



NVIDIA Jetson Linux

Release Notes

Version 35.4.1 GA

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1. About this Release

The NVIDIA® Jetson™ Linux 35.4.1 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 AGX Orin Industrial module. 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-agx-orin-devkit-industrial.conf</code>: Flashes Jetson Orin industrial module (P3701-0008) attached to a Jetson Orin reference carrier board (P3737-0000).</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</p>

Description	Supported version
	<p>Developer Kit (P3730-0000) reference carrier board (P3737-0000).</p> <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	<p>Bootlin GCC 9.3</p> <p>https://developer.nvidia.com/embedded/jetson-linux</p>
Release Tag	jetson_35.4.1

1.1. Login Credentials

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

1.2. What's New

- Adds support for the Jetson AGX Orin Industrial module
- In Bootloader, added support for the following:
 - Grub as OS Loader in UEFI
 - PXE boot
- Camera
 - Enhanced error resiliency for improved stability in Argus.
 - Added support for multiple camera synchronization (added sample `argus_syncstereo`).
 - Added support for Deskew calibration for high data rate sensors (> 1.5 Gbps).
 - Added support for alternating exposures in Argus (added sample `argus_userAlternatingAutoexposure`).
- Multimedia
 - Removed the deprecated `Nvbuf_utils`.
Refer to the migration guide ([migrate from Nvbuf_utils to NvUtils](#)) for more information.
- Security
 - Added support for up to three signing keys to sign bootloader in secure boot and added the ability to revoke the keys.
 - Provided the ability to add and revoke UEFI signing keys.
 - Enhanced secure boot for encrypting kernel, `kernel-dtb`, and `initrd`.
 - Added support for signing kernel modules.
 - Added support for delegated authentication with ability to sign UEFI with platform vendor-owned keys.
 - Added support in disk encryption to encrypt the User Data Partition (UDA) and the runtime-enabling encryption of UDA partitions.
- Over The Air Updates
 - Added support for Jetson Orin NX and Jetson Orin Nano in Image-based over-the-air (OTA) tools.

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"; + }; + bluedroid_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
	3. Build the kernel and reflash the board with the updated kernel and firewall settings.
3747765	The <code>Video_dec_drm</code> sample compilation becomes stuck and displays a blank screen when it is run on Jetson AGX Xavier that is connected to the Acer X27 4k60 monitor.
4120373	<p>When attempting to install Nsight Systems for Tegra in an environment without access to an actual Tegra device, or in an environment that lacks the required drivers, you might encounter the Unsupported Linux aarch64 platform. error.</p> <p>Workaround Install the package directly on a Tegra system.</p> <p>After the installation is complete, the unpacked binaries can be packaged/copied and used in any environment by running the following additional commands:</p> <ul style="list-style-type: none"> dGPU <ul style="list-style-type: none"> <code>sudo update-alternatives --install /usr/local/bin/nsys nsys /opt/nvidia/nsight-systems/2023.2.4/target-linux-sbsa-armv8/nsys</code> <code>sudo update-alternatives --set nsys /opt/nvidia/nsight-systems/2023.2.4/target-linux-sbsa-armv8/nsys</code> iGPU <ul style="list-style-type: none"> <code>sudo update-alternatives --install /usr/local/bin/nsys nsys /opt/nvidia/nsight-systems/2023.2.4/target-linux-tegra-armv8/nsys</code> <code>sudo update-alternatives --set nsys /opt/nvidia/nsight-systems/2023.2.4/target-linux-tegra-armv8/nsys</code>
4031936	To resolve this issue, clone version v2.1.2 on Github or update to the latest version using pip.

Issue	Description
3978244	<p>The single-bit DRAM ECC is supported in the release software for Jetson AGX Orin Industrial.</p> <p>In the current release, when a double-bit error correction is detected, the system reboots but fails to complete bad page management. This issue will be fixed in the next release.</p>
4189361	<p>IMX185 fails to detect in JetPack 5.1.2 because of a Control Gain range update failure.</p> <p>To avoid a probe failure, the <code>min_gain_val</code> param sensors in DT should be set to greater than 1 in linear scale.</p>
4191596	<p>The capsule update is aborted after an OTA to R35 top of tree.</p> <p>To update from release 35.3.1 to release 35.4.1 (slots A and B:</p> <ol style="list-style-type: none"> 1. Complete a fresh flash in release 35.3.1 and boot from slot A. 2. Switch to slot B and reboot. <pre data-bbox="459 1165 1047 1192">sudo nvbootctrl set-active-boot-slot 1</pre> <ol style="list-style-type: none"> 3. Verify that the current slot is B, trigger Debian OTA, and reboot. <pre data-bbox="459 1291 941 1318">sudo nvbootctrl dump-slots-info</pre> <ol style="list-style-type: none"> 4. After the reboot, start a system boot from slot A, verify that the current slot is A, and the version is 35.4.1 <p>Slot A has been updated to release 35.4.1.</p> <ol style="list-style-type: none"> 5. Verify that the current slot is A and trigger Debian OTA, and reboot. 6. After the reboot, start a system boot from slot B, verify that the current slot is B and the version is 35.4.1 <p>Slot B has been updated to release 35.4.1.</p>

Issue	Description
4180417	<p>Observing the Warning: Not all of the space available to /dev/nvme0n1 appears to be used, you can fix the GPT to use all of the space message during a Debian OTA.</p> <p>To resolve this issue:</p> <ol style="list-style-type: none"> 1. Stop the OTA script. 2. Run the following command. <pre>echo -e "Fix\n1\n\n" sudo parted ---pretend-input-tty /dev/nvme0n1 print >/dev/null 2>&1 command.</pre> <ol style="list-style-type: none"> 3. Trigger OTA again by running the following command. <pre>sudo apt dist-upgrade</pre>
4201491	<p>Although flashing the Jetson-Linux OS on multiple OS boot media such as USB, NVMe, SD, and so on is supported, the media should have an OS only from the same major release.</p> <p>An attempt to flash different OS versions to multiple boot media will lead to a system crash in UEFI because <code>dtb</code> overlays that are applied to the kernel <code>dtb</code> might be vastly different in their structure for every major release. As a result, UEFI will not be able to apply overlays in the expected manner, and components such as watchdog and the fan will not work as expected. The device might overheat and cause permanent damage.</p> <p>Workaround</p> <p>To workaround this issue, ensure that you keep only one boot media and flash again after the board cools down.</p>
4176559	<p>The CMakeLists.txt file and README are missing for the <code>nvidia-l4t-vulkan-sc-samples</code> package.</p> <p>To build the samples from source, users must download the files from https://developer.nvidia.com/embedded/jetson-linux and place the files in the Vulkan SC Samples root directory</p>

Issue	Description
	(/usr/src/nvidia/vulkan-sc/vulkan-sc-ecosystem/vulkan-sc-sample).
4201479	<p>Customers are advised to make a note of the various, connected secondary boot mediums.</p> <p>UEFI has a priority of the boot medium from which to boot. If you have a different Jetpack version flashed on these mediums, or the medium is empty, you might see a boot failure.</p> <p>Ensure that when you flash to a medium, a boot is also happening from that medium. UEFI has different overlays that are flashed in the UEFI partition and are based on whether you are flashing 5.10 or 5.15.</p> <p>If you boot 5.10 with overlays from 5.15, it will corrupt the kernel DTB and vice versa. This configuration is not supported. Refer to Overriding the Default Boot Order During Flashing for more information.</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>

2.3. Camera

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

Issue	Description
3692128	<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>
4035327	<p>Running the <code>nvgstcapture-1.0</code> application on Jetson AGX Orin can intermittently show color distortions in camera preview.</p>
3739243	<p>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.</p> <p>However, the sensor works through the v4l2 interface.</p>
3965871	<p>The <code>argus_syncstereo</code> Argus Public sample application provides streaming data for the stereo and the monocular camera sensors that are connected to the Jetson device. Currently, the option to select only a few from the connected camera sensors is not available.</p>
4175410	<p>There is a limitation on the C-PHY-supported data rate. C-PHY has been tested to work up to 3.0Gbps per trio, so there might be stream failures if data rate goes higher than 3.0Gbps.</p>

Issue	Description
4142996	Although single-bit error detection and correction is working, in double-bit error detection, MB1 cannot detect the injected error memory correctly. As a result, the badpage is not recognized and is removed from available memory.
4209096	Corruption might be observed during previews for the IMX318 sensor with Jetson AGX Orin.
4213277	If additional logging is enabled through the <code>nvargus daemon</code> in a parallel terminal window, other argus applications cannot be launched.

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	<p>In camera preview pipelines (<code>nvarguscamerasrc</code> + <code>nv3dsink</code>), to provide enough buffering for streaming use cases, use the queue element.</p> <p>Here is a sample pipeline:</p> <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>
4212752	<p>A minor display corruption might be encountered if a DP Hot-Plug event takes place while the Orin Nano Devkit is in sleep mode.</p> <p>Workaround A restart should resolve any visual effects.</p>
4154283	Single Bit error detection and correction is working.

Issue	Description
	For Double bit error detection, MB1 cannot correctly detect the injected error memory, and as a result, the badpage is not recognized and is removed from the available memory.

2.6. Deep Learning

The following Deep Learning-related issues are noted in this release.

Issue	Description
4053211	A warning appears when users attempt to run on a SKU that TensorRT did not test. This issue occurs only when the users' network requires more than 59GiB of memory to build.

3. Fixed Issues

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

Issue	Description
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>
3925680	<p>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.</p>
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>

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>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>sudo parted /dev/mmcblk0 rm 4</pre> <pre>sudo parted /dev/mmcblk0 resizepart 3 67.9MB</pre> <pre>sudo parted /dev/mmcblk0 mkpart A_reserved_on_user 67.9MB 101MB</pre>
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> <p>This issue will be fixed in a later Debian update.</p>
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>

Issue	Description
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>
3445976	<p>WiFi attachment points on Jetson Xavier NX are not listed after a headless installation with the default oem-config options.</p>

Issue	Description
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>nvdisp-init</code> does not support SBK/PKC-fused boards, so there will be no boot splash displayed on the screen.
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.

Issue	Description
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

This section provides information about 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 {
        . . .
    };
};
```

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

```
OVERLAY_DTB_FILE="${OVERLAY_DTB_FILE},tegra194-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.

4.2.3. Adaptation to the Carrier Board with HDMI for the Orin NX/Nano Modules

If you are using a third-party carrier board that supports HDMI, ensure that the following patch is applied in your `mb2 scr bct` in the

`./bootloader/t186ref/BCT/tegra234-mb2-bct-scr-p3767-0000.dts` file:

```
--- a/firewall/tegra234-mb2-bct-scr-p3767-0000.dts
+++ b/firewall/tegra234-mb2-bct-scr-p3767-0000.dts
@@ -5,6 +5,11 @@

/ {
    tfc {
+       reg@322 { /* GPIO_M_SCR_00_0 */
+           exclusion-info = <2>;
+           value = <0x38008080>;
+       };
+
        reg@5138 { /* CBB_CENTRAL_CBB_FIREWALL_QSPI0_BLF, READ_CTL */
            exclusion-info = <2>;
            value = <0x00100009>;
```

This change is needed because the `GPIO_M_0` GPIO pin is used for the HDMI hotplug. In Orin, the access to this pin should be limited **only** to the DCE firmware.

4.3. UEFI

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

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