# TEGRA LINUX DRIVER PACKAGE (R12.BETA)

RN_05071-001_12 | November 30, 2011
Advance Information | Subject to Change

## Release Notes

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# 1.0 ABOUT THIS RELEASE

The NVIDIA® Tegra® Linux Driver Package supports development of platforms running:

- NVIDIA® Tegra® 3 series computer-on-a-chip
- NVIDIA® Tegra® 2 series computer-on-a-chip
- The android-2.6.36 Linux kernel

**Note: This beta release of Tegra Linux Driver Package (R12.Beta) is a Beta release for Tegra 2 devices code-named "Harmony" and "Ventana", plus Tegra 3 code-named "Cardhu". The information in these release notes is preliminary.**

**Additionally, developers should note that support for Harmony devices shall be deprecated following this release.**

## 1.1 WHAT'S NEW

This release fixes some issues that were found during continued testing and adds/enhances the following features:

- Improved stability of graphics and multimedia drivers
- Tegra3 (Cardhu) reference platform available
- Tegra2 (Ventana) reference platform available
- Alignment of Linux kernel version 2.6.36 across all supported platforms
- Addition of nvgstplayer for playback of multimedia content
- Addition of GStreamer framework integration for hardware-accelerated multimedia
- Codecs available separately under separate software license agreement
- Wi-Fi firmware available separately (Ventana and Cardhu platforms)
- NAND and NFS boot functionality

## 1.2 TOP ISSUES FIXED SINCE LAST RELEASE

The following issues are assumed to have been resolved in this release but are still being verified.

- The power button must be used to wake from the Suspend (LP1) power state. This is because Suspend shuts off USB power, so Resume fails to wake up the target board from the USB keyboard/mouse and crashes the system. The workaround is to wake up the system using the power button.
- Wi-Fi is not present on Harmony.
- There is no NAND or NFS boot functionality in this release.
- Deep Sleep (LP0) does not work.

## 1.3 DOCUMENTATION

Supporting documentation included in the Tegra Linux Driver Package documents archive are:

- *Tegra Linux Driver Package Developers' Guide* (HTML)
- *Tegra Linux Driver Package Developers' Guide* (PDF)
- *Tegra Linux Driver Package Software Feature List* (PDF)

### 1.3.1 Documentation Updates

In this release, documentation has been moved from these *Release Notes* into a new documentation package:

- Tegra_Linux_Driver_Package_Documents_R12.Beta.tar

Extract the tar file to your local drive, and then open the `l4t_docs/welcome.htm` file in your browser to access the documentation. The following lists the new documents provided in this release.

**New Documents**

- *Tegra Linux Driver Package Developers' Guide*—provided in both HTML and PDF; describes requirements, setup information, and procedures for flashing, syncing, and building.
- *NVIDIA Tegra Linux Driver Package SW Feature List*—provided both as a chapter in the *Developers' Guide* and as a standalone PDF; describes the software features expected to be supported with this release.

# 2.0 IMPLEMENTATION NOTES

This section provides additional implementation and support information specific to this release of Tegra® Linux Driver Package.

## 2.1 LOGGING IN

When using the provided sample filesystem, log in as user "ubuntu". Both the password and the sudo password are "ubuntu". For more information, see "About the Root File System."

## 2.2 64-BIT UBUNTU REQUIRES 32-BIT RUNTIME SUPPORT

If you are running a 64-bit Ubuntu installation on the host PC, this release requires that you have 32-bit runtime support installed as well. The simple steps for installing 32-bit support on an Ubuntu host use the `apt-get` command.

**To install 32-bit runtime support**

- Execute the following commands:

```
$ sudo apt-get update
$ sudo apt-get install ia32-libs
```

**Note: If `ia32-libs` is not installed, flashing the boot loader with the kernel (and, possibly, other steps in the process) will fail.**

## 2.3 DISPLAY MODE AND RESOLUTION CONFIGURATION WITH THE XRANDR APPLICATION

You can use the X Resize, Rotate and Reflect Extension (RandR) extension to manipulate and configure the attached displays (both the internal panel and any externally connected HDMI® panel). The `xrandr(1)` utility is the most common way to do this.

A tutorial on `xrandr` can be found on the following website:

http://www.thinkwiki.org/wiki/Xorg_RandR_1.2

## 2.4 ALSA CONFIGURATION

This implementation note documents how to configure the Advanced Linux Sound Architecture (ALSA) to enable playback. It pertains to both the Harmony and Ventana boards.

**To playback using headset**

- Execute the following command:

```
$ amixer cset numid=45 1
```

**To playback using speaker on Cardhu**

- Execute the following commands:

```
$ amixer cset numid=42 2
$ amixer cset numid=43 2
$ amixer cset numid=44 63,63
$ amixer cset numid=45 4
$ amixer cset numid=49 1
$ amixer cset numid=50 1
$ amixer cset numid=51 1
$ amixer cset numid=52 1
$ amixer cset numid=53 1
$ amixer cset numid=54 1
$ amixer cset numid=55 1
$ amixer cset numid=56 1
$ amixer cset numid=29 120,120
```

## 2.5 PROVIDED SAMPLE FILE SYSTEM COMES WITH PRE-GENERATED SSH-HOST KEYS

For convenience, the provided sample target file system comes with pre-generated ssh host keys. These host keys can be re-generated with the following command:

```
$ 'ssh-keygen -t rsa -f /etc/ssh/ssh_host_rsa_key'
```

View the `ssh-keygen` man page for other `-t` options.

## 2.6 NAND MODULE ON THE HARMONY BOARDS IS 512 MB

Be advised that the NAND module on the Harmony developer board is only 512 MB, so it is possible to overrun the space if you use the sample file system provided and `apt-get ubuntu` desktop and other large packages.

## 2.7 FILE SYSTEM BECOMES READ-ONLY ON RESUME IF SD CARD IS IN CARD READER DEVICE

If the device resumes from suspend (LP1) while an SD card is in a connected card reader device, the file system is mounted as read-only resulting in a card reader read/write error and a system reboot is required. The workaround is to install the `udisks` utility (Debian package name `udisks_1.0.2-4ubuntu_armel.deb`). [869780]

## 2.8 SD CARD NOT DETECTED IF CARD READER IS PLUGGED IN WITHOUT SD CARD ALREADY INSERTED

If the user connects the card reader to the device before inserting the SD card into the card reader, the SD card is not detected. The SD card and card reader must be connected to the device simultaneously. The workaround is to install the `udisks` utility (Debian package name `udisks_1.0.2-4ubuntu_armel.deb`). [869780]

# 3.0 KNOWN ISSUES

This section provides details about issues that were discovered during development and QA but not resolved prior to this release of Tegra® Linux Driver Package.

## 3.1 SYSTEM

The following system-related issues were noted in this release.

### 3.1.1 [901451] System date/time is not kept across reboots

The system date and hardware clock do not show the same time after the device is rebooted. The date is reset to 1969 and the clock shows the latest time.

### 3.1.2 [888487] Warning from clocks when booting Cardhu

After booting the Cardhu device, warning messages from `tegra3_clocks.c` appear in the UART log. These messages are innocuous and can be safely ignored.

### 3.1.3 [898400] Enabling FRAMEBUFFER_CONSOLE causes hang on Ventana

When `FRAMEBUFFER_CONSOLE` is enabled for the L4T K36 kernel, the Ventana device hangs. The last message displayed in the debug console is “Jumping to kernel at:54917 ms”. If the same kernel is loaded without `FRAMEBUFFER_CONSOLE` enabled, the hang is not observed.

### 3.1.4 [847045] FB_CONSOLE does not appear correctly on Cardhu

The graphics display is not correct on FB_CONSOLE although the system comes up fine. Each pixel line is shifted x number of pixels to the right and the login prompt does not appear on the terminal.

### 3.1.5 [903479] USB-1 device detection does not succeed on Cardhu

USB devices such as the mouse, keyboard, and flash drive are not being detected on the USB-1 port with Cardhu. However device detection works fine with the USB-3 port.

### 3.1.6 A/V encoding is not supported

Audio/Video (A/V) encoding is not supported in this release, but support is planned in a later release.

## 3.2 DISPLAY

The following display-related issues were noted in this release.

### 3.2.1 [829592/884745] HDMI not supported as frame buffer console

There is presently no support for HDMI as the primary display. HDMI display will work for certain settings after the window manager is up and running.

### 3.2.2 [874562] CRT is not supported

There is presently no support for a CRT as the display.

### 3.2.3 [902809] “i2c transfer failed” error message displays on console on Cardhu

The error message “i2c transfer failed” often occurs on the console during normal operation. It is not indicative of touch screen or Inter-Integrated Circuit (I2C) failure.

## 3.3 CAMERA

The following camera-related issues were noted in this release.

### 3.3.1 Camera not supported

Camera is not supported in this release, but is planned to be supported in a later release.

## 3.4 MULTIMEDIA

The following system-related issues were noted in this release.

### 3.4.1 [903465] Interlaced stream playback does not work with EGL on Cardhu

Attempts to play interlaced Embedded-Systems Graphics Library (EGL) streams with the NvgstPlayer fail. As soon as playback starts, the Cardhu device freezes at the first frame.

### 3.4.2 [896768] nvgstplayer cannot play some MP4 streams

The nvgstplayer fails for the following two MP4 streams:

- H.264 HP 720i 30 fps 12 MB
- H.264 HP 720p 30 fps 10 MB

There is a workaround. The issue can be fixed by upgrading the sample filesystem to Ubuntu 11.10 (Oneiric). Updating the open source GStreamer components also resolve the issue.

## 3.5 POWER

The following power-related issues were noted in this release.

### 3.5.1 DVFS is not supported on Harmony

Dynamic Voltage and Frequency Scaling (DVFS) is not currently implemented on the Harmony platform.

### 3.5.2 [903471] USB drive re-enumerates after resuming from Deep Sleep

Waking the device up from Deep Sleep (LP) with the Power button, results in the USB drive showing as disconnected. It subsequently re-enumerates.

### 3.5.3 [867420] USB host intermittently does not work after device resumes from Deep Sleep on Cardhu

The Cardhu device wakes from Deep Sleep (LP0) but the USB host does not work. Using the mouse or keyboard will sometimes cause the system to resume immediately.

# 4.0 ABOUT EARLIER RELEASES

## 23 JUN 2011 (HARMONY)

### Supported “Alpha” features

The following list shows implemented features that were supported in this Alpha pre-release.

- Kernel version 2.6.38
- Media APIs:
  - OpenGL ES 2.0
  - OpenGL ES 1.1
  - Open GL ES path extensions
  - EGL 1.3 with EGLImage
- OpenMAX IL 1.1
- X Resize, Rotate and Reflect Extension (RandR) 1.3

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