



NT96680 AN Introduction of the Build System

- 1 -

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Table of Content

Table of Content	2
1 Uboot	3
2 Linux kernel and modules	4
3 Device Tree	5
4 Rootfs.....	6
4.1 Build flow	6
4.2 Add application	7
4.3 Add customer driver code	7
4.3.1 Build flow	7
4.3.2 Install path.....	8
5 Tools.....	9
5.1 Add Open source tools	9
6 Library	10
6.1 Add your custom library.....	10

1 Uboot

We have a configuration file needs to be copied to your uboot folder firstly, the uboot source code can build separately. Please follow up the below instructions.

- Copy uboot source code and configs/cfg_gen/ModelConfig.mk
-

```
$ cp ~/na51000_linux_sdk/configs/cfg_gen/ModelConfig.mk
    ${UBOOT_DIR}/board/novatek/nvt-na51000/
$ export NVT_PRJCFG_MODEL_CFG=${UBOOT_DIR}/board/novatek/nvt-na51000/ModelConfig.mk
$ export ARCH=arm
$ export
CROSS_COMPILE=${YOUR_PATH}/arm-ca53-linux-gnueabi-hf-6.4/usr/bin/arm-ca53-linux-gnueabi-hf-
$ make distclean
$ make nvt-na51000_defconfig
$ make -j4
# Non-compression type uboot image
$(BUILD_DIR)/nvt-tools/encrypt_bin SUM $(UBOOT_DIR)/u-boot.bin 0x350 ub51000
# LZ compression type uboot image
$(BUILD_DIR)/nvt-tools/bfc c lz $(UBOOT_DIR)/u-boot.bin $(UBOOT_DIR)/u-boot.lz.bin 0 0
```

2 Linux kernel and modules

- Linux kernel

```
$ export ARCH=arm
$ export
CROSS_COMPILE=${YOUR_PATH}/arm-ca53-linux-gnueabi-hf-6.4/usr/bin/arm-ca53-linux-gnueabi-hf-
AW$ cp ${KERNELDIR}/arch/${ARCH}/configs/na51000_evb_smp_defconfig_debug ${KERNELDIR}/.config
$ cd ${KERNELDIR}
$ make uImage -j4
$ make distclean
```

Please build kernel firstly.

- Linux kernel modules

```
$ cd ${KERNELDIR}
$ mkdir ${KERNELDIR}/_install_modules/
$ make modules -j4
# The modules will be installed on "${KERNELDIR}/_install_modules/"
$ make INSTALL_MOD_PATH=${KERNELDIR}/_install_modules/ modules_install -j4
```

3 Device Tree

Our device tree source is put in this path “configs”, you can copy it into your folder, and running below procedures to generate dtb.

```
$ export NVT_PRJCFG_MODEL_CFG=${YOUR_PATH}/configs/cfg_${YOUR_MODEL}/ModelConfig.mk
$ export CONFIG_DIR=${YOUR_PATH}/configs/
$ export KERNELDIR=${YOUR_PATH}/linux-kernel
$ export BUILD_DIR=${YOUR_PATH}/build
$ cd ${YOUR_PATH}/configs/
$ make
```

You can get dtb image here: “cfg_gen/nvt-na51000-smp-evb.dtb”

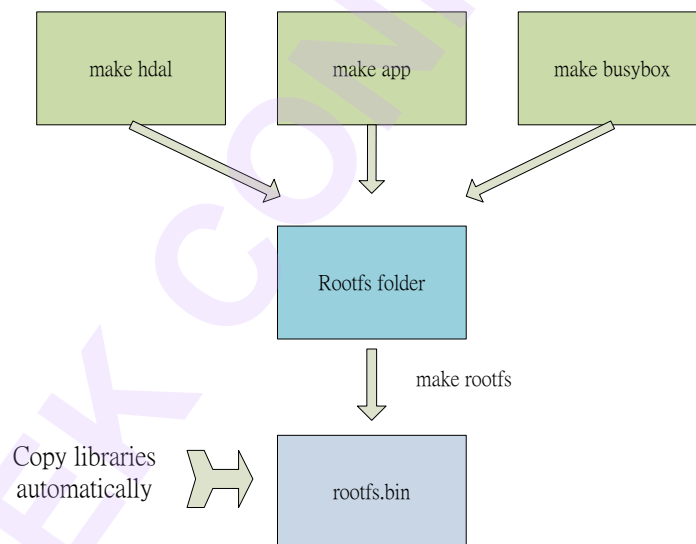
4 Rootfs

Please follow the following build sequence:

\$ make busybox	=> Generate basic rootfs file system
\$ make app	=> Install app to rootfs
\$ make hdal	=> Install hdal *.ko, sample and application
\$ make library	=> Update library
\$ make rootfs	=> Generate rootfs image

4.1 Build flow

The rootfs build flow can be shown as below

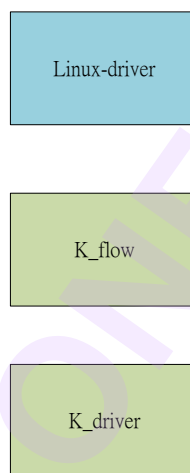


4.2 Add application

TBD

4.3 Add customer driver code

The basic software stack is as below, the customer driver code is named linux-driver and Novatek will provide k_driver and k_flow.



Please refer to debug/nvt_data_breakpoint Makefile.

na51000_linux_sdk/code/linux-driver\$ vi Makefile

```
obj-m += \
    debug/nvt_data_breakpoint/
```

4.3.1 Build flow

You have two selections can be used to build linux driver module

- Only support build and install to temp folder
nvt02854@oalnx7:~/na51000_linux_sdk/code/linux-driver\$ make; make modules_install

Or

- Including build and install to rootfs
nvt02854@oalnx7:~/na51000_linux_sdk/\$ make linux_driver

4.3.2 Install path

Install path: BSP/linux-kernel/_install_modules/lib/modules/

You can copy this folder to root-fs/rootfs/lib/modules/ and make rootfs to generate new rootfs.bin

6 Library

Path: na51000_linux_sdk/code/lib

We have three type libraries are necessary, external and custom.

necessary: Config the “must be” copied library to rootfs, it means that these libraries will be copied to rootfs/lib.

External: Open source libraries

Custom: Developed by ourselves

6.1 Add your custom library

Please refer to code/lib/nvlibc Makefile. This library will be installed into code/lib/output/