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Linux SDK编译说明

文档修订历史

版本	修订内容	修订	审核	日期
V1.0	创建文档	刘崇凯		2023/04/14

1、源码获取

1.1 下载源码

链接: <https://pan.baidu.com/s/1DouYPBSKiu19A55Thf39nA?pwd=1234>

提取码: 1234

1.2 解压源码

```
1 tar -zxvf sbc3526_open_source.tar.gz
```

得到sbc3526_open_source目录即为SDK目录。

2、Linux 开发环境搭建

建议使用Ubuntu1804及以上版本系统上开发，并安装依赖软件包。

```
1 sudo apt-get install repo git ssh make gcc libssl-dev liblz4-tool expect
2 sudo apt-get install g++ patchelf chrpath gawk texinfo chrpath diffstat
3 sudo apt-get install binfmt-support qemu-user-static live-build bison flex
4 sudo apt-get install fakeroot cmake gcc-multilib g++-multilib unzip
5 sudo apt-get install device-tree-compiler python-pip libncurses5-dev python-
  -pyelftools
```

3、SDK编译

3.1 选择开发板配置

```
1 bbelephant@dell-PowerEdge-R430:~/work/rk356x_linux_sdk$ ./build.sh lunch
2 processing option: lunch
3
4 You're building on Linux
5 Lunch menu...pick a combo:
6
7 0. default BoardConfig.mk
8 1. BoardConfig-rk3566-evb2-lp4x-v10-32bit.mk
9 2. BoardConfig-rk3566-evb2-lp4x-v10.mk
10 3. BoardConfig-rk3568-dzjg-evb3568-lvds.mk
11 4. BoardConfig-rk3568-est-evb3568v2-hdmi.mk
12 5. BoardConfig-rk3568-evb1-ddr4-v10-32bit.mk
13 6. BoardConfig-rk3568-evb1-ddr4-v10-spi-nor-64M.mk
14 7. BoardConfig-rk3568-evb1-ddr4-v10.mk
15 8. BoardConfig-rk3568-ido-evb3568-hantang.mk
16 9. BoardConfig-rk3568-ido-evb3568.mk
17 10. BoardConfig-rk3568-ido-evb3568v2-edp.mk
18 11. BoardConfig-rk3568-ido-evb3568v2-hdmi-lvds-1024x600.mk
19 12. BoardConfig-rk3568-ido-evb3568v2-hdmi-lvds-1280x800.mk
20 13. BoardConfig-rk3568-ido-evb3568v2-hdmi.mk
21 14. BoardConfig-rk3568-ido-evb3568v2-lvds.mk
22 15. BoardConfig-rk3568-ido-evb3568v2-mipi0.mk
23 16. BoardConfig-rk3568-ido-evb3568v2-mipi1.mk
24 17. BoardConfig-rk3568-ido-sbc3526-v1-dsi0-mipi.mk
25 18. BoardConfig-rk3568-ido-sbc3526-v1-dsi1-mipi.mk
26 19. BoardConfig-rk3568-ido-sbc3526-v1-edp.mk
27 20. BoardConfig-rk3568-ido-sbc3526-v1-hdmi.mk
28 21. BoardConfig-rk3568-ido-sbc3526-v1-lvds.mk
29 22. BoardConfig-rk3568-ido-sbc3526-v1-mipi2lvds-1080p.mk
30 23. BoardConfig-rk3568-ido-sbc3568-v1-edp.mk
31 24. BoardConfig-rk3568-ido-sbc3568-v1-hdmi.mk
32 25. BoardConfig-rk3568-ido-sbc3568-v1-lvds.mk
33 26. BoardConfig-rk3568-ido-sbc3568-v1-mipi0.mk
34 27. BoardConfig-rk3568-ido-sbc3568-v1-mipi2lvds-1080p.mk
35 28. BoardConfig-rk3568-nvr-spi-nand.mk
36 29. BoardConfig-rk3568-nvr.mk
37 30. BoardConfig-rk3568-uvic-evb1-ddr4-v10.mk
38 31. BoardConfig.mk
39
```

SDK默认根据开发板的屏幕配置了对应的mk，如要编译hdmi的固件，则选择BoardConfig-rk3568-ido-sbc3526-hdmi.mk即可。

执行./envsetup.sh

```
1 bbelephant@dell-PowerEdge-R430:rk/rk356x_linux_sdk$ ./envsetup.sh
2 This script is executed directly...
3 Top of tree: /rk/rk356x_linux_sdk
4
5 You're building on Linux
6 Lunch menu...pick a combo:
7
8 0. non-rockchip boards
9 1. rockchip_px30_32
10 2. rockchip_px30_64
11 3. rockchip_px30_64_opensource
12 4. rockchip_px30_recovery
13 5. rockchip_px30_robot32
14 6. rockchip_px30_robot64
15 7. rockchip_px30_robot64_no_gpu
16 8. rockchip_px30_robot_recovery
17 9. rockchip_px3se
18 10. rockchip_px3se_recovery
19 11. rockchip_rk1806_ficial_gate
20 12. rockchip_rk1806_recovery
21 13. rockchip_rk1806_thunder_boot
22 14. rockchip_rk1808
23 15. rockchip_rk1808_ai_camera
24 16. rockchip_rk1808_compute_stick
25 17. rockchip_rk1808-multi
26 18. rockchip_rk1808_recovery
27 19. rockchip_rk3036
28 20. rockchip_rk3036_recovery
29 21. rockchip_rk3126c_dpf
30 22. rockchip_rk3128h
31 23. rockchip_rk3128h_recovery
32 24. rockchip_rk312x
33 25. rockchip_rk312x_recovery
34 26. rockchip_rk3229
35
```

这里选择[66] chip 3568的buildroot defconfig。

这样就可以在源码根目录操作buildroot。

3.2 开始编译

由于未开放kernel、u-boot,所以只能配置文件系统, 添加使用工具等操作。

3.2.1 buidroot 编译

▼Shell

```
1 bbelephant@dell-PowerEdge-R430:~/rk/rk356x_linux_sdk$ ./build.sh buildroot
```

3.2.2 固件打包

这里我们需要将SBC3568-V1B默认的boot.img 、 recovery.img链接到rockdev目录下。
执行./firmware.sh 会将相应的img拷贝或链接至rockdev目录下。

参数1	参数2	描述
-s	mipi0	mipi0显示接口
	mipi1	mipi1显示接口
	edp	edp显示接口
	hdmi	hdmi显示接口
	lvds	lvds显示接口
	mipi2lvds	双lvds显示接口
-r	buildroot	buildroot文件系统
	debian	debian文件系统
	ubuntu	Ubuntu文件系统

例如：

▼Shell

```
1 rk/rk356x_linux_sdk$ ./firmware.sh -s hdmi -r buildroot
```

▼Shell

```
1 bbelephant@dell-PowerEdge-R430:~/work/rk356x_linux_sdk$ ls rockdev/  
2 boot.img MiniLoaderAll.bin misc.img oem.img parameter.txt recovery.im  
g rootfs.ext4 rootfs.img uboot.img userdata.img
```

3.2.2 打包完整镜像

把所有镜像链接至rockdev目录下后，就可以打包完整的update.img镜像了。

▼ Shell

```
1 bbelephant@dell-PowerEdge-R430:~/rk/rk356x_linux_sdk$ ./build.sh updateimg
```

▼ Shell

```
1 rk/rk356x_linux_sdk$ ls rockdev/
2 boot.img MiniLoaderAll.bin misc.img oem.img parameter.txt recovery.im
  g      update.img rootfs.img uboot.img      userdata.img
```

其中update.img为完整固件包。

4、编译可能遇到的问题及解决方法

问题1 编译buildroot g++:internal compoler error: Killed (program cclplus)

```
8/host/include -I/home/luffy/share/3568/rk356x_linux_sdk_211116/buildroot/output/rockchip_rk3568/host/include -I../gcc/./libdecnumber -I../gcc/./libdecnumber/dpd -I../libdecnumber -I../gcc/..
h.o -MT generic-match.o -MD -MF .deps/generic-match.o -c generic-match.c
2022-01-05T10:38:16 g++: internal compiler error: Killed (program ccplus)
2022-01-05T10:38:16 Please submit a full bug report.
2022-01-05T10:38:16 See <file:///usr/share/doc/gcc-5/README.Bugs> for instructions.
2022-01-05T10:38:16 Makefile:1116: recipe for target 'gimple-match.o' failed
2022-01-05T10:38:16 make[3]: *** [gimple-match.o] Error 4
2022-01-05T10:38:16 make[3]: *** Waiting for unfinished jobs....
2022-01-05T10:38:23 rm gcc.pod
2022-01-05T10:38:23 Makefile:4300: recipe for target 'all-gcc' failed
2022-01-05T10:38:23 make[2]: *** [all-gcc] Error 2
2022-01-05T10:38:23 package/pkg-generic.mk:228: recipe for target '/home/luffy/share/3568/rk356x_linux_sdk_211116/buildroot/output/rockchip_rk3568/build/host-gcc-initial-9.3.0/.stamp_built' failed
2022-01-05T10:38:23 make[1]: *** [/home/luffy/share/3568/rk356x_linux_sdk_211116/buildroot/output/rockchip_rk3568/build/host-gcc-initial-9.3.0/.stamp_built] Error 2
2022-01-05T10:38:26 /home/luffy/share/3568/rk356x_linux_sdk_211116/buildroot/output/rockchip_rk3568/Makefile:16: recipe for target '_all' failed
2022-01-05T10:38:26 make: *** [_all] Error 2
Command exited with non-zero status 1
you take 26:56.07 to build buildroot
ERROR: Running build_buildroot failed!
ERROR: exit code 1 from line 556:
/usr/bin/time -f "you take %E to build buildroot" $COMMON_DIR/mk-buildroot.sh $BOARD_CONFIG
root@luffy-virtual-machine:~/share/3568/rk356x_linux_sdk_211116# dd if=/dev/
```

提示memory 不够，可以通过增加swap空间来避免

- 查看Swap空间大小

▼ Shell

```
1 free -m
2
3
```

	total	used	free	shared	buff/cache	avail
Mem:	7868	1144	5495	352	1228	
Swap:	8075	0	8075			

- 在原有的Swap基础上增加8G空间（大小可自己定）

```

1  sudo dd if=/dev/zero of=swapfile bs=1G count=8
2
3  记录了8+0 的读入
4  记录了8+0 的写出
5  8589934592 bytes (8.6 GB, 8.0 GiB) copied, 45.0893 s, 191 MB/s

```

- 创建一个Swap文件

```

1  sudo mkswap /swap/swapfile
2
3  Setting up swspace version 1, size = 8 GiB (8589930496 bytes)
4  无标签, UUID=179cba9a-944b-458a-9e1c-c924ad578662

```

- 尝试激活Swap文件

```

1  swapon /swap/swapfile
2
3  swapon: /swap/swapfile: 不安全的权限 0644, 建议使用 0600。
4  swapon: /swap/swapfile: swapon 失败: 不允许的操作

```

- 修改文件权限

```

1  chmod 0600 /swap/swapfile

```

- 再次查看Swap空间大小

```

1  free -m
2
3  total        used        free        shared  buff/cache   avail
4  Mem:      7868      1178      1174        371       5516
5  Swap:    16267         0      16267

```

- 重启计算机可能会退回8G，如果需要一直保持这个swap空间，可以把它写入/etc/fstab文件中

```
▼ Shell |
1  sudo vim /etc/fstab
2
3  #增加以下两行:
4
5  (add swap space on /swap/swapfile)
6  /swap/swapfile          /swap          swap          defaults
                           0          0
```