89570 Android 12 Bringup User Manual

Table of Contents

HW Setup:

- Machine Details: Hikey960 android platform is the ref. platform
- 89570-PCIE card details: CYW955572FCIPA

S/W Details:

- Kernel Version: hikey_kernel 5.4
- Wlan Software Package Version : 89570_Android 12

Environment set-up

- Machine requirement for AOSP compilation
  - Ubuntu 14.04 or 16.04 is recommended.
- sudo apt-get update
- sudo apt-get install git-core gnupg flex bison gperf build-essential zip curl zlib1g-dev gcc-multilib g++-multilib libc6-dev-i386 lib32ncurses5-dev x11proto-core-dev libx11-dev lib32z-dev libgl1-mesa-dev libxml2-utils xsltproc unzip
- sudo apt-get install repo android-tools-adb android-tools-fastboot

Android 12 (S) bringup

Android 12 AOSP download

- mkdir android-12.0.0_r3
- cd android-12.0.0_r3
- repo init -u https://android.googlesource.com/platform/manifest -b android-12.0.0_r3
- repo sync -j32

Additional files for Hikey960 download:

- wget https://dl.google.com/dl/android/aosp/hisilicon-hikey960-OPR-3c243263.tgz
- tar -xvzf hisilicon-hikey960-OPR-3c243263.tgz
- ./extract-hisilicon-hikey960.sh
- Type "I ACCEPT" if you agree to the terms of the license: **I ACCEPT**

Hikey960 5.4 kernel download and build

- cd ../
- mkdir hikey960-5.4
- cd hikey960-5.4
- repo init -u https://android.googlesource.com/kernel/manifest -b common-android12-5.4
- repo sync -j32
- cd common
- cp wakelock.h from hikey_patches to ./include/linux
- patch -p1 < kernel_enable_bcmdhd.patch
- cd ../
- BUILD_CONFIG=common/build.config.hikey960 build/build.sh
- export **AOSP_TOPDIR**=<path-to-android-12.0.0_r3>
- export **KERNEL_HOME**=<PATH_TO_KERNEL_DIR>
- rm ${AOSP_TOPDIR}/device/linaro/hikey-kernel/hikey960/5.4/*
- cp out/android12-5.4/dist/*.ko ${AOSP_TOPDIR}/device/linaro/hikey-kernel/hikey960/5.4/
- cp out/android12-5.4/dist/Image.gz ${AOSP_TOPDIR}/device/linaro/hikey-kernel/hikey960/5.4/
- cp out/android12-5.4/dist/hi3660-hikey960.dtb ${AOSP_TOPDIR}/device/linaro/hikey-kernel/hikey960/5.4/
- cd ${AOSP_TOPDIR}
- cat device/linaro/hikey-kernel/hikey960/5.4/Image.gz device/linaro/hikey-kernel/hikey960/5.4/hi3660-hikey960.dtb > device/linaro/hikey-kernel/hikey960/5.4/Image.gz-dtb

Wlan host driver compilation

- export DHD_PATH=<path-to-dhd-source>
- PATH=$KERNEL_HOME/prebuilts-master/clang/host/linux-x86/clang-r416183b/bin/:$PATH
- make ARCH=arm64 LLVM=1 LLVM_IAS=1 CROSS_COMPILE=aarch64-linux-gnu- -C $DHD_PATH KDIR=$KERNEL_HOME/out/android12-5.4/common CONFIG_BCMDHD=m CONFIG_BCM4359=y CONFIG_BCMDHD_PCIE=y CONFIG_ANDROID=y CONFIG_WL_AP_IF=y CONFIG_BCMDHD_WPA3=y CONFIG_ANDROID12=y all
- $ cp $DHD_PATH/bcmdhd.ko ${AOSP_TOPDIR}/device/linaro/hikey-kernel/hikey960/5.4/

Cy patch

- Apply aosp_android12.patch using repo_apply.sh as below
  - cd $AOSP_TOPDIR
  - repo_apply.sh aosp_android12.patch **Note: Please update the correct firmware and nvram names in the patch.**
- Copy nvram and firmware to AOSP-directory vendor/cypress/ path.

Cy Supplicant Compilation:

Disable default supplicant being built by AOSP build system:

- cd $ANDROID_HOME/external/wpa_supplicant_8/
- mv Android.mk oldAndroid.mk
- touch Android.mk
- cd ../
- mkdir IFX-supplicant && cd IFX-supplicant
- copy Cypress-Infineon Supplicnt source to this path
- cd hostap
- cd hostapd && ln -s ../src ./ && cd ..
- cd wpa_supplicant && ln -s ../src ./ && cd ..
- cd $ANDROID_HOME
- source build/envsetup.sh
- lunch hikey960-userdebug
- cd external/IFX-supplicant/ && mma -j4
- “hostapd” and “wpa_supplicant” will be located in $OUT/vendor/bin/hw/
- “hostapd_cli” and “wpa_cli” will be located in $OUT/vendor/bin/
- cd .. && make -j12
- supplicant/hostapd binaries will now be part of vendor.img

Android build

- source build/envsetup.sh
- lunch hikey960-userdebug
- make TARGET_KERNEL_USE=5.4 HIKEY_USES_GKI=true -j8 2>&1 | tee build-log.txt

Flash and Bringup

Flashing

Build the Android and the Kernel sources to generate the super.img, boot.img,etc.

- Copy boot.img, super.img, userdata.img from /out/target/product/hikey960/ to image directory.
- Copy all bootloader images and flash-all.sh from device/linaro/hikey/installer/hikey960/ to image directory.
- Edit flash-all.sh to flash userdata.img. Also set INSTALLER_DIR and ANDROID_PRODUCT_OUT variable to current image directory.
- Run flash-all.sh script from image directory.

NOTE:
Sometimes we have seen while moving from Android 11 to Android 12 hikey board fails to enter fastboot mode. In this case we need to follow below recovery steps.

- Put the hikey board in recovery mode with below switch option.

  To boot into recovery mode set switch 1 & 2 to ON state and switch 3 to OFF state

- Verify the serial port connection with ls /dev/ttyUSB*.

- run recovery-flash.sh 'device name' script.

- After successful firmware flash put the device in hard fastboot mode using below option.

To boot into fastboot mode at every alternate rebooot set switch 1 to ON and switch 2 & 3 to OFF state.

- Execute flash-all.sh

- Put the hikey in normal boot mode and power ON.

Reference: https://github.com/96boards-hikey/tools-images-hikey960/blob/master/recovery-flash.sh
And https://www.96boards.org/documentation/consumer/hikey/hikey960/installation/board-recovery.md.html

Bringup

- For Debug binaries use below push commands.

FW : $adb push <firmware-file> /vendor/firmware/

NVRAM : $adb push <nvram-file> /vendor/firmware/

Supplicant : $adb push wpa_supplicant /vendor/bin/hw/

$adb push wpa_cli /vendor/bin/

hostpad : $adb push hostapd /vendor/bin/hw/

$adb push hostapd_cli /vendor/bin/hw/

WPA Lib : $adb push libwpa_client.so /vendor/lib64/

Bcmdhd module: $adb push bcmdhd.ko /vendor/lib/modules/

wl and dhd utility: $adb push wlarm_android /vendor/bin/

$adb push dhdarm_android /vendor/bin/

$adb shell chmod 777 /vendor/bin/*

- Reboot the board, wifi should be up. If you didn't turn on wifi, you can enable it using svc wifi enable command.

E.g)
$ adb shell
hikey960:/ $ su
hikey960:/ # svc wifi enable
hikey960:/ # wlarm_android ver
1.1 RC0.0
wl0: Jan 28 2022 04:56:34 version 18.53.70 (b491e00) FWID 01-73e2ecf1