



# NVIDIA Delivers Greatest-Ever Generational Leap with GeForce RTX 30 Series GPUs

## Powered by NVIDIA Ampere Architecture, Second-Generation RTX Delivers Up to 2x Performance Over Turing for Real-Time Ray Tracing and AI Gaming

NVIDIA today unveiled its [GeForce RTX™ 30 Series GPUs](#), powered by the NVIDIA Ampere architecture, which delivers the greatest-ever generational leap in GeForce® history.

Smashing performance records, the GeForce RTX 3090, 3080 and 3070 GPUs offer up to 2x the performance and 1.9x the power efficiency over the previous Turing-based generation. The GPUs take advantage of the second generation of NVIDIA RTX™ — the world's most powerful PC gaming platform — to provide unprecedented levels of real-time ray tracing and AI gaming.

The RTX 30 Series was unveiled during a virtual launch event by NVIDIA founder and CEO Jensen Huang, who also announced that [Fortnite](#), the pop culture gaming phenomenon, is turning on RTX real-time ray tracing, adding four ray-traced features for a more immersive gaming experience, including reflections, shadows, global illumination and ambient occlusion.

Huang additionally revealed powerful new tools for gamers, including [NVIDIA Reflex](#), which makes competitive gamers quicker; [NVIDIA Omniverse Machinima](#), for video game storytelling using real-time computer graphics engines; and [NVIDIA Broadcast](#), which harnesses AI to turn any room into a home broadcast studio.

“Today’s launch of NVIDIA Ampere GPUs is a giant step into the future,” said Huang. “The work of thousands of engineering years, the GeForce RTX 30 Series delivers our greatest generational leap ever. NVIDIA RTX fuses programmable shading, ray tracing and AI for developers to create entirely new worlds. Twenty years from now, we’ll look back and realize that the future of gaming started here.”

### Marvels of NVIDIA Ampere Architecture - 2nd Generation RTX

Enabling the blistering performance of the new RTX 30 Series GPUs and the NVIDIA Ampere architecture are cutting-edge technologies and over two decades of graphics R&D, including:

- **New streaming multiprocessors:** The building block for the world’s fastest, most efficient GPU, delivering 2x the FP32 throughput of the previous generation, and 30 Shader-TFLOPS of processing power.
- **Second-gen RT Cores:** New dedicated RT Cores deliver 2x the throughput of the previous generation, plus concurrent ray tracing and shading and compute, with 58 RT-TFLOPS of processing power.
- **Third-gen Tensor Cores:** New dedicated Tensor Cores, with up to 2x the throughput of the previous generation, making it faster and more efficient to run AI-powered technologies, like [NVIDIA DLSS](#), and 238 Tensor-TFLOPS of processing power.
- **NVIDIA RTX IO:** Enables rapid GPU-based loading and game asset decompression, accelerating input/output performance by up to 100x compared with hard drives and traditional storage APIs. In conjunction with Microsoft’s new DirectStorage for Windows API,<sup>(1)</sup> [RTX IO](#) offloads dozens of CPU cores’ worth of work to the RTX GPU, improving frame rates and enabling near-instantaneous game loading.
- **World’s fastest graphics memory:** NVIDIA has worked with Micron to create the world’s fastest discrete graphics memory for the RTX 30 Series, GDDR6X.<sup>(2)</sup> It provides data speeds of close to 1TB/s system memory bandwidth for graphics card applications, maximizing game and app performance.
- **Next-gen process technology:** New 8N NVIDIA custom process from Samsung, which allows for higher transistor density and more efficiency.

### RTX Comes to *Fortnite*, *Call of Duty: Black Ops Cold War*

Pop culture phenomenon *Fortnite* is the latest blockbuster game to turn RTX On, joining *Call of Duty: Black Ops Cold War* and a large group of AAA titles, such as [Cyberpunk 2077](#), [Dying Light 2](#) and [Watch Dogs: Legion](#).

Among other titles already shipping with ray-tracing support are [Control](#), [Minecraft with RTX Beta for Windows 10](#) and [Wolfenstein: Youngblood](#). Additionally, ray tracing is supported in industry-standard APIs, including Microsoft DirectX Raytracing and Vulkan, as well as in the game engines used by developers to create games, including Unreal Engine, Unity, Frostbite, id Tech, Northlight, Luminous Engine, 4A Engine and more.

### DLSS: AI-Powered Gaming Acceleration

NVIDIA DLSS, one of the biggest graphics breakthroughs of the past decade, uses the deep learning neural network powered by RTX Tensor Cores. When enabled, DLSS — which is supported exclusively on GeForce RTX GPUs — improves performance in titles such as [Control](#), [Minecraft with RTX for Windows 10](#) and [Death Stranding](#), while generating

images that are comparable to native resolution. DLSS will be heading to [Boundary](#), [Bright Memory Infinite](#), [Call of Duty: Black Ops Cold War](#), [Cyberpunk 2077](#), [Fortnite](#), [Ready or Not](#), [Scavengers](#) and [Watch Dogs: Legion](#). For those with more powerful PC configurations, a new [Ultra Performance mode enables DLSS to run up to 8K](#).

### New Ways to Play

NVIDIA also announced three new technologies designed for enhancing the experiences of gamers, broadcasters, esports professionals and creators:

- **NVIDIA Reflex: Become Instantly More Competitive.** Gamers strive for the lowest possible latency in competitive games because it allows the PC to respond faster to their inputs, enabling them to play with greater precision. [NVIDIA Reflex](#) is a new suite of technologies that optimize and measure system latency. Among these are NVIDIA Reflex Low-Latency Mode, a technology being integrated into popular esports games such as *Apex Legends*, *Call of Duty: Warzone*, *Fortnite* and *Valorant* that reduces latency by up to 50 percent, and NVIDIA Reflex Latency Analyzer, which detects input coming from the mouse and then measures the time it takes for the resulting pixels (for example, a gun muzzle flash) to change on screen. Reflex Latency Analyzer is integrated into [new 360Hz NVIDIA G-SYNC@ Esports displays](#) arriving this fall from Acer, Alienware, ASUS and MSI and supported by top esports peripherals from ASUS, Logitech, Razer and SteelSeries. Measuring system latency has previously been virtually impossible for gamers to do, requiring over \$7,000 in specialized high-speed cameras and equipment.<sup>(3)</sup>
- **NVIDIA Broadcast: Stream Like a Pro.** The world's 20 million<sup>(4)</sup> live streamers can turn their home into a broadcast studio with NVIDIA Broadcast, a universal plugin that enhances the quality of microphones and webcams with RTX-accelerated AI effects, such as audio noise removal, virtual background effects and webcam auto frame.
- **NVIDIA Omniverse Machinima: Enriching a New Art Form.** Modern gaming continues to extend the storytelling art genre, in which game assets are used to create cinematic masterpieces. Omniverse Machinima makes such work easy, providing a path-traced viewer tool and engine designed for physical accuracy, simulating light, physics, materials and AI. Users can take assets from supported games, and use their web camera and AI to create characters, add high-fidelity physics and face and voice animation, and publish film-quality cinematics using the rendering power of their RTX 30 Series GPU. Sign up for notification when [early access](#) opens.

### Introducing: GeForce RTX 3080, RTX 3070, RTX 3090 Founders Edition

- **GeForce RTX 3080** — Starting at \$699, the RTX 3080 is the ultimate gaming GPU — up to 2x faster than the RTX 2080. Featuring 10GB of the new high-speed GDDR6X memory running at 19Gbps, the RTX 3080 can consistently deliver 60 frames per second for 4K resolution gaming.
- **GeForce RTX 3070** — Starting at \$499, the RTX 3070 is faster than the RTX 2080 Ti at less than half the price, and on average is 60 percent faster than the original RTX 2070. It is equipped with 8GB of GDDR6 memory, hitting the sweet spot of performance for games running at 4K and 1440p resolutions.
- **GeForce RTX 3090** — At the top of the stack is the RTX 3090, priced at \$1,499 and referred to as the “BFGPU” — Big Ferocious GPU. It even comes with a silencer — a three-slot, dual-axial, flow-through design that is up to 10x quieter than the TITAN RTX and keeps the GPU up to 30 degrees C cooler. Its 24GB of GDDR6X memory can tackle the toughest AI algorithms and feed massive, content creation workloads. The RTX 3090 is up to 50 percent faster than the current ultimate PC graphics card, TITAN RTX, enabling gamers to experience 60 fps in 8K resolution across many top games.

The new cards feature several world firsts, including:

- **Dual-Axial, Flow-Through Thermal Solution** — Up to 2x more cooling performance, with a stunning unibody design. Gamers and creators will be able to enjoy unrivaled performance while their GPUs simultaneously run cooler and quieter than ever.
- **Exquisite Mechanical and Electrical Design** — A stronger mechanical structure — with a new low-profile leaf spring along with a new 12-pin power connector — allows more space for components and cooling, and is compatible with 8-pin connectors in existing power supplies, with an included adapter.
- **HDMI 2.1** — The increased bandwidth provided by HDMI 2.1 allows, for the first time, a single cable connection to 8K HDR TVs for ultra-high-resolution gaming.
- **AV1 Decode** — First discrete GPUs with support for the new AV1 codec, enabling gamers to watch up to 8K HDR internet video using as much as 50 percent less bandwidth.<sup>(5)</sup>

### Where to Buy

The GeForce RTX 3090, 3080 and 3070 GPUs will be available as custom boards, including stock-clocked and factory-overclocked models, from top add-in card providers such as ASUS, Colorful, EVGA, Gainward, Galaxy, Gigabyte, Innvision 3D, MSI, Palit, PNY and Zotac and as Founders Editions from [www.nvidia.com](http://www.nvidia.com).

Look for the GeForce RTX 30 Series GPUs in gaming systems built by Acer, Alienware, ASUS, Dell, HP, Lenovo and MSI, plus leading system builders worldwide, including CyberPower PC, Digital Storm, Falcon NW, IBUYPOWER, Maingear, Origin, NZXT, Puget and many more.

The GeForce RTX 3080 will be available starting Sept. 17. The GeForce RTX 3090 will be available starting Sept. 24. The

GeForce RTX 3070 will be available in October.

For a limited time, gamers who purchase a new GeForce RTX 30 Series GPU or system<sup>(6)</sup> will receive a [PC digital download of Watch Dogs: Legion](#) and a one-year subscription to the NVIDIA [GeForce NOW™](#) cloud gaming service.

#### Additional Information

Among just-published content showcasing the new GeForce RTX 30 Series GPU are:

- [GeForce Special Event replay with NVIDIA CEO Jensen Huang](#)
- [GeForce RTX 30 Series Announcement](#)
- [GeForce RTX 30 Series Bundle](#)
- [Fortnite with RTX](#)
- [NVIDIA Reflex](#)
- [Omniverse Machinima](#)
- [NVIDIA Broadcast](#)
- [RTX IO](#)
- [8K HDR with NVIDIA DLSS](#)
- [Call of Duty: Black Ops Cold War](#)
- [Cyberpunk 2077 with RTX](#)
- [Watch Dogs: Legion with RTX](#)
- [Minecraft RTX World Pack 3](#)
- [NVIDIA G-SYNC 360Hz Esports Displays](#)
- [AV1 Decode](#)

Press assets, including product photographs, specifications, chip and die shots and other materials, are available at [www.nvidia-press.com](http://www.nvidia-press.com).

#### About NVIDIA

NVIDIA's (NASDAQ: NVDA) invention of the GPU in 1999 sparked the growth of the PC gaming market, redefined modern computer graphics and revolutionized parallel computing. More recently, GPU deep learning ignited modern AI — the next era of computing — with the GPU acting as the brain of computers, robots and self-driving cars that can perceive and understand the world. More information at <http://nvidianews.nvidia.com/>.

1. Microsoft is targeting a developer preview of DirectStorage for Windows for game developers next year, and NVIDIA GeForce RTX gamers will be able to take advantage of RTX IO enhanced games as soon as they become available.
2. Available on RTX 3090 and 3080 GPUs only.
3. <https://www.krontech.ca/store/Chronos-2-1-HD-Pre-Order-p133345424>
4. Source: Streamlabs and Xiaohulu livestreaming industry reports
5. <https://www.nexttv.com/blog/facebook-tests-show-av1-streaming-performance-exceeding-expectations>
6. Participating partners only. Visit <https://www.nvidia.com/en-us/geforce/news/30-series-watch-dogs-legion-bundle/>.

Certain statements in this press release including, but not limited to, statements as to: NVIDIA delivering the greatest-ever generational leap in performance; the benefits, impact, features and performance of the NVIDIA Ampere architecture, second generation RTX, GeForce RTX 30 Series GPUs, NVIDIA Reflex, Omniverse Machinima, NVIDIA Broadcast and NVIDIA DLSS; *Fortnite* turning on RTX real-time ray tracing; the launch of NVIDIA Ampere GPUs being a giant step into the future; what the RTX 30 series allow and their ability to support 8K gaming; the benefits, performance and abilities of the technologies going into the RTX 30 Series GPUs and NVIDIA Ampere architecture and what they enable; the games featuring RTX technology and those featuring DLSS; the availability of RTX and DLSS in games and its impact; the APIs and game engines supporting ray tracing; the availability of the 360Hz NVIDIA G-SYNC Esports displays; modern gaming extending the storytelling art genre; the price and availability of the NVIDIA RTX 30 Series GPUs; gamers' and creators' ability to enjoy performance while their GPUs run cooler and quieter than ever; and gamers receiving *Watch Dogs: Legion* and subscription of GeForce NOW when purchasing a RTX 30 Series GPU are forward-looking statements that are subject to risks and uncertainties that could cause results to be materially different than expectations. Important factors that could cause actual results to differ materially include: global economic conditions; our reliance on third parties to manufacture, assemble, package and test our products; the impact of technological development and competition; development of new products and technologies or enhancements to our existing product and technologies; market acceptance of our products or our partners' products; design, manufacturing or software defects; changes in consumer preferences or demands; changes in industry standards and interfaces; unexpected loss of performance of our products or technologies when integrated into systems; as well as other factors detailed from time to time in the most recent reports NVIDIA files with the Securities and Exchange Commission, or SEC, including, but not limited to, its annual report on Form 10-K and quarterly reports on Form 10-Q. Copies of reports filed with the SEC are posted on the company's website and are available from NVIDIA without charge. These forward-looking statements are not guarantees of future performance and speak only as of the date hereof, and, except as required by law, NVIDIA disclaims any obligation to update these forward-looking statements to reflect future events or circumstances.

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