



# NVIDIA DRIVE OS 6.0.4 Linux

Release Notes (Rev. 1)



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# Introduction

The NVIDIA DRIVE™ OS 6.0 Linux Release Notes are for NVIDIA DRIVE™ AGX Orin Development Kits.

**Note:** This DRIVE OS and DriveWorks release may only be used for test and development.

**Note:** All Orin-X SoC (TA990SA) related platforms marked as PS must use NVIDIA DRIVE OS release 6.0.3.0 or later.  
All Orin SoC (TA979SA) and related platforms marked as PS must use NVIDIA DRIVE OS release 6.0.4.0 or later.

NVIDIA DRIVE™ OS is the reference operating system and associated software stack, which includes CUDA, TensorRT, NvMedia, NvStreams, and Developer Tools, designed specifically for developing and deploying autonomous applications on DRIVE AGX-based hardware.

## DRIVE OS Development Kits

NVIDIA DRIVE™ OS Software Development Kit (SDK) is used to develop DRIVE OS applications for deployment on NVIDIA DRIVE AGX™ based hardware platforms.

NVIDIA DRIVE™ OS Platform Development Kit (PDK) is used to adapt NVIDIA DRIVE OS to run on custom hardware based on NVIDIA Automotive SoC (i.e., Orin).

## DRIVE OS Base Operating Systems

### DRIVE OS Linux “Standard”

DRIVE OS Linux “Standard” is a reference platform based on Ubuntu 20.04 Linux which is intended for prototyping and development of autonomous vehicle platforms. DRIVE OS Linux is production ready but does not go through the same rigorous safety assessment as DRIVE OS QNX for Safety.

The NVIDIA® DRIVE® OS 6.0 TensorRT™ 8.4.11 release includes a TensorRT Standard+Proxy package. The Standard+Proxy package for NVIDIA DRIVE OS users of TensorRT, which is available on all platforms except QNX safety, contains the builder, standard runtime, proxy runtime, consistency checker, parsers, Python bindings, sample code, standard and safety headers, and documentation. The builder can create engines suitable for the standard runtime and DLA. This release includes safety headers and the capability to build standard engines restricted to the scope of operations that will be supported by the safety and proxy runtimes in this and future NVIDIA DRIVE OS 6.0 releases.

# Release Highlights

## Key Features in this Release

For a complete list of new features and enhancements in this release, see [New Features and Enhancements](#).

**Note:** NVIDIA recommends developers to use DRIVE OS 6.0.4 (rev.1) release for using DriveWorks 5.6. Instructions to download and install DRIVE OS 6.0.4 (rev.1) can be found in the latest *NVIDIA DRIVE OS 6.0 Installation Guide*.

## Deprecations in this Release

The following items are deprecated in this release:

Summary	Module	Impact
API names have been updated from <code>*_system_*</code> to <code>*_vm_*</code> to better depict the state transitions implemented in these APIs.	Hypervisor	<ul style="list-style-type: none"><li>• <code>nvdvms_get_system_state ( enum NvDvmsState* state )</code> and</li><li>• <code>nvdvms_set_system_state ( enum NvDvmsState state )</code></li></ul> were renamed to:  <ul style="list-style-type: none"><li>• <code>nvdvms_get_vm_state ( enum NvDvmsState* state )</code></li><li>• <code>nvdvms_set_vm_state ( enum NvDvmsState state )</code>.</li></ul>
Standalone DRIVE OS OSS Source Dockers have been deprecated and are no longer provided as part of each release as OSS content is now included in the standard Linux Dockers.	OSS	-
NvMedia streamlining is complete and the following APIs are removed from DRIVE OS: <ul style="list-style-type: none"><li>• NvMediaSurface APIs that help with Image creation</li></ul>	NvMedia, Standard	Transition away from the APIs for 6.0.4.0 if you have not already done so. This deprecation was announced and

<ul style="list-style-type: none"> <li>• NvMediaImage APIs that help create Image Surfaces</li> <li>• NvMediaVideoSurface APIs that help create Video Surfaces</li> <li>• NvMediaVideo APIs for Encoder, Decoder, Mixer etc., that use NvMediaVideoSurface as input/output</li> <li>• Legacy NvMediaIEP APIs that use NvMediaImage or NvMediaSurface types/attrs as input/output</li> <li>• Legacy NvMediaIDE APIs that use NvMediaImage or NvMediaSurface types/attrs as input/output</li> <li>• Legacy NvMediaIPE APIs that use NvMediaImage or NvMediaSurface types/attrs as input/output</li> <li>• Legacy NvMediaJPD APIs that use NvMediaImage or NvMediaSurface types/attrs as input/output</li> <li>• Legacy NvMedia2D APIs that use NvMediaImage or NvMediaSurface types/attrs as input/output</li> <li>• Legacy SIPL APIs that use NvMediaImage or NvMediaSurface types/attrs as input</li> <li>• NvMediaReleaseGetVersion</li> <li>• NvMediaCoreGetVersion</li> <li>• NvMediaArray APIs that help create buffer of type Array</li> <li>• NvMediaCVScratchPad APIs that help create Array based buffers</li> </ul> <p>The following APIs and libraries are marked deprecated and will be removed in 6.0.5.0.</p> <ul style="list-style-type: none"> <li>• NvMediaDeviceCreate</li> <li>• NvMediaDeviceDestroy</li> <li>• Libnvmmedia.so</li> <li>• Libnvmmedia_core.so</li> </ul> <p>Refer to the migration guide for details required to transitioning away from these APIs.</p>		<p>replacement APIs were provided as early as 6.0.2.0.</p>
<p>The NvMediaCore APIs, NvMediaDeviceCreate(), and NvMediaDeviceDestroy() are planned to be deprecated. In line with this, the new version of NvMediaTensorCreateFromNvSciBuf() and NvMediaTensorFillNvSciBufAttrs() APIs will require a NULL pointer to be passed as input, instead of a valid NvMediaDevice pointer.</p> <p>The clients of NvMediaTensor are recommended to remove NvMediaDeviceCreate() and</p>	<p>Standard</p>	<p>The API signature is not changing for any of the Tensor APIs, but the implementation has been changed. Hence the customers will have to use the recompiled libraries.</p> <p>The nvm_dlaSample application has been updated to remove the usage of NvMediaDevice APIs and NULL pointers</p>

NvMediaDeviceDestroy() usage from the applications. Clients are also recommended to remove libnvmmedia.so and libnvmmedia_core.so from linker/makefiles.		<p>are passed as input, where a NvMediaDevice handle is expected.</p> <p>Example from the app source code:</p> <p>File: dla_sample/tensor/tensor.cpp; Function: Tensor::Create()</p> <p>status = NvMediaTensorCreateFromNvSciBuf(NULL, bufObj, &amp;m_pTensor);</p>
IBuilder::setMaxBatchSize IBuilder::getMaxBatchSize	TensorRT builder	These functions are deprecated. Use explicit dimensions instead.

## Planned Upcoming Changes

The following sections describe planned, upcoming changes.

### Consistency checker

This release of the consistency checker performs most but not all possible checks to ensure that engines can be run in the safety runtime without invoking undefined or nondeterministic behavior. Operations within the safety scope are checked, tensor sizes and formats are checked, and inputs to each layer are analyzed to ensure no uninitialized values are read from memory. Some tactics require specialized kernels and internal data structures. Most, but not all, of these internal data structures are validated in this release. NVIDIA DRIVE OS 6.0.6.0 will contain a consistency checker that includes all expected checks.

Kernels that do not have consistency checker support include:

- Kernels that are used only in the first layer when optimizing three channel image input convolutions.
  - sm80\_xmma\_fprop\_image\_first\_layer\_f16f16\_f32\_f16\_nhwckrsc\_nhwc\_hmma
  - sm80\_xmma\_fprop\_image\_first\_layer\_f32f16f16\_f32\_f16\_nchwkrsc\_nhwc\_hmma
- Kernels used for deconvolution when certain restrictions on parameters are met.
  - sm80\_xmma\_deconv\_implicit\_gemm\_interleaved\_indexed\_i8i8\_i8i32\_f32\_nchw\_vect\_c\_32kcrs\_vect\_n\_32\_nchw\_vect\_c\_32 (strided)
  - sm80\_xmma\_deconv\_implicit\_gemm\_interleaved\_indexed\_i8f32\_i8i32\_f32\_nchw\_vect\_c\_32kcrs\_vect\_n\_32\_nchw\_vect\_c\_32 (strided)

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# New Features and Enhancements

This release includes support for these new features and enhancements.

## New Features for DRIVE OS

### DRIVE AGX Orin Revision D00 (P/N 940-63710-0010-D00)

DRIVE OS now supports DRIVE AGX Orin revision D00 (P/N 940-63710-0010-D00). If flashing the Developer Kit manually (outside of SDK Manager or Docker), refer to the flashing information for this board. For a complete list of DRIVE platform supported boards, refer to the *DRIVE OS 6.0 Installation Guide*.

### ISliceLayer

The DRIVE OS supports ISliceLayer on DLA in TensorRT with the following Precision Modes, Configuration/Function combinations as detailed in table below, for each cell marked "Yes":

		A	B
		Precision Mode FP16	Precision Mode INT8
1	Slicing Operation	Yes	Yes

**Note:**

1. Dimensions to slice: given NCHW or NHWC data format, slicing operations are necessary in H (Height), W (Weight), and C (Channel) dimensions.
2. We can assume that indexing happens within a valid range, i.e.,  $0 \leq \text{the queried index} < \text{the size in each dimension} \leq \text{the limit in size in each dimension}$ .



## Fence Timestamping on iGPU

The DRIVE OS provides time stamping information associated with start and end of the processing tasks, on different Hardware Engines, with a minimum resolution of 1 us.

## JTAG Debug Capability for FSI FW

The DRIVE OS provides documentation guidance for JTAG debug capability of FSI FW (Firmware), specifying

1. Supported debugger
2. iSystem only support (for more information, see the Debugger User Guide PDF in the FSI PDK package for 6.0.4.0)
3. Physical connections setup for the reference platform
4. Procedure to load FSI FW

## Build-Kit support DRIVE OS RFS Generation

The DRIVE OS provides a uniform Build-FS solution for generating custom root file system (RFS/IFS).

## Enable SoC Logging to Persistent Storage

The DRIVE OS provides a unified framework to log system level events, UART prints, error codes onto persistent storage.

## Customer Fields in BR-BCT

The DRIVE OS provides a Guest OS library that allows customer applications to read Board-Specific Customer Data field in BR-BCT. The DRIVE OS provides a mechanism to update Board-Specific Customer Data field in BR-BCT via Flashing Scripts for the following types.

Sl No	Fields
1	SKU ID
2	SKU Version
3	Board ID
4	Board Revision
5	Board Serial Number
6	2x Ethernet MAC ID

## Readable Unique ID (ECID) to Software on All Guest OSes

The DRIVE OS restricts read access of the Exclusive Chip Identification (ECID) to only those users who need it for their functionality. The DRIVE OS provides API to read the ECID in Guest OS.

## Ethernet Interface Concurrent Timestamp API

The DRIVE OS provides an interface to report concurrent time values, as maintained in hardware timestamps, for Orin 1G(EQoS) and 10G(MGBE) Ethernet Controllers with minimal read delay possible.

**Note:** This is applicable to all the 10G(MGBE) Orin Ethernet Controller Interfaces.

## Option to Enable Encryption for All Boot Images in the Bootchain

The DRIVE OS supports the Confidentiality of Secure Boot Binaries stored in External Non-Volatile Memory. If secure boot is enabled, the image is encrypted at image creation time and decrypted by bootloaders after loading.

## sMCU Fan Control

The DRIVE OS provides a mechanism to send SOC thermal information from Orin to MCU over Ethernet/VLAN200. The DRIVE OS supports Fan Control for DRIVE AGX Orin Platforms on the external Safety MCU, using thermal sensor information received from Orin over Ethernet.

**Note:** This is meant for Orin Fan only, other Fans on the platform would have Fan control solely executed on safety MCU without any involvement of Orin.

## cuDLA as a Backend for TensorRT

The DRIVE OS provides a CUDA Programming based DLA backend for TensorRT, to enable a unified model based for inference programming.

## Support for Fixed ROI Stats from ISP

The DRIVE OS supports the use of a fixed ROI, set during init-time per camera, when calculating the necessary image statistics for exposure control and ISP pipeline processing.

## Support eMMC Discard Command

The DRIVE OS supports discard command as part of mNAND library for eMMC device.

## Power Profile Support for TA979SA on 3710-A01-CT02

NVIDIA delivers qualified clock settings for TA979SA SoC in 6.0.4.0. Customers using this SoC can update their clock setting.

## NV\_OEM\_KEY2

NV\_OEM\_KEY2 was not available for key derivation in 6.0.3.1. In 6.0.4.0, it has been updated to support key derivation using SP800-108-Counter-KDF-HMAC-SHA256 scheme.

The two (2) keys (NV\_OEM\_KEY1 and NV\_OEM\_KEY2) are derived from OEM\_KDK0 using the same SP800-108-Counter-KDF-HMAC-SHA256 scheme. They are different in the sense that the label and context used to derive these keys from OEM\_KDK0 is different. While NV\_OEM\_KEY1 is the same for all devices, NV\_OEM\_KEY2 is a device-specific key as Exclusive Chip ID (ECID), which is unique to each device used as context for the derivation of this key. Use NV\_OEM\_KEY1 for generic use cases and NV\_OEM\_KEY2 for device-specific use cases.

## Macsec

Macsec is enabled and the MTU is reduced by 34 bytes to accommodate SECTag, ICV, and MACSEC frame type. If you set an MTU of 2000, you will see the MTU set as 1966.

## Security Service Token/Persistent Keys

Starting with the 6.0.4.0 release, token key changes are not written to secure storage immediately. Instead, they are saved when the single R/W session is closed (via C\_CloseSession, C\_CloseAllSessions or C\_Finalize). You may experience a delay when the R/W session is being closed, as write to secure NOR is occurring. The token keys can be used within the single R/W session as usual before the writing happens. However, it is recommended to close the single R/W session once all token key modifications have taken place to ensure that they have been written.

The token keys written to the secure NOR are associated with Token ID 2 in the 6.0.4.0 release of DRIVE OS. In future releases of DRIVE OS support multiple tokens, the existing token keys on the secure NOR will be part of a token with ID 2. The access controls of the Token ID 2 will be applicable for these token keys.

Any wrapped for provisioning using offline tool prior to 6.0.4.0 fails to be unwrapped, both because of base key for unwrapping key derivation change and because the Token ID is not set. If no token field is set in the wrapped AAD field, that wrapped key now becomes a session object rather than a token object.

This behavior is subject to change in a future release.

## New Features for TensorRT 8.4.11

This release includes support for these new features and enhancements.

- Sparse convolution support for FP16 and INT8 precision
- Less strict version checking for serialized engine plan files

### Sparse Convolution Support

This release supports sparse convolutions for weights that satisfy certain requirements. Convolutions must be FP16 or INT8 precision and use weights that satisfy the requirements from Developer Guide: Sparsity. To enable sparse convolution support, make sure to set the `kSPARSE_WEIGHTS` flag in the builder config and make sure that kFP16 and/or kINT8 modes are enabled.

In safe engines, only some convolution kernels support structured sparsity. In addition, there are some limitations on kernel sizes and padding sizes supported for convolution with structured sparsity. The product of kernel size must be less than or equal to 32, and the product of padding sizes must be less than or equal to 32. If a kernel is not found that supports structured sparsity in the given configuration, then a normal non-sparse kernel will be used. Kernels that support structured sparsity are expected to have higher performance.

### TensorRT Standard Build

The TensorRT 8.4 release includes changes to the standard builder and runtime that appear in TensorRT for DRIVE OS 6.0. For more information, refer to the [TensorRT 8.4.1 Release Notes](#).

### Documentation Changes

The TensorRT 8.4.11 documentation has been updated accordingly:

- The *NVIDIA DRIVE OS 6.0 TensorRT 8.4.11 Developer Guide* is based on the enterprise TensorRT 8.4.x release. We have modified the TensorRT 8.4.x Developer Guide documentation for DRIVE OS 6.0.4 accuracy. The TensorRT safety content has been removed.

The TensorRT safety content is located in the *NVIDIA DRIVE OS 6.0 Safety Developer Guide*. Refer to this PDF for all TensorRT safety specific documentation.

## New Features in DriveWorks 5.6

- ▶ System Task Manager
  - cuPVA scheduling support
- ▶ Image Processing
  - PVA Tracker, Dectector, ORB descriptor integration.
  - The stereo rectifier has been improved so the principal point caluculation is more precise. User can expect its value to change compared to previous versions.

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# Fixed Issues

The following DRIVE OS issues from the previous release are resolved in this release:

Feature	Module	Description
3614780	Camera Core	<b>What is the issue?</b> Documentation to disable FSI support is missing in the 6.0.3.1_ED release. <b>How does it impact the customer?</b> Use the documentation below to disable FSI support. <b>If there is a workaround, what is it?</b> Disable FSI for DRIVE AV PCT by modifying profile makefiles. Add the following in profile makefiles to disable FSI. <code>ENABLE_FSI := n</code> For information on which profile makefile to modify for different PCTs, refer to the Profile Makefile section in the customer documentation. <b>Is it for SDK/PDK?</b> All.
3643521	NvSciIPC	BOOT FAILRUES seen on ToT due to kernel panic related to NVGPU.
3653610	DRIVE Update	<b>What is the issue?</b> DRIVE Update is hard coding a sector size of 512 bytes, causing issue to process GPT partitions in devices using 4096 bytes sector size <b>How does it impact the customer?</b> DRIVE Update is unable to process customized GPT partition created at UFS devices. <b>If there is a workaround, what is it?</b> N/A <b>Is it for SDK/PDK?</b> All
3465342	MCU Firmware	<b>What is the issue?</b> OVLF fault is getting reported for rail - VDD_CV for the configured threshold value 1.160mV <b>How does it impact the customer?</b> The customer get VMON error notification due to this fault. This violates safety norms of voltage monitoring

		<p><b>If there is a workaround, what is it?</b> N/A</p>
3466065	MCU Firmware	<p><b>What is the issue?</b> VRS12 does power-up sequence verification of rails during power on. The power-up sequence of rails is not consistent for every power-up cycle, thus leading to intermittent fault during power-up sequence verification.</p> <p><b>How does it impact the customer?</b> The customer gets VRS12 power-up sequence failures during board power-on. This breaks voltage monitoring safety recommendations.</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>When can we expect the fix?</b> 6.0.5.0</p> <p><b>Is it for SDK/PDK?</b> All.</p>
3597626	FSI	<p><b>What is the issue?</b> After closing nvsipl_camera application, repeated HW errors are reported from VI error collator with high frequency at de-init phase. These error reports interrupts FSI and errors are processed and notified to system error handler on FSI. High frequency of error reports from VI error collator leads to increased FSI interrupt load which might disrupt normal task execution and we see OS crash on FSI.</p> <p><b>How does it impact the customer?</b> FSI OS crashes and FSI stops responding to Spi Master packet request from MCU, this leads to E2E error spews on MCU console.</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>Is it for SDK/PDK?</b> All</p>
3470744	Graphics	<p><b>What is the issue?</b> Corruption will be observed on buffers that are flipped by Weston clients to Weston via eglSwapBuffers.</p> <p><b>How does it impact the customer?</b> Customers will observe corruption on graphics applications that call eglSwapBuffers (EGL/GL).</p> <p><b>If there is a workaround, what is it?</b> The corruption is observed only when Weston assigns the graphics applications to overlays.</p>

		<p>As a WAR, forcing Weston to use gl-composition by setting WESTON_FORCE_RENDERER=1 will result in the correct content being rendered on display.</p> <p><b>Is the Issue part of SDK/PDK?</b> Linux Standard</p>
3512913	Graphics	<p><b>What is the issue?</b> Vulkan graphics applications on DRIVE OS Linux with raytracing support fail to run.</p> <p><b>If there is a workaround, what is it?</b> N/A</p>
3515496	Kernel	<p><b>What is the issue?</b> SC7 resume fails on the OEM Production fuse board when encryption is enabled.</p> <p><b>How does it impact the customer?</b> You are not able to exercise SC7 on the OEM Production fuse board if encryption is enabled. On normal board, SC7 works properly.</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>Is it for SDK/PDK?</b> Standard SDK/PDK.</p>
3551548	Connectivity	<p><b>What is the issue?</b> marvel phy firmware is not updated which is required for mgbe0 interface on the Orin board</p> <p><b>How does it impact the customer?</b> MGBE0 Interface link will not work</p> <p><b>If there is a workaround, what is it?</b> Fix is, update the firmware provided in BSP</p> <p><b>Is it for SDK/PDK?</b> Both.</p>
3558311	Display	<p><b>What is the issue?</b> The mouse cursor cannot move on the physical display connected to the target board. This affects any use case that uses the mouse cursor, such as Ubuntu desktop.</p> <p><b>If there is a workaround, what is it?</b> With VNC display, the mouse cursor still moves on the virtual display, but there is no workaround for the physical display monitors that are connected to the board.</p> <p><b>Is it for SDK/PDK?</b> Linux SDK</p>

3582439	Virtualization	<p><b>What is the issue?</b></p> <p>Resources are being assigned to Guest VM0 incorrectly. Because of this, you hit a CBB error from Hypervisor context.</p> <p><b>How does it impact the customer?</b></p> <p>Customer will see the following CBB error being reported in the Hypervisor console and logs, also to the HSM.</p> <pre>CBB2.0 ERR: FIREWALL_ERR - Attempt to access a region that is firewall protected</pre> <p><b>If there is a workaround, what is it?</b></p> <p>N/A</p> <p><b>Is it for SDK/PDK?</b></p> <p>Linux both SDK and PDK.</p>
3588727	TOS	<p><b>What is the issue?</b></p> <p>Boot failure seen with RSA3K / EDDSA fused boards because of resource contention issue seen at TZVault.</p> <p><b>How does it impact the customer?</b></p> <p>Customers cannot proceed with their development as there is a boot failure.</p> <p><b>If there is a workaround, what is it?</b></p> <p>NVIDIA has a WAR that needs to be patched on top of embedded/6.0.3.0 in &lt;top&gt;/drive-foundation/platform-config/hardware/nvidia/platform/t23x/automotive/pct/:</p> <pre>diff --git a/driver_av/guest_config.h b/driver_av/guest_config.h index f1cd5b4..49e98b1 100644 --- a/driver_av/guest_config.h +++ b/driver_av/guest_config.h @@ -678,7 +678,7 @@  .mempool_id = 0xffffffff,  },  //! [capture example2]  - .boot_delay = 0,  + .boot_delay = 1800,  .hsp.hsp_inst[TOP_HSP_0] = {  /* Mailbox Pair 0-1  * 4 - SCE -&gt; CCPLX @@ -957,6 +957,7 @@  .mempools = RESOURCE_POOL(88, 1),  },  },  + .boot_delay = 900,  .sysmgr_cfg = {  .lazy_boot_ack_flag = 0,</pre>



		<p>} ,</p> <p><b>Is it for SDK/PDK?</b> All</p>
3614365	DRIVE Update	<p><b>What is the issue?</b> Special steps are required to update from 6.0.2.0 to 6.0.3.0 using sample_driveupdate.</p> <p><b>How does it impact the customer?</b> You must follow the steps if sample_driveupdate was used to update.</p> <p><b>If there is a workaround, what is it?</b>  <ol style="list-style-type: none"> <li>1. Generate the 6.0.3.0 dupkg via 6.0.2.0 dupkg tool.</li> <li>2. scp 6.0.3.0 dupkg to the target.</li> <li>3. Use 6.0.2.0 content_server and 6.0.2.0 sample_driveupdate with the following commands to update inactive chain to 6.0.3.0:  <pre>./content_server &lt;package&gt; &amp; ./sample_driveupdate -i /gos-a/content/files</pre> </li> <li>4. After reboot, use 6.0.3.0 content_server, 6.0.3.0 sample_driveupdate with following commands to continue the deployment:  <pre>./content_server &lt;package&gt; &amp; ./sample_driveupdate -p /gos-a/content/files</pre> </li> </ol> </p> <p><b>Is it for SDK/PDK?</b> All</p>
3620931	DRIVE Update	<p><b>What is the issue?</b> Structure define of DUTR_IVC_PARAM has been removed in dutransport.h</p> <p><b>How does it impact the customer?</b> Customer would need to update their source code and re-compile on top of new PDK.</p> <p><b>If there is a workaround, what is it?</b> Need to change from DUTR_IVC_PARAM to DUTR_NVSCI_PARAM, name parameter needs to be changed to ep[0]</p>
3623406	System Software	<p><b>What is the issue?</b> Yocto fails to build with Driveworks enabled due to mismatch in a patch file</p> <p><b>How does it impact the customer?</b> Users who build Yocto with DWs enabled will face the build issue. Yocto without DWs enabled builds successfully</p> <p><b>If there is a workaround, what is it?</b> Yes. Yocto Driveworks samples recipe can be modified to fix the build failure:  Edit file : &lt;top&gt;/drive-linux_src/yocto/layers/meta-drive-samples/recipes-nv-samples/driveworks/driveworks-samples.bb  <ol style="list-style-type: none"> <li>1. Delete the line under SRC_URI "file://0001-fix-yocto-build.patch \"</li> <li>2. Add below task in the recipe (e.g., before "do_compile" line):</li> </ol> <pre>do_configure() {     sed -i 's/dwchannel//g' \${S}/samples/CMakeLists.txt</pre> </p>

		<pre>sed -i 's/cgf_nodes//g' \${S}/samples/CMakeLists.txt }</pre>
3623911	Software	<p><b>What is the issue?</b> USB device is not getting detected/enumerated on type A ports (both). This is an intermittent issue.</p> <p><b>How does it impact the customer?</b> On some boards, USB device is not getting detected/enumerated on type A ports.</p> <p><b>If there is a workaround, what is it?</b> Type C USB port is working for all boards.</p> <p><b>Is it for SDK/PDK?</b> Linux Standard SDK/PDK</p>
3592188	TensorRT safety samples	<p>Safety samples are provided in the Standard+Proxy package and are built from there. When building for QNX using static linking, the static libraries used were previously from Proxy and were thus the Proxy Runtime which was sometimes showing unexpected behavior.</p> <p>This release includes more detailed build instructions and build options to handle static linking without need for manual edits to build scripts.</p>
3602138	DriveWorks	Initialize/release dwFrameCapture in loop leads system to run out of memory.
3597225	DriveWorks	Video exporter & header-dump tool dumps Segmentation Fault while exiting.
200782352	DriveWorks	LRAW Preview Extraction Tool fails.
3605267	DriveWorks	sample_cgf_dwchannel is failing for hybrid inter-process, inter-chip scenario and sync_mode p2c and its giving segmentation fault.

## NVIDIA Software Security Updates

This release of NVIDIA DRIVE OS 6.0 Linux includes updates that address the following issue[s]:

CVE ID	NVIDIA Issue Number	Description
CVE-2020-13844	3521043	Arm Armv8-A core implementations utilizing speculative execution past unconditional changes in control flow may allow unauthorized disclosure of information to an attacker with local user access via a side-channel analysis, aka "straight-line speculation".
CVE-2022-23960	3566972	Computer systems with microprocessors utilizing speculative execution and indirect branch prediction, contain a cache speculation vulnerability known as Branch History Injection (BHI) or Spectre-BHB, where an attacker with local user access who performs a complex Spectre v2 style attack but using the shared branch history, may be able to infer sensitive information causing information disclosure.
CVE-2022-23960	3567284	Computer systems with microprocessors utilizing speculative execution and indirect branch prediction, contain a cache speculation vulnerability known as Branch History Injection (BHI) or Spectre-BHB, where an attacker with local user

		access who performs a complex Spectre v2 style attack but using the shared branch history, may be able to infer sensitive information causing information disclosure.
CVE-2019-14067	3588117	NVIDIA DRIVE OS contain a vulnerability in TZVault's memory comparison module, where an Observable Timing Discrepancy, may allow an unprivileged attacker with physical access to inference limited sensitive information.
Not Assigned	3591341	NVIDIA DRIVE OS contain a vulnerability in the Hypervisor Kernel for Automotive SMMU, where failure to validate the ending IPA of an allocation, may allow a local attacker to cause loss of Confidentiality.
CVE-2022-23960	3592037	Computer systems with microprocessors utilizing speculative execution and indirect branch prediction, contain a cache speculation vulnerability known as Branch History Injection (BHI) or Spectre-BHB, where an attacker with local user access who performs a complex Spectre v2 style attack but using the shared branch history, may be able to infer sensitive information causing information disclosure.

For more information about NVIDIA's vulnerability management, refer to the [NVIDIA Product Security](#) page.

## Third-Party Software Security Updates

This release of NVIDIA DRIVE OS 6.0 Linux includes updates that address the following issue(s):

CVE ID	Description
CVE-2020-26555	NVIDIA Linux distributions contain a vulnerability in a Bluetooth BR/EDR PIN Pairing procedure, where Improper Authorization may permit an unauthorized nearby device to complete pairing without knowledge of the PIN, which may lead to loss of Confidentiality and/or Integrity Impact.

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# Known Limitations

The following sections describe known limitations in this release.

Feature	Module	Description
Yocto	DriveWorks	DriveWorks is not updated in Yocto.
DLA	TensorRT	DLA standalone mode does not support mixed precision.
DLA	TensorRT	DLA is not supported through the TensorRT safety runtime. The DLA loadables for standard and safety can be consumed by the cuDLA runtime and the NvMedia runtime.
DLA	TensorRT	When running on DLA, various layers have restrictions on supported parameters and input shapes. Some existing limitations for the convolution, fully connected, concatenation, and pooling layers were newly documented in this release. See the <i>DLA Supported Layers</i> section in the <i>NVIDIA DRIVE OS 6.0 TensorRT 8.4.11 Developer Guide</i> for details.
DLA	TensorRT	When running INT8 networks on DLA using TensorRT, operations must be added to the same subgraph to reduce quantization errors across the subgraph of the network that runs on the DLA by allowing them to fuse and retain higher precision for intermediate results. Breaking apart the subgraph in order to inspect intermediate results by setting the tensors as network output tensors, can result in different levels of quantization errors due to these optimizations being disabled.
DLA	TensorRT	<p>There are two modes of softmax where the mode is chosen automatically based on the shape of the input tensor, where:</p> <ul style="list-style-type: none"><li>the first mode triggers when all non-batch, non-axis dimensions are 1, and</li><li>the second mode triggers in other cases if valid.</li></ul> <p>The second of the two modes is supported only for DLA 3.9.0 and later. It involves approximations which may result in errors of a small degree. Also,</p>

		batch size greater than 1 is supported only for DLA 3.9.0 and later. Refer to the <i>DLA Supported Layers</i> section in the <i>NVIDIA DRIVE OS 6.0 TensorRT 8.4.11 Developer Guide</i> for details.
Layers	TensorRT	For a list of safety-specific layer limitations, refer to the <i>Layer Limitations In GPU Safety Restricted Mode</i> section in the <i>NVIDIA DRIVE OS 6.0 Safety Developer Guide</i> .
I/O Formats	TensorRT	<p>When using reformat-free I/O, the extent of a tensor in a vectorized dimension might not be a multiple of the vector length. Elements in a partially occupied vector that are not within the tensor are referred to here as <i>vector-padding</i>. For example:</p> <ul style="list-style-type: none"> <li>• On GPU <ul style="list-style-type: none"> <li>○ for input tensors, the application shall set vector-padding elements to zero.</li> <li>○ for output tensors, the value of vector-padding elements is undefined. In a future release, TensorRT will support setting them to zero.</li> </ul> </li> <li>• On DLA <ul style="list-style-type: none"> <li>○ for input tensors, vector-padding elements are ignored.</li> <li>○ for output tensors, vector-padding elements are unmodified.</li> </ul> </li> </ul>
Safety samples	TensorRT	We cannot use <code>-Xcompiler -Wno-deprecated-declarations</code> options for safety samples; that is a standard certified option. We only add it for standard builds. Seeing the deprecated warnings during the build is expected for this case.
Execution context	TensorRT	Currently, the total execution context memory size is limited to 2 GiB due to internal safety constraints. This restriction is expected to be relaxed in a future release.

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# Known Issues

**Note:** DriveWorks samples that provide GUIs/visualization are crashing when executed in Docker container due to host display not being accessible for the Docker container.

These are issues discovered during development and QA and are scheduled to be resolved in a future release.

Feature	Module	Description
3750024	AURIX	<b>What is the issue?</b> Occasionally SDKManager Flashing step will fail due to garbled control messages between the host and target device. <b>How does it impact the customer?</b> Flashing will fail. <b>If there is a workaround, what is it?</b> Customer needs to restart flashing process. <b>When can we expect the fix?</b> 6.0.5.0 <b>Is it for SDK/PDK?</b> Both.
3726479	Kernel	<b>What is the issue?</b> When USB device is connected, SC7 resume fails. <b>How does it impact the customer?</b> If customer is connecting USB device to the board, then SC7 suspend/resume will not work. <b>If there is a workaround, what is it?</b> In 6.0.4.0 MCU firmware, after Orin enter SC7 the PREREG power is turned-off by pulling VBAT_SOC_ENA and SOC_PREREG_PWRON pins LOW from the MCU. If suspend-resume cycle is required with USB device the MCU should just put the Orin power regulators in SLEEP mode but should not turn-off the PREREG power. The VBAT_SOC_ENA and SOC_PREREG_PWRON should be driven HIGH from the MCU even when Orin is in SC7 mode. <b>When can we expect the fix?</b> Root cause analysis of why USB device is causing resume failure when PREREG is turned-off is still not concluded.

		<p>Expected fix date will be updated after root-cause analysis.</p> <p><b>Is it for SDK/PDK?</b> All.</p>
3722779	AURIX	<p><b>What is the issue?</b> SC7 exit fails intermittently on a few boards.</p> <p><b>How does it impact the customer?</b> Customers may see SC7 exit failure intermittently and need to perform aurixreset to recover from SC7 state.</p> <p><b>If there is a workaround, what is it?</b> No</p> <p><b>When can we expect the fix?</b> Not root caused. Contact NVIDIA support with the detailed logs if you see this issue.</p> <p><b>Is it for SDK/PDK?</b> This is for all versions of SDK/PDK.</p>
3679516	DRIVE Update	<p><b>What is the issue?</b> Unexpected closing sample_driveupdate/content_server; other modules in VM print errors about being unable to connect to closed plugins.</p> <p><b>How does it impact the customer?</b> If you press ctrl+c to end the sample_driveupdate/content_server, you may see errors similar to: [ERR][dutr_nvsci.c:dutrTxBufNvSci:1434]Handle Id 0x110005: Error 0x22 on NvSciIpcWrite [ERR][dulink_remote_helpers.c:dulinkTxMsg:438]Reach maximum retry count</p> <p><b>If there is a workaround, what is it?</b> You can send abort to DU to cancel the deployment.</p> <p><b>When can we expect the fix?</b> 6.0.5.0</p> <p><b>Is it for Standard/Safty, SDK/PDK?</b> All</p>
3730015	Filesystem	<p><b>What is the issue?</b> The Aurix Firmware will not be updated on first boot after flashing on upgrade to 6.0.4.0 from a previous release</p> <p><b>How does it impact the customer?</b> Additional features/bug fixes for the 6.0.4.0 Aurix FW vs. previous versions will not be available.</p> <p><b>If there is a workaround, what is it?</b> After flashing execute the following: <b>Target:</b> \$ sudo rm -rf /persistent/driveos/security/etc/systemd/</p> <p><b>Host Aurix Console:</b> NvShell&gt; tegrareset</p>

		<p><b>When can we expect the fix?</b> 6.0.5.0</p> <p><b>Is it for SDK/PDK?</b> All.</p>
3741367	Bootburn	<p><b>What is the issue?</b> flash_bsp_images.py fails with -x option.</p> <p><b>How does it impact the customer?</b> With flash_bsp_images.py , you cannot flash on a target if not in recovery mode and cannot find the board with "--find_board_name" option, as find_board option needs the -x option.</p> <p><b>If there is a workaround, what is it?</b> For flashing with flash_bsp_images.py , you must set the Tegra in recovery mode.</p> <p><b>When can we expect the fix?</b> 6.0.5.0</p> <p><b>Is it for SDK/PDK?</b> All.</p>
3535820	Security	<p><b>What is the issue?</b> FSI does not have access to EMC registers for -</p> <ul style="list-style-type: none"> <li>• Enabling DRAM uncorrected error reporting</li> <li>• Reading bad page information and handling DRAM uncorrected errors</li> </ul> <p><b>How does it impact the customer?</b> DRAM ECC uncorrected error cannot be handled , system continues to operate with DRAM ECC uncorrected error which is unsafe.</p> <p><b>If there is a workaround, what is it?</b> No workaround available for this issue.</p> <p><b>When can we expect the fix?</b> 6.0.5.0</p> <p><b>Is it for SDK/PDK?</b> All</p>
3724465	Bootburn	Intermittent flash failure observed.
3730926	Security	11 sub-tests of PKCS#11 test suite fail on ODM fused board.
3728354	NvMedia	ABI compatibility issue.
3719548	DRIVE Update	Deploy fails due to decomp persistent storage not being cleared and old data.
3726584	Bootburn	Boot to chain B fails after fuse programming and is unable to recover with aurixreset.
3712840	Connectivity	<p><b>What is the issue?</b> With tegraset or aurix reset, the Guest VM log in the serial console stops at: pl:[I]: jumping to kernel at 0x80200000 (virtual 0x80000000)</p> <p><b>How does it impact the customer?</b> Serial console cannot be accessed on the case where issue is seen.</p> <p><b>If there is a workaround, what is it?</b> Retry the tegraset or aurixreset.</p>



		<b>When can we expect the fix?</b> 6.0.5.0 <b>Is it for SDK/PDK?</b> All
3711431	Video	Support for rgba and argb format for nvm_ijpd_sci.
3711131	Camera Core	Nvsipl_camera application reports error when run with control plugin:1.
3710589	Camera Core	<b>What is the issue?</b> Frame Discontinuities are observed when using are observed when running nvsipl_camera sample application with more than 2 IMX728 camera modules (8 MP) with display enabled under following condition 3 ISP outputs are enabled simultaneously (none of the --disableISP0Output, --disableISP1Output or --disableISP2Output are specified) <b>How does it impact the customer?</b> Customer can only use 2 ISP outputs from each camera for display when using 3 or more 8MP cameras <b>If there is a workaround, what is it?</b> No <b>When can we expect the fix?</b> To be determined. <b>Is it for SDK/PDK?</b> Issue is observed on Embedded Linux AV+L PDK/SDK.
3709049	FSI	Fabric error spews observed on demo reference firmware V 1.3.0 and V 1.3.1
3708327	Yocto	Starting Weston throws drm-backend.so undefined symbol error.
3704449, 3727638	SDK Manager	<b>What is the issue?</b> Sometimes when user tries to install CUDA or DriveWorks on host, apt command reports "Hash sum mismatch" error. This is an intermittent issue that is not easily reproduced. <b>How does it impact the customer?</b> Customer will not be able to proceed with the installation of DRIVE OS 6.0.4 with SDKM tool, with this error. <b>If there is a workaround, what is it?</b> Retry installation. <b>When can we expect the fix?</b> Unknown. This ppears to be an Ubuntu issue and not related to NVIDIA packages. <b>Is it for SDK/PDK?</b> All.
3698885	Video	<b>What is the issue?</b> The system mLockTimeout will occur during the Decoding process for all those frames where Decoding time > mLockTimeout. For High Bitrate streams (mostly of 8K resolution), which do not decode in real time, the Decode Time may exceed the NVDEC mLocktimeout set. Hence certain streams that can't decode in real time due to very High Bitrate, may fail during Decoding on (AV +Q) and (AV + L) platforms . <b>How does it impact the customer?</b> Decoding of streams encoded in a High resolution (like 8k) with very high bitrates may fail

		<p><b>If there is a workaround, what is it?</b></p> <p>No</p> <p><b>When can we expect the fix?</b></p> <p>Will not fix.</p> <p><b>Is it for SDK/PDK?</b></p> <p>All.</p>
3664734	System Software	<p><b>What is the issue?</b></p> <p>DemoAppCom assumes that the current user (that is executing the app) is a member of the group nvfsicom,nvepl. The group nvfsicom already exists in the filesystem, but the membership is not. The permission occurs due to 2 reasons:</p> <p>Filesystem user account does not have nvfsicom,nvepl memberships preset.</p> <p>The instructions to execute DemoAppCom do not update the memberships of the user account before executing the app.</p> <p><b>How does it impact the customer?</b></p> <p>DemoAppCom fails to launch and reports permission denied.</p> <p><b>If there is a workaround, what is it?</b></p> <p>The workaround is to update the current user account's membership using the command below, reboot the system and launch the application DemoAppCom.</p> <pre>\$ sudo usermod -aG nvfsicom,nvepl &lt;user&gt;</pre> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>Standard and SDK.</p>
3664337	System Software	<p><b>What is the issue?</b></p> <p>DemoAppCom assumes that the current user (that is executing the app) is a member of the group nvfsicom,nvepl. The group nvfsicom already exists in the filesystem, but the membership is not. The permission occurs due to 2 reasons:</p> <p>Filesystem user account does not have nvfsicom,nvepl memberships preset.</p> <p>The instructions to execute DemoAppCom do not update the memberships of the user account before executing the app.</p> <p><b>How does it impact the customer?</b></p> <p>DemoAppCom fails to launch and reports permission denied.</p> <p><b>If there is a workaround, what is it?</b></p> <p>WAR is to update the current user account's membership using the command below, reboot the system and launch the application DemoAppCom.</p> <pre>\$ sudo usermod -aG nvfsicom,nvepl &lt;user&gt;</pre> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>SDK.</p>
3727547	BPMP	<p>Safe shutdown timeout happens in simulated safe poweroff MCU shell command (fails on P3663, but PASS on P3710).</p>
3646829	AURIX	<p><b>What is the issue?</b></p> <p>On P3663 board with AV+L, due to ethernet de-initialization timing, Safe Shutdown acknowledgment is not received from Orin to MCU when safe shutdown is performed</p>

		<p>using command poweroff and aurixreset command . Thus, poweroff and aurixreset sequence completes only on a safe shutdown timeout.</p> <p><b>How does it impact the customer?</b></p> <p>Safeshutdown failure is seen on Orin, and poweroff and aurixreset always completes on safeshutdown timeout at MCU side. However, safeshutdown works with the tegraret command.</p> <p><b>If there is a workaround, what is it?</b></p> <p>N/A</p> <p><b>When can we expect the fix?</b></p> <p>Fix is ready and it will be delivered as a patch or in the next release 6.0.5.0.</p> <p><b>Is it for SDK/PDK?</b></p> <p>All.</p>
3626664	Safety Services	Additional error is getting injected and reported on injecting PSC_CLUSTER_CE fault (errorcode: 0x2e4e) on FSI and AURIX.
3698410	Camera Core	Errors observed while nvsipl_camera is launched the first few times.
3609001	IST	Increase ist-clk freq for production KIST.
3609001	IST	<p><b>What is the issue?</b></p> <p>Some KeyIST configuration values are not POR value.</p> <p><b>How does it impact the customer?</b></p> <p>The KeyIST diagnostic may run longer the POR KPIs.</p> <p>In very rare conditions, the diagnostic may report a false failure.</p> <p><b>If there is a workaround, what is it?</b></p> <p>No workaround.</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>All</p>
3734112	DRIVE Update	<p><b>What is the issue?</b></p> <p>DUPKG tool errors out when provided an absolute path for the "--out" argument.</p> <p><b>How does it impact the customer?</b></p> <p>Customer will not be able to generate the package if an absolute path is provided to "--out" argument</p> <p><b>If there is a workaround, what is it?</b></p> <p>Workaround is to provide a relative path for "--out" argument</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>All</p>
3698410	Camera Core	<p><b>What is the issue?</b></p> <p>After starting nvsipl_camera application, 1 - HW error (Code - 0x28b6) is reported from VI error collator . These error reports interrupts FSI and errors are processed and notified to system error handler on FSI.</p> <p><b>How does it impact the customer?</b></p>

		<p>Error is seen by customer, but there is no functional impact, happens only first few times after boot, quality and throughput of images are not impacted in runtime.</p> <p><b>If there is a workaround, what is it?</b> No workaround. Error is not seen after 2 runs.</p> <p><b>When can we expect the fix?</b> Debugging is in progress. The projected fix date is by 6.0.5.0 release.</p> <p><b>Is it for SDK/PDK?</b> PDK.</p>
3465334	MCU Firmware	<p><b>What is the issue?</b> VRS12 does power-down sequence verification of rails during power off. The power-down sequence of rails is not consistent for every power-off cycle, thus leading to intermittent fault during power-off sequence verification.</p> <p><b>How does it impact the customer?</b> The customer gets VRS12 power-down sequence failures during power-off. This breaks voltage monitoring safety recommendations</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>Is it for SDK/PDK?</b> All</p>
3626664	Safety Services	<p><b>What is the issue?</b> The security settings of error collators in PSC are set up such that only PSC could access the same. This is an exception to Global Rule that all Error Collators shall be accessible only by FSI.</p> <p>During Fault injection testing, when an error is injected FSI SW attempts to access Error Collators in PSC and Crashes with an illegal access exception.</p> <p>The Affected Fault names related to ECs in PSC are:</p> <p>PSC_CLUSTER_UE PSC_SE_UE PSC_DMA_UE PSC_FABRIC_UE PSC_AON_UE PSC_SE_CE PSC_DMA_CE PSC_CLUSTER_CE PSC_FABRIC_CE PSC_AON_CE PSC_FABRIC_AON_UE PSC_FABRIC_AON_CE CAR_PSC_UE PADCTL_PSC_G8_UE</p>

		<p><b>How does it impact the customer?</b></p> <p>Whenever there is an Error in PSC reported via Error Collators FSI would also have an exception. The customer will not be able to perform fault injection testing. However, SOC_ERROR would be asserted by HW which could be detected by MCU SW.</p> <p>MCU would also observe SPI E2E error as FSI would crash (@shubhamj to Confirm the same)</p> <p><b>If there is a workaround, what is it?</b></p> <p>No workaround in 6.0.4.0; a fix will be provided in 6.0.5.0.</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>All</p>
3694755	Safety Services	<p><b>What is the issue?</b></p> <p>In DOS-SHR-5980, HSI T23X-QSPI_HSIv2-3 has not yet been implemented. The HSI expects QSPI errors in PSC to be reported to the Safety Services SW in FSI.</p> <p><b>How does it impact the customer?</b></p> <p>Customers will not be able to receive QSPI errors in Safety Services SW in FSI.</p> <p><b>If there is a workaround, what is it?</b></p> <p>Errors are propagated back as return value along the calling sequence to the caller of DRIVE OS API.</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>All.</p>
3698885	Video	<p><b>What is the issue?</b></p> <p>The system mLockTimeout will occur during the Decoding process for all those frames where Decoding time &gt; mLockTimeout. For High Bitrate streams (mostly of 8K resolution), which do not decode in real time, the Decode Time may exceed the NVDEC mLocktimeout set. Hence certain streams that can't decode in real time due to very High Bitrate, may fail during Decoding on (AV +Q) and (AV + L) platforms .</p> <p><b>How does it impact the customer?</b></p> <p>Decoding of streams encoded in a High resolution (like 8k) with very high bitrates may fail</p> <p><b>If there is a workaround, what is it?</b></p> <p>No</p> <p><b>When can we expect the fix?</b></p> <p>WNF</p> <p><b>Is it for SDK/PDK?</b></p> <p>All</p>
3708327	Yocto	<p><b>What is the issue?</b></p> <p>Weston launch fails due to failure in loading drm-backend.so</p> <p><b>How does it impact the customer?</b></p>

		<p>Customers using Weston need to apply a patch and rebuild it.</p> <p><b>If there is a workaround, what is it?</b></p> <p>Weston source code is included in Drive OS Linux releases. Make the following edit in the Weston sources and rebuild.</p> <p>(Note: A Yocto drive-os-av-image build automatically includes a Weston build.)</p> <p>In the file 3rdparty/weston/libweston/meson.build, insert the following line into the "srcs_drm" list, under line 201:</p> <pre>'drm-hdr-metadata.c',</pre> <p>Then rebuild drive-os-av-image.</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>All.</p>
3709049	FSI	<p><b>What is the issue?</b></p> <p>Fabric Error Spews observed on FSI Console. This is due to memory access from FSI SW on Core 0 to address 0x60000030, without disengaging DBB Isolation.</p> <p>Due to this MCU receives error:</p> <pre>ErrCode-0x100c ReprId-0xe00e</pre> <pre>ErrCode-0x100c ReprId-0x800e</pre> <p><b>How does it impact the customer?</b></p> <p>No functional Impact, just error spews are observed on the FSI &amp; MCU console.</p> <p><b>If there is a workaround, what is it?</b></p> <p>No</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>All</p>
3709711	Camera Core	<p><b>What is the issue?</b></p> <p>The SIPL and FuSa UMD libraries may emit Capture Status Timeout error logs at Deinitialization, if the StopModule API is implemented for the sensor driver.</p> <p><b>How does it impact the customer?</b></p> <p>The Capture Status Timeout error logs are benign and do not have any safety impact.</p> <p><b>If there is a workaround, what is it?</b></p> <p>The Capture Status Timeout logs can be ignored, they emitted by user-mode applications and are not reported to the SEH.</p> <p><b>When can we expect the fix?</b></p> <p>The issue with the Capture Status Timeout error logs will be resolved for the Drive OS 6.0.5.0 release.</p> <p><b>Is it for SDK/PDK?</b></p> <p>The issue with the Capture Status Timeout error logs is present in all the above packages where the sensor driver implements the StopModule API.</p> <p><b>What is the issue?</b></p> <p>The StopModule API has not been implemented in the AR0820 and OV2311 sensor drivers. At Deinitialization, the sensors will not receive a command to gracefully stop streaming, and will instead continue transmitting data until the power is disabled.</p>

		<p><b>How does it impact the customer?</b></p> <p>The customer will see SEH error logs to the AURIX and CCPLX UART terminals due to CSI pixel data continuing to be transmitted to Tegra despite the capture pipeline(s) having already been arrested. SEH logs may be reported to the application.</p> <p><b>If there is a workaround, what is it?</b></p> <p>The client should ignore Camera capture-related SEH error logs after the Deinitialization API(s) are called..</p> <p><b>When can we expect the fix?</b></p> <p>The StopModule APIs will be implemented for the AR0820 and OV2311 sensor for the Drive OS 6.0.5.0 release, pending clarification with their vendors and testing.</p> <p><b>Is it for SDK/PDK?</b></p> <p>The issue affects the standard build for the AR0820 sensor and OV2311 sensor, for both the SDK and PDK for both sensors.</p>
3711131	Camera Core	<p><b>What is the issue?</b></p> <p>nvsipl_camera application reports error when run with command line option "--plugin 1"</p> <p>The error appears to be during SetExposure call in CDD which sets the new sensor exposure settings computed by auto control algorithm.</p> <p>"--plugin 1" exercises a custom auto control plugin implemented in the sample app and hence may result in different settings than the default auto control algorithm</p> <p><b>How does it impact the customer?</b></p> <p>If any customer is writing a custom auto control plugin, they may also see the failures.</p> <p><b>If there is a workaround, what is it?</b></p> <p>No workaround available as the issue is not root caused yet.</p> <p><b>When can we expect the fix?</b></p> <p>Investigation is in progress. Fix is expected to be in next release (6.0.5.0).</p> <p><b>Is it for SDK/PDK?</b></p> <p>All</p>
3711431	Video	<p><b>What is the issue?</b></p> <p>nvm_ijpd_sci application and the underlying IJPD driver does not support ARB and RGBA formats (that the deprecated nvmimg_jpgdec supported) in the 6.0.4.0 release.</p> <p><b>How does it impact the customer?</b></p> <p>ARGB and RGBA output formats will not be functional.</p> <p><b>If there is a workaround, what is it?</b></p> <p>Use the available YUV output formats.</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>SDK</p>
3719548	DRIVE Update	<p><b>What is the issue?</b></p>

		<p>DRIVE Update decompressor does not handle abort, calling abort during deploy would lock up decompressor if was used in deployment</p> <p><b>How does it impact the customer?</b></p> <p>Deployment with decompressor cannot be aborted.</p> <p><b>If there is a workaround, what is it?</b></p> <p>Do not use decompressor if planned to have abort support.</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>All</p>
3639779	Camera Core	<p><b>What is the issue?</b></p> <p>Link enable/disable feature does not work for GMSL1 camera.</p> <p><b>How does it impact the customer?</b></p> <p>This impacts the customers who use MAX96705 serializer in the camera module.</p> <p><b>If there is a workaround, what is it?</b></p> <p>N/A</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p>
3597381, 3687948	MCU	<p><b>What is the issue</b></p> <p>AXI CBB clock is running at rate above the maximum limit set by power workload profile.</p> <p><b>How does it impact the customer?</b></p> <p>Platform power consumption exceeds target grade (55W profile only).</p> <p>MCU Console will see the following error spew on boot (all power profiles):</p> <p>MCU_FOH: ErrReport: ErrorCode-0x28cb ReporterId-0xffff Error_Attribute-0x4c000008 Timestamp-0x4cc3bce</p> <p><b>If there is a workaround, what is it?</b></p> <p>N/A</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p>
200454454	Clocks	<p><b>What is the issue?</b></p> <p>Switching AXI CBB to PLLC2 (202 Mhz) as per POR causing (benchmark, memory etc) test failures.</p> <p><b>How does it impact the customer?</b></p> <p>You may see high CBB performance as it is on PLLP (405MHz) than as per POR (PLLC2/ -&gt; ~202MHz) for 55W profile.</p> <p>We are updating 105W Profile POR to be set to PLLP (405Mhz) so this is not an issue for 105W Profile</p> <p><b>If there is a workaround, what is it?</b></p> <p>No workaround in 6.0.3.1 release for 55W profile.</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>All</p>
3664355	Yocto	<p><b>What is the issue?</b></p>



		<p>Yocto tegra-initramfs-recovery build fails if the PDK packages are not installed.</p> <p><b>How does it impact the customer?</b></p> <p>Customers who install SDK-only debians and build Yocto tegra-initramfs-recovery image will hit a build failure. However, the Recovery initramfs is for the PDK package only, so requires PDK packages to be installed.</p> <p><b>If there is a workaround, what is it?</b></p> <p>Users with access to PDK debian packages (via NVOnline) may install those packages following the steps documented in the Developer's Guide, prior to launching the tegra-initramfs-recovery Yocto build.</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>All.</p>
3622118	Bootburn	<p><b>What is the issue?</b></p> <p>New DRIVE AGX Orin Devkit boards taken out of box may fail a new flashing process if you attempt to flash before the EULA is accepted on the Devkit.</p> <p><b>If there is a workaround, what is it?</b></p> <p>You can either 1) accept the EULA (and finish additional setup screens) and allow the board to boot to the prompt before attempting to flash a DRIVE OS build, or 2) use commands at the Aurix console to manually put the Tegra in Recovery mode and flash the Tegra device.</p> <p>For the second option, the commands are as follows:</p> <p>Connect to MCU console:</p> <pre>sudo minicom -w -D /dev/ttyACM1</pre> <p>From the MCU console:</p> <pre>tegrarecovery x1 on tegrareset x1</pre> <p>From the x86 Host DRIVE OS Install:</p> <pre>cd &lt;install_folder&gt;/drive-foundation make/bind_partitions -b p3710-10-a01 linux cd tools/flashtools/bootburn ./bootburn.py -b p3710-10-a04 -B qspi</pre> <p>Check the "Board Properties" section for the correct board names for both commands.</p> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p> <p><b>Is it for SDK/PDK?</b></p> <p>All</p>
3506785	System Software	<p><b>What is the issue?</b></p> <p>SOC_ERROR is asserted by ORIN due to errors in SOC. However, SOC_ERROR assertion is a decision by SEH and for SEH is only sample implementation, hence suggested</p>

		<p>customers to look for notification as primary expected results. SOC_ERROR Pin need not be monitored.</p> <p>However, all error notifications should be tracked.</p> <p><b>How does it impact the customer?</b></p> <p>Customer has to handle SOC_ERRORS in customers implementation of SEH decide SOC_ERROR Assertion.</p> <p><b>If there is a workaround, what is it?</b></p> <p>Customer needs to ignore the list of Errors in SEH implementation.</p> <p><b>When can we expect the fix?</b></p> <p>TBD</p> <p><b>Is it for SDK/PDK?</b></p> <p>All</p>
200765598	Virtualization	<p><b>What is the issue?</b></p> <p>Warm/Guest OS reboot (i.e., “sudo reboot”) not supported on AV+L/Linux platform for DRIVE OS 6.0/Orin</p> <p><b>How does it impact the customer?</b></p> <p>Customer is not able to use the traditional command to reboot the Linux Guest OS alone.</p> <p><b>If there is a workaround, what is it?</b></p> <p>Reboot the Hypervisor system using the Hypervisor reboot command from the Linux command line:</p> <pre>\$ sudo su \$ echo 1 &gt; /sys/class/tegra_hv_pm_ctl/tegra_hv_pm_ctl/device/trigger_sys_reboot</pre> <p><b>When can we expect the fix?</b></p> <p>6.0.5.0</p>
3591349	Docker	<p><b>What is the issue?</b></p> <p>With DRIVE OS 6.0, we have included the Docker runtime as part of the RFS and so Docker is now available in the Guest OS. However, the runtime is unable to access the internet.</p> <p><b>How does this impact the customer?</b></p> <p>The customer is unable to perform a subset of basic Docker-related actions such as pulling and pushing images.</p> <p><b>If there is a workaround, what is it?</b></p> <p>The workaround is to run apt-get install --no-install-recommends ca-certificates after flashing the system and before attempting to use Docker in the Guest OS.</p>

		<p><b>When can we expect the fix?</b> 6.0.5.0</p>
3562408	Camera Core	<p><b>What is the issue?</b> Frame drops are observed when running <code>nvsipl_camera</code> sample application with more than 2 IMX728 camera modules (8 MP) with display enabled under following conditions:</p> <ul style="list-style-type: none"> <li>• 4K display is connected</li> </ul> <p>-OR-</p> <ul style="list-style-type: none"> <li>• RAW output is enabled (<code>--enableRawOutput</code> command line option to <code>nvsipl_camera</code>)</li> </ul> <p><b>How does it impact the customer?</b> Customers may observe similar frame drops with their camera applications if they use a similar pipeline and have a 4K display connected with more than 2 camera modules of 8MP or higher.</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>When can we expect the fix?</b> No fix available as the use cases here likely exceeds the available memory/processing BW of VIC/display.</p> <p><b>Is it for SDK/PDK?</b> Linux AV+L</p>
3605893	Foundation	<p><b>What is the issue?</b> The KeyOn IST test always fails.</p> <p><b>How does it impact the customer?</b> Customer can only run KeyOff IST test.</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>When can we expect the fix?</b> 6.0.5.0</p>
200775377	System Software	<p><b>What is the issue?</b> PTP client connected to spruce port P7 fails to sync with PTP server due to known bug from Marvell switch firmware.</p> <p><b>How does it impact the customer?</b> Any sensor/device connected to spruce port P7 is not able to sync with PTP server.</p>

		<p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>When can we expect the fix?</b> The issue is being addressed with the vendor; resolution date is TBD.</p> <p><b>Is it for SDK/PDK?</b> All.</p>
3410375	Resource Manager	<p><b>What is the issue?</b> Intermittent deadlock in kernel nvhost driver during channel timeout recovery with virtualized nvhost-based engines.</p> <p><b>How does it impact the customer?</b> If the application is triggering timeouts on virtualized nvhost-based engines, nvhost could deadlock and effectively cause a system hang. However, if timeouts are being triggered, the application is already not working correctly and likely the "pipeline is broken".</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>When can we expect the fix?</b> N/A</p> <p><b>Is it for SDK/PDK?</b> All.</p>
200775377	System Software	<p><b>What is the issue?</b> PTP client connected to spruce port P7 fails to sync with PTP server due to known bug from Marvell switch firmware.</p> <p><b>How does it impact the customer?</b> Any sensor/device connected to spruce port P7 will not be able to sync with PTP server.</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>When can we expect the fix?</b> N/A</p>
3410375	Resource Manager	<p><b>What is the issue?</b> Intermittent deadlock in kernel nvhost driver during channel timeout recovery with virtualized nvhost-based engines.</p> <p><b>How does it impact the customer?</b></p>

		<p>If the application is triggering timeouts on virtualized nvhost-based engines, nvhost could deadlock and effectively cause a system hang. However if timeouts are being triggered, the application is already not working correctly and likely the "pipeline is broken".</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>When can we expect the fix?</b> N/A</p>
3470744	Graphics	<p><b>What is the issue?</b> Corruption will be observed on buffers that are flipped by Weston clients to Weston via eglSwapBuffers.</p> <p><b>How does it impact the customer?</b> Customers will observe corruption on Graphics applications that call eglSwapBuffers (EGL/GL).</p> <p><b>If there is a workaround, what is it?</b> The corruption is observed only when Weston assigns the graphics applications to overlays. As a WAR, forcing Weston to use gl-composition by setting WESTON_FORCE_RENDERER=1 will result in the correct content being rendered on display.</p> <p><b>When can we expect the fix?</b> 6.0.5.0</p>
3476824	Docker	<p><b>What is the issue?</b> DRIVE OS support for building and running Docker in Linux Guest OS does not yet support access to the GPU as GPU support is still under study. Docker images can be built and run on the target, but users will not be able to run any GPU-accelerated containers.</p> <p><b>How does it impact the customer?</b> The customer will not be able to run any containerized GPU workloads</p> <p><b>If there is a workaround, what is it?</b> N/A The user must manually include the required devices and mounts in the docker command line using the --device and -v flags. In addition, the user would have to run ldconfig in the container to ensure that the libraries are available in the LD cache</p> <p><b>When can we expect the fix?</b> 6.0.5.0</p>
3480301	Bootloader	Device failed to boot (hung in QB) after PKC (RSA 3K) fusing.

3479678	System Software	<p><b>What is the issue?</b> USB storage devices (Pen drive, hdd) are not immediately automounted when connected, there is a delay of 5-6 minutes before devices are mounted. This is whether hotplug or connected at boot.</p> <p><b>How does it impact the customer?</b> The user will need to wait for USB storage devices to be mounted</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>When can we expect the fix?</b> 6.0.5.0</p>
3478510	Multimedia	<p>In DRIVE OS 5.2 all NvMedia engine APIs were based on NvMediaImage. But that is being removed in 6.0. In 6.0 there's a new set of APIs that are based on NvSciBuf. These APIs are incompatible with the old 5.2 APIs and customers will need to port their applications to use the new API. The new APIs are in the mentioned include/nvmedia_6x folder and the old APIs will be removed in a later DRIVE OS 6.0.x.0 release.</p>
3477463	Display	<p><b>What is the issue?</b> EGLDevice based sample applications are failing to display their content on DELL 2415b monitor.</p> <p><b>How does it impact the customer?</b> Customers using DELL 2415b is not able to use EGLDevice based applications.</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>When can we expect the fix?</b> 6.0.5.0 release.</p>
3474024	DRIVE Update	<p><b>What is the issue?</b> DRIVE Update fails to switch chain via scratch method. That method is used to verify the newly updated boot chain before permanent switching of bootchain via BR_BCT. While switching boot chain via scratch method, a mb1 reset is observed which is switch the chain back to original chain. This bug can be blocker for SW update if they are using this feature.</p> <p><b>How does it impact the customer?</b> Customer may not be able to validate the newly updated chain before final switch for boot chain.</p> <p><b>If there is a workaround, what is it?</b> There is no WAR for this issue. We are still debugging root cause. Till now it seems p3663 platform specific.</p> <p><b>When can we expect the fix?</b> We are working on root causing this issue. It depends on board availability and repro rate.</p>
3469587	BPMP	<p><b>What is the issue?</b></p>

		<p>AXI_CBB clock is running at 408MHz frequency, the POR value for use case is 204MHz</p> <p><b>How does it impact the customer?</b> Potentially marginally higher performance for MMIO accesses than in final product, potentially slightly higher power consumption than in final product.</p> <p><b>If there is a workaround, what is it?</b>  No workaround. (It may be possible to lower the frequency via bootrom BCT files, but details of this option are not studied).</p> <p><b>When can we expect the fix?</b> N/A</p>
3445088	MCU Firmware	<p><b>What is the issue?</b> IST specific VRS12 threshold values are not available and thus default value used during IST mode</p> <p><b>How does it impact the customer?</b> The customer runs IST with default threshold values.</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>When can we expect the fix?</b> 6.0.5.0</p>
3436673	Bootloader	P3663 ES is not flashing/booting after FSKP changes.
200775377	System Software MCU Firmware	<p><b>What is the issue?</b> PTP client connected to spruce port P7 fails to sync with PTP server due to known bug from Marvell switch firmware.</p> <p><b>How does it impact the customer?</b> Any sensor/device connected to spruce port P7 will not be able to sync with PTP server.</p> <p><b>If there is a workaround, what is it?</b> N/A</p> <p><b>When can we expect the fix?</b> The issue is being addressed with the vendor; resolution date is TBD.</p>
200770274		<p><b>What is the issue?</b> TMON gets powered off before MCU when the board is disconnected from the power supply. Thus TMON pins go low which gets detected by MCU</p> <p><b>How does it impact the customer?</b> The customer gets TMON alerts/notifications on board poweroff/powercycle</p> <p><b>If there is a workaround, what is it?</b> No workaround available</p> <p><b>When can we expect the fix?</b> 6.0.5.0</p>

		<p>The following algorithms are not supported on Orin's OFA and/or PVA engines in this release:</p> <ul style="list-style-type: none"> <li>• ImageFilter (Recursive Gaussian Filter, BoxFilter, 2Dconv).</li> <li>• FAST9 Feature Detector, Standard Harris Corner Detector.</li> <li>• IC and fastIC Feature Tracker.</li> <li>• DenseOpticalFlow.</li> <li>• Stereo.</li> <li>• Template Tracker.</li> </ul>
200778180 3416653		<ul style="list-style-type: none"> <li>• The CGF Demo is not functional on the host or target.</li> </ul> <p>DriveWorks Graph UI Tool is not included in the packages; it can be provided upon request.</p>
	Image and Point Cloud Processing	<p>The following algorithms are not supported on Orin's OFA and/or PVA engines in this release:</p> <ul style="list-style-type: none"> <li>• ImageFilter (Recursive Gaussian Filter, BoxFilter, 2Dconv).</li> <li>• FAST9 Feature Detector, Standard Harris Corner Detector.</li> <li>• IC and fastIC Feature Tracker.</li> <li>• DenseOpticalFlow.</li> <li>• Stereo.</li> <li>• Template Tracker.</li> </ul>
3478783		sample_image_pyramid_pva with 8MP camera input fails; other resolutions are supported.
		Tensor Streaming is not operational in this release.
3719823		Image Processing is not supported.
200782352		LRAW Preview Extraction Tool fails.
3602138		Initialize/release dwFrameCapture in loop will lead system run out of memory.
3597225		Video exporter & header-dump tool dumps Segmentation fault while exit.
3605267		sample_cgfdwchannel is failing for hybrid inter-process, inter-chip scenario and sync_mode p2c and its giving segmentation fault.
3719823		Camera interfacing is not supported.
3263411	TensorRT builder	<p><b>What is the issue?</b> For some networks, building and running an engine in the standard runtime will have better performance than the safety runtime. This can be due to various limitations in scope of the safety runtime including more limited tactics, tensor size limits, and operations supported in the safety scope.</p> <p><b>How does it impact the customer?</b> Inference in the safety runtime may be significantly slower than in the standard runtime.</p> <p><b>If there is a workaround, what is it?</b> Depending on the network, it may or may not be possible to reorganize operations into a more efficient form matching the safety runtime scope.</p> <p><b>What is the recommendation?</b></p>



		It is recommended to work with NVIDIA and provide proxy networks as early as possible that demonstrate key performance metrics close to actual production networks. Future releases will target performance improvements for networks within the safety scope.
200759535	TensorRT builder	<p><b>What is the issue?</b> Due to the limitation in the DLA compiler adding copy operators for the bindable inputs, TensorRT builder falls back the concat layer to GPU if any of its input tensors is the input of the DLA subgraph.</p> <p><b>How does it impact the customer?</b> If there is a concat layer in the network and any of its input tensors is the input of the DLA subgraph, the TensorRT builder fails to build the engine when <code>allowGPUPFallback</code> is disabled.</p> <p><b>If there is a workaround, what is it?</b> If <code>allowGPUPFallback</code> or safe DLA must be enabled, you could explicitly add dummy node(s) supported by DLA as the producer of the concat layer.</p> <p><b>When can we expect the fix?</b> The issue is not expected to be fixed in a future release.</p>
3448473	TensorRT builder	<p><b>What is the issue?</b> The DLA compilation process in NVIDIA DRIVE OS 6.0.4.0 has a deep recursive call which requires a lot of stack memory. On QNX, this may exceed the available stack space, leading to memory faults.</p> <p><b>How does it impact the customer?</b> Building engines involving DLA for large networks or networks with large batch sizes may lead to memory faults on QNX.</p> <p><b>If there is a workaround, what is it?</b> To avoid this issue, it's recommended to build the sample applications to utilize a bigger stack size. This can be done by adding the <code>-N</code> option to the linker flags while building. For example: use <code>-N8000K</code> to utilize an 8 MB stack when the application runs. Applications with larger stack footprint can adjust the size accordingly.</p> <p><b>When can we expect the fix?</b> The issue is not expected to be fixed in a future release.</p>
3698054	TensorRT builder	<p><b>What is the issue?</b> In some cases, the TensorRT builder may allow input and output tensors in HWC16 format in FP16 precision. This format is outside the safety scope.</p> <p><b>How does it impact the customer?</b> The TensorRT builder may generate safe engines outside the safety scope which will fail consistency check and so should not be used for inference.</p> <p><b>If there is a workaround, what is it?</b> Do not mark inputs and outputs to safe engines with HWC16 format.</p> <p><b>When can we expect the fix?</b> A fix will be available in the DRIVE OS 6.0.6 release.</p>
3494734	DLA	<b>What is the issue?</b>

		<p>Some networks may suffer accuracy degradation when run on DLA with large batch sizes.</p> <p><b>How does it impact the customer?</b> When running networks on DLA with batch sizes larger than 32, accuracy may degrade.</p> <p><b>If there is a workaround, what is it?</b> To work around this issue, use a smaller batch size.</p> <p><b>When can we expect the fix?</b> The issue will be fixed in a future DLA release.</p>
3494777	DLA	<p><b>What is the issue?</b> There is a known performance regression for Xavier DLA.</p> <p><b>How does it impact the customer?</b> Performance may drop by up to 20% for AlexNet, MNIST, ResNet-50, and VGG-16 when using DLA on Xavier platforms.</p> <p><b>When can we expect the fix?</b> A fix will be available in the DRIVE OS 6.0.6 release.</p>
3498326	DLA	<p><b>What is the issue?</b> There is a known issue with DLA clocks that requires users to reboot the system after changing the nvpmode power mode or otherwise experience a performance drop.</p> <p><b>How does it impact the customer?</b> Performance may drop significantly after changing the nvpmode power mode.</p> <p><b>If there is a workaround, what is it?</b> Reboot the system after changing the nvpmode power mode.</p> <p><b>When can we expect the fix?</b> A fix will be available in the DRIVE OS 6.0.6 release.</p>
3656116	TensorRT runtime	<p><b>What is the issue?</b> There is an up to 7% performance regression for the 3D-UNet networks compared to TensorRT 8.4 EA when running in INT8 precision on NVIDIA Orin due to a functionality fix.</p> <p><b>How does it impact the customer?</b> When running 3D-UNet networks in INT8 precision, the latency will be up to 7% longer than in TensorRT 8.4 EA.</p> <p><b>If there is a workaround, what is it?</b> To work around this issue, set the input type and format to kINT8 and kCHW32, respectively.</p> <p><b>When can we expect the fix?</b> We do not plan to fix this performance regression since it was caused by a necessary fix for an accuracy issue.</p>
3657753	TensorRT runtime	<p><b>What is the issue?</b></p>

		<p>There may be issues with large channel sizes with structured sparsity convolution kernels (seen at size 4096).</p> <p><b>How does it impact the customer?</b> Computation on the GPU may halt unexpectedly in this case.</p> <p><b>If there is a workaround, what is it?</b> Turn off structured sparsity if this issue is present.</p> <p><b>When can we expect the fix?</b> A fix will be available in the DRIVE OS 6.0.6 release.</p>
CUDA	CUDA	<p>During ongoing testing NVIDIA identified that due to a rounding algorithm error in a very small number of corner cases (less than 0.0000005% of tested combinations) 64-bit floating point division results can differ from the IEEE754 standard by 1 least-significant bit.</p> <p>Floating point operations have many sources of error accumulation and most algorithms will not have encountered this discrepancy. NVIDIA recommends that all developers requiring strict IEEE754 compliance update to CUDA Toolkit 11.7 Update 1 or newer.</p> <p>The affected algorithm is present in both offline compilation as well as just-in-time (JIT) compilation. As JIT compilation is handled by the driver, NVIDIA recommends updating to driver version 515.48.08 or newer for full IEEE754 compliance when required and when using JIT.</p> <p>This issue was identified late in the development cycle and will be addressed in the next DRIVE OS software release.</p>
200782948	DriveWorks	Lraw recording replay fails. However, raw/mp4 replay is unaffected.
200777663	DriveWorks	LRAW recording works with an additional sensor parameter "encoder-instance=0". h264/5 recording is unaffected.
200778225	DriveWorks	Camera Server Client crashes.
200778085 3409980	DriveWorks	Video Exporter Tool fails.
3408375	DriveWorks	SIPL recorded playback of 16 8MP raw/lraw video failed.
200618961	DriveWorks	Low frames per second (FPS) observed while replaying LRAW/RAW videos with the Camera Replay Sample.
2539131	DriveWorks	Xsens has a reordering issue with timestamps when reset.
3614812	DriveWorks	LRAW format recording is not working with sample_camera
3795061	DriveWorks	Recorder and replayer tool with rig file fails with error: 'dw::core::OutOfBoundsException' what(): HashMap: Index not found
3499987	DriveWorks	Lidar chop process get stuck for infinite time
	DriveWorks	<p>The following algorithms are not supported on Orin's OFA and/or PVA engines in this release:</p> <ul style="list-style-type: none"> <li>• ImageFilter (Recursive Gaussian Filter, BoxFilter, 2Dconv).</li> <li>• Standard Harris Corner Detector.</li> <li>• IC and fastIC Feature Tracker.</li> </ul>

		<ul style="list-style-type: none"> <li>DenseOpticalFlow.</li> <li>Stereo.</li> <li>Template Tracker</li> </ul>
3496936	DriveWorks	Sample_stereo_disparity dumps "Error calling GL deleter" on console
3478840	DriveWorks	sample_feature_descriptor with raw video input fails, Fast9 task submission failed: PvaError_Error
	DriveWorks	Tensor Streaming is not operational in this release.
3597551	DriveWorks	Sample_feature_tracker with PVA Detector fails to run, DW_NOT_AVAILABLE: FeatureDetectPipelinePVA: PVA is not available on this platform
3558283	DriveWorks	LRAW recording playback gives blank output & both raw & lraw playback fails to exit gracefully, need to kill the playback
3777686	DriveWorks	Recorder app with 4 cam recording crashes Segmentation fault : NvMapMemAllocInternalTagged: 1074810371 error 12 NvMapMemHandleAlloc: error 0 (nvidia.com)
3754813	DriveWorks	Video_exporter fails with error: DW_INVALID_ARGUMENT: calculateImageLayout: plane count 0 and format 0 combination is invalid
3754693	DriveWorks	Sample_calibration_stereo, camera_seek, video_rectifier dumps error on exit: "Bus Error", functionality wise working fine
3776375	DriveWorks	Sample_video_rectifierLDC fails to record the screen, crash with segmentation fault
3776370	DriveWorks	Sample_image_capture fails to capture the screen, DW_NOT_AVAILABLE: dwFrameCapture_initialize is not available for serializeGL is true in current version
3776381	DriveWorks	Sample_video_rectifier recorded mp4 video fails to playback: Driveworks exception thrown: DW_FILE_INVALID: ContainerMp4: error loading header
3755898	DriveWorks	Playback of H264 video is corrupted which is extracted using extractLRawPreview tool.
3741019	DriveWorks	Sample_video_rectifier crash on exit: DW_INVALID_ARGUMENT: SyncNvMedia2D::fillNvSciSyncAttrs: NvMedia2DUnregisterNvSciSyncObj failed.
3432606	DriveWorks	DriveWorks exception thrown: DW_INVALID_HANDLE: Cannot cast to C++ handle when exiting "sample_image_streamer_cross".
3404259	DriveWorks (DNN Framework)	Sample_dnn_plugin with custom digits fails to detect drawn digit on output window. Always show Detected digit: 1
3744318	DriveWorks (Calibration)	Luminar H3 lidar self-calibration using DW sample sample_calibration_lidar is not working
3795934	DriveWorks	STM and SSM samples binary not generating after compilation and cross compilation. sample_image_pyramid_pva is also missing
3746011	DriveWorks	Sample_cgf_camera_interprocess failing with error: Failed with NvSciError_BadParameter(256) in src/dwcgf/channel/impl/ChannelNvSciStream_new.hpp:466
3790584	DriveWorks	CFG Demo tool shows inconsistent behavior. Generates random exit codes. 207, 6, 0 etc.
200776374 200776376	DriveWorks	Nuisance Error Messages that do not affect functionality:

200778230 3401171 3773202 3598944		<ul style="list-style-type: none"> <li>• Every GUI based sample dumps error on console: Failed to list sessions: Unit dbus-org.freedesktop.login1.service is masked.</li> <li>• All samples dump error on console: TimeSource Eth: PTP ioctl returned error. Synchronized time will not be available from this timesource.</li> <li>• All samples dump error on console: No resources(.pak) mounted from '/usr/local/driveworks-5.0/data'. Please adjust path or some modules won't function properly</li> <li>• DW_GL_ERROR visible in multiple samples applications</li> <li>• Replayer tool dumps segmentation fault (core dumped) at the end of exit. Functionality is working properly</li> <li>• Recorder-qtgui and recorder-tui fail to launch: ModuleNotFoundError: No module named 'Crypto'.</li> </ul>
3793123	DriveWorks	DW samples fail in Yocto FS

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# Release Properties

The following table describes the release properties and software versions.

Release Properties	
Property	Description
Linux	Specifies the operating system.
20.04	Specifies the host Ubuntu operating system version.
Focal Fossa	Specifies the codename for the host version of Ubuntu.
20.04	Specifies the target root file system operating system version.
embedded/6.0.4.0	Specifies the NVIDIA Git release branch.
6.0.4.0	Specifies the NVIDIA release branch number.
31006010 31009903	Specifies the build ID for the operating system. Specifies the build ID for Foundation.
drive-linux	Specifies the product name.
Linux	Specifies the platform.
p3710-10-a01 p3710-10-a03 p3710-10-a04 p3710-12-a04 p3710-10-s05 p3710-12-a03 p3710-12-s05	Specifies the board name <sup>1</sup> .
940-63710-0010-000 940-63710-0012-000	Specifies the board SKU.
A00	Specifies the board revision <sup>2</sup> .

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<sup>1</sup> This information is used for certain flashing commands. Refer to the Flashing chapter in the *NVIDIA DRIVE OS 6.0 Developer Guide* for more information.

<sup>2</sup> See the AV PCT Configuration chapter in the *NVIDIA DRIVE OS 6.0 Developer Guide* for more information.

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Software Version	
Software	Version
cuDNN	8.4.2
TensorRT	8.4.11
CUDA GPU Driver	
OpenGL ES	3.2
OpenGL: Provided for development purposes. Production systems are expected to use OpenGL ES.	4.6
GCC Cross-compiler Toolchain for user applications and libraries for Yocto root file system.	9.3
GCC Cross-compiler Toolchain for user applications and libraries for Ubuntu root file system.	9.3
Wayland	1.18
DriveWorks	5.6
DLA	3.10 <sup>3</sup>
CUDA	11.4.17
TensorFlow	1.15.0
ONNX	1.9.0 and opset 13

## DRIVE OS Supported Sensors

The following cameras are supported in this release. Future releases will include support for additional cameras.

Camera Make/Model	Sensor	Availability
Sekonix SF3324	ON Semi AR0231 (120)	Please contact the vendor for information on how to access the DRIVE OS driver for this camera.
Entron F008A030RM0AES	ON Semi AR0820 (120)	The driver for this camera is included with the DRIVE OS SDK release.

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<sup>3</sup> DLA versions 1.3.7, 1.3.8, and 3.9.0 are also supported.

# Component Properties

## CUDA

The following table describes CUDA support.

Host OS	Host OS Version	Target OS	Target OS Version	Compiler Support
Ubuntu	20.04 LTS	Ubuntu	Ubuntu 20.04	GCC 9.3

## Standard

The current release label is 11.4.17. The various components in the toolkit are versioned independently. The following table shows each component and its version:

Component Name	Version Information	Supported Architectures
CUDA Runtime (cudart)	11.4.212	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
cuobjdump	11.4.212	Linux (aarch64), Linux (x86_64)
CUPTI	11.4.212	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
CUDA cuxxfilt (demangler)	11.4.212	Linux (aarch64), Linux (x86_64)
CUDA Demo Suite	11.4.212	Linux (x86_64)
CUDA GDB	11.4.212	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
CUDA NVCC	11.4.212	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
CUDA nvdisasm	11.4.212	Linux (aarch64), Linux (x86_64)
CUDA NVML Headers	11.4.212	Linux (aarch64), Linux (x86_64)
CUDA nvprof	11.4.212	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
CUDA nvprune	11.4.212	Linux (aarch64), Linux (x86_64)
CUDA NVRTC	11.4.212	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
CUDA NVTX	11.4.212	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
CUDA NVVP	11.4.212	Linux (x86_64)
CUDA Samples	11.4.212	l4t_aarch64, Linux (aarch64), Linux (x86_64)
CUDA Compute Sanitizer API	11.4.212	Linux (aarch64), Linux (x86_64)
CUDA Thrust	11.4.212	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64



CUDA cuBLAS	11.6.5.69	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
CUDA cuDLA	11.4.212	Linux (aarch64), qnx-standard_aarch64
CUDA cuFFT	10.6.0.116	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
CUDA cuRAND	10.2.5.211	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
CUDA cuSOLVER	11.2.0.211	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
CUDA cuSPARSE	11.6.0.211	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
CUDA NPP	11.4.0.201	Linux (aarch64), Linux (x86_64), qnx-standard_aarch64
CUDA nvJPEG	11.5.2.211	Linux (x86_64), qnx-standard_aarch64
Nsight Compute	2021.2.4.1	Linux (x86_64), qnx-standard_aarch64
Nsight Systems	2022.1.3.2	Linux (x86_64)
NVIDIA Linux Driver	470.103.01	Linux (x86_64)

## TensorRT

The following sections are related to TensorRT.

	Linux x86-64	Linux AArch64
<a href="#">Supported CUDA versions</a>	11.4	11.4
<a href="#">Supported cuDNN versions</a>	8.4.2	8.4.2
TensorRT Python API	Yes	Yes
NvUffParser	Deprecated	Deprecated
NvOnnxParser	Yes	Yes

**Note:** Version numbers must match (in major, minor, patch, and build) for the previously generated serialized engine to be compatible. Version numbers for major, minor, and patch must be earlier or equal to the runtime version numbers, and later than or equal to 8.4.11.

## Hardware and Precision

The following table lists NVIDIA hardware and which precision modes each hardware supports. It also lists availability of Deep Learning Accelerator (DLA) on this hardware. For standard runtime, TensorRT supports SM 7.x or SM 8.x. For proxy runtime, TensorRT supports all hardware with capability of 8.x. For safety runtime, TensorRT supports hardware with capability of 8.7.

For more information, refer to the “If I build the engine on one GPU and run the engine on another GPU, will this work?” question in the FAQ section in the *NVIDIA DRIVE OS 6.0 TensorRT 8.4.11 Developer Guide*.

<a href="#">CUDA Compute Capability</a>	Example Device	TF32	FP32	FP16	INT8	FP16 Tensor Cores	INT8 Tensor Cores	DLA
8.7	NVIDIA Orin	No (TensorRT safety) Yes (TensorRT standard)	Yes	Yes	Yes	Yes	Yes	Yes
8.6	NVIDIA A10	Yes	Yes	Yes	Yes	Yes	Yes	No
8.0	NVIDIA A100/GA100 GPU	Yes	Yes	Yes	Yes	Yes	Yes	No
7.5	NVIDIA T4	No	Yes	Yes	Yes	Yes	Yes	No
7.2	Jetson AGX Xavier	No	Yes	Yes	Yes	Yes	Yes	Yes
7.0	NVIDIA V100	No	Yes	Yes	Yes	Yes	No	No
6.1	NVIDIA P4	No	Yes	No	Yes	No	No	No
6.0	NVIDIA P100	No	Yes	Yes	No	No	No	No

## Software Versions Per Platform

The following lists supported platforms per software version.

Platform	Compiler Version	Python Version
Ubuntu 20.04 x86-64	<a href="#">gcc 9.3.0</a>	<a href="#">3.8</a>
Ubuntu 20.04 AArch64	<a href="#">gcc 9.3.0</a>	<a href="#">3.8</a>

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