



Virtual GPU Software R418 for Citrix Hypervisor

Release Notes

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Chapter 1. Release Notes

These *Release Notes* summarize current status, information on validated platforms, and known issues with NVIDIA vGPU software and associated hardware on Citrix Hypervisor.



Note: The most current version of the documentation for this release of NVIDIA vGPU software can be found online at [NVIDIA Virtual GPU Software Documentation](#).

1.1. NVIDIA vGPU Software Driver Versions

Each release in this release family of NVIDIA vGPU software includes a specific version of the NVIDIA Virtual GPU Manager, NVIDIA Windows driver, and NVIDIA Linux driver.

NVIDIA vGPU Software Version	NVIDIA Virtual GPU Manager Version	NVIDIA Windows Driver Version	NVIDIA Linux Driver Version
8.10	418.240	427.71	418.240
8.9	418.226.00	427.60	418.226.00
8.8	418.213	427.48	418.211.00
8.7	418.196	427.33	418.197.02
8.6	418.181	427.11	418.181.07
8.5	418.165.01	426.94	418.165.01
8.4	418.149	426.72	418.149
8.3	418.130	426.52	418.130
8.2	418.109	426.26	418.109
8.1	418.92	426.04	418.92
8.0	418.66	425.31	418.70

For details of which Citrix Hypervisor releases are supported, see [Hypervisor Software Releases](#).

1.2. Compatibility Requirements for the NVIDIA vGPU Manager and Guest VM Driver

The releases of the NVIDIA vGPU Manager and guest VM drivers that you install must be compatible. If you install an incompatible guest VM driver release for the release of the vGPU Manager that you are using, the NVIDIA vGPU fails to load. See [VM running older NVIDIA vGPU drivers fails to initialize vGPU when booted](#).

Different versions of the vGPU Manager and guest VM driver from within the same main release branch can be used together. For example, you can use the vGPU Manager from release 8.1 with guest VM drivers from release 8.0. However, versions of the vGPU Manager and guest VM driver from different main release branches cannot be used together. For example, you cannot use the vGPU Manager from release 8.1 with guest VM drivers from release 7.2.



Note: This requirement does not apply to the NVIDIA vGPU software license server. All releases in this release family of NVIDIA vGPU software are compatible with **all** releases of the license server.

1.3. Updates in Release 8.10

New Features in Release 8.10

- ▶ Security updates - see *Security Bulletin: NVIDIA GPU Display Driver - February 2022*, which is posted shortly after the release date of this software and is listed on the [NVIDIA Product Security](#) page
- ▶ Miscellaneous bug fixes

Hardware and Software Support Introduced in Release 8.10

- ▶ Support for Red Hat Enterprise Linux 8.5 as a guest OS

Feature Support Withdrawn in Release 8.10

- ▶ Red Hat Enterprise Linux 8.1 is no longer supported as a guest OS.
- ▶ Red Hat Enterprise Linux 7.8. and 7.7 are no longer supported as a guest OS.

1.4. Updates in Release 8.9

New Features in Release 8.9

- ▶ Security updates - see *Security Bulletin: NVIDIA GPU Display Driver - October 2021*, which is posted shortly after the release date of this software and is listed on the [NVIDIA Product Security](#) page
- ▶ Miscellaneous bug fixes

1.5. Updates in Release 8.8

New Features in Release 8.8

- ▶ Security updates - see [Security Bulletin: NVIDIA GPU Display Driver - July 2021](#)
- ▶ Miscellaneous bug fixes

Hardware and Software Support Introduced in Release 8.8

- ▶ Support for Red Hat Enterprise Linux 8.4 as a guest OS

Feature Support Withdrawn in Release 8.8

- ▶ Citrix Hypervisor 7.0 is no longer supported.

1.6. Updates in Release 8.7

New Features in Release 8.7

- ▶ Security updates - see [Security Bulletin: NVIDIA GPU Display Driver - April 2021](#)
- ▶ Miscellaneous bug fixes

1.7. Updates in Release 8.6

New Features in Release 8.6

- ▶ Security updates - see [Security Bulletin: NVIDIA GPU Display Driver - January 2021](#)
- ▶ Miscellaneous bug fixes

Feature Support Withdrawn in Release 8.6

- ▶ Red Hat Enterprise Linux 7.6 is no longer supported as a guest OS

1.8. Updates in Release 8.5

New Features in Release 8.5

- ▶ Security updates- see [Security Bulletin: NVIDIA GPU Display Driver - September 2020](#)
- ▶ Miscellaneous bug fixes

Feature Support Withdrawn in Release 8.5

- ▶ Citrix Hypervisor 8.0 is no longer supported.

As a result of the withdrawal of support for Citrix Hypervisor 8.0, the following features are withdrawn on Citrix Hypervisor:

- ▶ Support for the Tesla T4 GPU
- ▶ Support for XenMotion with vGPU
- ▶ Support for the following releases as a guest OS:
 - ▶ Red Hat Enterprise Linux 8.2 and 8.1
 - ▶ CentOS Linux 8 (1911)

1.9. Updates in Release 8.4

New Features in Release 8.4

- ▶ Miscellaneous bug fixes
- ▶ Security updates - see [Security Bulletin: NVIDIA GPU Display Driver - June 2020](#)

Hardware and Software Support Introduced in Release 8.4

- ▶ Support for the following guest OS releases
 - ▶ Red Hat Enterprise Linux 8.2 and 7.8
 - ▶ CentOS 7.8

Feature Support Withdrawn in Release 8.4

- ▶ The following OS releases are no longer supported as a guest OS:
 - ▶ Red Hat Enterprise Linux 7.5

- ▶ CentOS 7.5

1.10. Updates in Release 8.3

New Features in Release 8.3

- ▶ Miscellaneous bug fixes
- ▶ Security updates - see [Security Bulletin: NVIDIA GPU Display Driver - February 2020](#)

Hardware and Software Support Introduced in Release 8.3

- ▶ Support for the following guest OS releases
 - ▶ Red Hat Enterprise Linux 8.1
 - ▶ CentOS Linux 8 (1911)
- ▶ Support for Citrix Virtual Apps and Desktops version 7 1912

Feature Support Withdrawn in Release 8.3

- ▶ Citrix Hypervisor 7.6 is no longer supported.
- ▶ The following OS releases are no longer supported as a guest OS:
 - ▶ Windows Server 2008 R2
 - ▶ Red Hat Enterprise Linux 7.0-7.4
 - ▶ CentOS 7.0-7.4

1.11. Updates in Release 8.2

New Features in Release 8.2

- ▶ Miscellaneous bug fixes
- ▶ Security updates - see [Security Updates](#)

Hardware and Software Support Introduced in Release 8.2

- ▶ Support for Citrix Virtual Apps and Desktops version 7 1909

1.12. Updates in Release 8.1

New Features in Release 8.1

- ▶ Security updates

- ▶ Miscellaneous bug fixes

Hardware and Software Support Introduced in Release 8.1

- ▶ Support for Red Hat Enterprise Linux 7.7 as a guest OS
- ▶ Support for Citrix Virtual Apps and Desktops version 7 1906

1.13. Updates in Release 8.0

New Features in Release 8.0

- ▶ New -1B4 virtual GPU types
- ▶ XenMotion support on the following GPUs:
 - ▶ Tesla V100 SXM2
 - ▶ Tesla V100 SXM2 32GB
 - ▶ Tesla V100 PCIe
 - ▶ Tesla V100 PCIe 32GB
 - ▶ Tesla V100 FHHL
 - ▶ Quadro RTX 6000
 - ▶ Quadro RTX 8000

For the complete list of GPUs that support XenMotion, see [XenMotion with vGPU Support](#).

- ▶ XenMotion support on Citrix Hypervisor 8.0
- ▶ Security updates
- ▶ Miscellaneous bug fixes

Hardware and Software Support Introduced in Release 8.0

- ▶ Support for the following GPUs:
 - ▶ Quadro RTX 6000
 - ▶ Quadro RTX 8000
- ▶ Support for Citrix Hypervisor 8.0
- ▶ Support for the following OS releases as a guest OS:
 - ▶ Windows 10 October 2018 Update (1809)
 - ▶ Windows Server 2019

Feature Support Withdrawn in Release 8.0

- ▶ Citrix Hypervisor 7.5 is no longer supported.

Chapter 2. Validated Platforms

This release family of NVIDIA vGPU software provides support for several NVIDIA GPUs on validated server hardware platforms, Citrix Hypervisor hypervisor software versions, and guest operating systems. It also supports the version of NVIDIA CUDA Toolkit that is compatible with R418 drivers.

2.1. Supported NVIDIA GPUs and Validated Server Platforms

This release of NVIDIA vGPU software provides support for the following NVIDIA GPUs on Citrix Hypervisor, running on validated server hardware platforms:

- ▶ GPUs based on the NVIDIA Maxwell™ graphic architecture:
 - ▶ Tesla M6
 - ▶ Tesla M10
 - ▶ Tesla M60
- ▶ GPUs based on the NVIDIA Pascal™ architecture:
 - ▶ Tesla P4
 - ▶ Tesla P6
 - ▶ Tesla P40
 - ▶ Tesla P100 PCIe 16 GB (XenMotion with vGPU is **not** supported.)
 - ▶ Tesla P100 SXM2 16 GB (XenMotion with vGPU is **not** supported.)
 - ▶ Tesla P100 PCIe 12GB (XenMotion with vGPU is **not** supported.)
- ▶ GPUs based on the NVIDIA Volta architecture:
 - ▶ Tesla V100 SXM2
 - ▶ Tesla V100 SXM2 32GB
 - ▶ Tesla V100 PCIe
 - ▶ Tesla V100 PCIe 32GB
 - ▶ Tesla V100 FHHL

- ▶ GPUs based on the NVIDIA Turing architecture:
 - ▶ **8.0-8.4 only:** Tesla T4
 - ▶ Quadro RTX 6000 in displayless mode (GRID Virtual PC and GRID Virtual Applications are **not** supported.)
 - ▶ Quadro RTX 8000 in displayless mode (GRID Virtual PC and GRID Virtual Applications are **not** supported.)

In displayless mode, local physical display connectors are disabled.

For a list of validated server platforms, refer to [NVIDIA GRID Certified Servers](#).



Note:

Tesla M60 and M6 GPUs support compute mode and graphics mode. NVIDIA vGPU requires GPUs that support both modes to operate in graphics mode.

Recent Tesla M60 GPUs and M6 GPUs are supplied in graphics mode. However, your GPU might be in compute mode if it is an older Tesla M60 GPU or M6 GPU, or if its mode has previously been changed.

To configure the mode of Tesla M60 and M6 GPUs, use the `gpumodeswitch` tool provided with NVIDIA vGPU software releases.

2.2. Hypervisor Software Releases

Changes to Citrix Product Names and Release Numbers

Citrix has changed the product names of its hypervisor and virtual desktop software.

Old Name	New Name
XenServer	Citrix Hypervisor
XenApp and XenDesktop	Citrix Virtual Apps and Desktops
Citrix Receiver	Citrix Workspace App

The release number of Citrix Virtual Apps and Desktops releases **after 7.18** is in the form `7.yyymm`, where `yyymm` denotes the year and month that the product was released. For example, for a product released in August 2018, `yyymm` is `1808`.

For more information, see these topics in the Citrix documentation:

- ▶ [New product names](#)
- ▶ [New product and component version numbers](#)

Supported Citrix Hypervisor Releases

This release family of NVIDIA vGPU software is supported on the Citrix Hypervisor releases listed in the table.



Note:

Support for NVIDIA vGPU software requires the Premium Edition (previously Enterprise Edition) of Citrix Hypervisor. For details, see [Licensing](#) in the Citrix documentation.

Cumulative update releases for a base release of Citrix Hypervisor are compatible with the base release and can also be used with this version of NVIDIA vGPU software unless expressly stated otherwise.

Software	Releases Supported	Notes
8.0-8.4 only: Citrix Hypervisor 8.0	RTM build and compatible cumulative update releases	<p>In NVIDIA vGPU mode, all NVIDIA GPUs that support NVIDIA vGPU software are supported.</p> <p>In GPU pass-through mode, the following GPUs are not supported:</p> <ul style="list-style-type: none"> ▶ Quadro RTX 6000 ▶ Quadro RTX 8000 <p>This release supports XenMotion with vGPU on suitable GPUs as listed in Supported NVIDIA GPUs and Validated Server Platforms.</p>
8.0-8.2 only: Citrix XenServer 7.6	RTM build and compatible cumulative update releases	<p>All NVIDIA GPUs that support NVIDIA vGPU software are supported.</p> <p>This release supports XenMotion with vGPU on suitable GPUs as listed in Supported NVIDIA GPUs and Validated Server Platforms.</p>
Citrix XenServer 7.1	RTM build and compatible cumulative update releases	<p>Not supported on Tesla T4.</p> <p>XenMotion with vGPU is not supported.</p>

Software	Releases Supported	Notes
8.0-8.7 only: Citrix XenServer 7.0	RTM build 125380 and compatible cumulative update releases	Not supported on Tesla T4. XenMotion with vGPU is not supported.

Supported Virtual Desktop Software Releases

This release supports **only** the virtual desktop software releases listed in the table. Except where otherwise stated, HDX 3D Pro mode is supported but not required.

Software	Releases Supported
Citrix Virtual Apps and Desktops	<p>Since 8.3: Versions 7 1912, 7 1909, 7 1906, 7 1903, and 7 1808</p> <p>8.2 only: Versions 7 1909, 7 1906, 7 1903, and 7 1808</p> <p>8.1 only: Versions 7 1906, 7 1903, and 7 1808</p> <p>8.0 only: Versions 7 1903 and 7 1808</p>
XenApp/XenDesktop	<p>Versions 7.18 and 7.17</p> <p>Version 7.15 in HDX 3D Pro mode (required to ensure that the NVIDIA GPU can be used unrestricted)</p>

2.3. Guest OS Support

NVIDIA vGPU software supports several Windows releases and Linux distributions as a guest OS. The supported guest operating systems depend on the hypervisor software version.



Note:

Use only a guest OS release that is listed as supported by NVIDIA vGPU software with your virtualization software. To be listed as supported, a guest OS release must be supported not only by NVIDIA vGPU software, but also by your virtualization software. NVIDIA **cannot** support guest OS releases that your virtualization software does not support.

NVIDIA vGPU software supports **only** 64-bit guest operating systems. No 32-bit guest operating systems are supported.

In GPU pass-through mode, the following GPUs are **not** supported on Citrix Hypervisor 8.0:

- ▶ Quadro RTX 6000
- ▶ Quadro RTX 8000

2.3.1. Windows Guest OS Support

NVIDIA vGPU software supports **only** the 64-bit Windows releases listed in the table as a guest OS on Citrix Hypervisor. The releases of Citrix Hypervisor for which a Windows release is supported depend on whether NVIDIA vGPU or pass-through GPU is used.



Note:

If a specific release, even an update release, is not listed, it's **not** supported.

XenMotion with vGPU is supported on supported Windows guest OS releases.

Guest OS	NVIDIA vGPU - Citrix Hypervisor Releases	Pass-Through GPU - Citrix Hypervisor Releases
Windows Server 2019	<p>Since 8.5: 7.1 cumulative update 2</p> <p>8.0-8.4 only: 8.0, 7.1 cumulative update 2</p>	<p>Since 8.5: 7.1 cumulative update 2</p> <p>8.0-8.4 only: 8.0, 7.1 cumulative update 2</p>
Windows Server 2016 1709, 1607	<p>Since 8.8: 7.1</p> <p>8.5-8.7 only: 7.1, 7.0</p> <p>8.3, 8.4 only: 8.0, 7.1, 7.0</p> <p>8.0-8.2 only: 8.0, 7.6, 7.1, 7.0</p>	<p>Since 8.8: 7.1</p> <p>8.5-8.7 only: 7.1, 7.0</p> <p>8.3, 8.4 only: 8.0, 7.1, 7.0</p> <p>8.0-8.2 only: 8.0, 7.6, 7.1, 7.0</p>
Windows Server 2012 R2	<p>Since 8.8: 7.1</p> <p>8.5-8.7 only: 7.1, 7.0</p> <p>8.3, 8.4 only: 8.0, 7.1, 7.0</p> <p>8.0-8.2 only: 8.0, 7.6, 7.1, 7.0</p>	<p>Since 8.8: 7.1</p> <p>8.5-8.7 only: 7.1, 7.0</p> <p>8.3, 8.4 only: 8.0, 7.1, 7.0</p> <p>8.0-8.2 only: 8.0, 7.6, 7.1, 7.0</p>
8.0-8.2 only: Windows Server 2008 R2	8.0, 7.6, 7.1, 7.0	<p>8.0, 7.6, 7.1, 7.0</p> <p>Supported only on GPUs based on the Maxwell architecture</p>
Windows 10 October 2018 Update (1809) and all Windows 10 releases supported by Microsoft up to and including this release	<p>Since 8.8: 7.1</p> <p>8.5-8.7 only: 7.1, 7.0</p> <p>8.3, 8.4 only: 8.0, 7.1, 7.0</p> <p>8.0-8.2 only: 8.0, 7.6, 7.1, 7.0</p>	<p>Since 8.8: 7.1</p> <p>8.5-8.7 only: 7.1, 7.0</p> <p>8.3, 8.4 only: 8.0, 7.1, 7.0</p> <p>8.0-8.2 only: 8.0, 7.6, 7.1, 7.0</p>
Windows 8.1 Update	Since 8.8: 7.1	Since 8.8: 7.1

Guest OS	NVIDIA vGPU - Citrix Hypervisor Releases	Pass-Through GPU - Citrix Hypervisor Releases
	8.5-8.7 only: 7.1, 7.0 8.3, 8.4 only: 8.0, 7.1, 7.0 8.0-8.2 only: 8.0, 7.6, 7.1, 7.0	8.5-8.7 only: 7.1, 7.0 8.3, 8.4 only: 8.0, 7.1, 7.0 8.0-8.2 only: 8.0, 7.6, 7.1, 7.0
Windows 8.1	Since 8.8: 7.1 8.5-8.7 only: 7.1, 7.0 8.3, 8.4 only: 8.0, 7.1, 7.0 8.0-8.2 only: 8.0, 7.6, 7.1, 7.0	-
Windows 8	Since 8.8: 7.1 8.5-8.7 only: 7.1, 7.0 8.3, 8.4 only: 8.0, 7.1, 7.0 8.0-8.2 only: 8.0, 7.6, 7.1, 7.0	-
Windows 7	Since 8.8: 7.1 8.5-8.7 only: 7.1, 7.0 8.3, 8.4 only: 8.0, 7.1, 7.0 8.0-8.2 only: 8.0, 7.6, 7.1, 7.0	Since 8.8: 7.1 8.5-8.7 only: 7.1, 7.0 8.3, 8.4 only: 8.0, 7.1, 7.0 8.0-8.2 only: 8.0, 7.6, 7.1, 7.0 Supported only on GPUs based on the Maxwell architecture

2.3.2. Linux Guest OS Support

NVIDIA vGPU software supports **only** the Linux distributions listed in the table as a guest OS on Citrix Hypervisor. The releases of Citrix Hypervisor for which a Linux release is supported depend on whether NVIDIA vGPU or pass-through GPU is used.



Note:

If a specific release, even an update release, is not listed, it's **not** supported.

XenMotion with vGPU is **not** supported on any Linux guest OS release.

Guest OS	NVIDIA vGPU - Citrix Hypervisor Releases	Pass-Through GPU - Citrix Hypervisor Releases
Since 8.4: Red Hat Enterprise Linux 8.2	8.4 only: 8.0	8.4 only: 8.0
8.3, 8.4 only: Red Hat Enterprise Linux 8.1	8.0	8.0
8.3, 8.4 only: CentOS Linux 8 (1911)	8.0	8.0
8.6-8.9 only: Red Hat Enterprise Linux 7.7-7.8	8.8, 8.9 only: 7.1 8.0-8.7 only: 7.1, 7.0	8.8, 8.9 only: 7.1 8.0-8.7 only: 7.1, 7.0
8.4, 8.5 only: Red Hat Enterprise Linux 7.6-7.8	8.5 only: 7.1, 7.0 8.4 only: 8.0, 7.1, 7.0	8.5 only: 7.1, 7.0 8.4 only: 8.0, 7.1, 7.0
8.3 only: Red Hat Enterprise Linux 7.5-7.7	8.0, 7.1, 7.0	8.0, 7.1, 7.0
8.1, 8.2 only: Red Hat Enterprise Linux 7.0-7.7	8.0, 7.6, 7.1, 7.0	8.0, 7.6, 7.1, 7.0
8.0 only: Red Hat Enterprise Linux 7.0-7.6	8.0, 7.6, 7.1, 7.0	8.0, 7.6, 7.1, 7.0
Since 8.6: CentOS 7.7-7.8	Since 8.8: 7.1 8.6, 8.7 only: 7.1, 7.0	Since 8.8: 7.1 8.6, 8.7 only: 7.1, 7.0
8.4, 8.5 only: CentOS 7.6-7.8	8.5 only: 7.1, 7.0 8.4 only: 8.0, 7.1, 7.0	8.5 only: 7.1, 7.0 8.4 only: 8.0, 7.1, 7.0
8.3 only: CentOS 7.5, 7.6	8.0, 7.1, 7.0	8.0, 7.1, 7.0
8.0-8.2 only: CentOS 7.0-7.6	8.0, 7.6, 7.1, 7.0	8.0, 7.6, 7.1, 7.0
Ubuntu 18.04 LTS	8.3, 8.4 only: 8.0 8.0-8.2 only: 8.0, 7.6	8.3, 8.4 only: 8.0 8.0-8.2 only: 8.0, 7.6
Ubuntu 16.04 LTS	Since 8.8: 7.1 8.5-8.7 only: 7.1, 7.0 8.3, 8.4 only: 8.0, 7.1, 7.0 8.0-8.2 only: 8.0, 7.6, 7.1, 7.0	Since 8.8: 7.1 8.5-8.7 only: 7.1, 7.0 8.3, 8.4 only: 8.0, 7.1, 7.0 8.0-8.2 only: 8.0, 7.6, 7.1, 7.0
Ubuntu 14.04 LTS	Since 8.8: 7.1 8.5-8.7 only: 7.1, 7.0 8.3, 8.4 only: 8.0, 7.1, 7.0 8.0-8.2 only: 8.0, 7.6, 7.1, 7.0	Since 8.8: 7.1 8.5-8.7 only: 7.1, 7.0 8.3, 8.4 only: 8.0, 7.1, 7.0 8.0-8.2 only: 8.0, 7.6, 7.1, 7.0

2.4. NVIDIA CUDA Toolkit Version Support

The releases in this release family of NVIDIA vGPU software support NVIDIA CUDA Toolkit 10.1.

For more information about NVIDIA CUDA Toolkit, see [CUDA Toolkit 10.1 Documentation](#). This documentation applies to the base NVIDIA CUDA Toolkit 10.1 release and updates to the base release.



Note:

If you are using NVIDIA vGPU software with CUDA on Linux, avoid conflicting installation methods by installing CUDA from a distribution-independent runfile package. Do not install CUDA from a distribution-specific RPM or Deb package.

To ensure that the NVIDIA vGPU software graphics driver is not overwritten when CUDA is installed, deselect the CUDA driver when selecting the CUDA components to install.

For more information, see [NVIDIA CUDA Installation Guide for Linux](#).

2.5. XenMotion with vGPU Support

XenMotion with vGPU is supported only on a subset of supported GPUs, Citrix Hypervisor releases, and guest operating systems.

Supported GPUs:

- ▶ Tesla M6
- ▶ Tesla M10
- ▶ Tesla M60
- ▶ Tesla P4
- ▶ Tesla P6
- ▶ Tesla P40
- ▶ Tesla V100 SXM2
- ▶ Tesla V100 SXM2 32GB
- ▶ Tesla V100 PCIe
- ▶ Tesla V100 PCIe 32GB
- ▶ Tesla V100 FHHL
- ▶ **8.0-8.4 only:** Tesla T4
- ▶ Quadro RTX 6000
- ▶ Quadro RTX 8000

Supported Citrix Hypervisor releases:

- ▶ **8.3, 8.4 only:** 8.0 only
- ▶ **8.0-8.2 only:** 8.0 and 7.6 only



Note: As a result of the withdrawal of support for Citrix Hypervisor 8.0 and 7.6, XenMotion with vGPU is supported only on NVIDIA vGPU software releases 8.0-8.4.

Supported guest OS releases: Windows only. XenMotion with vGPU is **not** supported on Linux.

Chapter 3. Known Product Limitations

Known product limitations for this release of NVIDIA vGPU software are described in the following sections.

3.1. Issues occur when the channels allocated to a vGPU are exhausted

Description

Issues occur when the channels allocated to a vGPU are exhausted and the guest VM to which the vGPU is assigned fails to allocate a channel to the vGPU. A physical GPU has a fixed number of channels and the number of channels allocated to each vGPU is inversely proportional to the maximum number of vGPUs allowed on the physical GPU.

When the channels allocated to a vGPU are exhausted and the guest VM fails to allocate a channel, the following errors are reported on the hypervisor host or in an NVIDIA bug report:

```
Jun 26 08:01:25 srvxen06f vgpu-3[14276]: error: vmiop_log: (0x0): Guest attempted to
allocate channel above its max channel limit 0xfb
Jun 26 08:01:25 srvxen06f vgpu-3[14276]: error: vmiop_log: (0x0): vGPU message 6
failed, result code: 0x1a
Jun 26 08:01:25 srvxen06f vgpu-3[14276]: error: vmiop_log: (0x0):
0xc1d004a1, 0xff0e0000, 0xff0400fb, 0xc36f,
Jun 26 08:01:25 srvxen06f vgpu-3[14276]: error: vmiop_log: (0x0):          0x1,
0xff1fe314, 0xff1fe038, 0x100b6f000, 0x1000,
Jun 26 08:01:25 srvxen06f vgpu-3[14276]: error: vmiop_log: (0x0):
0x80000000, 0xff0e0200, 0x0, 0x0, (Not logged),
Jun 26 08:01:25 srvxen06f vgpu-3[14276]: error: vmiop_log: (0x0):          0x1, 0x0
Jun 26 08:01:25 srvxen06f vgpu-3[14276]: error: vmiop_log: (0x0): , 0x0
```

Workaround

Use a vGPU type with more frame buffer, thereby reducing the maximum number of vGPUs allowed on the physical GPU. As a result, the number of channels allocated to each vGPU is increased.

3.2. Total frame buffer for vGPUs is less than the total frame buffer on the physical GPU

Some of the physical GPU's frame buffer is used by the hypervisor on behalf of the VM for allocations that the guest OS would otherwise have made in its own frame buffer. The frame buffer used by the hypervisor is not available for vGPUs on the physical GPU. In NVIDIA vGPU deployments, frame buffer for the guest OS is reserved in advance, whereas in bare-metal deployments, frame buffer for the guest OS is reserved on the basis of the runtime needs of applications.

The approximate amount of frame buffer that NVIDIA vGPU software reserves can be calculated from the following formula:

$$\text{max-reserved-fb} = \text{vgpu-profile-size-in-mb} \div 16 + 16$$

max-reserved-fb

The maximum total amount of reserved frame buffer in Mbytes that is not available for vGPUs.

vgpu-profile-size-in-mb

The amount of frame buffer in Mbytes allocated to a single vGPU. This amount depends on the vGPU type. For example, for the T4-16Q vGPU type, *vgpu-profile-size-in-mb* is 16384.



Note: In VMs running a Windows guest OS that supports Windows Display Driver Model (WDDM) 1.x, namely, Windows 7, Windows 8.1, Windows Server 2008, and Windows Server 2012, an additional 48 Mbytes of frame buffer are reserved and not available for vGPUs.

3.3. Issues may occur with graphics-intensive OpenCL applications on vGPU types with limited frame buffer

Description

Issues may occur when graphics-intensive OpenCL applications are used with vGPU types that have limited frame buffer. These issues occur when the applications demand more frame buffer than is allocated to the vGPU.

For example, these issues may occur with the Adobe Photoshop and LuxMark OpenCL Benchmark applications:

- ▶ When the image resolution and size are changed in Adobe Photoshop, a program error may occur or Photoshop may display a message about a problem with the graphics hardware and a suggestion to disable OpenCL.

- ▶ When the LuxMark OpenCL Benchmark application is run, XID error 31 may occur.

Workaround

For graphics-intensive OpenCL applications, use a vGPU type with more frame buffer.

3.4. vGPU profiles with 512 Mbytes or less of frame buffer support only 1 virtual display head on Windows 10

Description

To reduce the possibility of memory exhaustion, vGPU profiles with 512 Mbytes or less of frame buffer support only 1 virtual display head on a Windows 10 guest OS.

The following vGPU profiles have 512 Mbytes or less of frame buffer:

- ▶ Tesla M6-0B, M6-0Q
- ▶ Tesla M10-0B, M10-0Q
- ▶ Tesla M60-0B, M60-0Q

Workaround

Use a profile that supports more than 1 virtual display head and has at least 1 Gbyte of frame buffer.

3.5. NVENC requires at least 1 Gbyte of frame buffer

Description

Using the frame buffer for the NVIDIA hardware-based H.264/HEVC video encoder (NVENC) may cause memory exhaustion with vGPU profiles that have 512 Mbytes or less of frame buffer. To reduce the possibility of memory exhaustion, NVENC is disabled on profiles that have 512 Mbytes or less of frame buffer. Application GPU acceleration remains fully supported and available for all profiles, including profiles with 512 Mbytes or less of frame buffer. NVENC support from both Citrix and VMware is a recent feature and, if you are using an older version, you should experience no change in functionality.

The following vGPU profiles have 512 Mbytes or less of frame buffer:

- ▶ Tesla M6-0B, M6-0Q

- ▶ Tesla M10-0B, M10-0Q
- ▶ Tesla M60-0B, M60-0Q

Workaround

If you require NVENC to be enabled, use a profile that has at least 1 Gbyte of frame buffer.

3.6. VM running older NVIDIA vGPU drivers fails to initialize vGPU when booted

Description

A VM running a version of the NVIDIA guest VM drivers from a previous main release branch, for example release 4.4, will fail to initialize vGPU when booted on a Citrix Hypervisor platform running the current release of Virtual GPU Manager.

In this scenario, the VM boots in standard VGA mode with reduced resolution and color depth. The NVIDIA virtual GPU is present in **Windows Device Manager** but displays a warning sign, and the following device status:

```
Windows has stopped this device because it has reported problems. (Code 43)
```

Depending on the versions of drivers in use, the Citrix Hypervisor VM's `/var/log/messages` log file reports one of the following errors:

- ▶ An error message:
`vmiop_log: error: Unable to fetch Guest NVIDIA driver information`
- ▶ A version mismatch between guest and host drivers:
`vmiop_log: error: Guest VGX version(1.1) and Host VGX version(1.2) do not match`
- ▶ A signature mismatch:
`vmiop_log: error: vGPU message signature mismatch.`

Resolution

Install the current NVIDIA guest VM driver in the VM.

3.7. Virtual GPU fails to start if ECC is enabled

Description

Tesla M60, Tesla M6, and GPUs based on the Pascal GPU architecture, for example Tesla P100 or Tesla P4, support error correcting code (ECC) memory for improved data integrity. Tesla

M60 and M6 GPUs in graphics mode are supplied with ECC memory disabled by default, but it may subsequently be enabled using `nvidia-smi`. GPUs based on the Pascal GPU architecture are supplied with ECC memory enabled.

However, NVIDIA vGPU does not support ECC memory. If ECC memory is enabled, NVIDIA vGPU fails to start.

Citrix XenCenter displays the following error message:

```
An emulator required to run this VM failed to start
```

The following error is logged in the Citrix Hypervisor host's `/var/log/messages` log file:

```
vmiop_log: error: Initialization: VGX not supported with ECC Enabled.
```

Resolution

Ensure that ECC is disabled on all GPUs.

Before you begin, ensure that NVIDIA Virtual GPU Manager is installed on your hypervisor.

1. Use `nvidia-smi` to list the status of all GPUs, and check for ECC noted as enabled on GPUs.

```
# nvidia-smi -q
=====NVSMI LOG=====

Timestamp                : Tue Dec 19 18:36:45 2017
Driver Version           : 384.99

Attached GPUs            : 1
GPU 0000:02:00.0

[...]

  Ecc Mode
    Current                : Enabled
    Pending                 : Enabled

[...]
```

2. Change the ECC status to off on each GPU for which ECC is enabled.

- ▶ If you want to change the ECC status to off for all GPUs on your host machine, run this command:

```
# nvidia-smi -e 0
```

- ▶ If you want to change the ECC status to off for a specific GPU, run this command:

```
# nvidia-smi -i id -e 0
```

id is the index of the GPU as reported by `nvidia-smi`.

This example disables ECC for the GPU with index `0000:02:00.0`.

```
# nvidia-smi -i 0000:02:00.0 -e 0
```

3. Reboot the host.

```
# shutdown -r now
```

4. Confirm that ECC is now disabled for the GPU.

```
# nvidia-smi -q
=====NVSMI LOG=====
```

```

Timestamp                : Tue Dec 19 18:37:53 2017
Driver Version           : 384.99

Attached GPUs             : 1
GPU 0000:02:00.0
[...]

  Ecc Mode
  Current                 : Disabled
  Pending                 : Disabled

[...]

```

If you later need to enable ECC on your GPUs, run one of the following commands:

- ▶ If you want to change the ECC status to on for all GPUs on your host machine, run this command:

```
# nvidia-smi -e 1
```

- ▶ If you want to change the ECC status to on for a specific GPU, run this command:

```
# nvidia-smi -i id -e 1
```

id is the index of the GPU as reported by `nvidia-smi`.

This example enables ECC for the GPU with index `0000:02:00.0`.

```
# nvidia-smi -i 0000:02:00.0 -e 1
```

After changing the ECC status to on, reboot the host.

3.8. Single vGPU benchmark scores are lower than pass-through GPU

Description

A single vGPU configured on a physical GPU produces lower benchmark scores than the physical GPU run in pass-through mode.

Aside from performance differences that may be attributed to a vGPU's smaller frame buffer size, vGPU incorporates a performance balancing feature known as Frame Rate Limiter (FRL). On vGPUs that use the best-effort scheduler, FRL is enabled. On vGPUs that use the fixed share or equal share scheduler, FRL is disabled.

FRL is used to ensure balanced performance across multiple vGPUs that are resident on the same physical GPU. The FRL setting is designed to give good interactive remote graphics experience but may reduce scores in benchmarks that depend on measuring frame rendering rates, as compared to the same benchmarks running on a pass-through GPU.

Resolution

FRL is controlled by an internal vGPU setting. On vGPUs that use the best-effort scheduler, NVIDIA does not validate vGPU with FRL disabled, but for validation of benchmark

performance, FRL can be temporarily disabled by specifying `frame_rate_limiter=0` in the VM's `platform:vgpu_extra_args` parameter:

```
[root@xenserver ~]# xe vm-param-set uuid=e71afda4-53f4-3a1b-6c92-a364a7f619c2
platform:vgpu_extra_args="frame_rate_limiter=0"
[root@xenserver ~]#
```

The setting takes effect the next time the VM is started or rebooted.

With this setting in place, the VM's vGPU will run without any frame rate limit. The FRL can be reverted back to its default setting in one of the following ways:

- ▶ Removing the `vgpu_extra_args` key from the `platform` parameter
- ▶ Removing `frame_rate_limiter=0` from the `vgpu_extra_args` key
- ▶ Setting `frame_rate_limiter=1`. For example:

```
[root@xenserver ~]# xe vm-param-set uuid=e71afda4-53f4-3a1b-6c92-a364a7f619c2
platform:vgpu_extra_args="frame_rate_limiter=1"
[root@xenserver ~]#
```

3.9. `nvidia-smi` fails to operate when all GPUs are assigned to GPU pass-through mode

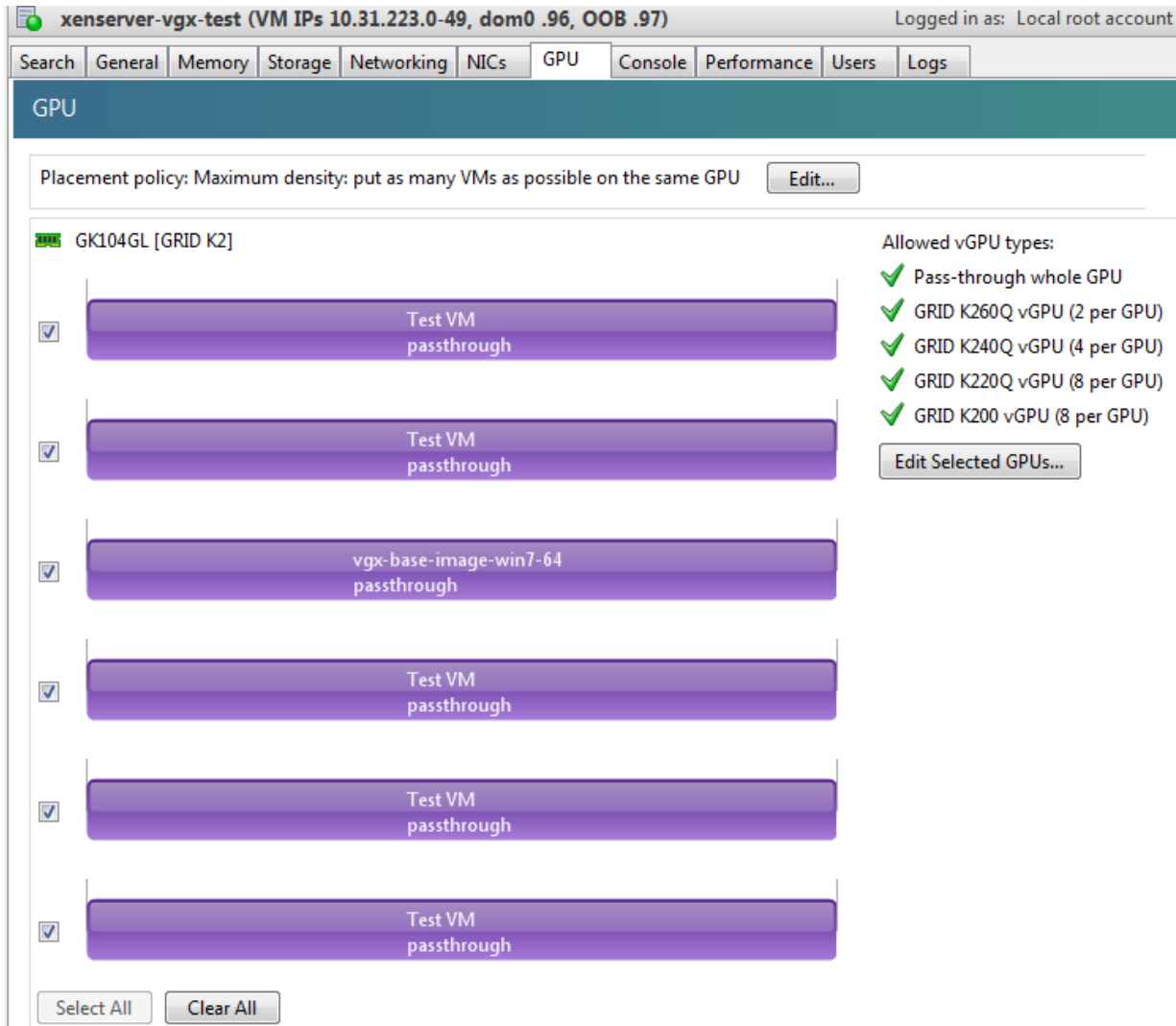
Description

If all GPUs in the platform are assigned to VMs in pass-through mode, `nvidia-smi` will return an error:

```
[root@xenserver-vgx-test ~]# nvidia-smi
Failed to initialize NVML: Unknown Error
```

This is because GPUs operating in pass-through mode are not visible to `nvidia-smi` and the NVIDIA kernel driver operating in the Citrix Hypervisor dom0.

To confirm that all GPUs are operating in pass-through mode, use XenCenter's GPU tab to review current GPU assignment:



Resolution

N/A

3.10. Windows Aero is disabled on Citrix Virtual Apps and Desktops session using 3 or 4 monitors in 2560×1600 resolution

Description

Windows Aero may be disabled when Citrix Virtual Apps and Desktops is connected to a VM with a vGPU or passthrough GPU, with 3 or 4 monitors at 2560×1600 resolution.

This limitation is a limitation of Windows 7. For details, see the Microsoft knowledge base article [Desktop background disappears with very large extended desktop on Windows 7](#).

3.11. VMs configured with large memory fail to initialize vGPU when booted

Description

When starting multiple VMs configured with large amounts of RAM (typically more than 32GB per VM), a VM may fail to initialize vGPU. In this scenario, the VM boots in standard VGA mode with reduced resolution and color depth. The NVIDIA vGPU software GPU is present in **Windows Device Manager** but displays a warning sign, and the following device status:

Windows has stopped this device because it has reported problems. (Code 43)

The Citrix Hypervisor VM's `/var/log/messages` log file contains these error messages:

```
vmiop_log: error: NVOS status 0x29
vmiop_log: error: Assertion Failed at 0x7620fd4b:179
vmiop_log: error: 8 frames returned by backtrace
...
vmiop_log: error: VGPU message 12 failed, result code: 0x29
...
vmiop_log: error: NVOS status 0x8
vmiop_log: error: Assertion Failed at 0x7620c8df:280
vmiop_log: error: 8 frames returned by backtrace
...
vmiop_log: error: VGPU message 26 failed, result code: 0x8
```

Resolution

vGPU reserves a portion of the VM's framebuffer for use in GPU mapping of VM system memory. The reservation is sufficient to support up to 32GB of system memory, and may be increased to accommodate up to 64GB by specifying `enable_large_sys_mem=1` in the VM's `platform:vgpu_extra_args` parameter:

```
[root@xenserver ~]# xe vm-param-set uuid=e71afda4-53f4-3a1b-6c92-a364a7f619c2
platform:vgpu_extra_args="enable_large_sys_mem=1"
```

The setting takes effect the next time the VM is started or rebooted. With this setting in place, less GPU FB is available to applications running in the VM. To accommodate system memory larger than 64GB, the reservation can be further increased by specifying `extra_fb_reservation` in the VM's `platform:vgpu_extra_args` parameter, and setting its value to the desired reservation size in megabytes. The default value of 64M is sufficient to support 64GB of RAM. We recommend adding 2M of reservation for each additional 1GB of system memory. For example, to support 96GB of RAM, set `extra_fb_reservation` to 128:

```
platform:vgpu_extra_args="enable_large_sys_mem=1, extra_fb_reservation=128"
```

The reservation can be reverted back to its default setting in one of the following ways:

- ▶ Removing the `vgpu_extra_args` key from the `platform` parameter
- ▶ Removing `enable_large_sys_mem` from the `vgpu_extra_args` key
- ▶ Setting `enable_large_sys_mem=0`

3.12. vGPU host driver RPM upgrade fails

Description

Upgrading vGPU host driver RPM fails with an error message about failed dependencies on the console.

```
[root@xenserver ~]# rpm -U NVIDIA-vGPU-xenserver-6.5-352.46.x86_64.rpm
error: Failed dependencies:
        NVIDIA-vgx-xenserver conflicts with NVIDIA-vGPU-xenserver-6.5-352.46.x86_64
[root@xenserver ~]#
```

Resolution

Uninstall the older vGPU RPM before installing the latest driver.

Use the following command to uninstall the older vGPU RPM:

```
[root@xenserver ~]# rpm -e NVIDIA-vgx-xenserver
```

Chapter 4. Resolved Issues

Only resolved issues that have been previously noted as known issues or had a noticeable user impact are listed. The summary and description for each resolved issue indicate the effect of the issue on NVIDIA vGPU software **before the issue was resolved**.

Issues Resolved in Release 8.10

No resolved issues are reported in this release for Citrix Hypervisor.

Issues Resolved in Release 8.9

No resolved issues are reported in this release for Citrix Hypervisor.

Issues Resolved in Release 8.8

No resolved issues are reported in this release for Citrix Hypervisor.

Issues Resolved in Release 8.7

Bug ID	Summary and Description
3226853	<p><u>8.0-8.6 Only: NVIDIA vGPU software graphics driver installation fails in Ubuntu guest VMs</u></p> <p>Installation of the NVIDIA vGPU software graphics driver from a <code>.run</code> file fails in Ubuntu guest VMs that are running Linux kernel version 5.8 or later.</p>

Issues Resolved in Release 8.6

Bug ID	Summary and Description
2925629	<p><u>8.0-8.5 Only: Desktop sessions disconnect after the server becomes unresponsive</u></p> <p>Desktop sessions disconnect after the server becomes unresponsive. Before the sessions disconnect, the error message <code>VGPU message 32 failed, result code: 0x59</code> is written to the log files on the hypervisor host.</p>

Issues Resolved in Release 8.5

Bug ID	Summary and Description
200494400	<p><u>8.0-8.4 Only: Citrix Virtual Apps and Desktops connection freezes initially</u></p> <p>When -0B and -0Q vGPU types are used with Citrix Virtual Apps and Desktops version 7 1903 and later versions, the session freezes or a black screen is seen when the connection is first made. When this issue occurs, the error message DXGI_ERROR_DEVICE_REMOVED is displayed. The affected versions of Citrix Virtual Apps and Desktops use Microsoft DDAPI.</p>

Issues Resolved in Release 8.4

Bug ID	Summary and Description
200594274	<p><u>8.0-8.3 Only: When the VMs to which 16 vGPUs on a single GPU are assigned are started simultaneously, one VM fails to boot</u></p> <p>When the VMs to which 16 vGPUs on a single GPU (for example 16 T4-1Q vGPUs on a Tesla T4 GPU) are assigned are started simultaneously, only 15 VMs boot and the remaining VM fails to start. When the other VMs are shut down, the VM that failed to start boots successfully.</p>
2814740	<p><u>8.0-8.3 Only: Uncorrectable machine check exception occurs after initial reboot of the hypervisor host</u></p> <p>When the hypervisor host is first rebooted after the Virtual GPU Manager is installed, an uncorrectable machine check exception occurs during POST immediately after the message SYSTEM CHIPSET INITIALIZATION UPI LINK INITIALIZATION - START. This issue affects HP systems that are running a hypervisor release that has a newer kernel, for example, Citrix Hypervisor 8.0 or 8.1.</p>
2870295	<p><u>8.0-8.3 Only: Out of memory errors cause VM crashes on Citrix Hypervisor</u></p> <p>Out of memory errors caused by extreme memory fragmentation cause VM crashes on Citrix Hypervisor.</p>

Issues Resolved in Release 8.3

Bug ID	Summary and Description
2175888	<p><u>8.0-8.2 Only: Even when the scheduling policy is equal share, unequal GPU utilization is reported</u></p> <p>When the scheduling policy is equal share, unequal GPU engine utilization can be reported for the vGPUs on the same physical GPU.</p>

Issues Resolved in Release 8.2

Bug ID	Summary and Description
2644858	<p><u>8.0, 8.1 Only: VMs fail to boot with failed assertions</u></p> <p>In some scenarios with heavy workloads running on multiple VMs configured with NVIDIA vGPUs on a single physical GPU, additional VMs configured with NVIDIA vGPU on the same GPU fail to boot. The failure of the VM to boot is followed by failed assertions. This issue affects GPUs based on the NVIDIA Volta GPU architecture and later architectures.</p>

Issues Resolved in Release 8.1

Bug ID	Summary and Description
200534988	<p>Error XID 47 followed by multiple XID 32 errors</p> <p>After disconnecting Citrix Virtual Apps and Desktops and clicking the power button in the VM, error XID 47 occurs followed by multiple XID 32 errors. When these errors occur, the hypervisor host becomes unusable.</p>
200434909	<p><u>8.0 Only: Users' view sessions may become corrupted after migration</u></p> <p>When a VM configured with vGPU under heavy load is migrated to another host, users' view sessions may become corrupted after the migration.</p>
-	<p><u>8.0 Only: Incorrect NVIDIA vGPU software Windows graphics driver version in the installer</u></p> <p>The NVIDIA vGPU software Windows graphics driver version in the installer is incorrect. The driver version incorrectly appears as 325.31 instead of 425.31 in the Extraction path field and the title of the NVIDIA Graphics Driver (325.31) Package Window.</p>

Issues Resolved in Release 8.0

Bug ID	Summary and Description
1971698	<p>NVIDIA vGPU encoder and process utilization counters don't work with Windows Performance Counters</p> <p>GPU encoder and process utilization counter groups are listed in Windows Performance Counters, but no instances of the counters are available. The counters are disabled by default and must be enabled.</p>

Chapter 5. Security Updates

5.1. Restricting Access to GPU Performance Counters

The NVIDIA graphics driver contains a vulnerability (CVE-2018-6260) that may allow access to application data processed on the GPU through a side channel exposed by the GPU performance counters. To address this vulnerability, update the driver and restrict access to GPU performance counters to allow access only by administrator users and users who need to use CUDA profiling tools.

The GPU performance counters that are affected by this vulnerability are the hardware performance monitors used by the CUDA profiling tools such as CUPTI, Nsight Graphics, and Nsight Compute. These performance counters are exposed on the hypervisor host and in guest VMs only as follows:

- ▶ On the hypervisor host, they are always exposed. However, the Virtual GPU Manager does not access these performance counters and, therefore, is not affected.
- ▶ In Windows and Linux guest VMs, they are exposed **only** in VMs configured for GPU pass through. They are not exposed in VMs configured for NVIDIA vGPU.

5.1.1. Windows: Restricting Access to GPU Performance Counters for One User by Using NVIDIA Control Panel

Perform this task from the guest VM to which the GPU is passed through.

Ensure that you are running **NVIDIA Control Panel** version 8.1.950.

1. Open **NVIDIA Control Panel**:
 - ▶ Right-click on the Windows desktop and select **NVIDIA Control Panel** from the menu.
 - ▶ Open **Windows Control Panel** and double-click the **NVIDIA Control Panel** icon.
2. In **NVIDIA Control Panel**, select the **Manage GPU Performance Counters** task in the **Developer** section of the navigation pane.

3. Complete the task by following the instructions in the **Manage GPU Performance Counters > Developer** topic in the **NVIDIA Control Panel** help.

5.1.2. Windows: Restricting Access to GPU Performance Counters Across an Enterprise by Using a Registry Key

You can use a registry key to restrict access to GPU Performance Counters for all users who log in to a Windows guest VM. By incorporating the registry key information into a script, you can automate the setting of this registry for all Windows guest VMs across your enterprise.

Perform this task from the guest VM to which the GPU is passed through.



CAUTION: Only enterprise administrators should perform this task. Changes to the Windows registry must be made with care and system instability can result if registry keys are incorrectly set.

1. Set the RmProfilingAdminOnly Windows registry key to 1.

```
[HKLM\SYSTEM\CurrentControlSet\Services\nvlddmkm\Global\NVTweak]
Value: "RmProfilingAdminOnly"
Type: DWORD
Data: 00000001
```

The data value 1 restricts access, and the data value 0 allows access, to application data processed on the GPU through a side channel exposed by the GPU performance counters.

2. Restart the VM.

5.1.3. Linux Guest VMs and Hypervisor Host: Restricting Access to GPU Performance Counters

On systems where unprivileged users don't need to use GPU performance counters, restrict access to these counters to system administrators, namely users with the `CAP_SYS_ADMIN` capability set. By default, the GPU performance counters are not restricted to users with the `CAP_SYS_ADMIN` capability.

Perform this task from the guest VM to which the GPU is passed through or from your hypervisor host machine.

In Linux guest VMs, this task requires `sudo` privileges. On your hypervisor host machine, this task must be performed as the root user on the machine.

1. Log in to the guest VM or open a command shell on your hypervisor host machine.
2. Set the kernel module parameter `NVreg_RestrictProfilingToAdminUsers` to 1 by adding this parameter to the `/etc/modprobe.d/nvidia.conf` file.

- ▶ If you are setting only this parameter, add an entry for it to the `/etc/modprobe.d/nvidia.conf` file as follows:
- ▶ If you are setting multiple parameters, set them in a single entry as in the following example:

```
options nvidia NVreg_RegistryDwords="NVreg_RestrictProfilingToAdminUsers=1"
```

```
options nvidia NVreg_RegistryDwords="RmPVMRL=0x0"  
"NVreg_RestrictProfilingToAdminUsers=1"
```

If the `/etc/modprobe.d/nvidia.conf` file does not already exist, create it.

3. Restart the VM or reboot your hypervisor host machine.

Chapter 6. Known Issues

6.1. Since 8.9: NVENC does not work with Teradici Cloud Access Software on Windows

Description

The NVIDIA hardware-based H.264/HEVC video encoder (NVENC) does not work with Teradici Cloud Access Software on Windows. This issue affects NVIDIA vGPU and GPU pass through deployments.

This issue occurs because the check that Teradici Cloud Access Software performs on the DLL signer name is case sensitive and NVIDIA recently changed the case of the company name in the signature certificate.

Status

Not an NVIDIA bug

This issue is resolved in the latest 21.07 and 21.03 Teradici Cloud Access Software releases.

Ref.

200749065

6.2. A licensed client might fail to acquire a license if a proxy is set

Description

If a proxy is set with a system environment variable such as `HTTP_PROXY` or `HTTPS_PROXY`, a licensed client might fail to acquire a license.

Workaround

Perform this workaround on each affected licensed client.

1. Add the address of the NVIDIA vGPU software license server to the system environment variable `NO_PROXY`.

The address must be specified exactly as it is specified in the client's license server settings either as a fully-qualified domain name or an IP address. If the `NO_PROXY` environment variable contains multiple entries, separate the entries with a comma (,).

If high availability is configured for the license server, add the addresses of the primary license server and the secondary license server to the system environment variable `NO_PROXY`.

2. Restart the NVIDIA driver service that runs the core NVIDIA vGPU software logic.
 - ▶ On Windows, restart the **NVIDIA Display Container** service.
 - ▶ On Linux, restart the `nvidia-gridd` service.

Status

Closed

Ref.

200704733

6.3. 8.0-8.6 Only: NVIDIA vGPU software graphics driver installation fails in Ubuntu guest VMs

Description

Installation of the NVIDIA vGPU software graphics driver from a `.run` file fails in Ubuntu guest VMs that are running Linux kernel version 5.8 or later.

Version

Ubuntu 18.04 LTS with Linux kernel version 5.8 or later

Workaround

Revert to a Linux kernel version earlier than 5.8.

Status

Resolved in NVIDIA vGPU software 8.7

Ref.

3226853

6.4. 8.0-8.5 Only: Desktop sessions disconnect after the server becomes unresponsive

Description

Desktop sessions disconnect after the server becomes unresponsive. Before the sessions disconnect, the error message `vGPU message 32 failed, result code: 0x59` is written to the log files on the hypervisor host.

Status

Resolved in NVIDIA vGPU software 8.6

Ref.

2925629

6.5. 8.0-8.3 Only: When the VMs to which 16 vGPUs on a single GPU are assigned are started simultaneously, one VM fails to boot

Description

When the VMs to which 16 vGPUs on a single GPU (for example 16 T4-1Q vGPUs on a Tesla T4 GPU) are assigned are started simultaneously, only 15 VMs boot and the remaining VM fails to start. When the other VMs are shut down, the VM that failed to start boots successfully.

The log file on the hypervisor host contains these error messages:

```

2020-03-04T16:01:13.626Z| vmx| E110: vmiop_log: NVOS status 0x51
2020-03-04T16:01:13.626Z| vmx| E110: vmiop_log: Assertion Failed at 0x5e530d8c:303
...

```



```

2020-03-04T16:01:13.626Z| vmx| E110: vmiop_log: (0x0): Failed to alloc guest FB
memory
2020-03-04T16:01:13.626Z| vmx| E110: vmiop_log: (0x0): init_device_instance failed
for inst 0 with error 2 (vmiop_display: error allocating framebuffer)
2020-03-04T16:01:13.626Z| vmx| E110: vmiop_log: (0x0): Initialization:
init_device_instance failed error 2
2020-03-04T16:01:13.629Z| vmx| E110: vmiop_log: display_init failed for inst: 0

```

Status

Resolved in NVIDIA vGPU software 8.4

Ref.

200594274

6.6. 8.0, 8.1 Only: VMs fail to boot with failed assertions

Description

In some scenarios with heavy workloads running on multiple VMs configured with NVIDIA vGPUs on a single physical GPU, additional VMs configured with NVIDIA vGPU on the same GPU fail to boot. The failure of the VM to boot is followed by failed assertions. This issue affects GPUs based on the NVIDIA Volta GPU architecture and later architectures.

When this error occurs, error messages similar to the following examples are logged to the Citrix Hypervisor log file `/var/log/messages`:

```

nvidia-vgpu-mgr[31526]: error: vmiop_log: NVOS status 0x1e
nvidia-vgpu-mgr[31526]: error: vmiop_log: Assertion Failed at 0xb2d3e4d7:96
nvidia-vgpu-mgr[31526]: error: vmiop_log: 12 frames returned by backtrace
nvidia-vgpu-mgr[31526]: error: vmiop_log: /usr/lib64/libnvidia-vgpu.so(_nv003956vgpu
+0x18) [0x7f4bb2cfb338] vmiop_dump_stack
nvidia-vgpu-mgr[31526]: error: vmiop_log: /usr/lib64/libnvidia-vgpu.so(_nv004018vgpu
+0xd4) [0x7f4bb2d09ce4] vmiopd_alloc_pb_channel
nvidia-vgpu-mgr[31526]: error: vmiop_log: /usr/lib64/libnvidia-vgpu.so(_nv002878vgpu
+0x137) [0x7f4bb2d3e4d7] vgpufceInitCopyEngine_GK104
nvidia-vgpu-mgr[31526]: error: vmiop_log: /usr/lib64/libnvidia-vgpu.so(+0x80e27)
[0x7f4bb2cd0e27]
nvidia-vgpu-mgr[31526]: error: vmiop_log: /usr/lib64/libnvidia-vgpu.so(+0x816a7)
[0x7f4bb2cd16a7]
nvidia-vgpu-mgr[31526]: error: vmiop_log: vgpu() [0x413820]
nvidia-vgpu-mgr[31526]: error: vmiop_log: vgpu() [0x413a8d]
nvidia-vgpu-mgr[31526]: error: vmiop_log: vgpu() [0x40e11f]
nvidia-vgpu-mgr[31526]: error: vmiop_log: vgpu() [0x40bb69]
nvidia-vgpu-mgr[31526]: error: vmiop_log: vgpu() [0x40b51c]
nvidia-vgpu-mgr[31526]: error: vmiop_log: /lib64/libc.so.6(__libc_start_main+0x100)
[0x7f4bb2feed20]
nvidia-vgpu-mgr[31526]: error: vmiop_log: vgpu() [0x4033ea]
nvidia-vgpu-mgr[31526]: error: vmiop_log: (0x0): Alloc Channel(Gpfifo) for device
failed error: 0x1e
nvidia-vgpu-mgr[31526]: error: vmiop_log: (0x0): Failed to allocate FCE channel
nvidia-vgpu-mgr[31526]: error: vmiop_log: (0x0): init_device_instance failed for
inst 0 with error 2 (init frame copy engine)
nvidia-vgpu-mgr[31526]: error: vmiop_log: (0x0): Initialization:
init_device_instance failed error 2

```

```
nvidia-vgpu-mgr[31526]: error: vmiop_log: display_init failed for inst: 0
nvidia-vgpu-mgr[31526]: error: vmiop_env_log: (0x0): vmiop_process_configuration:
plugin registration error
nvidia-vgpu-mgr[31526]: error: vmiop_env_log: (0x0): vmiop_process_configuration
failed with 0x1a
kernel: [858113.083773] [nvidia-vgpu-vfio] ace3f3bb-17d8-4587-920e-199b8fed532d:
start failed. status: 0x1
```

Status

Resolved in NVIDIA vGPU software 8.2

Ref.

2644858

6.7. NVIDIA Control Panel fails to start if launched too soon from a VM without licensing information

Description

If NVIDIA licensing information is not configured on the system, any attempt to start **NVIDIA Control Panel** by right-clicking on the desktop within 30 seconds of the VM being started fails.

Workaround

Wait at least 30 seconds before trying to launch **NVIDIA Control Panel**.

Status

Open

Ref.

200623179

6.8. DWM crashes randomly occur in Windows VMs

Description

Desktop Windows Manager (DWM) crashes randomly occur in Windows VMs, causing a blue-screen crash and the bug check `CRITICAL_PROCESS_DIED`. Computer Management shows problems with the primary display device.

Version

This issue affects Windows 10 1809, 1903 and 1909 VMs.

Status

Not an NVIDIA bug

Ref.

2730037

6.9. 8.0-8.4 Only: Citrix Virtual Apps and Desktops connection freezes initially

Description

When -0B and -0Q vGPU types are used with Citrix Virtual Apps and Desktops version 7 1903 and later versions, the session freezes or a black screen is seen when the connection is first made. When this issue occurs, the error message `DXGI_ERROR_DEVICE_REMOVED` is displayed. The affected versions of Citrix Virtual Apps and Desktops use Microsoft DDAPI.

Version

Citrix Virtual Apps and Desktops version 7 1903 and later versions

Workaround

Disable the **use hardware encoding for video codec** Citrix policy, which is enabled by default.

Status

Resolved in NVIDIA vGPU software 8.5

Ref.

200494400

6.10. 8.0-8.3 Only: Uncorrectable machine check exception occurs after initial reboot of the hypervisor host

Description

When the hypervisor host is first rebooted after the Virtual GPU Manager is installed, an uncorrectable machine check exception occurs during POST immediately after the message `SYSTEM CHIPSET INITIALIZATION UPI LINK INITIALIZATION - START`. This issue affects HP systems that are running a hypervisor release that has a newer kernel, for example, Citrix Hypervisor 8.0 or 8.1.

After the uncorrectable machine check exception, the hypervisor host is automatically reset and returns to a working state.

When this issue occurs, the following error messages are logged:

```
Uncorrectable Machine Check Exception (Processor 1, APIC ID 0x00000000, Bank
0x00000006,
Status 0xFB800000'0000E0B, Address 0x00000000'00000000, Misc 0x00000000'5B000000).
Uncorrectable PCI Express Error Detected. Slot 255 (Segment 0x0, Bus 0x5D, Device
0x48, Function 0x0)
Uncorrectable PCI Express Error Detected. Slot 255 (Segment 0x0, Bus 0x5D, Device
0x88, Function 0x0)
Uncorrectable PCI Express Error Detected. Slot 255 (Segment 0x0, Bus 0x5D, Device
0x80, Function 0x0)
Uncorrectable PCI Express Error Detected. Slot 255 (Segment 0x0, Bus 0x5D, Device
0x40, Function 0x0)
```

Workaround

Wait for the host to return to a working state. No other action is required.

Status

Resolved in NVIDIA vGPU software 8.4

Ref.

2814740

6.11. 8.0-8.3 Only: Out of memory errors cause VM crashes on Citrix Hypervisor

Description

Out of memory errors caused by extreme memory fragmentation cause VM crashes on Citrix Hypervisor.

When this issue occurs, error messages similar to the following examples are logged:

```
Feb 4 10:45:53 copic-xs-4 kernel: [3067294.076077] Out of memory: Kill process 6989 (xapi) score 7 or sacrifice child
Feb 4 10:45:53 copic-xs-4 kernel: [3067294.076399] Killed process 6989 (xapi) total-vm:638288kB, anon-rss:53824kB, file-rss:9292kB, shmem-rss:4kB
Feb 4 10:45:53 copic-xs-4 kernel: [3067294.138425] oom_reaper: reaped process 6989 (xapi), now anon-rss:0kB, file-rss:8kB, shmem-rss:4kB
```

The kill process in the messages might be different than xapi.

Workaround

Increase the memory for the Citrix Hypervisor dom0 domain to at least 16 GB.

Status

Resolved in NVIDIA vGPU software 8.4

Ref.

2870295

6.12. NVIDIA Control Panel fails to launch in a platform layer or published image

Description

When NVIDIA vGPU software is used with Citrix App Layering and a platform layer for a vGPU is being configured, **NVIDIA Control Panel** might fail to launch. The driver might be working normally or it might fail with code 31 or code 43.

For more information and a workaround for this issue, see [NVIDIA Control Panel fails to launch in platform layer or published image](#) in the Citrix Support Knowledge Center.

6.13. Citrix Virtual Apps and Desktops session freezes when the desktop is unlocked

Description

When a Citrix Virtual Apps and Desktops session that is locked is unlocked by pressing **Ctrl+Alt+Del**, the session freezes. This issue affects only VMs that are running Microsoft Windows 10 1809 as a guest OS.

Version

Microsoft Windows 10 1809 guest OS

Workaround

Restart the VM.

Status

Not an NVIDIA bug

Ref.

2767012

6.14. NVIDIA vGPU software graphics driver fails after Linux kernel upgrade with DKMS enabled

Description

After the Linux kernel is upgraded (for example by running `sudo apt full-upgrade`) with Dynamic Kernel Module Support (DKMS) enabled, the `nvidia-smi` command fails to run. If DKMS is enabled, an upgrade to the Linux kernel triggers a rebuild of the NVIDIA vGPU software graphics driver. The rebuild of the driver fails because the compiler version is incorrect. Any attempt to reinstall the driver fails because the kernel fails to build.

When the failure occurs, the following messages are displayed:

```
-> Installing DKMS kernel module:
```

```

ERROR: Failed to run `/usr/sbin/dkms build -m nvidia -v 418.70 -k 5.3.0-28-
generic`:
Kernel preparation unnecessary for this kernel. Skipping...
Building module:
cleaning build area...
'make' -j8 NV_EXCLUDE_BUILD_MODULES='' KERNEL_UNAME=5.3.0-28-generic
IGNORE_CC_MISMATCH='' modules...(bad exit status: 2)
ERROR (dkms apport): binary package for nvidia: 418.70 not found
Error! Bad return status for module build on kernel: 5.3.0-28-generic
(x86_64)
Consult /var/lib/dkms/nvidia/ 418.70/build/make.log for more information.
-> error.
ERROR: Failed to install the kernel module through DKMS. No kernel module
was installed;
please try installing again without DKMS, or check the DKMS logs for more
information.
ERROR: Installation has failed. Please see the file '/var/log/nvidia-
installer.log' for details.
You may find suggestions on fixing installation problems in the README
available on the Linux driver download page at www.nvidia.com.

```

Workaround

When installing the NVIDIA vGPU software graphics driver with DKMS enabled, use one of the following workarounds:

- ▶ Before running the driver installer, install the `dkms` package, then run the driver installer with the `-dkms` option.
- ▶ Run the driver installer with the `--no-cc-version-check` option.

Status

Not a bug.

Ref.

2836271

6.15. A PCIe bus error occurs in iLO after Tesla M10 installation

Description

When a Tesla M10 GPU is installed in an HPE ProLiant DL380 Gen9 or Gen10 server that is running Citrix Hypervisor 8.0, a PCIe bus error occurs in the Integrated Lights-Out (iLO) remote server management processor. When this error occurs, the server can no longer be shut down, the error message `CPU Panic` is issued, and a reboot of the server is forced.

This issue is specific to the PLX chip on the Tesla M10 GPU.

Version

This issue affects **only** the following combination of software and hardware:

- ▶ **Hypervisor software:** Citrix Hypervisor 8.0
- ▶ **Server hardware:** HPE ProLiant DL380 Gen9 or Gen10
- ▶ **GPU hardware:** Tesla M10

Status

Open

Ref.

200588187

6.16. 8.0 Only: Users' view sessions may become corrupted after migration

Description

When a VM configured with vGPU under heavy load is migrated to another host, users' view sessions may become corrupted after the migration.

Workaround

Restart the VM.

Status

Resolved in NVIDIA vGPU software release 8.1.

Ref.

200434909

6.17. Migrating a VM configured with NVIDIA vGPU software release 8.1 to a host running release 8.0 fails

Description

If a VM configured with NVIDIA vGPU software release 8.1 is migrated to a host running NVIDIA vGPU software release 8.0, the migration fails and the VM shuts down.

This issue occurs only with the following combination of releases of guest VM graphics driver, vGPU manager on the source host, and vGPU manager on the destination host:

Guest VM Graphics Driver	Source vGPU Manager	Destination vGPU Manager
8.1	8.1	8.0

Workaround

1. On the host that is running vGPU Manager 8.1, set the registry key `RMSetVGPUVersionMax` to `0x20001`.
2. Start the VM.
3. Confirm that the vGPU version in the log files is `0x20001`.

```
2019-07-09T10:19:05.420Z | vthread-2142280 | I125: vmiop_log: vGPU version: 0x20001
```

The VM can now be migrated.

Status

Open

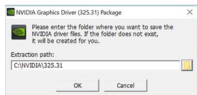
Ref.

200533827

6.18. 8.0 Only: Incorrect NVIDIA vGPU software Windows graphics driver version in the installer

Description

The NVIDIA vGPU software Windows graphics driver version in the installer is incorrect. The driver version incorrectly appears as 325.31 instead of 425.31 in the **Extraction path** field and the title of the **NVIDIA Graphics Driver (325.31) Package Window**.



Version

NVIDIA vGPU software Windows graphics driver version 425.31 in NVIDIA vGPU software release 8.0

Workaround

To simplify future administration of your system, you can correct the driver version in the folder name when the installer prompts you for the extraction path. However, if you do not change the name of the folder in the extraction path, the installation succeeds and the driver functions correctly.

Status

Resolved in NVIDIA vGPU software release 8.1

6.19. Incorrect GPU type shown for Quadro RTX 8000 GPUs in Citrix XenCenter

Description

On the **GPU** tab in **Citrix XenCenter**, Quadro RTX 8000 GPUs are incorrectly shown as [QUADRO RTX 6000].

However, the virtual GPU types for a Quadro RTX 8000 GPU are listed correctly.

NVIDIA vGPU software does not support systems with a mixture of GPU types. Therefore, you can assume that any GPU in a system that you know to contain Quadro RTX 8000 GPUs that is shown as [QUADRO RTX 6000] is, in fact, a Quadro RTX 8000 GPU.

Status

Not an NVIDIA bug

Ref.

200492607

6.20. NVIDIA Notification Icon prevents log off of Citrix Published Application user sessions

Description

By default on Windows Server operating systems, the **NVIDIA Notification Icon** application is started with every Citrix Published Application user session. This application might prevent the Citrix Published Application user session from being logged off even after the user has quit all other applications.

Resolution

Disable the **NVIDIA Notification Icon** application for Citrix Published Application user sessions as explained in [Virtual GPU Software User Guide](#).

Status

Resolved by the provision of Windows registry keys for disabling the **NVIDIA Notification Icon** application for Citrix Published Application user sessions.

Ref.

2206368

6.21. Vulkan applications crash in Windows 7 guest VMs configured with NVIDIA vGPU

Description

In Windows 7 guest VMs configured with NVIDIA vGPU, applications developed with Vulkan APIs crash or throw errors when they are launched. Vulkan APIs require sparse texture support, but in Windows 7 guest VMs configured with NVIDIA vGPU, sparse textures are not enabled.

In Windows 10 guest VMs configured with NVIDIA vGPU, sparse textures are enabled and applications developed with Vulkan APIs run correctly in these VMs.

Status

Open

Ref.

200381348

6.22. Host core CPU utilization is higher than expected for moderate workloads

Description

When GPU performance is being monitored, host core CPU utilization is higher than expected for moderate workloads. For example, host CPU utilization when only a small number of VMs are running is as high as when several times as many VMs are running.

Workaround

Disable monitoring of the following GPU performance statistics:

- ▶ vGPU engine usage by applications across multiple vGPUs
- ▶ Encoder session statistics
- ▶ Frame buffer capture (FBC) session statistics
- ▶ Statistics gathered by performance counters in guest VMs

Status

Open

Ref.

2414897

6.23. Frame capture while the interactive logon message is displayed returns blank screen

Description

Because of a known limitation with NvFBC, a frame capture while the interactive logon message is displayed returns a blank screen.

An NvFBC session can capture screen updates that occur after the session is created. Before the logon message appears, there is no screen update after the message is shown and, therefore, a black screen is returned instead. If the NvFBC session is created after this update has occurred, NvFBC cannot get a frame to capture.

Workaround

See [Black Screen at Logon with Nvidia HDX 3D Pro enabled](#) in the Citrix knowledge base.

Status

Not a bug

Ref.

2115733

6.24. RDS sessions do not use the GPU with some Microsoft Windows Server releases

Description

When some releases of Windows Server are used as a guest OS, Remote Desktop Services (RDS) sessions do not use the GPU. With these releases, the RDS sessions by default use the Microsoft Basic Render Driver instead of the GPU. This default setting enables 2D DirectX applications such as Microsoft Office to use software rendering, which can be more efficient than using the GPU for rendering. However, as a result, 3D applications that use DirectX are prevented from using the GPU.

Version

- ▶ Windows Server 2019
- ▶ Windows Server 2016
- ▶ Windows Server 2012

Solution

Change the local computer policy to use the hardware graphics adapter for all RDS sessions.

1. Choose **Local Computer Policy > Computer Configuration > Administrative Templates > Windows Components > Remote Desktop Services > Remote Desktop Session Host > Remote Session Environment** .
2. Set the **Use the hardware default graphics adapter for all Remote Desktop Services sessions** option.

6.25. Cloned VMs configured with a vGPU type different than the type in the master image fail to start

Description

Cloned VMs configured with a vGPU type different than the type in the master image fail to start.

When a Windows 10 VM is booted, the VM becomes stuck in a loop and alternately displays Getting devices ready: 50% and Preparation in progress.

Workaround

Create one master image for each vGPU type that you want to use. Do not attempt to configure a cloned VM with a vGPU type different than the type in the master image.

Status

Not an NVIDIA bug

Ref.

2285306

6.26. 8.0-8.2 Only: Even when the scheduling policy is equal share, unequal GPU utilization is reported

Description

When the scheduling policy is equal share, unequal GPU engine utilization can be reported for the vGPUs on the same physical GPU.

For example, GPU engine usage for three P40-8Q vGPUs on a Tesla P40 GPU might be reported as follows:

```
[root@localhost:~] nvidia-smi vgpu
Wed Jun 27 10:33:18 2018
+-----+
| NVIDIA-SMI 390.59                Driver Version: 390.59                |
+-----+-----+
| GPU   Name                               | Bus-Id                               | GPU-Util |
| vGPU ID   Name                           | VM ID   VM Name                       | vGPU-Util |
+-----+-----+-----+-----+
| 0   Tesla P40                           | 00000000:81:00.0                     | 52%      |
| 2122661  GRID P40-8Q                     | 2122682  centos7.4-xmpl-211...       | 19%      |
| 2122663  GRID P40-8Q                     | 2122692  centos7.4-xmpl-211...       | 0%       |
| 2122659  GRID P40-8Q                     | 2122664  centos7.4-xmpl-211...       | 25%      |
+-----+-----+-----+-----+
| 1   Tesla P40                           | 00000000:85:00.0                     | 58%      |
| 2122662  GRID P40-8Q                     | 2122689  centos7.4-xmpl-211...       | 0%       |
| 2122658  GRID P40-8Q                   | 2122667  centos7.4-xmpl-211... | 59%    |
| 2122660  GRID P40-8Q                     | 2122670  centos7.4-xmpl-211...       | 0%       |
+-----+-----+-----+-----+
```

The vGPU utilization of the vGPU 2122658 is reported as 59%. However, the expected vGPU utilization should not exceed 33%.

This behavior is a result of the mechanism that is used to measure GPU engine utilization.

Status

Resolved in NVIDIA vGPU software 8.3

Ref.

2175888

6.27. When the scheduling policy is fixed share, GPU utilization is reported as higher than expected

Description

When the scheduling policy is fixed share, GPU engine utilization can be reported as higher than expected for a vGPU.

For example, GPU engine usage for six P40-4Q vGPUs on a Tesla P40 GPU might be reported as follows:

```
[root@localhost:~] nvidia-smi vgpu
Mon Aug 20 10:33:18 2018
```

NVIDIA-SMI 390.42		Driver Version: 390.42	
GPU	Name	Bus-Id	GPU-Util
vGPU ID	Name	VM ID	vGPU-Util
0	Tesla P40	00000000:81:00.0	99%
85109	GRID P40-4Q	85110	32%
87195	GRID P40-4Q	87196	39%
88095	GRID P40-4Q	88096	26%
89170	GRID P40-4Q	89171	0%
90475	GRID P40-4Q	90476	0%
93363	GRID P40-4Q	93364	0%
1	Tesla P40	00000000:85:00.0	0%

The vGPU utilization of vGPU 85109 is reported as 32%. For vGPU 87195, vGPU utilization is reported as 39%. And for 88095, it is reported as 26%. However, the expected vGPU utilization of any vGPU should not exceed approximately 16.7%.

This behavior is a result of the mechanism that is used to measure GPU engine utilization.

Status

Open

Ref. #

2227591

6.28. `nvidia-smi` reports that vGPU migration is supported on all hypervisors

Description

The command `nvidia-smi vgpu -m` shows that vGPU migration is supported on all hypervisors, even hypervisors or hypervisor versions that do not support vGPU migration.

Status

Closed

Ref. #

200407230

6.29. NVIDIA Control Panel Crashes in a VM connected to two 4K displays

Description

When **NVIDIA Control Panel** is started in a VM connected through a pass-through GPU to two 4K displays, a **Citrix HDX 3D Pro Warning** pop-up window opens containing the following error message:

```
Full screen applications are not supported on Citrix HDX 3D Pro. Press Ok to exit
```

NVIDIA Control Panel then crashes.

After the VM is rebooted, **NVIDIA Control Panel** is available again.

Version

Citrix Virtual Apps and Desktops 7.16

Status

Not an NVIDIA bug

Ref.

200393766

6.30. vGPU guest VM driver not properly loaded on servers with more than 512 GB or 1 TB or more of system memory

Description

If PV IOMMU is enabled, support for vGPU is limited to servers with a maximum of 512 GB of system memory. On servers with more than 512 GB of system memory and PV IOMMU enabled, the guest VM driver is not properly loaded. **Device Manager** marks the vGPU with a yellow exclamation point.

If PV IOMMU is disabled, support for vGPU is limited to servers with less than 1 TB of system memory. This limitation applies only to systems with supported GPUs based on the Maxwell architecture: Tesla M6, Tesla M10, and Tesla M60. On servers with 1 TB or more of system memory, VMs configured with vGPU fail to power on. However, support for GPU pass through is not affected by this limitation.

Resolution

1. If PV IOMMU is enabled, disable it.

```
[root@xenserver ~]# /opt/xensource/libexec/xen-cmdline --set-xen iommu=dom0-passthrough
```
2. If the server has 1 TB or more of system memory, limit the amount of system memory on the server to 1 TB minus 16 GB.

If the server has less than 1 TB or more of system memory, omit this step.
3. Reboot the server.

Status

Not an NVIDIA bug

Ref.

1799582

6.31. Luxmark causes a segmentation fault on an unlicensed Linux client

Description

If the Luxmark application is run on a Linux guest VM configured with NVIDIA vGPU that is booted without acquiring a license, a segmentation fault occurs and the application core dumps. The fault occurs when the application cannot allocate a CUDA object on NVIDIA vGPUs where CUDA is disabled. On NVIDIA vGPUs that can support CUDA, CUDA is disabled in unlicensed mode.

Status

Not an NVIDIA bug.

Ref.

200330956

6.32. Resolution is not updated after a VM acquires a license and is restarted

Description

In a Red Enterprise Linux 7.3 guest VM, an increase in resolution from 1024×768 to 2560×1600 is not applied after a license is acquired and the `gridd` service is restarted. This issue occurs if the `multimonitor` parameter is added to the `xorg.conf` file.

Version

Red Enterprise Linux 7.3

Status

Open

Ref.

200275925

6.33. On Tesla P40, P6, and P4 GPUs, the default ECC setting prevents NVIDIA vGPU from starting

Description

On Tesla P40, Tesla P6, and Tesla P4 GPUs, the default error-correcting code (ECC) memory setting prevents NVIDIA vGPU from starting. By default, ECC memory is enabled on these GPUs, but NVIDIA vGPU does not support ECC memory.

Workaround

Before running NVIDIA vGPU, disable ECC memory as explained in [Virtual GPU Software User Guide](#).

Status

Closed.

Ref.

200269717

6.34. A segmentation fault in DBus code causes `nvidia-gridd` to exit on Red Hat Enterprise Linux and CentOS

Description

On Red Hat Enterprise Linux 6.8 and 6.9, and CentOS 6.8 and 6.9, a segmentation fault in DBus code causes the `nvidia-gridd` service to exit.

The `nvidia-gridd` service uses DBus for communication with **NVIDIA X Server Settings** to display licensing information through the **Manage License** page. Disabling the GUI for licensing resolves this issue.

To prevent this issue, the GUI for licensing is disabled by default. You might encounter this issue if you have enabled the GUI for licensing and are using Red Hat Enterprise Linux 6.8 or 6.9, or CentOS 6.8 and 6.9.

Version

Red Hat Enterprise Linux 6.8 and 6.9

CentOS 6.8 and 6.9

Status

Open

Ref.

- ▶ 200358191
- ▶ 200319854
- ▶ 1895945

6.35. No Manage License option available in NVIDIA X Server Settings by default

Description

By default, the **Manage License** option is not available in **NVIDIA X Server Settings**. This option is missing because the GUI for licensing on Linux is disabled by default to work around the issue that is described in [A segmentation fault in Dbus code causes nvidia-gridd to exit on Red Hat Enterprise Linux and CentOS](#).

Workaround

This workaround requires sudo privileges.



Note: Do **not** use this workaround with Red Hat Enterprise Linux 6.8 and 6.9 or CentOS 6.8 and 6.9. To prevent a segmentation fault in Dbus code from causing the `nvidia-gridd` service from exiting, the GUI for licensing must be disabled with these OS versions.

1. If **NVIDIA X Server Settings** is running, shut it down.
2. If the `/etc/nvidia/gridd.conf` file does not already exist, create it by copying the supplied template file `/etc/nvidia/gridd.conf.template`.
3. As root, edit the `/etc/nvidia/gridd.conf` file to set the `EnableUI` option to `TRUE`.
4. Start the `nvidia-gridd` service.

```
# sudo service nvidia-gridd start
```

When **NVIDIA X Server Settings** is restarted, the **Manage License** option is now available.

Status

Open

6.36. Licenses remain checked out when VMs are forcibly powered off

Description

NVIDIA vGPU software licenses remain checked out on the license server when non-persistent VMs are forcibly powered off.

The NVIDIA service running in a VM returns checked out licenses when the VM is shut down. In environments where non-persistent licensed VMs are not cleanly shut down, licenses on the license server can become exhausted. For example, this issue can occur in automated test environments where VMs are frequently changing and are not guaranteed to be cleanly shut down. The licenses from such VMs remain checked out against their MAC address for seven days before they time out and become available to other VMs.

Resolution

If VMs are routinely being powered off without clean shutdown in your environment, you can avoid this issue by shortening the license borrow period. To shorten the license borrow period, set the `LicenseInterval` configuration setting in your VM image. For details, refer to [Virtual GPU Client Licensing User Guide](#).

Status

Closed

Ref.

1694975

6.37. Memory exhaustion can occur with vGPU profiles that have 512 Mbytes or less of frame buffer

Description

Memory exhaustion can occur with vGPU profiles that have 512 Mbytes or less of frame buffer.

This issue typically occurs in the following situations:

- ▶ Full screen 1080p video content is playing in a browser. In this situation, the session hangs and session reconnection fails.
- ▶ Multiple display heads are used with Citrix Virtual Apps and Desktops or VMware Horizon on a Windows 10 guest VM.
- ▶ Higher resolution monitors are used.
- ▶ Applications that are frame-buffer intensive are used.
- ▶ NVENC is in use.

To reduce the possibility of memory exhaustion, NVENC is disabled on profiles that have 512 Mbytes or less of frame buffer.

When memory exhaustion occurs, the NVIDIA host driver reports Xid error 31 and Xid error 43 in the Citrix Hypervisor `/var/log/messages` file.

The following vGPU profiles have 512 Mbytes or less of frame buffer:

- ▶ Tesla M6-0B, M6-0Q
- ▶ Tesla M10-0B, M10-0Q
- ▶ Tesla M60-0B, M60-0Q

The root cause is a known issue associated with changes to the way that recent Microsoft operating systems handle and allow access to overprovisioning messages and errors. If your systems are provisioned with enough frame buffer to support your use cases, you should not encounter these issues.

Workaround

- ▶ Use an appropriately sized vGPU to ensure that the frame buffer supplied to a VM through the vGPU is adequate for your workloads.
- ▶ Monitor your frame buffer usage.
- ▶ If you are using Windows 10, consider these workarounds and solutions:
 - ▶ Use a profile that has 1 Gbyte of frame buffer.

- ▶ Optimize your Windows 10 resource usage.

To obtain information about best practices for improved user experience using Windows 10 in virtual environments, complete the [NVIDIA GRID vGPU Profile Sizing Guide for Windows 10 download request form](#).

For more information, see also [Windows 10 Optimization for XenDesktop](#) on the Citrix blog.

Status

Open

Ref.

- ▶ 200130864
- ▶ 1803861

6.38. VM bug checks after the guest VM driver for Windows 10 RS2 is installed

Description

When the VM is rebooted after the guest VM driver for Windows 10 RS2 is installed, the VM bug checks. When Windows boots, it selects one of the standard supported video modes. If Windows is booted directly with a display that is driven by an NVIDIA driver, for example a vGPU on Citrix Hypervisor, a blue screen crash occurs.

This issue occurs when the screen resolution is switched from VGA mode to a resolution that is higher than 1920×1200.

Fix

Download and install [Microsoft Windows Update KB4020102](#) from the Microsoft Update Catalog.

Workaround

If you have applied the fix, ignore this workaround.

Otherwise, you can work around this issue until you are able to apply the fix by not using resolutions higher than 1920×1200.

1. Choose a GPU profile in Citrix XenCenter that does not allow resolutions higher than 1920×1200.
2. Before rebooting the VM, set the display resolution to 1920×1200 or lower.

Status

Not an NVIDIA bug

Ref.

200310861

6.39. On Citrix Hypervisor 7.0, VMs unexpectedly reboot and Citrix Hypervisor crashes or freezes

Description

On Citrix Hypervisor 7.0, VMs to which a vGPU is attached unexpectedly reboot and Citrix Hypervisor crashes or freezes.

The event log in the Citrix Hypervisor `/var/log/crash/xen.log` file lists the following errors:

- ▶ A fatal bus error on a component at the slot where the GPU card is installed
- ▶ A fatal error on a component at bus 0, device 2, function 0

This issue occurs when page-modification logging (PML) is enabled on Intel Broadwell CPUs running Citrix Hypervisor 7.0. Citrix is aware of this issue and is working on a permanent fix.

Workaround

Disable page-modification logging (PML) as explained in [XenServer 7 host crash while starting multiple virtual machines](#) in the Citrix Support Knowledge Center.

Status

Not an NVIDIA bug

Ref.

1853248

6.40. With no NVIDIA driver installed, Citrix Hypervisor misidentifies Tesla M10 cards

Description

An erroneous entry in the `pci.ids` database causes Citrix Hypervisor to identify Tesla M10 cards as GRID M40 when no NVIDIA driver is installed.

Version

Citrix Hypervisor 6.5 and 7.0

Workaround

None

Status

Not an NVIDIA bug

Ref.

NVIDIA-420/1792341

6.41. GNOME Display Manager (GDM) fails to start on Red Hat Enterprise Linux 7.2 and CentOS 7.0

Description

GDM fails to start on Red Hat Enterprise Linux 7.2 and CentOS 7.0 with the following error:

```
Oh no! Something has gone wrong!
```

Workaround

Permanently enable permissive mode for Security Enhanced Linux (SELinux).

1. As root, edit the `/etc/selinux/config` file to set `SELINUX` to `permissive`.

```
SELINUX=permissive
```
2. Reboot the system.

```
~]# reboot
```

For more information, see [Permissive Mode](#) in *Red Hat Enterprise Linux 7 SELinux User's and Administrator's Guide*.

Status

Not an NVIDIA bug

Ref.

200167868

6.42. Video goes blank when run in loop in Windows Media Player

Description

When connected to a vGPU-enabled VM using Citrix Virtual Apps and Desktops, a video played back in looping mode on Windows Media Player goes blank or freezes after a few iterations.

Workaround

None

Status

Not an NVIDIA bug

Ref.

1306623

6.43. Local VGA console is momentarily unblanked when Citrix Virtual Apps and Desktops changes resolution of the VM desktop

Description

When Citrix Virtual Apps and Desktops establishes a remote connection to a VM using vGPU, the VM's local VGA console display in XenCenter is blanked (assuming the VM local console

has not been disabled by setting `platform:vgpu_extra_args="disable_vnc=1"`). If the Citrix Virtual Apps and Desktops session changes resolution of the VM's desktop, the local VGA console momentarily unblanks, allowing a XenCenter user to briefly view the desktop.

Workaround

Disable the VM's local VGA console

```
xe vm-param-set uuid=vm-uuid platform:vgpu_extra_args="disable_vnc=1"
```

Status

Open

Ref.

NVIDIA-145/1375164

6.44. VM bugchecks on shutdown/ restart when Citrix Virtual Apps and Desktops is installed and NVIDIA driver is uninstalled or upgraded.

Description

If the Citrix Virtual Apps and Desktops agent is installed in a VM before any NVIDIA GPU driver is installed, the VM will bugcheck (bluescreen) when the NVIDIA driver is subsequently upgraded or uninstalled. The bugcheck code is 0x7E, `SYSTEM_THREAD_EXCEPTION_NOT_HANDLED`.

Workaround

Use one of the following workarounds:

- ▶ Do a force shutdown of the VM and restart it.
- ▶ Install the NVIDIA driver in guest VMs before installing Citrix Virtual Apps and Desktops.

Status

Open

Ref.

NVIDIA-295/200018125

6.45. Application frame rate may drop when running Citrix Virtual Apps and Desktops at 2560×1600 resolution.

Description

An application's rendering frame rate may drop when running Citrix Virtual Apps and Desktops at 2560×1600 resolution, relative to the frame rate obtained at lower resolutions.

Fix

Using the Windows `regedit` utility within the VM, open the `HKLM\SOFTWARE\Citrix\Graphics` registry key and create a new `DWORD` value, `EncodeSpeed`, with a value of 2. Reboot the VM. This setting may improve the delivered frame rate at the expense of a reduction in image quality.

Status

Open

Ref.

NVIDIA-190/1416336

6.46. Windows VM BSOD

Description

Windows VM bugchecks on Citrix Hypervisor when running a large number of vGPU based VMs.

The Citrix Hypervisor `/var/log/messages` file contains these error messages:

```
NVRM: Xid (PCI:0000:08:00): 31, Ch 0000001e, engmask 00000111, intr 10000000
NVRM: Xid (PCI:0000:08:00): 31, Ch 00000016, engmask 00000111, intr 10000000
...
vmiop_log: error: Assertion Failed at 0xb5b898d8:4184
vmiop_log: error: 8 frames returned by backtrace
vmiop_log: error: /usr/lib/libnvidia-vgx.so(_nv000793vgx+0x69d) [0xb5b8064d]
vmiop_log: error: /usr/lib/libnvidia-vgx.so(_nv000479vgx+0x118) [0xb5b898d8]
vmiop_log: error: /usr/lib/libnvidia-vgx.so(_nv000782vgx+0x59) [0xb5b85f49]
vmiop_log: error: /usr/lib/libnvidia-vgx.so(_nv000347vgx+0x3db) [0xb5b932db]
vmiop_log: error: /usr/lib/libnvidia-vgx.so [0xb5b78e4a]
vmiop_log: error: /usr/lib/xen/bin/vgpu [0x80554be]
vmiop_log: error: /lib/libpthread.so.0 [0xb7612912]
vmiop_log: error: /lib/libc.so.6(clone+0x5e) [0xb76fc5ee]
vmiop_log: error: failed to initialize guest PTE entries
vmiop_log: error: failed to fill up guest PTE entries 3
```

```
vmiop_log: error: VGPU message 27 failed, result code: 0xff000003
vmiop_log: error:      0xc1d00001, 0xff010000, 0x1a77ba000, 0x0, 0x1,
vmiop_log: error:      0x1, 0x1000, 0x10202, 0xc1d00001, 0xff010000,
vmiop_log: error:      0xcaf00004, 0x0
vmiop_log: error: Timeout occurred, reset initiated.
```

Version

Citrix Hypervisor 6.2

Fix

Ensure that you are running the latest OEM firmware for your NVIDIA vGPU software boards.

Status

Closed

Ref.

NVIDIA-327/1632120

6.47. Windows VM BSOD when upgrading NVIDIA drivers over a Citrix Virtual Apps and Desktops session

Description

Windows VM bugchecks when NVIDIA guest drivers are upgraded over a Citrix Virtual Apps and Desktops session.

If the VM is restarted after the bugcheck, the upgraded driver loads correctly and full functionality is available.

Fix

Upgrade Citrix Virtual Apps and Desktops to 7.6 Feature Pack 3

Status

Closed

Ref.

NVIDIA-370/200130780

6.48. XenCenter does not allow vGPUs to be selected as a GPU type for Linux VMs

Description

When creating a new Linux VM or editing the properties of an existing Linux VM, XenCenter does not allow vGPUs to be selected as a GPU type.

vGPU on Linux VMs is supported as a technical preview on Citrix Hypervisor 6.5, and does include XenCenter integration.

Version

Affects the XenCenter integration with Citrix Hypervisor 6.5 only.

Resolved in the XenCenter integration with Citrix Hypervisor 7.0.

Workaround

Refer to XenServer vGPU Management in [Virtual GPU Software User Guide](#) for how to configure vGPU by using the `xe` CLI.

Status

Closed

Ref.

NVIDIA-360

6.49. If X server is killed on a RHEL7 VM running vGPU, XenCenter console may not automatically switch to text console

Description

If X server is killed on a RHEL7 VM running vGPU, XenCenter console may display a corrupted image and fail to switchover to text console.

The failure to switchover to text console is due to a bug in RHEL7, which causes X server to not start correctly under certain configurations.

Workaround

Use **CTRL+ALT+F1**, **F2**, or **F3** to switch between Linux terminals.

Status

Closed

Ref.

NVIDIA-350/200123378

6.50. Citrix Virtual Apps and Desktops shows only a black screen when connected to a vGPU VM

Description

Citrix Virtual Apps and Desktops sometimes displays only a black screen when it is connected to an NVIDIA vGPU VM. The probable cause is that the display that is connected to the NVIDIA vGPU is entering a lower power state.

Fix

Disable all display-related power management settings.

For detailed instructions, visit [Microsoft power plans frequently asked questions](#) and from the list, select your OS version.

Status

Not an NVIDIA bug

Ref.

1719877

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