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# Watch Dogs® 2

## Introduction

*Use hacking as a weapon in the massive & dynamic open world of* Watch Dogs 2*.*

In 2016, ctOS 2.0, an advanced operating system networking city infrastructure, was implemented in several US cities to create a safer, more efficient metropolis.

Play as Marcus Holloway, a brilliant young hacker living in the birthplace of the tech revolution, the San Francisco Bay Area. Team up with DedSec, a notorious group of hackers, and expose the hidden dangers of ctOS 2.0, which, in the hands of corrupt corporations, is being wrongfully used to monitor and manipulate citizens on a massive scale.

With the power of hacking and DedSec by your side, launch the Hack of the Century, take down ctOS 2.0 and give freedom back to whom it belongs: the people.



## Key Features

**WELCOME TO THE SAN FRANCISCO BAY AREA**

* Explore a massive and dynamic open-world offering an incredible variety of gameplay possibilities. Hack your way through traffic while you engage in dangerous car chases through the winding streets of San Francisco, traverse the rooftops of the colorful and vibrant neighborhoods of Oakland, and infiltrate the cutting edge offices of Silicon Valley companies. There are many secrets to uncover in the birthplace of the tech revolution.

**HACKING IS YOUR WEAPON**

* Hack into the city’s infrastructure, every connected device, and everyone’s personal database. Take control of drones, cars, cranes, security robots, and much more. Hack your enemies and bystanders alike– manipulate them in different ways to trigger unpredictable chains of events. Every person, any vehicle they might drive, any connected device they possess can be hacked.

**YOU ARE IN CTRL**

* Use hacking and stealth to complete missions without killing a single enemy or combine hacking and your weapons for a more ferocious approach. Develop different skills to suit your playstyle, and upgrade your hacker tools – RC cars, Quadcopter drones, 3D printed weapons and much more.

**SEAMLESSLY CONNECT WITH FRIENDS**

* Stay connected to your friends with a brand new seamless multiplayer experience that includes both Co-op and Player vs. Player activities, all available in a shared open world experience.

# NVIDIA Features

*Watch Dogs® 2* features NVIDIA® Ansel™ capture technology, HBAO+™ shading technology, HFTS™ shadow technology, PCSS™ shadow technology, and TXAA™ anti-aliasing technology, providing GTX users a gaming experience with the utmost features, visual graphics and realism. Take full advantage of some of the best graphics technologies and architectural features available in GeForce GTX 10-series graphics cards with NVIDIA technologies.

## NVIDIA TXAA

Post-Process Temporal Anti-Aliasing (TXAA) is used in numerous games to remove jagged edges from surfaces and to combat shader aliasing. It also prevents temporal aliasing, which is the distracting shimmering of anti-aliased edges when the camera, game elements, or player’s viewpoint are in motion. Before Post Process Temporal Anti-Aliasing became commonplace, NVIDIA developed [TXAA](http://www.geforce.com/hardware/technology/txaa/technology), a hardware-based solution that combined MSAA with temporal filtering, anti-aliasing resolves, and NVIDIA secret sauce.

MSAA has increasingly become incompatible with game engines, or simply too expensive to use, in turn preventing the implementation of TXAA. In response, our developers have created a new post-process, platform-agnostic TXAA that’s faster, sharper, and clearer than the majority of Temporal Anti-Aliasing solutions used in today’s games.

***NOTE: TXAA is not properly observed with static screen shots, only with scenes in motion.***

## NVIDIA HBAO+

NVIDIA HBAO+ (Horizon Based Ambient Occlusion) adds realistic Ambient Occlusion shadowing and shading around objects and surfaces that occlude light, with a considerably higher degree of precision than previous AO techniques. This helps scenes look less flat and more realistic. HBAO+ is a super-efficient method of modelling occlusion shadows, and the performance hit is negligible when compared to the existing implementations.

The following screenshots demonstrate the additional shading that enabling HBAO+ in *Watch Dogs® 2* can provide.



Figure NVIDIA HBAO+ is set in the Video Settings.



Figure NVIDIA HBAO+ is set to off in the Video Settings.

To advance Screen Space Ambient Occlusion (SSAO) tech, the first goal NVIDIA had with HBAO+ was to make it fast enough to be rendered in full resolution on high end GPUs.

Our second goal was to maximize the efficiency of the implementation on DX11 GPUs, by optimizing the locality of the samples that are taken from the input depth buffer.

Our third goal was to make HBAO+ always look better than the original HBAO algorithm, especially on scenes with thin objects such as grass and leaves, which have always been problematic for the original HBAO algorithm.

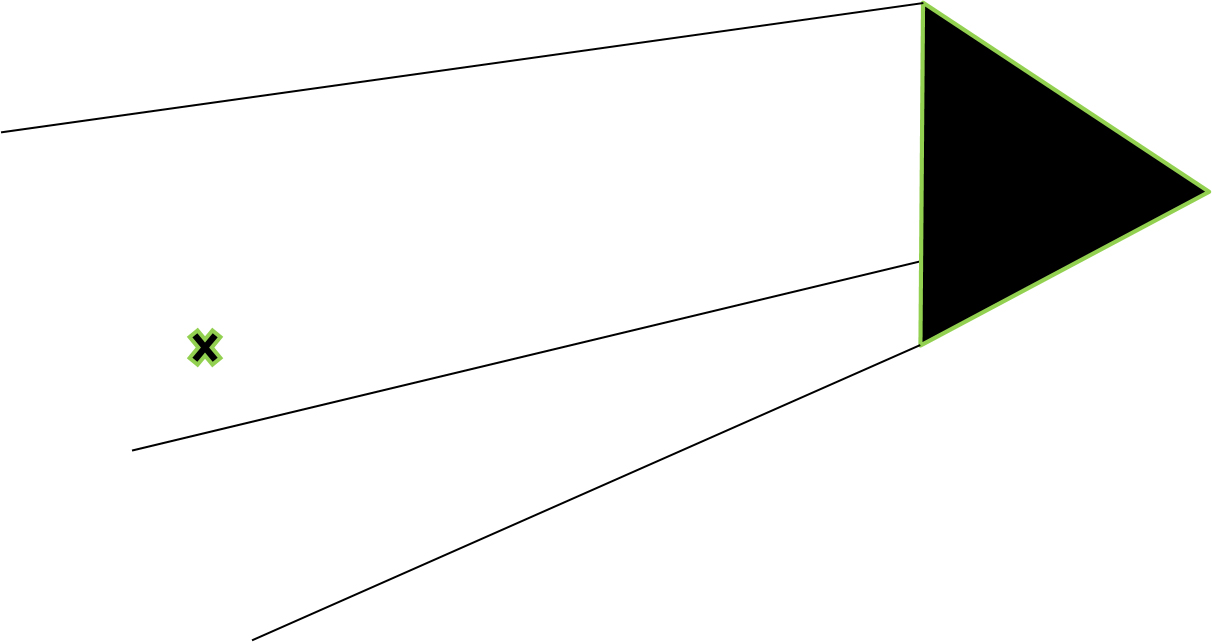
More details on HBAO+ can be found by clicking [**here**](http://www.geforce.com/hardware/technology/hbao-plus/technology)**.**

## NVIDIA HFTS | Hybrid Frustrum Traced Shadows

One of the fundamental problems in computer graphics is generating accurate soft shadows from area light sources. Soft shadows provide valuable cues about the relationships between objects, becoming sharper near the casting object and softer further away.

NVIDIA HFTS is an advanced hybrid shadow technique that combines frustum tracing, variable penumbra soft shadow filters, and screen-space anti-aliasing. HFTS makes for more geometrically accurate and precise shadows that appear hard closer to the object, and softer the farther they extend. Additionally, NVIDIA HFTS addresses issues that other shadow technologies do not including shadow detachment, aliasing, and interference from overlapping blockers.

### Frustum Tracing

Frustum Tracing is a form of Ray Tracing. A conventional ray tracer shoots a ray from a point in the scene into a stored hierarchy of triangles. Based upon where the ray intersects the hierarchy, a sub-set of triangles are then tested for intersection with the ray. This approach is problematic from the point of view of hierarchy construction, pure storage and incoherent memory access.

HFTS does not store a hierarchy of triangles, and thus circumvents this fundamental problem. Instead it creates a list of the screen pixels that map to a given light space texel. When triangles are rendered in light space, a frustum (bounding volume) is constructed using the triangle itself and the light direction. Then all of the screen pixels that map to it, are tested using a classic point-in-frustum algorithm. If a screen pixel is deemed to be inside the frustum, then it is marked as in shadow.

A new hardware feature of the GPU called Conservative Rasterization ensures that even the smallest triangles do not escape being frustum traced.

### Hybrid Approach

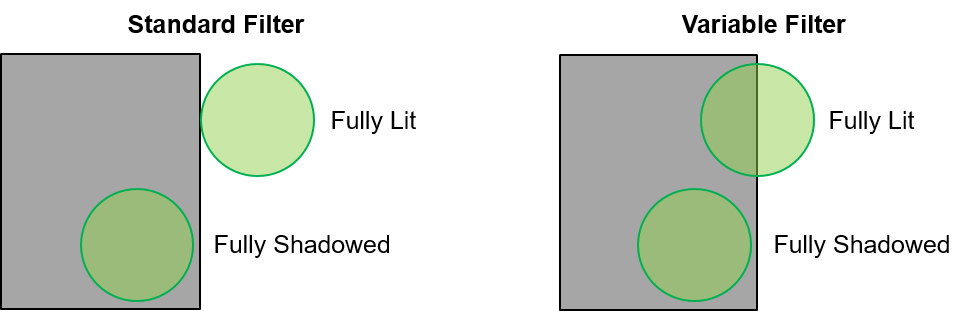
When NVIDIA released PCSS (Percentage-Closer Soft Shadows) technology, it was to build upon regular shadow mapping. It ddid this by shading each pixel in camera space, and then computing the penumbra size by analyzing the average distance to occluded objects. An advanced version called PCSS Ultra improved on the technique by removing aliasing on hardened shadows. This improved the quality of shadows that were observed in the distance.

NVIDIA HFTS is essentially a hybrid between two techniques; it is a frustum traced hard shadow with PCSS soft shadows. During the frustum tracing phase, the distance between the receiving screen pixel and the blocking triangle is recorded. This distance is attenuated and used as an interpolation factor between the hard shadow and the soft shadow. The result is razor sharp anti-aliased hard shadows near the point of contact that smoothly transition to super soft shadows further away.



### Variable Penumbra Soft Shadow Filters

A variable penumbra soft shadow filter is used to perfect the form of the shadow, otherwise the soft shadow result would not be fully contained by the ray traced result.



The variable filter removes issues when performing linear interpolations (lerps) between fully lit and fully shadowed pixels.

### Shadow Screenshot Comparisons

**Figure 3:** Low Setting



Figure : Medium Setting



Figure : High Setting



Figure : Very High Setting



Figure : Ultra Setting



Figure : PCSS Setting

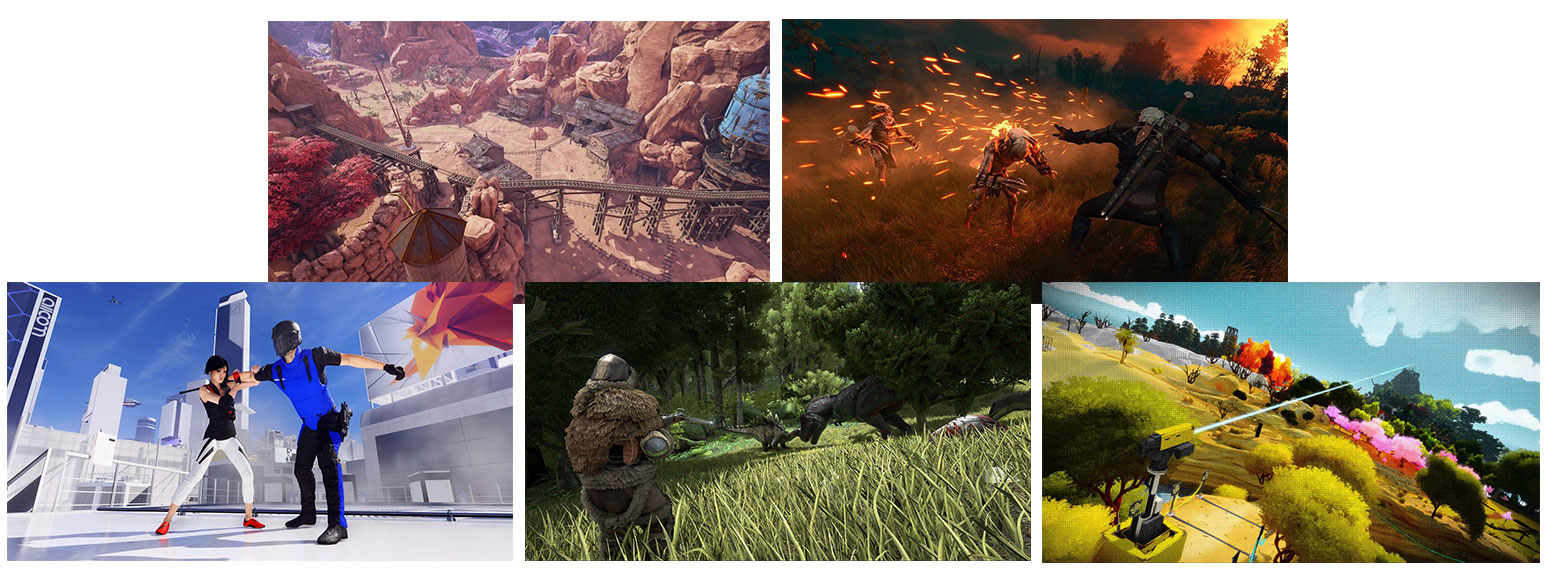


Figure : HFTS Setting

## NVIDIA Ansel

Gaming has evolved. It is no longer just about playing games. It is also about artistry and expression. Introducing Ansel, a new platform for artists. A new platform for expression. And a new platform for gamers. Think of Ansel as a camera that is integrated into your gaming experience that allows you to capture gameplay that was never before possible.

For years gamers have admired the in-game photos captured by professionals to display iconic moments and gameplay, screenshots featured on products ranging from posters to box art. But what if the casual user or gamer could do that too? This is where the revolutionary new Ansel technology comes into play.



You’re no longer limited to screenshots of what you’re looking at in the game. In *Watch Dogs® 2*, Ansel allows you to remove the game UI and point the camera in any direction to compose the perfect shot. With Ansel’s Camera Mode, you can compose a shot from any angle, and then capture a 360-degree picture of the game world. Once captured, that image can be viewed in a VR headset, on a PC, or with your cell phone by moving it around to view the 360-degree image. These photos can even be viewed in full stereo using VR headsets or Google Cardboard.

### How to use Ansel in *Watch Dogs® 2*

Activate Ansel by pressing **ALT+F2,** which will pause the game and bring up the Ansel overlay.



### Ansel samples from *Watch Dogs® 2*

The following images were captured using solely Ansel without any third party editing software.



# Recommended Driver & GPU

## Recommended Game Ready Driver

NVIDIA recommends updating your graphics driver to thelatest Game Ready graphics driver. This will deliver the optimal experience for *Watch Dogs® 2* upon release. Contact your local NVIDIA PR manager for details.



## Recommended GPU

If you’re unfamiliar with our suite of game-enhancing effects, HBAO+ adds rich, realistic shadows around objects that occlude light, giving scenes extra depth and detail and TXAA anti-aliasing creates a smoother, clearer image than any other anti-aliasing solution by combining high-quality MSAA multisample anti-aliasing, post processes, and NVIDIA-designed temporal filters. Enabling all of these graphics settings will require a powerful graphics card, such as the **GeForce GTX 1060**. In addition to giving you the performance to play *Watch Dogs® 2*, the recommended **GeForce GTX 1060** graphics card supports our vast array of critically acclaimed technologies, giving you the definitive gaming experience, unmatched by any other platform.

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| **SPECIFICATION** | **SCREEN RESOLUTION** | **PRODUCT** |
| VERY HIGH | 2560 x 1440 | GeForce GTX 1080 |
| HIGH | 1920 x 1080 | GeForce GTX 1060 |
| MINIMUM | 1600 x 900 | GeForce GTX 660 |

# GeForce Experience

## NVIDIA GeForce Experience

GeForce Experience is an application from NVIDIA that optimizes your PC in two key ways. First, it maximizes your game performance and game compatibility by automatically downloading the latest GeForce Game Ready drivers. Second, GeForce Experience intelligently optimizes graphics settings for all your favorite games based on your hardware configuration. 

GeForce Experience is fully compatible with *Watch Dogs® 2* and can help you get the proper settings for your specific configuration by using the Optimal Playability Settings. To do this, simply select the **Optimize** button in GeForce Experience once you have the game installed. GeForce Experience will automatically configure your game settings to give you the best experience possible. There are quite a few graphics options in *Watch Dogs® 2* and if you don’t want to spend the time to dial in the settings yourself, you can easily get started playing right away with one click.

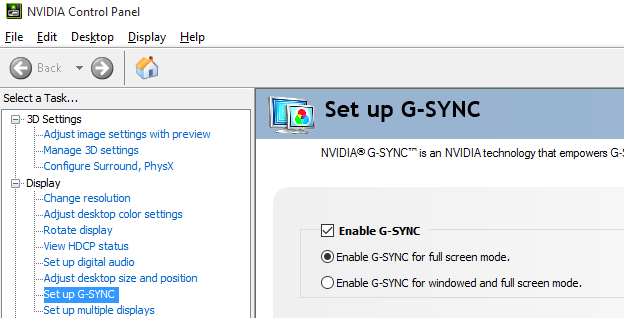
**Download the Client:** <http://www.geforce.com/drivers/geforce-experience/download>

# NVIDIA G-SYNC

NVIDIA G-SYNC display technology eliminates screen tearing, and reduces display stutter and input lag, to deliver the smoothest and fastest gaming experience possible. G-SYNC is comprised of a hardware logic board installed inside your monitor that works in conjunction with existing NVIDIA GPUs. The only other requirement for the smooth delivery of variable frames to the display is a G-SYNC optimized GeForce driver. The distinction of G-SYNC and current display technologies is that the rate at which game frames are delivered is now determined by the GeForce GPU, and not the fixed refresh rate of your display. With G-SYNC, we give complete control of your games to the GPU allowing for a completely smooth and tear-free gaming experience.

### Enabling NVIDIA G-SYNC

To enable NVIDIA GSYNC, simply open the **NVIDIA Control Panel** and navigate to the **Set up G-SYNC** tab on the left hand side, then make sure you have **NVIDIA G-SYNC** enabled.



**NOTE**: If you have any questions regarding NVIDIA G-SYNC, please contact your local NVIDIA PR Manager or navigate to [**http://www.geforce.com/hardware/technology/g-sync**](http://www.geforce.com/hardware/technology/g-sync)**.**

# NVIDIA Surround

With the power of GeForce GPUs, gamers are able to combine up to five displays to create the most immersive gaming environment possible. Here, you can leverage the latest NVIDIA display technologies including G-SYNC and 3D Vision and run them at resolutions up to 4K!



### Enabling NVIDIA Surround

To enable NVIDIA Surround with *Watch Dogs® 2*, open the **NVIDIA Control Panel.** Within the navigation tree pane, under **3D Settings**, select **Configure SLI, PhysX, Surround** andselect **Span displays with Surround.** Click the **Configure** button to arrange displays and to adjust for bezel correction.

**NOTE**: If you have any questions regarding NVIDIA Surround, please contact your local NVIDIA PR Manager or navigate to [**http://www.geforce.com/hardware/technology/surround**](http://www.geforce.com/hardware/technology/surround)**.**

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