编译 hostapd 2.9 支持 wpa3(SAE)

4.1 设置 libnl3.0 的环境变量

```
export
PKG_CONFIG_PATH=/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1
/third_app/libnl3/lib/pkgconfig:$PKG_CONFIG_PATH
```

4.2 配置 hostapd 功能

```
mv deconfig .config
```

.config 设置编译配置项:

动态编译:

```
CC=/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/tools/a
rm-anykav500-linux-uclibcgnueabi/bin/arm-anykav500-linux-uclibcgnueabi-gcc
```

静态编译:

```
CC=/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/tools/a
rm-anykav500-linux-uclibcgnueabi/bin/arm-anykav500-linux-uclibcgnueabi-gcc
-static
```

```
CONFIG_DRIVER_NL80211=y
```

```
CONFIG_LIBNL32=y
```

```
CFLAGS +=
-I/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/third_app/lib
nl3/include/libnl3
```

```
LIBS +=
-L/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/third_app/lib
nl3/lib/
```

```
CFLAGS +=
-I/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/third_app/lib
ssl/include/
```

```
LIBS +=
-L/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/third_app/lib
ssl/lib/
```

```
CONFIG_CTRL_IFACE=y
```

```
CONFIG_WPA_CLI_EDIT=y
```

```
CONFIG_SAE=y
CONFIG_IEEE80211W=y
CONFIG_TLS=openssl
CONFIG_IEEE80211N=y
```

4.3 编译

```
make -j8
```

4.4 Strip

由于是静态编译的所以 hostapd 体积会比较大

```
/usr/lchome/yuzhihuang/ankai/Linux/anyka37E/AK37E_SDK_V1.01_1/tools/arm-anyka
v500-linux-uclicbnueabi/bin/arm-anykav500-linux-uclicbnueabi-strip hostapd
```

```
-rw-r--r-- 1 yuzhihuang software 2.7K 1月 7 11:09 eap_register.o
-rw-r--r-- 1 yuzhihuang software 2.6K 8月 7 2019 eap_testing.txt
-rw-r--r-- 1 yuzhihuang software 364 8月 7 2019 hapd_module_tests.c
-rw-r--r-- 1 yuzhihuang software 24K 8月 7 2019 hlr_auc_gw.c
-rw-r--r-- 1 yuzhihuang software 909 8月 7 2019 hlr_auc_gw.milenage_db
-rw-r--r-- 1 yuzhihuang software 3.2K 8月 7 2019 hlr_auc_gw.txt
-rwxr-xr-x 1 yuzhihuang software 2.4M 1月 7 11:10 hostapd
-rw-r--r-- 1 yuzhihuang software 1.5K 8月 7 2019 hostapd.8
-rw-r--r-- 1 yuzhihuang software 276 8月 7 2019 hostapd.accept
-rw-r--r-- 1 yuzhihuang software 453 8月 7 2019 hostapd.android.rc
-rwxr-xr-x 1 yuzhihuang software 134K 1月 7 11:11 hostapd_cli
-rw-r--r-- 1 yuzhihuang software 1.9K 8月 7 2019 hostapd_cli.1
-rw-r--r-- 1 yuzhihuang software 51K 8月 7 2019 hostapd_cli.c
-rw-r--r-- 1 yuzhihuang software 1.3K 1月 7 11:09 hostapd_cli.d
-rw-r--r-- 1 yuzhihuang software 110K 1月 7 11:09 hostapd_cli.o
-rwxr-xr-x 1 yuzhihuang software 113K 1月 7 14:15 hostapd.conf
-rw-r--r-- 1 yuzhihuang software 144 8月 7 2019 hostapd.deny
-rw-r--r-- 1 yuzhihuang software 4.3K 8月 7 2019 hostapd.eap_user
-rw-r--r-- 1 yuzhihuang software 909 8月 7 2019 hostapd.eap_user.sqlite
-rw-r--r-- 1 yuzhihuang software 142 8月 7 2019 hostapd.radius_clients
-rw-r--r-- 1 yuzhihuang software 409 8月 7 2019 hostapd.sim_db
-rw-r--r-- 1 yuzhihuang software 282 8月 7 2019 hostapd.vlan
-rw-r--r-- 1 yuzhihuang software 834 8月 7 2019 hostapd.wpa_psk
drwxr-xr-x 2 yuzhihuang software 4.0K 8月 7 2019 logwatch
-rw-r--r-- 1 yuzhihuang software 23K 8月 7 2019 main.c
-rw-r--r-- 1 yuzhihuang software 3.4K 1月 7 11:09 main.d
-rw-r--r-- 1 yuzhihuang software 103K 1月 7 11:09 main.o
-rw-r--r-- 1 yuzhihuang software 28K 8月 7 2019 Makefile
-rw-r--r-- 1 yuzhihuang software 922 8月 7 2019 nt_password_hash.c
-rw-r--r-- 1 yuzhihuang software 16K 8月 7 2019 README
-rw-r--r-- 1 yuzhihuang software 8.1K 8月 7 2019 README-MULTI-AP
-rw-r--r-- 1 yuzhihuang software 15K 8月 7 2019 README-WPS
-rw-r--r-- 1 yuzhihuang software 1.2K 8月 7 2019 wired.conf
-rwxr-xr-x 1 yuzhihuang software 9.8K 8月 7 2019 wps-ap-nfc.py
[yuzhihuang@ubuntu-sz-2nd hostapd]$
```

4.5 配置为支持 SAE 模式

(1) 强制只支持 SAE 模式

```
interface=p2p0
ctrl_interface=/tmp/ap
ctrl_interface_group=0
driver=nl80211
ieee80211n=1
ssid=IPC_123456
hw_mode=g
channel=11
macaddr_acl=0
auth_algs=1
ignore_broadcast_ssid=0
wpa_group_rekey=0
wpa=2
sae_password=12345678
wpa_key_mgmt=SAE
rsn_pairwise=CCMP
ieee80211w=1
sae_require_mfp=1
```

STA 端搜索到的 AP 的配置显示:

[WPA2-SAE-CCMP][ESS] IPC_123456

(2) 支持 WPA3 加密方式连接(WPA/WPA2/WPA3)

```
interface=p2p0
ctrl_interface=/tmp/ap
ctrl_interface_group=0
driver=nl80211
```

```
ieee80211n=1
ssid=IPC_123456
hw_mode=g
channel=11
macaddr_acl=0
auth_algs=1
ignore_broadcast_ssid=0
wpa=2
sae_password=12345678
ieee80211w=1
sae_require_mfp=1
wpa_passphrase=12345678
wpa_key_mgmt=SAE WPA-PSK
wpa_pairwise=CCMP TKIP
rsn_pairwise=CCMP TKIP
wpa_group_rekey=0
```

STA 端搜索到的 AP 的配置显示:

```
[WPA2-PSK+SAE-CCMP+TKIP][ESS] IPC_123456
```

5 驱动配置

驱动编译需要打开如下配置:

```
[*] Enable loader driver fast function
[ ] Enable iwpriv some prive func
[*] Enable WPA3 support, but make sure the kernel support sae before enabled
```

6 确定内核支持 SAE

在内核目录下直接执行

```
grep -nr "NL80211_FEATURE_SAE" .
```

如果支持:

```
[yuzhihuang@ubuntu_sz_2nd kernel]$ grep -nr "NL80211_FEATURE_SAE" .
Binary file ./net/wireless/cfg80211.o matches
./net/wireless/nl80211.c:3754:         if (!(rdev->wiphy.features & NL80211_FEATURE_SAE) &&
Binary file ./net/wireless/nl80211.o matches
Binary file ./net/wireless/core.o matches
Binary file ./net/wireless/cfg80211.ko matches
./net/mac80211/main.c:546:         NL80211_FEATURE_SAE |
./include/uapi/linux/nl80211.h:4497: * @NL80211_FEATURE_SAE: This driver supports simultaneous authentication of
./include/uapi/linux/nl80211.h:4583:     NL80211_FEATURE_SAE
                                     = 1 << 5,
Binary file ./modules/cfg80211.ko matches

[yuzhihuang@ubuntu_sz_2nd kernel]$
[yuzhihuang@ubuntu_sz_2nd kernel]$
```

如果不支持就搜不到

```
[yuzhihuang@ubuntu_sz_2nd linux-3.0.8]$
[yuzhihuang@ubuntu_sz_2nd linux-3.0.8]$
[yuzhihuang@ubuntu_sz_2nd linux-3.0.8]$
[yuzhihuang@ubuntu_sz_2nd linux-3.0.8]$ grep -nr "NL80211_FEATURE_SAE" .
[yuzhihuang@ubuntu_sz_2nd linux-3.0.8]$
[yuzhihuang@ubuntu_sz_2nd linux-3.0.8]$
[yuzhihuang@ubuntu_sz_2nd linux-3.0.8]$
[yuzhihuang@ubuntu_sz_2nd linux-3.0.8]$
```

7 编译遇到的问题&解决

7.1 undefined reference to 'lrint'

```

/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib/libcrypto.a(b_sock.o): In function `BIO_gethostbyname':
b_sock.c:(.text+0x30): warning: Using 'gethostbyname' in statically linked applications requires at runtime the shared libraries from the glibc version used for linking
LD wpa_passphrase
CC wpa_supplicant.c
CC ../src/drivers/driver_wext.c
CC ctrl_iface.c
CC wpa_cli.c
LD wpa_cli
CC ../src/drivers/driver_nl80211.c
ctrl_iface_unix.o: In function `wpas_global_ctrl_iface_open_sock':
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/wpa_supplicant-2.9/wpa_supplicant/ctrl_iface_unix.c:1221: warning: Using 'getgrnam' in statically linked applications requires at runtime the shared libraries from the glibc version used for linking
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/lib/libnl-3.a(addr.o): In function `nl_addr_info':
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/libnl-3.2.25/lib/addr.c:767: warning: Using 'getaddrinfo' in statically linked applications requires at runtime the shared libraries from the glibc version used for linking
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib/libcrypto.a(b_sock.o): In function `BIO_gethostbyname':
b_sock.c:(.text+0x30): warning: Using 'gethostbyname' in statically linked applications requires at runtime the shared libraries from the glibc version used for linking
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/lib/libnl-3.a(utils.o): In function `nl_ip_proto2str':
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/libnl-3.2.25/lib/utils.c:822: warning: Using 'getprotobynumber' in statically linked applications requires at runtime the shared libraries from the glibc version used for linking
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/lib/libnl-3.a(utils.o): In function `nl_str2ip_proto':
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/libnl-3.2.25/lib/utils.c:835: warning: Using 'getprotobyname' in statically linked applications requires at runtime the shared libraries from the glibc version used for linking
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/lib/libnl-3.a(utils.o): In function `nl_prob2int':
utils.c:(.text+0x668): undefined reference to `lrint'

```

该问题是因为最后一句 undefined reference to 'lrint'

解决方法:

-lnl 库要引用在-lm 之前

```

# to override previous values of the variables.
CC:=/usr/lchome/yuzhihuang/Mstar/IPC_I3/arm-linux-gnueabi-hf-4.8.3-201404/bin/arm-linux-gnueabi-hf-gcc -static -pthread
CFLAGS += -I/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/include/libnl3
LIBS += -L/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/lib/
LIBS += -lnl-3
LIBS += -lm

CFLAGS += -I/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/include/
LIBS += -L/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib/

# Uncomment following two lines and fix the paths if you have installed OpenSSL
# or GnuTLS in non-default location

```

7.2 undefined reference to 'pthread_XXXXXXX'

```
CC:=/usr/lchome/yuzhihuang/Mstar/IPC_I3/arm-linux-gnueabi-hf-4.8.3-201404/bin/arm-linux-gnueabi-hf-gcc -static -pthread
```

CFLAGS

+=

```
-I/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/include/libnl3
```

```
LIBS += -L/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/lib/
```

```
LIBS += -lnl-3
```

```
LIBS += -lm
```

CFLAGS

+=

```
-I/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/include/
```

```
LIBS += -L/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib/
```

```
threads_pthread.c:(.text+0x3a): undefined reference to `pthread_rwlock_init'
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(threads_pthread.o
READ_read_lock':
threads_pthread.c:(.text+0x5a): undefined reference to `pthread_rwlock_rdlock'
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(threads_pthread.o
READ_write_lock':
threads_pthread.c:(.text+0x6a): undefined reference to `pthread_rwlock_wrlock'
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(threads_pthread.o
READ_unlock':
threads_pthread.c:(.text+0x7a): undefined reference to `pthread_rwlock_unlock'
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(threads_pthread.o
READ_lock_free':
threads_pthread.c:(.text+0x8e): undefined reference to `pthread_rwlock_destroy'
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(threads_pthread.o
READ_run_once':
threads_pthread.c:(.text+0xaa): undefined reference to `pthread_once'
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(threads_pthread.o
READ_init_local':
threads_pthread.c:(.text+0xba): undefined reference to `pthread_key_create'
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(threads_pthread.o
READ_set_local':
threads_pthread.c:(.text+0xd4): undefined reference to `pthread_setspecific'
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(threads_pthread.o
READ_cleanup_local':
threads_pthread.c:(.text+0xe4): undefined reference to `pthread_key_delete'
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(threads_pthread.o
nit_fork_handlers':
threads_pthread.c:(.text+0x14a): undefined reference to `pthread_once'
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(threads_pthread.o
_func':
threads_pthread.c:(.text+0x10): undefined reference to `pthread_atfork'
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(threads_pthread.o
READ_get_local':
threads_pthread.c:(.text+0xca): undefined reference to `pthread_getspecific'
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(threads_pthread.o
READ_get_current_id':
```

缺少 pthread 库

解决方法:

```
# i.e., just setting VARIABLE=1 is not disabling that variable.
#
# This file is included in Makefile, so variables like CFLAGS and LIBS can also
# be modified from here. In most cases, these lines should use += in order not
# to override previous values of the variables.
CC:=/usr/lchome/yuzhihuang/Mstar/IPC_I3/arm-linux-gnueabi-hf-4.8.3-201404/bin/arm-linux-gnueabi-hf-gcc -static -pthread
CFLAGS += -I/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/include/libnl3
LIBS += -L/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/lib/
LIBS += -lnl3
LIBS += -lm

CFLAGS += -I/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/include/
LIBS += -L/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib/

# Uncomment following two lines and fix the paths if you have installed OpenSSL
# or GnuTLS in non-default location
#CFLAGS += -I/usr/local/openssl/include
#LIBS += -L/usr/local/openssl/lib

# Some Red Hat versions seem to include kerberos header files from OpenSSL, but
# the kerberos files are not in the default include path. Following line can be
```

7.3 静态编译报需要 glibc 动态库来链接

```
CC ../src/ap/ieee802_11.c
CC ../src/drivers/driver_nl80211.c
main.o: In function `hostapd_get_ctrl_iface_group':
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/hostapd-2.9/hostapd/main.c:548: warning: Using 'getgrnam' in static
ally linked applications requires at runtime the shared libraries from the glibc version used for linking
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/lib//libnl-3.a(addr.o): In function `nl_addr_info':
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/libnl-3.2.25/lib/addr.c:767: warning: Using 'getaddrinfo' in static
ally linked applications requires at runtime the shared libraries from the glibc version used for linking
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/ssl_lib/lib//libcrypto.a(b_sock.o): In function `BIO_gethostbyname'
:
b_sock.c:(.text+0x30): warning: Using 'gethostbyname' in statically linked applications requires at runtime the shared libraries
from the glibc version used for linking
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/lib//libnl-3.a(utils.o): In function `nl_ip_proto2str':
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/libnl-3.2.25/lib/utils.c:822: warning: Using 'getprotobynumber' in
statically linked applications requires at runtime the shared libraries from the glibc version used for linking
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/nl_lib/lib//libnl-3.a(utils.o): In function `nl_str2ip_proto':
/usr/lchome/yuzhihuang/Mstar/IPC_I3/third_app/hostapd_wpa_2.9/libnl-3.2.25/lib/utils.c:835: warning: Using 'getprotobyname' in s
tatically linked applications requires at runtime the shared libraries from the glibc version used for linking
```

这里如果编译成功,在使用过程中没有用到: getgrnam, getaddrinfo, gethostbyname, getprotobynumber 这些函数的就没事。

7.4 undefined reference to `dlopen'

```
CC ../src/drivers/driver_n100211.c
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/toolchain/arm-fullhanv2-linux-uclibcgnueabi-b2/bin/../lib/gcc/arm-fullhanv2-linux-uclibcgnueabi/5.5.0/../../../../arm-fullhanv2-linux-uclibcgnueabi/bin/ld: /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libssl/lib/libcrypto.a(b_sock.o): in function `BIO_gethostbyname':
b_sock.c:(.text+0x54): warning: gethostbyname is obsolescent, use getnameinfo() instead.
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/toolchain/arm-fullhanv2-linux-uclibcgnueabi-b2/bin/../lib/gcc/arm-fullhanv2-linux-uclibcgnueabi/5.5.0/../../../../arm-fullhanv2-linux-uclibcgnueabi/bin/ld: /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libssl/lib/libcrypto.a(dso_dlfcn.o): in function `dlfcn_globallookup':
dso_dlfcn.c:(.text+0x10): undefined reference to `dlopen'
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/toolchain/arm-fullhanv2-linux-uclibcgnueabi-b2/bin/../lib/gcc/arm-fullhanv2-linux-uclibcgnueabi/5.5.0/../../../../arm-fullhanv2-linux-uclibcgnueabi/bin/ld: dso_dlfcn.c:(.text+0x20): undefined reference to `dlsym'
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/toolchain/arm-fullhanv2-linux-uclibcgnueabi-b2/bin/../lib/gcc/arm-fullhanv2-linux-uclibcgnueabi/5.5.0/../../../../arm-fullhanv2-linux-uclibcgnueabi/bin/ld: dso_dlfcn.c:(.text+0x2c): undefined reference to `dlclose'
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/toolchain/arm-fullhanv2-linux-uclibcgnueabi-b2/bin/../lib/gcc/arm-fullhanv2-linux-uclibcgnueabi/5.5.0/../../../../arm-fullhanv2-linux-uclibcgnueabi/bin/ld: /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libssl/lib/libcrypto.a(dso_dlfcn.o): in function `dlfcn_bind_func':
dso_dlfcn.c:(.text+0x1ac): undefined reference to `dlsym'
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/toolchain/arm-fullhanv2-linux-uclibcgnueabi-b2/bin/../lib/gcc/arm-fullhanv2-linux-uclibcgnueabi/5.5.0/../../../../arm-fullhanv2-linux-uclibcgnueabi/bin/ld: dso_dlfcn.c:(.text+0x260): undefined reference to `dlerror'
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/toolchain/arm-fullhanv2-linux-uclibcgnueabi-b2/bin/../lib/gcc/arm-fullhanv2-linux-uclibcgnueabi/5.5.0/../../../../arm-fullhanv2-linux-uclibcgnueabi/bin/ld: /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libssl/lib/libcrypto.a(dso_dlfcn.o): in function `dlfcn_load':
dso_dlfcn.c:(.text+0x2d0): undefined reference to `dlopen'
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/toolchain/arm-fullhanv2-linux-uclibcgnueabi-b2/bin/../lib/gcc/arm-fullhanv2-linux-uclibcgnueabi/5.5.0/../../../../arm-fullhanv2-linux-uclibcgnueabi/bin/ld: dso_dlfcn.c:(.text+0x33c): undefined reference to `dlclose'
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/toolchain/arm-fullhanv2-linux-uclibcgnueabi-b2/bin/../lib/gcc/arm-fullhanv2-linux-uclibcgnueabi/5.5.0/../../../../arm-fullhanv2-linux-uclibcgnueabi/bin/ld: dso_dlfcn.c:(.text+0x36c): undefined reference to `dlerror'
```

该问题需要在编译的时候添加上`-ldl`,这个库必须要在`n1`库以后

```
# i.e., just setting VARIABLE=n is not disabling that variable.
#
# This file is included in Makefile, so variables like CFLAGS and LIBS can also
# be modified from here. In most cases, these lines should use += in order not
# to override previous values of the variables.
CC:=/usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/toolchain/arm-fullhanv2-linux-uclibcgnueabi-b2/bin/
fullhanv2-linux-uclibcgnueabi-gcc -static -pthread
CFLAGS += -I/usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libn1/include/libn13
LIBS += -L/usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libn1/lib/
#LIBS += -ln1-3
#LIBS += -lm

CFLAGS += -I/usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libssl/include/
LIBS += -L/usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libssl/lib/
LIBS += -lrt -ln1-3 -ln1-genl-3 -lcrypto -ldl -lm
#LIBS += -ln1-3 -ldl -lm
# Uncomment following two lines and fix the paths if you have installed OpenSSL
# or GnuTLS in non-default location
```

7.5 skipping incompatible xxxxx when searching for -lnl-3

```
CC ../src/ap/ieee802_11_ht.c
CC ../src/drivers/driver_common.c
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libn1/lib/libn1-3.so when searching for -lnl-3
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libn1/lib/libn1-3.a when searching for -lnl-3
/usr/bin/ld: cannot find -lnl-3
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libn1/lib/libn1-genl-3.so when searching for -lnl-genl-3
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libn1/lib/libn1-genl-3.a when searching for -lnl-genl-3
/usr/bin/ld: cannot find -lnl-genl-3
/usr/bin/ld: skipping incompatible /usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libssl/lib/libcrypto.a when searching for -lcrypto
collect2: error: ld returned 1 exit status
make: *** [Makefile:1320: hostapd] Error 1
```

原因是编译的库使用的工具链和目前编译的工具链不一致导致。

配置工具链的时候少了个 CC

```
C:/usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/toolchain/arm-fullhanv2-  
linux-uclibcgnueabi-b2/bin/arm-fullhanv2-linux-uclibcgnueabi-gcc -static -pthread  
CFLAGS += -I/usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libn1  
/include/libn1  
LIBS += -L/usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libn1/  
lib  
#LIBS += -ln1-3  
#LIBS += -lm  
  
CFLAGS += -I/usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libss  
l/include  
LIBS += -L/usr/lchome/yuzhihuang/FullH/8856/FH8856_IPC_V1.2.0_20200324/board_support/third_app/libss/  
lib
```



CONTACT INFORMATION

AltoBeam (China) Inc.

Address: B808, Tsinghua Tongfang Hi-Tech Plaza, Haidian, Beijing, China 100083

Tel: (8610) 6270 1811

Fax: (8610) 6270 1830

Website: www.altobeam.com

Email: support@altobeam.com

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