



Virtual GPU Software R450 for Microsoft Windows Server

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 Microsoft Windows Server.



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 Windows driver and NVIDIA Linux driver.

NVIDIA vGPU Software Version	NVIDIA Windows Driver Version	NVIDIA Linux Driver Version
11.13	454.23	450.248.02
11.12	454.14	450.236.01
11.11	454.02	450.216.04
11.10	453.94	450.216.04
11.9	453.64	450.203.02
11.8	453.51	450.191.01
11.7	453.37	450.172.01
11.6	453.23	450.156.00
11.5	453.10	450.142.00
11.4	452.96	450.119.03
11.3	452.77	450.102.04
11.2	452.57	450.89
11.1	452.39	450.80.02

NVIDIA vGPU Software Version	NVIDIA Windows Driver Version	NVIDIA Linux Driver Version
11.0	451.48	450.51.05

**Note:**

All releases in this release family of NVIDIA vGPU software are compatible with **all** releases of the NVIDIA vGPU software license server.

1.2. Updates in Release 11.13

New Features in Release 11.13

- ▶ Security updates - see *Security Bulletin: NVIDIA GPU Display Driver - June 2023*, 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 11.13

- ▶ Support for Red Hat Enterprise Linux 8.8 as a guest OS

1.3. Updates in Release 11.12

New Features in Release 11.12

- ▶ Security updates - see *Security Bulletin: NVIDIA GPU Display Driver - March 2023*, 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 11.12

- ▶ Support for Windows 11 22H2 as a guest OS
- ▶ Support for Windows 10 2022 Update (22H2) as a guest OS

1.4. Updates in Release 11.11

New Features in Release 11.11

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

1.5. Updates in Release 11.10

New Features in Release 11.10

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

Feature Support Withdrawn in Release 11.10



Note: All versions of Microsoft Windows Server 2016 remain supported as a guest OS. Similarly, all versions of Microsoft Windows Server 2016 with Hyper-V role remain supported as a hypervisor. The earlier statement that Microsoft Windows Server 2016 is no longer supported is **incorrect**.

1.6. Updates in Release 11.9

New Features in Release 11.9

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

1.7. Updates in Release 11.8

New Features in Release 11.8

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

1.8. Updates in Release 11.7

New Features in Release 11.7

- ▶ 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

Feature Support Withdrawn in Release 11.7

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

1.9. Updates in Release 11.6

New Features in Release 11.6

- ▶ 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

1.10. Updates in Release 11.5

New Features in Release 11.5

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

Feature Support Withdrawn in Release 11.5

- ▶ Red Hat Enterprise Linux 8.3 is no longer supported as a guest OS.

1.11. Updates in Release 11.4

New Features in Release 11.4

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

Hardware and Software Support Introduced in Release 11.4

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

1.12. Updates in Release 11.3

New Features in Release 11.3

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

Hardware and Software Support Introduced in Release 11.3

- ▶ Support for Windows 10 October 2020 Update (20H2) as a guest OS
Windows 10 May 2021 Update (21H1), which is a bug fix release for Windows 10 October 2020 Update (20H2), is also supported.
- ▶ Support for Red Hat Enterprise Linux 8.3 as a guest OS

Feature Support Withdrawn in Release 11.3

- ▶ Citrix Hypervisor 8.1 is no longer supported.
- ▶ Red Hat Enterprise Linux 7.6 is no longer supported as a guest OS

1.13. Updates in Release 11.2

New Features in Release 11.2

- ▶ Miscellaneous bug fixes

1.14. Updates in Release 11.1

New Features in Release 11.1

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

Hardware and Software Support Introduced in Release 11.1

- ▶ Support for the following GPUs:
 - ▶ NVIDIA A100 PCIe 40GB
 - ▶ NVIDIA A100 HGX 40GB
- ▶ Support for the Red Hat Enterprise Linux 7.9 as a guest OS

Feature Support Withdrawn in Release 11.1

- ▶ Windows Server 2012 R2 is no longer supported as a guest OS with GPUs based on architectures after NVIDIA Turing™ architecture.

1.15. Updates in Release 11.0

New Features in Release 11.0

- ▶ Licensing grace period for unlicensed GPUs
An unlicensed GPU initially operates at full capability but its performance is degraded over time if a license is not obtained.
- ▶ Miscellaneous bug fixes

Hardware and Software Support Introduced in Release 11.0

- ▶ Support for Windows 10 May 2020 Update (2004) as a guest OS

Feature Support Withdrawn in Release 11.0

- ▶ The following guest OS releases are no longer supported:
 - ▶ Windows Server 2012
 - ▶ Windows Server 2008 R2
 - ▶ Windows 8.1
 - ▶ Windows 8
 - ▶ Windows 7

Chapter 2. Validated Platforms

This release family of NVIDIA vGPU software provides support for several NVIDIA GPUs on validated server hardware platforms, Microsoft Windows Server hypervisor software versions, and guest operating systems.

2.1. Supported NVIDIA GPUs and Validated Server Platforms

This release of NVIDIA vGPU software on Microsoft Windows Server provides support for several NVIDIA GPUs running on validated server hardware platforms. For a list of validated server platforms, refer to [NVIDIA GRID Certified Servers](#).

The supported products for each type of NVIDIA vGPU software deployment depend on the GPU.



Note: All GPUs that support graphics acceleration are supported as a secondary device in a bare-metal deployment. Tesla M6 is also supported as the primary display device in a bare-metal deployment.

GPUs Based on the NVIDIA Ampere Architecture

GPU	Supported NVIDIA vGPU Software Products ^{1, 2, 3, 4}		
	Time-Sliced NVIDIA vGPU	MIG-Backed NVIDIA vGPU	DDA
Since 11.1: NVIDIA A100 PCIe 40GB	N/A	N/A	vCS
Since 11.1: NVIDIA A100 HGX 40GB	N/A	N/A	vCS

GPUs Based on the NVIDIA Turing™ Architecture

GPU	Supported NVIDIA vGPU Software Products ^{1' 2' 3' 4}		
	Time-Sliced NVIDIA vGPU	MIG-Backed NVIDIA vGPU	DDA
Tesla T4	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications
Quadro RTX 6000 ⁵	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications
Quadro RTX 6000 passive ⁵	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications
Quadro RTX 8000 ⁵	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications
Quadro RTX 8000 passive ⁵	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications

GPUs Based on the NVIDIA Volta Architecture

GPU	Supported NVIDIA vGPU Software Products ^{1' 2' 3' 4}		
	Time-Sliced NVIDIA vGPU	MIG-Backed NVIDIA vGPU	DDA
Tesla V100 SXM2	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS

GPU	Supported NVIDIA vGPU Software Products ^{1' 2' 3' 4}		
	Time-Sliced NVIDIA vGPU	MIG-Backed NVIDIA vGPU	DDA
			<ul style="list-style-type: none"> ▶ GRID Virtual Applications
Tesla V100 SXM2 32GB	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications
Tesla V100 PCIe	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications
Tesla V100 PCIe 32GB	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications
Tesla V100S PCIe 32GB	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications
Tesla V100 FHHL	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications

GPUs Based on the NVIDIA Pascal™ Architecture

GPU	Supported NVIDIA vGPU Software Products ^{1' 2' 3' 4}		
	Time-Sliced NVIDIA vGPU	MIG-Backed NVIDIA vGPU	DDA
Tesla P4	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS

GPU	Supported NVIDIA vGPU Software Products ^{1' 2' 3' 4}		
	Time-Sliced NVIDIA vGPU	MIG-Backed NVIDIA vGPU	DDA
			<ul style="list-style-type: none"> ▶ GRID Virtual Applications
Tesla P6	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications
Tesla P40	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications
Tesla P100 PCIe 16 GB	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications
Tesla P100 SXM2 16 GB	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications
Tesla P100 PCIe 12GB	N/A	N/A	<ul style="list-style-type: none"> ▶ vCS ▶ Quadro vDWS ▶ GRID Virtual Applications

GPUs Based on the NVIDIA Maxwell™ Graphic Architecture



Note: NVIDIA Virtual Compute Server (vCS) is **not** supported on GPUs based on the NVIDIA Maxwell graphic architecture.

GPU	Supported NVIDIA vGPU Software Products ^{1 2 3 4}		
	Time-Sliced NVIDIA vGPU	MIG-Backed NVIDIA vGPU	DDA
Tesla M6	N/A	N/A	<ul style="list-style-type: none"> ▶ Quadro vDWS ▶ GRID Virtual Applications
Tesla M10	N/A	N/A	<ul style="list-style-type: none"> ▶ Quadro vDWS ▶ GRID Virtual Applications
Tesla M60	N/A	N/A	<ul style="list-style-type: none"> ▶ Quadro vDWS ▶ GRID Virtual Applications

2.2. Hypervisor Software Releases

This release supports **only** the hypervisor software versions listed in the table.



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

Software	Version Supported	Notes
Microsoft Windows Server 2019	Windows Server 2019 with Hyper-V role	
Microsoft Windows Server 2016	Windows Server 2016 1803 with Hyper-V role Windows Server 2016 1709 with Hyper-V role Windows Server 2016 1607 with Hyper-V role	Not supported on the following GPUs: <ul style="list-style-type: none"> ▶ NVIDIA A100 PCIe 40GB ▶ NVIDIA A100 HGX 40GB

¹ The supported products are as follows:

- ▶ vCS: NVIDIA Virtual Compute Server
- ▶ Quadro vDWS: NVIDIA Quadro Virtual Data Center Workstation
- ▶ GRID Virtual PC: NVIDIA GRID Virtual PC
- ▶ GRID Virtual Applications: NVIDIA GRID Virtual Applications

² N/A indicates that the deployment is not supported.

³ vCS is supported only on Linux operating systems.

⁴ GRID Virtual Applications is supported only on Windows operating systems.

⁵ This GPU is supported only in displayless mode. In displayless mode, local physical display connectors are disabled.

2.3. Guest OS Support

NVIDIA vGPU software supports several Windows releases and Linux distributions as a guest OS using GPU pass-through.

Microsoft Windows Server with Hyper-V role supports GPU pass-through over Microsoft Virtual PCI bus. This bus is supported through paravirtualized drivers.



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.

2.3.1. Windows Guest OS Support

NVIDIA vGPU software supports **only** the 64-bit Windows releases listed as a guest OS on Microsoft Windows Server.



Note:

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

- ▶ Windows Server 2019
- ▶ Windows Server 2016 1607, 1709
- ▶ Windows Server 2012 R2 with patch `windows8.1-KB3133690-x64.msu` (not supported on GPUs based on architectures after the NVIDIA Turing architecture)
- ▶ **Since 11.12:** Windows 11 22H2
- ▶ **Since 11.12:** Windows 10 22H2 Update (22H2) and all Windows 10 releases supported by Microsoft up to and including this release
- ▶ **11.3-11.11 only:** Windows 10 May 2021 Update (21H1) and all Windows 10 releases supported by Microsoft up to and including this release
- ▶ **11.0-11.2 only:** Windows 10 May 2020 Update (2004) and all Windows 10 releases supported by Microsoft up to and including this release

2.3.2. Linux Guest OS Support

NVIDIA vGPU software supports **only** the 64-bit Linux distributions listed as a guest OS on Microsoft Windows Server.



Note:

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

- ▶ **Since 11.7:** Red Hat Enterprise Linux 7.9
- ▶ **11.3-11.6 only:** Red Hat Enterprise Linux 7.7-7.9
- ▶ **11.1, 11.2 only:** Red Hat Enterprise Linux 7.6-7.9
- ▶ **11.0 only:** Red Hat Enterprise Linux 7.6-7.8
- ▶ CentOS 7.6, 7.7
- ▶ Ubuntu 18.04 LTS
- ▶ Ubuntu 16.04 LTS
- ▶ SUSE Linux Enterprise Server 12 SP2

Chapter 3. Known Issues

3.1. **NVIDIA Control Panel** crashes if a user session is disconnected and reconnected

Description

On all supported Windows Server guest OS releases, **NVIDIA Control Panel** crashes if a user session is disconnected and then reconnected while **NVIDIA Control Panel** is open.

Version

This issue affects all supported Windows Server guest OS releases.

Status

Open

Ref.

4086605

3.2. 11.0-11.12 Only: Remote desktop connection is lost and the NVIDIA vGPU software graphics driver is unloaded

Description

The remote desktop connection is lost and the NVIDIA vGPU software graphics driver is unloaded after an attempt to access a VM over RDP and VMware Horizon agent direct connect. After an attempt to log in again, a black screen is displayed.

When this issue occurs, the following errors are written to the log files on the guest VM:

- ▶ A timeout detection and recovery (TDR) error:

```
vmiop_log: (0x0): Timeout occurred, reset initiated.  
vmiop_log: (0x0): TDR_DUMP:0x52445456 0x006907d0 0x000001cc 0x00000001
```

- ▶ XID error 43:

```
vmiop_log: (0x0): XID 43 detected on physical_chid
```

- ▶ vGPU error 22:

```
vmiop_log: (0x0): vGPU message 22 failed
```

- ▶ Guest driver unloaded error:

```
vmiop_log: (0x0): Guest driver unloaded!
```

Workaround

To recover from this issue, reboot the VM.

11.12 only: To prevent this issue from occurring, disable translation lookaside buffer (TLB) invalidation by setting the vGPU plugin parameter `tlb_invalidate_enabled` to 0.

Status

Resolved in NVIDIA vGPU software 11.13

Ref.

3596327

3.3. With multiple active sessions, NVIDIA Control Panel incorrectly shows that the system is unlicensed

Description

In an environment with multiple active desktop sessions, the **Manage License** page of **NVIDIA Control Panel** shows that a licensed system is unlicensed. However, the `nvidia-smi` command and the management interface of the NVIDIA vGPU software license server correctly show that the system is licensed. When an active session is disconnected and reconnected, the **NVIDIA Display Container** service crashes.

The **Manage License** page incorrectly shows that the system is unlicensed because of stale data in **NVIDIA Control Panel** in an environment with multiple sessions. The data is stale because **NVIDIA Control Panel** fails to get and update the settings for remote sessions when multiple sessions or no sessions are active in the VM. The **NVIDIA Display Container** service crashes when a session is reconnected because the session is not active at the moment of reconnection.

Status

Open

Ref.

3761243

3.4. VP9 and AV1 decoding with web browsers are not supported on Microsoft Windows Server 2019

Description

VP9 and AV1 decoding with web browsers are not supported on Microsoft Windows Server 2019. This issue occurs because starting with Windows Server 2019, the required codecs are not included with the OS and are not available through the **Microsoft Store** app. As a result, hardware decoding is not available for viewing YouTube videos or using collaboration tools such as Google Meet in a web browser.

Version

This issue affects Microsoft Windows Server releases starting with Windows Server 2019.

Status

Not an NVIDIA bug

Ref.

200756564

3.5. 11.0-11.7 Only: Linux VM might fail to return a license after shutdown if the license server is specified by its name

Description

If the license server is specified by its fully qualified domain name, a Linux VM might fail to return its license when the VM is shut down. This issue occurs if the `nvidia-gridd` service cannot resolve the fully qualified domain name of the license server because `systemd-resolved.service` is not available when the service attempts to return the license. When this issue occurs, the `nvidia-gridd` service writes the following message to the `systemd` journal:

```
General data transfer failure. Couldn't resolve host name
```

Status

Resolved in NVIDIA vGPU software 11.8

Ref.

200756399

3.6. NVIDIA Control Panel is started only for the RDP user that logs on first

Description

On all supported Windows Server guest OS releases, **NVIDIA Control Panel** is started only for the RDP user that logs on first. Other users cannot start **NVIDIA Control Panel**. If more than one RDP user is logged on when **NVIDIA Control Panel** is started, it always opens in the session of the RDP user that logged on first, irrespective of which user started **NVIDIA Control Panel**. Furthermore, on Windows Server 2016, **NVIDIA Control Panel** crashes if a user session is disconnected and then reconnected while **NVIDIA Control Panel** is open.

Version

This issue affects all supported Windows Server guest OS releases.

Status

Open

Ref.

3334310

3.7. 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

3.8. Disconnected sessions cannot be reconnected or might be reconnected very slowly with NVWMI installed

Description

Disconnected sessions cannot be reconnected or might be reconnected very slowly when the NVIDIA Enterprise Management Toolkit (NVWMI) is installed. This issue affects Citrix Virtual Apps and Desktops and VMware Horizon sessions on Windows guest VMs.

Workaround

Uninstall NVWMI.

Status

Open

Ref.

3262923

3.9. 11.0-11.3 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 20.04 LTS and 18.04 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 11.4

Ref.

3226853

3.10. 11.1 Only: Licensing event logs indicate license renewal from unavailable primary server

Description

Licensing event logs for the guest VM indicate that a license is renewed from primary license server even when primary license server is unavailable and the license is renewed from the secondary server.

Workaround

None. However, these incorrect event log entries are benign and can be ignored.

Status

Resolved in NVIDIA vGPU software 11.2

Ref.

200658253

3.11. 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

Restart the VM and wait at least 30 seconds before trying to launch **NVIDIA Control Panel**.

Status

Open

Ref.

200623179

3.12. Citrix Virtual Apps and Desktops session corruption occurs in the form of residual window borders

Description

When a window is dragged across the desktop in a Citrix Virtual Apps and Desktops session, corruption of the session in the form of residual window borders occurs.

Version

This issue affects only Citrix Virtual Apps and Desktops version 7 2003

Workaround

Use Citrix Virtual Apps and Desktops version 7 1912 or 2006.

Status

Not an NVIDIA bug

Ref.

200608675

3.13. 11.0 Only: Remoting solution session freezes with VGPU message 21 failed and VGPU message 14 failed errors

Description

The remoting solution session sometimes freezes while a window is being resized. For a Windows guest VM, the error message `VGPU message 21 failed` is written to the log file on the hypervisor host. For a Linux guest VM, the error messages `VGPU message 21 failed` and `VGPU message 14 failed` are written to the log file on the hypervisor host.

Workaround

Try resizing the window again.

Status

Resolved in NVIDIA vGPU software 11.1

Ref.

200627445

3.14. On Linux, the frame rate might drop to 1 after several minutes

Description

On Linux, the frame rate might drop to 1 frame per second (FPS) after NVIDIA vGPU software has been running for several minutes. Only some applications are affected, for example, `glxgears`. Other applications, such as Unigine Heaven, are not affected. This behavior occurs because Display Power Management Signaling (DPMS) for the Xorg server is enabled by default and the display is detected to be inactive even when the application is running. When DPMS is enabled, it enables power saving behavior of the display after several minutes of inactivity by setting the frame rate to 1 FPS.

Workaround

1. If necessary, stop the Xorg server.

```
# /etc/init.d/xorg stop
```

2. In a plain text editor, edit the `/etc/X11/xorg.conf` file to set the options to disable DPMS and disable the screen saver.

- a). In the `Monitor` section, set the `DPMS` option to `false`.

```
Option "DPMS" "false"
```

- b). At the end of the file, add a `ServerFlags` section that contains option to disable the screen saver.

```
Section "ServerFlags"
    Option "BlankTime" "0"
EndSection
```

- c). Save your changes to `/etc/X11/xorg.conf` file and quit the editor.

3. Start the Xorg server.

```
# /etc/init.d/xorg start
```

Status

Open

Ref.

200605900

3.15. Microsoft DDA fails with some GPUs

Description

Microsoft Discrete Device Assignment (DDA) fails with GPUs that have more than 16 GB of GPU memory. After the NVIDIA vGPU software graphics driver is installed in the guest VM, a second display device appears on the GPU and the driver prompts for a reboot.

After the reboot, the device disappears and the Microsoft Hyper-V Video device appears.

This issue occurs because less memory-mapped input/output (MMIO) space is configured for the operating system than the device requires.

Workaround

Perform this workaround in a **Windows Power Shell** window on the hypervisor host.

Set the upper MMIO space to the amount that the device requires to allow all of the MMIO to be mapped. Upper MMIO space starts at approximately 64 GB in address space.

```
Set-VM -HighMemoryMappedIoSpace mmio-space -VMName vm-name
```

mmio-space

The amount of MMIO space that the device requires, appended with the appropriate unit of measurement, for example, **64GB** for 64 GB of MMIO space.

The required amount of MMIO space depends on the amount of BAR1 memory on the installed GPUs and the number of GPUs assigned to the VM as follows:

$$mmio-space = 2 \# gpu-bar1-memory \# assigned-gpus$$

gpu-bar1-memory

The amount of BAR1 memory on one of the installed GPUs. For example, in a server in which eight GPUs are installed and each GPU has 32 GB of BAR1 memory, *gpu-bar1-memory* is 32 GB.

assigned-gpus

The number of GPUs assigned to the VM.

vm-name

The name of the VM to which the GPU is assigned.

The following example sets the upper MMIO space to 64 GB for the VM named `mygpvm`, to which one GPU with 32 GB of BAR1 memory is assigned.

```
Set-VM -HighMemoryMappedIoSpace 64GB -VMName mygpvm
```

For more information, see [Deploy graphics devices using Discrete Device Assignment](#) on the Microsoft technical documentation site.

Status

Not an NVIDIA bug

Ref.

2812853

3.16. 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

3.17. 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 450.51.05 -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: 450.51.05 not found
    Error! Bad return status for module build on kernel: 5.3.0-28-generic
(x86_64)
    Consult /var/lib/dkms/nvidia/450.51.05/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

3.18. Blue screen crash occurs or no devices are found after VM reset

Description

If a VM on Microsoft Windows Server with Hyper-V role is reset from the hypervisor host, a blue screen crash (BSOD) occurs on Windows VMs and the `nvidia-smi` command reports `No devices were found` on Linux VMs. This issue occurs only on Windows Server 2019 with Tesla T4 GPUs with SRIOV enabled, Quadro RTX 8000 passive GPUs, and Quadro RTX 6000 passive GPUs.

Workaround

Contact NVIDIA Enterprise Support for a workaround for this issue, referencing the knowledge base article *Workaround for Blue Screen Crashes On Hyper-V DDA With SRIOV-Enabled GPUs*. This article is available only to NVIDIA Enterprise Support personnel.

Status

Not an NVIDIA bug

Ref.

200567935

3.19. Publisher not verified warning during Windows 7 driver installation

Description

During installation of the NVIDIA vGPU software graphics driver for Windows on Windows 7, Windows warns that it can't verify the publisher of the driver software. If **Device Manager** is used to install the driver, **Device Manager** warns that the driver is not digitally signed. If you install the driver, error 52 (CM_PROB_UNSIGNED_DRIVER) occurs.

This issue occurs because Microsoft is no longer dual signing WHQL-tested software binary files by using the SHA-1 and SHA-2 hash algorithms. Instead, WHQL-tested software binary files are signed only by using the SHA-2 hash algorithm. All NVIDIA vGPU software graphics drivers for Windows are WHQL tested.

By default, Windows 7 systems cannot recognize signatures that were created by using the SHA-2 hash algorithm. As a result, software binary files that are signed only by using the SHA-2 hash algorithm are considered unsigned.

For more information, see [2019 SHA-2 Code Signing Support requirement for Windows and WSUS](#) on the Microsoft Windows support website.

Version

Windows 7

Workaround

If you experience this issue, install the following updates and restart the VM or host before installing the driver:

- ▶ Servicing stack update (SSU) ([KB4490628](#))
- ▶ SHA-2 update ([KB4474419](#))

Status

Not a bug

3.20. 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

Press **Enter** or wait for the screen to update for NvFBC to capture the frame.

Status

Not a bug

Ref.

2115733

3.21. 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.

3.22. 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

3.23. 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.

If you are licensing a physical GPU for vCS, you **must** use the configuration file `/etc/nvidia/gridd.conf`.

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

3.24. 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

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