



NVFBC WINDOWS 10 SUPPORT DEPRECATION

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Technical Bulletin



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NVFBC WINDOWS 10 SUPPORT DEPRECATION

NVFBC

NVIDIA® Frame Buffer Capture (NVFBC) is a fast, low latency desktop capture API supported on Windows and Linux. It works for all types of content on screen irrespective of how the content is generated. It uses the NVIDIA GPU and the GPU driver's capabilities to accelerate capture and deliver captured frames in GPU memory or CPU accessible memory according to the user's choice.

NVFBC is supported on Linux and on Windows OS versions starting with Windows 7.

NVFBC DEPRECATION

NVFBC is planned to be deprecated on Windows 10 starting with Windows 10 October 2019 Update for reasons explained in this document. NVFBC will not receive any bug fixes or support for OS features on Windows 10. NVFBC capture functionality is frozen at the level offered in Capture SDK 7.1, which supports Windows 10 Spring Creators Update (OS Build 1803, 17134).



Note: NVFBC support on Linux and Windows7 remains unchanged.

NVFBC LIMITATIONS ON WINDOWS 10

NVFBC is a multi-process user mode infrastructure that works within the GPU driver framework. It has limited visibility with respect to desktop composition, window positions, occlusion, display modes and OS optimizations that affect presentation. This limitation prevents NVFBC from working seamlessly when certain Windows 10 features are in use. The highest impact is seen in the following:

- ▶ Virtual display modes:

Windows 10 optimizes display mode changes to offer a smooth experience while switching between full-screen applications or changing display resolution.

Information about these optimizations is not accessible by NVFBC, resulting in incorrectly scaled or cropped captures.

- ▶ Containerization of applications:

Windows 10 RS5 (OS Version 1809, build no. 17763) update introduces application containerization for security. Applications running inside secure containers cannot communicate with applications outside the secure container. This and more restrictions on inter-process communication prevent NVFBC from reliably capturing the desktop when a containerized application runs in full screen, such as when using Microsoft Edge in secure browsing mode

- ▶ GPU work scheduling:

Evolution of Windows 10 DDI is changing the fundamentals of GPU work scheduling, with a focus on improving the experience with user-visible applications. This makes NVFBC latency unpredictable.

ALTERNATIVES: WINDOWS 10 NATIVE CAPTURE APIS

Windows 10 provides the following native capture APIs that can be considered as alternatives to NVFBC.

Desktop Duplication API (DDA)

DDA (a.k.a. IDXGIOutputDuplication) is a DXGI based desktop capture infrastructure. It was introduced in Windows 8.1 and continues to be supported on Windows 10. DDA uses the DXGI framework and the Windows Desktop Window Manager's capabilities to accelerate capture and deliver captured frames in GPU memory.

DDA as an alternative to NVFBC

DDA does not suffer from the above-mentioned problems. DDA functionality and performance continue to be unaffected by the evolution of Windows 10. DDA offers video memory capture output through a D3D11 resource. It accumulates updates during desktop composition. It supplies metadata about moved and dirty rectangles since the last time an image was captured.

Efficient Desktop Streaming using DDA and NVENC

DDA offers output in GPU memory, using D3D11 resources. This makes it simple to process further on the GPU or to retrieve output on the CPU.

For a desktop streaming application, the next step after capture is compressing the series of snapshots into a video bitstream that can be streamed over the network. The NVENC hardware engine on NVIDIA GPUs can be used to accelerate this compression step. Since DDA provides output in GPU memory, it can be efficiently accessed by NVENC for compression.

For details about DDA, its features, and usage, refer to the MSDN documentation at: <https://docs.microsoft.com/en-us/windows/desktop/direct3ddxgi/desktop-dup-api>.

For details about NVENCODE API, refer to the Video Codec SDK documentation at: <https://developer.nvidia.com/nvidia-video-codec-sdk>.



Note: As described above, DDA provides a similar feature set as NVFBC with greater stability and synergy with Windows OS features than NVFBC on Windows 10. Therefore, we recommend using DDA over NVFBC for desktop capture on Windows 10.

Windows.Graphics.Capture API (WGC)

In addition to DDA, Windows 10 RS4 Spring Creators Update (OS version 1803, build no 17134) introduces a new Capture API: "Windows.Graphics.Capture", referred to here as "WGC". WGC is also coupled with the Desktop Window Manager to accelerate capture and deliver captured frames in GPU memory. It can be used for desktop capture or window capture.

Refer to the MSDN documentation at: <https://docs.microsoft.com/en-us/windows/uwp/audio-video-camera/screen-capture>



Note: WGC is mentioned here for completeness. It does not have feature parity with NVFBC as on Windows 10 October 2018 Update (OS version 1809, build no 17563). Therefore, it is not recommended to use WGC as a drop-in replacement for NVFBC on this OS version.

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