



# GRID VGPU FOR CITRIX XENSERVER VERSION 361.45.48/363.36

RN-06927-001 \_v3.4 (GRID) Revision 02 | May 2017

## 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 GRID™ vGPU™ software and hardware on Citrix XenServer.

This release includes the following software:

- ▶ NVIDIA GRID Virtual GPU Manager version 361.45.48 for the Citrix XenServer releases listed in [Hypervisor Software Versions](#)
- ▶ NVIDIA Windows drivers for vGPU version 363.36
- ▶ NVIDIA Linux drivers for vGPU version 361.45.48



### Caution

If you install the wrong package for the version of Citrix XenServer you are using, GRID vGPU Manager will fail to load.

The GRID vGPU Manager and Windows guest VM drivers must be installed together. Older VM drivers will not function correctly with this release of GRID vGPU Manager. Similarly, older GRID vGPU Managers will not function correctly with this release of Windows guest drivers. See [VM running older NVIDIA vGPU drivers fails to initialize vGPU when booted](#).

Updates in this release:

- ▶ Miscellaneous bug fixes

# Chapter 2.

## VALIDATED PLATFORMS

This release of virtual GPU provides support for several NVIDIA GPUs on validated server hardware platforms, Citrix XenServer hypervisor software versions, and guest operating systems.

### 2.1. Supported NVIDIA GPUs and Validated Server Platforms

This release of virtual GPU provides support for the following NVIDIA GPUs on Citrix XenServer, running on validated server hardware platforms:

- ▶ GRID K1
- ▶ GRID K2
- ▶ Tesla M6
- ▶ Tesla M60

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



Tesla M60 and M6 GPUs support compute mode and graphics mode. GRID 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 GRID software releases.

### 2.2. Hypervisor Software Versions

This release has been tested with the following hypervisor software versions:

Software	Version tested
Citrix XenServer 6.2	Version 6.2 with XS62ESP1 and applicable hotfixes including XS62ESP1009 and XS62ESP1011. The GRID vGPU Manager included in this release will not install without these hotfixes: <ul style="list-style-type: none"> <li>▶ XS62ESP1009</li> <li>▶ XS62ESP1011</li> </ul>
Citrix XenServer 6.5	Version 6.5 with XS65ESP1. The GRID vGPU Manager included in this release will not install without XenServer 6.5 SP1.
Citrix XenServer 7.0	RTM build 125380 is supported.
Citrix XenDesktop	Version 7.6, 7.8 in HDX 3D Pro mode.



GRID vGPU on Citrix XenServer 6.2 does not support operation with physical GPUs BARs mapped above the 4 Gigabyte boundary in the system address space.

For XenServer 6.2, ensure that GPUs are mapped below the 4G boundary by disabling your server's SBIOS option that controls 64-bit memory-mapped I/O support. This option may be labeled **Enable >4G Decode** or **Enable 64-bit MMIO**. See [Virtual GPU fails to start when GPUs are mapped above 4G](#).

## 2.3. Guest OS Support

GRID vGPU supports several Windows releases and Linux distributions as a guest OS.



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

### 2.3.1. Windows Guest OS Support

GRID vGPU supports the following Windows releases as a guest OS on Citrix XenServer:

- ▶ Windows 7 (32/64-bit)
- ▶ Windows 8 (32/64-bit)
- ▶ Windows 8.1 (32/64-bit)
- ▶ Windows 10 (32/64-bit)
- ▶ Windows Server 2008 R2
- ▶ Windows Server 2012 R2

### 2.3.2. Linux Guest OS Support

GRID vGPU supports the following Linux distributions as a guest OS **only** on Tesla M60 and M6 on Citrix XenServer 7.0:

- ▶ Red Hat Enterprise Linux 7.0-7.2
- ▶ CentOS 7.0-7.2
- ▶ Ubuntu 14.04 LTS



GRID K1 and GRID K2 do not support vGPU on a Linux guest OS.

GRID vGPU does not support Linux as a guest OS on XenServer 6.2.

# Chapter 3.

## KNOWN PRODUCT LIMITATIONS

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

### 3.1. 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
- ▶ GRID K100, K120Q
- ▶ GRID K200, K220Q

#### Workaround

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

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

### Description

A VM running older NVIDIA drivers, such as those from a previous vGPU release, will fail to initialize vGPU when booted on a Citrix XenServer platform running the current release of GRID Virtual GPU Manager.

In this scenario, the VM boots in standard VGA mode with reduced resolution and color depth. The NVIDIA GRID 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 XenServer 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 latest NVIDIA vGPU release drivers in the VM.

## 3.3. Virtual GPU fails to start if ECC is enabled

### Description

GRID K2, Tesla M60, and Tesla M6 support error correcting code (ECC) for improved data integrity. If ECC is enabled, virtual GPU fails to start. The following error is logged in the Citrix XenServer VM's `/var/log/messages` log file:

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

Virtual GPU is not currently supported with ECC active. GRID K2 cards and Tesla M60, M6 cards in graphics mode ship with ECC disabled by default, but ECC may subsequently be enabled using `nvidia-smi`.



## Resolution

Ensure that ECC is disabled on all GPUs.

1. Use `nvidia-smi` to list the status of all GPUs, and check for ECC noted as enabled on GPUs.
2. Change the ECC status to off on each GPU for which ECC is enabled by executing the following command:

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

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

## 3.4. Single vGPU benchmark scores are lower than passthrough GPU

### Description

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

Aside from performance differences that may be attributed to a vGPU's smaller framebuffer size, vGPU incorporates a performance balancing feature known as Frame Rate Limiter (FRL), which is enabled on all vGPUs. 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 passthrough GPU.

### Resolution

FRL is controlled by an internal vGPU setting. 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 ~]#
```

## 3.5. Virtual GPU fails to start when GPUs are mapped above 4G

### Version

XenServer 6.2

### Status

Fixed in XenServer 6.5

### Description

GRID vGPU on Citrix XenServer 6.2 does not support operation with GPUs mapped above the 4 gigabyte (4G) boundary in the system's physical address space.

If GPUs are mapped above 4G, the GRID vGPU Manager rpm will warn at the time of installation:

```
Warning: vGPU does not support GPUs mapped in 64-bit address space. Please
disable 64-bit MMIO from the system's BIOS. Refer to vGPU release notes for
details.
```

Also, the NVIDIA kernel driver will fail to load in XenServer's dom0, so the `nvidia` module won't appear in the module listing produced by `lsmod`. Additionally, the following warning messages will be present in the output of `dmesg`:

```
NVRM: This PCI I/O region assigned to your NVIDIA device is invalid:
NVRM: BAR1 is 128M @ 0xf800000000000000 (PCI:03ff:00:07.0)
NVRM: This is a 64-bit BAR mapped above 4GB by the system
NVRM: BIOS or the Linux kernel. The NVIDIA Linux/x86
NVRM: graphics driver and other system software components
NVRM: do not support this configuration.
```

### Resolution

Ensure that GPUs are mapped below the 4G boundary by disabling your server's SBIOS option that controls 64-bit memory-mapped I/O support. This option may be labeled **Enable4G>Decode** or **Enable 64-bit MMIO**.

## 3.6. nvidia-smi fails to operate when all GPUs are assigned to GPU passthrough mode

### Description

If all GPUs in the platform are assigned to VMs in passthrough 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 passthrough mode are not visible to `nvidia-smi` and the NVIDIA kernel driver operating in the Citrix XenServer dom0.

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

The screenshot shows the XenCenter interface for a VM named 'xenserver-vgx-test'. The 'GPU' tab is active, displaying the following information:

- Placement policy:** Maximum density: put as many VMs as possible on the same GPU (with an 'Edit...' button).
- GPU:** GK104GL [GRID K2]
- Allowed vGPU types:**
  - ✓ Pass-through whole GPU
  - ✓ GRID K260Q vGPU (2 per GPU)
  - ✓ GRID K240Q vGPU (4 per GPU)
  - ✓ GRID K220Q vGPU (8 per GPU)
  - ✓ GRID K200 vGPU (8 per GPU)
- Assigned VMs (all in passthrough mode):**
  - Test VM passthrough
  - Test VM passthrough
  - vgx-base-image-win7-64 passthrough
  - Test VM passthrough
  - Test VM passthrough
  - Test VM passthrough
- Buttons:** 'Edit Selected GPUs...', 'Select All', and 'Clear All'.

**Resolution**

N/A

## 3.7. Windows Aero is disabled on XenDesktop session using 3 or 4 monitors in 2560×1600 resolution

**Description**

Windows Aero may be disabled when XenDesktop 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](#).

## 3.8. 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 GRID 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 XenServer 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`

## 3.9. vGPU host driver RPM upgrade fails

### Description

Upgrading vGPU host driver RPM fails with the following message 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

Bug ID	Summary and Description
1816508	<b>YouTube or other video players get stuck at full screen in Google Chrome</b> When GRID vGPU is used with a Windows 10 guest OS, YouTube or other video players get stuck at full screen in the Google Chrome web browser. This issue does not occur with a Windows 7 guest OS.

# Chapter 5.

## KNOWN ISSUES

### 5.1. 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 XenDesktop 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 XenServer's `/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

- ▶ GRID K100, K120Q
- ▶ GRID K200, K220Q

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

## 5.2. 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

## 5.3. Video goes blank when run in loop in Windows Media Player

### Description

When connected to a vGPU-enabled VM using Citrix XenDesktop, 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

## 5.4. Local VGA console is momentarily unblanked when XenDesktop changes resolution of the VM desktop

### Description

When XenDesktop 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 XenDesktop 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

## 5.5. VM bugchecks on shutdown/restart when XenDesktop is installed and NVIDIA driver is uninstalled or upgraded.

### Description

If the XenDesktop 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 XenDesktop.

**Status**

Open

**Ref. #**

NVIDIA-295/200018125

## 5.6. Application frame rate may drop when running XenDesktop at 2560×1600 resolution.

**Description**

An application's rendering frame rate may drop when running XenDesktop 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

## 5.7. Windows VM BSOD

**Description**

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

XenServer's `/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**

XenServer 6.2

**Fix**

Ensure that you are running the latest OEM firmware for your GRID boards.

**Status**

Closed

**Ref. #**

NVIDIA-327/1632120

## 5.8. Windows VM BSOD when upgrading NVIDIA drivers over a XenDesktop session

**Description**

Windows VM bugchecks when NVIDIA guest drivers are upgraded over a XenDesktop session.

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

**Fix**

Upgrade XenDesktop to 7.6 Feature Pack 3

**Status**

Closed

**Ref. #**

NVIDIA-370/200130780

## 5.9. 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 XenServer 6.5, and does not include XenCenter integration.

**Workaround**

Refer to XenServer vGPU Management in *GRID Virtual GPU User Guide* for how to configure vGPU by using the `xe` CLI.

**Status**

Closed

**Ref. #**

NVIDIA-360

## 5.10. 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

## 5.11. Multiple WebGL tabs in Microsoft Internet Explorer may trigger TDR on Windows VMs

**Description**

Running intensive WebGL applications in multiple IE tabs may trigger a TDR on Windows VMs.

**Workaround**

Disable hardware acceleration in IE.

To enable software rendering in IE, refer to the Microsoft knowledge base article [How to enable or disable software rendering in Internet Explorer](#).

**Status**

Open

**Ref. #**

200148377

## 5.12. XenDesktop shows only a black screen when connected to a vGPU VM

**Description**

XenDesktop 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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