6AO.1.0 Release Notes

Introduction

Contents

These Release Notes provide instructions for both,

- Testing the release using a pre-built binary image which can be loaded onto eMMC on EVM board
- Rebuilding the Android binary image from the Android sources

This software release has been developed and verified in the following software and hardware environment.

OS Kernel: Linux® 4.4.91
Android: Android™ 8.0 Oreo™ (OPR6.170623.023)
Toolchain: Android linux-x86 toolchain android-eabi-4.9
Supported J6 Platforms: J6 EVM (REV H), J6 Eco EVM (Rev C), J6 Entry EVM, and J6 Plus EVM
IPC Version: 3.47.00.00
Build Host OS: Ubuntu 64 bit with Java8
Daily Build Version: JACINTO6_O_DB build 90

NOTE: Same set of software binaries work for both J6, J6 Eco, J6 Entry, and J6 Plus EVMs, only the device tree file (.dtb) is different for different EVMs. Refer to 6AO.1.0_Application_Notes for more details

Release Features

Following new features are enabled/tested for J6 and J6 Eco in this release:

- **Boot:** fastboot, QSPI/NOR + emmc boot, Single stage bootloader, USB peripheral boot, HS Boot with FIT model, IPU Loading, Switch to recovery mode
- **Platform:** LPAE support, SELinux enforce mode
- **IPC:** MessageQ, MmRpc, Late attach support, error recovery : DEH And MMU faults
- **Connectivity:** USB2.0/USB3.0 Host, Gadget and dual-role, Dual Ethernet, SD card detect, eMMC HS200 mode, DCAN
- **Power:** AVS0, MPU DVFS, ABB
- **Thermal:** Governors implemented for MPU (On Die), Monitoring implemented for all on chip sensors
- **Video:** 1080p60 MP4/H264/MP2, H264 Video Encode (F2F)
- **Audio:** MP3/AAC playback, stereo audio out on McASP, 5.1 Audio on HDMI, Downmix to Stereo on McASP when disconnected, Aux-In, ARM<->DSP Audio Routing, APPE HAL phase-1
- **Display:** SGX accelerated UI and touch, DRM/KMS, DSS WB, SGX and DSS simultaneous composition.
- **Camera:** Android Camera App with TVP5158 Analog camera on JAMR3, VIP: YUYV/RGB888 format capture, NV12 capture, Interlaced capture, VPE: color conversion, V4L2 M2M, scalar, DEI
- **Radio:** HD 1.5 Radio Library (ARM/DSP rendering) and DAB Radio support
- **WiLink8Q:** WLAN - Wi-Fi/Wi-Fi
- **Secure boot:** Validated in this release on HS device and M-Shield DK Lite v4.5.4 (available in CDDS Only). Customers needing access to the M-Shield DK Lite package should contact their TI representatives.
- **Vehicle:** Auto HMI, VehicleHAL with DCAN

Release Limitations

In this release:

Key	Severity	Component	Summary	Impact	Workaround
PSDKAA-1960	S2-Major	Connectivity	J6Plus: WLAN is not enabled	WLAN not available on J6Plus	Will provide post-release patch
PSDKAA-1954	S3-Minor	Connectivity	Android: Serial console jumbled		
PSDKAA-1950	S3-Minor	Display	J6: Random sgx crash on J6 with HDMI connected, one time issue.	Full HDMI support is added on 6AO.1.1	
PSDKAA-1949	S3-Minor	Display	J6: Touchscreen errors when terminal disconnected	Issue with touchscreen with some PSUs	
PSDKAA-1948	S3-Minor	Display	After leaving SGX idle, UI was observed to freeze with SGX crash. One time issue		
PSDKAA-1946	S2-Major	Audio	APPE HAL not loading when primary HAL	Issue is only when APPE is primary HAL	Set APPE as secondary HAL
PSDKAA-1945	S2-Major	Connectivity	J6Plus DCAN not enabled	DCAN not available on J6Plus	Will provide post-release patch
PSDKAA-	S3-	Video	Crash seen with MPEG2 robustness test		Robustness issue will be

1943	Minor				addressed in 6AO.1.1, functionality not affected
PSDKAA-1942	S2-Major	Video	H264 encode fails with main and high profiles		Will provide post-release patch
PSDKAA-1941	S2-Major	Boot	DRA76x: USB Peripheral boot fails	Cannot flash J6 Plus using USB peripheral boot	
PSDKAA-1938	S3-Minor	Display	Wallpaper is loaded a few seconds after UI comes up		Will provide post-release patch
PSDKAA-1937	S3-Minor	Display	Crashes seen while running gfxbench		
PSDKAA-1932	S3-Minor	Boot	System crashes and reboots after adb remount		Will be fixed by Android-O MR1
PSDKAA-1797	S2-Major	Platform	OOM and Kernel crash with 10 minutes of monkey test	Targeted for 6AO.1.1	Targeted for 6AO.1.1
PSDKAA-1718	S1-Critical	Display	Fence timeout issue	HWC timeout is not cleaned up correctly causing graphics failure	Timeout is already increased in 6AO.1.0 to point where this should not occur. Post release patch provided here
PSDKAA-1101	S3-Minor	Display	Touch problems on DRA7xx EVM OSD 1920x1200 Panel	Issue specific to TI EVM touch screen, does not affect customer platforms	

Using the Prebuilt Release Image

The prebuilt release image can be obtained from here (http://software-dl.ti.com/infotainment/jacinto6/android/6AO_1_0_Release/index_FDS.html). After you download the binaries, follow the flashing instruction from "Flashing eMMC images" section.

Rebuilding Android from Sources

Build PC setup

You need a 64 bit Ubuntu machine for building Android file system.

Install Pre-requisite packages for building the Android File System

Follow instructions from official Android page here (https://source.android.com/source/initializing.html#setting-up-a-linux-build-environment) for setting up the packages required for building Android.

Proxy/Firewall

If you are behind proxy/firewall, workaround it using the instructions in [1] (http://omapedia.org/wiki/Host_PC_Setup). For installing repo make sure you also export https_proxy environment variable.

Install latest repo tool

```
mkdir ~/bin -p
sudo apt-get install curl
curl http://commondatastorage.googleapis.com/git-repo-downloads/repo > ~/bin/repo
chmod a+x ~/bin/repo
```

Tool Chain for building Kernel and Drivers

The Kernel and Driver sources are built using the Android linux-x86 toolchain for ARM GNU/Linux version . This tool chain can be obtained when you pull the Android code based on the released manifest that will be given.

Downloading Release Software

Android Filesystem Sources

You can get the Android source for this release by doing:

```
cd <your work directory>
mkdir -p 6AO.1.0
cd 6AO.1.0
export YOUR_PATH=$PWD
mkdir -p mydroid; cd mydroid
```

```
export MYDROID=$PWD
repo init -u git://git.omapzoom.org/platform/omapmanifest.git -b 6AO.x -m RLS_6AO.1.0.xml
repo sync
```

U-Boot Sources

```
cd ${YOUR_PATH}
git clone git://git.omapzoom.org/repo/u-boot.git
cd u-boot
git checkout 6AO.1.0
```

Kernel & Driver Sources

```
cd ${YOUR_PATH}
mkdir kernel
git clone git://git.omapzoom.org/kernel/omap.git kernel/android-4.4
cd kernel/android-4.4
git checkout 6AO.1.0
```

Build Instructions

Setting up build environment

From your work directory (6AO.1.0 folder):

```
export YOUR_PATH=$PWD
export MYDROID=${YOUR_PATH}/mydroid
export CROSS_COMPILE=${MYDROID}/prebuilts/gcc/linux-x86/arm/arm-linux-androideabi-4.9/bin/arm-linux-androideabi-
```

Building U-boot sources

Instructions for building x-loader and bootloader

```
cd ${YOUR_PATH}/u-boot
export CROSS_COMPILE=${MYDROID}/prebuilts/gcc/linux-x86/arm/arm-linux-androideabi-4.9/bin/arm-linux-androideabi-
export ARCH=arm
make distclean
make dra7xx_evm_config
make
```

Building Kernel

Instructions for building kernel and device tree. Note the new step to build modules.

```
cd ${YOUR_PATH}/kernel/android-4.4
export CROSS_COMPILE=${MYDROID}/prebuilts/gcc/linux-x86/arm/arm-linux-androideabi-4.9/bin/arm-linux-androideabi-
export ARCH=arm
make mrproper
./ti_config_fragments/defconfig_builder.sh -t ti_sdk_dra7x_android_release
make ti_sdk_dra7x_android_release_defconfig
make uImage LOADADDR=0x80008000
make dtbs
make modules
```

Building Android Filesystem (AFS)

Instructions for building Android file system. Note that building AFS now requires that you build Kernel and export the Kernel path before starting the build.

```
cd $MYDROID
. build/envsetup.sh
lunch full_jacinto6evm-userdebug
export KERNELDIR=${YOUR_PATH}/kernel/android-4.4
make -j2 clean
make -j2
```

Preparing Android Image

Preparing eMMC binaries/images

```
cd $YOUR_PATH
mkdir emmc_files
cp -v ${MYDROID}/out/target/product/jacinto6evm/*img emmc_files
cp -v ${MYDROID}/device/ti/jacinto6evm/fastboot.sh emmc_files
cp -v ${MYDROID}/out/host/linux-x86/bin/{simg2img,make_ext4fs,mkbootimg,fastboot,adb} emmc_files
cp -v ${MYDROID}/out/host/linux-x86/lib64/{libc++.so,libcutils.so,liblog.so,libselinux.so,libpcre2.so} emmc_files
```

```
cp -v ${YOUR_PATH}/kernel/android-4.4/arch/arm/boot/zImage emmc_files/kernel
cp -v ${YOUR_PATH}/kernel/android-4.4/arch/arm/boot/dts/dra7*.dtb emmc_files
cp -v ${YOUR_PATH}/u-boot/MLO emmc_files/GP_MLO
cp -v ${YOUR_PATH}/u-boot/MLO emmc_files/
cp -v ${YOUR_PATH}/u-boot/u-boot.img emmc_files
```

Flashing eMMC images

The default setup is to flash MLO and u-boot.img to QSPI and remaining binaries (kernel, dtb file and AFS) to emmc.

- Instructions are same for J6 and J6 Eco EVM
- For more info on partitions and flashing refer to "QSPI NOR/eMMC partitions" Application note.

DIP Switch settings

Required DIP switch settings: This configuration corresponds to the following device boot order: SD ⇒ QSPI_1

J6 ES1.x / J6 Eco EVM

```
SYSBOOT [0-15]
OFF ON ON OFF OFF OFF OFF OFF    ON OFF OFF OFF OFF OFF OFF OFF ON

USERCONFIG [SW5]
OFF OFF ON OFF ON ON ON OFF OFF OFF
```

J6 ES2.0 EVM

```
SYSBOOT [0-15]
OFF ON ON OFF OFF OFF OFF OFF    ON OFF OFF OFF OFF OFF OFF OFF OFF

USERCONFIG [SW5]
OFF OFF ON OFF ON ON ON OFF OFF OFF
```

Flashing procedure

- Copy u-boot.img and MLO files to an SD card (boot partition) and then boot the target board from this external SD card.
- Connect a USB cable from the Linux PC to the USB3.0 port on board
- Power on the board and stop the board at u-boot prompt by interrupting with key press

```
Hit any key to stop autoboot:  3
```

- Set the right environment variables for Android SDK and save (This step is needed only for fresh flash, for incremental flashing this is optional)

```
=> env default -f -a
=> setenv partitions $partitions_android
=> env save
```

- Now reset the board and stop again in u-boot
- Put the board in fastboot mode by typing in below command

```
=> fastboot 0
```

- On the Linux PC which has the emmc images run the fastboot.sh script to flash the binaries

```
cd $YOUR_PATH/emmc_files
sudo ./fastboot.sh
```

- **NOTE:** After the flashing is done, remove the external SD card and reboot the board.

Application notes/Additional Info

- 6AO.1.0_Application_Notes

Refer to Application notes page for more info on features of this release, additional boot options, etc...

Technical support

We strongly recommend using the TI E2E forum for all queries. E2E Support Forums for all DRA7xx platforms - Click Here (https://e2e.ti.com/support/arm/automotive_processors/f/1020) There could be a few cases where your query has confidential information and cannot be posted publicly. In such cases, please contact your FAE or CPM.

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