NVAPI Open Source Interface for Driver Release 535

Release Notes

June 2023

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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 details, please see:

  http://developer.download.nvidia.com/NVAPI/PG-5116-001_v01_public.pdf

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.

  Please consult 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;
  }
  ```

Changes in NVAPI for Driver Release 535

New Functions

- Added NvAPI_D3D_SetVerticalSyncMode
- Added NvAPI_D3D12_GetNeedsAppFPBlendClamping
- Added NvAPI_D3D_SetReflexSync
- Added NvAPI_D3D12_LaunchCuKernelChainEx
- Added NvAPI_D3D12_GetRaytracingDisplacementMicromapArrayPrebuildInfo
- Added NvAPI_D3D12_BuildRaytracingDisplacementMicromapArray
- Added NvAPI_D3D12_RelocateRaytracingDisplacementMicromapArray
- Added NvAPI_D3D12_EmitRaytracingDisplacementMicromapArrayPostbuildInfo
- Added NvAPI_DirectD3D12GraphicsCommandList_Create
- Added NvAPI_DirectD3D12GraphicsCommandList_Release
- Added NvAPI_DirectD3D12GraphicsCommandList_Reset

New/Updated Structures

- Added bFsVrr and bCplVsyncOn to NV_GET_SLEEP_STATUS_PARAMS_V1
- Added NV_SET_REFLEX_SYNC_PARAMS_V1
- Added NVAPI_CU_KERNEL_LAUNCH_PARAMS_EX

- Added NVAPI_D3D12_RAYTRACING_DISPLACEMENT_MICROMAP_USAGE_COUNT
- Added NVAPI_D3D12_RAYTRACING_DISPLACEMENT_MICROMAP_DESC
- Added NVAPI_D3D12_BUILD_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_INPUTS
- Added NVAPI_D3D12_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_PREBUILD_INFO
- Added NVAPI_GET_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_PREBUILD_INFO_PARAMS_V1
- Added NVAPI_D3D12_RAYTRACING_GEOMETRY_DMM_ATTACHMENT_DESC
- Added NVAPI_D3D12_RAYTRACING_GEOMETRY_DMM_TRIANGLES_DESC
- Added NVAPI_D3D12_RAYTRACING_GEOMETRY_DMM_TRIANGLES_DESC to NVAPI_D3D12_RAYTRACING_GEOMETRY_DESC_EX
- Added NVAPI_D3D12_BUILD_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_DESC
- Added NVAPI_D3D12_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_POSTBUILD_INFO_CURRENT_SIZE_DESC
- Added NVAPI_D3D12_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_POSTBUILD_INFO_DESC
- Added NVAPI_BUILD_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_PARAMS_V1
- Added NVAPI_RELOCATE_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_PARAMS_V1
- Added NVAPI_EMIT_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_POSTBUILD_INFO_PARAMS_V1

New/Updated Enums

- Added NVAPI_VSYNC_MODE
- Added NVAPI_D3D12_RAYTRACING_DISPLACEMENT_MICROMAP_CAPS
- Added NVAPI_D3D12_RAYTRACING_CAPS_TYPE_DISPLACEMENT_MICROMAP to NVAPI_D3D12_RAYTRACING_CAPS_TYPE
- Added NVAPI_D3D12_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_BUILD_FLAGS
- Added NVAPI_D3D12_RAYTRACING_DISPLACEMENT_MICROMAP_FORMAT
- Added NVAPI_D3D12_PIPELINE_CREATION_STATE_FLAGS_ENABLE_DMM_SUPPORT to NVAPI_D3D12_PIPELINE_CREATION_STATE_FLAGS

- Added NVAPI_D3D12_SERIALIZED_DATA_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_EX to NVAPI_D3D12_SERIALIZED_DATA_TYPE_EX
- Added NVAPI_D3D12_RAYTRACING_ACCELERATION_STRUCTURE_BUILD_FLAG_ALLOW_DATA_ACCESS_EX to NVAPI_D3D12_RAYTRACING_ACCELERATION_STRUCTURE_BUILD_FLAGS_EX
- Added NVAPI_D3D12_RAYTRACING_GEOMETRY_TYPE_DMM_TRIANGLES_EX to NVAPI_D3D12_RAYTRACING_GEOMETRY_TYPE_EX
- Added NVAPI_D3D12_RAYTRACING_DISPLACEMENT_MICROMAP_PRIMITIVE_FLAGS
- Added NVAPI_D3D12_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_POSTBUILD_INFO_TYPE

New/Updated Unions

- None

New Macros

- Added NVAPI_D3D12_RAYTRACING_DISPLACEMENT_MICROMAP_ARRAY_BYTE_ALIGNMENT
- Added NVAPI_D3D12_RAYTRACING_DISPLACEMENT_MICROMAP_DC1_MAX_SUBDIVISION_LEVEL

New Errors

- None

TCC Support

- None

Deprecated NVAPI Functions

- None

NVAPIDriverSettings Additions/Removals

- Removed enum EValues_OGL_SLI_CFR_MODE
- Added enum EValues_PS_SHADERDISKCACHE_FLAGS

- Removed setting OGL_SLI_CFR_MODE
- Added setting PS_SHADERDISKCACHE_FLAGS
- Added setting APPIDLE_DYNAMIC_FRL_FPS
- Added setting APPIDLE_DYNAMIC_FRL_THRESHOLD_TIME
- Added setting PS_SHADERDISKCACHE_DLL_PATH_WCHAR

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 a `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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