

Gaming in 2022:

What Matters for Desktops, Laptops, and Storage



Gaming in 2022

2021 has been an exciting time for gaming and 2022 only looks to further that trend. New consoles, powerful

phones – as a surprisingly capable mobile platform – and of course ubiquitous streaming are all on the horizon. There are many cloud-based streaming services with more to come, but also Augmented Reality (AR) and Virtual Reality (VR) are starting to take off with platforms like the Metaverse. However, it's hard to beat the performance of a dedicated gaming laptop or desktop – if not in raw power, then in all-important latency. There are exciting improvements coming here, too, for those that want the best experience.

Software

The primary Operating System (OS) for gaming on laptops and desktops is, of course, Microsoft Windows. Microsoft officially rolled out Windows 11 earlier this year. While Windows 10 will still work fine moving forward, including with the new DirectStorage Application Programming Interface (API) that promises to leverage storage for gaming in a whole new way, its capabilities are limited. This includes support for processor families like Intel's Alder Lake which relies on the Windows 11 scheduler to work most efficiently and effectively, particularly for games. DirectStorage, for its part, allows the Personal Computer (PC) platform to enjoy what is seen on the PlayStation 5 and Xbox Series S/X consoles – fast NVMe™ storage taken to the next level.

Support for gaming has also increased on the Linux platform, particularly through Valve's Steam. 2022 will see the release of their own dedicated hardware – the Steam Deck – which can internally utilize a 2230 NVMe™ SSD. Of course, a whole host of platforms can game with streaming, including on tablets and smartphones. However, those users that wish to record and stream their games while playing will still want to use a powerful laptop or desktop with appropriate storage. New processors, including Alder Lake on Windows 11, will allow these users to share their experiences with no frame rate penalty.

Internal Hardware

So, what is important for a gaming laptop or desktop in order for the user to have the best gaming experience? It starts with the internal hardware. This includes the Central Processing Unit (CPU) such as one from the Alder Lake family mentioned above. Generally speaking, more cores is better, higher clocks – including boost or turbo – are better, and higher efficiency is better. This can involve complicated comparisons as newer generations of processors tend to be able to do more instructions per second (IPC) – a valuable metric.

Often more important than the CPU is the Graphics Processing Unit (GPU), or simply the video card. GPUs have been in high demand throughout 2021 and it does not appear that this will change. GPUs also have cores, a certain amount of video RAM (VRAM), and myriad other useful features like NVIDIA's Deep Learning Super Sampling (DLSS). The system will also have its own memory, or DRAM, which can vary in speed and latency, impacting bandwidth and therefore gaming performance. Games will typically have requirements for the CPU, GPU, and DRAM amount, so a system must be chosen with future titles in mind.

Of secondary importance are the Power Supply Unit (PSU) plus the battery or Uninterruptible Power Supply (UPS) – the system must have sufficient power and a backup can be useful for reliability and portability. Also, the system requires sufficient cooling because overheated components will throttle or even fail. The central part of the system, the motherboard, is also critical because it can impact upgradeability. If you're building a system that will last, you want to make sure you have sufficient power, good cooling, and a feature-full motherboard. However, the user experience also relies – and perhaps more directly – on the external hardware.

External Hardware

The user does not generally interact with the internal hardware but rather the external devices that allow for input and output. This includes the monitor and audio – speakers or headset – for output along with a keyboard, mouse, controller, or touch interface for input. Also of importance could be a microphone, a camera, and networking. These devices can often be wired or wireless with their own pros and cons. In either case, latency is a critical concept – this can be impacted by the monitor, the input devices, and the networking setup.



The most expensive external hardware device, though, is likely to be the monitor or the display. A modern panel can use many different technologies – Vertical Alignment (VA), In-Plane Switching (IPS), or Twisted Nematic

(TN) – which balance response time, color quality, contrast, and brightness. A good display will support Adaptive Sync which means the GPU and display are synchronized for rendering, which enables smooth gameplay. A monitor with a higher refresh rate and lower response time translates to less total input latency – this is especially key for competitive gaming. A fast monitor and computer, paired with wired components and networking, ensure the shortest delay or “lag” between action and reaction.

Storage

Storage was not always important for gaming, but that has changed within the last few years and is bound to change further. Hard Drives (HDD) were cost-effective and sufficiently fast for gaming. However, Solid State Drives (SSDs) are now capacious and cheap enough to compete. This is especially true as game load times are far lower with an SSD, regardless of type. General system response and consistency are also much improved with an SSD which can improve multitasking even while gaming, including when streaming or recording.

Games are getting larger; however, it is also advantageous to rely on compression to save on console costs. This means being able to decompress data on-the-fly but also make better use of fast storage for certain assets. On Windows, this means the DirectStorage API, which requires a Non-Volatile Memory Express (NVMe™) SSD (see our [NVMe™ Specification 2.0 white paper](#)). This is the perfect time to move away from HDDs as SSDs run cooler, use less power, produce less heat, can use the smaller M.2 form factor, and are more upgradeable as we move to faster interface speeds. Almost all laptops and desktops today can be upgraded or modified for faster storage.

Summary

Gaming in the year ahead promises to be thrilling: new technology abounds and there are more gamers than ever due to pandemic lockdowns (see our blog on the subject). Windows 11 is here and Steam Deck is on the way, even as powerful 5G phones and new CPUs are coming to the market. The consoles have paved the way forward for DirectStorage, as well, which promises to make NVMe™ SSDs a worthwhile investment over traditional SATA SSDs. Streaming is at the height of its popularity but AR and VR are also around the corner. Those that want the very best, however, are still carefully building and upgrading their own machines.

Although it has been difficult to get a hand on some hardware, it's still important to have the right CPU, a sufficiently fast GPU, and plenty of DRAM. These components must all be properly cooled and powered while allowing for upgradeability. The best experience is topped off with superior input and output devices, particularly an amazing display with a high refresh rate. Behind all of this is fast storage – an SSD drive, in the least, and preferably an NVMe™ SSD, even if it's not the primary drive. Regardless of your needs, Solid State Storage Technology Corporation has you covered with our wide selection of products and our dedication to keeping up with the cutting edge.

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