

AM335x 优化 Android 启动时间的一些方法

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1) Uboot 阶段

- ✓ 去掉 SDK 中自带的 EEPROM 版本检测代码，主要涉及到的函数有

s_init(SPL)

board_init(SPL)

board_init(u-boot)

- ✓ 将 Bootdelay 的时间设置为 0

```
diff --git a/include/configs/am335x_evm.h
b/include/configs/am335x_evm.h
index 0ad3682..8cfa924 100755
--- a/include/configs/am335x_evm.h
+++ b/include/configs/am335x_evm.h
@@ -229,7 +229,7 @@ to a higher value if a higher sized RAM support
is available in Hardware /
```

```
#ifndef CONFIG_RESTORE_FLASH
/ set to negative value for no autoboot */
-#define CONFIG_BOOTDELAY 3
+#define CONFIG_BOOTDELAY 0
```

```
#ifdef CONFIG_STORAGE_EMMC
#ifdef CONFIG_USE_MMC0
```

- ✓ 关闭 uImage CheckSum 效验

- 在 Uboot 中设置 setenv verify n
- 修改默认配置

```
diff --git a/common/cmd_bootm.c b/common/cmd_bootm.c
index 62d3ad4..d2baa84 100644
--- a/common/cmd_bootm.c
+++ b/common/cmd_bootm.c
@@ -223,7 +223,8 @@ static int bootm_start(cmd_tbl_t *cmdtp, int
flag, int argc, char * const argv[])
int ret;

memset ((void *)&images, 0, sizeof (images));
- images.verify = getenv_yesno ("verify");
+ // images.verify = getenv_yesno ("verify");
+ images.verify = 0;
```

```
bootm_start_lmb();
```

✓ 使用默认的环境变量

一般来说，uboot 会从 MMC 或者 nandflash 读取 uEnv.txt。但是这个过程会消耗一定的启动时间。可以参考以下代码配置，读取默认环境设置。

```
diff --git a/include/configs/am335x_evm.h
b/include/configs/am335x_evm.hindex 8cfa924..4c51df2 100755
--- a/include/configs/am335x_evm.h
+++ b/include/configs/am335x_evm.h
@@ -141,7 +141,7 @@ to a higher value if a higher sized RAM
support is available in Hardware /
#define CONFIG_EXTRA_ENV_SETTINGS \
"bootfile=uImage\0" \
"loadaddr=0x82000000\0" \
- "kloadaddr=0x80007fc0\0" \
+ "kloadaddr=0x81000000\0" \
"script_addr=0x81900000\0" \
"console=ttyO0,115200n8\0" \
"mmc_dev=0\0" \
@@ -230,7 +230,9 @@ to a higher value if a higher sized RAM
support is available in Hardware */
#ifndef CONFIG_RESTORE_FLASH
/ set to negative value for no autoboot */
#define CONFIG_BOOTDELAY 0
-
+
+#define CONFIG_BOOTCOMMAND "mmc rescan;fatload mmc 0 81000000
uImage;bootm 81000000"
+#define CONFIG_BOOTARGS "bootargs=console=ttyO0,115200n8
androidboot.console=ttyO0 mem=256M root=/dev/mmcblk0p2 rw
rootfstype=ext4 rootwait rootdelay=1 init=/init ip=off
lpj=3590144 quiet"
+#if 0
#ifdef CONFIG_STORAGE_EMMC
#ifdef CONFIG_USE_MMC0
#define CONFIG_BOOTCOMMAND "booti mmc0"
@@ -258,6 +260,7 @@ to a higher value if a higher sized RAM
support is available in Hardware */
"run nand_boot;" \

#endif
#endif

#else
#define CONFIG_BOOTDELAY 0
```

✓ 优化 uboot 配置

尽量在 uboot 中去掉不用的模块初始化代码和配置，从而减小镜像大小以及 uboot 执行时间。

✓ 使能 I&D Cache

可以参考

http://www.devisupport.com/question_answer/dsp_arm/sitara_arm/f/25/t/51477.aspx

✓ 屏蔽编译选项

具体参考以下代码，

```
diff --git a/config.mk b/config.mk
index e2b440d..d5df67f 100644
--- a/config.mk
+++ b/config.mk
@@ -163,8 +163,8 @@ else
ARFLAGS = crv
endif
=RELFLAGS= $(PLATFORM_RELFLAGS)
-DBGFLAGS= -g # -DDEBUG
-OPTFLAGS= -Os #-fomit-frame-pointer
+DBGFLAGS= # -DDEBUG
+OPTFLAGS= -O2 #-fomit-frame-pointer

OBJCFLAGS += --gap-fill=0xff=
```

2) kernel 阶段

✓ 配置

去掉不需要的 kernel 选项以减小 kernel 大小，比如：

- 多文件系统的支持，分区支持等
- 调试特性
- 调试文件系统
- 内核跟踪 等

✓ 关掉调试信息的输出

3) Android 系统

Android 启动时间一般会消耗在，

- 初始化过程
- Package 的扫描
- 服务启动

✓ 初始化过程

Init 是 android 第一个用户进程，包含在 init.rc 和 init.<hardware>.rc 文件中。主要用于初始化驱动和启动服务。

一般来说，除非产品中会使用否则以下都可以被去掉，

- debuggerd
- rild
- drmservice
- bootanimation
- dbus-daemon
- bluetoothd
- flash-recovery
- racoon
- mtpd
- dumpstate
- sshd
- mDNSd
- Services related to WLAN and ethernet, etc

✓ Package scan

在启动阶段，每个包都会被 scan。为了节省启动时间，确保你的文件系统里没有包含多余的 Package

以下文件中包含了会被编译进 android 的 Package，你可以根据自己系统的需求来移除多余的 package。

- build/target/product/core.mk
- build/target/product/full_base.mk
- build/target/product/generic_no_telephony.mk
- device/ti/am335xevm/device.mk

例如，

```
diff --git a/target/product/core.mk b/target/product/core.mk
index b7934b3..3aa5aec 100644
--- a/target/product/core.mk
+++ b/target/product/core.mk
@@ -26,22 +26,13 @@ PRODUCT_PACKAGES := \
ApplicationsProvider \
BackupRestoreConfirmation \
Browser \
- Contacts \
- ContactsProvider \
- DefaultContainerService \
- DownloadProvider \
- DownloadProviderUi \
HTMLViewer \
Home \
```

```
- KeyChain \
MediaProvider \
PackageInstaller \
- PicoTts \
SettingsProvider \
SharedStorageBackup \
- TelephonyProvider \
UserDictionaryProvider \
- VpnDialogs \
apache-xml \
atrace \
bouncycastle \
```

```
diff --git a/target/product/full_base.mk b/target/product/full_base.mk
index 6a702da..d89af51 100644
```

```
--- a/target/product/full_base.mk
+++ b/target/product/full_base.mk
@@ -32,16 +32,6 @@ PRODUCT_PACKAGES := \
VideoEditor \
WAPPushManager
-PRODUCT_PACKAGES + \
- Galaxy4 \
- HoloSpiralWallpaper \
- LiveWallpapers \
- LiveWallpapersPicker \
- MagicSmokeWallpapers \
- NoiseField \
- PhaseBeam \
- VisualizationWallpapers
-
# Additional settings used in all AOSP builds
PRODUCT_PROPERTY_OVERRIDES := \
ro.com.android.dateformat=MM-dd-yyyy \=
```

✓ 去掉不需要的服务，

一般来说，除非产品中会使用否则以下都可以被去掉，你可以通过 frameworks/base/services/java/com/android/server/SystemServer.java 文件修改

- Telephony registry
- Vibrator service
- Bluetooth service
- Location manager
- Country detector
- Wallpaper service
- Doc observer
- Wired accessory observer

- USB service
- Serial service
- Backup service
- App widget service
- Recognition service
- Diskstats service
- Sampling profiler service
- Network time update service
- Cert black listener
- Dreams service