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1.0 About this Release

The NVIDIA® Tegra® Linux Driver Package (BSP) and JetPack support development on the NVIDIA® Jetson AGX Xavier™ Developer Kit.

NVIDIA has released a security update in BSP 31.0.2 and JetPack 4.1, which is available from NVIDIA DevZone. In addition, the update includes functional and performance enhancements for NVIDIA Jetson AGX Xavier, including:

- Improved bandwidth utilization of the memory subsystem
- Enables coherency for Ethernet transactions.
- Fixes the installer to not fail silently when installing from unsupported file systems

Platform and Release Information

<table>
<thead>
<tr>
<th>Description</th>
<th>Supported Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host machine version for flashing software onto Jetson devices.</td>
<td>Ubuntu x64 16.04 or 18.04 (x64 distribution)</td>
</tr>
<tr>
<td>Sample rootfs derived from Ubuntu operating system to run on Jetson devices.</td>
<td>Ubuntu 18.04 (arm64 distribution)</td>
</tr>
<tr>
<td>Supported Linux kernel version.</td>
<td>4.9</td>
</tr>
<tr>
<td>Supported ARM architecture.</td>
<td>aarch64</td>
</tr>
<tr>
<td>The board/module name, used in flashing and paths in the software.</td>
<td>jetson-xavier</td>
</tr>
<tr>
<td>The board/module and revision number.</td>
<td>Jetson Xavier: P2972-0000</td>
</tr>
<tr>
<td>The release tag name. Consult the kernel source to identify the tag name at:</td>
<td>Not available for this early access release.</td>
</tr>
<tr>
<td><a href="http://nv-tegra.nvidia.com/gitweb/?p=linux-4.9.git">http://nv-tegra.nvidia.com/gitweb/?p=linux-4.9.git</a></td>
<td></td>
</tr>
<tr>
<td>Kernel source are live across several repositories.</td>
<td></td>
</tr>
<tr>
<td>Consult the topic Kernel Customization &gt; Obtaining the Kernel Sources with</td>
<td></td>
</tr>
<tr>
<td>Git in the Development Guide for details.</td>
<td></td>
</tr>
</tbody>
</table>
Platform Support with Quality Target

The platform supported, at the targeted quality level, is as follows.

<table>
<thead>
<tr>
<th>Platform</th>
<th>Quality Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVIDIA Tegra® Linux Driver Package</td>
<td>Beta</td>
</tr>
</tbody>
</table>

1.1 Login Credentials

The default login credentials are:

- Username: nvidia
- Password: nvidia

Note: For security purposes and for best practices, NVIDIA recommends changing the default password.
2.0 Known Issues

This section provides details about issues discovered during development and QA but not resolved in this release.

2.1 General System Usability

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

<table>
<thead>
<tr>
<th>Issue</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2183567</td>
<td>Type-C devices unable to drive DP due to length of delay before handshake begins. Workaround: see Type-C Devices Unable to Drive DisplayPort.</td>
</tr>
<tr>
<td>200441525</td>
<td>An application to be debugged NVIDIA Developer Tools (CUDA tools, NVIDIA Nsight Systems/Graphics) must be run as the root user, or with root permissions.</td>
</tr>
<tr>
<td>2218290</td>
<td>Thermal shutdown reboots system instead of powering off.</td>
</tr>
<tr>
<td>200436049</td>
<td>nvvp (Visual Profiler) launch fails after installing cuda-repo-ubuntu1804-10-0-local-10.0.96-410.27_1.0-1_amd64.deb.</td>
</tr>
<tr>
<td>200442461</td>
<td>VisionWorks SFM sample fails to run; shows black image when launching nvx_sample_sfm sample.</td>
</tr>
<tr>
<td>200447045</td>
<td>SC7 system suspend/resume may have intermittent resume failures in this release.</td>
</tr>
</tbody>
</table>

2.2 Boot

The following boot related issues are noted in this release.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2305640</td>
<td>CBoot bootloader cannot access USB mass storage devices connected via a USB hub.</td>
</tr>
</tbody>
</table>
## 2.3 Camera

The following camera related issues are noted in this release.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2258817</td>
<td>Incorrect ISP settings may be applied if camera module is replaced with a module that does not support a unique identifier (fuse ID). (Workaround: manually remove the cached .bin files in /var/nvidia/nvcam/settings.)</td>
</tr>
<tr>
<td>200422466</td>
<td>IMX185 sensor not supported in this release.</td>
</tr>
<tr>
<td>200445964</td>
<td>Greenish image capture with argus_onshot.</td>
</tr>
<tr>
<td>2199266</td>
<td>Temporal noise reduction may cause a slight green tint to images.</td>
</tr>
<tr>
<td>200407738</td>
<td>Greenish tint on displayed preview image when running the sample software argus_userautowhitebalance.</td>
</tr>
</tbody>
</table>

## 2.4 CUDA

The following CUDA related issues are noted in this release.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>200431121</td>
<td>If a CUDA application calls malloc() within a CUDA kernel (device-side malloc) while running concurrently with another CUDA or GPU-accelerated graphics application, the application may fail.</td>
</tr>
</tbody>
</table>

## 2.5 Display

The following display related issues are noted in this release.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2284878</td>
<td>Cannot operate GeChic 1101 display connected through USB-C to USB-A when aut-search mode is enabled.</td>
</tr>
<tr>
<td>200404683</td>
<td>Display Port (DP) monitors do not show a bootloader splash screen at boot, and may require a hotplug after boot to display content properly.</td>
</tr>
<tr>
<td>200434425</td>
<td>Display driver may produce “Failed to write DPCD data” errors after a display hotplug with certain monitors including Dell U2413 and Dell U2713.</td>
</tr>
</tbody>
</table>
2.6 JetPack Installer

The following JetPack Installer related issues are noted in this release.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2340186</td>
<td>After installation of CUDA 10.0 host packages, the apt package management system may produce “Failed to fetch” messages due to the addition of the arm64 architecture to the apt package repository configuration.</td>
</tr>
</tbody>
</table>

2.7 Kernel

The following kernel related issues are noted in this release.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>200443630</td>
<td>Hotplugging a UFS card may cause the Linux kernel to report a CPU SError.</td>
</tr>
<tr>
<td>200399574</td>
<td>Using USB devices that are not fully compatible with the USB Gen2 specification may cause kernel error messages like “tegra-xusb 3610000.xhci: Cannot set link state.”</td>
</tr>
<tr>
<td>2211831</td>
<td>UART serial console using USB to TTL serial cable does not work.</td>
</tr>
</tbody>
</table>
3.1 Architecture

In the “JetPack Installer for Jetson Developer Kits” diagram, make the following change:

- Change the “OpenCV4 Tegra” label to “OpenCV.”

In the table of components, “Computer Vision” section, “OpenCV4 Tegra” entry, make the following changes:

- Change the item name from “OpenCV4 Tegra” to “OpenCV.”
- Replace the description with:

  “Open Source Computer Vision Library, an open source computer vision and machine learning software library.”
4.0 Implementation Details

4.1 Video Decoder Instance Selection Planned Deprecation

To ensure portability of code across product generations, the interfaces for specification of the NVIDIA Video Decoder instance are planned for deprecation.

In a future release, the Video Decoder interface is planned to be replaced with support for workload scaling across available decoder instances.

The interfaces planned for deprecation include:

- V4L2 external control ID V4L2_CID_MPEG_VIDEO_DECODE_INSTANCE
- GStreamer decoder property dec-instanceId

4.2 Symlinks May be Overwritten by Installation of Third Party Libraries

Installing third party libraries on the target device may overwrite the accelerated library provided by Linux for Tegra.

For example, installing Mesa EGL may create a /usr/lib/<arch>/libEGL.so symlink, overwriting the symlink to the implementation library that should be used instead, /usr/lib/<arch>/tegra-egl/libEGL.so.

Linux for Tegra installs a boot-time initialization script /etc/init/nv.conf, that corrects typical occurrences, such as with OpenGL, EGL, and X11 GLX libraries. This script runs at boot and corrects typical occurrences.

To workaround

- Reboot after installation of packages that install conflicting library symlinks.
4.3 New Users Must be Added to Video Group

When adding users to the system you must add them to the video group for the Linux desktop to appear and function correctly.

4.4 Type-C Devices Unable to Drive DisplayPort

This is Known Issue 2183567.

For DP, Bootloader display polls for at most 1 msec. by default when trying to detect whether HPD has been asserted by the sink. Different Type-C downstream devices connected to the Type-C ports on Galen (cables, adapters, hubs, etc) may incur different amounts of latency before they trigger the handshake process needed to drive DP over Type-C.

Workaround: If a seamless display does not come up with the Type-C device you are using, try increasing the HPD_TIMEOUT_MS value in tegrabl_display_dtb.c. We recommend increasing the timeout value in 500 msec. increments. Increasing the timeout value guarantees interoperability with a larger variety of devices, but also increases the boot time.

4.5 Instability after GDM Restart

This is Known Issue 200427185.

After GDM restart, multiple issues may appear like desktop not coming back (device entering infinite loop of tegradc blank/unblank) or unable to log in.

Workaround: Add this line to /lib/systemd/system/gdm.service:

```bash
ExecStopPost=/bin/loginctl terminate-seat seat0
```

4.6 DLA Cores Do Not Support INT8

The DLA can accelerate Deep Learning inference workloads with INT8 and FP16. In this early access release, only FP16 is supported. INT8 will be supported in a later release.
4.7 OpenGL-ES 1.1 Support Not Available

OpenGL-ES 1.1 support is not present in this release because Canonical did not provide the libGLESv1_CM.so library as part of GLVND libraries in Ubuntu 18.04. Any app that is linked with this library cannot run.

Canonical is working on the issue via bug https://bugs.launchpad.net/ubuntu/+source/libglvnd/+bug/1780039.

After the bug is fixed, an updated GLVND package will be available for Ubuntu 18.04 (Bionic). After the update is applied, libGLESv1_CM.so will be available and OpenGLES 1.1 support will work as expected without requiring any changes to the BSP.

4.8 Khronos Conformance Status

This release supports the following Khronos APIs:

- OpenGL-ES 3.2
- OpenGL 4.6
- Vulkan 1.1

The product is based on a published Khronos specification. It has been submitted to, and is expected to pass, the Khronos Conformance Process. Current conformance status can be found at http://www.khronos.org/conformance.

The CTS test version used to run conformance for each of the APIs is:

- OpenGL-ES: 3.2.5.0
- OpenGL: 4.6.0.0
- Vulkan: 1.1.1.2

4.9 Visual Profiler Launch Failure Workaround

This is Known Issue 200436049.

To run Visual Profiler on Ubuntu 18.04:

Install the package openjdk-8-jre, and

Invoke Visual Profiler with the -vm command line option included:

```
nvvp -vm /usr/lib/jvm/java-8-openjdk-amd64/jre/bin/java
```
The `-vm` option is only required if JRE is not included in CUDA Toolkit package and JRE 1.8 is not in the default path.
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