

Removing NVIDIA Grid host driver from AHV host

Article # 000007973

Last modified on Oct 12th 2023

Visibility Customers

Summary: Procedure for removing NVIDIA Grid vGPU host drivers from a Nutanix AHV host for certain break/fix scenarios, GPU HW changes or allow a path for vGPU-enabled clusters to upgrade between certain AHV hypervisor major versions.

Versions affected: ALL AHV Versions

AHV

Description:

This article discusses the procedure for removing NVIDIA Grid vGPU host drivers from a Nutanix AHV host.

This may be required for certain break/fix scenarios, GPU hardware removal, or to allow a path for vGPU-enabled clusters to upgrade AHV hypervisor (per [KB 8727](#)).

Whilst we do use **install_host_package** to simplify the install/upgrade of NVIDIA Grid Virtual GPU Manager for AHV (per AHV Administration Guide: [NVIDIA GRID Virtual GPU Support on AHV](#)), removing the package from an AHV host is a manual operation.

The following steps 1-4 can be performed to validate and confirm the current vGPU status and information on the AHV host prior to package removal, and can be done at any time without impact to the cluster, host, or UVMs.

1. From the AHV host cli, confirm the physical GPU installation and model with **lspci | grep -i nvidia**:

```
[root@AHV ~]# lspci | grep -i nvidia
b1:00.0 VGA compatible controller: NVIDIA Corporation GM107GL [Tesla M10] (rev a2)
b2:00.0 VGA compatible controller: NVIDIA Corporation GM107GL [Tesla M10] (rev a2)
b3:00.0 VGA compatible controller: NVIDIA Corporation GM107GL [Tesla M10] (rev a2)
```

b4:00.0 VGA compatible controller: NVIDIA Corporation GM107GL [Tesla M10] (rev a2)

2. Confirm and record the GPU capabilities, number of GPUs, and driver version on the AHV host CLI with **nvidia-smi**:

```
[root@AHV ~]# nvidia-smi
Tue Jun 30 05:16:57 2020
+-----+
+-----+
| NVIDIA-SMI 430.46                Driver Version: 430.46                CUDA Version: N/A
|
|-----+-----+-----+
+-----+
| GPU   Name           Persistence-M| Bus-Id        Disp.A | Volatile
Uncorr. ECC |
| Fan   Temp   Perf   Pwr:Usage/Cap|      Memory-Usage | GPU-Util
Compute M.  |
|=====+=====+=====|
=====|
|    0   Tesla M60                On      | 00000000:06:00.0 Off  |
Off |
| N/A    34C    P8      24W / 150W |    2050MiB /   8191MiB |      0%
Default |
+-----+-----+-----+
+-----+
|    1   Tesla M60                On      | 00000000:07:00.0 Off  |
Off |
| N/A    28C    P8      23W / 150W |     526MiB /   8191MiB |      0%
Default |
+-----+-----+-----+
+-----+
|    2   Tesla M60                On      | 00000000:84:00.0 Off  |
Off |
| N/A    34C    P8      25W / 150W |     14MiB /   8191MiB |      0%
Default |
+-----+-----+-----+
+-----+
|    3   Tesla M60                On      | 00000000:85:00.0 Off  |
Off |
| N/A    30C    P8      23W / 150W |     14MiB /   8191MiB |      0%
Default |
+-----+-----+-----+
+-----+
```

```

+-----+
-----+
| Processes:                                     GPU
Memory |
| GPU      PID    Type    Process name                               Usage
|
|=====
=====|
|    0      3835    C+G     vgpu                               2031MiB
|    1      14634   C+G     vgpu                               507MiB
|
+-----+
-----+

```

In the above example, there are two vGPU-enabled UVMs running on this host, each using a different vGPU profile (2031MiB vs 507MiB)

3. Collect additional information about any vGPU UVMs and their GPU usage, status and configuration with **nvidia-smi vgpu -q**:

```

[root@AHV ~]# nvidia-smi vgpu -q
GPU 00000000:06:00.0
    Active vGPUs                : 1
    vGPU ID                     : 325163nnnn
    VM UUID                    : eda2c97c-0b67-4e6a-xxxx-
xxxxxxxxxxxx
    VM Name                     : eda2c97c-0b67-4e6a-xxxx-
xxxxxxxxxxxx
    vGPU Name                   : GRID M60-2B
    vGPU Type                   : 17
    vGPU UUID                   : cffa6f63-c27f-46a9-xxxx-
xxxxxxxxxxxx
    Guest Driver Version        : 431.79
    License Status              : Unlicensed
    Accounting Mode             : Disabled
    ECC Mode                    : N/A
    Accounting Buffer Size       : 4000
    Frame Rate Limit            : 3 FPS
    FB Memory Usage
        Total                   : 2048 MiB
        Used                    : 277 MiB
        Free                    : 1771 MiB

```

```

Utilization
  Gpu                : 0 %
  Memory             : 0 %
  Encoder            : 0 %
  Decoder            : 0 %
Encoder Stats
  Active Sessions    : 0
  Average FPS        : 0
  Average Latency     : 0
FBC Stats
  Active Sessions    : 0
  Average FPS        : 0
  Average Latency     : 0
...
GPU 00000000:85:00.0
  Active vGPUs       : 0

```

4. Confirm and record the NVIDIA AHV host software package RPM version with **rpm -qa | grep -i nvidia**:

```

[root@AHV ~]# rpm -qa | grep -i nvidia
NVIDIA-vGPU-nutanix-5.x-430.27.x86_64

```

Solution:

Starting from LCM 2.5, manual removal of the GPU driver is not required to upgrade the driver or AHV. Please refer to [Updating the NVIDIA GRID Driver with LCM](#) for details about the driver upgrade procedure.

Due to the requirement of manual RPM package manipulation on the AHV host(s), and the potential impact on the cluster's Data Resiliency as a result of maintenance mode and manual CVM + Host reboots; during this procedure, we recommend engaging [Nutanix Support](#) for assistance with package removal, as well as planning a maintenance window for your vGPU UVMs/Apps accordingly.

Note: If you do not re-install the host driver package after removal then the vGPU feature will no longer be available to your UVMs; only [GPU-Passthrough](#) could be used but requires configuration update of the affected UVM(s).

Overview of the removal procedure (contact [Nutanix Support](#) for details and assistance):

1. Enter the AHV host into maintenance mode and shut down the local Controller VM (CVM). If there are vGPU-enabled UVMs on the host (identified in step 3 in Description), they will need to be shut down, as vGPU UVMs cannot be live migrated between hosts (requires validation that cluster is otherwise healthy and Data Resiliency is OK).

2. Remove NVIDIA RPM package from AHV host.
3. Reboot the affected AHV host.
4. Confirm that the AHV host and Controller VM come back online and Data Resiliency is OK.
5. Confirm the NVIDIA host package has been uninstalled.
6. Exit the AHV host out of maintenance mode to ensure it is '*schedulable*'.
7. Repeat the steps for any other AHV hosts, one at a time, which require the NVIDIA GRID vGPU host package to be removed.

Internal Comments:

If you use this KB to remove the driver, please link the case to PM-3115 and describe in detail why it is needed.

Note: driver upgrade is not a valid scenario for this PM ticket, as driver upgrades can be done via LCM starting from 2.5. If the driver upgrade did not work for any reason, please perform an RCA and open an ENG ticket instead.

Internal detailed instructions for SREs

Before beginning driver removal, if upgrade/reinstall is expected after this workflow (per [KB 8727](#)) then make sure you/customer has the latest NVIDIA Grid driver from the NVIDIA Enterprise Licensing Portal before uninstalling the current driver. Do not proceed unless you have confirmed the post-uninstall plans, otherwise you may leave the cluster without a vGPU driver for an extended time and vGPU UVMs will not operate as expected until the driver is acquired and installed!

I. After confirming the cluster is otherwise healthy and Data Resiliency = OK, Starting from a CVM cli put the AHV host into maintenance mode and shutdown the CVM (see AHV Admin Guide - "[Shutting Down a Node in a Cluster \(AHV\)](#)") *Step 1* but **do not** power down the host per *Step 3* as we'll restart it later). If there are vGPU-enabled UVMs on the host (Identified in *Step 3* from Description) they will need to be shut down, as vGPU UVMs cannot be live migrated between hosts: *acli*

host.enter_maintenance_mode <host_ip> <options>

```
nutanix@CVM:~$ acli host.enter_maintenance_mode <host_ip> <options>
EnterMaintenanceMode: pending -> complete
```

II. From the AHV host cli as "*root*" user, remove the NVIDIA RPM package (from *Step 4* in Description) from the AHV Host (review this command output and confirm prompt "*y/N*"): *yum remove <nvidia-gpu-package-name-from-step4>*

```
[root@AHV ~]# yum remove NVIDIA-vGPU-nutanix-5.x-430.27.x86_64
Loaded plugins: fastestmirror, post-transaction-actions
Setting up Remove Process
Resolving Dependencies
--> Running transaction check
```

---> Package NVIDIA-vGPU-nutanix.x86_64 1:5.x-430.27 will be erased

--> Finished Dependency Resolution

Dependencies Resolved

| ===== | | | |
|------------|------|---------|------|
| ===== | | | |
| Package | Arch | Version | |
| Repository | | | Size |
| ===== | | | |
| ===== | | | |

Removing:

| | | | |
|---|--------|--------------|------|
| NVIDIA-vGPU-nutanix | x86_64 | 1:5.x-430.27 | |
| @/NVIDIA-vGPU-nutanix-5.x-430.27.x86_64 | | | 37 M |

Transaction Summary

| ===== | | | |
|-------|--|--|--|
| ===== | | | |

Remove 1 Package(s)

Installed size: 37 M

Is this ok [y/N]: y

Downloading Packages:

Running rpm_check_debug

Running Transaction Test

Transaction Test Succeeded

Running Transaction

| | | |
|---------|---|-----|
| Erasing | : 1:NVIDIA-vGPU-nutanix-5.x-430.27.x86_64 | 1/1 |
|---------|---|-----|

| | | |
|-----------|---|-----|
| Verifying | : 1:NVIDIA-vGPU-nutanix-5.x-430.27.x86_64 | 1/1 |
|-----------|---|-----|

Removed:

NVIDIA-vGPU-nutanix.x86_64 1:5.x-430.27

Complete!

III. Reboot the affected AHV host: *shutdown -r now*

```
[root@AHV ~]# shutdown -r now
```

```
Broadcast message from root@AHV
```

```
(/dev/pts/1) at 11:28 ...
```

```
The system is going down for reboot NOW!
```

IV. Confirm that the AHV host and Controller VM come back online and Data Resiliency is OK.

Consider using these commands from another CVM in the cluster to help, and ensure Prism Data Resiliency = OK:

i. ping <host_ip> and ping <cvm_ip> | Make sure you see stable responses from both

- ii. `nodetool -h0 ring` | Ensure all nodes are in 'Normal' state
- iii. `cluster status | grep "CVM:"` | Ensure all CVMs are 'UP'
- iv. `ncli cluster get-dm-ft-stat type=node` | Ensure all "Current Fault Tolerance" > 0

V. From the AHV host, confirm the NVIIDA host package has been uninstalled. There should be no output from the command: `rpm -qa | grep -i nvidia`

```
[root@AHV ~]# rpm -qa | grep -i nvidia
```

VI. Exit the AHV host out of maintenance mode to ensure it is '*schedulable*': `accli host.exit_maintenance_mode <host_ip>`

```
nutanix@CVM:~$ accli host.exit_maintenance_mode <host_ip>

nutanix@CVM:~$ accli host.get <host_ip> | grep schedulable
    schedulable: True
```

VII. Repeat the steps for any other AHV hosts which require the NVIDIA GRID vGPU host package to be removed

VIII. (Optional) If this is break/fix, then to reinstall the NVIDIA Grid AHV host package use the CVM script 'install_host_package' (per *AHV Admin Guide*: [INSTALLING NVIDIA GRID VIRTUAL GPU MANAGER \(HOST DRIVER\)](#)) This walks you through the installation and will also kick off a rolling reboot of hosts which had the GPU driver installed, trackable via Prism Tasks. The customer will need to provide the RPM bundle which they acquire directly from NVIDIA Enterprise Licensing portal.

IX. (Optional) If the driver removal is preparation for AHV EL6 to EL7 AOS 5.17.1+ LCM upgrade (*Per [KB8727](#)*), then perform the upgrade now prior to installing the minimum required NVIDIA Grid v10.1 host package, which is required for AHV el7.20190916.231+ after the AHV upgrade to support the vGPU UVMs. The customer will need to provide the RPM bundle which they acquire directly from NVIDIA Enterprise Licensing portal.

Notes:

- vGPU live migration is supported from AOS 5.18.1: [FEAT-8414](#)
- Multi-vGPU per VM is supported from AOS 5.18: [FEAT-7958](#)