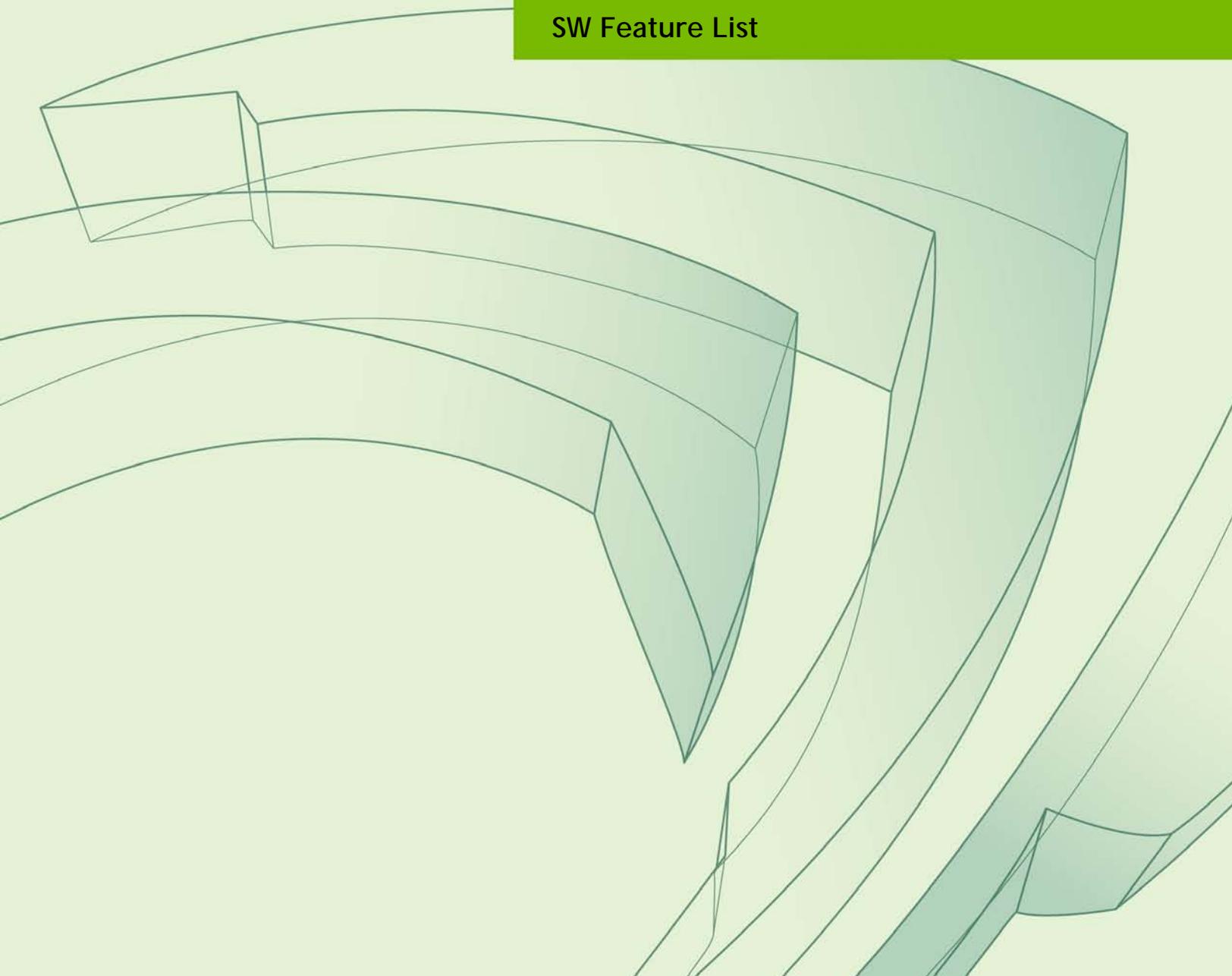




NVIDIA TEGRA LINUX DRIVER PACKAGE R16 RELEASE

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SW Feature List



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NVIDIA Corporation
2701 San Tomas Expressway
Santa Clara, CA 95050
www.nvidia.com

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SOFTWARE FEATURES

This document describes the software features expected to be supported with this release of NVIDIA® Tegra® Linux Driver Package, which provides users with a complete package to bring up Linux on certain Tegra devices.

This release supports NVIDIA® Tegra® 3 series code-name Cardhu and NVIDIA® Tegra® 2 series code-name Ventana devices.

Note: Always check the *Release Notes* for constraints related to these features. Read the following sections to learn more about supported features in this release.

- [Linux](#)
- [Graphics and Multimedia](#)
- [Decoders](#)
- [Encoders](#)
- [Container Formats](#)
- [Streaming Protocols](#)
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LINUX

Kernel	Notes
Linux Kernel	3.1
Kernel Native Drivers	Notes
Audio	ALSA
External SD card	-
USB	Keyboard/mouse, mass storage device (MSD)
Wi-Fi	Firmware provided separately
Boot Devices	Notes
eMMC	-
External boot media	USB flash devices and hard-drives, SD Cards
Network file-system (NFS) boot	-
Additional Notes	
Unless otherwise noted, all features pertain to Cardhu and Ventana.	

GRAPHICS AND MULTIMEDIA

Media APIs	Notes
EGL 1.4 with EGLImage	-
GStreamer OpenMAX-IL plug-in	Both for A/V playback and A/V capture
Open GL ES path extensions	-
OpenGL ES 1.1	-
OpenGL ES 2.0	For automatic stereo support
OpenMAX IL 1.1 decoding	Planned to be deprecated in a later release
OpenMAX IL 1.1 encoding	Planned to be deprecated in a later release
X11	ABI: 5, 6, 7, 8, 10, 11, 12
X Resize, Rotate and Reflect Extension (RandR) 1.3	-
Additional Notes	
Unless otherwise noted, all features pertain to Cardhu and Ventana.	

DECODERS

Audio Decoders (Tegra 3/Tegra 2)

The features in this table are supported by both Tegra 3 and Tegra 2.

Audio Decode	Profile	Sampling	Bitrate
AAC+	AAC-LC with SBR; mono, stereo, and 2-channel mixing only	Up to 48 kHz	Up to 320 kilobits per second (Kbps)
AAC-LC	Mono, stereo, and 2-channel [5.1]	Up to 48 kHz	Up to 320 Kbps
eAAC+	AAC-LC with SBR+PS; mono, stereo, and 2-channel mixing only	Up to 48 kHz	Up to 320 Kbps
AMR-NB	1 channel	Up to 8 kHz	Up to 12.2 Kbps
AMR-WB	1 channel	Up to 16 kHz	Up to 23.85 Kbps
MP3	2 channel	Up to 48 kHz	Up to 320 Kbps
MPEG-2 (MPEG-1 Layer 2)	2 channel	Up to 48 kHz	Up to 320 Kbps
Vorbis	Ogg Audio	Up to 48 kHz	Up to 256 Kbps
WAV linear PCM	16-bit, 2 channels	Up to 48 kHz	-
WMA 9 Std.	Standard 2-channel	Up to 48 kHz	Up to 384 Kbps
WMA Lossless	Lossless: Up to N1 Profile; WMA 10: 2 channel	Up to 48 kHz	-
WMA Pro LBR 10	M2 Profile; 2 channel [5.1]	Up to 96 kHz	Up to 768 Kbps

Image Decoders (Tegra 3/Tegra 2)

The features in this table are supported by both Tegra 3 and Tegra 2.

Image Decode	Profile	Resolution	Notes
JPEG	Baseline	Up to 20 MP	Gstreamer JPEG decoder supported by default

Video Decoders (Tegra 3)

The features in this table are supported by Tegra 3.

Video Decode	Profile and Level	Sampling Frequency and Bit rate/Frame rate	Notes
DivX 4/5/6	1080p HD Profile	Up to 1080p @ 30 fps Up to 10 Mbps	-
DivX 4/5/6	PlusHD	Up to 1080p @ 30 fps Up to 20 Mbps	-
H.263	Baseline Profile 0	Standard H.263 picture formats up to 4CIF @ 30 fps Up to 8 Mbps	Baseline Profile 0 Tools; Also supports custom formats at any resolution
H.264 AVC	Baseline Profile, Main Profile High Profile @ L4.1	Up to 720p @ 60 fps Up to 40 Mbps	-
H.264 AVC	Baseline Profile Main Profile High Profile @ L4.1	Up to 720p @ 60 fps Up to 40 Mbps	-
H.264 AVC	Baseline Profile Main Profile High Profile @ L4.1	Up to 1080i @ 60 fps Up to 40 Mbps	-
H.264 AVC	Baseline Profile Main Profile High Profile @ L4.1	Up to 1140p @ 30 fps Up to 40 Mbps	-
H.264 AVC (SEI)	High Profile	Up to 1080p @ 30 fps Up to 40 Mbps	-
MPEG-2 Video	Main Profile @ High Level	Up to 720p @ 60p Up to 80 Mbps	-
MPEG-2 Video	Main Profile @ High Level	Up to 1080p @ 30p/1080i 60 fps Up to 80 Mbps	-
MPEG-4	Advanced Simple Profile @ L5	Up to 1080p @ 30 fps Up to 10 Mbps	-

VC-1/WMV	Simple Profile	Up to 1080p @ 30 fps Up to 45 Mbps	-
VC-1/WMV	Main Profile	Up to 1080p @ 30 fps Up to 45 Mbps	-
VC-1/WMV	Advanced Profile	Up to 1080p @ 30 fps Up to 45 Mbps	-
Xvid	Highdef Profile	Up to 1080p @ 30 fps Up to 10 Mbps	-

Video Decoders (Tegra 2)

The features in this table are supported by Tegra 2.

Video Decode	Profile and Level	Sampling Frequency and Bit rate/Frame rate	Notes
DivX 4/5/6	1080p HD	Up to 1080p 30 fps Up to 10 Mbps	-
H.263	Baseline Profile 0	Standard H.263 formats up to 4CIF 30 fps Up to 8 Mbps peak	Standard H.263 picture formats = SQCIF, QCIF, CIF, 4CIF; Also supports custom formats at any resolution
H.264	Baseline Profile @ L4	Up to 1080p 30 fps Up to 20 Mbps peak	
H.264 Dynamic Resolution Change (DRC)	-	-	AP20 only
H.264	Main Profile @ L2.2	Up to 576i 60 fps Up to 4 Mbps	CABAC; MBAFF; Interlaced
H.264	Main Profile @ L3.1	Up to 720p 30 fps Up to 4 Mbps	CAVLC; With weighted prediction
H.264	Main Profile @ L3.1	Up to 720p 30 fps Up to 5 Mbps	CABAC; CAVLC; No weighted prediction
H.264	High Profile @ L2.2	Up to 576i 60 fps Up to 4 Mbps	CABAC; MBAFF; Interlaced

H.264	High Profile @ L3.1	Up to 720p 30 fps Up to 4 Mbps	CAVLC; With weighted prediction
H.264	High Profile @ L3.1	Up to 720p 30 fps Up to 5 Mbps	CAVLC; CABAC; No weighted prediction
MPEG-4	Advanced Simple Profile @ L5	Up to 1080p 30 fps Up to 10 Mbps	-
VC-1	Simple Profile	Up to 1080p 30 fps Up to 10 Mbps	-
VC-1	Main Profile	Up to 1080p 30 fps Up to 10 Mbps	-
VC-1	Advanced Profile	Up to 1080p 30 fps Up to 10 Mbps	-
Xvid	Highdef Profile	Up to 1080p 30 fps Up to 10 Mbps	-

ENCODERS

Audio Encoders (Tegra 3/Tegra 2)

The features in this table are supported by both Tegra 3 and Tegra 2.

Audio Encode	Profile	Resolution	Bit Rates
AAC-LC	-	-	Up to 320 kbps

Image Encoders (Tegra 3/Tegra 2)

The features in this table are supported by both Tegra 3 and Tegra 2.

Image Decode	Profile	Resolution	Bit Rates
JPEG	Exif	Up to 14 MP	Q-100

Video Encoders (Tegra 3)

The features in this table are supported by Tegra 3 only.

Video Encode	Profile and Level	Sampling Frequency and Bit rate/Frame rate	Notes
H.264	Baseline Profile	Up to 1080p 30 fps Up to 20 Mbps	-
MPEG4	Simple Profile	Up to 30fps	-
H.263	Baseline Profile	Up to 30fps	-

Video Encoders (Tegra 2)

The features in this table are supported by Tegra 2 only.

Video Encode	Profile and Level	Sampling Frequency and Bit rate/Frame rate	Notes
H.264	Baseline Profile	Up to 1080p 24 fps Up to 14 Mbps	-

CONTAINER FORMATS

Codecs are provided by GStreamer. You can download GStreamer codecs from the gstreamer opensource project at:

<http://gstreamer.freedesktop.org>

Or you can use `apt-get` in the provided Ubuntu-derived sample file system.

Hardware codecs are not included in the base release but can be provided separately under a software license agreement.

STREAMING PROTOCOLS

Streaming protocols are provided by GStreamer. You can download GStreamer codecs from the gstreamer opensource project at:

<http://gstreamer.freedesktop.org>

Or you can use `apt-get` in the provided Ubuntu-derived sample file system.

Hardware codecs are not included in the base release but can be provided separately under a software license agreement.

Protocol	Notes
HTTP 1.0	ASF, AVI, 3GP, MOV, MP3, MP4, WMA, WMV
HTTP 1.1	ASF, AVI, 3GP, MOV, MP3, MP4, WMA, WMV
RTP/RTSP/RTCP	3GP, MP3
SDP (RFC 4566)	3GP

PLAYBACK

General	Notes
NvGstPlayer application	Supports the following functionality: <ul style="list-style-type: none">· Basic local playback· Streaming playback with HTTP and RTSP· Trick modes· Audio/video synchronization· Automation for batch mode execution· Playbin2 support· Native pipeline support

CAMERA

Application	Feature	Notes
NvGstCapture application	Bayer camera sensor	-
	Camera capture mode selection	-
	Still image capture	-
	Video record	-
	Camera focus position control	-
	Camera exposure control	-
	Camera ISO control (exposure control)	-
	Camera contrast control	-
	Camera flash control	-
	Camera zoom control	-
	Camera pre-capture converge control	-
	Camera half press with 3A control	-
	Camera brightness control	-
	Camera saturation control	-
	Camera hue control	-
	Camera white balance control	-
	Image multishot	-
	Camera image filter control (color effect)	-
	Camera pause preview after capture	-
	Camera EV compensation Control	-
	Camera flicker control	-
	Camera edge enhancement control	-
	Camera meter mode control (exposure control)	-
	Camera preview rotate control	-
	Camera capture rotate control	-
	Camera timer control (delay capture)	-
	Camera scene mode control (non-standard modes)	-
	Camera noise reduction	-
	Camera still capture resolution	-
	Camera video capture resolution	-
Camera video encoder selection	-	
Voice control	-	

Application	Feature	Notes
	Camerabin2 support	GStreamer 10.36 only
	GstPhotography support	GStreamer 10.36 only

DISPLAYS

Feature	Description		Notes
HDMI 1.4a	Up to 1080p		-
Internal LCD	-		-
Feature	Mode No.	Resolution	Rate
HDMI supported modes	1	640 X 480	60
	2	640 X 480	72
	3	640 X 480	74
	4	720 x 480	59
	5	720 X 576	50
	6	800 X 600	59
	7	800 X 600	72
	8	800 X 600	74
	9	1024 X 768	60
	10	1024 X 768	70
	11	1024 X 768	74
	12	1152 X 864	74
	13	1280 X 720	60
	14	1280 X 1024	74
	15	1280 X 1024	59
	16	1680 X 1050	59
	17	1920 X 1080	50
	18	1920 X 1080	60
Feature	Description		Notes
HDMI DDC modesetting support	-		-
Dual display (LVDS + HDMI)	Mirror mode, Extended mode		-
Additional Notes			
DC fallback mode (640x480 @ 60Hz) is the default video mode for an HDMI monitor when using an fb_console device. See the <i>Release Notes</i> for known issues.			

POWER

General	Notes
DVFS	-
Tegra Active Power Management	Notes
Dynamic voltage scaling for core	-
Dynamic voltage scaling for CPU	-
Dynamic frequency scaling for CPU	-
Dynamic frequency scaling for memory controller	-
Dynamic frequency scaling for AVP	-
Dynamic frequency scaling for system buses	-
Low power idle state (LP2)	Cardhu only
Frequency-boosted burst modes	Cardhu only; CPU running at higher frequencies in single-core mode
EDP support	Cardhu only
External temperature sensing	-
CPU hotplug support	Cardhu only
Switch to ULP CPU mode	Cardhu only
Dynamic thermal throttling	Software with hardware fail-safe
DRAM self-refresh	
Ultra-Low Power Standby	Notes
Suspend (LP1)	-
Deep Sleep (LP0)	-
USB Suspend during Deep Sleep	-
Wake with power button and RTC	-
Peripheral Power Management	Notes
NVIDIA Pixel Rendering Intensity and Saturation Management (PRISM)	Cardhu only; Display driver
Additional Notes	
Unless otherwise noted, all features pertain to Cardhu and Ventana.	

BOOT LOADERS

General	Notes
Fastboot	Supports booting from USB, SD card, internal memory (eMMC), and network file-system (NFS) boot
U-Boot	Source code available. Supports booting from USB, SD card, internal memory (eMMC), network file-system (NFS) boot, and Trivial File Transfer Protocol (TFTP) boot