U-Boot

From Rockchip open source Document

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Download U-Boot

Upstream U-Boot

You can clone the u-boot repository by running:

```
git clone https://gitlab.denx.de/u-boot/u-boot.git
```

Alternatively you can use u-boot-rockchip instead which may with some patches not get in mainline:

```
git clone https://gitlab.denx.de/u-boot/custodians/u-boot-rockchip.git
```

Rockchip U-Boot

You can clone the u-boot repository by running:

```
git clone https://github.com/rockchip-linux/u-boot.git
```

Supported Devices

Upstream U-Boot support Rockchip SoCs:

RK3036, RK3188, RK3288 (http://opensource.rock-chips.com/wiki_RK3288), RK3328 (http://opensource.rock-chips.com/wiki_RK3328), RK3399 (http://opensource.rock-chips.com/wiki_RK3399)

- RK3036 boards supported:

1. EVB RK3036 - use evb-rk3036 configuration
2. Kylin - use kylin_rk3036 configuration

- RK3288 boards supported:

1. EVB RK3288 - use evb-rk3288 configuration
2. Firefly RK3288 - use firefly-rk3288 configuration
3. Hisense Chromebook - use chromebook_jerry configuration
4. Miniarm RK3288 - use miniarm-rk3288 configuration
5. PopMetal RK3288 - use popmetal-rk3288 configuration
6. Radxa Rock 2 - use rock2 configuration
7. ASUS Tinker

- RK3188 boards supported:

1. Radxa Rock - use rock configuration

- RK3328 boards supported:

1. EVB RK3328 - use evb-rk3328 configuration

- RK3399 boards supported:

1. EVB RK3399 - use evb-rk3399 configuration

Get a toolchain

If you haven't done so before, get a suitable toolchain installed and add it to your PATH.

In Ubuntu 14.04, you can use below command to install cross compiler for armv7:

```
sudo apt-get install gcc-arm-linux-gnueabi
```

Or for ARM64

```
sudo apt-get install gcc-aarch64-linux-gnu
```

Note that the latest U-Boot require version gcc-5.0 and later, we recommand to use linaro 6.3.1.

```
https://github.com/rockchip-linux/gcc-linaro-6.3.1-2017.05-x86_64_arm-linux-gnueabihf.git
```

```
https://github.com/rockchip-linux/gcc-linaro-6.3.1-2017.05-x86_64_aarch64-linux-gnu.git
```

Build U-Boot

Configure U-Boot

First you need to choose a correct defconfig for your board;

When you have determined what <board_name> you want to build, configure:

```
make CROSS_COMPILE=arm-linux-gnueabi- <board_name>_defconfig
```

You may need to change the U-Boot function/feature support by modify the defconfig file or,

there is also menuconfig to play with settings if you feel like it:

```
make CROSS_COMPILE=arm-linux-gnueabi- menuconfig
```

Buid Rockchip U-Boot

For convenience, Rockchip provide a script 'make.sh' to make it easy to get everything before kernel, this script need toolchain and rkbin (https://github.com/rockchip-linux/rkbin) support.

```
├── prebuilts
│   └── gcc
│       └── linux-x86
│           ├── aarch64
│           └── arm
├── rkbin
├── u-boot
```

expample for build rk3399:

```
./make.sh rk3399
```

and use './make.sh -h' for more option.

The output will including pre-loader, trust and u-boot image which is ready to use with rockchip upgrade tool,

```
u-boot/
├── rk3399_loader_v1.09.112.bin
├── trust.img
└── uboot.img
```

Build Upstream U-Boot

This is common and available for both Upstream U-Boot and Rockchip U-Boot.

For armv7:

```
make CROSS_COMPILE=arm-linux-gnueabi-
```

or for ARM64:

```
make ARCH=arm CROSS_COMPILE=aarch64-linux-gnu-
```

In order to support debug symbol in ARM DS-5, you may need add ctags in make command:

```
CFLAGS='-gdwarf-3'
```

The output including u-boot.bin, spl/u-boot-spl.bin, tpl/u-boot-tpl.bin at this step, and you need to package it with mkimage tool before use with rockchip upagrade tool. Get detail at boot option (http://opensource.rock-chips.com/wiki_Boot_option).

Support ATF with SPL FIT image

For trust support in SPL, we are using FIT image with 'mkimage' cmd in Makefile and its script defined in defconfig:

```
make u-boot.itb
```

Note: please copy the trust binary(optee.bin or bl31.elf from rkbin project) to u-boot root directory and rename it to tee.bin(armv7) or bl31.elf(armv8).

The output u-boot.itb is a its based package including u-boot-nodtb.bin, board.dtb, and trust binaries which can be used directly with upgrade tool.

```
├── u-boot
│   ├── u-boot.bin
│   ├── u-boot.itb
│   ├── spl
│   │   └── u-boot-spl.bin
│   └── tpl
│       └── u-boot-tpl.bin
```

Install U-Boot

See boot option (http://opensource.rock-chips.com/wiki_Boot_option) about how to

- package the available binaries

- flash and boot from eMMC/SD card.

Boot cmd

Rockchip U-Boot supports image type:

Android boot(boot_android), Rockchip RKIMG boot(boot_rockchip) and LInux distro boot(distro_bootcmd).

Upstream U-Boot supports image type::

Linux distro boot(distro_bootcmd).

Firmware download in U-Boot

In U-Boot, there are multi way to update image into emmc via U-Boot, you can chose any of one easy use for you.

fastboot: See fastboot (http://opensource.rock-chips.com/wiki_Fastboot)

rockusb: See rockusb

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