



NVIDIA Jetson Linux

Release Notes

Version 35.3.1 GA

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1. About this Release

The NVIDIA® Jetson™ Linux 35.3.1 General Availability (GA) includes the Linux Kernel 5.10, the UEFI based Bootloader, the Ubuntu 20.04-based root file system, NVIDIA drivers, the necessary firmware, toolchain, and more. This release adds support for the Jetson Orin Nano Developer Kit and the Jetson AGX Orin 64GB, Jetson Orin NX 8GB, Jetson Orin Nano 8GB, and the Jetson Orin Nano 4GB production modules. This release also supports all Jetson Orin- and Xavier-based production modules and Developer Kits.

Important: This GA release can be used for production purposes.

Platform and Release Information

Description	Supported version
Host machine Linux distribution for flashing software onto Jetson devices	Ubuntu x64 18.04 or 20.04 (x64 distribution)
Sample rootfs derived from Ubuntu operating system to run on Jetson devices	Ubuntu 20.04
Supported Linux kernel version	5.10 LTS
Supported ARM architecture	aarch64

Description	Supported version
<p>Name of the configuration file used in flashing.</p> <p>Note: When you flash a configuration file with <code>flash.sh</code>, specify the configuration's basename, i.e. the file name without the <code>.conf</code> suffix.</p> <p>For a complete description of supported platforms and configuration names, see the <i>Jetson Modules and Configurations</i> table in Environment Variables.</p>	<p><code>jetson-orin-nano-devkit.conf</code>: Flashes one of the following modules that is attached to a Jetson Orin Nano Carrier board (P3768-0000):</p> <ul style="list-style-type: none"> • Jetson Orin Nano developer kit module with SD Card (P3767-0005) • Jetson Orin Nano 8GB module (P3767-0003) • Jetson Orin Nano 4GB module (P3767-0004) • Jetson Orin NX 16GB module (P3767-0000) • Jetson Orin Nx 8GB module (P3767-0001) <p><code>jetson-agx-orin-devkit.conf</code>: Flashes one of the following modules that is attached to a Jetson AGX Orin Developer Kit (P3730-0000) reference carrier board (P3737-0000):</p> <ul style="list-style-type: none"> • Jetson AGX Orin developer kit module (P3701-0000) • Jetson AGX Orin 32GB module (P3701-0004) • Jetson AGX Orin 64GB module (P3701-0005) <p><code>jetson-agx-orin-devkit-as-nx-16gb.conf</code>: Flashes a configuration that emulates a Jetson Orin NX 16GB module on a Jetson AGX Orin module (P3701-0000) that is attached to a Jetson AGX Orin Developer Kit (P3730-0000) reference carrier board (P3737-0000).</p> <p><code>jetson-agx-orin-devkit-as-nx-8gb.conf</code>: Flashes a configuration that emulates a Jetson Orin NX 8GB module on a Jetson AGX Orin module (P3701-0000) that is attached to a Jetson AGX Orin Developer Kit (P3730-0000) reference carrier board (P3737-0000).</p> <p><code>jetson-agx-orin-devkit-as-jao-32gb.conf</code>: Flashes a configuration that emulates a Jetson AGX Orin 32GB module on a Jetson AGX Orin module (P3701-0000) that is attached to a Jetson AGX Orin Developer Kit (P3730-0000) reference carrier board (P3737-0000).</p>

Description	Supported version
	<p><code>jetson-agx-xavier-devkit.conf</code>: Flashes a Jetson AGX Xavier module that is attached to a Jetson AGX Xavier Developer Kit reference carrier board.</p> <p><code>jetson-xavier-nx-devkit.conf</code>: Flashes QSPI-NOR and microSD card for Jetson Xavier NX (P3668-0000).</p> <p><code>jetson-xavier-nx-devkit-emmc.conf</code>: Flashes QSPI-NOR and eMMC for Jetson Xavier NX (P3668-0001).</p> <p><code>Jetson-agx-xavier-industrial.conf</code>: Flashes QSPI-NOR and eMMC for Jetson AGX Xavier Developer Kit with Jetson AGX Xavier Industrial module (P2888-0008).</p>
Board names, module names, and revision numbers	Refer to the Jetson FAQ for a detailed list of Jetson device information.
Toolchain for cross-compilation	Bootlin GCC 9.3 https://developer.nvidia.com/embedded/jetson-linux
Release Tag	jetson_35.3.1

1.1. Login Credentials

To create your login credentials, follow the system prompts at the first boot.

1.2. What's New

Here is the list of new features in this Jetson Linux 35.3.1 GA production public release:

- Adds support for the Jetson Orin Nano Developer Kit.
- Adds support for the Jetson AGX Orin 64GB, the Jetson Orin NX 8GB, the Jetson Orin Nano 8GB, and the Jetson Orin Nano 4GB production modules.
- Over The Air Updates

Image-Based OTA tools that support upgrades to Xavier- or Orin-based modules that run JetPack 5 in the field¹.

- Camera:
 - Support for Multi-Point Lens Shading Correction (LSC) on Orin.
 - Enhanced resilience of Argus SyncStereo app to maintain synchronization between stereo camera pairs.
- Multimedia:
 - Support for the dynamic frame rate in AV1 encoding.
 - A new `argus_camera_sw_encode` sample for demonstrating software encoding on CPU cores.
 - Updated `nvgstcapture-1.0` with an option for software encoding on CPU cores.

Here is some additional information:

- Jetson Linux Sources are now available on Git in addition to the Jetson **Linux page** (refer to [Working with Sources](#) for more information).
- For more information about the adaptation and bring up process for your custom carrier boards, refer to [Jetson Module Adaptation and Bringup](#) for the Jetson AGX Orin, Orin NX, Orin Nano, AGX Xavier, and Xavier NX platforms.
- Refer to the [Jetson Linux Developer Guide](#) for Jetson Linux documentation and [Implementation Details](#) for more information about implementation details that cover a variety of topics.

2. Known Issues

This section provides details about issues that were discovered during development and QA but have not yet been resolved in this release.

2.1. General System Usability

The following general system usability-related issues are noted in this release.

Issue	Description
4033331	<p>To enable the pwm7 node in the kernel and give CCPLEX access to pwm7 registers to enable pwm7:</p> <ol style="list-style-type: none">1. Update the following files to enable the pwm7 node in the kernel and give CCPLEX access to pwm7 registers to enable pwm7.2. Build the kernel and reflash the board needs to be built, and the board should be reflashed with the updated kernel and firewall settings. <p>+++ b/cvb/tegra234-p3768-0000-a0.dtsi</p> <pre>@@ -253,6 +253,10 @@ status = "disabled"; }; + pwm@32e0000 { /* PWM7 - 40pin header, pin 32 */ + status = "okay"; + }; + blueandroid_pm { status = "disabled"; };</pre>

Issue	Description
	<pre> +++ b/firewall/tegra234-mb2-bct-scr-p3767-0000.dts @@ -2535,6 +2535,17 @@ exclusion-info = <0>; value = <0x80030000>; }; + + + reg@5126 { /* CBB_CENTRAL_CBB_FIREWALL_PWM7_BLF, READ_CTL */ + + exclusion-info = <2>; + + value = <0x0010000a>; + + }; + + + reg@5127 { /* CBB_CENTRAL_CBB_FIREWALL_PWM7_BLF, WRITE_CTL */ + + exclusion-info = <2>; + + value = <0x0010000a>; + + }; + + + /* ARF Section */ + + reg@5837 { /* FSI_FABRIC, FSI_CHSM_CPU_T_FIREWALL_ARF_0, ARF_SIZE */ </pre>

Issue	Description
	<p>3. Build the kernel and reflash the board with the updated kernel and firewall settings.</p>
3941437	<p>If a Jetson device does not have Internet access by using a connected LAN cable, the OEM configuration screen will take about 4 minutes to display at first boot.</p> <p>We suggest that you connect the LAN cable with Internet access to the Jetson device at first boot, which will shorten the waiting time for the OEM configuration screen.</p>
3931770	<p>After a system suspend and resume, the CPU power at <i>OSIdle</i> might increase slightly, which causes the <code>nvpmodel</code> service on Jetson Orin NX to turn off the CPU cores in some power modes to fit the power budget.</p> <p>This is a known issue and will be fixed in a future release.</p>
4021049	<p>On the Jetson Orin Nano developer kit, if you need to update the QSPI image on the target to match the SD Card image version, complete the following steps:</p> <ol style="list-style-type: none"> 1. When booting into the desktop, to update the slot B bootloader and reboot, run the following command: <pre>\$ sudo dpkg-reconfigure nvidia-l4t-bootloader</pre> <p>It will boot with the bootloader in slot B.</p> 2. After rebooting into the desktop, to update slot A bootloader and reboot, run the following command: <pre>\$ sudo dpkg-reconfigure nvidia-l4t-bootloader</pre> <p>It will boot with the bootloader in slot A.</p> 3. Both slots of the bootloader partition on the devkit have now been updated to the same SD card image version of the SD card image. <p>This update will be done automatically in a future release.</p>

Issue	Description
3747765	The <code>Video_dec_drm</code> sample compilation becomes stuck and displays a blank screen when it is run on Jetson AGX Xavier connected to the Acer X27 - 4k60 monitor.
3971915	<p>Jetson AGX Orin, Jetson Orin NX, and Nano devices fail cold start tests at -20°C by failing to boot.</p> <p>This is due to issues in MB1 temperature handling and will be fixed in the next release.</p>

2.2. Flashing

The following flashing-related issues are noted in this release.

Issue	Description
3601114 3601261	The minimum recommended SD card size for flashing the complete JetPack SDK to an SD card for Jetson Xavier NX Developer Kit is 64 GB.
3586898	<p>A complete JetPack installation on the Jetson Xavier NX production module on the 16GB EMMC fails.</p> <p>Workaround</p> <p>Starting with release 35.1, the SDK Manager offers the following options:</p> <ul style="list-style-type: none"> • A complete JetPack installation. • An installation of only the JetPack runtime components <p>The JetPack runtime installation does not include samples and documentation and is helpful for Jetson modules with limited storage and during production.</p>

Issue	Description
3925680	USB can not be used as a flash and boot device for Jetson AGX Xavier series and Jetson Xavier NX because of issues with UEFI Xhci controller driver.

2.3. Camera

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

Issue	Description
3692128 3447132	<p>The E3331 (Cphy - IMX318) sensor fails to load and probe.</p> <p>To resolve this issue, before you flash, remove the camera-related DTBO filenames from the <code>OVERLAY_DTB_FILE</code> string in the corresponding <code><boardname>.conf</code> file.</p> <p>This file is used to flash the device by using the <code>sudo ./flash.sh <boardname> mmcblk0p1</code> command.</p>
3883254	Multi Video recording in the same session fails for the <code>argus_camera</code> app.
3914914	<code>argus_eglimage</code> fails intermittently due to a buffer mapping failure in camera kernel drivers.
3984467	E3331 camera module detection through Jetson IO does not work on Jetson AGX Orin series or Jetson Xavier series of products because of missing DTB configuration files and hardware wiring.

Issue	Description
4035327	Running <code>nvgstcapture-1.0</code> application on Jetson AGX Orin can show color distortions in camera preview intermittently.
3989818	Since the Jetson Orin Nano developer kit and Orin Nano modules do not have support for NVENC hardware, a software encoder is used instead. Starting from the NVIDIA JetPack™ 5.1.1 release, the Sample application for the demonstration <code>argus_camera_sw_encoder</code> demo application is available in the <code>jetson_multimedia_api</code> in the <code>jetson_multimedia_api</code> package starting with the JetPack 5.1.1 release.
3739243	On Jetson AGX Industrial boards with IMX185, the sensor might periodically stop streaming at times through argus when the sensor mode is set to 0. THowever, the sensor works through the v4l2 interface.

2.4. Multimedia

The following issues are noted in this release related to multimedia.

Issue	Description
3796170	A long duration test with <code>detectnet-camera</code> on Jetson Xavier NX might lead to an <code>Out of memory</code> error after three days.
3907557	In camera preview pipelines (<code>nvarguscameraSrc + nv3dsink</code>), to provide enough buffering for streaming use cases, use the <code>queue</code> element. Here is a sample pipeline:

	<pre>\$ gst-launch-1.0 nvarguscamerasrc ! "video/x-raw(memory:NVMM),width=(int)3840,height=(int)2160,framerate=(fraction)60/1" ! queue ! nv3dsink -e</pre>
--	--

2.5. Display

The following TensorRT-related issues are noted in this release.

Issue	Description
3695925	On Jetson AGX Orin, the display might intermittently go blank during the boot.
3724559	<p>HDMI 4K@60Hz does not work on an ACER Predator X27 monitor that is connected to Jetson AGX Xavier.</p> <p>To work around this issue, change the resolution to 4K@30 or a lower resolution.</p>
3517183	<p>After an idle time of the display on Jetson AGX Orin, the following message is repeated in the logs:</p> <pre>NVRM rpcRmApiControl_dce: NVRM_RPC_DCE: Failed RM ctrl call cmd:0x731341 result 0xffff:</pre> <p>This message should not cause any functional impact.</p>

2.6. Graphics

Issue	Description
4033129	<p>The graphics library, the Vulkan Khronos Compliance Test Suite (GL 4.6), and Vulkan (1.3.1.1) can crash on Jetson Orin NX and Jetson Orin Nano devices.</p> <p>The (dEQP-VK.ray_tracing_pipeline.misc.maxrtinvocations_tri) ray tracing subtests for Vulkan CTS fails with a completion fence timeout, and the graphics library CTS fails to run because of SIGBUS.</p>

3. Fixed Issues

This section provides details about the issues that were resolved in this release.

Issue	Description
3948609	<p>A Debian-based OTA update on Jetson AGX Orin to 35.2.1/ JP 5.1 will fail on installations that were not reflashed with 35.1/JP 5.0.2 release with the following error:</p> <pre data-bbox="407 699 1166 726">ERROR. Procedure for A_kernel-dtb update FAILED.</pre> <p>Example: Jetson AGX Orin, which was originally flashed with the 34.1 release and then updated to release 35.1, will see this issue when you update to the 35.2.1 release.</p> <p>To work around this issue use the following commands to resize the <code>A_kernel-dtb</code> before you start an APT upgrade.</p> <pre data-bbox="407 1010 857 1037">sudo parted /dev/mmcblk0 rm 4</pre> <pre data-bbox="407 1073 1089 1100">sudo parted /dev/mmcblk0 resizepart 3 67.9MB</pre> <pre data-bbox="407 1136 1292 1199">sudo parted /dev/mmcblk0 mkpart A_reserved_on_user 67.9MB 101MB</pre>
3977671	<p>When Jetson AGX Xavier is connected to a Windows host, it fails to connect at the USB3 speed and falls back to USB 2.0 after a hotplug of the cable.</p> <p>This issue is now fixed.</p>
3854735	<p>The UPHY-2 Lane 1 C9 controller is not working.</p> <p>This will be fixed by JetPack 5.1.1.</p>
3949848	<p>Running the Jetson-io tool over the command line on Jetson AGX Orin does not show the option to configure compatible hardware for the <i>Configure Jetson AGX CSI Connector</i> option.</p>

Issue	Description
	This issue will be fixed in a later Debian update.
3933522 3926037	<p>In the AGX Orin series and Orin NX series, there can be color shading in the highlight region due to Lens shading limitations.</p> <p>It will be improved in the next JetPack release.</p>
3643516	<p>By default, the IMX185 camera module has a <code>pca9570</code> GPIO expander that sets the day mode. If you do not enable the expander, the IR cut filter in the sensor is disabled, and daylight preview might have a pinkish tint.</p> <p>To enable the expander, run the following command:</p> <pre>\$ sudo modprobe pca9570</pre>
3880856	<p>When you run native rendering X11 applications, such as <code>xterm</code> on a bare X server, you might experience some corruption.</p> <p>To avoid this issue, before you run a bare X server, use <code>ForceComposition</code> by adding the following to the <code>/etc/X11/xorg.conf</code> file in the Device section:</p> <pre>Option "ForceCompositionPipeline" "On"</pre>
3905997	<p>SC7(suspend/resume) does not work on Jetson devices that are connected to the Display in MST mode. SC7 works as expected with all other DP versions in SST mode.</p>
3697875	<p>If you installed CUDA 11.4.14 from JetPack 5.0.1 DP and earlier releases, the <code>apt upgrade</code> to JetPack 5.0 GA will fail. This occurs because in the JP 5.0 GA release, the <code>cuda-nvprof-11-4</code> package has been renamed.</p> <p>After the <code>apt upgrade</code>, to fix this issue, run the following command:</p> <pre>\$ sudo apt install --fix-broken -o Dpkg::Options::="--force-overwrite"</pre>

Issue	Description
3445976	WiFi attachment points on Jetson Xavier NX are not listed after a headless installation with the default oem-config options.
3660805	The SPE's IVC channel does not work with Jetson AGX Orin.
3657961	After an <code>apt upgrade</code> , the Xavier NVME SSD failed to boot.
3623353	Flashing Jetson Xavier NX 16GB fails on Jetpack 5.0.
3605453	Flashing the Jetson Orin Developer Kit with a custom carrier board with no EEPROM fails.
3603552	Flashing a custom carrier board with the Jetson Xavier modules fails.
3573905	Monitors with a DP++ interface are not supported.
3570293	Jetson Xavier NX: Jetson-IO might fail to configure the IMX477 sensor.
3499398	GPIO configuration utility does not work as expected in the Linux 5.10 kernel that is included in the Jetpack 5.0 DP release.
3712616	<code>nvdsp-init</code> does not support SBK/PKC-fused boards, so there will be no boot splash displayed on the screen.

Issue	Description
3692886	The Display MST does not work on Jetson AGX Orin and will be addressed in an upcoming release.
3431695	Watchdog nodes are not enabled on Jetson AGX Xavier Industrial.
3420652	Display does not resume after SC7 suspend/resume cycle.
3447132 3574718	Wake-on-Lan is not supported in release 35.1.

4. Implementation Details

4.1. Camera

Because UEFI boot is enabled in JP5.x releases, Camera Auto Detection will not work if the EEPROM ID is not configured for a camera sensor.

4.2. Device Registration

After you complete the driver development, you **must** add the new device's information to the system kernel device tree so it can be registered (instantiated) when the kernel boots. The following sections describe ways to register a new device.

Before you begin, ensure that you obtain the kernel source files.

4.2.1. Device Tree Overlay

Because UEFI boot is enabled in this release, the plugin manager is no longer supported. You must create a device tree overlay (DTB overlay or `.dtbo`) file to register the camera module.

If your camera module has an on-board EEPROM, and is programmed with a valid camera ID, at runtime, you can use the device tree overlay file to apply the overlay for a specific camera module and update the device tree entries with proper information. Using a device tree overlay with an EEPROM ID allows a system image to support multiple camera devices. To select a different camera, power down the device, replace the camera module, and reboot. The new module works automatically.

To create and apply a device tree overlay file:

1. Add the `.dtsi` file to the camera configuration `.dtsi` file.
2. Set the status of your device tree nodes to `disabled`.

```
imx185_cam0: imx185_a@1a {  
    status = "disabled";  
};
```

3. Add the overlay information as fragments to a new `.dts` file.

```
<top>/hardware/nvidia/platform/t19x/common/kernel-dts/t19x-common-modules/tegra194-camera-overlay-file.dts
```

You can also see the camera DTB overlay files that are provided with the current release for examples.

4. Update the `.dts` file with the correct overlay information and a compatible string.

```
/ {
    overlay-name = "Jetson Camera Dual-IMX274";
    jetson-header-name = "Jetson AGX Xavier CSI Connector";
    compatible = "nvidia,p2822-0000+p2888-0001";

    fragment@0 {
        target= "<&imx185_cam0>";
        board_config {
            ids = "LPRD-dual-imx274-002" ;
            sw-modules = "kernel";
        };
        __overlay__ {
            status = "okay";
        };
        };
        fragment@1 {
            . . .
        };
    };
};
```

5. To generate a `.dtbo` file, compile the `.dts` file.
6. **Before flashing**, move the `.dtbo` file to `flash_folder/kernel/dtb/`.
7. Add the following line to the `<board>.conf` file, which is used to flash the device.

```
OVERLAY_DTB_FILE="${OVERLAY_DTB_FILE},tegra 194-camera-overlay-file.dtbo";
```

This line causes the following tasks to completed:

- If a specific camera board is found when the kernel boots, the override data is applied to that camera board's tree nodes.
- The tree nodes are made available for the system to use.

4.2.2. Using the Jetson IO Tool

If your camera module does not have an on-board EEPROM, you can use the same DTB overlay file to statically configure the board for the attached camera.

1. After you attach the camera module, apply the camera module's DTB overlay using the Jetson-IO tool, and reboot.

The new module will work immediately after Jetson Linux starts.

Note: You might have to delete the `board_config{}` node from the fragments in the DTB overlay file.

2. After you compile the `.dts` file to generate a `.dtbo` file, move the `.dtbo` file to `/boot` on the Jetson device, so that the Jetson-IO tool can recognize it.
3. Launch the Jetson-IO tool and configure the DTB overlay.

4.3. UEFI

For fixes that were made in the UEFI sources after the release, go to the [UEFI GitHub](#).

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