



# **NVAPI Open Source SDK for Driver Release 555**

Release Notes

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# NVAPI Release Notes

## Introduction

NVAPI is NVIDIA Corporation's core software development kit that allows access to NVIDIA GPUs and drivers on all Windows platforms. NVAPI provides support for categories of operations that range beyond the scope of those found in familiar graphics APIs such as DirectX and OpenGL.

This release contains a version of `nvapi.h`, provided under MIT license, to enable open-source re-implementations of NVAPI for Windows emulation environments.

For those interested in developing applications using the NVAPI Developer SDK on Windows, NVIDIA recommends using the NVAPI Developer SDK available at <https://developer.nvidia.com/nvapi>.

The following files are provided by NVIDIA:

- > `nvapi.h`

This file contains the interface constants, structure definitions and function prototypes for NVAPI interface.

- > `nvapi_interface.h`

This file is a reference for mapping the NVAPI identifiers to functions.

- > `NvApiDriverSettings.h`

- > `NvApiDriverSettings.c`

These files are used to query and change driver settings. For more information, see [NVIDIA Driver Settings Programming Guide](#).

- > `nvHLSLExtns.h`

- > `nvHLSLExtnsInternal.h`

- > `nvShaderExtnEnums.h`

These release notes describe the changes made in the NVAPI Open Source Interface for this release.

## NVAPI Runtime

The NVAPI runtime (NVAPI DLL) provides the following key functions:

> `nvapi_QueryInterface()`:

Maps a 32-bit identifier to a function pointer.

```
void *nvapi_QueryInterface(NvU32 id);
```

The NVAPI application will call `nvapi_QueryInterface()` to get individual NVAPI function pointers from `nvapi.dll`.

Refer to `nvapi_interface.h` for a mapping of identifiers to NVAPI function names.

> `NvAPI_Initialize()`:

```
NvAPI_Status __cdecl NvAPI_Initialize()
{
    return NVAPI_OK;
}
```

> `NvAPI_Unload()`:

```
NvAPI_Status __cdecl NvAPI_Unload()
{
    return NVAPI_OK;
}
```

## New Features and Enhancements

### New APIs for GPU Handle Enumeration

The following two new APIs are introduced for GPU handle enumeration:

> `NvAPI_SYS_GetPhysicalGPUs`

> `NvAPI_SYS_GetLogicalGPUs`

These two APIs will replace the existing APIs: `NvAPI_EnumPhysicalGPUs`, `NvAPI_EnumTCCPhysicalGPUs`, and `NvAPI_EnumLogicalGPUs`.

The following table shows the API usage in detail.

| Adapter Type / Driver Mode | Existing API                           | New API                                |
|----------------------------|--|--|
| WDDM <sup>1</sup>          | <code>NvAPI_EnumPhysicalGPUs</code>    | <code>NvAPI_SYS_GetPhysicalGPUs</code> |
| TCC <sup>2</sup>           | <code>NvAPI_EnumTCCPhysicalGPUs</code> | <code>NvAPI_SYS_GetPhysicalGPUs</code> |
| MCDM <sup>3</sup>          | None                                   | <code>NvAPI_SYS_GetPhysicalGPUs</code> |
| WDDM Logical GPUs          | <code>NvAPI_EnumLogicalGPUs</code>     | <code>NvAPI_SYS_GetLogicalGPUs</code>  |
| MCDM Logical GPUs          | None                                   | <code>NvAPI_SYS_GetLogicalGPUs</code>  |

1 = Windows Display Driver Model

2 = Tesla Compute Cluster

3 = Microsoft Compute Driver Model

We recommend that you switch to the new APIs because they provide a single interface to enumerate the handles for different adapter types (GPU driver modes). In the future, the old GPU handle enumeration APIs might be marked as deprecated.

## NVAPI Support for Microsoft Compute Driver Model (MCDM)

- > Starting with R555 SDK release, NVAPI is adding support for NVIDIA GPUs in MCDM mode. Any user application that wants to enumerate the GPU handles for MCDM mode GPUs must use the new GPU handle enumeration APIs described in the previous section.
- > A new tag is introduced in the header file: `MCDM_SUPPORTED`. APIs containing this tag in the description are expected to work on MCDM GPUs.

## Changes in NVAPI for Driver Release 555

### New Functions

- > Added `NvAPI_SYS_GetPhysicalGPUs`
- > Added `NvAPI_SYS_GetLogicalGPUs`

### New/Updated Structures

- > Added `rsvd0` to `NV_LATENCY_MARKER_PARAMS_V1`
- > Added `NV_ASYNC_FRAME_MARKER_PARAMS_V1`
- > Added `NV_PHYSICAL_GPU_HANDLE_DATA`
- > Added `NV_PHYSICAL_GPUS_V1`
- > Added `NV_LOGICAL_GPU_HANDLE_DATA`
- > Added `NV_LOGICAL_GPUS_V1`

### New/Updated Enums

- > Added `OUT_OF_BAND_IGNORE` to `NV_OUT_OF_BAND_CQ_TYPE`
- > Added `NV_ADAPTER_TYPE`

### New/Updated Unions

- > None

## New Macros

- > None

## New Errors

- > None

## TCC Support

- > None

## MCDM Support

- > Added `NvAPI_GetPhysicalGPUFromGPUID`
- > Added `NvAPI_GetGPUIDfromPhysicalGPU`
- > Added `NvAPI_GPU_GetShaderSubPipeCount`
- > Added `NvAPI_GPU_GetGpuCoreCount`
- > Added `NvAPI_GPU_GetSystemType`
- > Added `NvAPI_GPU_GetFullName`
- > Added `NvAPI_GPU_GetPCIIdentifiers`
- > Added `NvAPI_GPU_GetGPUType`
- > Added `NvAPI_GPU_GetBusType`
- > Added `NvAPI_GPU_GetBusId`
- > Added `NvAPI_GPU_GetBusSlotId`
- > Added `NvAPI_GPU_GetIRQ`
- > Added `NvAPI_GPU_GetVbiosRevision`
- > Added `NvAPI_GPU_GetVbiosOEMRevision`
- > Added `NvAPI_GPU_GetVbiosVersionString`
- > Added `NvAPI_GPU_GetCurrentPCIEDownstreamWidth`
- > Added `NvAPI_GPU_GetPhysicalFrameBufferSize`
- > Added `NvAPI_GPU_GetVirtualFrameBufferSize`
- > Added `NvAPI_GPU_GetBoardInfo`
- > Added `NvAPI_GPU_GetRamBusWidth`
- > Added `NvAPI_GPU_GetArchInfo`
- > Added `NvAPI_GPU_GetHDCPSupportStatus`
- > Added `NvAPI_GPU_GetTachReading`
- > Added `NvAPI_GPU_GetECCStatusInfo`
- > Added `NvAPI_GPU_GetECCErrorInfo`
- > Added `NvAPI_GPU_ResetECCErrorInfo`

- > Added `NvAPI_GPU_GetECCConfigurationInfo`
- > Added `NvAPI_GPU_SetECCConfiguration`
- > Added `NvAPI_GPU_GetVirtualizationInfo`
- > Added `NvAPI_GPU_GetLicensableFeatures`
- > Added `NvAPI_GPU_GetGPUInfo`
- > Added `NvAPI_GPU_GetVRReadyData`
- > Added `NvAPI_GPU_GetGspFeatures`
- > Added `NvAPI_GPU_GetPstates20`
- > Added `NvAPI_GPU_GetCurrentPstate`
- > Added `NvAPI_GPU_GetDynamicPstatesInfoEx`
- > Added `NvAPI_GPU_GetThermalSettings`
- > Added `NvAPI_GPU_GetAllClockFrequencies`
- > Added `NvAPI_GPU_QueryIlluminationSupport`
- > Added `NvAPI_GPU_GetIllumination`
- > Added `NvAPI_GPU_SetIllumination`
- > Added `NvAPI_GPU_ClientIllumDevicesGetInfo`
- > Added `NvAPI_GPU_ClientIllumDevicesGetControl`
- > Added `NvAPI_GPU_ClientIllumDevicesSetControl`
- > Added `NvAPI_GPU_ClientIllumZonesGetInfo`
- > Added `NvAPI_GPU_ClientIllumZonesGetControl`
- > Added `NvAPI_GPU_ClientIllumZonesSetControl`
- > Added `NvAPI_SYS_GetPhysicalGPUs`
- > Added `NvAPI_SYS_GetLogicalGPUs`
- > Added `NvAPI_GPU_GetMemoryInfoEx`

## Deprecated NVAPI Functions

- > None

## NVAPIDriverSettings Additions/Removals

- > Removed `WKS_MEMORY_ALLOCATION_POLICY_ID`

## HLSL Extensions Additions/Removals

The following header files are provided to expose intrinsic functions that are not present in the HLSL instruction set. For more information, see [Unlocking GPU Intrinsic in HLSL](#).

- > `nvShaderExtnEnums.h`

This header file contains all the shader extensions opcodes. The application should call `NvAPI_D3D12_IsNvShaderExtnOpCodeSupported()` or

`NvAPI_D3D11_IsNvShaderExtnOpCodeSupported()` to check for support for these NV shader extension opcodes.

> `nvHLSLExtns.h`

This header file needs to be included in the application HLSL shader code to use the NVIDIA shader extensions.

> `nvHLSLExtnsInternal.h`

This file contains internal functions that are not to be called by application directly.

## NVAPI Security Information

User administrator privilege is required to access certain driver features per NVIDIA's overall security vision. This helps mitigate the impact of malware.

Each API requiring administrator access, will return an `NVAPI_INVALID_USER_PRIVILEGE` error when run with standard user privilege.

The application will require Administrator privileges to access this API, which can be elevated to a higher permission level by selecting "Run as Administrator" in Admin approval mode.



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