

Radeon 660M RDNA2 iGPU Outperforms Intel's Iris Xe iGPU In Gaming Benchmarks

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754 words

20 February 2022

Tom's Hardware

TOMHA

English

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AMD's new Radeon 660M iGPU shows competitive results against Intel's competing solutions in a slew of new gaming benchmarks.

Chinese news outlet [Zhuanlan](#) has tested two of AMD's new Rembrandt Zen3+ mobile CPUs, with one of those chips being the new mid-range Ryzen 5 6600H with Radeon 660M graphics. According to the outlet's benchmark results, performance is impressively good, with the Radeon 660M usually outperforming Intel's highest-end graphics options in its [Alder Lake mobile](#) CPUs.

The Ryzen 5 6600H is part of AMD's new Zen3+ product stack, codename [Rembrandt](#). The new microarchitecture upgrade brings excellent efficiency improvements to the Ryzen architecture, with 50 additional features added to Zen3+ to improve the power consumption of the entire SoC. Unfortunately, as a result, performance has not been improved that much -- despite the transition to TSMC's 6nm process.

However, this isn't the case for AMD's new graphics engine. AMD has finally made the jump to RDNA2 for its latest series of integrated GPUs, which pack some severe upgrades over AMD's previous Vega architecture, found in its prior IGPs. Clock speeds have increased by 300 MHz, and memory bandwidth has improved by 50% -- thanks to LPDDR5X, and the IGP's execution engine is now 50% larger. These are just some of the upgrades found in Rembrandt's new IGPs.

The [Ryzen 5 6600H](#) includes six cores and 12 threads, with a peak boost of 4.5 GHz and a default TDP of 45W. For graphics, the 6600H comes with the new Radeon 660M with six RDNA2 cores and a peak boost of 1.9 GHz. For comparison, AMD's flagship iGPU is the Radeon 680M which features double the core count and a maximum boost clock of 2.4 GHz.

[Ryzen 5 6600H Gaming Benchmark Results \(Image credit: Zhuanlan\)](#)

Despite having just six GPU cores, the Radeon 660M shows competitive results in Zhuanlan's suite of game benchmarks, including League of Legends, CS:GO, Dota 2, Shadow of the Tomb Raider, Gears 5, and more. In addition, the Radeon 660M outperformed the Core i7-12700H with its 96 EU Iris Xe graphics engine -- the highest available graphics engine in Intel's mobile lineup.

However, performance is not entirely in favor of AMD. There were a couple of games where the Radeon 660M lost to Intel's Iris Xe iGP flagship, particularly in Apex Legends, F1 2018, Nark: Bladepoint, A Total War Saga, Troy, and Gears Tactics.

But for the most part, performance between the Radeon 660M and Iris Xe iGP was identical primarily, with just a few frames per second difference in most of the games tested. The only outliers were League of Legends, CS:GO, Assassin's Creed Odyssey, and Metro Exodus, which saw significant performance differences between the two iGPs. Of course, this can result from many things, including graphics drivers, core architectures, and power limits.

[Ryzen 5 6600H Gaming Benchmark Results \(Image credit: Zhuanlan\)](#)

In further testing, Zhuanlan also evaluated the Ryzen 5 6600H's gaming capabilities under a range of power targets, including 25W, 42W, and 54W. Surprisingly, the benchmarks show gaming performance to be incredibly similar between all three power targets -- especially between the 42W and 54W results. The only outliers include League of Legends, Dota 2, and CS:GO, where performance severely drops off with the 25W limit.

The results show us that performance and efficiency peak at the Ryzen 5 6600H's default 42-45W power limit, and anything beyond that won't yield any beneficial gains when it comes to gaming.

Performance at 25W showed favorable results but was consistently below that of the 42W data. With some outliers showing severe performance drop off with the 25W limit. The Ryzen 5 6600H can perform well at 25W but can be prone to performance drop-off in specific workloads due to the shallow power target.

Overall, it appears AMD's new mid-range RDNA2 integrated graphics engine is a huge success and is a massive upgrade over the company's previous Vega graphics. In general, the Radeon 660M can slightly outperform Intel's top-of-the-line 96EU Iris Xe graphics featured in its Alder Lake CPUs. However, a significant achievement considering the 660M is AMD's mid-range iGP and doesn't even count AMD flagship Radeon 680M, which boasts twice the core count of the 660M.

[Ryzen 6000 \(AMD\)](#)

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GPU Maker COLORFUL Launches Gaming Laptops With Intel 12th Gen CPU And RTX 3050Ti

Yetnesh Dubey

413 words

17 February 2022

Digit

HTDIGI

English

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India, Feb. 17 -- Primarily known for making GPUs, COLORFUL is stepping into a whole new territory by releasing its brand new gaming laptop featuring Intel 12th Core series processor and an Nvidia RTX 3050Ti GPU.

The COLORFUL X15 XS laptop is pretty portable by gaming laptop standards with just 1.9kg of overall body weight. Here's the full story. The gaming laptop also comes in an anime style theme which looks aesthetically pleasing. Here's everything you need to know.

COLORFUL X15 XS Gaming Laptop Specs, Features, Launch, Price In India

The COLORFUL gaming laptop is powered by an Intel 12th Gen Core series processor. Here the users have a choice to either opt for a Core i5-12500H featuring 12 cores (4P + 8E cores) or a Core i7-12700H featuring 14 cores (6P + 8E cores). Both CPUs come paired with an Nvidia GeForce RTX 3050 Ti, featuring 4GB GDDR6 VRAM. The laptop also comes with 16GB DDR4 memory running in dual channel mode (2 X 8GB) with a clock speed of 3200MHz and 512GB NVMe SSD storage as well.

In terms of design, the laptop takes inspiration from anime and is available in two unique colours Pine Blue and Mist Grey. The COLORFUL gaming laptop also comes with a 144Hz FHD display with support for G-Sync, Nvidia's anti-screen tearing technology. The gaming laptop does not skimp out on equipment either as it features a 1MP webcam, Wi-Fi 6E, a microSD card slot, an HDMI port, an ethernet port, a Mini DisplayPort 1.4 along with 2 X Type-C (USB 3.2) ports and other USB Type-A ports as well.

Powering the COLORFUL gaming laptop is a 54WH lithium-ion battery and cooling it is the brand's patented Storm Blade 2.0 technology with freezing mode, which spins the fans really fast and rapidly cools the laptop down.

The COLORFUL Gaming laptop with Intel 12th Gen Core i5-12500H has a price tag of \$999 (Rs 74,977) or \$1,099 (Rs 82,496). The exact Indian pricing for both models is not yet available, we will update the same as more information comes to light.

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Document HTDIGI0020220217ei2h0008k

GlobalData plc - Tower Semiconductor is a useful addition for Intel, but investors await its take on the metaverse, says GlobalData

GlobalData plc published this content on 15 Feb 2022 and is solely responsible for the information contained herein. Distributed by PUBT, unedited and unaltered, on 15 Feb 2022 17:15:34 UTC.

305 words

15 February 2022

Public Companies News and Documents via PUBT

LCDVP

English

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Tower Semiconductor is a useful addition for Intel, but investors await its take on the metaverse, says GlobalData

15 Feb 2022

Tower Semiconductor is a useful addition for Intel, but investors await its take on the metaverse, says GlobalData

Posted in [Thematic Research](#)

Following the news that [Intel](#) will acquire [Tower Semiconductor](#):

David Bicknell, Principal Analyst in the Thematic Research Team at GlobalData, a leading data and analytics company, offers his view:

"Intel's proposed acquisition of Tower Semiconductor will bolster its production of trailing edge chips, something that is vital for many companies, particularly automakers. Tower Semiconductor will be a useful addition to Intel's portfolio, without the tension and regulatory scrutiny that might have been involved had Intel bought a reluctant GlobalFoundries. However, this acquisition will have no impact on global chip shortages."

Dr Lil Read, Analyst in the Thematic Research Team at GlobalData, offers her view:

"The announcement comes just days before Intel's investor meeting, but it is unlikely to be the main topic of conversation at that event. Instead, investors will be eager to hear what Intel has to say about the metaverse, a topic on which it has been relatively quiet until now, and get an update on its self-driving company Mobileye, which go public in 2022."

* [Original Link](#)

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Document LCDVP00020220215ei2f00kiy

online news

Acer unveils plethora of gaming hardware at CES, adds Intel Arc-powered ultrabook

1,034 words

15 February 2022

ETMAG.com

FMETMA

English

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Aside from any availability issues down the road, Acer's plentiful new PC gaming hardware should be enough for a variety of audiences. From the 48-inch 4K CG48 monitor pitched as a TV replacement, to a couple of regularly sized Predator gaming displays, full and mid-tower PCs, and gaming laptops. There are also two new Swift X models with 16:10 displays and two Aspire-branded AIOs for productivity users.

Predator monitors (CG48, X32 and X32 FP) The Predator CG48 gaming monitor comes with a sizeable 48-inch OLED panel that offers 4K resolution with a 138Hz refresh rate. Acer is targeting PC and console owners with this monitor, who can take advantage of its 1 x HDMI 2.1, 3 x HDMI 2.0, 1 x DisplayPort 1.4 ports, as well as 4 x USB 3.2 and 1 x USB-C.

Acer claims a 0.1ms GtG response time for the CG48, alongside HDR10, 98 percent DCI-P3 color gamut coverage and AMD FreeSync Premium Pro support. The monitor will arrive in China first in Q2, 2022, followed by the US and other global markets in Q3 2022 with a \$2,499 / €2,199 price tag.

The Predator X32 and X32 FP make up Acer's remaining gaming monitor announcements. Both of these sharp-looking IPS monitors come in at 32-inches with 4K resolution and feature 576-zone miniLED backlighting but have noticeable differences otherwise.

The more expensive \$1,999 / €1,899 X32 features a 160Hz refresh rate, Nvidia G-Sync Ultimate and Reflex support, and ports including 3 x HDMI 2.0, 1 x DisplayPort 1.4 and a USB 3.0 hub.

The \$1,799 / €1,599 X32 FP, on the other hand, can be overclocked to a slightly higher 165Hz refresh rate from its native 160Hz, supports AMD FreeSync Premium Pro and has a different port setup. There are 4 x HDMI 2.1 ports aimed at console users, 1 x DisplayPort 1.4, alongside a 90W-capable USB-C port, 1 x USB-B port and a USB 3.0 hub.

The Predator X32 FP launches in Q2 2022 globally, while the X32 will arrive in Q3 2022 for North American and EMEA markets.

Predator desktops (Orion 5000 and 3000) Acer's desktop offerings include the full-sized Predator Orion 5000 and the mid-tower Orion 3000. Both Windows 11 PCs can be specced with up to a 12th-gen Intel i7 chip and an RTX 3080 GPU in the bigger model, and an RTX 3070 in the Orion 3000.

Both PCs also support up to 64GB RAM (higher clock speeds on the Orion 5000) and up to 2TB of NVMe storage. Their darkened glass and metal finish cases have transparent side panels and feature Predator FrostBlade RGB fans on the front.

These gaming PCs will hit the North American market in February, starting at \$2,599 / €1,999 for the Orion 5000 and \$1,999 / €1,299 for the Orion 3000.

Predator and Nitro laptops (Triton 500 SE, Helios 300 and Nitro 5) Acer's laptop refresh for the Predator Helios line includes 12th-gen Intel silicon and the latest Nvidia RTX 3000 graphics, while the new Nitro 5 series can also be specced with an AMD Ryzen 6000 processor.

The flagship Predator Triton 500 Special Edition can be had with up to a 12th-gen i9, an RTX 3080 Ti Laptop and 32GB of 5,200Mhz RAM. This beastly machine supports up to 2TB of PCIe Gen 4 storage, packs a large 99.98Wh battery and uses a triple-fan cooling system.

Its 16-inch 16:10 aspect ratio display has a 2,560 x 1,600 resolution that refreshes at 240Hz and supports G-Sync. It arrives in North America in March for \$2,299 / €3,499 and next month for EMEA markets.

There's also the cheaper Helios 300 series that Acer is launching in 15.6-inch QHD 165Hz and 17.3-inch QHD/FHD 165Hz/144Hz versions. These laptops use slightly less powerful hardware than the Triton 500 SE,

with up to a 12th-gen i7 and RTX 3080/3070 Ti combo. RAM and storage max out at 32GB and 2TB, respectively.

The Helio 300 series will start at \$1,649 / €2,299 for the 15.6-inch model when it comes to North America in May, while the 17.3-inch version will arrive sooner in March with a \$1,749 / €2,399 price tag.

Acer also announced a hardware refresh for the Nitro 5, which supports up to a 12th-gen i7 or an AMD Ryzen 6000 chip that can be paired with an RTX 3070 Ti and up to 32GB of RAM. Like the Helios 300, the Nitro 5 series will also come in 15.6-inch and 17.3-inch sizes that use either QHD/FHD 165Hz or FHD 144Hz panels.

The Nitro 5's smaller, Intel variant arrives first in North America with a \$1,049 / €1,549 price tag, followed by the \$1,099 / €1,599 AMD version in April.

Swift X ultrabooks and Aspire AIOs For the non-gaming, ultrabook crowd, Acer has announced two new Swift X models with 16:10 displays. The 14-inch variant can be had with a 12-core 12th-gen Intel silicon and RTX 3050 Ti graphics, while the bigger, 16-inch model features the same CPU, but with discrete Intel Arc graphics.

Acer notes 16GB RAM and 2TB SSD storage for these models, alongside plenty of connectivity options, including Thunderbolt 4, USB 3.2 and a Windows Hello fingerprint reader.

Lastly, there's a couple of Aspire-branded AIOs: The 27-inch C27 and 24-inch C24. These slim workstations support up to 12th-gen i7 silicon and GeForce MX550 GPU, alongside 64GB of RAM and 1TB SSD + 2TB HDD of storage.

Acer notes connectivity features like Thunderbolt 4 support, Bluetooth 5.2, and a 5MP webcam with two stereo mics for teleconferencing. Pricing and availability info for Acer's upcoming Swift X ultrabooks and Aspire AIOs is currently unknown.

Document FMETMA0020220215ei2f0000o

Intel Core i3-12100 Review: The Little Gaming Giant

Paul Alcorn

6,213 words

14 February 2022

Tom's Hardware

TOMHA

English

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The Intel Core i3-12100 brings an incredible amount of gaming and application performance for a mere \$104.

Intel's four-core eight-thread Core i3-12100 comes with an incredibly competitive \$129 price tag that earns a spot on our list of [best CPUs for gaming](#) and [Best Cheap CPUs](#) as Intel finally addresses what has become the most ignored part of the PC market — the sub-\$200 segment. That's not to mention that the chip also comes as a \$104 F-series Core i3-12100F that Intel ships with deactivated integrated graphics for \$25 less than the full-featured model. In fact, with no clear current-gen competitor from AMD and stellar performance for its price point, the Core i3-12100 easily leads our [CPU benchmark hierarchy](#) in the \$105 to \$130 bracket.

Intel refreshed its Comet Lake Core i3 lineup when it released its [11th-Gen Rocket Lake](#) chips in 2020, but those models didn't come with a new architecture or any meaningful performance improvements. Rather, they came as refreshed 10th-Gen models with a paltry 100 MHz clock speed increase. Not that it mattered — given the realities of the chip shortages, we rarely saw those chips at retail anyway.

Speaking of chips we never really saw at retail, AMD's last budget model came as the incredibly impressive [Ryzen 3 3300X](#) that landed back in 2020. The quad-core 3300X brought an unheard-of level of performance for a \$120 chip, promising new levels of gaming performance for budget builds. Unfortunately, that didn't come to fruition as the chip was a ghost and never appeared in any meaningful volume at retail.

Things haven't improved in the interim, either. AMD abandoned the sub-\$200 market when it launched its [Ryzen 5000](#) processors, leaving its older 3000-series processors to hold the line. However, as you'll see in our benchmarks below, they aren't relevant. AMD's lowest point of entry into its Zen 3-powered Ryzen 5000 series comes in the form of the [\\$259 Ryzen 5 5600G](#). At twice the price of the 12100, it's a non-factor for lower-end gaming rigs unless you plan to use integrated graphics.

PriceCores | ThreadsP-Core Base/BoostE-Core Base/BoostTDP / PBP / MTPDDR4-3200L3 CacheCore
i9-12900K / KF\$589 (K) - \$564 (KF)8P + 8E | 16 Cores / 24 Threads3.2 / 5.2 GHz2.4 / 3.9 GHz125W /
241WDDR4-3200 / DDR5-480030MBCore i7-12700K / KF\$409 (K) - \$384 (KF)8P + 4E | 12 Cores / 20
Threads3.6 / 5.0 GHz2.7 / 3.8 GHz125W / 190WDDR4-3200 / DDR5-480025MBCore i5-12600K / KF\$289 (K)
- \$264 (KF)6P + 4E | 10 Cores / 16 Threads3.7 / 4.9 GHz2.8 / 3.6 GHz125W / 150WDDR4-3200 /
DDR5-480016MBCore i5-12400 / F\$192-\$199 | \$167-\$174 (F)6P + 0E | 6 Cores / 12 Threads4.4 / 2.5
GHzn/a65W / 117WDDR4-3200 / DDR5-480018MBCore i3-12100 / F\$122 - \$129 | \$97 - \$1044P + 0E | 4
Cores / 8 Threads3.3 / 4.3 GHzn/a60W / 89WDDR4-3200 / DDR5-480012MB

* [Intel Core i9-12900K vs Ryzen 9 5900X and 5950X: Alder Lake and Ryzen 5000 Face Off](#)

* [Intel Core i5-12600K vs AMD Ryzen 5 5600X and 5800X Face Off: Ryzen Has Fallen](#)

* [Intel Core i7-12700K vs AMD Ryzen 9 5900X and 5800X Face Off: Intel Rising](#)

* [Intel Core i5-12400 vs AMD Ryzen 5 5600X Face-Off: The Gaming Value Showdown](#)

That leaves Intel unchecked in the budget segment, adding to the company's newfound dominance with the Alder Lake chips that even outperform more expensive Ryzen 5000 chips. Intel's advantages also extend to the motherboard ecosystem too, with B660 and H610 motherboards providing a great pairing for the Core i3-12100. So even though these boards do cost more than we're accustomed to for the lowest-end models, they provide plenty of connectivity for budget systems.

Alder Lake's performance advantages come even without its support for DDR5 memory and PCIe 5.0 interfaces (both of which Intel brought to market first). As such, you can use standard DDR4 memory and PCIe 4.0 devices and still have superior performance and connectivity options over AMD's aging AM4 platform. There are also plenty of B- and H-series boards that leverage less-expensive DDR4 memory, which is a saving grace given the ongoing DDR5 shortages.

Alder Lake also brings another innovation — the hybrid x86 design. The higher-end Alder Lake chips have big and fast Performance cores (P-cores) for latency-sensitive work paired with clusters of small and powerful

Efficiency cores (E-cores) that chew through background processes. The [Golden Cove architecture](#) powers the 'big' P-cores, while the 'little' E-cores come with the [Gracemont architecture](#).

However, the Core i3-12100 doesn't have a hybrid architecture, instead coming with a more traditional design with only four Golden Cove P-Cores active. That means this four-core eight-thread processor doesn't need Intel's new Windows 11-exclusive [Thread Director](#) technology to place workloads on the correct cores. As a result, unlike Intel's hybrid models, the 12100 is just as potent in Windows 10 as it is in Windows 11.

As you'll see in our benchmarks below, the Core i3-12100 doesn't have a similarly-priced competitor from AMD. However, despite a total lack of competition, it still brings impressive generational performance gains to the table. In fact, in 1080p gaming, the \$129 Core i3-12100 delivers 88% of the \$299 Core i5-12400's performance, but for 56% less cash. The Core i3-12100 also trails the previous-gen \$262 Core i5-11600K by a mere 3% in gaming, but at half the price.

As you'll see in our benchmarks below, the quad-core i3-12100's potent combination of price, performance, and improved stock cooler dominates the \$100 to \$130 price range while punching up against more expensive competitors.

Intel Alder Lake-S Core i3-12100 Specifications and Pricing

We have deep-dive coverage of the Alder Lake [design and microarchitectures here](#), along with a broader overview in our [Alder Lake all we know article](#). Additionally, Intel now assigns a Processor Base Power (PBP) spec instead of using the 'TDP' (Thermal Design Point) nomenclature. The company also added a secondary Maximum Turbo Power (MTP) value to represent the highest power level during boost activity. You can [read more about that here](#).

Intel fabs Alder Lake on the 'Intel 7' process. We previously knew this 'Intel 7' manufacturing tech as [10nm Enhanced SuperFin](#), but [Intel recently renamed its process nodes](#) to match industry nomenclature. Technically, 'Intel 7' is the second generation of Intel's 10nm process, but it's a first for desktop PCs.

Intel 12th-Gen Alder Lake Core i3-12100 and Core i3-12100F Pricing and Specifications

Price	Cores Threads	P-Core Base/Boost	E-Core Base/Boost	TDP / PBP / MTP	Memory Support	L3 Cache
Ryzen 5 5600X \$299	6 12	3.7 / 4.6 GHz	3.5 / 4.0 GHz	65W	DDR4-3200 / DDR5-4800	32MB
Ryzen 5 5600G \$259	6 12	3.9 / 4.5 GHz	3.5 / 4.0 GHz	65W	DDR4-3200 / DDR5-4800	32MB
Core i3-12100 \$129	4 8	3.3 / 4.3 GHz	3.3 / 4.3 GHz	60W / 89W	DDR4-3200 / DDR5-4800	12MB
Core i3-12100F \$97	4 8	3.3 / 4.3 GHz	3.3 / 4.3 GHz	60W / 89W	DDR4-3200 / DDR5-4800	12MB

All Alder Lake chips support DDR4-3200 or up to DDR5-4800 memory, but [caveats apply](#). PCIe support will vary by motherboard, but Alder Lake chips expose up to 16 lanes of PCIe 5.0 (technically for storage and graphics only, no networking devices) and an additional four lanes of PCIe 4.0 from the chip for M.2 storage. Intel's Alder Lake drops into [Socket 1700 motherboards](#) from the 600-series, including Z690, H670, B660, and H610.

The Core i3-12100 comes with a 60W PBP (base) and 89W MTP (peak) power rating. The chip clocks in with a 3.3 GHz base and boosts up to 4.3 GHz. It also comes with 12 MB of L3 cache.

The Core i3-12100 is a locked chip, meaning it isn't overclockable. However, Intel supports memory overclocking on Z690 and B660 motherboards (Z690 doesn't make sense for this class of chip, though). Manipulating the power limits serves as a quasi-overclock that can eke out some additional performance in some gaming and threaded work, but you don't get much of a benefit with chips this far down on the low end.

Intel has revamped its stock air coolers with Alder Lake. These coolers are designed to address two major deficiencies with Intel's stock coolers: Thermal dissipation limitations and aesthetics. AMD's stock coolers have long beat Intel in both of these departments, so this is a sorely-needed upgrade. The Core i3-1100 ships with the Laminar RM1 cooler that comes without RGB lighting but has a decorative blue plastic ring lining the fin stack. Intel rates this cooler for 'quiet performance' at 3.9 BA.

[Click to view image \(Image credit: Intel\)](#)

We tested with both the stock heatsink and a Corsair H115i watercooler to gauge the strength of the air cooler. We didn't measure any meaningful difference between the two, so as long as you're not experiencing [severe chip bowing issues](#), you can use the stock cooler without worry.

The standard Core i3-12100 comes with the UHD Graphics 730 engine with 24 EUs. The engine runs at 300/1400 MHz base/boost frequencies. If you're looking to save some coin, the graphics-less Core i3-12100

comes with a \$25 price reduction and has the same specs as the 12100, which is incredibly attractive if you plan on using a discrete graphics card. The only difference between the standard 12100 and the 12100F is that the latter has a 58W PBP rating, so performance is identical with both models. Notably, going with the 12100F means you will lose Quick Sync capabilities and the iGPU fallback that you can use for troubleshooting in the event of an issue with a discrete GPU.

Test Setup

We tested with Windows 11 and DDR4 memory on a Z690 motherboard to maintain a comparable test environment with the rest of the processors in the test pool. Of course, you wouldn't pair this chip with this class of motherboard, but the 600-series B- and H-series motherboards also support overclocking memory and removing power limits. Given the 12100's tame power consumption, even lower-end motherboards will provide the chip with enough juice for full operation. We used DDR4 memory for testing, as DDR5 pricing removes it from consideration for this class of chip.

The Core i3-12100 is a locked chip, but you can overclock the memory on Z- and B-series motherboards. We also tested with secure boot, virtualization support, and fTPM/PTT active to reflect a properly configured Windows 11 install. We have a full breakdown of the test system configurations at the end of the article. We tested the Core i3-12100 in two different configurations:

- * Core i3-12100 DDR4-3800: Corsair H115i 280mm water cooler, power limits removed, memory overclocked to DDR4-3800 in Gear 1 mode (Gear 2 results in performance regressions)

- * Core i3-12100: Stock cooler, Intel recommended stock power limits (60/89W), Stock DDR4-3200 in Gear 1

Intel Core i3-12100 Gaming Benchmarks — The TLDR

As usual, we're testing with an Nvidia GeForce RTX 3090 to reduce GPU-imposed bottlenecks as much as possible, and differences between test subjects will shrink with lesser cards or higher resolutions. You would never see the Core i3-12100 paired with an RTX 3090, but this allows us to highlight unrestrained chip performance. Because most of the titles below show little meaningful differentiation at higher resolutions, we only tested four of the seven titles at 1440p.

Image 1 of 4

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 2 of 4

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 3 of 4

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 4 of 4

[Click to view image \(Image credit: Tom's Hardware\)](#)

We paired the Core i3-12100 with affordable DDR4 memory for our testing. We removed the 12100's power limits and overclocked the memory for the 'Core i3-12100 DDR4-3600' entry, but only registered a 2.2% improvement. That means you won't benefit much from investing in a more expensive memory kit.

The 12100 doesn't need too much help, though: The chip was a whopping 29.5% faster than the Core i3-10100 in our cumulative gaming measurement, representing a massive leap forward for budget 1080p gaming.

The 11600K, last-gen's fastest Core i5, was only 3.5% faster than the stock Core i3-12100, but overclocking the 12100's memory narrowed that to 1.4%. That's an impressive gen-on-gen improvement given the 11600K is twice the price of the 12100. Naturally, overclocking the 11600K would give it the lead, but that also requires a much more expensive cooler and other accommodations.

The 12100 is even more impressive against AMD's lower-end models. Moving on to the only comparably-priced AMD chip, the mythical quad-core Ryzen 3 3300X, finds the 12100 beating it by 19.2% and 18.8% at stock and overclocked settings, respectively. The 12100 is also 19% and 9% faster than the six-core \$199 Ryzen 5 3600 and \$240 3600X, respectively, showing that it has the chops to take on AMD's entire sub-\$250 roster.

That means we have to move up into the \$260 range to find an AMD chip that can compete with the 12100, but there isn't a great AMD comparable at that price point. AMD's Ryzen 5 5600G APU isn't designed as a direct competitor for the 12100 — it's designed for gaming on its integrated graphics, and there it will easily outmaneuver the 12100. However, when paired with a discrete GPU, the 12100 is 6% and 1% faster than the 5600G at stock and overclocked settings, respectively. So at twice the price, it's clear that the Ryzen 5 5600G isn't a suitable competitor for the 12100 if you plan on using a discrete GPU.

The Core i5-12400 is the next step up the Intel ladder. At \$199, the 12400 is 13% and 16% faster than the 12100 at stock and unlocked power settings, respectively. Put another way, the 12100 delivers 88% of the 12400's gaming performance, but for 56% less cash. The Core i5-12400 delivers much more performance in threaded application benchmarks than the 12100, though, making it a better all-rounder.

1080p Gaming Benchmarks %age Relative to Core i9-12600K with DDR4

Tom's Hardware 1080p Game Benchmarks - fps %age Core i5-12600K DDR4 100%
Core i5-12400 97.1% Ryzen 5 5600X 95.36% Core i5-11600K 88.9% Core i3-12100 DDR4-3800 / Stock 87.6% / 86%
Ryzen 5 5600G 81.1% Ryzen 5 3600X 74.95% Ryzen 3 3300X 72.1% Core i3-10100 66.2%

Naturally, moving over to 1440p brings a GPU bottleneck into the equation, so the performance deltas between the chips shrink tremendously. Flipping through the 99th percentile charts for both resolutions also shows larger deltas, but we have to view those with caution as Windows 11 seems to suffer from more framerate variability than our Windows 10 test platform.

The Core i3-12100 easily beats the Ryzen comparables, but be aware that large performance deltas in a few of the game titles can heavily impact these types of overall measurements. It's always best to make an informed decision based on the types of titles you play frequently, so be sure to check out the individual game benchmarks below.

In either case, the Core i3-12100 is now the budget gaming champion, offering a superior level of performance at its price point with no clear competitors.

3DMark, VRMark, Chess Engines on Intel Core i3-12100

Image 1 of 5

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Synthetic benchmarks don't tend to translate well to real-world gaming, but they do show us the raw amount of compute power exposed to game engines. It's too bad most games don't fully exploit it.

Far Cry 6 on Core i3-12100

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F1 2021 on Intel Core i3-12100

Image 1 of 4

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Hitman 3 on Core i3-12100

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Horizon Zero Dawn on Core i3-12100

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Microsoft Flight Simulator 2021 on Core i3-12100

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Red Dead Redemption 2 on Core i3-12100

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Watch Dogs Legion on Core i3-12100

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Core i3-12100 Application Benchmarks — The TLDR

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We can boil down productivity application performance into two broad categories: single- and multi-threaded. These slides show the geometric mean of performance in several of our most important tests in each category, but be sure to look at the expanded benchmark results further below.

The Core i3-12100 is surprisingly agile in our cumulative measure of single-threaded performance. The 12100 is 27% and 5% faster than the Core i5-10100 and i5-11600K, respectively, but the 12400 leads by roughly 2%.

Compared to Ryzen, the 12100 dominates in single-threaded applications, with its lead stretching between 25% over the Ryzen 5 3600 to 11% over the Ryzen 5 5600G.

Overall, the Core i3-12100 offers great performance in single-threaded workloads for its price point, but if you're looking for the closest thing to a "catch," you'll find it in threaded application workloads.

In multi-threaded work, the Core i3-12100 continues to assert its dominance over comparably-priced chips with an 18% lead over the Ryzen 3 3300X and a 30% lead over the Core i3-10100. However, the 124100 isn't as impressive in multi-threaded work against the six-core chips as we saw in our gaming benchmarks. The Ryzen 5 3600 and 3600X lead by ~11%, while the 5600G leads by 19%.

Those six-core chips obviously lead in threaded productivity applications, they do carry much higher price tags after all, but they pale in comparison to the Core i5-12400 as it takes a 32% lead over the 12100. Unfortunately, unlocking the power limits and tuning the memory didn't yield any performance increases in threaded work for either the 12100 or 12400.

Overall the Core i3-12100 offers a solid blend of performance in both single- and multi-threaded apps given its price point, but its single-threaded performance stands out as exceptional. You'll have to look to Intel's own Alder Lake family for faster single-threaded performance. The 12100 also dispatches the comparably-priced Ryzen 3 3300X and Core i3-10100 easily in threaded work.

1080p Gaming Benchmarks %age Relative to Core i9-12600K with DDR4

Tom's Hardware - Application Benchmarks	Single-Threaded	Multi-Threaded
Core i5-12600K	100%	100%
DDR4	100%	100%
Core i5-12400	90.7%	78.3%
Core i3-12100	80.7% / 88.9%	53.6% / 53.5%
Core i5-11600K	84.1%	73.8%
Ryzen 5 5600X	82.1%	71.5%
Ryzen 5 5600G	78.4%	65.9%
Ryzen 3 3300X	69.3%	43.7%
Ryzen 5 3600X	69.2%	60.8%
Core i3-10100	64.5%	37.3%

Rendering Benchmarks on Core i3-12100

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The Core i3-12100 is impressive in single-threaded rendering work, leading all competing Ryzen chips in both Cinebench and POV-Ray benchmarks, including those that cost more than twice the price.

The 12100 also easily beats AMD's price-comparable Ryzen 3 3300X throughout the full gamut of threaded rendering benchmarks and shows massive gains over the Core i3-10100. The six-core Ryzen models take the lead in the threaded workloads over the quad-core Core i3-12100, but that isn't a fair comparison because they are in a much higher price class.

Encoding Benchmarks on Core i3-12100

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Web Browsing on Intel Core i3-12100

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The ubiquitous web browser is one of the most frequently used applications. These tests tend to be lightly threaded, so a snappy response time is critical. The Core i3-12100 beats the competing Ryzen processors in its price bracket easily.

Adobe Premiere Pro, Photoshop, and Lightroom on Core i3-12100

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We've integrated the UL Benchmarks Procyon tests into our suite to replace the aging PCMark 10. This new benchmark runs complex Adobe Premiere Pro, Photoshop, and Lightroom workflows with the actual software, making for a great real-world test suite.

The Core i3-12100 is incredibly impressive as it takes the lead over all the Ryzen chips in Adobe Lightroom and Photoshop and trails only the vastly more expensive \$299 Ryzen 5 5600X in Adobe Premiere Pro.

Office and Productivity on Core i3-12100

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The Core i3-12100 provides snappy application load times, but the Ryzen 5 5600G and Ryzen 3 3300X are faster. Conversely, the 12100 beats the entire Ryzen roster in the Microsoft Office suite.

Compilation, Compression, AVX Benchmarks on Core i3-12100

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The Core i3-12100 easily beats the comparably-priced Ryzen 3 3300X in nearly all of these workloads, including exceedingly branchy code in the LLVM compilation workload and the massively parallel molecular dynamics simulation code in NAMD. That said, most of these types of workloads aren't well-suited for this class of chip, but we include them as a reference.

Intel Alder Lake Core i3-12100 Power Consumption and Efficiency

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The Intel Alder Lake chips still suck more power than AMD's Zen 3-powered Ryzen 5000 series chips, but pairing the Intel 7 process with the hybrid architecture brings big improvements, particularly in threaded work.

As we can see, the 12100 jockeys with the quad-core Comet Lake Core i3-10100, with the latter often consuming less power. But that comes at the cost of performance. As you can see in our renders-per-day measurements, the Core i3-12100 is more efficient, which comes as a byproduct of its higher performance within a similar power envelope.

The Zen 3-equipped Ryzen 5 5600G takes the crown as the most efficient chip in the test pool and often finds itself in the mix with the Core i3 models in the average power measurements. This six-core 12-thread chip also serves up quite a bit more performance than the i3's, so it takes a big lead in our renders-per-watt-per-day metrics.

However, the Core i3-12100 doesn't have a modern quad-core AMD competitor, and it takes the win against MD's only quad-core entrant, the Zen 2-powered Ryzen 3 3300X.

Image 1 of 4

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Here we take a slightly different look at power consumption by calculating the cumulative energy required to perform Blender and x264 and x265 HandBrake workloads, respectively. We plot this 'task energy' value in Kilojoules on the left side of the chart.

These workloads are comprised of a fixed amount of work, so we can plot the task energy against the time required to finish the job (bottom axis), thus generating a really useful power chart.

Bear in mind that faster compute times, and lower task energy requirements, are ideal. That means processors that fall the closest to the bottom left corner of the chart are best.

As you can see, Intel's chips have descended from the undesirable upper right of the chart down closer to the lower left hand, indicating improved efficiency. The gap between the Core i3-12100 and the Core i3-10100 illustrates just how much the Golden Cove architecture paired with the 'Intel 7' process has improved the company's standings in our efficiency measurements.

Budget Gaming Dominance

Like the rest of the Alder Lake family, the \$104 to \$130 Core i3-12100 comes to market with disruptive pricing as Intel continues to attempt to claw back market share from AMD at any cost.

Frankly, given that Intel has virtually no competition from AMD in the sub-\$200 market, it's surprising that Intel has delivered this much performance at such attractive pricing. Below, we have the geometric mean of our gaming test suite at 1080p and 1440p and a cumulative measure of performance in single- and multi-threaded applications. We conducted our gaming tests with an RTX 3090, so performance deltas will shrink with lesser cards and higher resolution and fidelity settings.

Image 1 of 6

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The Core i3-12100 eschews the hybrid Alder Lake design, instead going with 'only' four P-cores. That doesn't hold the chip back in gaming, though, and the Core i3-12100 now reigns as the fastest budget gaming CPU on the market.

The Core i3-12100 represents a massive leap forward for Intel in budget gaming performance, beating the Core i3-10100 by a whopping 29.5% at 1080p. The Core i5-11600K, last-gen's fastest Core i5, was surprisingly only 3.5% faster than the stock Core i3-12100, but at twice the price. The 12100 is also equally impressive compared to Intel's higher-end Alder Lake models, delivering 88% of the 12400's gaming performance but for 56% less cash.

AMD's chips can't compete, but that's because the company has completely abandoned the sub-\$250 market. The Core i3-12100 easily beat AMD's previous-gen Ryzen 5 3600 and 3600X, not to mention the venerable 3300X, by margins ranging from 9% to 19%, respectively, showing that the 12100 has the chops to take on AMD's entire sub-\$250 roster in gaming.

The Core i3-12100 is plenty impressive in lightly-threaded apps, too. In fact, the \$800 [Ryzen 9 5950X](#) is the only Ryzen chip that can match the Core i3-12100's single-threaded performance in our [CPU benchmarks hierarchy](#). You'll have to look to other Alder Lake chips to find faster performance in single-threaded work.

The Core i3-12100 is impressive in threaded productivity workloads for its price point, easily beating the price-comparable Ryzen 3 3300X in nearly every benchmark and establishing a commanding 30% lead over the Core i3-10100. Of course, AMD's more expensive six-core chips provide more performance in threaded work, but they should given their higher price tags.

You can also pick up the graphics-less \$104 Core i3-12100F for ~\$25 less than the full-featured model, but it provides the same level of performance. In addition, both the Core i3-12100 and 12100F also come with a capable Laminar RM1 cooler that delivers the full performance of the chip, making a sweet deal even sweeter for budget builders.

You should pair the Core i3-12100 with a B- or H-series motherboard, though the latter doesn't allow memory overclocking. That said, memory overclocking only imparted a 2.2% gain in 1080p gaming performance and no gain in most applications, so it doesn't make too much sense — especially for budget builds.

The Core i3-12100 also has a much more modern platform than AMD's AM4 ecosystem. Leading-edge DDR5 and PCIe 5.0 interfaces add too much cost for this class of chip, so look for DDR4 B660 and H610 motherboards for the best value. You won't need DDR5 memory to unlock the best gaming performance, and that's a good thing because DDR5's high pricing doesn't make sense for sub-\$250 chips.

Alder Lake has delivered a decisive blow to AMD's entire Ryzen 5000 family, and it doesn't look like we'll have a chance to see competitive new budget offerings until the [Zen 4 'Raphael' Ryzen 7000 chips](#) arrive later this year. If you're looking for a bit more performance in threaded workloads than you'll get with the 12100, the Core i5-12400 remains the undisputed value champ for an all-rounder chip, but you'll have to shell out an additional \$65.

Overall, the Core i3-12100 is a balanced chip that offers exceptional performance in gaming and lightly-threaded work in tandem with leading performance for its price point in multi-threaded workloads. If you're looking for an unprecedented amount of gaming and application performance from a \$105 to \$130 chip, the Core i3-12100 is the hands-down winner and takes a spot on our list of [Best CPUs for gaming](#).

Core i9-12900K and Core i5-12600K Test System Configurations

Intel Socket 1700 DDR4 (Z690)Core i3-12100, Core i5-12600K, Core i5-12400MSI Z690A WiFi DDR42x 8GB Trident Z Royal DDR4-3600 - Stock: DDR4-3200 14-14-14-36Intel Socket 1200 (Z590)Core i5-11600K, Core i3-10100MSI Z590 Godlike2x 8GB Trident Z Royal DDR4-3600 - Stock DDR4-3200/2933 Gear 1AMD Socket AM4 (X570)Ryzen 5 5600X, 5600G, 3600X, 3600, Ryzen 3 3300X

MSI MEG X570 Godlike2x 8GB Trident Z Royal DDR4-3600 - Stock: DDR4-3200 14-14-14-36All SystemsGigabyte GeForce RTX 3090 Eagle - Gaming and ProViz applicationsNvidia GeForce RTX 2080 Ti FE - Application tests

2TB Sabrent Rocket 4 Plus

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Silverstone ST1100-TIOpen BenchtableArctic MX-4 TIMWindows 11 ProCoolingCorsair H115i, Custom loop

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[Intel Core i3-12100 Review \(Tom's Hardware\)](#)

Document TOMHA00020220215ei2e00001

Intel Corporation; Patent Issued for Haptic gloves for virtual reality systems and methods of controlling the same (USPTO 11231781)

2,357 words

11 February 2022

Investment Weekly News

INVWK

2152

English

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2022 FEB 19 (VerticalNews) -- By a News Reporter-Staff News Editor at Investment Weekly News -- From Alexandria, Virginia, VerticalNews journalists report that a patent by the inventors Cao, Buddy (Shanghai, CN), Xiong, Yuan (Shanghai, CN), Yang, Wenlong (Shanghai, CN), Zhai, Feiyue (Shanghai, CN), filed on August 3, 2017, was published online on January 25, 2022.

The patent's assignee for patent number 11231781 is Intel Corporation (Santa Clara, California, United States).

News editors obtained the following quote from the background information supplied by the inventors: "A virtual reality (VR) environment is a digital representation of an environment (e.g., a real or imaginary environment). A VR environment can be created using audio content and/or visual content. The VR environment can be displayed or presented to a user in any number of ways, for example, via a computer monitor, a virtual reality head-mounted device, speakers, etc. Some VR environments simulate a user's presence in the environment such that the user can interact with the virtual reality environment. For example, a hand movement such as a user gesture indicative of picking up an object can be reflected in the VR environment.

"The figures are not to scale. Instead, to clarify multiple layers and regions, the thickness of the layers may be enlarged in the drawings. Wherever possible, the same reference numbers will be used throughout the drawing(s) and accompanying written description to refer to the same or like parts. As used in this patent, stating that any part (e.g., a layer, film, area, or plate) is in any way positioned on (e.g., positioned on, located on, disposed on, or formed on, etc.) another part, indicates that the referenced part is either in contact with the other part, or that the referenced part is above the other part with one or more intermediate part(s) located therebetween. Stating that any part is in contact with another part means that there is no intermediate part between the two parts."

As a supplement to the background information on this patent, VerticalNews correspondents also obtained the inventors' summary information for this patent: "A virtual reality (VR) environment is a digital representation of an environment (e.g., a real or imaginary environment). VR systems simulate a VR environment using audio content and/or visual content. The VR environment can be displayed in any number of ways, for example, via a computer monitor, a virtual reality head-mounted device, speakers, etc. Some VR environments simulate a user's presence in the environment such that the user can interact with the virtual reality environment. Some known VR systems enable a user to interact with the VR environment using a controller, such as a joystick, or a handheld device. However, while known VR systems can provide excellent visual and audio simulation, these known VR systems have not yet provided the sensation of touch.

"Disclosed herein are example methods, apparatus, systems, and articles of manufacture that provide the sense of touch to a user interacting with a VR environment. The example methods, apparatus, systems, and articles of manufacture may be used to provide touch sensation to a part of a user's body, such as the user's hand, for example, to simulate contact of the user's hand with an object in the VR environment. Disclosed herein are example haptic gloves that may be worn on the hands of a user. The example gloves may be worn while the user experiences the VR environment (e.g., via audio and/or visual content) and interacts with objects in the VR environment using the user's hands. The haptic gloves generate pressure on different sections of the user's hands to simulate the feeling of touching the objects in the VR environment. As such, the example gloves provide a realistic sense of touch.

"An example haptic glove disclosed herein includes an ultrasonic array (referred to herein as an ultrasonic array device or an ultrasonic array chip) disposed on an inner surface of the glove. The ultrasonic array device includes a plurality of ultrasonic generators that are activated to produce ultrasonic waves at substantially the same frequency (e.g., within a tolerance level). The ultrasonic generators create sound waves in the ultrasound level, which is higher than the upper audible limit of human hearing (~20 kilohertz (kHz)). The ultrasonic waves interact (known as sound interference) to generate a focused pressure point at a

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particular distance from the ultrasonic array device. The ultrasonic array device is positioned on the inside of the glove and separated from the skin of the hand of the user such that when the ultrasonic array device is activated, the focused pressure point is generated at or near the skin on the hand. For example, the ultrasonic array device may be disposed on an inside of the glove near the tip of the index finger. When the ultrasonic array device is activated, a focused pressure point is created at or near the skin on the tip of the index finger. This focused pressure point replicates the counter-force that would be applied by an object on the tip of the finger, thereby simulating the feeling of touching the object with the tip of the finger. The frequency and/or intensity of the ultrasonic array device can be changed to produce different pressures that can simulate different forces and/or textures or materials. For example, a higher intensity can be used to create a higher pressure, which may simulate a harder, more rigid surface (e.g., metal). Whereas a lower intensity can be used to create a lower pressure, which may simulate a softer surface (e.g., rubber).

"In some examples, the haptic glove includes a plurality of ultrasonic array devices disposed on the inner surface of the glove. The ultrasonic array devices are positioned at different locations around the inside of the glove and aimed at different sections of the hand. For example, a plurality of ultrasonic array devices may be disposed along the bottom side of the index finger section, along the sides of the index finger section, and/or along the top side of the index finger section. Likewise, ultrasonic array devices can be disposed along the other finger sections, along the palm side of the glove, the back of the hand side of the glove, etc. The ultrasonic array devices can be activated, independently or simultaneously, to simulate touch sensation on different parts of the hand, thus giving a 360° full range experience to the user's hand. The frequency and/or intensity of the different ultrasonic array devices can be changed to simulate different forces and/or textures.

"In some examples, the haptic glove includes a control unit that activates or triggers the ultrasonic array device(s). The control unit may be implemented as, for example, an integrated circuit, sometimes referred to as a chip. The control unit may be coupled to (e.g., sewn or embedded in) the material of the glove. In some examples, the control unit includes a power source (e.g., a battery) to power the ultrasonic array device(s) and/or other components of the control unit. In some examples, the control unit includes a haptic controller that determines when to activate one or more of the ultrasonic array device(s) and at what frequency and/or intensity. For example, the haptic controller may determine when the distance between a section of a user's hand (e.g., a tip of the index finger) and an object in the VR environment is zero or substantially zero. Then, the haptic controller may activate the ultrasonic array device(s) (e.g., by sending an instruction to an ultrasonic array device actuator) corresponding to that section of the glove, thereby creating a focused pressure point on the user's hand that simulates contact of the user's hand with the object in the VR environment."

The claims supplied by the inventors are:

"1. An apparatus comprising: a glove to be worn on a hand of a user; an array of ultrasonic generators on an inner surface of the glove; and control circuitry to activate the ultrasonic generators to provide haptic feedback on the hand of the user, the ultrasonic generators, when activated, to generate sound waves in air, the sound waves respectively having repeating patterns of compressions and refractions, the ultrasonic generators arranged such that, when the ultrasonic generators are activated, the compressions of the sound waves interact at a distance from the ultrasonic generators to create a focused pressure point, the ultrasonic generators to be spaced from the hand of the user by the distance such that that the focused pressure point is created at or near skin on the hand of the user.

"2. The apparatus of claim 1, further including a substrate, the ultrasonic generators on the substrate.

"3. The apparatus of claim 2, wherein the ultrasonic generators are in a pattern of rows and columns on the substrate.

"4. The apparatus of claim 2, where the substrate is curved.

"5. The apparatus of claim 1, wherein the control circuitry is to activate the ultrasonic generators at substantially a same frequency.

"6. The apparatus of claim 1, wherein the glove includes an outer layer and an inner layer, the inner layer to be in contact with the hand, the outer layer to be spaced apart from and surrounding the inner layer, the inner surface of the glove corresponding to an inner surface of the outer layer, and the ultrasonic generators coupled to the inner surface of the outer layer and facing the inner layer.

"7. The apparatus of claim 6, wherein the glove includes a spacer between the inner layer and the outer layer to separate the outer layer from the inner layer.

"8. The apparatus of claim 1, wherein the ultrasonic generators are in a finger section of the glove.

"9. The apparatus of claim 1, wherein the control circuitry is coupled to the glove near a back side of the hand.

PC/ Laptops

Lenovo IdeaCentre 5 17IAB7 Gaming PC Unveiled, to Be Powered by 12th Gen Intel Alder Lake CPUs: Report

Satvik Khare

426 words

7 February 2022

13:00

NDTV

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English

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Lenovo has reportedly launched an updated version of its gaming PC - Lenovo IdeaCentre 5 17IAB7. The new gaming PC is said to be powered by up to 12th Gen Intel Core i7 'Alder Lake' processors. For graphics processors, users have the choice of selecting from between a few AMD and Nvidia GPUs. The report also mentions that Lenovo IdeaCentre 5 17IAB7 supports DDR4 RAM as well as an M.2 SSD. Alongside the SSD, users can also install two 3.5-inch mechanical hard drives.

Lenovo IdeaCentre 5 17IAB7 availability

ITHome (in Chinese) [reported](#) that [Lenovo](#) recently updated its gaming PC, dubbed Lenovo IdeaCentre 5 17IAB7. However, the report did not mention the price at which it will retail. The gaming PC is said to be available to purchase sometime soon but its destined markets are not yet defined.

Lenovo IdeaCentre 5 17IAB7 specifications, features

Lenovo IdeaCentre 5 17IAB7 is reportedly powered by either 12th Gen [Alder Lake](#) Intel Core i5-12400 or Intel Core i7-12700 processors. The report also mentions that the gaming PC could get the F-variants of the aforementioned processors. As for the bundled GPUs, users are said to have an option to select from [AMD](#) Radeon RX 6400, AMD Radeon RX 6500 XT, [Nvidia](#) GeForce GTX 1650, Nvidia GeForce GTX 1660 Super, Nvidia GeForce RTX 3060, or Nvidia GeForce RTX 3060Ti.

Furthermore, the report mentions that Lenovo IdeaCentre 5 17IAB7 supports DDR4 RAM but doesn't specify the capacity. For storage, the gaming PC is said to get an M.2 SSD along with two 3.5-inch mechanical hard drives. The report also shared some images of the Lenovo gaming PC and they show that the PC may get a 3.5mm headphone jack, a USB 3.2 Gen 1 Type-C port, a USB 3.2 Gen 1 Type-A port, and a USB 3.2 Gen 2 Type-A port.

One of the images shows the side profile of Lenovo IdeaCentre 5 17IAB7 but it is hard to judge the remaining connectivity options on the gaming PC. It is said to measure 170x304x376mm and have a volume of 17 litres.

[Click here to view video](#) What are the best games of 2021? We discuss this on [Orbital](#), the Gadgets 360 podcast. Orbital is available on [Spotify](#), [Gaana](#), [JioSaavn](#), [Google Podcasts](#), [Apple Podcasts](#), [Amazon Music](#) and wherever you get your podcasts.

[Click here to view video](#)

Document NDTVIN0020220207ei270005I

Next-Gen Intel Arc Gaming GPUs To Utilize Multi-Chiplet Design As Hinted Within Patent

Hassan Mujtaba

837 words

7 February 2022

Wccfttech.com

NEWAGAE

English

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As we get close to the launch of Intel's first major discrete graphics family, the [latest patent](#) has revealed that the blue team is also working on its own multi-chiplet GPU design for the next-gen Arc gaming lineup.

Intel's Next-Gen Arc Gaming GPUs To Leverage From MCM Design, Hints New Patent

Intel is no stranger to MCM technology, in fact, their [Ponte Vecchio GPU](#) is a full-on Multi-chiplet design though it is being designed and built for the data center segment. However, a new patent titled 'Position-Based Rendering Apparatus and Method for Multi-Die/GPU Graphics Processing', which has been discovered by [Underfox](#), talks about how several GPUs (MCM) can work together for image rendering.

Patent: Position-based rendering apparatus and method for multi-die/GPU graphics processing - Intel

Intel MCM GPUs is coming...

More details: <https://t.co/GlkfwrXGzVpic.twitter.com/sXGt9nbJ1S>

— Underfox (@Underfox3) [February 3, 2022](#)

In the patent, Intel proposes a solution to GPU-based graphics rendering by integrating multiple silicon dies into a single cohesive unit (MCM) capable of running a single 3D context in order to address manufacturability, salinity, and power delivery problems. It is stated that doing this will require solutions for multiple classes of scalability and interconnect challenges in order to deliver the best performance on a single 3D application running multiple GPU dies. Some of the algos that are currently in use to solve these problems include AFR (Alternate Frame Rendering) and SFR (split frame rendering).

[Click to view image.](#)

The patent specifically talks about integrating tile-based checkerboard rendering, which is a very common rendering technique used on current GPUs, along with distributed GPU vertex position calculation to enable more efficient scaling on multi-die GPUs. The draw calls are partitioned in the form of puzzles and sent to the individual GPUs on the MCM chip so that they can execute POSH (Position-Only Shaders) to determine the full-frame visibility data for the draws for all dies.

Visibility data then indicate if the given primitive is present on each of the pre-defined set of screen space tiles (checkerboard). When the relevant visibility data is received, each GPU die will use it to limit the geometry work only to relevant primitives and perform pixel processing work for all the tiles of the checkerboard that it owns. These GPUs work really fast in working on the single-frame.

[Click to view image.](#)

Overall, with such a design, the next generation of Intel Arc gaming MCM GPUs can deliver scaled-up performance with more dies being added to the chip without facing the performance limitations of existing multi-die solutions such as AMD XDMA/Crossfire and NVIDIA SLI/NVLink. Intel states that these solutions are limited in terms of performance and while one should expect a perfect scaling of 200% performance with a 2-way and 400% with a 4-way configuration, the actual GPU performance is significantly lower, and in most cases, non-existent hence why most GPU makers aren't investing in these technologies any more.

* [Click to view image.](#)

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This would allow the GPU system to scale more efficiently. Now one would say that the 4-GPU/tile solution that is used as the example is official but that's the design that has been proposed and the final number of GPUs per tile could be vastly different.

* [Click to view image.](#)

* [Click to view image.](#)

As mentioned earlier, all GPU makers are investing in multi-GPU technologies with AMD already out with the world's first MCM solution in the form of their [Instinct MI200 series](#), NVIDIA releasing [Hopper this year with MCM](#). There are also the gaming consumer parts such as the [AMD RDNA 3 lineup](#) which is expected to utilize the same tech when it launches later this year. Intel themselves are working on several tile-based multi-chip CPU & GPU solutions such as their [Meteor Lake and Granite Rapids designs](#) and within 1 or 2 gens, we could see a proper MCM solution within the [Arc gaming graphics lineup](#).

Intel ARC Gaming GPU Lineup

GPU Family	Intel Xe-HPG	Intel Xe2-HPG
	Intel Xe3-HPG	Intel Xe Next
	Intel Xe Next Next	
GPU Products	ARC Alchemist GPUs	ARC Battlemage GPUs
	ARC Celestial GPUs	ARC Druid GPUs
	ARC E*** GPUs	
GPU Segment	Mainstream / High-End Gaming (Discrete)	Mainstream / High-End
	Gaming (Discrete)	Mainstream / High-End Gaming (Discrete)
	Gaming (Discrete)	Mainstream / High-End Gaming (Discrete)
GPU Gen	Gen 12	Gen 13?
	Gen 14?	Gen 15?
	Gen 16?	
Process Node	TSMC 6nm	TBA
	TBA	TBA
	TBA	
Specs / Design	512 EUs / 1 Tile / 1 GPU	TBA
	TBA	TBA
	TBA	
Memory Subsystem	GDDR6	TBA
	TBA	TBA
	TBA	
Launch	2022	2023?
	2024?	2025?
	2026?	

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Document NEWAGAE020220207ei2700001

Dying Light 2 Stay Human Gaming PC by Newegg available in Intel Sweepstakes!

Jason R. Wilson

603 words

5 February 2022

Wccftech.com

NEWAGAE

English

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Newegg reveals first look at the custom PC build based on the sequel to Dying Light, Dying Light 2 Stay Human. This custom PC is part of the current Intel sweepstakes, decked with the company's 12th Gen Core i9-12900K desktop processor.

Tech e-commerce retailer, Newegg, launches custom PC building capabilities with a one-of-a-kind gaming system to be awarded to one lucky winner through Intel.

Overlapping with today's highly anticipated launch of [Dying Light 2 Stay Human](#), published by [Techland](#), [Newegg](#) presents a one-of-a-kind custom-built gaming computer system that will be awarded through an Intel sweepstake. The aesthetically designed PC, powered by Intel's 12th Gen Core processor and designed after the game's looks with a replica of the street sign weapon inside the case, will be cited to one lucky contestant.

The Dying Light 2 Stay Human PC from Newegg contains an Intel Core i9-12900K Desktop Processor and other leading and popular components, creating a system with a retail value comparable to roughly \$5,000. Constructed by Newegg's BuildENIAC custom PC building department, the system's distinctive visual elements incorporate a metal street sign and a galvanized steel pipe inside the chassis—just a few of the aspects based on a weapon used to fight the oncoming horde of zombies in the game. Dying Light 2 Stay Human licensed artwork decorates the case's exterior employing laser engraving on glass and vinyl wrap on the surface.

[Click to view image.](#)

Consumers can enter the Dying Light 2 Stay Human + Intel sweepstakes by entering at <https://game.intel.com/giveaway/dyinglight2sweeps/nar/>. The contest is open to select the United States and Canadian residents 18 years old and older. The new sweepstakes start today and are held until March 17, 2022. (Additional terms and conditions about the sweepstakes are available on the site above).

We set out to create a one-of-a-kind gaming PC for Dying Light 2 Stay Human with components that deliver top-of-the-line performance to bring the game's zombies alive in stunning visuals and memorable audio to create immersive gameplay, while also offering truly unique hardware reflecting the savage weapons and rough combat in the game.

Our case designers and PC builders leveraged their expertise to tackle this challenge and the combined internal and external elements speak for themselves.

— Vishal Mane, Head of BuildENIAC for Newegg

Anna Kubica, Senior Brand Manager at Techland, has this to say about the custom gaming PC built by BuildENIAC:

This build just looks awesome! We are impressed by Newegg's work! The lucky sweepstakes winner will be engrossed in the game's suspenseful story, brutal combat and colorful graphics while having a really cool PC to play it.

Starting February 19, in addition to the current sweepstakes, consumers who purchase a qualifying 12th Gen Intel Core powered device from Newegg can receive a digital token to download Dying Light 2 Stay Human for PC as a gift with purchase. This offer is only available while supplies last, so users will want to hurry and pick up their Intel device and game soon. To find out more about the offer, check out [Newegg.com/DyingLight2](#).

Dying Light 2 Stay Human, published by [Techland](#), launches today on PC, PlayStation 4, PlayStation 5, Xbox One, and Xbox Series X|S. Nintendo Switch owners will see the release of the cloud version of the game later on in 2022.

[Click to view image.](#)

Document NEWAGAE020220205ei25000b7

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Dying Light 2 Stay Human Gaming PC Built by Newegg Available Through Intel Sweepstakes

1,136 words

4 February 2022

22:30

Business Wire

BWR

English

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Leading technology e-commerce retailer showcases custom PC building capabilities with one-of-a-kind system

Game keys available as gift with purchase for qualifying 12(th) generation Intel core powered devices

CITY OF INDUSTRY, Calif.--(BUSINESS WIRE)--February 04, 2022--

Coinciding with today's highly anticipated release of Dying Light 2 Stay Human, published by Techland, Newegg is introducing a one-of-a-kind custom-built gaming PC that will be given away through an Intel sweepstakes. The unique PC, powered by a 12th generation Intel(R) Core(TM) processor and themed for the game with a street sign weapon replica inside the case, will be rewarded to one lucky winner.

This press release features multimedia. View the full release here:

<https://www.businesswire.com/news/home/20220204005072/en/>

A custom one-of-a-kind Dying Light 2 Stay Human gaming PC built by Newegg is available through an Intel sweepstakes. The PC includes an Intel Core i9-12900K Desktop Processor along with other leading and highly sought components. The system's unique visual elements include a metal street sign and a galvanized steel pipe inside the case, elements based on a weapon used to fight zombies in the game. (Photo: Business Wire)

The Dying Light 2 Stay Human PC from Newegg includes an Intel Core i9-12900K Desktop Processor along with other leading and highly sought components, creating a system with an actual retail value equivalent to approximately \$5,000. Built by Newegg's BuildENIAC custom PC building division, the system's unique visual elements include a metal street sign and a galvanized steel pipe inside the case, elements that are based on a weapon used to fight zombies in the game. Dying Light 2 Stay Human licensed artwork adorns the case's exterior using laser engraving on glass and vinyl wrap on the surface.

Users can enter the Dying Light 2 Stay Human + Intel sweepstakes by filling out the form at <https://game.intel.com/giveaway/dyinglight2sweeps/nar/>. The promotion is open to select residents of the United States and Canada 18 years old and older. The sweepstakes is open starting today until March 17, 2022. (Additional sweepstakes terms and conditions are available at the link above.)

"We set out to create a one-of-a-kind gaming PC for Dying Light 2 Stay Human with components that deliver top-of-the-line performance to bring the game's zombies alive in stunning visuals and memorable audio to create immersive gameplay, while also offering truly unique hardware reflecting the savage weapons and rough combat in the game," said Vishal Mane, head of BuildENIAC. "Our case designers and PC builders leveraged their expertise to tackle this challenge and the combined internal and external elements speak for themselves."

"This build just looks awesome! We are impressed by Newegg's work!" said Anna Kubica, Senior Brand Manager at Techland. "The lucky sweepstakes winner will be engrossed in the game's suspenseful story, brutal combat and colorful graphics while having a really cool PC to play it."

In addition to the PC sweepstakes, starting Feb. 19, purchasers of a qualifying 12(th) Gen Intel(R) Core(TM) powered device from Newegg can receive a digital token to download Dying Light 2 Stay Human for PC as a free gift with purchase. Available while supplies last. For details and to purchase, see Newegg.com/DyingLight2.

Dying Light 2 Stay Human, published by Techland, launches today on PC, PlayStation 4, PlayStation 5, Xbox One, and Xbox Series X|S, followed by the release of the cloud version on Nintendo Switch in 2022.

About Dying Light 2 Stay Human

Dying Light 2 Stay Human is a story-driven open-world action role-playing game, a sequel to Dying Light, published in 2015, critically acclaimed Dying Light, which has been played by over 25 million people around the world. This time, players visit The City -- one of mankind's last strongholds in the fight against the virus. Developed parkour mechanics enable players to explore the vast open world and master tactical combat. This lost civilization, a world set in the Modern Dark Ages, requires creative approaches to finding items and crafting gear. Gameplay shifts during a day and night cycle, so players can dare plunder abandoned lairs of the infected at night and discover the dark secrets of those in power by day. Players must choose which side they want to take and write their own story.

About Newegg

Newegg Commerce, Inc. (NASDAQ: NEGG), headquartered in the City of Industry, Calif., within Los Angeles County, is a top global technology e-commerce retailer, serving customers throughout North America, Asia, Europe, Latin America and the Middle East. Founded in 2001, the company offers direct sales and an online marketplace for PC hardware, consumer electronics, gaming products, home appliances, automotive and a wide assortment of additional products. Newegg also offers products and services for businesses, including IT, marketing, logistics and other partner services. For more information: Newegg.com.

Follow Newegg on Twitter, Instagram, Facebook, YouTube, Discord and TikTok.

This news release includes "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Forward-looking statements give our current expectations, opinion, belief or forecasts of future events and performance. A statement identified by the use of forward-looking words including "will," "may," "expects," "projects," "anticipates," "plans," "believes," "estimate," "should," and certain of the other foregoing statements may be deemed forward-looking statements. Although Newegg believes that the expectations reflected in such forward-looking statements are reasonable, these statements involve risks and uncertainties that may cause actual future activities and results to be materially different from those suggested or described in this news release. Investors are cautioned that any forward-looking statements are not guarantees of future performance and actual results or developments may differ materially from those projected. The forward-looking statements in this press release are made as of the date hereof. The Company takes no obligation to update or correct its own forward-looking statements, except as required by law, or those prepared by third parties that are not paid for by the Company. The Company's SEC filings are available at <http://www.sec.gov>.

NOTE: For photos of the Dying Light 2 Stay Human PC from Newegg, access this link:

<https://newegg.io/DyingLight2PC>

View source version on businesswire.com: <https://www.businesswire.com/news/home/20220204005072/en/>

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SOURCE: Newegg

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Document BWR0000020220204ei240008I

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Global Cloud Gaming Market (2021 to 2027) - Featuring IBM, Microsoft and Intel Among Others - ResearchAndMarkets.com

850 words

3 February 2022

23:58

Business Wire

BWR

English

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DUBLIN--(BUSINESS WIRE)--February 03, 2022--

The "Global Cloud Gaming Market By Offering, By Device Type, By Solution, By Regional Outlook, Industry Analysis Report and Forecast, 2021 - 2027" report has been added to ResearchAndMarkets.com's offering.

The Global Cloud Gaming Market size is expected to reach \$14.01 billion by 2027, rising at a market growth of 64.1% CAGR during the forecast period.

Key Market Players

--

IBM Corporation

-- Activision Blizzard, Inc.

-- Advanced Micro Devices, Inc.

-- Microsoft Corporation

-- Amazon.com, Inc.

-- Intel Corporation

-- Meta Platforms, Inc.

-- NVIDIA Corporation

-- Sony Corporation

-- Tencent Holdings Ltd.

Cloud gaming refers to a form of gaming that is based on cloud technology. It is designed in a way that allows the users to operate and play a variety of games on remote servers that streams the whole game on the device with which the cloud is connected to. Cloud gaming technology, unlike conventional gaming procedures that runs on the local disk spaces of the gaming device, works as an integration into the cloud technology with lesser requirement of user's device storage. In other words, Cloud gaming is also called gaming-as-a-service.

For using cloud gaming technology, the user needs a cloud gaming platform which is provided by the developer organization of the game with a subscription pack. These platforms run in a similar fashion like remote desktops and video-on-demand services.

Market Growth Factors:

Minimized restrictions for high-end specifications and freedom for cross-platform gaming

A lot of games across the gaming industry demand high-end PCs with ultra-advanced specifications and external sources like graphic cards and additional RAM, which deprives the gamers, without access to these resources, from the gaming experiences. Cloud gaming allows the users to play a wide range of games on a variety of compatible devices without any restrictions of high-end specifications as well as other external resources.

Due to the advent of cloud gaming services in the gaming industry, gamers are now enabled to play games with intensive graphics smoothly on their low-end devices with lesser specifications. The operation of cloud games runs on the capabilities of network connections. The high-scale infrastructure developed intending to smoothen the cloud gaming experience, allows the user to run graphic-intense games on their low-spec devices like mobile phones, laptops, tablets, gaming consoles, and other devices.

Increasing trend of gaming communities

With the increasing interest and attention of people toward rising trend of gaming communities is one of the reason that is encouraging cloud gaming. While playing on cloud gaming platforms, the developers allow the gamers to form a new gaming community or join an existing one on the developer provided cloud gaming platform. The gaming community allow the gamers to interact with various gamers across the world respective to the language and preferences selected by the user. Gaming communities also enable the user to join clans and crews so they can play with few particular gamers across the platform.

Market Restraining Factor:

Addiction to cloud games due to increased access

The diffusion of cloud gaming trend is constantly rising due to the increased access to these games, that too in a very low prices. More people are now capable of reaching cloud games and platforms. With the rising number of cloud game players across the world, the problem of addiction to these games occurs. People have a complete remote access of these games that may increase the vulnerability towards the addiction of these games which can put negative impacts on their mental health. In addition, addiction to these games is expected to disrupt the productivity along with mental well-being.

Key Topics Covered:

Chapter 1. Market Scope & Methodology

Chapter 2. Market Overview

2.1 Introduction

2.1.1 Overview

2.1.1.1 Market Composition and Scenario

2.2 Key Factors Impacting the Market

2.2.1 Market Drivers

2.2.2 Market Restraints

Chapter 3. Competition Analysis - Global

3.1 Cardinal Matrix

3.2 Recent Industry Wide Strategic Developments

3.2.1 Partnerships, Collaborations and Agreements

3.2.2 Product Launches and Product Expansions

3.2.3 Acquisition and Mergers

3.3 Top Winning Strategies

3.3.1 Key Leading Strategies: Percentage Distribution (2017-2021)

3.3.2 Key Strategic Move: (Partnerships, Collaborations and Agreements: 2019, May - 2021, Oct) Leading Players

Chapter 4. Global Cloud Gaming Market by Offering

Chapter 5. Global Cloud Gaming Market by Device Type

Chapter 6. Global Cloud Gaming Market by Solution

Chapter 7. Global Cloud Gaming Market by Region

Chapter 8. Company Profiles

For more information about this report visit <https://www.researchandmarkets.com/r/nb5k9t>.

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Document BWR0000020220203ei23000fr



MSI Gaming Laptops with up to 12th-gen Intel Core H-Series processors and Nvidia GeForce RTX 3080 Ti Graphics arrive in India

G. S. Vasani

930 words

3 February 2022

Digit

HTDIGI

English

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India, Feb. 3 -- MSI has brought laptops with Intel chips that are fresh from the oven. Some of them are refreshed with up to Intel's 12th-gen Core i9 H-series processors. The graphics processors in them go up to GeForce RTX 3080Ti. Among the list of goodies, you also get features like CPU Optimizer, Rapid Core Scaling, and Battery Boost 2.0. While the lattermost setting is meant for improved power efficiency, MSI claims the laptops would offer up to 40% gain in performance metrics too. And to spice things up, the company has slapped on the "Meta-ready" logo, which we presume means hardware-equipped for Metaverse. Let's see other details about these newcomers now.

MSI's 12th-gen Intel laptops: Specs

MSI Stealth series

MSI Stealth GS77-series laptops come with 17.3-inch FHD@360Hz, QHD@240Hz, and UHD@120Hz displays, Dynaudio-designed two speakers plus four woofers setup, up to 12th-gen Intel Core i9-12900H processor, up to 16GB DDR6 Nvidia GeForce RTX 3080 Ti graphics, and up to 64GB of GDDR5 RAM. In terms of connectivity options, you get a USB 3.2 Gen 2 Type-C port, a Thunderbolt 4 port, and two USB 3.2 Gen 2 Type-A ones.

MSI Stealth GS66, meanwhile, is available with a 15.3-inch UHD/QHD/FHD screen, Duo Wave speaker system, a thunderbolt 4 port, USB Type-C port for charging, two USB 3.2 Gen 2 Type-C ports, and an HDMI port. The compute and graphics processors as well as memory options are the same as the GS77.

MSI Raider series

MSI Raider GE76 can be bought in 17-inch screens and GE66 in 15.6-inch ones. They both will be out in varied resolution and refresh rate options. Other common specs among them include up to 12th-gen Intel Core i9 processor, up to Nvidia GeForce RTX 3080 Ti graphics, up to 64GB of DDR5 RAM, Duo Wave speakers from Dynaudio, a USB 3.2 Gen 2 Type-C port, a Thunderbolt 4 port, and two USB 3.2 Gen 2 Type-A ports.

MSI Vector series

MSI Vector GP76 and MSI Vector GP66 series will be available with 17.3-inch QHD@240Hz IPS display and 15.6-inch QHD/FHD screens respectively. Internally, they are housing up to Intel 12th-gen Core i7 processor, up to 8GB GDDR6 Nvidia GeForce RTX 3080 GPU, SteelSeries RGB gaming keyboard, two speakers with Nahimic 3 Audio Enhancement, a USB 3.2 Gen 2 Type-C port, a USB 3.2 Gen 1 Type-A port, an HDMI port, Bluetooth 5.2, and WiFi 6E.

MSI Pulse series

MSI Pulse GL76 has got a 17.3-inch FHD 360Hz IPS screen while Pulse GL66 has a 15.6-inch FHD+ 165Hz IPS screen. Other than this difference, they have both got up to 12th-gen Intel Core i7 CPU along with 6GB DDR6 Nvidia GeForce RTX 3060 GPU, up to 64GB RAM, two stereo speaker units, RGB backlight gaming keyboard, USB 3.2 Gen 1 Type-C ports, USB 3.2 Gen 1 Type-A ports, USB 2.0 Type-A ports, HDMI, Bluetooth 5.2, and WiFi 6.

MSI Crosshair 15 series

MSI Crosshair 15 has got a regular edition and special Crosshair 15 Rainbow Six Extraction variant and both of them are armed with 15.6-inch QHD 165Hz IPS display, Spectrum Backlight keyboards, up to 12th Gen Intel Core i7 processors, up to 64GB of RAM, Nahimic 3 Audio Enhancer backed dual stereo speakers, and connectivity options akin to the other models. The difference is in their GPUs, i.e., an 8GB GDDR6 Nvidia GeForce RTX 3060 GPU on the vanilla edition and RTX 3070 on the Rainbow Six Extraction Edition.

MSI Katana series

MSI Katana GF76 sports a 17.3-inch FHD 144Hz IPS display, while the Katana GF66 laptops flaunt 15.6-inch FHD IPS displays with either 144Hz or 240Hz refresh rate option. Under the hood, there will be up to a 12th-gen Intel Core i7-12700H processor, up to 64GB RAM, and similar audio and connectivity solutions as the MSI Pulse series laptops.

MSI's 12th-gen Intel laptops: Price and Availability

These are the price of the top-end model of each of these series.

Stealth GS77 12UHS: Rs. 4,81,990

Stealth GS77 12UGS: Rs. 3,35,990

Stealth GS66 12UGS: Rs. 3,30,990

Raider GE76 12UHS : Rs. 4,81,990

Raider GE76 12UGS: Rs. 2,85,990

Raider GE66 12UHS: Rs. 4,47,990

Raider GE66 12UGS: Rs. 2,79,990

Vector GP76 12UH: Rs. 2,46,990

Vector GP76 12UGS: Rs. 2,23,990

Vector GP66 12UH: Rs. 2,40,990

Vector GP66 12UGS: Rs. 2,12,990

Pulse GL76 12UEK: Rs. 1,62,990

Pulse GL66 12UEK: Rs. 1,56,990

Crosshair 15 B12UEZ: Rs. 1,56,990

Crosshair 15 Rainbow Six Extraction Edition B12UGZ: Rs. 1,90,990

Katana GF76 12UE: Rs. 1,51,990

Katana GF76 12UD: Rs. 1,28,990

Katana GF66 12UE: Rs. 1,45,990

Katana GF66 12UD: Rs. 1,23,990

Katana GF66 12UC: Rs. 1,11,990

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Document HTDIGI0020220203ei2300031

GADGETS NEWS

MSI launched new Metaverse ready gaming laptop lineup powered by 12th-generation Intel processors, Nvidia RTX 30 series graphics in India: Price, features and other details

1,108 words

3 February 2022

The Times of India

TOI

English

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MSI, the company known for making gaming, creator and business laptops has expanded its gaming laptop portfolio in India. The company has announced the 2022 lineup of gaming laptops under its Stealth, Vector, Katana, Crosshair and Pulse series that it showcased during the CES 2022 earlier this year. The new laptop lineup comes powered with the latest 12th-generation Intel Core H series processors and Nvidia RTX 30 series graphics card. The company also says that this new laptop lineup is Meta-ready and capable of offering Metaverse-compatible performance. MSI new gaming laptop lineup: Price and availabilityThe new 12th-generation gaming laptops from the company starts atRs 1,11,990 and it goes up toRs 4,81,990. The laptops will be available starting February 1 via MSI authorised online and offline retail stores across the country. MSI is also offering \$50 steam wallet code on the purchase of 12th-generation gaming laptops.

Here's the pricing of all the laptops MSI has announced today.

Model	CPU + GPU	MRP
Stealth GS77 12UGS	12th Gen Intel Core i9 (RTX3080Ti, GDDR6 16GB)	Rs 4,81,990.00
Stealth GS66 12UGS	12th Gen Intel Core i7 (RTX3070Ti, GDDR6 8GB)	Rs 3,35,990.00
Stealth GS66 12UGS	12th Gen Intel Core i9 (RTX3070Ti, GDDR6 8GB)	Rs 3,30,990.00
Raider GE76 12UHS	12th Gen Intel Core i9 (RTX3080Ti, GDDR6 16GB)	Rs 4,81,990.00
Raider GE66 12UHS	12th Gen Intel Core i7 (RTX3070Ti, GDDR6 8GB)	Rs 2,85,990.00
Raider GE66 12UHS	12th Gen Intel Core i9 (RTX3080Ti, GDDR6 16GB)	Rs 4,47,990.00
Vector GP76 12UH	12th Gen Intel Core i7 (RTX3080, GDDR6 8GB)	Rs 2,79,990.00
Vector GP66 12UGS	12th Gen Intel Core i7 (RTX3070Ti, GDDR6 8GB)	Rs 2,23,990.00
Vector GP66 12UGS	12th Gen Intel Core i9 (RTX3080, GDDR6 8GB)	Rs 2,40,990.00
Pulse GL76 12UEK	12th Gen Intel Core i7 (RTX3060, GDDR6 6GB)	Rs 1,62,990.00
Pulse GL66 12UEK	12th Gen Intel Core i7 (RTX3060, GDDR6 6GB)	Rs 1,56,990.00
Crosshair 15 B12UEZ	12th Gen Intel Core i7 (RTX3060, GDDR6 6GB)	Rs 1,56,990.00
Rainbow Six Extraction Edition B12UGZ	12th Gen Intel Core i7 (RTX3070, GDDR6 8GB)	Rs 1,90,990.00
Katana GF76 12UE	12th Gen Intel Core i7 (RTX3060, GDDR6 6GB)	Rs 1,51,990.00

MSI Stealth GS77/G66 specifications

Operating System: Windows 11 Home / Windows 11 Pro (MSI recommends Windows 11 Pro for business.)

Memory: DDR5-4800, 2 slots, up to 64GB

Display: 17.3" UHD (3840x2160), 120 Hz Refresh Rate, 100% Adobe RGB (Typical), IPS-Level panel (Optional) 17.3" QHD (2560x1440), 240 Hz Refresh Rate, 100% DCI-P3 (Typical), IPS-Level panel 17.3" Full HD (1920x1080), 360 Hz Refresh Rate, IPS-Level panel 15.6" UHD (3840x2160), 100% Adobe RGB (Typical), IPS-Level panel (Optional) 15.6" QHD (2560x1440), 240 Hz Refresh Rate, 100% DCI-P3 (Typical), IPS-Level panel 15.6" Full HD (1920x1080), 360 Hz Refresh Rate, IPS-Level panel

Graphics: Up to NVIDIA GeForce RTX 3080 Ti

Laptop GPU: 16GB GDDR6

Keyboard: Per-Key RGB gaming keyboard by SteelSeries

Audio: 2 x 2W Speakers and 4 x 2W Woofers designed by Dynaudio system 1 x Audio combo jack Nahimic 3 Audio Enhancer Hi-Res Audio ready The Duo Wave speaker designed by Dynaudio system (2x 2W speakers) 1 x Audio combo jack Nahimic 3 Audio Enhancer Hi-Res Audio ready

USB Port: 1 x Thunderbolt 4 / DP / USB Type-C (w/ PD Charging), 1 x USB 3.2 Gen2 Type-C / DP, 2 x USB 3.2 Gen2 Type-A, 1 x Thunderbolt 4 / DP / USB Type-C (w/ PD Charging), 2 x USB 3.2 Gen2 Type-C / DP, 2 x USB 3.2 Gen2 Type-A

Card Reader: 1 x SD Express Memory Card Reader

Video Output: 1 x Thunderbolt 4 / DP / USB Type-C (w/ PD Charging), 1 x USB 3.2 Gen2 Type-C / DP, 1 x HDMI (8K@ 60Hz / 4K@ 120Hz) 1 x Thunderbolt 4 / DP / USB Type-C (w/ PD Charging), 2 x USB 3.2 Gen2 Type-C / DP, 1 x HDMI (8K@ 60Hz / 4K@ 120Hz)

Communication: Intel Killer Ethernet E3100G (up to 2.5 GbE) Intel Killer Wi-Fi 6E AX1675, Bluetooth v5.2

Webcam / Microphone: IR FHD type (30fps@1080p) / Quadruple Microphone

Sensor: Fingerprint Reader / Ambient Light Sensor

Battery: 4-Cell, Li-Polymer, 99.9Whr

Power Adapter: 240W Slim adapter

Dimension: 397.6 (W) x 283.5 (D) x 20.1-20.8 (H) mm

Weight: 2.8 Kg

Model Name: Raider GE76 / Raider GE66

Processor: Up to latest 12th Gen Intel Core i9 Processor

Operating System: Windows 11 Home / Windows 11 Pro (MSI recommends Windows 11 Pro for business.)

Memory: DDR5-4800, 2 slots, up to 64GB

Display: 17.3" UHD (3840x2160), 120 Hz Refresh Rate, 100% Adobe RGB (Typical), IPS-Level panel (Optional) 17.3" QHD (2560x1440), 240 Hz Refresh Rate, 100% DCI-P3 (Typical), IPS-Level panel 17.3" Full HD (1920x1080), 360 Hz Refresh Rate, IPS-Level panel 15.6" UHD (3840x2160), 100% Adobe RGB (Typical),

IPS-Level panel(Optional)15.6" QHD (2560x1440), 240 Hz Refresh Rate, 100% DCI-P3(Typical), IPS-Level panel15.6" Full HD (1920x1080), 360 Hz Refresh Rate, IPS-Level panelGraphicsUp to NVIDIA GeForce RTX 3080 Ti Laptop GPUKeyboardPer-Key RGB gaming keyboard by SteelSeriesAudioThe Duo Wave Woofers + Speakers designed by Dynaudio system(2 x 1W Speakers + 2 x 2W Woofers)1 x Audio combo jackNahimic 3 Audio EnhanceHi-Res Audio readyThe Duo Wave speakers design by Dynaudio system (2x 2W speakers)1 x Audio combo jackNahimic 3 Audio EnhancerHi-Res Audio readyUSB Ports1 x Thunderbolt 4 / DP/ USB Type-C,1 x USB 3.2 Gen2 Type-C / DP1 x USB 3.2 Gen2 Type-A, 2 x USB 3.2 Gen 1 Type-ACard Reader1 x SD Express Memory Card ReaderVideo Output1 x Thunderbolt 4 / DP/ USB Type-C, 1 x Mini DisplayPort1 x USB 3.2 Gen2 Type-C / DP1 x HDMI (8K@ 60Hz / 4K@ 120Hz)CommunicationIntel Killer Ethernet E3100G (up to 2.5 GbE)Intel Killer Wi-Fi 6E AX1675, Bluetooth v5.2WebcamFHD type (30fps@1080p)Battery4-Cell, Li-Polymer, 99.9WhrPower Adapter330W(12UHS) / 280W (12UH / 12UGS)280WDimension397 (W) x 284 (D) x 25.9 (H) mm358 (W) x 267 (D) x 23.4 (H) mmWeight2.9 Kg2.38 Kg

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Document TOI0000020220202ei2300059



CE Noticias Financieras English

Giants Gaming confirms its participation in VRL Spain: Rising MediaMarkt and Intel

509 words

27 January 2022

CE NoticiasFinancieras

NFINCE

English

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Giants will be present in the VRL Spain: Rising MediaMarkt and Intel, the new official VALORANT competition in Spain organized by the Liga de Videojuegos Profesional (LVP). After the experience of the Rising Series in 2021, the Giants roster is confirmed as one of the participants and starts with the goal of obtaining the best possible results: victory. In addition to competing in the Valorant Champions Tour (VCT), which is the international circuit, the Malaga club will do the same in this national league, which will bring together ten elite contenders who are also part of the aforementioned VCT. February 15 is the date marked in red for the start of the VRL Spain: Rising Mediamarkt and Intel. The Giants quintet was presented at the beginning of the month. Leading the group is Adolfo 'Fit1nho' Gallego, one of the most relevant Spanish professionals and one of the most important duelists in Europe.

He was joined by Fabián 'Quick' Pereira, Ondřej 'MONSTEERR' Petr, Batuhan 'russz' Malgaç and Adam 'Jesse' Tvrtić. On the technical side is coach Tanishq 'Tanizhq' Sabharwal. "In every competition we play, Giants must be contenders, and that's how we believe we should approach this competition. We know that there are very tough rivals and that everyone will be looking for the same thing, which is to win, but we have a quality roster with the qualities to try to achieve great things", says David Alonso 'Lozark', Giants' sporting director. Fit1nho highlights: "I think our presence is important, as we achieved good goals last year and in 2022 it will not be less. We will constantly evolve and improve. We are a winning club and our expectations are to be champion of the VRL Spain. But I think all the teams have a very good level. It's going to be a complicated league, I think there are some teams that have a higher level than people expect". This competition was born after last year's Rising Series. Giants won one of the four stops in that circuit and was one of the outstanding teams. Like the League of Legends Super League, VRL Spain will be composed of ten professional teams and will have two seasons each year: spring and summer. The VRL Spain: Rising MediaMarkt and Intel will be launched in mid-February and can be followed every Tuesday, Wednesday and Thursday (17:00 CEST) on LVP's Twitch channel. The ten teams that will make up the first edition of the Rising are incorporated through two ways: nine teams have been selected by LVP from its professional ecosystem, and the tenth will be chosen at the end of January through a qualifying tournament. Thus, together with the giants; Movistar Riders, UCAM Esports, Team Queso, Finetwork KOI, BISON ECLUB, Team Heretics, Rebels Gaming, Arctic Gaming and the team that comes from the closed qualifier will form the table of participants that will make up the first season in history.

Document NFINCE0020220127ei1r007sp

Artificial Intelligence In Gaming Market to Get a New Boost | Intel, Salesforce, Brighterion

837 words

27 January 2022

iCrowdNewswire

ICROWDN

English

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The Latest research study released by HTF MI "Worldwide Artificial Intelligence In Gaming Market" with 100+ pages of analysis on business Strategy taken up by key and emerging industry players and delivers know how of the current market development, landscape, technologies, drivers, opportunities, market viewpoint and status. Understanding the segments helps in identifying the importance of different factors that aid the market growth. Some of the Major Companies covered in this Research are Ubisoft, EA, Tencent, Sony, Microsoft, Playtika, Activision Blizzard, NetEase, Nintendo, Square Enix, Konami, Take-Two Interactive, NCSoft, Google, Baidu, IBM, SAP, Intel, Salesforce, Brighterion & KITT.AI etc.

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<https://www.htfmarketreport.com/sample-report/3563616-worldwide-artificial-intelligence-in-gaming-market>

Browse market information, tables and figures extent in-depth TOC on "Worldwide Artificial Intelligence In Gaming Market by Application (PC Gaming, TV Gaming & Smartphone & Tablet Gaming), by Product Type (On-Premise & Cloud-based), Business scope, Manufacturing and Outlook – Estimate to 2027".

for more information or any query mail at sales@htfmarketreport.com

At last, all parts of the Worldwide Artificial Intelligence In Gaming Market are quantitatively also subjectively valued to think about the Global just as regional market equally. This market study presents basic data and true figures about the market giving a deep analysis of this market based on market trends, market drivers, constraints and its future prospects. The report supplies the worldwide monetary challenge with the help of Porter's Five Forces Analysis and SWOT Analysis.

If you have any Enquiry please click here @:

<https://www.htfmarketreport.com/enquiry-before-buy/3563616-worldwide-artificial-intelligence-in-gaming-market>

Customization of the Report: The report can be customized as per your needs for added data up to 3 businesses or countries or 2 analyst hours.

On the basis of report- titled segments and sub-segment of the market are highlighted below:

Worldwide Artificial Intelligence In Gaming Market By Application/End-User (Value and Volume from 2022 to 2027) : PC Gaming, TV Gaming & Smartphone & Tablet Gaming

Market By Type (Value and Volume from 2022 to 2027) : On-Premise & Cloud-based

Worldwide Artificial Intelligence In Gaming Market by Key Players: Ubisoft, EA, Tencent, Sony, Microsoft, Playtika, Activision Blizzard, NetEase, Nintendo, Square Enix, Konami, Take-Two Interactive, NCSoft, Google, Baidu, IBM, SAP, Intel, Salesforce, Brighterion & KITT.AI

Geographically, this report is segmented into some key Regions, with manufacture, depletion, revenue (million USD), and market share and growth rate of Worldwide Artificial Intelligence In Gaming in these regions, from 2015 to 2027 (forecast), covering China, USA, Europe, Japan, Korea, India, Southeast Asia & South America and its Share (%) and CAGR for the forecasted period 2022 to 2027.

Informational Takeaways from the Market Study: The report Worldwide Artificial Intelligence In Gaming matches the completely examined and evaluated data of the noticeable companies and their situation in the market considering impact of Coronavirus. The measured tools including SWOT analysis, Porter's five powers analysis, and assumption return debt were utilized while separating the improvement of the key players performing in the market.

Key Development's in the Market: This segment of the Worldwide Artificial Intelligence In Gaming report fuses the major developments of the market that contains confirmations, composed endeavors, R&D, new thing dispatch, joint endeavours, and relationship of driving members working in the market.

To get this report buy full copy @: <https://www.htfmarketreport.com/buy-now?format=1&report=3563616>

Some of the important question for stakeholders and business professional for expanding their position in the Worldwide Artificial Intelligence In Gaming Market :

Q 1. Which Region offers the most rewarding open doors for the market Ahead of 2022?

Q 2. What are the business threats and Impact of latest scenario Over the market Growth and Estimation?

Q 3. What are probably the most encouraging, high-development scenarios for Worldwide Artificial Intelligence In Gaming movement showcase by applications, types and regions?

Q 4.What segments grab most noteworthy attention in Worldwide Artificial Intelligence In Gaming Market in 2022 and beyond?

Q 5. Who are the significant players confronting and developing in Worldwide Artificial Intelligence In Gaming Market?

For More Information Read Table of Content @:

<https://www.htfmarketreport.com/reports/3563616-worldwide-artificial-intelligence-in-gaming-market>

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Chapter 11 Business / Industry Chain (Value & Supply Chain Analysis)

Chapter 12 Conclusions & Appendix

Thanks for reading this article; you can also get individual chapter wise section or region wise report version like North America, LATAM, Europe or Southeast Asia.

Document ICROWDN020220127ei1r0005n

MSI Launches MSIOlogy: MSI Gameverse Virtual Event to Unveil the Latest 12th Gen Intel® H series Gaming and Content Creation Laptops

1,470 words

26 January 2022

22:42

InPR

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English

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[DATELINE] (TAIPEI, TAIWAN) MSI, a world-leading gaming and business computing brand, has launched a virtual event, MSIOlogy: Gameverse, announcing their latest gaming and content creation laptops. Features include the latest 12 gen Intel® H series processors, up to NVIDIA® GeForce RTX™ 3080 Ti Laptop GPU, and MSI-exclusive thermal solutions, which boosts performance to the whole new level. MSI not only just released the highest performance laptop in the market but also delivered a series of Meta-Ready laptops to connect users to the Metaverse.

[MSIOlogy: Gameverse, announcing their latest gaming and content creation laptops]

MSI Gameverse: Your key to Metaverse

MSI always focuses on the combination of aesthetic design, extreme performance, and user-friendly experience. Now, MSI unveils the vision of MSI Gameverse. No matter if you are content creators or a VR user, the latest MSI laptops are a bridge to connect people to the Metaverse. Derek Chen, MSI Notebook Worldwide Sales & Marketing Director, said that "MSI has carried out the booming demands of the Metaverse, creating a series of Meta-ready laptops."

[MSI Gameverse: Your key to Metaverse]

Phase-Change Liquid Metal Pad: The secret to MSI's High Performance*

MSI proudly announces the brand-new exclusive cooling technology, "Phase-Change Liquid Metal Pad." When the computer's heat reaches 58° Celsius (136° F), the Phase-Change Liquid Metal Pad melts and fills the space between the CPU and the thermal block. This phase transition makes the heat transfer more efficient than traditional thermal pastes and more reliable than liquid metal solutions. With this new innovative cooling technology, the overall performance increases up to 10%.

[MSI Gameverse: Your key to Metaverse]

A Gentle Combination between Business and Gaming Laptop: Stealth GS77

MSI announces their new flagship gaming laptop, Stealth GS77 - winner of the latest 2022 CES Innovation Awards. The Stealth GS77 comes with a brand new design that shifts the hinge towards the middle and uses more robust materials, resulting in two times the durability compared to previous models. Walking the line between work and gaming, the Stealth GS77 packs in additional features for business use. It has enlarged the trackpad by 50% and provides 8% larger keycaps for an even smoother experience. The Stealth GS77 also comes with a physical camera lock to add an additional layer of privacy.

[Stealth GS77]

The MSI Stealth GS77 is equipped with the latest 12th gen CPU and the Nvidia GeForce RTX 3080 Ti Laptop GPU. "The power of the Stealth GS is not something to ignore. It can race through your day and then power your gaming during the night," said by Marc Chen, MSI Notebook Director of Product Management.

[Stealth GS77]

"I could use this as my workstation for my video editing, take it on the road with me for a business meeting, and then at the end of the day, play some games. It does everything I need," said Tom Honeyands, host of The Tech Chap.

[Stealth GS77]

Raider GE series, the Performance Beast

"When we talk about performance, the Raider GE sits right on top of the gaming industry," said Eddie Chen, MSI Notebook Senior Product Marketing. The MSI Raider GE series not only provides the latest 12th gen i9 CPU and Nvidia GeForce RTX 3080 Ti Laptop GPU, but also equips MSI exclusive OverBoost technology, which delivers up to 220 watts in total. That is 13% more compared to other brands.

[Raider GE series]

[Raider GE series]

[Raider GE series]

"Some laptops may feel that they are chasing the tail of a desktop PC in performance, but with the Raider GE, they stand equal," said Eddie.

[Raider GE series]

Ubisoft Collaboration: Crosshair 15 Rainbow Six Extraction Edition

MSI proudly announced its collaboration with Ubisoft on the new Crosshair 15 Rainbow Six Extraction Edition. Referencing the palette from the game, it comes with a brand new eye-catching design featuring yellow, green and blue colors as if users are entering the game itself.

[Ubisoft Collaboration: Crosshair 15 Rainbow Six Extraction Edition]

Crosshair 15 Rainbow Six Extraction Edition comes with brand new eye-catching design

Designed for FPS gamers, the MSI Crosshair 15 is armed with up to QHD 240Hz display and up to Nvidia RTX 3070Ti GPU, which boosts up to 140 watts TGP, nearly a 50% increase in extra power than average laptops with the same specifications. Most importantly, the new Crosshair 15 is also a "Meta Ready" laptop.

[FPS gamers]

Marc Desfosses, the lead programmer of Rainbow Six Extraction said that the latest MSI Crosshair 15 Rainbow Six Extraction Edition is "a great union of Ubisoft and MSI. The powerful performance helps you immerse yourself in and dominate games. It's power that you don't want to miss out on."

[FPS gamers]

Intel is also proud to showcase its new platform during the MSI launch event. Greg Cnossen, Intel Global Consumer Sales General Manager, pointed out that the new architecture of 12th Gen CPUs have offered a mix of performance and efficiency, with up to 14 cores available in the H series CPU. "Combine our brand new 12th Gen CPU along with the thermal performance and experienced design capabilities from MSI, and you can see why we were so excited for MSI next-generation gaming and creator laptops."

[FPS gamers]

Tech Meets Aesthetic with the New MSI Creator 17 and Creator Z16P

MSI also announced their new Content Creation Series laptop at the second-half show. MSI revealed their latest CES Innovation Award winner, Creator Z17. Crafted with a CNC-milled aluminum chassis and a golden ratio 16:10 display, the design of the Creator Z17 perfectly interprets the concept of technological aesthetics.

[Creator 17 and Creator Z16P]

Creator Z17 also comes with a full-size UHS express card reader and supports MSI Pen - the first 17-inch laptop that supports pen-touch. Bruce Lin, the Senior Notebook Product Marketing Manager, noted that, "no matter if you're at the coffee shop laying back and flying through your imagination, or proposing your new ideas to the team, the Creator Z17 is your perfect sidekick."

MSI also updated their flagship model, the Creator Z16, into the Creator Z16P. It is built with the new MSI exclusive "Vapor Chamber Cooler" cooling solutions, where the cooling area is enlarged 76%, with 65% more airflow, pushing the performance up to 70% compared to the previous generation.

[Creator 17 and Creator Z16P]

Color precision is a key for content creation, and the Creator Z17 and Creator Z16P both use MSI True Pixel technology, which meets the standard of 100% DCI-P3 color gamut and a less than 2 delta-E color accuracy. Moreover, to increase efficiency, the new Creator Series comes with the latest 12th gen i9 CPU and Nvidia GeForce RTX 3080 Ti Laptop GPU. They are also "Meta-Ready" laptops.

[Creator 17 and Creator Z16P]

Both Creator Z17 and Creator Z16P support MSI True Pixel Technology

Nvidia also endorsed MSI Content Creation laptops during the launch event. Stephanie Johnson, Nvidia Studio Global Marketing VP, said that the latest MSI Creator Z17 and Z16 take performance and mobility to new heights. Collaborating with the Nvidia Studio program and Omniverse platform, and using top creator applications, artists can move assets between applications in real-time. "Artist will never miss a beat with the new MSI Creator laptops"

[MSI Content Creation laptops]

Brand New MSI Center AI Technology

Not solely focused on hardware performance, MSI also worked on intelligent technologies for a smoother experience. The latest MSI Center now provides AI modes. The new "Smart Auto" feature will detect which situation you're in, and automatically adjust the system into different modes, getting the best experience of your laptop. The "Ambient Silent AI" feature will dynamically balance fan speed based on the surrounding noise level and give the highest possible performance while still keeping the laptop quiet.

Meta-Ready with MSI Laptops

The entire MSI Gaming and Content Creation series are fully upgraded to the latest 12th gen Intel H series processors and up to the latest Nvidia GeForce RTX 3080 Ti Laptop GPU for brand new Meta-Ready laptops. The new 12th Gen MSI laptops are your bridge to the virtual world.

[Meta-Ready with MSI Laptops]

*Phase-Change Liquid Metal Pad only available for Raider GE series and Stealth GS77 with Intel® Core™ i9 processor on configuration for maximized performance.

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Document BUINPR0020220126ei1q001b9

Nvidia and Intel make this MSI gaming laptop go zoom, zoom

Lori Grunin
1,306 words
25 January 2022
CNET News.com
CNEWSN
English

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MSI's top-end 17-inch Raider GE76 gaming laptop comes with state-of-the-art components that let it fly. It's stacked with an [Intel Core i9-12900HK CPU](#) and [Nvidia GeForce RTX 3080 Ti](#) GPU. That processor is the newest Intel mobile [Alder Lake](#) architecture, which splits the cores into performance-optimized and efficiency optimized (like [Apple's M1 chips](#)).

And while the RTX 3080 Ti is just a new iteration of Nvidia's top mobile GPU, the MSI shows how well it performs when you push it -- and not even to the max -- in a system that allows it to draw full power.

In other words, the components are performing better than they would on a laptop with a pretty thin-and-light design; those have to compromise on power for the sake of cooling, battery size and AC adapter size. The downside is that the Raider is a lot more traditional. It also lacks Nvidia's Advanced Optimus, which is better at juggling the internal and discrete GPUs than the older version of Optimus used in the Raider GE76.

The laptop's display isn't on the GPU bus, so the battery life is highly dependent on whether you remember to switch into hybrid mode. (In hybrid mode, the rendering and acceleration are performed by the Nvidia GPU and passed over the system bus to the CPU to render to the screen.) That means you have to manually force it to use the discrete graphics -- it can't toggle back and forth intelligently and automatically. MSI does have a utility that automatically switches in and out of "extreme" mode as you launch games.

On the other hand, this isn't really a "laptop" laptop. It's a desktop replacement, so I'm not sure how important a little extra battery life is. It's big and relatively heavy, with one of those mondo power bricks that add another 2 pounds to the carry weight. It's also loud, even in hybrid mode, though it doesn't seem to run particularly hot. (Caveat: I haven't done any overclocking-related testing yet, so it might well turn into a fireball.)

MSI Raider GE76

MSI Raider GE76 Price as reviewed NA (closest configuration is \$3,999) Display 17.3-inch 360Hz PC CPU Intel Core i9-12900HK PC Memory 32GB DDR5-4800 Graphics Nvidia GeForce RTX 3080 Ti Storage 2TB NVMe SSD (with DirectStorage support), SD card reader Ports 4 x USB-A, 1 x USB-C/Thunderbolt, 1 combo audio, 1 x HDMI 2.1, 1 x Mini DisplayPort 1.4 Networking Killer Wi-Fi 6E AX1675, 2.5Gb Killer E3100 Operating system Microsoft Windows 11 Pro (21H2) Weight 6.4 pounds (2.9 kilograms)

The few processor results I've gotten thus far also place it best in class (or close), by a significant margin in some cases. Single-core speed, traditionally Intel's strong point, is also impressive. When you combine all the advances in GPU and CPU in the system, it becomes a powerhouse for video editing.

[Click to view image.](#)

The Raider GE76 comes in about seven different configurations that range in price from \$1,599 (with an i7-12700H, RTX 3060 and 1080p 360Hz display) to \$4,199 (i9-12900HK, RTX 3080 Ti and 4K 120Hz display). Our test system configuration isn't available here, but the closest option, with an i9-12900HK, RTX 3080 Ti and 1440p 240Hz display for \$3,999 is actually better; 4K can be overkill for 17 inches and 1080p is OK, but QHD is just right. (\$3,999 converts to approximately £2,970 or AU\$5,600.)

Among the laptop's performance-related perks is support for DirectStorage, Microsoft's programming interface for high-bandwidth SSD file operations in Windows (and the Xbox Series X/S), that, combined with its Samsung SSD and PCIe 4 bus, delivers quite a nice score of 2,802 on [3DMark's SSD performance test](#) (we're still building our database of comparison numbers). MSI's also one of the first companies to partner with BlueStacks for its mobile-gaming-on-laptop technology, which lets you play games designed for phones on the laptop as if they were written for the laptop -- a bigger screen, high-power processing, full controller support and more. I haven't yet tried that, but it sounds cool.

[Click to view image.](#)

There's a lot to unpack for this laptop which I haven't yet been able to tackle, but I do have a couple of observations that I don't think I'll have a change of opinion on. For one, given the size of the laptop, the touchpad is ludicrously small, and I'm finding it intermittently nonresponsive. For the other, the SteelSeries keyboard feels mushy; quiet, but more like gel than membrane. I do like the laptop's lighting design, but I'm a sucker for a lightbar (as well as underglow).

I'm still only a fraction of the way through my testing, so stay tuned for my upcoming final review.

Performance snapshot

Geekbench 5 (multicore)

Asus ROG Flow X13 with XG Mobile 7,964 Alienware m17 R4 8,214 Asus ROG Strix Scar 15 (G533QS) 8,359 MSI Raider GE76 13,796

Note:

Longer bars indicate better performance

Cinebench R23 CPU (single core)

Alienware m17 R4 1,313 Asus ROG Flow X13 with XG Mobile 1,460 Asus ROG Strix G15 Advantage Edition (G513QY) 1,495 MSI Raider GE76 1,659

Note:

Longer bars indicate better performance

Far Cry 5 (1080p)

Asus ROG Strix G15 Advantage Edition (G513QY) 96 Asus ROG Flow X13 with XG Mobile 109 Alienware m17 R4 138 MSI Raider GE76 151

Note:

NOTE: Longer bars indicate better performance (FPS)

Shadow of the Tomb Raider gaming test (1080p)

Asus ROG Strix G15 Advantage Edition (G513QY) 102 Asus ROG Flow X13 with XG Mobile 111 MSI Raider GE76 126 Alienware m17 R4 129

Note:

Longer bars indicate better performance (FPS)

3DMark Time Spy

Asus ROG Strix G15 Advantage Edition (G513QY) 10,248 Asus ROG Flow X13 with XG Mobile 10,290 Alienware m17 R4 12,145 MSI Raider GE76 12,320

Note:

NOTE: Longer bars indicate better performance

3DMark Fire Strike Ultra

Asus ROG Flow X13 with XG Mobile 7,004 Alienware m17 R4 7,964 Asus ROG Strix G15 Advantage Edition (G513QY) 7,994 MSI Raider GE76 8,171

Note:

Longer bars indicate better performance

3DMark Port Royal

Alienware m17 R4 7,589 MSI Raider GE76 7,975

Note:

Longer bars indicate better performance

Procyon Video (Premiere Pro)

Asus ROG Strix G15 Advantage Edition (G513QY) 5404 Asus ROG Flow X13 with XG Mobile 5409
Alienware m17 R4 5850 MSI Raider GE76 7051

Note:

Higher scores indicate better performance

SpecViewPerf 2020 SolidWorks (1080p)

MSI Raider GE76 243 Asus ROG Flow X13 w/ XG Mobile 244

Note:

Longer bars indicate better performance (FPS)

Configurations

Alienware m17 r4 Microsoft Windows 10 Home (20H2); 2.4GHz Intel Core i7-10980HK; 32GB DDR4 SDRAM 2,933MHz; 16GB Nvidia GeForce RTX 3080 512GB SSD + 953GB RAID 0 Asus ROG Flow X13 with XG Mobile Microsoft Windows 10 Home (2004); 3.3GHz AMD Ryzen 9 5900HS; 6GB DDR4 SDRAM 4,266MHz; 4GB Nvidia GeForce GTX 1650 (16GB GeForce RTX 3080 mobile in XG Mobile) Asus ROG Strix G15 AMD Advantage Edition Microsoft Windows 10 Home (21H1); 3.3GHz AMD Ryzen 9 5900HX; 16GB DDR4 SDRAM 3,200MHz; 12GB AMD Radeon RX 6800M; 512TB SSD MSI Raider GE76 Microsoft Windows 11 Pro (21H2); 2.9GHz Intel Core i9-12900HK; 32GB DDR5 SDRAM 4,800MHz; 16GB Nvidia GeForce RTX 3080 Ti; 2 x 1TB NVMe SSD

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Intel Core i5-12400 vs AMD Ryzen 5 5600X Face-Off: The Gaming Value Showdown

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5,708 words
23 January 2022
Tom's Hardware
TOMHA
English

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We put the Core i5-12400, Ryzen 5 5600X and Ryzen 5 5600G through a six-round fight to see which gaming chip comes out on top.

The \$199 [Intel Core i5-12400](#) vs \$299 [Ryzen 5 5600X](#) contest is a pitched battle that finds AMD's most popular CPU facing off against an Intel competitor that costs roughly \$100 less at retail. That may seem like an odd comparison, but AMD abandoned the sub-\$200 market when it launched its [Ryzen 5000](#) processors, leaving its older processors to hold the line as Intel has opened a new front in the [AMD vs Intel](#) price wars.

Based on pricing alone, the aging Zen 2-powered [Ryzen 5 3600X](#) and 3600 will remain the go-to competitors for the 12400 even though they debuted nearly two and a half years ago. As you'll see, those old Zen 2 chips aren't competitive, and AMD's \$259 [Ryzen 5 5600G](#) APU targets a different market. That means AMD's least expensive Zen 3 model, the Ryzen 5 5600X, is the 12400's only true competitor in the benchmarks.

Intel's [Alder Lake](#) chips are surprisingly powerful, already earning key upsets against higher-priced Ryzen chips on our list of [Best CPUs for gaming](#) and [CPU Benchmark](#) hierarchy. As seen in our previous faceoffs, Intel's hybrid x86 [Alder Lake](#) design, which mixes fast performance cores (P-cores) with small efficiency cores (E-Cores), represents the company's most disruptive architectural shift in a decade. As a result, Intel upsets AMD's highest-end mainstream chips, particularly in price-to-performance metrics.

* [Intel Core i9-12900K vs Ryzen 9 5900X and 5950X](#)

* [Intel Core i5-12600K vs AMD Ryzen 5 5600X and 5800X](#)

* [Intel Core i7-12700K vs Ryzen 9 5900X and 5800X](#)

However, the Core i5-12400 doesn't have a hybrid architecture. Instead, it comes with a more traditional design and only has six P-Cores active, so it doesn't use Gracemont-based cores for background tasks. That means this six-core 12-thread processor doesn't need Intel's new Windows 11-exclusive [Thread Director](#) technology to place workloads on the correct cores. As a result, unlike Intel's hybrid models, the 12400 is just as potent in Windows 10 as it is in Windows 11.

Below we've put the Core i5-12400 vs Ryzen 5 5600X through a six-round faceoff to see which chip takes the crown in our gaming and application benchmarks, along with other key criteria like power consumption and pricing. We have the final score at the end of the article.

Features and Specifications: Intel Core i5-12400 vs AMD Ryzen 5 5600X and Ryzen 5 5600G

Intel 12th-Gen Alder Lake Core i5-12400 and 12400F Pricing and Specifications

Price	Cores Threads	P-Core Base/Boost	E-Core Base/Boost	TDP / PBP / MTP	Memory Support	L3	
CACHE	Ryzen 5 5600X	\$299	6P 12 threads	3.7 / 4.6 GHz	65W	DDR4-3200	32MB
Ryzen 5 5600G	\$259	6P + 0E 6 Cores	12 Threads	4.4 / 4.4 GHz	65W	DDR4-3200	16MB
Core i5-12400	\$192-\$199	6P + 0E 6 Cores	12 Threads	4.4 / 4.4 GHz	65W	DDR4-3200 / DDR5-4800	18MB
Ryzen 5 3600X	\$240	6P + 0E 6 Cores	12 Threads	4.4 / 4.4 GHz	65W	DDR4-3200	32MB
Ryzen 5 3600	\$206	6P + 0E 6 Cores	12 Threads	4.4 / 4.4 GHz	65W	DDR4-3200	32MB

The Core i5-12400 has six P-cores and 12 threads that operate at a 2.5 GHz base and 4.4 GHz boost clock. The chip comes armed with 18MB of L3 cache and has 65W PBP (base) and 117W MTP (peak) power ratings. The chip also comes with a bundled Laminar RM1 cooler with a semi-transparent plastic shroud and a blue ring lining the fin stack.

The Core i5-12400 is a locked chip, meaning it isn't overclockable. However, Intel supports memory overclocking on Z690, B660, and H670 motherboards (Z690 doesn't make sense for this class of chip, though). As you'll soon see, manipulating the power limits can eke out some additional performance in some types of gaming and threaded work.

The chip has the UHD Graphics 730 engine with 24 EUs running at a 300/1450 MHz base/boost frequency. If you're looking to save some coin, the graphics-less Core i5-12400F comes with a \$25 price reduction and

has the same specs as the 12400, which is incredibly attractive if you plan on using a discrete graphics card. Notably, you will lose Quick Sync capabilities and the iGPU fallback that you can use for troubleshooting in the event of an issue with a discrete GPU. However, there also isn't an option for graphics on AMD's Ryzen 5 5600X or the Ryzen 5 3600X and 3600, though all three of those competing chips also come with a bundled cooler.

Unlike the standard [Ryzen 5000](#) models, the [Ryzen 5 5600G](#) APU does come with integrated graphics. This Cezanne APU pairs six Zen 3 execution cores with the Radeon Vega graphics engine for iGPU-powered gaming rigs. As a result, this APU is the best value on the market if you're looking to game at lower resolutions without a discrete GPU. But aside from gaming on the iGPU, it can't compete with the Core i5-12400 and comes at a higher price point.

The 12400 goes toe-to-toe with the 6-core, 12-thread Ryzen 5 5600X that has long been the favorite for enthusiasts because of its incredible blend of pricing and performance. This chip comes with a 65W TDP rating, 32MB of L3 cache, and has only high-performance cores. It also supports DDR4-3200 memory and the PCIe 4.0 interface.

All Alder Lake chips support DDR4-3200 or up to DDR5-4800 memory (odd [DDR5 population rules apply](#)). Unfortunately, these new technologies add cost to the 600-series motherboards that house the chips, and DDR5 memory is largely unavailable. However, plenty of DDR4-powered motherboard options are available, especially with the value-centric B- and H-series chipsets that make the most sense for this class of chips. AMD also has a robust ecosystem of affordable AM4 motherboards on offer.

Winner: Intel

Intel's chip pricing is an advantage, and the 600-series platform also has a clear connectivity advantage: With DDR5 and PCIe 5.0 on the menu, AMD's AM4 platform finds itself looking a bit long in the tooth, but Intel's new features do make for more expensive motherboards. DDR5 pricing is terrible, and we expect that to continue for some time. Fortunately, the 12400 is just as fast with DDR4 in the majority of tasks, and you can pick from plenty of cost-saving DDR4 motherboards.

The Core i5-12400 comes with integrated graphics by default, though you can sacrifice those and save \$25 with the Core i5-12400F. Meanwhile, you'll have to look to AMD's [Ryzen 7 5600G](#) APU if you want integrated graphics from Team Red, but that chip isn't really directly comparable to the 12400 in our performance benchmarks.

Gaming Benchmarks and Performance: Intel Core i5-12400 vs AMD Ryzen 5 5600X and Ryzen 5 5600G

This article is an overview of our much more in-depth testing in our [Intel Core i5-12400 review](#). We're focusing on our Windows 11 test results in this article, but given that the 12400 doesn't have integrated graphics, you should experience similar results in Windows 10. We also include tests with the Core i5-12400 with the power limits lifted and overclocked memory (again, head to the review for details).

Below you can see the geometric mean of our gaming tests with the Core i5-12400 vs the Ryzen 5 5600X and Ryzen 5 5600G at 1080p and 1440p, with each resolution split into its own chart. Notably, these results aren't too important for the 5600G — the 5600G is designed to use its integrated graphics, not a discrete GPU, and easily beats the 12400 in every iGPU contest ([You can see an example of that here](#)). As per usual, we're testing with an Nvidia GeForce RTX 3090 to reduce GPU-imposed bottlenecks as much as possible, and differences between test subjects will shrink with lesser cards or higher resolutions.

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Paired with affordable DDR4 memory at the 1080p resolution, the previous-gen flagship \$584 Core i9-11900K is a scant 2.5% faster than the \$199 Core i5-12400, but tuning the Core i5's memory to DDR4-3800 gives it a 1.9% lead over the stock 11900K in our cumulative performance measurement. Even though the 11900K would take the lead after overclocking, that's an incredible gen-on-gen improvement in performance.

The Core i5-12400 at stock settings is 1.9% faster than AMD's venerable ~\$299 Ryzen 5 5600X. After tuning, the Core i5-12400 ties the overclocked 5600X, an impressive showing for a chip that costs \$100 less.

It's a bit unfair to compare the \$259 Ryzen 5 5600G to the Core i5-12400; AMD's APU isn't designed as a direct competitor and is more expensive than the 12400. However, aside from the Ryzen 5 3600X and 3600,

the \$249 5600G is the only AMD processor close to this price class. Regardless, with a discrete GPU, the Core i5-12400 is 16.8% faster than the 5600G and 14% faster after tuning both chips. However, if you're looking for the best performance without a discrete GPU, the Ryzen 5 5600G outclasses the 12400.

The Ryzen 5 3600X and 3600 also feel like odd comparisons to the 12400 — both are several years old and have the previous-gen Zen 2 architecture. But, again, these are the only suitable comparables from the AMD camp. The Core i5-12400 is 22.7% and 26% faster than the Ryzen 5 3600X and 3600, respectively. As you can imagine, overclocking the Ryzen chips doesn't do much to close that chasm.

Naturally, moving over to 1440p pushes the bottleneck to the GPU, so the difference between the chips shrinks tremendously. Gamers with lower-resolution panels with high refresh rates will benefit more from Alder Lake's faster frame rates. Flipping through the 99th percentile charts shows larger deltas between the chips, but Windows 11 seems to suffer from more framerate variability than Windows 10.

The [AMD vs Intel](#) gaming competition is closer now, with some games favoring one architecture over the other. As such, it's best to make an informed decision based on the types of games that you play frequently. Be sure to check out the individual tests in the above album. In either case, Intel holds the lead.

Winner: Intel

The Core i5-12400 leads convincingly over all of the chips in its price class and also punches up to beat the Ryzen 5 5600X and 5600G at stock settings. It even stands toe-to-toe with the \$100 more expensive 5600X after tuning. The Ryzen 5 3600X and 3600 shouldn't be asked to face the 12400, they aren't in the same performance class, but AMD's decision to abandon the low-end market makes this an unfortunate reality.

Overall it's clear that the Core i5-12400 is now the value gaming champion, offering a superior level of performance at its price point with no clear price/performance competitors.

Application Performance: Intel Core i5-12400 vs AMD Ryzen 5 5600X and Ryzen 5 5600G

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We can boil down productivity application performance into two broad categories: single- and multi-threaded. The first slide above shows the geometric mean of performance in several of our most important tests in the single-threaded category, but be sure to look at the expanded results below.

The Core i5-12400 is 13.5% faster than the Ryzen 5 5600G in single-threaded work (10% faster after tuning the 5600G), and a whopping 24% and 27% faster than the Ryzen 5 3600X and 3600, respectively. You'll have to look to other Alder Lake chips to find faster performance in single-threaded work: As you can see in our [CPU Benchmark](#) hierarchy, even the beastly \$799 [Ryzen 9 5950X](#) can't match the Core i5-12400 in single-threaded tasks.

As expected, we don't see a significant difference between the 12400's different power/memory settings, which has more impact on threaded work and gaming, but the 12400 doesn't need much help. The chip is 2.3% faster than the Core i9-11900K, 6% faster than the 11700K, and an incredible 15.7% faster than the 11400.

This superior performance in lightly-threaded apps will equate to a snappier, faster experience in all manner of light day-to-day tasks. The 12400's snappy performance will be most noticeable in gaming, web browsers, and application start-up tasks.

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The 12400 is incredibly competitive against the Ryzen 5 models in threaded workloads, even beating the potent Ryzen 5 5600X by 2.3% at standard settings and 6.7% after tuning both chips. That's impressive given the 12400's much more forgiving price tag, but as you'll see in the benchmarks above, the Ryzen 5 5600X does carve out wins in more than a few of those applications.

We see larger gains over the Ryzen 5 5600G, 3600X, and 3600, with the stock 12400 taking leads of 15.8%, 22.4%, and 23.6%, respectively. Frankly, AMD really doesn't have any worthy competing chips at this price point for this type of work.

Removing the power restrictions gives the Core i5-12400 a 7% boost in our cumulative measure of threaded performance, allowing it to beat the overclocked Ryzen 5 5600X, not to mention the rest of the competing Ryzen chips.

Winner: Intel

Given its price point, the Core i5-12400 offers an incredible blend of performance in both single- and multi-threaded apps that simply can't be beaten. You'll have to look to Intel's own Alder Lake family for faster single-threaded performance, and the 12400 often beats the price-comparable Ryzen models (and even the \$100 more expensive Ryzen 5 5600X) in threaded applications by convincing margins. If you need more threaded horsepower, Intel's Core i5-12600K offers a 21% boost over the 12400 due to its additional E-cores and is officially overclockable, but you'll have to fork out some extra cash for the privilege.

Overclocking: Intel Core i5-12400 vs AMD Ryzen 5 5600X and Ryzen 5 5600G

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Intel's Core i5-12400 isn't an overclockable part, so you shouldn't be able to manipulate core clocks, though you can remove power limits and overclock the memory. However, enterprising motherboard manufacturers have [found a way to sidestep Intel's restrictions and allow BCLK overclocking](#), which in turn has led to [spectacular overclocking results with "locked" processors](#).

As you would expect, [Intel has said this is an unsupported practice](#). As we've seen in the past with other similar workarounds, we expect that Intel will alter its microcode to prevent such efforts soon by locking out BCLK overclocking. Therefore you won't be able to update your BIOS to newer versions if you want to continue to leverage BCLK overclocking. Additionally, Intel theoretically could push microcode updates via Windows Update, which could provide another avenue to disable BCLK overclocking. Since we expect the feature to be disabled soon, we won't take BCLK overclockability into account for scoring in this round.

Intel has long kept overclocking as a feature of its pricey K-series chips and Z-series motherboards, while AMD freely allows overclocking with all SKUs on almost any platform (except A320). Intel has made strides with its overclocking, though. For example, the Core i5-12400 is a locked chip, but you can overclock the memory on Z-, B- and some H-series motherboards. You can also lift the power limits, which serves as a sort of quasi-overclock (definitely not as effective) that will boost performance in some threaded applications and gaming, all while technically remaining within the definition of stock settings (and thus warranted).

Memory overclocking allows tuners to extract more performance from the chips, particularly in gaming, via easy-to-use XMP profiles or manual tuning. Naturally, the rules around [Intel's Gear 1 and Gear 2 modes](#) apply here, and you'll want to stick with the low-latency Gear 1 for most practical use-cases (especially gaming). For the Core i5-12400, the effective limit of Gear 1 operation is around DDR4-3800. That means you can buy a reasonably-priced XMP-equipped memory kit and reap pretty substantial benefits.

AMD's Ryzen chips are all fully overclockable. However, these chips come with innovative boost technology that largely consumes most of the available frequency headroom, so there is precious little room for bleeding-edge clock rates. In fact, all-core overclocking with AMD's chips is lackluster; you're often better off using its auto-overclocking Precision Boost Overdrive 2 (PBO2) feature that boosts multi-threaded performance. AMD also has plenty of Curve Optimization features that leverage undervolting to increase boost activity.

However, it's always important to remember that chip quality can vary for both vendors, so the silicon lottery always comes into play. That will apply to any unsupported BCLK overclocking for the Core i5-12400, along with the standard memory supported memory overclocking capabilities — integrated memory controller (IMC) quality has a big impact on how well the Core i5-12400 can support overclocked memory in the Gear 1 configuration.

Winner: AMD

Intel has long locked all overclocking features to K-series chips on Z-series motherboards, but the company has made strides by allowing memory overclocking for non-K processors on almost all chipsets that support Alder Lake (except some H-series boards).

However, this is still a far cry from AMD's practice of allowing full core and memory overclocking with all of its chips and nearly all chipsets (except A320). That gives AMD the win in the overclocking category, but bear in mind that some of the AMD chips in this face-off can't beat the Core i5-12400 in gaming and application benchmarks, even after overclocking.

Power Consumption, Efficiency, and Cooling: Intel Core i5-12400 vs AMD Ryzen 5 5600X and 5600G

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Intel's Alder Lake marks an overdue and drastic improvement to the company's power consumption and efficiency. The new Intel 7 process reduces power consumption and improves efficiency. For the more expensive models, those improvements also come from the new architecture that shuffles heavily-threaded work to smaller, more efficient cores (E-cores). But while the Core i5-12400 lacks the advantage of E-cores, it actually proves to be the most power-efficient Alder Lake chip we've tested.

Overall, the Ryzen processors are still the most power-efficient chips we've ever tested, but Alder Lake closes the gap significantly. However, Intel's improvement here is noteworthy: We measured a peak of 88W with the 12400 with the power limits lifted, while the previous-gen 11400 peaked at a whopping 145W.

Peak power consumption isn't the most important metric, though. The Core i5-12400 is also faster than its predecessor. As you can see in our renders-per-day measurements, the Core i5-12400 is nearly twice as efficient as the previous-gen 11400, and is more efficient than the Ryzen 5 5600X, which offers comparable performance.

The last four slides in the above album give us a different view of power efficiency. Here we calculate the cumulative energy required to perform a given task. We plot this 'task energy' value in Kilojoules on the left side of the chart. These workloads are comprised of a fixed amount of work, so we can plot the task energy against the time required to finish the job (bottom axis) to give us a better look at efficiency.

Bear in mind that faster completion times and lower task energy are ideal. That means processors that are closest to the bottom left corner are best. It's easy to see that Intel has made a massive generational improvement here; the Core i5-12400 is far more efficient than the 11400.

However, AMD still holds the advantage in all of the key power criteria, with the Ryzen 5000 models retaining the crown of the most efficient desktop CPUs that we've ever tested by a slim margin.

Winner: AMD

Intel has made plenty of progress, but AMD still holds the crown of the most power-efficient chips even though the margin has gotten slimmer, largely due to the single-die Ryzen 5000G models. The Ryzen 5000 chips generally consume less peak power, and some models can also accomplish more work per unit of

power consumed. That results in superior power consumption, efficiency, and thermal output, so you'll end up with a cooler and quieter system.

Pricing: Intel Core i5-12400 vs AMD Ryzen 5 5600X and Ryzen 5 5600G

The Core i5-12400 has a suggested price point that ranges from \$192 to \$199, but you can ditch the integrated graphics and go with the Core i5-12400F for \$167 to \$174, which is an incredible value if you plan on using a discrete GPU. In terms of modern AMD competitors, the Ryzen 5 5600X lands at around \$299 while the 5600G costs \$259.

Both Ryzen 5000 models command a significant premium that simply isn't worth the level of performance. AMD has abandoned the value segment of the market, so we can only find price-competitive chips from Team Red by stepping back to the previous-gen Zen 2-powered [Ryzen 3000](#) series. However, as you can see in the benchmarks above, the \$240 Ryzen 5 3600X and \$200 Ryzen 5 3600 can't compete with the Core i5-12400 in performance benchmarks.

All of the chips come with a bundled cooler, which levels the playing field when you're only buying the chip.

In chip pricing alone, the Core i5-12400 obviously dominates the competition. However, while the CPU is one of the most important components in the build, it is but one factor in the equation — you also need a motherboard and memory. Naturally, DDR5 memory is the elephant in the room, but that's pretty simple: You should expect to pay a massive early adopter premium for DDR5 memory, and more for the higher-end DDR5 motherboards. If you're looking for bang-for-the-buck, DDR5 is off the table for now. Luckily, DDR4 offers nearly the same performance as DDR5 in most applications, and high DDR5 pricing effectively removes it from the conversation for this class of chip.

You should plan on using a 600-series B- or H-series motherboard with the 12400, and there are a plethora of options available that support DDR4 memory. AMD's AM4 motherboard ecosystem is generally less expensive, but AM4's connectivity options have come a bit long in the tooth.

In contrast, Intel offers more robust connectivity options, like PCIe 5.0, but you do have to pay extra for those capabilities. Even the lower-end 600-series motherboards carry higher pricing than many of the options in AMD's robust AM4 motherboard ecosystem, often to the tune of a ~\$50 premium, but Intel's lower chip pricing, not to mention performance advantages, make up for the higher motherboard costs. We're also in the early days of B660 availability, and pricing typically cools off after a few months (though shortages could prevent that).

Winner: Intel

As long as you skip DDR5 memory, Intel wins in the overall pricing category. While lower-end 600-series motherboards are more expensive than comparable AM4 motherboards, the Core i5-12400's lower chip pricing and superior performance outweigh the additional motherboard costs, meaning you get more value for your dollar.

Bottom Line: Intel Core i5-12400 vs AMD Ryzen 5 5600X and Ryzen 5 5600G

Intel Core i5-12400 vs Ryzen 5 5600X

Intel Core i5-12400AMD Ryzen 5 5600X / 5600GFeatures and SpecificationsXGamingXApplication PerformanceXOverclockingXPower Consumption, Efficiency and CoolingXPricingXTotal43

The Core i5-12400 takes a four-to-three lead in this Core i5-12400 vs Ryzen 5 5600X and Ryzen 5 5600G battle. Like the rest of the Alder Lake family, the Core i5-12400 comes to market with excellent pricing as part of Intel's price war with AMD, which is particularly painful as Intel attacks the sub-\$200 segment that AMD has largely abandoned.

The \$192 Core i5-12400 beats the more expensive \$299 Ryzen 5 5600X and \$259 Ryzen 5 5600G in key areas. At stock settings, the Core i5-12400 is 1.9% faster than AMD's venerable ~\$299 Ryzen 5 5600X in gaming, an impressive showing for a chip that costs \$100 less. It feels unfair to compare the Ryzen 5 5600G to the Core i5-12400, but the \$249 5600G is the only Zen 3 chip close to this price class. Regardless, with a discrete GPU, the Core i5-12400 is 16.8% faster than the 5600G but costs \$50 less.

Putting the Core i5-12400 up against AMD's price-comparable models isn't a fair fight; the Core i5-12400 beats them by huge margins. That's because the Ryzen 5 3600X and 3600 are several years old and have the previous-gen Zen 2 architecture. But, again, these are the only price-comparable chips from the AMD camp. In gaming, the Core i5-12400 is 22.7% and 26% faster than the Ryzen 5 3600X and 3600, respectively.

The Core i5-12400 now reigns as the budget gaming CPU champ. Of course, you also have to consider that you can get the graphics-less Core i5-12400F for ~\$25 less. That's an excellent price point for access to this level of performance.

The 12400 is just as impressive in lightly-threaded apps. In fact, not a single Ryzen processor beat the Core i5-12400 in our cumulative measure of single-threaded performance, and that includes the \$800 [Ryzen 9 5950X](#). You'll have to look to other Alder Lake chips to find faster performance in single-threaded work.

In threaded work, the Core i5-12400 is 'only' 12.4% faster than the previous-gen Core i5-11400, but we still see impressive performance over competing Ryzen chips. Even though the 5600X carves out some wins in some applications, the 12400 is 2.3% faster in threaded work and 6.7% faster after overclocking. That's surprising given the 5600X's \$100 premium. Frankly, AMD doesn't have any worthy competing chips for threaded work at the 12400's price point. We see larger leads for the 12400 over the Ryzen 5 5600G, 3600X, and 3600, with the Core i5-12400 taking leads of 15.8%, 22.4%, and 23.6%, respectively.

The Core i5-12400 has a much more modern platform than AMD's AM4 motherboards. Access to DDR5 and PCIe 5.0 interfaces adds cost, but support for DDR4 enables less-expensive B660 motherboards that help reduce that overhead. In either case, the Core i5-12400 provides more than enough performance to justify the platform costs. You also won't need DDR5 memory to unlock the best gaming performance, and that's a plus because DDR5's high pricing doesn't make sense for this class of chip.

The 12400 delivers solid performance in all manner of threaded productivity applications and beats even the highest-end Ryzen 5000 chips in single-threaded work. The Core i5-12400 also serves up incredible levels of gaming performance but at a much lower price point than any comparable AMD processor, setting a new bar for budget gaming chips. For gamers looking for the best value, the Core i5-12400 is now the uncontested [best value CPU for gaming](#).

* MORE: [Best CPUs for Gaming](#)

* MORE: [CPU Benchmark Hierarchy](#)

* MORE: [AMD vs Intel](#)

* MORE: [All CPUs Content](#)

Core i9-12900K and Core i5-12600K Test System Configurations

Intel Socket 1700 DDR4 (Z690)Core i7-12700K, Core i5-12600K, Core i5-12400MSI Z690A WiFi DDR42x 8GB Trident Z Royal DDR4-3600 - Stock: DDR4-3200 14-14-14-36Intel Socket 1200 (Z590)Core i9-11900K, Core i7-11700K, Core i5-11400MSI Z590 Godlike2x 8GB Trident Z Royal DDR4-3600 - Stock DDR4-3200/2933 Gear 1AMD Socket AM4 (X570)Ryzen 5 5600X, 5600G, 3600X, 3600

MSI MEG X570 Godlike2x 8GB Trident Z Royal DDR4-3600 - Stock: DDR4-3200 14-14-14-36All SystemsGigabyte GeForce RTX 3090 Eagle - Gaming and ProViz applicationsNvidia GeForce RTX 2080 Ti FE - Application tests

2TB Sabrent Rocket 4 Plus

Silverstone ST1100-TIOpen BenchtableArctic MX-4 TIMWindows 11 ProCoolingCorsair H115i, Custom loop

[amd vs intel \(Future\)](#)

Document TOMHA00020220124ei1n00001

iBuypower Intel 12th Gen Z690 i7 DDR4 Gaming Review: One Way to Get Parts

Andrew E. Freedman

3,099 words

21 January 2022

Tom's Hardware

TOMHA

English

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The iBuypower Intel 12th Gen Z690 i7 DDR4 Gaming lets you build an Alder Lake machine to your liking, with a three-year warranty. But it may not have all the bells and whistles.

Let me tell you a story: Back in 2020 the world shut down, and a confluence of supply and demand issues, a chip shortage, surging cryptocurrencies and a global pandemic made a number of tech-related products difficult to impossible to buy. Flash forward to today and things are still sort of that way—at least when it comes to graphics cards.

These ongoing issues continue to drive the sales of pre-built systems, including those on our list of the [best gaming PCs](#). With the launch of Intel's 12th Gen "Alder Lake" chips, [which are particularly impressive when it comes to gaming](#), iBuypower has released its "iBuypower Intel 12th Gen Z690 i7 DDR4 Gaming" PC. The name is definitely a mouthful, but it's more of a configurator for numerous Intel-based PCs than anything else. And there's a fair bit to like when it comes to performance.

The iBuypower model we reviewed sports an Intel Core i7-12700K, an Nvidia GeForce RTX 3070 and one of iBuypower's own cases. And in our testing, it held up against and/or surpassed last year's models, though there is some room for improvement.

Design of the iBuypower 12th Gen Z690 i7 Gaming PC

Image 1 of 3

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 2 of 3

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 3 of 3

[Click to view image \(Image credit: Tom's Hardware\)](#)

This PC was built in iBuypower's own Slate Hako MR case, which is a pretty standard case with a dash of attitude.

It's hard not to notice the very front of the case, which is a bit unusual. It's tempered glass, which shows off three 240 mm case fans in their RGB glory. It's a dark glass, however, which makes it highly reflective and only shows the most lit-up parts. If you don't have a lot of RGB, you won't be able to see your parts well. Whether or not that's a pro or a con is a matter of personal taste.

There's a bit of venting on the right side of the case to let in some air, but there's also some smack dab in the middle of the front. The effect kind of looks like a lightning bolt, but with a space in the middle to allow for a bit of airflow. Both edges of the bolt overlap to create a layered effect. Between the lightning and the pattern, my wife referred to it as "very David Bowie," which I'm told was a compliment. But if you don't like the look, iBuypower offers a staggering 19 other options, although some add significantly to the price of the system.

The left side of the desktop features more tempered glass, letting you see into the case. For our review unit, that featured a smattering of RGB on the four case fans and on the pump for the CPU cooler. I'm of the opinion that this is a tasteful amount of lights. The right side panel, like on many cases, is an aluminum door that slides off.

There are a few dust filters around the case, including at the top over the radiator, which can be removed by taking out a thumb screw and separating a section of the top of the case to clean it. There are also filters in front of the three intake fans and at the bottom, where the power supply sits. That last one is the easiest to remove, and is held in with a set of clips. I wish iBuypower would have gone with magnetic, easy-to-remove filters for faster, simpler cleaning.

For cooling, there's room for three 120 mm fans in the front and another in the back. Ours used a 240 mm all-in-one water cooler mounted on top, but it can be configured with larger 280 mm or 360 mm AIOs as well.

Out of the box, the RGB lighting was stuck on a subtle blue and purple combination. I actually quite liked it, but was surprised to see no software had been installed to adjust it (not even a remote in the box!). I went to the driver and utilities page for the Asus Prime Z690-P D4 motherboard and got the latest version of Aura Sync, which gave me more control over the lighting on the fans and cooler pump. If you have a motherboard from a different vendor, like MSI or Gigabyte, you will need different software, so check accordingly.

The mod-tower ATX case measures 19.3 x 18.8 x 8.66 inches (491 x 478 x 220 mm), which I could fit on my desk, though I think many will want to place it on their floor. It's a bit bigger than some other desktops we reviewed in the past year, like the [NZXT Streaming Plus](#) (18.11 x 16.85 x 8.27 inches), [MSI Aegis RS 11th](#) (17.72 x 16.93 x 8.46 inches) and [Zotac Mek Hero](#) (a comparably small 17.4 x 16.2 x 8.7 inches.)

iBuypower 12th Gen Z690 Gaming PC Specifications

ProcessorIntel Core i7-12700KFMotherboardAsus Prime Z690-P D4Memory16GB TeamGroup T-Force Vulcan Z DDR4-3200GraphicsMSI RTX 3070 Ventus 3X LHR (8GB GDDR6)Storage1TB WD Blue SN550 NVMe Internal SSDNetworkingRealTek 2.5Gb EthernetFront Ports2x USB 3 Type-A ports, headphone jack, microphone jackRear Ports (Motherboard)2x USB 2.0 ports, DisplayPort, HDMI, USB 3.1 Gen 2 Type-A, USB 3.2 Gen 2x2 Type-C, 2x. USB 3.2 Gen 1 Type-A, Ethernet, 5x audio jacks, Optical S/PDIF outVideo Output (GPU)3x DisplayPort 1.4a, HDMIPower Supply700W High Power HP1-J700GD-F12S 80 Plus GoldCoolingiBuypower 240 mm Addressable RGB liquid cooler, 4x 240 mm case fansCaseiBuypower Slate Hako MROperating SystemWindows 11 HomeDimensions19.3 x 18.8 x 8.66 inches / 491 x 478 x 220 mmPrice as Configured~ \$2,452

Ports and Upgradeability on the iBuypower 12th Gen Z690 Gaming PC

iBuypower's port selection is pretty standard. On the top of the case, there are two USB 3 Type-A ports alongside separate headphone and microphone jacks. This is a pretty common setup, but I'd like to see iBuypower add a USB Type-C port to the case for the increasing number of external drives and other peripherals that are switching to the newer port.

[Click to view image \(Image credit: Tom's Hardware\)](#)

The rest of the ports are going to depend entirely on the motherboard and GPU you get. In our case, the Asus Prime Z690-P D4 motherboard has an additional six USB ports (two USB 2.0 Type-A, a pair of of USB 3.2 Gen 1 Type-A, one USB 3.2 Gen 2 Type-A port and a single USB 3.2 Gen 2x2 Type-C), as well as DisplayPort and HDMI if your CPU has integrated graphics (ours did not), an Ethernet jack, [S/PDIF](#) out and five audio jacks. Our GPU, the MSI RTX 3070 Ventus 3X, has three DisplayPorts and an HDMI output.

[Click to view image \(Image credit: Tom's Hardware\)](#)

Getting inside is easy and requires no tools. The tempered glass left side panel is held in by two thumb screws and can be carefully slid from the [chassis](#), giving you access to most of the components, including the motherboard, CPU, GPU, RAM, SSD and cooler. There's room add two [SATA SSDs](#) in the main case compartment.

The right side panel comes off in a similar fashion, with two thumb screws. From there, you can see the power supply, which is under a shroud, as well as an RGB controller. There's room to add a lot more storage in the back, including hard drives in a caddy next to the power supply, as well as two SATA drives that can be vertically mounted on a panel and wired to the PSU and motherboard.

[Click to view image \(Image credit: Tom's Hardware\)](#)

The cable management in the rear is fine. It's not the nicest I've ever seen, but it's about as good as I could do with a non-modular power supply, which adds unnecessary cable mess to any PC. The case has plenty of passthroughs between the front and back, and I can already see which ones I would use if I added more storage.

Gaming and Graphics on the iBuypower 12th Gen Z690 Gaming PC

Intel's latest, in the form of the Core i7-12700KF, paired with an Nvidia GeForce RTX 3070 in our iBuypower review configuration, proved to be a powerful combination for mainstream gaming.

I took the iBuypower through its paces by playing Deathloop, one of my favorite games from last year. The RTX 3070 didn't have enough VRAM to play at 4K on medium or high settings without throwing up warning flags, so I settled for [1440p](#) on ultra settings, which was still pretty great. As I played as Colt, trading fire with

Eternalists in the Karl's Bay area, I found that the game typically ran between 75 and 84 frames per second on these settings, though I did see it get as high as 92 fps a few times.

Image 1 of 5

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 2 of 5

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 3 of 5

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 4 of 5

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 5 of 5

[Click to view image \(Image credit: Tom's Hardware\)](#)

On Shadow of the Tomb Raider's benchmark (very high settings), the iBuypower system ran at 119 fps at [1080p](#) and 40 fps at 4K. That's in striking distance of both the NZXT Streaming Plus PC and Zotac Mek Hero, which differed by just a couple of frames. But the MSI Aegis RS 11th with a more powerful RTX 3080, unsurprisingly outperformed the rest with 147 fps at FHD and 57 fps for [4K](#).

There was a similar trend for Grand Theft Auto V (very high settings), where iBuypower's rig ran at 119 fps at 1080p and 40 fps at 4K. The NZXT was almost tied and the Zotac edged a couple frames higher, but it was the Aegis, again, with the performance edge, at 147 fps at 1080p and 57 fps at 4K.

On Far Cry New Dawn (ultra settings) the iBuypower was the best of the group in 1080p at 128 fps, even beating the Aegis (134 fps). The Zotac was the next closest at 111 fps at full HD. Meanwhile, at 4K, the iBuypower reached 74 fps, tying with the NZXT but falling 40 frames behind the MSI.

The iBuypower ran the Red Dead Redemption 2 benchmark (medium settings) at 88 fps at 1080p and 36 fps at 4K. It was slightly ahead of the NZXT and Zotac (82 and 80 fps, respectively), but behind the MSI (113 fps). At 4K, the iBuypower hit 36 fps, close to its RTX 3070-based competitors but behind the MSI's 50 fps.

The three RTX 3070 machines effectively held hands and crossed the finish line together on the Borderlands 3 benchmark (badass settings). At 1080p, both the iBuypower and Zotac Mek Hero hit 108 fps (the NZXT reached 106 fps) and all three of them averaged 44 fps at 4K. The MSI Aegis RS 11th ran at 136 fps at 1080p and 58 fps at 4K.

We also ran the iBuypower PC through our gaming stress test, in which we ran the Metro Exodus benchmark 15 times at RTX settings, simulating roughly half an hour of gaming. The game ran at an average of 84.33 fps across the runs and was pretty stable throughout.

During the test, the CPU's performance cores measured an average of 4.49 GHz, while the efficiency cores measured an average of 3.41 GHz. The CPU package measured an average of 59.11 degrees Celsius (120.39 degrees Fahrenheit). On the GPU side of things, the RTX 3070 ran at an average [clock speed](#) of 1.65 GHz and measured 63.4 degrees Celsius (146.12 degrees Fahrenheit).

Productivity Performance on the iBuypower 12th Gen Z690 Gaming PC

Between Intel's Core i7-12700KF, with eight performance cores and four efficiency cores, as well as 16GB of RAM and a 1TB SSD, this gaming desktop is primed to do some serious office work on the side. Its biggest weakness, in the configuration we tested, was an entry-level SSD that fell behind faster, more expensive options.

Image 1 of 3

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 2 of 3

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 3 of 3

[Click to view image \(Image credit: Tom's Hardware\)](#)

On Geekbench 5, an overall performance test, the iBuypower notched a single-core score of 1,955 and a multi-core score of 3,502. That handily defeated the competitors running last year's chips, the best of which was the MSI Aegis RS 11th with 1,676/10,102 with an Intel Core i7-11700K. The Mek Hero and NZXT Streaming Plus, with Ryzen 7 5800X and Ryzen 5 5600X processors respectively, trailed further behind.

The script was flipped in our next test, where the iBuypower PC transferred 25GB of files at a rate of 474.06 MBps. That was behind the NZXT (712.67 MBps) Zotac Mek Hero (700 MBps) and MSI Aegis (635.3 MBps).

On Handbrake, in which we have computers transcode a 4K video to 1080p, the iBuypower needed 3 minutes and 57 seconds to complete the task. That's far ahead of the next closest, the MSI Aegis (5:19), as well as the Zotac Mek Hero (5:32) and the NZXT Streaming Plus (6:33).

Software and Warranty on the iBuypower 12th Gen Z690 Gaming PC

iBuypower delivers a fairly clean build of Windows 11 with its PC's. Our unit came with an installation of Windows 11 Home that was light on bloatware, minus some of the usual Microsoft Store bloat like Amazon Prime, tikTok, Spotify and Disney Plus.

In fact, iBuypower's only addition is a link to a website detailing Chimera Core, its community on Discord. This link is pinned to the taskbar, in the Start Menu and also bookmarked in the Edge browser.

The default iBuypower warranty is three years of service and one year of parts. The configurator clarifies that the Three Year Standard Warranty "...protects the system and its parts against defects in materials or workmanship for three years labor and one year parts from the original date of invoice. During this period, we will replace or repair any defective parts without charge to you."

For some, this is easier because if one part fails, it's all covered under warranty, though I'm sure there are some who prefer managing their own warranties, especially for long-term warranties on certain power supplies.

iBuypower 12th Gen Z690 Gaming PC Configurations

We tested the iBuypower 12th Gen Z690 i7 DDR4 Gaming PC with an Intel Core i7-12700KF processor, 16GB of TeamGroup T-Force Vulcan Z RAM, an MSI RTX 3070 Ventus 3X GPU and a 1TB WD Blue SN50 NVMe SSD. An Asus Prime Z690-P D4 motherboard ties it all together. As of press time, this specific configuration wasn't available, but the closest options would run you \$2,452.

Because iBuypower isn't currently offering this combination of parts as one of its "RDY" ready-to-ship builds, this means that our review unit is really just one of many permutations that could come out of iBuypower's configurator.

You can config this system can with processors from a Core i3-12100F up to a Core i9-12900K, with AIO water coolers up to 360mm. RAM goes up to 64GB DDR5 3600 or 16GB DDR4-4000 (dependant on your motherboard choice), and you can pick from a number of brands including Corsair, G.Skill, Adata and more.

GPUs, too, include all of the latest from AMD and Nvidia, from budget options (even an Nvidia GeForce GT 1030) up to a GeForce RTX 3090 or Radeon RX 6900 XT.

There are also choices for motherboards, power supplies and several different cases. If you get one of these, it could be an entirely different computer from what we saw. As of this writing, the motherboard we tested the PC with isn't available, likely a casualty of component shortages and other supply chain issues.

At its cheapest, you can get a very entry-level build for just over \$1,300, but that would include a mechanical hard drive and other major steps down from what we tested.

Bottom Line

[Click to view image \(Image credit: Tom's Hardware\)](#)

It is 2022, and it's still hard to get all of the components you want, let alone at a fair price. For better or worse, buying a prebuilt gaming PC is a fairly surefire way of getting them.

The iBuypower 12th Gen Z690 i7 DDR4 Gaming puts a series of competent components together in a chassis. That's a broad statement, but with so many configuration options to choose from, yours could come out totally different from our review unit.

There are only a handful of 12th Gen Intel prebuilts out now, with more surely to come soon, especially since the chipmaker announced a slew of new processors at CES. But the new silicon certainly offers a bump over 11th Gen Intel processors and AMD's current chips.

If you're looking to be able to buy a fixed system in a store, this might be a bit much for you. But for those who want to pick every part, iBuypower's 12th Gen Z690 i7 DDR4 Gaming is definitely an option when you're looking to get the parts you want but can't find them on their own.

[iBuypower 12th Gen Z690 i7 DDR4 Gaming \(Tom's Hardware\)](#)

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Press Release: INTEL(R) COLLABORATES WITH VSBLTY COMPUTER VISION IN A METAVERSE RETAIL EXPERIENCE FEATURING STORE AS A MEDIUM

757 words

18 January 2022

17:24

Dow Jones Institutional News

DJDN

English

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INTEL(R) COLLABORATES WITH VSBLTY COMPUTER VISION IN A METAVERSE RETAIL EXPERIENCE FEATURING STORE AS A MEDIUM

Philadelphia, PA, Jan. 18, 2022 (GLOBE NEWSWIRE) -- VSBLTY Groupe Technologies Corp. (OTCQB: VSBGF) (CSE: VSBY) (Frankfurt 5VS) ("VSBLTY"), a leading software provider of security and retail analytics technology, today announced that its Store as a Medium program is being featured in the WPP/Intel Store as a Medium app.

The group has leveraged the metaverse in a unique and interesting way to feature the supermarket and C-Store of the future. The Store-WPP/Intel/VSBLY collaboration was created as a free downloadable app available on the iTunes App Store and for Android. The virtual experience projects the future of retail and provides a window into what is happening worldwide as the pandemic wanes and retail rebounds.

A white paper, "Store as a Medium", will also be released at the National Retail Federation Conference along with the app. The white paper encapsulates key global reporting about SaaS and substantiates that the time is now for retailers to take advantage of the high profit opportunities in retail media networks.

On February 10, the group will also be hosting a round table discussion with ecosystem partners, that will strengthen the proposition that retailers can boost sales, improve store efficiency and receive data that will enable them to better understand shoppers, in addition to gaining new revenue. The discussion will also explain how SaaS will enable manufacturers and brands to have deeper engagements with customers right at point of sale and benefit from the data collected. The team leverages a group of best-in-class service providers, including Lenovo and Westrock, to provide turnkey solutions for brands and retailers.

Among those on the SaaS panel, who have contributed to the white paper, will be David Roth, CEO of The Store-WPP and Chairman BAV; Maroun Ishac, Director of Business Development, Retail Solutions Division for Intel Corporation; Pedro Garavito, Vice President Tech & Transformation, CTO, Middle Americas at Anheuser-Busch InBev; Jay Hutton, VSBLTY Co-founder & CEO; Leon Nicholas, WestRock Vice President, Retail Insights & Solutions; Akama Davis, Global Digital Out-of-Home Practice Lead, Xaxis; Jon Bird, Executive Director, VMLY&R Commerce; Luke Hurd, Director of Experience Design XR, VMLY&R; and Robert Daigle, Senior Manager, Global AI Business, Lenovo ISG.

"We have been working worldwide with joint venture partners uniquely qualified to play a role in helping transform and monetize the Store as a Medium with retailers and brands," said VSBLTY CEO Jay Hutton. "As the white paper validates, the future of SaaS is now. It's where the internet of things meets media advertising, machine learning and big data analytics. SaaS is not just for the 'big guys'. Even 'Mom & Pop' stores can also profit from SaaS," Hutton added.

"This innovation is happening today in retail," states Alec Gefrides, Vice President of the Internet of Things Group and General Manager of Retail, Banking, Hospitality and Education at Intel Corporation. "The app provides a sense of how quickly retail is evolving and is a place to connect and help brands, retailers and manufacturers imagine the innovation," said Gefrides.

Click on links below to Store as a Medium App:

iPhone and iPad: <https://apps.apple.com/us/app/store-as-a-medium/id1600728363>

Android: <https://play.google.com/store/apps/details?id=com.lmersar.StoreasaMedium>

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About VSBLTY (vsblty.net)

Headquartered in Philadelphia, VSBLTY (OTCQB: VSBGF) (CSE: VSBY) (Frankfurt: 5VS) (OTC: VSBGF) ("VSBLTY") is the world leader in Proactive Digital Display(TM), which transforms retail and public spaces as well as place-based media networks with SaaS-based audience measurement and security software that uses artificial intelligence and machine learning. Its proprietary technology effectively integrates with other digital retail solutions, including QR codes and mobile applications. The firm is also recognized for its leadership role in the growing Store as a Medium movement that enables brands to reach customers when and where buying decisions are being made while producing a new revenue stream for retailers.

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(END) Dow Jones Newswires

January 18, 2022 06:54 ET (11:54 GMT)

Document DJDN000020220118ei1i001dk

YouTuber Shows Why The **Intel Core i3-12100 \$97 US CPU is better than The \$200 AMD Ryzen 5 3600 In **Gaming****

Jason R. Wilson

727 words

8 January 2022

Wccftech.com

NEWAGAE

English

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YouTube channel [Testing Games](#) compared ten games, pitting each between the recently released [Intel Core i3-12100F](#) and AMD's (almost) three-year-old [Ryzen 5 3600](#) CPUs at 1080p resolution. As you can tell by the title of this article, you will see how far Intel has come in the last several years to be a formidable opponent to AMD as far as affordable but surprisingly powerful processor technology.

Ten game tests compare the \$97 US Intel Core i3-1200F 4-Core and \$200 US AMD Ryzen 5 3600 6-Core CPUs with surprising results

First, let's walk through the system components being used. The test setup used by Testing Games is running Microsoft's previous Windows 10 operating system, ASUS ROG STRIX Z690-A D4 motherboard utilizing the Intel Core i3 12100F processor, the ASUS ROG X570 Crosshair VIII Hero motherboard for the AMD Ryzen 5 3600 test, and then uses the be quiet! Dark Rock Pro 4 CPU cooler, two Samsung 970 EVO M.2 2280 1 TB SSD memory, CORSAIR's RM850i 850W PSU, and an unknown DDR4 memory.

The reason for not listing the specific brand of DDR4 memory is odd. The linked memory, however, is the G.SKILL Trident Z RGB Series 32GB (2 x 16GB) 288-pin DDR4 SDRAM DDR4-3600 (PC4 28800) Intel XMP 2.0 desktop memory. Not specifically listing this in the components used for the test does raise questions as to why it was not revealed initially. However, the final result would essentially offer similar results to the tests.

The games tested are:

- * Forza Horizon 5
- * Call of Duty: Warzone
- * Hitman 3
- * Cyberpunk 2077
- * Death Stranding
- * PUBG (Players Unknown Battle Ground)
- * Microsoft Flight Simulator
- * Horizon Zero Dawn
- * Mafia Definitive Edition
- * Shadow of the Tomb Raider

Here is the video to witness the tests in action:

[Click to access link.](#)

The results of the test prove that Intel's newer Golden Cove cores easily outperform AMD's somewhat older Zen 2 technology. Where the AMD R5 3600 CPU, with its 6 cores and 12 threads, offers lower frame rates per second than the newer Intel Core i3-12100F, with its 4 cores and 8 threads, offers a slightly higher frame rate with similar results.

Let's break down the total results. We have included screenshots of each game during the test and tried to find peak times that both systems were running at full power.

When first looking at the Forza Horizon 5 test, tested with the AMD Ryzen 5 3600 chip, averaged 175 FPS compared to Intel's result of 188 FPS—Intel receiving a small improvement (only 13 FPS better; not much more than a 1% improvement)—however, Intel's test was drawing more power from the GPU than AMD

(around 30-40W between the two tests). For processing power, even though Intel was processing higher with an average of around 65% with a very minimal difference in the MHz, the temperature and power consumption was lower for Intel compared to AMD.

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And, going through the remainder of the games listed, the results were extremely similar. Graphically, it is very hard to distinguish large differences in visuals between the two chips. I saw only a few skips in images during Hitman 3 and Horizon Zero Dawn. Users would have to look meticulously for minor differences between the two companies. Temperatures can definitely affect performance, but even then, with Intel running slightly higher than AMD, it was nowhere near dangerously high levels produced by either company.

As far as the final outcome, it seems beneficial to save up to \$100 between the two CPUs, especially with just slightly better performance while gaming from Intel, compared to the older AMD chipset. The 6 cores from AMD might come in handy but for gaming setups, the Core i3-12100F seems like a perfect choice when coupled with an entry-level H610 board and DDR4 memory.

Source: [Testing Games](#)

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GADGETS NEWS

CES 2022: MSI unveils new gaming and creator laptops with 12th Gen Intel Core H-series processors and up to RTX 3080 Ti GPUs

623 words

7 January 2022

The Times of India

TOI

English

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Taiwanese gaming hardware maker MSI has unveiled its new lineup of laptops equipped with the latest 12th Gen Intel H series processors. The new laptops are equipped with Intel Core i7 or above processors and Nvidia GeForce RTX 3070 or above graphics cards. Following the global launch, the new range of laptops will be available in the Indian market soon. Here is a brief look at the new laptops. MSI GS77/66 Stealth The GS77 Stealth laptop comes with a new "core black" colour and a more durable zinc alloy hinge. At less than 21mm for Z height, MSI managed to enlarge the touchpad and keycap size for a precise and comfortable typing experience. It is also equipped with six speakers. As per the company, business gamers will benefit from the webcam lock switch and support for up to 100W PD charging. MSI Raider GE76/66 The MSI Raider GE series retains the panoramic aurora lighting which creates an alluring sci-fi ambience.

With the thermal design by MSI, the Raider GE series performance can reach up to a total of 220W with GeForce RTX 3080 Ti via MSI OverBoost, claims the company. The Phase Change Liquid Metal Pad is meant to increase performance by an extra 10%, and the series comes with displays up to 4K with the support of Discrete Graphics Mode. MSI Vector GP76/66 As per MSI, the branding "Vector" represents MSI's expectation for the GP series to have all the power needed to move forward with a satisfying experience in gaming, engineering, or scientific computing. With Cooler Boost 5 Technology, the Vector's performance can reach up to 210W via MSI OverBoost, claims the gaming hardware maker. Rainbow Six Extraction Edition – Crosshair 15 The Crosshair GL series is a collaboration between MSI and Ubisoft. The series features a futuristic design with exclusive sci-fi elements inspired by the feeling and mood of gameplay and comes equipped with Intel Core™ i9 processors and Cooler Boost 5 Technology. The Crosshair GL Series comes in three variants: Crosshair 15, Crosshair 17 and the limited-edition Crosshair 15 Rainbow Six Extraction Edition that comes with an exclusive bundle pack. MSI Pulse GL76/66 The MSI Pulse GL76/66 keeps the design features by Maarten Verhoeven along with the titanium power armor inspired by Pulse energy for the Dragon Army to enhance agility and flexibility. MSI claims that in this device, Cooler Boost 5 increases airflow by 15%, even with a 33% reduction of wall thickness. MSI Sword 17/15, Katana GF76/66 The MSI Sword series boasts a new knight image with "magical immortal force" – "Dragon Power" - wielding an enchanted sword of victory. This knight character was created by Justin Goby Fields, a famous concept artist from the United States. Both the Sword and Katana series are set to help gamers succeed with a comfortable key travel at 1.7mm and Cooler Boost 5. Creator Z17, Creator Z16P and Creator Z16 As per the company, the Creator Z17 is the world's first 17-inch laptop to support pen touch, and features the 16:10 screen ratio with a thin bezel design and True Color Technology. The Creator Z16P has an extra 20% performance boost with Vapor Chamber Cooler, which generates 76% extra more cooling area, 65% more airflow, and decreases the surface temperature by 2°C (3.6°F). The Creator M16 is a more portable choice for students or creators with the need for a powerful performance. It features a QHD+ True Pixel display that lays flat at 180° and a slim aluminium chassis.

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Document TOI0000020220106ei1700068



CE Noticias Financieras English

Portaltic.-Asus TUF Gaming F15 and F17: new laptops with 12th generation Intel and Nvidia RTX 3070

353 words

5 January 2022

CE NoticiasFinancieras

NFINCE

English

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MADRID, 5 (Portaltic/EP) Asus has put the finishing touch on Wednesday to its new products presented at CES 2022 with the announcement of new gaming-oriented laptops, among which are the new TUF Gaming F15 and F17, with 12th generation Intel Core processors and Nvidia GeForce RTX 3070 graphics. TUF Gaming F15 and F17 head the TUF catalog, the 'gaming' series of Asus (apart from its ROG brand). Both models boast two display options: a 300Hz FHD display for competitive gaming and a 165Hz QHD panel. In terms of design, the F15 and F17 feature an aesthetic inspired by Mecha anime and are built according to the MIL-STD-810H military durability and resistance standard. The new gaming laptops are available in a configuration with the 12th generation Intel Core i7-12700H processor and Nvidia GeForce RTX 3070 graphics with 140W maximum TGP. The MUX switch optimizes the graphics power of these machines, preventing the notebook from using the integrated GPU when more frames are needed.

Gamers can also activate a GPU mode from Armoury Crate that reduces latency and improves performance by 5-10% on average. Asus has also equipped these PCs with new Arc Flow fans with 84 blades and variable thickness to reduce turbulence and increase airflow. This design is quieter and ventilates 13% better than the previous generation of fans. TUF DASH F15 The brand has concluded its news with the announcement of TUF Dash F15, a refresh of the lightweight gaming notebook model originally launched in 2020 as part of the TUF family. The 2022 TUF Dash F15 maintains a sub-20mm thickness, while improving its performance with 12th Gen Intel Core i7-12650H processors and Nvidia GeForce RTX 3070 notebook graphics with MUX Switch The machine also features new DDR5 memory at 4.800 MHz DDR5 memory, two PCIe 4.0 SSD slots, a 165 Hz QHD panel covering the full DCI-P3 color space, Thunderbolt 4 connectivity and 100W Power Delivery charging via USB-C.

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Intel focuses on autonomous driving, gaming and laptop chips at CES 2022

639 words

5 January 2022

15:23

MarketWatch

MRKWC

English

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New Mobileye system-on-a-chip designed for consumer usage, while new gaming chips seek to challenge Nvidia and AMD offerings

BloombergIntel Corp. highlighted its challenge to rivals in gaming and autonomous driving, as well as a new generation of laptop chips Tuesday at CES 2022.

In a Media Days presentation that was streamed for those not in attendance at the Las Vegas tech conference, Intel INTC introduced its 12th generation Core i9-12900HK processor for laptops, which it said offered 40% higher performance and up to 28% faster game play from its previous i9-11980HK chip.

The company said it expects more than 100 devices from Acer Inc. TW:2353, AsusTek Computer Inc. TW:2357, Dell Technologies Inc. DELL, HP Inc. HPQ, Lenovo Group Ltd. HK:992 and more to carry the i9-12900HK. Additionally, Intel introduced its ultraportable mobile P-series product line for thin-and-light laptops.

Read: [The pandemic boom in videogames is expected to disappear in 2022](#)

The chip maker also said it was shipping its "Alchemist" Arc ray-tracing graphics chip this quarter to original equipment manufacturers to be used in more than 50 mobile and desktop products. Intel has been trying to develop new gaming technology that can challenge rivals Nvidia Corp. NVDA and Advanced Micro Devices Inc. AMD, chip makers that have managed to effectively challenge Intel in the data center and other chip markets in recent years.

"This is such a huge step forward in our XPU journey," Gregory Bryant, who leads Intel's Client Computing Group, said in Tuesday's presentation.

Earlier in the day, both [Nvidia](#) and [AMD](#) announced their latest releases for gaming chips and laptops in presentations linked to CES but not part of the official Media Days lineup.

Read: [For the videogame industry to grow, it needs to first grow up](#)

Intel also detailed a new Mobileye chip for autonomous driving, which it foresees as the cheap chip needed to get automated driving in the hands of consumers. Most experts expect vehicles with more autonomous capabilities to roll out in the coming years, but not in cars owned by typical consumers — most are expected to be ride-hail vehicles or freight-movers, like big-rigs, where higher prices will lead to savings over time for the owner.

Mobileye is marketing the EyeQ Ultra as a system-on-a-chip that can scale down the price of automated driving for consumers, with capability for Level 4 autonomous driving, just short of full autonomy. Mobileye, [which Intel expects to spin off this year in an initial public offering](#), projected that the chips will start being produced in late 2023 and full automotive-grade production to hit in 2025.

Mobileye announced other advancements Tuesday with Geely Automotive Holdings Ltd.'s HK:175 Zeekr electric vehicle brand from China. The two companies are producing and shipping a new "Level 2+" advanced driver-assistance system, and plan to begin production in 2023 on a Level 4 consumer car. Mobileye also brought out Ford Motor Co. F Chief Executive Jim Farley to discuss work being done with that automaker, as well as Volkswagen Group XE:VOW CEO Herbert Diess, who detailed his company's integration of Mobileye's mapping features.

"We just couldn't offer the systems we do at Ford without you, and we're betting on Mobileye for the future," Farley told Mobileye CEO Amnon Shashua in the presentation.

Intel shares finished Tuesday down 0.1% at \$53.14, while AMD and Nvidia stocks closed down 3% and \$5, respectively, after earlier presentations. Intel shares are up 7% over the past 12 months through Tuesday,

compared with a 44% gain on the PHLX Semiconductor Index SOX and a 30% gain on the S&P 500 index SPX.

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PC/ Laptops

CES 2022: Asus ROG Gaming Laptops, Desktops Refreshed With Updated Intel, AMD, Nvidia Hardware

David Delima

1,208 words

5 January 2022

14:05

NDTV

NDTVIN

English

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Asus ROG Zephyrus Duo 16, Zephyrus G14, Strix SCAR, and Strix G Series laptops have been launched by the company at CES 2022. The new gaming laptops feature updated Intel and AMD processors, along with Nvidia and AMD GPUs, and run on Windows 11. The company also launched Asus Flow Z13 gaming tablet which runs on Windows for portable gaming. It comes with powerful Nvidia RTX graphics, a 4K display with 60Hz refresh rate, and 1TB SSD storage. Asus has also updated the ROG Strix GT15 gaming desktop with updated Intel and Nvidia RTX graphics, and announced a new mechanical keyboard — Asus ROG Strix Flare II Animate. Prices and availability details of most new products are yet to be announced by the company.

Asus ROG Strix G15

Photo Credit: Asus

Asus ROG Strix SCAR, Strix G15, Strix G17 specifications

The new Asus ROG Strix SCAR comes with up to 12th-Gen Intel Core i9-12900H processors, the latest mobile processors from the company. The gaming laptop comes with an Nvidia GeForce RTX 3080 Ti GPU, PCIe 4.0 storage, and DDR5 memory. The laptop will be available in [15-inch](#) and [17-inch](#) models, according to Asus. The [15-inch model](#) will offer customers a choice of three IPS displays — Quad-HD resolution at 120Hz and 165Hz refresh rate and full-HD at 300Hz refresh rate. Meanwhile, the [17-inch model](#) will offer either Quad-HD at 240Hz refresh rate or full-HD at 360Hz refresh rate display options.

Meanwhile, [Asus Strix G15](#) and [Strix G17](#) are equipped with AMD Ryzen 9 6900HX processors and Nvidia GeForce RTX 3080 Ti GPUs. [Asus ROG Strix G15](#) sports a full-HD display with 300Hz refresh rate or Quad-HD resolution at 165Hz refresh rate, while the [ROG Strix G17](#) offers a full-HD display at 360Hz refresh rate or Quad-HD resolution with a 240Hz refresh rate. The Strix models are equipped with 90Whr batteries and come with support for 100W charging over USB Type-C, along with Wi-Fi 6E and 2.5G LAN connectivity for improved network performance.

Asus ROG Zephyrus M16 (2022)

Photo Credit: Asus

Asus ROG Zephyrus G14, Zephyrus G15, Zephyrus M16 specifications

Asus has updated its ROG Zephyrus series of gaming laptops for 2022 with the latest AMD processors and GPUs. The updated Asus ROG [Zephyrus G14](#) is equipped with an AMD Ryzen 9 Series processor, paired with AMD Radeon RX 6000S series graphics. The laptop is equipped with 1TB of PCIe SSD storage and DDR5 RAM.

Asus ROG [Zephyrus G14](#) sports the company's ROG Nebula display, offering Quad-HD resolution at 120Hz refresh rate, 100 percent DCI-P3 coverage, and 3ms response time. Asus also unveiled its refreshed [ROG Zephyrus G15](#) and [M16](#) laptops that have been updated with the latest hardware from AMD and Nvidia, along with DDR5 RAM and support for Wi-Fi 6E.

Asus ROG Zephyrus Duo 16 (2022)

Photo Credit: Asus

Asus ROG Zephyrus Duo 16 specifications

Asus has equipped [ROG Zephyrus Duo 16](#) with an AMD Ryzen 9 6980HX processor, along with an Nvidia GeForce RTX 3080 Ti GPU at 150W. The gaming laptop comes with two display options, the first featuring a Quad-HD ROG Nebula HDR display with 512 mini-LED dimming zones, with 165Hz refresh rate and VESA DisplayHDR 1000 certification. The second display option features a BOE Dual Spec panel, which offers switching between 4K resolution at 120Hz and full-HD resolution at 240Hz.

The [ROG Zephyrus Duo 16](#) also features a secondary display, which offers additional control support in games like Dying Light 2, and comes with Asus' NumberPad technology on the trackpad, and the company's Liquid Metal Conduction Extreme solution to reduce CPU temperatures by 15 degrees compared to regular thermal paste solutions. The company also states that the ROG Zephyrus Duo 16 fits a 16-inch display into a 15-inch laptop chassis, offering a smaller footprint than the previous generation.

Asus ROG Flow Z13

Photo Credit: Asus

Asus ROG Flow Z13, ROG Flow X13 specifications

Asus also unveiled the [ROG Flow Z13](#), pushing its ROG Flow gaming laptop series into a compact gaming tablet. The new ROG Flow Z13 is a convertible tablet featuring a Surface-like design which is equipped with a 14-core Intel Core i9-12900H processor, paired with an Nvidia GeForce RTX 3050 Ti GPU and LPDDR5 memory at 5,200MHz. Asus ROG Flow Z13 packs 1TB of PCIe SSD storage and comes with support for fast charging over USB Type-C.

The new Asus ROG Flow Z13 gaming tablet comes in two display options with Gorilla Glass protection and offers 500 nits of peak brightness — the first is a 4K display with 60Hz refresh rate and 85 percent DCI-P3 coverage, while the full-HD resolution display offers a 120Hz refresh rate and 100 percent sRGB coverage. Asus ROG Flow Z13 comes with a screen cover keyboard and comes with mouse support and also supports touch input as well as gamepads.

Asus has updated its [ROG Flow X13](#) gaming laptop for 2022 with the latest AMD Ryzen 9 6000 Series processor and an Nvidia GeForce RTX 3050 GPU. [Asus ROG Flow Z13](#) and [Rog Flow X13](#) are both compatible with the company's XG Mobile external GPUs according to Asus, featuring an AMD Radeon RX 6850M XT GPU and additional ports for connectivity.

Asus ROG Strix GT15 specifications

The company's [ROG Strix GT15](#) gaming desktop has also been updated, and this year's model will be powered by an Intel Core i7-12700KF processor, paired with an Nvidia GeForce RTX 3080 GPU and 64GB of DDR4 RAM at 3200MHz. Asus ROG Strix GT15 will also be available in other configurations and will come with an inbuilt carrying handle and a headphone hook, according to the company.

Asus ROG Strix Flare II Animate price, specifications, features

In addition to the gaming laptops, convertible tablet and desktop announced by Asus, the company has also launched the ROG Strix Flare II Animate, a mechanical keyboard which sports a dot-matrix LED display at the top right corner. The Strix Flare II Animate is capable of showing animations and logos or information like battery life and the time of day. The mechanical keyboard comes with an RGB strip at the bottom, and a wrist rest.

[Asus ROG Strix Flare II Animate](#) keyboard is equipped with swappable ROG NX switches, while customers can also choose Cherry MX Blue, Brown, or Red switches. features media controls, 8000Hz polling, and come with USB 2.0 passthrough support along with PBT Double-shot keycaps and sound dampening foam, according to the company.

The new Strix Flare II Animate is priced at \$200 (roughly Rs.14,900), while a stripped-down version of the keyboard without swappable keys and the LED lighting will be sold for \$180 (roughly Rs. 13,400), according to the company. What are the best games of 2021? We discuss this on [Orbital](#), the Gadgets 360 podcast. Orbital is available on [Spotify](#), [Gaana](#), [JioSaavn](#), [Google Podcasts](#), [Apple Podcasts](#), [Amazon Music](#) and wherever you get your podcasts.

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Document NDTVIN0020220105ei150008p

Razer's 2022 Blade Lineup Features Next-Gen **Intel** Alder Lake & AMD Ryzen 6000 CPUs, Up To RTX 3080 Ti Graphics, More **Gaming** Performance

Hassan Mujtaba

2,254 words

4 January 2022

Wccftech.com

NEWAGAE

English

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Razer has officially revealed its 2022 lineup of Blade laptops which are powered by the next-gen Intel & [AMD CPUs](#) and the most powerful discrete GPU ever made.

Razer Goes All Out With 2022 Blade Laptop Lineup: Intel Alder Lake & AMD Ryzen 6000 CPUs With The Fastest NVIDIA Mobile GPU Ever Made!

Razer is going all out by upgrading not one but its entire [Blade laptop](#) stack, including 17-inch, 15-inch, and 14-inch models. The new laptops are outfitted with the latest and greatest hardware that the tech world has to offer so let's start with the specifications.

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Razer Blade 17 Laptop (Intel 2022)

We first have the high-performance Razer Blade 17 which will be featuring Intel Alder Lake CPUs with options including the Core i9-12900HK and Core i7-12800H (14 cores up to 5 GHz). There are at least 6 options to select from with FHD, QHD, and UHD options (with and without GSYNC) & up to 360Hz refresh rates. As for GPU options, you can start with a GeForce RTX 3060 or go all the way up to the RTX 3070, RTX 3070 Ti, RTX 3080, and even an RTX 3080 Ti option. It is said that the new Ti options are geared for extreme gamers with the 3070 Ti being 70% faster than the RTX 2070 SUPER while the RTX 3080 Ti blazes past the desktop Titan RTX.

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For memory, the Razer Blade 17 features up to 32 GB DDR5-5200, and storage options include up to 4 TB NVMe SSD and an additional M.2 slot. The laptop comes with a compact 280W adapter and houses an 82 WHr lithium polymer battery. The Razer Blade 17 starts at \$2699.99 US for the base variant and goes up to \$4299.99 US for the fully stacked variant.

Razer Blade 15 Laptop (Intel 2022)

Just like the Blade 17, the Razer Blade 15 comes in six different options to select from with almost the same configurations except being within a smaller package that allows for only 2 TB SSD and a 15" display across all models that can go either FHD or QHD. There isn't any UHD option within the Blade 15 stack. The battery is slightly smaller at 80 WHr and is powered by the same 230W adapter. The Razer Blade 15 starts at \$2499.99 US for the base configuration and goes all the way up to an insane \$3999.99 US for the fully stacked model.

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Razer Blade 14 Laptop (AMD 2022)

The Razer Blade 14 moves away from Intel CPUs and goes all AMD with three configurations that are powered by AMD's latest Ryzen 6000 'Rembrandt' APUs. The three options include a single FHD model (144 Hz) and two QHD variants (165 Hz). These are all AMD Freesync and GSync compatible / compliant. All variants are equipped with AMD's Ryzen 9 6900HX APU which features 8 cores, 16 threads, 20 MB of L3 cache along with the latest RDNA 2 based Radeon 680M graphics. As for the CPU clocks, they have been rated at 4.6 GHz Max boost which is slightly lower than the max 4.9 GHz that this chip offers. This is due to the TDP configured down to 35W from its original 45 Watt spec.

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The discrete GPU options for the Razer Blade 14 include the GeForce RTX 3060, RTX 3070 Ti, and RTX 3080 Ti. Memory comes in the form of a soldered 16 GB DDR5-4800 (Dual-Channel) design & there's up to 2 TB of upgradable storage onboard the laptop. The Razer Blade 14 laptops with AMD Ryzen 6000 APUs will have a price starting at \$1,999.99 US.

Razer Blade 17, 15, 14 Official Specs Sheet:

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RAZER ANNOUNCES ALL-NEW BLADE GAMING LAPTOPS AT CES 2022

Razer, the leading global lifestyle brand for gamers (Hong Kong Stock Code: 1337), is kicking off 2022 with new Razer Blade gaming laptop models including the Razer Blade 14, Razer Blade 15, and Razer Blade 17. The world's fastest laptops for gamers and creators are equipped with the recently announced NVIDIA® GeForce RTX 30 Series Laptop GPUs, up to an RTX 3080 Ti, making the new Blades better than ever, now shipping with Windows 11. All new Razer Blade gaming laptops now also include groundbreaking DDR5 memory, providing blistering clock speeds up to 4800MHz, an increase in frequency by up to 50% compared to the previous generation.

"The Razer Blade series continues to be the best gaming laptop by providing desktop-class performance on-the-go," says Travis Furst, Senior Director of Razer's Systems business unit. "Additionally, we've enabled creators to work anywhere with gorgeous displays, available NVIDIA Studio drivers, and up to 14-Core CPUs. Users will have the ability to choose any model or configuration that best fits their gaming or creating needs, while getting the latest and greatest in graphics, memory and processing technology."

NVIDIA GeForce RTX laptops are based on the revolutionary Ampere architecture, with 2nd generation RT Cores for ray tracing and 3rd generation Tensor Cores for DLSS and AI.

The new GeForce RTX 3080 Ti Laptop GPU brings the flagship 80 Ti class of GPUs to laptops for the first time. Featuring 16GB of the fastest GDDR6 memory ever shipped in a laptop, the RTX 3080 Ti delivers higher performance than the desktop TITAN RTX. The new GeForce RTX 3070 Ti is up to 70% faster than RTX 2070 SUPER laptops and can deliver 100 frames per second at 1440p resolution.

Additionally, the new 4th generation of Max-Q Technologies, with CPU Optimizer, Rapid Core Scaling, and Battery Boost 2.0, further enhance efficiency, performance, and battery life.

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Lean, Mean, and Razer Green

The Razer Blade 14, 15, and 17 are powered by cutting-edge advancements from both AMD® and Intel®. The Blade 14 returns with the next generation of AMD Ryzen 6000 Series processors. Every configuration offers the ultra-fast Ryzen 9 6900HX processor, enabling some of the most powerful AMD gaming possible on a mobile device.

Both the Blade 15 and Blade 17 come equipped with the newest 12th Gen Intel Core H-Series Processors, up to an Intel Core i9-12900H with a new 14-core count over the previous 8-core generation. Intel's 12th Gen processors bring a revolutionary new design with a performance hybrid architecture that combines performance-cores with efficient-cores, offering users the freedom to chat, browse, stream, edit, record, and play. The newest generation of Intel Core i9 processors will see high-speed frequencies up to 5.0GHz.

Each Razer Blade is uniquely imagined with exemplary CNC-milled aluminum chassis and high-quality custom components, resulting in a gaming laptop unlike any other on the market. Designed with the gamer's wellness in mind, the new Blades sport a refreshed keyboard design, with slightly larger keys, making the typing experience more ergonomic than ever before. The revised design also includes laser-cut speakers, a refined hinge design with a thinner profile and additional ventilation with well-designed rubber feet to create convenient cooling airways.

Blade 14: The Ultimate 14" Gaming Laptop

The most powerful 14-inch gaming laptop of 2021 is back and more powerful than ever before. The new Razer Blade 14 combines the latest AMD Ryzen 9 processor with an improved 16GB of DDR5 memory to create a blazing-fast gaming device that surpasses the previous generation.

The Blade 14 AMD laptop continues to be a remarkably thin, light, and compact device with impeccable performance, now packed with further refinements to make a great gaming laptop that much better. With a newly implemented MUX Switch, the Blade 14 sees increases in gameplay performance by utilizing the discrete GPU to drive games on the internal display. The Razer Blade 14 now also joins its slightly larger family members with the addition of the same fingerprint resistant coating and a 1080p IR webcam that supports Windows Hello, making video calls twice as clear as before.

Blade 15: Power. Performance. Perfection.

Beyond offering the latest chipsets from both NVIDIA GeForce and Intel, the Razer Blade 15 returns with cutting edge displays to make the most of the latest hardware. The Blade 15 will continue to offer the best of the best in display technology, including Full HD 360Hz and QHD 240Hz configurations, as well as an all-new UHD 144Hz configuration. The new IPS-Grade display features improved refresh rates, up from the 60Hz of previous generations, while simultaneously covering 100% of the DCI-P3 color gamut, to provide superb clarity and contrast when gaming or creating. Featuring the most powerful processors, boundary pushing displays, and blazing-fast memory all fitted into a finely tuned premium chassis, the Razer Blade 15 remains the perfect gaming laptop.

Blade 17: Built for the Pros.

Professional creators and gamers hunting for the ultimate desktop replacement need to look no further, as the new Razer Blade 17 comes with specifically chosen advancements in both audio and power delivery. The Razer Blade 17 doubles down on music and gameplay, boasting eight total speakers, up from the previous four, meaning creators can pick up minute details in audio mixing even without dedicated speakers or headsets. Enjoy more hours of gameplay than ever before when unplugged or on the go with the larger 82Whr internal battery, over 10Whrs larger than previous generations. And when bringing the Blade 17 on to go, traveling is easier than ever as it now ships with a newly designed GaN-powered 280W charger, giving users access to even more power in a size comparable to the average 180W power brick.

Classic Features and Extended Razer Care

Page 75 of 260 © 2022 Factiva, Inc. All rights reserved.

The new iterations of the Razer Blade 14, 15, and 17 ship with Windows® 11 pre-installed, with all its prevalent gaming benefits including DirectStorage, Xbox GameBar and Xbox Game Pass. The sides of each Razer Blade are lined with a variety of inputs, depending on the chassis, ranging from USB-C to HDMI 2.1 to a high-speed UHS-II SD card reader, so users can connect to anything, without hunting for a dongle.

The keyboards of all three Razer Blades are powered by Razer Chroma RGB that can be customized for productivity or gaming with front-facing speakers to keep work and play fun and engaging. All three of the new Razer Blades continue to provide immersive audio for a 360-degree soundscape when listening to movies, music, or games with THX® certified THX Spatial Audio over any analog headphones or the device speakers.

Additionally, the new generation of Razer Blades will begin a new extended battery warranty of up to 2 years, to help ensure users that their Blades are taken care of every step of the way by helpful Razer service and support.

To learn more about the all-new Razer Blades, go [here](#)

PRICE & AVAILABILITY

The new Razer Blade 14 starts at \$1,999.99/2,199.99€ MSRP on Razer.com and will be available for pre-order at Razer.com, Razer Store locations and select retailers on February 10th and for purchase from select retailers in Q1 2022.

The new Razer Blade 15 starts at \$2,499.99/2,799.99€ MSRP and will be available for pre-order exclusively at Razer.com and Razer Store locations on January 25th and for purchase from select retailers in Q1 2022.

The new Razer Blade 17 starts at \$2,699.99/2,999.99€ MSRP and will be available for pre-order exclusively at Razer.com and Razer Store locations on January 25th and for purchase from select retailers in Q1 2022.

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MSI Shows off Its Powerful Gaming & Creator Lineup at CES 2022: Stealth, Raider, Crosshair, Pulse, Creator Series With Intel Alder Lake & NVIDIA RTX 30 'Ti' Series

Hassan Mujtaba

4,925 words

4 January 2022

Wccftech.com

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English

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MSI has introduced its next-gen gaming and creator series laptops powered by Intel's Alder Lake CPUs & NVIDIA GeForce RTX 30 'Ti' GPUs.

MSI 2022 Stealth, Raider, Crosshair, Pulse, Creator 2022 Series Laptops Displayed at CES, Feature Intel Alder Lake CPUs & NVIDIA GeForce RTX 30 'Ti' GPUs

Press Release: MSI, a world-leading gaming and business computing brand, has launched the [MSIology: Gameverse](#) virtual event announcing its latest gaming and content creation laptops. The event is available to [stream now](#).

The new lineup features the latest 12th Gen Intel H series processors, up to NVIDIA GeForce RTX 3080 Ti Laptop GPU, and MSI-exclusive thermal solutions, which boosts performance to a whole new level. MSI not only just released the highest-performance laptop in the market but also delivered a series of Meta-Ready laptops to connect users to the Metaverse.

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The new MSI laptops boasting the Meta-ready logo are equipped with Intel Core i7 or above processors and NVIDIA® GeForce RTX 3070 Laptop GPUs or above, for anyone who'd like to experience Metaverse-compatible performance.

Hardware & Software Changes:

Phase-Change Liquid Metal Pad: The Secret to MSI's High Performance

MSI proudly announces brand-new exclusive cooling technology: the Phase-Change Liquid Metal Pad. When the computer's heat reaches 58° Celsius (136° F), the Phase-Change Liquid Metal Pad melts and fills the space between the CPU and the thermal block. This phase transition makes the heat transfer more efficient and reliable than traditional thermal pastes and liquid metal solutions. With this new innovative cooling technology, the overall performance increases up to 10%.

The GPUs of the Future

NVIDIA GeForce RTX laptops are based on the revolutionary Ampere architecture, with 2nd generation RT Cores for ray tracing and 3rd generation Tensor Cores for DLSS and AI.

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The new GeForce RTX 3080 Ti Laptop GPU brings the flagship 80 Ti class of GPUs to laptops for the first time. Featuring 16GB of the fastest GDDR6 memory ever shipped in a laptop, the RTX 3080 Ti delivers higher performance than the desktop TITAN RTX. The new GeForce RTX 3070 Ti is up to 70% faster than RTX 2070 SUPER laptops and can deliver 100 frames per second at 1440p resolution.

Additionally, the new 4th generation of Max-Q Technologies, with CPU Optimizer, Rapid Core Scaling, and Battery Boost 2.0, further enhance efficiency, performance, and battery life.

Brand New MSI Center AI Technology

Not solely focused on hardware performance, MSI also worked on intelligent technologies for a smoother experience. The latest MSI Center now provides AI modes. The new “Smart Auto” feature will detect which situation you’re in, and automatically adjust the system into different modes, resulting in the best experience for your laptop. The “Ambient Silent AI” feature will dynamically balance fan speed based on the surrounding noise and give the highest possible performance while still keeping the laptop quiet.

New & Updated Laptops:

Unleash New Gaming Power

The new gaming laptop lineup features a significant performance improvement over previous models, including up to 30%~45% increase in CPU performance. MSI also brought its signature innovative technologies to the thermal solution, with the exclusive Phase Change Liquid Metal Pad. As efficient as liquid metal but safer and more reliable, Phase Change Liquid Metal Pad allows users to fully unleash the power of the new 12th Gen Intel Processors.

Sleek & Sophisticated – GS77/66 Stealth

The award-winning Stealth GS series is a lightweight powerful laptop for enthusiastic gaming and professional use. GS77 comes with a new “core black” color and a new, more durable, zinc alloy hinge. At less than 0.83” (21mm) for Z height, MSI managed to enlarge the touchpad and keycap size for a precise and comfortable typing experience.

[Click to view image.](#)

It is also equipped with 6 speakers for crisp treble and powerful bass. Business gamers will benefit from the webcam lock switch and support of up to 100W PD charging for better security and mobility.

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Ultimate Powerhouse – Raider GE76/66

MSI Raider GE series is a real eye-catcher and keeps the panoramic aurora lighting which creates an alluring sci-fi ambiance. The performance, however, is even more astonishing; with the innovative thermal design by MSI, the Raider GE series can reach up to a total of 220W via MSI OverBoost. The Phase Change Liquid Metal Pad increases 10% of performance, and with displays of up to 4K and Discrete Graphic Mode, gamers will have a fast and smooth experience with the MSI Raider Series.

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*Phase-Change Liquid Metal Pad only available for Raider GE series and Stealth GS77 with Intel® Core i9 processor on configuration for maximized performance.

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Born for Performance – Vector GP76/66

The Vector GP Series represents a new way of thinking about computing; the name “Vector” was born from users’ experiences in gaming, engineering, and scientific computing. The newly crowned Vector GP series features MSI-exclusive Cooler Boost 5 Technology and performance that can reach up to 210W.

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Rainbow Six Extraction Edition – Crosshair 15

Crosshair GL series is a collaboration between MSI and Ubisoft. The futuristic design featuring exclusive sci-fi elements is inspired by the tension and unsettling mood of gameplay. It is equipped with Intel® Core™ i9 processors and Cooler Boost 5 Technology, and the graphic performance is at its maximized level, allowing the Crosshair 15 to stand its mid-tier competitors. Crosshair GL Series comes in three variants: Crosshair 15, Crosshair 17, and the limited-edition Crosshair 15 Rainbow Six Extraction Edition that comes with an exclusive bundle pack.

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Pulsating Power– Pulse GL76/66

The MSI Pulse GL76/66 keeps the image designed by Maarten Verhoeven - the titanium power armor inspired by Pulse energy for the Dragon Army to enhance agility and flexibility - but adds Cooler Boost 5 that increases 15% airflow with a 33% reduction in wall thickness.

[Click to view image.](#)

Sharpen Your Game - Sword 17/15, Katana GF76/66

The MSI Sword series has a new knight image with the magical immortal force, "Dragon Power", wielding an enchanted immortal sword of victory. This knight character is created by Justin Goby Fields, a famous concept artist from the United States. Both Sword and Katana series are set for gamers with a comfortable key journey at 1.7mm and the Cooler Boost 5 Cooling system.

Bigger and Better Content Creation Machines

MSI's new Creator series is now a bigger family with panels up to 17 inches, and the CPU performance is improved by 45% with the new Vapor Chamber Cooler. MSI also added in new features specifically for creators, such as touch support for MSI Pen, Calman verified True Pixel Display, and collaboration with DTS for rich, immersive surround sound effects.

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New Ways to Create - Creator Z17, Creator Z16P, and Creator M16

The Creator Z17 is the world's first 17-inch laptop to support pen touch, and with a 16:10 screen with thin-bezel design and True Color Technology, the perfect companion for creators. The Creator Z16P has an extra 20% performance boost with Vapor Chamber Cooler, which generates 76% more cooling area, 65% more airflow, and decreases 2°C on surface temperature. With the competitive performance and the CNC-milled aluminum chassis, the Creator Z Series laptops are Studio Laptops for creators, inquisitive professionals, or consumers looking for high-quality, premium products.

[Click to view image.](#)

The Creator M16 is a more portable and stylish choice for students or creators with the need for powerful performance. It features QHD+ True Pixel displays with a 180° lay-flat screen and an ultra-light and slim aluminum chassis.

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Appendix – Specifications (You can also find the full specs and pricing in the pictures below by clicking on them to view the high-res images).

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Model Name	Stealth GS77	Stealth GS66
Processor	Up to latest 12th Gen Intel® Core i9-12900H Processor	
Operating System	Windows 11 Home Windows 11 Pro (MSI recommends Windows 11 Pro for business.)	
Memory	DDR5-4800, 2 slots, up to 64GB	
Display	* 17.3" UHD (3840x2160), 120 Hz Refresh Rate, 100% Adobe RGB(Typical), IPS-Level panel (Optional) * 17.3" QHD (2560x1440), 240 Hz Refresh Rate, 100% DCI-P3(Typical), IPS-Level panel * 17.3" Full HD (1920x1080), 360 Hz Refresh Rate, IPS-Level panel * 15.6" UHD (3840x2160), 100% Adobe RGB(Typical), IPS-Level panel(Optional) * 15.6" QHD (2560x1440), 240 Hz Refresh Rate, 100% DCI-P3(Typical), IPS-Level panel * 15.6" Full HD (1920x1080), 360 Hz Refresh Rate, IPS-Level panel	
Graphics	Up to NVIDIA® GeForce RTX 3080 Ti Laptop GPU 16GB GDDR6	
Keyboard	Per-Key RGB gaming keyboard by SteelSeries	
Audio	* 2 x 2W Speakers and 4 x 2W Woofers designed by Dynaudio system * 1 x Audio combo jack * Nahimic 3 Audio Enhancer * Hi-Res Audio ready* The Duo Wave speaker designed by Dynaudio system(2x 2W speakers) * 1 x Audio combo jack * Nahimic 3 Audio Enhancer * Hi-Res Audio ready	
USB Port	* 1 x Thunderbolt 4 / DP/ USB Type-C (w/ PD Charging), * 1 x USB 3.2 Gen2 Type-C / DP, 2 x USB 3.2 Gen2 Type-A, * 1 x Thunderbolt 4 / DP/ USB	

Type-C (w/ PD Charging), * 2 x USB 3.2 Gen2 Type-C / DP, 2 x USB 3.2 Gen2 Type-A

Card Reader * 1 x SD Express Memory Card Reader

Video Output * 1 x Thunderbolt 4 / DP/ USB Type-C (w/ PD Charging), * 1 x USB 3.2 Gen2 Type-C / DP, 1 x HDMI (8K@ 60Hz / 4K@ 120Hz)* 1 x Thunderbolt 4 / DP/ USB Type-C (w/ PD Charging), * 2 x USB 3.2 Gen2 Type-C / DP, 1 x HDMI (8K@ 60Hz / 4K@ 120Hz)

Communication Intel® Killer Ethernet E3100G (up to 2.5 GbE) Intel® Killer Wi-Fi 6E AX1675, Bluetooth v5.2

Webcam / Microphone IR FHD type (30fps@1080p) / Quadruple Microphone

Sensor Fingerprint Reader / Ambient Light Sensor
Fingerprint Reader

Battery 4-Cell, Li-Polymer, 99.9Whr

Power Adapter 240W Slim adapter

Dimension 15.65"(W) x 11.16"(D) x 0.79"(H)
14.17"(W) x 9.65"(D) x 0.71"(H)

Weight 5.7 lbs
4.63 lbs

* Product specification, functions and appearance may vary by models and differ from country to country. All specifications are subject to change without notice.

Model Name Raider GE76
Raider GERaider GE66 66

Processor Up to latest 12th Gen Intel® Core i9 Processor

Operating System Windows 11 Home Windows 11 Pro (MSI recommends Windows 11 Pro for business.)

Memory DDR5-4800, 2 slots, up to 64GB

Display * 17.3" UHD (3840x2160), 120 Hz Refresh Rate, 100% Adobe RGB(Typical), IPS-Level panel (Optional) * 17.3" QHD (2560x1440), 240 Hz Refresh Rate, 100% DCI-P3(Typical), IPS-Level panel * 17.3" Full HD (1920x1080), 360 Hz Refresh Rate, IPS-Level panel* 15.6" UHD (3840x2160), 100% Adobe RGB(Typical), IPS-Level panel(Optional) * 15.6" QHD (2560x1440), 240 Hz Refresh Rate, 100% DCI-P3(Typical), IPS-Level panel * 15.6" Full HD (1920x1080), 360 Hz Refresh Rate, IPS-Level panel

Graphics Up to NVIDIA® GeForce RTX 3080 Ti Laptop GPU

Keyboard Per-Key RGB gaming keyboard by SteelSeries

Audio * The Duo Wave Woofers + Speakers designed by Dynaudio system * (2 x 1W Speakers + 2 x 2W Woofers) * 1 x Audio combo jack * Nahimic 3 Audio Enhance * Hi-Res Audio ready* The Duo Wave speakers design by Dynaudio system (2x 2W speakers) * 1 x Audio combo jack * Nahimic 3 Audio Enhancer * Hi-Res Audio ready

USB Ports * 1 x Thunderbolt 4 / DP/ USB Type-C, * 1 x USB 3.2 Gen2 Type-C / DP * 1 x USB 3.2 Gen2 Type-A, 2 x USB 3.2 Gen 1 Type-A

Card Reader * 1 x SD Express Memory Card Reader

Video Output * 1 x Thunderbolt 4 / DP/ USB Type-C, 1 x Mini DisplayPort * 1 x USB 3.2 Gen2 Type-C / DP * 1 x HDMI (8K@ 60Hz / 4K@ 120Hz)

Communication Intel® Killer Ethernet E3100G (up to 2.5 GbE) Intel® Killer Wi-Fi 6E AX1675, Bluetooth v5.2

Webcam FHD type (30fps@1080p)

Battery 4-Cell, Li-Polymer, 99.9Whr

Power Adapter 330W(12UHS) / 280W (12UH / 12UGS)
280W

Dimension 15.63"(W) x 11.18"(D) x 1.02"(H)
14.09"(W) x 10.51"(D) x 0.92"(H)

Weight 8.8 lbs
7.25 lbs

* Product specification, functions and appearance may vary by models and differ from country to country. All specifications are subject to change without notice.

Model Name Vector GP76
Vector GP66VeVector GP66

Processor Up to latest 12th Gen Intel® Core i9 Processor

Operating System Windows 11 Home

Memory DDR4-3200, 2 slots, up to 64GB
Display * 17.3" QHD (2560x1440), 240 Hz Refresh Rate, 100%
DCI-P3(Typical), IPS-Level panel * 17.3" Full HD (1920x1080), 360 Hz Refresh
Rate, IPS-Level panel* 15.6" Full HD (1920x1080), 144 Hz Refresh Rate, IPS-Level
panel * 15.6" Full HD (1920x1080), 360 Hz Refresh Rate, IPS-Level panel
Graphics Up to
NVIDIA® GeForce RTX 3080 Laptop GPU 8GB GDDR6
Keyboard Per-Key RGB gaming keyboard by SteelSeries
Audio * 2 x 2W Stereo Speakers * 1 x Audio combo jack * Nahimic 3
Audio Enhance * Hi-Res Audio ready
USB Ports * 1 x USB 3.2 Gen2 Type-C / DP * 3 x USB 3.2 Gen1 Type-A
Video Output * 1 x USB 3.2 Gen2 Type-C / DP, 1 x Mini DisplayPort * 1 x HDMI
(8K@60Hz / 4K@120Hz)
Communication Gigabit Ethernet (up to 2.5GbE) Intel® Killer Wi-Fi 6E AX1675,
Bluetooth v5.2
Webcam HD type (30fps@720p)
Battery 4-Cell, Li-Polymer, 65Whr
Power Adapter Up to 280W
Dimension 15.63"(W) x 11.18"(D) x 1.02"(H)
14.09"(W) x 10.51"(D) x 0.92"(H)
Weight 7.65 lbs
5.25 lbs

* Product specification, functions and appearance may vary by models and differ
from country to country. All specifications are subject to change without
notice.

Model Name CROSSHAIR 17
CROSSHAIR CROSSHAIR 1515
Processor Up to latest 12th Gen Intel® Core i9 Processor
Operating System Windows 11 Home
Display 17.3" Full HD (1920x1080), 144 Hz Refresh Rate, IPS-Level panel
* 15.6" Full HD (1920x1080), 144 Hz Refresh Rate, IPS-Level panel * 15.6" Full
HD (1920x1080), 360 Hz Refresh Rate, IPS-Level panel
Graphics Up to
NVIDIA® GeForce RTX 3070 Ti Laptop GPU 8GB GDDR6 (B12UGSZ)
Keyboard Spectrum Backlight Gaming Keyboard
Audio * 2 x 2W Stereo Speakers * 1 x Audio combo jack * Nahimic 3
Audio Enhancer * Hi-Res Audio ready
USB Port * 1 x USB 3.2 Gen1 Type-C * 2 x USB 3.2 Gen1 Type-A * 1 x USB
2.0 Type-A
Video Output 1x HDMI (4K@60Hz)
Communication Gigabit Ethernet Intel® Wi-Fi 6 AX201 Bluetooth v5.2
Webcam HD type (30fps@720p)
Battery 4-Cell, Li-Polymer, 90Whr (B12UGSZ / B12UGZ) 3-Cell,
Li-Polymer, 53.5Whr (B12UEZ)
Power Adapter 240W
Dimension 15.68"(W) x10.76"(D) x1.07"(H)
14.13"(W) x10.20"(D) x1.06"(H)
Weight 5.73 lbs
5.07 lbs

* Product specification, functions and appearance may vary by models and differ
from country to country. All specifications are subject to change without
notice.

Model Name Crosshair 15 Rainbow Six Extraction Edition
Processor Up to latest 12th Gen Intel® Core i9-12900H Processor
Operating System Windows 11 Home
Memory DDR4-3200, 2 slots, up to 64GB
Display 15.6" QHD (2560x1440), 165 Hz Refresh Rate, 100%
DCI-P3(Typical), IPS-Level panel (Optional)
Graphics Up to
NVIDIA® GeForce RTX 3070 Laptop GPU 8GB GDDR6
Keyboard Spectrum Backlight Gaming Keyboard
Audio 2 x 2W Stereo Speakers 1 x Audio combo jack Nahimic 3 Audio
Enhancer Hi-Res Audio ready

USB Port 1 x USB 3.2 Gen1 Type-C 2 x USB 3.2 Gen1 Type-A 1 x USB 2.0 Type-A
Video Output 1x HDMI (4K@60Hz)
Communication Gigabit Ethernet Intel® Wi-Fi 6 AX201 Bluetooth v5.2
Webcam HD type (30fps@720p)
Battery 4-Cell, Li-Polymer, 90Whr (B12UGZ) 3-Cell, Li-Polymer, 53.5Whr (B12UEZ)
Power Adapter 240W
Dimension 14.13"(W) x10.20"(D) x1.06"(H)
Weight 5.07 lbs
* Product specification, functions and appearance may vary by models and differ from country to country. All specifications are subject to change without notice.

Model Name	Pulse GL76	Pulse GL66
Processor	Up to latest 12th Gen Intel® Core i9-12900H Processor	
Operating System	Windows 11 Home	
Memory	DDR4-3200, 2 slots, up to 64GB	
Display	17.3" Full HD (1920x1080), 360 Hz Refresh Rate, IPS-Level panel (Optional) 17.3" Full HD (1920x1080), 144 Hz Refresh Rate, IPS-Level panel 15.6" Full HD (1920x1080), 144 Hz Refresh Rate, IPS-Level panel	
Graphics	Up to	
NVIDIA® GeForce	RTX 3070 Laptop GPU 8GB GDDR6	
Keyboard	RGB Backlight Gaming Keyboard	
Audio	* 2 x 2W Stereo Speakers * 1 x Audio combo jack * Nahimic 3	
Audio Enhancer	* Hi-Res Audio ready	
USB Port	* 1 x USB 3.2 Gen1 Type-C * 2 x USB 3.2 Gen1 Type-A * 1 x USB 2.0 Type-A	
Video Output	1x HDMI (4K@60Hz)	
Communication	* Gigabit Ethernet * Intel® Wi-Fi 6 AX201 * Bluetooth v5.2	
Webcam	* HD type (30fps@720p)	
Battery	4-Cell, Li-Polymer, 90Whr (12UGK) 3-Cell, Li-Polymer, 53.5Whr (12UEK)	
Power Adapter	240W	240W
Dimension	15.67"(W) x10.75"(D) x0.95"(H)	14.13"(W) x10.20"(D) x0.94"(H)
Weight	5.73 lbs	4.96 lbs

* Product specification, functions and appearance may vary by models and differ from country to country. All specifications are subject to change without notice.

Model Name	SWORD 15
Processor	Up to latest 12th Gen Intel® Core i7-12700H Processor
Operating System	Windows 11 Home
Memory	DDR4-3200, 2 slots, up to 64GB
Display	15.6" Full HD (1920x1080), 144 Hz Refresh Rate, IPS-Level panel
Graphics	Up to latest
NVIDIA® GeForce	RTX 3070 Ti Laptop GPU 8GB GDDR6
Keyboard	Blue Backlit Gaming Keyboard
Audio	* 2 x 2W Stereo Speakers * 1 x Audio combo jack * Nahimic 3
Audio Enhancer	* Hi-Res Audio ready
USB Port	* 1 x USB 3.2 Gen1 Type-C * 2 x USB 3.2 Gen1 Type-A * 1 x USB 2.0 Type-A
Video Output	1x HDMI (4K@60Hz)
Communication	Gigabit Ethernet / Intel® Wi-Fi 6 AX201 / Bluetooth v5.2
Webcam	HD type (30fps@720p)
Battery	3-Cell, Li-Polymer, 53.5Whr
Dimension	14.13"(W) x10.20"(D) x0.98"(H)
Weight	4.96 lbs

* Product specification, functions and appearance may vary by models and differ from country to country. All specifications are subject to change without notice.

Model Name KATANA GF76
 KATANAKATANA GF66 GF66
 Processor Up to latest 12th Gen Intel® Core i7-12700H Processor
 Operating System Windows 11 Home
 Memory DDR4-3200, 2 slots, up to 64GB
 Display 17.3" Full HD (1920x1080), 144 Hz Refresh Rate, IPS-Level panel
 * 15.6" Full HD (1920x1080), 144 Hz Refresh Rate, IPS-Level panel
 Graphics Up to latest
 NVIDIA® GeForce RTX 3070 Ti Laptop GPU 8GB GDDR6
 Keyboard Red Backlit Gaming Keyboard
 Audio * 2 x 2W Stereo Speakers * 1 x Audio combo jack * Nahimic 3
 Audio Enhancer * Hi-Res Audio ready
 USB Port * 1 x USB 3.2 Gen1 Type-C * 2 x USB 3.2 Gen1 Type-A * 1 x USB
 2.0 Type-A
 Video Output 1 x HDMI (4K@60Hz)
 Communication Gigabit Ethernet / Intel® Wi-Fi 6 AX201 / Bluetooth v5.2
 Webcam HD type (30fps@720p)
 Battery 3-Cell, Li-Polymer, 53.5Whr
 Power Adapter 240W (12UGS / 12UG / 12UE) / 180W (12UD / 12UC)
 Dimension 15.67"(W) x 10.75"(D) x 0.99"(H)
 14.13"(W) x 10.20"(D) x 0.98"(H)
 Weight 5.73 lbs
 4.96 lbs

* Product specification, functions and appearance may vary by models and differ from country to country. All specifications are subject to change without notice.

Model Name Creator Z17
 Processor Up to latest 12th Gen Intel® Core i9-12900H Processor
 Operating System Windows 11 Home Windows 11 Pro (MSI recommends Windows 11 Pro for business.)
 Display 17" QHD+ (2560x1600), 16:10, Touchscreen, 165Hz Refresh Rate, 100% DCI-P3(Typical), IPS-Level panel, Support MSI Pen
 Graphics Up to
 NVIDIA® GeForce RTX 3080 Ti Laptop GPU 16GB GDDR6
 Memory DDR5-4800, 2 slots, up to 64GB
 Webcam / Microphone IR FHD type (30fps@1080p) / Quadruple Microphone
 Keyboard Per-Key RGB keyboard by SteelSeries
 Sensor Fingerprint Reader/Ambient Light Sensor
 Communication Intel® Killer Wi-Fi 6E AX1675, Bluetooth v5.2
 Audio 4 x 2W Stereo Speakers by Dynaudio system 1 x Audio combo jack
 I/O Port 1 x Thunderbolt 4 / DP/ USB Type-C (w/ PD Charging) 1 x Thunderbolt 4 / DP/ USB Type-C 1 x USB 3.2 Gen 2 Type-A 1 x HDMI (8K@ 60Hz / 4K@ 120Hz) 1 x SD Express Memory Card Reader 1 x DC-in
 Battery/Adapter 4-Cell, Li-Polymer, 90Whr 240W adaptor
 Weight/Dimension 5.49 lbs 15.04"(W) x 10.24"(D) x 0.75"(H)

* Product specification, functions and appearance may vary by models and differ from country to country. All specifications are subject to change without notice.

Model Name Creator Z16P
 Processor Up to latest 12th Gen Intel® Core i9-12900H Processor
 Operating System Windows 11 Home Windows 11 Pro (MSI recommends Windows 11 Pro for business.)
 Display 16" QHD+ (2560x1600), 16:10, Touchscreen, 165Hz Refresh Rate, 100% DCI-P3(Typical), IPS-Level panel, Support MSI Pen
 Graphics Up to
 NVIDIA® GeForce RTX 3080 Ti Laptop GPU 16GB GDDR6
 Memory DDR5-4800, 2 slots, up to 64GB
 Webcam / Microphone IR FHD type (30fps@1080p) / Quadruple Microphone
 Keyboard Per-Key RGB keyboard by SteelSeries
 Sensor Fingerprint Reader/Ambient Light Sensor
 Communication Intel® Killer Wi-Fi 6E AX1675, Bluetooth v5.2
 Audio 4 x 2W Stereo Speakers by Dynaudio system 1 x Audio combo jack

I/O Port 1 x Thunderbolt 4 / DP/ USB Type-C (w/ PD Charging) 1 x USB 3.2 Gen 2 Type-C/ DP 1 x USB 3.2 Gen 2 Type-A 1 x SD Express Memory Card Reader 1 x DC-in

Battery/Adapter 4-Cell, Li-Polymer, 90Whr 240W adaptor

Weight/Dimension 5.27 lbs 14.13"(W)x10.08"(D)x0.75"(H)

* Product specification, functions and appearance may vary by models and differ from country to country. All specifications are subject to change without notice.

Model Name Creator Z16

Processor Up to latest 12th Gen Intel® Core i7-12700H Processor

Operating System Windows 11 Home Windows 11 Pro (MSI recommends Windows 11 Pro for business.)

Display 16" QHD+ (2560x1600), 16:10, Touchscreen, 120Hz Refresh Rate, 100% DCI-P3(Typical), IPS-Level panel (Optional)

Graphics Up to

NVIDIA® GeForce RTX 3060 Laptop GPU 6GB GDDR6

Memory DDR5-4800, 2 slots, up to 64GB

Webcam IR HD type (30fps@720p)

Input MiniLED Per-Key RGB keyboard by SteelSeries Fingerprint Reader

Communication Intel® Killer Wi-Fi 6E AX1675, Bluetooth v5.2

Audio 4 x 2W Stereo Speakers by Dynaudio system 1 x Audio combo jack

I/O Port 2 x Thunderbolt 4 / DP/ USB Type-C 2 x USB 3.2 Gen 2 Type-A 1 x microSD Card Reader 1 x DC-in

Battery/Adapter 4-Cell, Li-Polymer, 90Whr 180W Slim adaptor

Weight/Dimension 5.07 lbs 14.13"(W)x10.08"(H)x0.64"(D)

* Product specification, functions and appearance may vary by models and differ from country to country. All specifications are subject to change without notice.

Model Name Creator M16

Processor Up to latest 12th Gen Intel® Core i7-12700H Processor

Operating System Windows 11 Home Windows 11 Pro (MSI recommends Windows 11 Pro for business.)

Display 16" QHD+ (2560x1600), 16:10, Touchscreen, 60Hz Refresh Rate, 100% DCI-P3(Typical), IPS-Level panel (Optional)

Graphics Up to

NVIDIA® GeForce RTX 3060 Laptop GPU 6GB GDDR6

Memory DDR4-3200, 2 slots, up to 32GB

Webcam IR HD type (30fps@720p)

Input White keyboard with Anti-Ghost key

Communication Intel Wi-Fi 6 AX201(2*2 ax), Bluetooth v5.2

Audio 2 x 2W Stereo Speakers by Dynaudio system 1 x Audio combo jack

I/O Port 2 x USB 3.2 Gen 2 Type-A 1x USB 3.2 Gen1 Type C

Battery/Adapter 3-Cell, Li-Polymer, 53Whr 240W Slim adaptor

Weight/Dimension 6.06 lbs 14.13"(W)x10.2"(H)x0.94"(D)

* Product specification, functions and appearance may vary by models and differ from country to country. All specifications are subject to change without notice.

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Document NEWAGAE020220104ei14000p5



CE Noticias Financieras English

Razer renews its gaming laptops with the latest 'monsters' from AMD, Intel and Nvidia

525 words

4 January 2022

CE NoticiasFinancieras

NFINCE

English

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Razer has taken advantage of the latest announcements from major component manufacturers to launch new versions of its most desired laptops.

On the occasion of CES 2021, AMD has presented its new Ryzen 6000 range processors for laptops, which in addition to the power jump, includes support for the new DDR5 memory and new connections. For its part, Nvidia has announced new models of its RTX 30 range of graphics cards for laptops; and to all this, we must add Intel's new 12th generation processors.

With all this, it's not surprising that all manufacturers are in the queue to announce new models that take advantage of these components, and Razer has been one of the first to do so, renewing its entire range of gaming laptops. And if we talk about gaming, we know that the graphics card is the most important component; that's why we have to start by saying that these new laptops can mount up to an RTX 3080 Ti, the first time that such a model comes out of desktop computers. With a higher performance than the Titan RX, it's meant to get up to 100 frames per second at 1440p resolution.

Another detail is that all the new Razer Blade will have DDR5 RAM memory, faster than DDR4, which can reach up to 4800 MHz, an increase of 50%.

As for the processors, things are a bit more divided. The new Razer Blade 14 will be based on the new Ryzen 6000 from AMD, being able to mount up to the top of the range Ryzen 9 6900HX for great performance. It's still the lightest of the bunch, but brings aspects of its 'big brothers' like fingerprint-resistant coating and a 1080p camera with infrared for face login. On the performance side, the biggest change is the 'MUX switch', which allows Nvidia's graphics to connect directly to the display, avoiding unnecessary lag. The Blade 14 will be available in the first quarter of 2022, with a starting price of 2199 euros.

Meanwhile, the Razer Blade 15 and Razer Blade 17 will offer Intel's new 12th generation H-Series processors, with up to a 14-core Core i9-12900H, a big leap from the last generation's 8-core. What's interesting is that not all cores are the same, but it has a 'hybrid' design combining efficient cores with performance cores.

The Blade 15 gets a new screen with 4K resolution and 144 Hz refresh rate, in addition to the current 1080p and 360 Hz and 2k and 240 Hz, all covering 100% of the DCI-P3 color gamut. It will be available in the first quarter of the year, starting at €2799.99.

The Razer Blade 17, the largest and most complete model, now takes advantage of the extra space with eight speakers instead of four, and a new 82Wh battery for more hours of gaming; the 280W charger has also been modified for portability. It will be available in Q1 2022, starting at €2999.99.

Document NFINCE0020220104ei14007ex

Intel's DG2 Gaming GPU Rumored to Launch in March

Anton Shilov

393 words

29 December 2021

Tom's Hardware

TOMHA

English

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Intel's DG2 targets GeForce RTX 3070 Ti and GeForce RTX 3060 Ti levels of performance.

As the formal launch of Intel's next-generation discrete graphics processors approaches, more rumors about the lineup and actual availability timeframe emerge. For example, a report from [IT Home](#), citing anonymous sources, says that Intel will offer only two DG2 desktop graphics cards for gamers and will not target the highest end of the market, at least initially.

Based on Intel's marketing materials, the [Arc Alchemist](#) (aka DG2) family of discrete GPUs will contain two chips, but there could be up to [32 SKUs](#) according to Intel's drivers. In addition, Intel will offer two halo products initially, one with 512 execution units (EUs) and 16GB of GDDR6 memory that will offer performance akin to the GeForce RTX 3070/3070 Ti, and another with 384 EUs and 12GB of DDR6 SGRAM with performance similar to the GeForce RTX 3060/3060 Ti.

Targeting the performance-mainstream and high-end markets is a good way to capture market share, as sales of such boards are rather high given their combination of price and performance. However, this approach might not impress enthusiasts.

While Intel originally planned to release its new-generation discrete GPUs in January and has even delivered samples of its GPUs to various brands, the report says the company is now looking at a launch date in March (which is still Q1). This delay will help Intel polish off its drivers and avoid direct competition with Nvidia's rumored new GPUs in January. Still, at the same time, those interested in buying a new graphics card early in the year might not wait for Intel but go with AMD or Nvidia.

Notably, for notebooks, Intel is expected to offer an entry-level discrete GPU with 128 EUs that is projected to provide the performance of Nvidia's GeForce RTX 2050. However, the claim is odd since there are no reliable performance tests of the standalone graphics processor from the green company.

As with all leaks, you should take the info with a grain of salt. Intel naturally does not comment on rumors and unofficial information, though we expect the company to shed some light on its standalone DG2 GPUs during CES 2022.

[Intel \(Intel\)](#)

Document TOMHA00020211229ehct0002y

MSI Announces the Brand New 12th Gen Intel Alder Lake Gaming Desktops with DDR 5 memory

837 words

27 December 2021

16:26

InPR

BUINPR

English

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KEY POINTS

- Powered by the latest 12th Generation Intel® Core™ processors, providing 3A games with the best processing power – smoothest gameplay.
- Features DDR5-4800Mhz memory, more bandwidth for data transmission and increased performance.
- Includes PCIe Gen 5 bandwidth support, improved workloads and render capabilities for enhanced gaming experience.
- HMI Gaming Dial design, allowing gamers to quickly control and monitor the system without touching the keyboard and mouse.
- Preloaded Window 11, Auto HDR and Direct storage will provide improved gaming experience.
- The all new MSI CENTER, enrich your gaming experience and system tuning.

TAIPEI, TAIWAN, Nov 25, 2021 —

MSI, a world leading brand for gaming and creation, continues to introduce ground breaking technologies and innovations in its new products.

Today, MSI announced the latest lineup of gaming desktops equipped with Intel 12th Gen Alder Lake processor. Based on a new hybrid architecture, the 12th generation Intel Core processor combines a mix of Performance cores (P-cores) and Efficiency cores (E-cores) to maximize performance, increases multi-thread performance by up to 55%, the gaming performance has more than 13% increase compared to the previous generation. The full lineup of K Series gaming desktops adopted DDR5 memory with read speed up to 60% higher than the previous generation equipped with DDR4. Support for PCIe 5 which is primed to provide speedy and improved transmission. Additionally, MSI has also upgraded MSI Center and MSI App Player. The new MSI Center helps to control and customize your system. With innovation in MSI App Player, it is easier to play mobile games on the PC. The lineup also features 2.5G Ethernet LAN and Wi-Fi 6E to offer faster data transfer speeds.

MSI launched 3 models of gamer-oriented desktops, including Aegis Series, Trident Series and Codex X5 series to cater towards all types of gamers.

[MEG Aegis Ti5 12th – Path to the Future]

MEG Aegis Ti5 12th – Path to the Future

Being the flagship segment, the MEG Aegis Ti 5 12th is equipped with the latest Intel Core i9-12900K processor and NVIDIA RTX 3090 graphics card. The Silent Storm Cooling 4 features separated chamber design to ensure that the system maintains superior cooling at high performance. MSI also had strengthened the Gaming Dial function allowing users to switch various (gaming) utilities rapidly.

[MEG Trident X 12th]

MEG Trident X 12th – The Centerpiece of Gaming

MEG Trident X 12th is the best for gamers who prefers small form factor and mobility. The compact desktop is only 10 liters in volume which comes with the latest 12th Gen Intel processor and Nvidia GeForce RTX 3090 graphics. With the latest DDR5-4800 memory and exclusive Silent Storm Cooling to optimize airflow, the new standard will take your gaming experience to the next level.

[MAG Codex X5 12th]

MAG Codex X5 12th

The MAG Codex X5 12th is based on Nvidia's GeForce GPUs and Intel's 12th-generation processors. It features powerful heat dissipation system to help you achieve maximum cooling performance. The water cooling and optimized airflow prevents the system from potential slowdown caused by overheating. The tempered glass panel design and Mystic lights allows for full view of personalized configuration.

AVAILABILITY & PRICING

Product availability varies by region. Please contact your local contact window for further information.

SPECIFICATION

To learn more about MSI's complete line of products, visit <https://www.msi.com/> or follow us on Facebook and Twitter.

Marketing Name

Aegis series

Trident series

Codex series

Model

MEG Aegis Ti5 12th

MEG Trident X 12th

MAG Codex X5 12th

Operating System

Windows 11

Windows 11

Windows 11

CPU

Up to 12th Gen Intel Core i9-12900K

Up to 12th Gen Intel Core i7-12700K

Up to 12th Gen Intel Core i9-12900K

Chipset

Intel Z690

Intel Z690

Intel Z690

Storage

3x M.2 slots (2x PCIe Gen 4 x4, 1x SATA / PCIe Gen 3 Auto switch)

2x 2.5" Drive bays

1x 3.5" Drive bay

2x M.2 slots (1x PCIe Gen 4 x4, 1x Auto switch)

2x 2.5" Drive bays

4x M.2 slots, 1x PCIe Gen 3x4 / SATA Auto switch, 1x PCIe Gen 4x4 / SATA Auto switch

2x 2.5" Drive bays

2x 3.5" Drive bay

System Memory

4x DDR5 4400Mhz, up to 128GB

2x DDR5 4800Mhz, up to 64GB

4x DDR5 4400MHz DIMMs, up to 128GB

Graphics

Up to NVIDIA RTX 3090 Graphics

Up to NVIDIA RTX 3090 Graphics

Up to NVIDIA RTX 3090 Graphics

Dimensions

551 x 239 x 511 mm

15 kg

129 x 382 x 396 mm

6.7 kg

210 x 450 x 488 mm (42L)

12 kg

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Document BUINPR0020211227ehcr000dx



LG Ultra Gear **Gaming** Laptop Revealed With **Intel** 11th-Gen Core i7 CPU and Nvidia RTX 3080 GPU

Yetnesh Dubey

544 words

22 December 2021

Digit

HTDIGI

English

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India, Dec. 22 -- The LG Ultra Gear 17G90Q is the first gaming laptop from the brand in a long time. LG isn't a brand known for making gamer-focused products. They're mostly known for making the thin and light "Gram" series and their value for money TV sets. Beyond that, LG generally focuses on manufacturing home appliances. However, times are changing and now eSports gaming tournaments could very well see sponsorships from LG, the makers of your favourite fridge. Nonetheless, here's everything you need to know about the LG Ultra Gear 17G90Q.

LG Ultra Gear 17G90Q Specs and Features

First and foremost, the LG laptop comes with an Intel 11th Gen Core i7 Tiger Lake processor. Our best guess would be an Intel Core i7-11800H featuring 8-cores and 16-threads along with 4.60GHz max turbo frequency and 24MB Intel smart L3 cache. In terms of GPU, the LG Ultra Gear 17G90Q will feature an Nvidia RTX 3080 Max-Q graphics card. This particular GPU features a massive 16GB GDDR6 of visual memory, which should be enough to handle the ever-increasing requirements of modern AAA gaming. At the time of writing this article, no word is available on the TGP of the GPU.

The LG Ultra Gear 17G90Q features a 17-inch 1080p display with support for up to a 300hz refresh rate. I guess the screen response time would also be close to 1ms as well. In terms of RAM and storage, the laptop features 32GB DDR4 RAM and 1TB SSD storage. Considering how LG packs its products, like the LG Gram 2021, the storage will most likely be upgradable via a second M.2 slot on this gaming laptop.

The LG Ultra Gear 17G90Q also comes equipped with all the necessary ports like a USB Type A, Type C, an RJ45 Ethernet port, an HDMI slot, a microSD port alongside a Thunderbolt port as well. Gaming is power intensive and that's why LG Ultra Gear comes with a massive 93Wh battery. It is a little less than the 99Wh battery that comes with the likes of the MSI GE66 Raider gaming laptop though.

Packing all these components and keeping them cool takes a lot of space hence the LG Ultra Gear 17G90Q is 21.4mm thick, which is slightly thicker than the Alienware X17 which measures 20.99mm. The latter does a great job at keeping its internals cool thanks to four powerful fans and a special thermal paste compound. In terms of weight, the LG Ultra Gear 17G90Q is surprisingly light thanks to an overall weight of 2.6kg, much lighter than the Alienware X17, another 17-inch laptop with a weight of 3.19kg.

The LG Ultra Gear 17G90Q will hit the shelves in the USA and South Korea in early 2022 with more details coming out soon at the upcoming CES 2022.

Also Read: Would you buy a 42-inch LG OLED TV?

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Document HTDIGI0020211222ehcm00005

Alleged Intel ARC Alchemist DG2 Gaming Graphics Card Spotted Within Ashes of The Singularity Benchmark

Hassan Mujtaba

990 words

21 December 2021

Wccftech.com

NEWAGAE

English

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An alleged Intel ARC Alchemist graphics card based on the Xe-HPG DG2 GPU has appeared within the [Ashes of The Singularity benchmark](#).

Intel's ARC Alchemist DG2 Gaming Graphics Card Pops Up In Ashes of The Singularity Benchmark

We can tell that this is indeed a discrete graphics card based on the performance it offers and the fact that it was featured on a system running the Intel Core i9-12900K Alder Lake CPU. It looks like that this could be one of the early samples that is being tested before the [full demo and unveil](#) at CES 2022.

* [Click to view image.](#)

* [Click to view image.](#)

The Intel ARC Alchemist graphics card was tested at the Medium 1080 preset and scored 12500 points with an average of 126.9 FPS. The AOTS benchmark database isn't the most reliable of all when it comes to comparing scores due to different versions and custom presets being used. As such, we don't want to go ahead and compare performance since the score puts it on par with an RTX 3080 Ti but the RX 6700 XT and RX 5700 XT also offer the same score. So you can see why I've advised from comparing the results.

Intel Xe-HPG 512 EU GPUs Powered ARC Alchemist Gaming Graphics Lineup

The top Alchemist 512 EU (32 Xe Cores) variant is said to feature at least three configurations. The full die features 4096 cores, a 256-bit bus interface, and up to 16 GB GDDR6 memory featuring a 16 Gbps clock though 18 Gbps cannot be ruled out as per the rumor. Following are all the ARC 512 EU variants that we can expect based on the DG2-SOC1:

* 512 EU (4096 ALUs) / 16 GB @ Up To 18 Gbps / 256-bit / 225W (Desktops) & 120-150W (Laptops)

* 384 EU (3072 ALUs) / 12 GB @ Up To 16 Gbps / 192-bit / 150-200W (Desktops) & 80-120W (Laptops)

* 256 EU (2048 ALUs) / 8 GB @ Up To 16 Gbps / 128-bit / 60-80W (Laptops)

[Intel ARC A780 Graphics card leaked renders. \(Image Credits: Moore's Law is Dead\)](#)

The Xe-HPG Alchemist 512 EU chip is suggested to feature clocks of around 2.2 - 2.5 GHz though we don't know if these are the average clocks or the maximum boost clocks. Let's assume that it's the max clock speed and in that case, the card would deliver up to 18.5 TFLOPs FP32 compute which is 40% more than the RX 6700 XT but 9% lower than the NVIDIA RTX 3070.

In terms of performance positioning, the top 512 EU variant is said to compete against the RTX 3070 / RTX 3070 Ti, the 384 EU variant is said to compete against the RTX 3060 / RTX 3060 Ti on desktops. On the laptop side, the 512 EU might be just as fast as the RTX 3080, 384 EU variant around RTX 3070 level and the 256 EU will end up against the RTX 3060.

Intel ARC Alchemist vs NVIDIA GA104 & AMD Navi 22 GPUs

Graphics Card Name	Intel ARC A780?	NVIDIA GeForce RTX 3070 Ti	AMD Radeon RX 6700 XT
GPU Name	Alchemist DG-512		
NVIDIA GA104	AMD Navi 22		
Architecture	Xe-HPG	Ampere	RDNA 2
Process Node	TSMC 6nm	Samsung 8nm	TSMC 7nm
Die Size	~396mm ²	392mm ²	335mm ²
FP32 Cores	32 Xe Cores	48 SM Units	40 Compute Units
FP32 Units	4096	6144	2560
Memory Bus	256-bit	256-bit	192-bit

Memory Capacity	16 GB GDDR6	8 GB GDDR6X	16 GB GDDR6
Launch	Q1 2022	Q2 2021	Q1 2021

Also, it is stated that Intel's initial TDP target was 225-250W but that's been upped to around 275W now. We can expect a 300W variant with dual 8-pin connectors too if Intel wants to push its clocks even further. In either case, we can expect the final model to rock an 8+6 pin connector config, The reference model is also going to look very much like the [drone marketing shot Intel put out during the ARC branding reveal](#).

As for the launch, the SOC1 variants are planned for launch in Mid-February & while AIBs are waiting on final dies to test with their custom PCB designs, desktop variants may be launching first, followed by laptop and then workstation in late 2022.

Intel Xe-HPG Based Discrete Alchemist GPU Configurations:

GPU Variant (Cores)	Graphics Card Variant	GPU Die	Execution Units	Shading Units
Memory Capacity	Memory Speed	Memory Bus	TGP	
Xe-HPG 512EU ARC A780?	Up To 32/16 GB GDDR6	18 / 16 / 14 Gbps	256-bit	~225W (Desktops)
120-150W (Laptops)				
Xe-HPG 384EU ARC A750?	Up To 12 GB GDDR6	16 / 14 Gbps	192-bit	150-200W (Desktops)
80-120W (Laptops)				
Xe-HPG 256EU ARC A580?	Up To 8 GB GDDR6	16 / 14 Gbps	128-bit	60-80W (Laptops)
Xe-HPG 128EU ARC A380?	Up To 6 GB GDDR6	16 / 14 Gbps	96-bit	~75W (Desktops)
Xe-HPG 128EU ARC A350?	Up To 4 GB GDDR6	16 / 14 Gbps	64-bit	35-50W (Laptops)
Xe-HPG 96EU ARC A330?	Up To 4 GB GDDR6	16 / 14 Gbps	64-bit	~35W (Laptops)

What do you want to see in Intel's ARC Alchemist Gaming graphics card lineup?

- * Better Performance Than Competition at Lower Prices
- * Better Efficiency Than Competition
- * Higher Overclocking Capability
- * More Memory (and Faster Speeds)
- * Faster Raytracing Performance
- * Better IQ & Performance With Upscaling Technologies (XeSS)
- * Better Graphics Card Availability At Launch
- * More Enthusiast Graphics Card Options
- * More Entry-Level Graphics Card Options
- * More Design Choices (Custom Models) To Select From

View Results

[Click to view image.](#)

Document NEWAGAE020211221ehcl0008d

Intel looks forward to metaverse, but chipmaker has some bad news for Mark Zuckerberg

FE Online

385 words

20 December 2021

Financial Express Online

FIEXON

English

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Meta founder Mark Zuckerberg's dream metaverse project will need a 1,000-fold increase in computational efficiency to be successful, chipmaker Intel said.

Intel, in its first statement on the metaverse, said it remained a believer in what some think could be the future of how physical and digital worlds would coexist, but warned that there were major roadblocks ahead.

Raja Koduri, Senior Vice President and General Manager of Intel's Accelerated Computing Systems and Graphics Group, said in a blog post: "Indeed, the metaverse may be the next major platform in computing after the world wide web and mobile."

"Consider what is required to put two individuals in a social setting in an entirely virtual environment... Now, imagine solving this problem at scale – for hundreds of millions of users simultaneously – and you will quickly realise that our computing, storage and networking infrastructure today is simply not enough to enable this vision."

For the uninitiated, the metaverse removes the digital world from a fixed device to create virtual spaces enabled by augmented reality, virtual reality, and mixed reality. It blends the real world with the digital where digital objects exist in the real world and the digital world appears like the physical one.

However, according to Koduri: "We need several orders of magnitude more powerful computing capability, accessible at much lower latencies across a multitude of device form factors. To enable these capabilities at scale, the entire plumbing of the internet will need major upgrades."

Vested interests seemingly also drive Intel's statement. Intel makes CPUs for consumer devices and data centres and if a metaverse needs a 1,000-times increase in computing capacity, it would be good for business. For its part, Intel is already planning for the metaverse and claims some of its scheduled products for release in 2022 would bring it a step closer.

"Beyond these 2022 products, we have a multigenerational roadmap of high-performance XPU's from client through edge to cloud that move us toward zettascale computing in the next five years," Koduri said.

[Intel makes CPUs for consumer devices and data centres and if a metaverse needs a 1,000-times increase in computing capacity, it would be good for business. \(Reuters\)](#)

Document FIEXON0020211221ehck00043

LG's first UltraGear **gaming** laptop pairs 11th-gen **Intel** with RTX 3080 GPU, 300Hz display

Joshua Goldman

365 words

20 December 2021

CNET News.com

CNEWSN

English

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LG is finally venturing away from its slim and ultralight laptop lineup with its first gaming laptop, the LG UltraGear 17G90Q. Not too far away, though: As with its Gram laptops, LG went high-end right out of the gate with this 17.3-inch gaming laptop and kept the laptop thin and relatively lightweight for its size at just under 6 pounds (2.6 kilograms).

LG didn't announce pricing but the 17G90Q is expected to be available in the US and South Korea in the first quarter of 2022. The laptop will run on an 11th-gen Intel Core Tiger Lake H-series processor with Nvidia GeForce RTX 3080 Max-Q graphics, dual-channel memory up to 32GB and a dual-SSD array with up to 1TB of storage. And as you might expect, LG used a high-quality display: a 17.3-inch, 1,920x1,080-pixel wide-screen panel with a 1-millisecond response time, 300Hz refresh rate and 99% sRGB color gamut.

Read more: [Best gaming laptops of 2021](#)

The port assortment isn't lacking, either, with a ThunderBolt 4 USB-C port, a Type-C and two Type-A 3.2 Gen 2 ports, a combo headset jack, HDMI-out, Gigabit Ethernet and a microSD card slot. Other features include a full-HD webcam and IR cam for facial recognition, a fingerprint reader in the power button, a per-key RGB LED-backlit keyboard and [Wi-Fi 6E](#) from Killer Wireless. An UltraGear Studio app will be available for customizing your gaming experience, too.

While LG seems to have all the right pieces in place for its first gaming laptop, the price might keep buyers away. It's certainly one of the knocks we have against its [UltraGear Gaming Speaker GP9](#). Likewise, LG's Gram laptops, though excellent, tend to be expensive compared with the competition and gaming laptops from established brands like Alienware, Omen and Razer are already pricey. But, this is definitely a gaming laptop we'll be keeping an eye out for next year.

[Click to view image.](#)

| LG

Document CNEWSN0020211220ehck0008t

LG UltraGear gaming laptop with 11th Gen Intel processor launched: Key specs and features

486 words

20 December 2021

India Today Online

INTYON

English

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LG has introduced its latest UltraGear gaming laptop (17G90Q) ahead of Consumer Electronics Show (CES) 2022 in Las Vegas next month, and the company has announced that it has already received the Innovation Award at CES 2022.

The LG UltraGear 17G90Q gaming laptop has a vapour chamber cooling system. More information about the laptop will be available during the CES 2022. The South Korean tech giant is expected to start the rollout of the gaming laptop in January 2022 and its native country will be the first to get it.

LG UltraGear gaming laptop is powered by an 11th Gen Intel Tiger Lake H processor, NVIDIA GeForce RTX 3080 Max-Q graphics card, dual-channel memory, and an ultra-fast dual SSD setup. In addition to a 17-inch IPS panel with a 1 millisecond response time and a 300 Hz refresh rate, the LG UltraGear gaming laptop ensures immersive, fluid gameplay for even the most graphically demanding PC games thanks to the latest top-of-the-line hardware. The LG UltraGear Studio allows users to control the CPU and GPU depending on the game.

LG installed an unspecified SSD in the UltraGear 17G90Q for storage but mentions that it supports both channels. It benefits from a vapor chamber cooling system and DTS: X Ultra 3D sound. The gaming laptop has a full-size keyboard including a number pad.

In terms of thermals, it comes with a vapor chamber which they claim keeps the laptop running cool, even when pushed to the limits.

Other than that, it weighs in at 2.64kg, comes with a per-key RGB backlit keyboard, USB 4 Gen 3x2 Type-C, USB 3.2 Gen 2x1 Type-C, HDMI, RJ45, DC-in, as well as microSD/UFS ports. Not to forget, there's a 93Wh battery under the hood, FHD webcam with dual mic, Wi-Fi 6E, and Intel Killer Wireless, as well as 2 way speakers with DTS X Ultra.

Since its launch in 2018, UltraGear laptops have been one of LG Electronics' flagship brands along with lightweight brand Gram and high-performance Ultra PC.

Also, besides laptops, LG Electronics launched premium gaming speakers and monitors under the UltraGear brand earlier this year, including the speaker LG GP9, compatible with personal computers and gaming consoles.

LG has said that it plans to roll out the new LG Ultra Gear gaming laptops gradually in the global market, starting in Korea in January 2022.

Also Read | [Reable GT 2 series to launch today: What to expect and how to watch live stream](https://www.indiatoday.in/technology/news/story/reable-gt-2-series-to-launch-today-what-to-expect-and-how-to-watch-live-stream-1889848-2021-12-20) Also Read | <https://www.indiatoday.in/technology/news/story/reable-gt-2-series-to-launch-today-what-to-expect-and-how-to-watch-live-stream-1889848-2021-12-20> Also Read | [Facebook, now Meta, is the worst company of 2021 according to this survey](#)

Document INTYON0020211220ehck000ul

Intel aims to develop computing infrastructure for the Metaverse - watch

273 words

19 December 2021

Jpost.com (The Jerusalem Post online edition)

JPSTEN

English

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[Intel](#) is planning to develop the computing infrastructure needed to make the Metaverse accessible to all kinds of platforms, the company announced on Sunday.

The company's belief is that the new Internet phenomenon created by Facebook founder Mark Zuckerberg should be accessible to all platforms, from smartphones and PCs to augmented reality (AR) and virtual reality (VR) eyewear, it explained.

A new "architectural" model of the internet will be needed in order to realize this, since, in order for the Metaverse to work it needs 10 Petaflops of computing processing power and 10 Petabytes of storage in 10 milliseconds, an enormous leap in computing capabilities.

"Intel has been developing core technologies that de-couple workloads from the underlying hardware and taking a [cloud-first approach](#) with our products," the company said.

"We are taking the first steps in this direction with the launch of GPUs [graphics processing units] based on our Xe architecture in 2022. These will be the first GPUs born in the cloud, which permeates the whole design philosophy," the company said.

[Click to view video](#)

Hitman III

The company presented its first demo of the game "Hitman 3," which is based on its new graphics processing unit (GPU). The demo shows that the game can transition from running on local software infrastructure to running on the cloud without the user noticing the change.

"We want to liberate the gaming experience from the limits of dedicated hardware and remove the friction – be it the dependence on expensive hardware tied to a physical location, twitch response times, or download and patch size."

Document JPSTEN0020211219ehcj0018i

Technology

Intel says metaverse needs a 1000-times computing power boost

Abhishek Chatterjee

272 words

17 December 2021

The Hindu Online

THINDO

English

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Technology

Metaverse may be the next major platform in computing after the world wide web and mobile.

Metaverse will need a thousand-times boost in computational efficiency from today's state of the art, to be persistent and accessible by billions of humans in real time, Intel said in a statement.

(Sign up to our Technology newsletter, Today's Cache, for insights on emerging themes at the intersection of technology, business and policy. Click [here](#) to subscribe for free.)

"We need several orders of magnitude more powerful computing capability, accessible at much lower latencies," said Raja Koduri, senior vice president and general manager of the Accelerated Computing Systems and Graphics Group at Intel Corporation.

"The entire plumbing of the Internet will need major upgrades."

[He highlighted that we are on the cusp of the next major transition in computing and metaverse may be the next major platform in computing after the world wide web and mobile](#) but reckons that our current computing, storage and networking infrastructure is not enough to achieve this vision.

To put different individuals in a social setting in an entirely virtual environment we need convincing and detailed avatars with realistic clothing, hair and skin tones, rendered in real time and based on sensor data capturing real world 3D objects, gestures, audio.

[Also Read | Intel's first foray into the metaverse will be software to use others' chips](#)

To achieve this, data transfer at super high bandwidths and extremely low latencies are required. Beyond the hardware improvements, we also need new algorithms and software architectures, Koduri said.

Document THINDO0020211217ehch000e3

Technology

Metaverse will need thousand times the computing efficiency than what we have today: **Intel**

Prasid Banerjee

441 words

16 December 2021

TechCircle

MMVTCE

English

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Facebook's Mark Zuckerberg and Microsoft's Satya Nadella may be bullish on the metaverse concept, but chipmaker Intel isn't quite as expected. In the company's first statement [1] on the subject, Raja Koduri, Senior Vice President and General Manager of Accelerated Computing Systems and Graphics Group at Intel, noted that while the metaverse could indeed be the next step in computing, it isn't as close as many of us have been led to believe.

In a post on Intel's blog, Koduri wrote that the computing, storage and networking infrastructure we have today is "simply not enough" for what the metaverse needs. "We need several orders of magnitude more powerful computing capability, accessible at much lower latencies across a multitude of device form factors. To enable these capabilities at scale, the entire plumbing of the internet will need major upgrades," Koduri wrote in his post.

###SIMAGECAPTION###Raja Koduri###EIMAGECAPTION###

Koduri is a veteran in the chip industry and has worked at Intel, AMD and Apple in the past. While he wasn't as bullish on the metaverse as Zuckerberg, he did note that it is possibly the next step in computing. The post says that Intel does have "building blocks" for the metaverse in place, and they are divided into three days — a meta intelligence layer, a meta ops layer and a meta compute layer.

The meta intelligence layer focuses on a "unified programming model" and software development tools and libraries that will help developers build products for the metaverse. On the other hand, the meta ops layer delivers the compute power beyond what is easily available today and required by developers to build for the future, while the meta compute layer is the "raw horsepower necessary to power these metaverse experiences".

Koduri then listed some of Intel's most powerful chips available for consumers and cloud computing today, before pivoting to what the metaverse will need. "Truly persistent and immersive computing, at scale and accessible by billions of humans in real time, will require even more: a 1000 times increase in computational efficiency from today's state of the art," he said, adding that "many advances" in packaging, memory, transistors and more are currently in the pipeline. And it's not hardware alone, Koduri noted that new algorithms and software will also be needed for the metaverse Big Tech is imagining and marketing today.

[1] <https://www.intel.com/content/www/us/en/newsroom/opinion/powering-metaverse.html#gs.iyi67m>

[Click here to view story.](#)

[Click here to view image.](#)

Document MMVTCE0020211216ehcg0000b

Lifestyle, Tech

Metaverse will need 'a 1,000-times increase' in computing power, **Intel** executive says

Adam Smith

470 words

16 December 2021

19:37

Independent Online

INDOP

English

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The metaverse represents a 'utopian convergence of digital experiences', the executive claimed, but we are unlikely to reach anything near that soon

[Intel](#) has claimed that the [metaverse](#) will require 1,000 times more computing power than what is currently available.

The metaverse, which aims to bring about a digitally-connected ecosystem of platforms across multiple devices, is still yet to be realized in any concrete form. Many technology companies, most notably [Facebook](#), which rebranded to [Meta](#), [believe this will be the future of how we use computers](#).

"The term 'metaverse' was coined by Neal Stephenson in a science fiction novel almost 30 years ago. In recent years, metaverse has come to represent a utopian convergence of digital experiences fueled by Moore's Law – an aspiration to enable rich, real-time, globally-interconnected virtual-and augmented-reality environments that will enable billions of people to work, play, collaborate and socialize in entirely new ways", [writes](#) Intel vice president Raja Koduri.

Mr Stephenson's novel, *Snow Crash*, paints the metaverse as a poor, desperate nation governed by corporate franchises that is necessary because the real world has become unbearable to live in, though that did not appear in Mr Koduri's summary.

Nevertheless, the executive said that industry will "need several orders of magnitude more powerful computing capability, accessible at much lower latencies across a multitude of device form factors" in order to create this vision.

"Truly persistent and immersive computing, at scale and accessible by billions of humans in real time, will require even more: a 1,000-times increase in computational efficiency from today's state of the art."

This is because of the computational prowess needed to simulate convincing clothing and appearance of users, the sensory data gathered from their movements, and audio information – not to mention transmitting all of that in real time. Meta's Horizon Worlds, its flagship VR experience, can currently only support 20 people at a time.

Moore's Law, which holds that computational capacity doubles every two years, means that a realistic metaverse is unlikely to happen any time soon.

Technology companies such as Intel, Samsung, and IBM are working on the problem – with the [latter two recently proposing a new semiconductor chip that could revolutionise transistor design](#).

The companies claim that they could offer "two times improvement in performance or an 85 percent reduction in energy use" and make smartphone batteries last for one week. It could also reduce the carbon footprint of energy-intensive tech such as crypto mining, data encryption, and potentially support a digital universe.

[Read More](#)

[Facebook chief blames misinformation on 'individual humans' not social media](#)

[Instagram is bringing back its chronological feed](#)

[Apple delays office return plans for employees indefinitely](#)

Document INDOP00020211216ehcg008sq

India

Building Metaverse needs 1,000X more computing power: Intel

337 words

16 December 2021

Indo-Asian News Service

HNIANS

English

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New Delhi, Dec 16 (IANS) Leading chip-maker Intel has stressed that building Metaverse -- at scale and accessible by billions of humans in real time -- will require a 1,000-times increase in computational efficiency from what we have today.

Raja Koduri, a senior vice president and head of Intel's Accelerated Computing Systems and Graphics Group, said that our computing, storage and networking infrastructure today is simply not enough to enable this Metaverse vision, being popularised by Meta (formerly Facebook) and other companies.

"We need several orders of magnitude more powerful computing capability, accessible at much lower latencies across a multitude of device form factors," Koduri said in a blog post.

To enable these capabilities at scale, the entire plumbing of the internet will need major upgrades, he added.

The term Metaverse was coined by Neal Stephenson in a science fiction novel almost 30 years ago.

In recent years, metaverse has come to represent a utopian convergence of digital experiences fuelled by Moore's Law - an aspiration to enable rich, real-time, globally-interconnected virtual- and augmented-reality environments that will enable billions of people to work, play, collaborate and socialise in entirely new ways.

"Indeed, the metaverse may be the next major platform in computing after the world wide web and mobile," Koduri said.

The once-in-a-lifetime pandemic has forced many to rely on digital technology as the only way to communicate, collaborate, learn and sustain our lives.

The explosion of decentralised digital finance technologies inspires business models that encourage everyone to play a role in creating these Metaverses, argued the Intel executive.

Social media giant Facebook has said it will spend more than \$10 billion to build out its vision for Metaverse.

Facebook has announced to hire 10,000 people to help the social network build the Metaverse.

According to the company, the next computing platform has the potential to help unlock access to new creative, social and economic opportunities

--IANS

na/ksk/

Document HNIANS0020211216ehcg002mh

Intel Core i5-12400F Alder Lake CPU Slays The AMD Ryzen 5 5600X In Latest Benchmarks, Faster Than i7-11700K In Gaming

Hassan Mujtaba

1,380 words

15 December 2021

Wccftech.com

NEWAGAE

English

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New benchmarks of Intel's Alder Lake Core i5-12400F Desktop CPU have popped up online which shows it faster than AMD's Ryzen 5 5600X in gaming and synthetic benchmarks.

Intel's Sub-\$200 US Core i5-12400F Crushes AMD's Ryzen 5 5600X In Leaked Benchmarks, Faster Than The i7-11700K Too

Update: [Igor's Lab](#) has posted the first in-depth gaming benchmarks of the Core i5-12400 CPU (that was simulated through Intel Core i5-12600K) with DDR4 memory and the performance against the Ryzen 5 5600X looks amazing at its expected price. [Check out Igor's full review here!](#)

Intel Core i5-12400 Alder Lake Gaming Performance Power & Performance Efficiency (Image Credits: Igor's Lab):

* [Click to view image.](#)

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The Intel Core i5-12400 is going to be the most entry-level chip within the Alder Lake Core i5 CPU segment. It will rock 6 cores, 12 threads and rely only on Golden Cove (P-Cores). There will be no Gracemont cores on the 12400. Additionally, it will rock a base clock of 2.5 GHz and boost all the way up to 4.4 GHz (4.0 GHz all-core). The CPU has a base TDP of 65W but the maximum wattage should be between 100-150W. Well, not actually 150 since that's what the Core i5-12600K, the top Core i5 unlocked chip features but we would only know once we get to test the chip.

[Click to view image.](#)

The new benchmarks were leaked by a [content creator at Bilibili](#) who got access to the QS variant of the chip. The motherboard used was an OEM B660M-N D4 which supports DDR4 memory and overclocking too. 16 GB DDR4-3200 memory along with an RTX 3070 were part of the test system.

In terms of performance, the Intel Core i5-12400F is compared against the Core i7-11700K, Core i5-11400F, and the Ryzen 5 5600X. The chip beats all CPUs in terms of single-core performance within CPU-z and is faster than the 5600X and 11400F in multi-threaded tests. It only loses out to the Core i7-11700K which rocks a much higher clock speed and more threads (12 vs 16). Same is the case in the Cinebench R23 benchmark where the little i5-12400F chip is 19% faster in multi-threaded & 11 percent faster in single-threaded tests. In the TimeSpy CPU score, the Intel i5-12400F is around 13 percent faster than the AMD Ryzen 5 5600X.

Intel Core i5-12400F CPU Synthetic Benchmarks:

* [Click to view image.](#)

* [Click to view image.](#)

* [Click to view image.](#)

Moving over to gaming benchmarks, all CPUs were tested at 1080p. In CSGO, the i5-12400F is 4% faster, in Shadow of The Tomb Raider, the average frame rate is about on par with the Ryzen 5 & finally, we have Red Dead Redemption 2 where the chip is faster than all of the chips tested.

Intel Core i5-12400F CPU Gaming Benchmarks:

* [Click to view image.](#)

* [Click to view image.](#)

* [Click to view image.](#)

Intel Core i5-12400F Alder Lake CPU Benchmarks:

CPU Name	Intel Core i5-12500	Intel Core i5-12400F	AMD Ryzen 5 5600X
Intel Core i7-11700K	Intel Core i5-11400F	Vs Ryzen 5 5600X	
CPU-z (ST)	704	684.7	626.6
634.4	556.9	+10%	
CPU-z (MT)	5101	5000	4621.9
6297.3	4333.4	+8%	
Cinebench R23 (ST)	1688	1686	1513
1581	1341	+11%	
Cinebench R23 (MT)	12667	12311	10357
14914	9295	+19%	
3DMark Time Spy (CPU Score)	8994	9066	8058
12262	8606	+13%	
CSGO 1080p	N/A	546	523
476	428	+4%	
RDR2 1080P	N/A	153	145
147	140	+6%	
SOTR 1080P	N/A	167	171
184	134	-5%	

The Intel Core i5-12400F has already been reported to operate at 60C maximum temperatures at full load while consuming under 80 Watts of power. This means that the Alder Lake i5 chip is a tad bit more efficient than AMD's Ryzen 5 5600X Zen 3 chip. Aside from that, the Core i5-12400 is going to cost under \$200 US, & competing with a Ryzen chip that costs 50% more is just incredible value. The chip would make for an excellent budget build when paired with [several inexpensive 600-series motherboards that are launching next month](#) (with DDR5 and DDR4 memory support).

Update: Another content creator has also [published](#) performance benchmarks of the Intel Core i5-12500 which you can see below. Once again, the i5-12500 seems to run around 60C while sipping an average of 70 Watts (80W maximum power consumption at full load).

[Previous benchmarks](#) have also shown the Core i5-12400 to offer similar or even better performance than the Ryzen 5 5600X at the same power consumption so overall, the little i5 is aiming to be a budget PC builders dream with the 12600K(F) being the mainstream king. Intel has really nailed the mainstream and budget segment this time and we can't wait to see how AMD will respond to them and if a price cut or 3D V-Cache will be enough to compete with the blue team's offerings.

Intel 12th Gen Alder Lake Desktop CPU Specs "Preliminary"

CPU Name	P-Core Count	E-Core Count	Total Core / Thread	P-Core Base / Boost	E-Core Base / Boost	E-Core Boost (All-Core)	L3
(Max) P-Core Boost (All-Core)	E-Core Base / Boost	E-Core Boost (All-Core)	L3				
Cache TDP (PL1)	TDP (PL2)	Expected (MSRP)	Price				
Core i9-12900K	8	8	16 / 24	3.2 / 5.2 GHz			
5.0 GHz			2.4 / 3.9 GHz	3.7 GHz			30 MB
125W	241W	\$599 US					
Core i9-12900	8	8	16 / 24	2.4 / 5.1 GHz			
TBA			1.8 / TBA GHz	TBA			30 MB
65W	~200W	TBA					
Core i9-12900T	8	8	16 / 24	TBA / 4.9 GHz			
TBA			TBA	TBA			30 MB
35W	TBA	TBA					
Core i7-12700K	8	4	12 / 20	3.6 / 5.0 GHz			
4.7 GHz			2.7 / 3.8 GHz	3.6 GHz			25 MB
125W	190W	\$419 US					
Core i7-12700	8	4	12 / 20	2.1 / 4.9 GHz			
TBA			1.6 / TBA GHz	TBA			25 MB
65W	~190W	TBA					
Core i7-12700T	8	4	12 / 20	TBA / 4.7 GHz			
TBA			TBA	TBA			25 MB
35W	TBA	TBA					
Core i5-12600K	6	4	10 / 16	3.7 / 4.9 GHz			
4.5 GHz			2.8 / 3.6 GHz	3.4 GHz			20 MB
125W	150W	\$299 US					
Core i5-12600	6	0	6 / 12	3.3 / 4.8 GHz			
4.4 GHz			N/A	N/A			18 MB
65W	~200W	TBA					
Core i5-12600	6	0	6 / 12	3.0 / 4.6 GHz			
TBA			N/A	N/A			18 MB
35W	TBA	TBA					
Core i5-12500T	6	0	6 / 12	TBA / 4.4 GHz			
TBA			N/A	N/A			18 MB
35W	TBA	TBA					
Core i5-12400	6	0	6 / 12	2.5 / 4.4 GHz			
4.0 GHz			N/A	N/A			18 MB
65W	~150W	TBA					
Core i5-12400T	6	0	6 / 12	TBA / 4.2 GHz			
TBA			N/A	N/A			18 MB
35W	TBA	TBA					
Core i3-12300	4	0	4 / 8	2.5 / 4.4 GHz			
TBA			N/A	N/A			12 MB
65W	~100W	TBA					
Core i3-12200T	4	0	4 / 8	TBA / 4.2 GHz			
TBA			N/A	N/A			12 MB
35W	TBA	TBA					
Core i3-12100	4	0	4 / 8	3.3 / 4.3 GHz			
TBA			N/A	N/A			12 MB
65W	~100W	TBA					
Core i3-12100T	4	0	4 / 8	TBA / 4.1 GHz			
TBA			N/A	N/A			12 MB
35W	TBA	TBA					

[Click to view image.](#)

Document NEWAGAE020211215ehcf000b6

Intel's 'continual compute' tech could turn normal laptops into gaming powerhouses

Mark Hachman

581 words

15 December 2021

PC World (Australia)

IDGPCW

English

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Intel has begun showing off a continual compute demonstration that essentially takes the concept of an eGPU — an external graphics card connected to a laptop via Thunderbolt — and abstracts it further over your network to a remote PC.

Intel presented the concept at the Realtime Conference on Monday, which, like virtually every company within the past few weeks, latched on to the concept of the metaverse as an opportunity to sell more products. Raja Koduri, senior vice president and general manager of the Accelerated Computing Systems and Graphics Group, presented continual compute as a solution to the problems posed by the metaverse. Those problems being capturing real-world objects in real time and then translating that environment into the virtual space and vice versa.

Intel said that by tapping the resources of the external GPU, gamers and VR enthusiasts could enjoy higher resolutions and frame rates.

Essentially, though, continual compute has a more immediate impact on PC gaming. That's how Intel chose to show the technology off in a blog post on Tuesday. Using the game Hitman 3, Intel showed off how a thin-and-light laptop could connect to a local gaming PC and use its GPU to offload some of the graphics workload. (Intel hasn't posted the embedded video to its YouTube channel, so you'll have to watch it on its site.)

The video shows the game running on the laptop and taxing the CPU and GPU to its limits. After remotely connecting the external gaming PC, the same game ran at higher frame rates and visual quality. However, Intel didn't enable a framerate counter and it's not quite clear what the visual settings were set at during the demo. The video did appear to run more smoothly and at a better quality.

Intel showed how its continual compute demonstration didn't tax the local laptop's resources.

Intel's secret sauce here isn't hardware, but software. It's an abstraction layer that can detect what Intel calls ambient computing, or the presence of a more powerful PC that can be applied to the task at hand. This is precisely what Intel's infrastructure layer delivers, the video's narrator says. It sends us additional compute resources available within the network and intelligently allocates it to me delivering the best user experience possible.

As the game launches at runtime, the infrastructure layer determines that a better experience is possible using ambient computing resources from my gaming rig, the narrator continues. The improvements are part of what Intel calls system resource abstraction, where the game's file system is being abstracted and delivered over the network.

To be fair, we've seen some of this before. In 2015, Microsoft enabled game streaming from Xbox Ones to PCs running Windows 10 even over Wi-Fi. In that case, the console was handling the bulk of the work. Intel's blog post implies that its technology could be a bit more collaborative. Companies like Steam and Moonlight have offered similar experiences, though. Cloud gaming on Windows, of course, simply abstracts these shared resources into the cloud.

Still, it's good to have top chip vendors supporting an (optimistic) future where we simply have underutilized GPUs lying about and waiting to be taken advantage of for gaming. We already have network-attached storage, could we eventually see network-attached GPUs too?

Document IDGPCW0020211215ehcf00001

Intel Jumps Head-First Into the Metaverse

Francisco Pires

648 words

14 December 2021

Tom's Hardware

TOMHA

English

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Intel is taking the Metaverse pretty seriously, providing the computing power and also working on the software.

Intel has [finally spoken publicly](#) about the Metaverse, the latest push from Meta (previously known as Facebook) toward a digitally-interconnected world. As the world's largest semiconductor manufacturer, Intel is a natural player in this science-fiction-meets-reality story. Its technological solutions are part of the backbone of computing itself, whether local (in your PC) or distributed (in the cloud). However, Intel seems to think its greatest efforts toward enabling and supporting the vision for an eventual Metaverse space won't come from the hardware realm. Instead, Intel is focusing on the elegant hell of software.

The basic gist of the situation is this. Intel has taken giant's steps since the introduction of the semiconductor in increasing available computing performance. These advances mean increased performance at a chip level, and the parallel advances in cloud infrastructure that can now stream interactive experiences (i.e., games) to a low-power, local device. But even these devices are now powerful enough to drive their own experiences. The CPUs in our mobile phones are now more powerful than the ones that were employed in the Xbox 360 and PS3 consoles, and GPUs are heading in the same direction.

[In an interview with Quartz](#), Raja Koduri, head of Intel's accelerated computing systems and graphics group, said that "the [personal computers] are getting better, the phone is amazing these days, you've got a two-teraflop GPU in the phone... and then you have cloud. There's lots of progress made, but it is not enough." While it may sound impractical today, companies are working on bringing enough graphics performance to phones to [support ray tracing](#) — and it will come, in time.

These devices and others with embedded processing power are mostly left idle. The question then becomes: What if we could build an infrastructure that would allow for available computing resources in a network to be pooled together irrespective of manufacturer, and get them seamlessly and transparently working for the same goal? Koduri seems to think that this is an essential element in enabling a true Metaverse experience.

"One foundational thing we always knew is that for what we imagined in Snow Crash, what we imagined in Ready Player One, for those experiences to be delivered, the computational infrastructure that is needed is 1000 times more than what we currently have."

As reported by Reuters, Intel is currently developing such a software solution that would enable for computing resources to be pooled together according to usage requirements. Of course, that resource pooling across networks — and across vast stretches of physical space between your home and Microsoft's Xbox Cloud render farms, for example — requires many pieces to work in lockstep. Imagine powering up your laptop in your bedroom, starting a game, and your system automatically powers up other devices on your network, like a game consoles or a PC packing one of the [best graphics cards](#).

"The compute that you need to render a photo-realistic you of me or your environment needs to be continued anywhere," added Raja Koduri. "That means that your PCs, your phones, your edge networks, your cell stations that have some compute, and your cloud computing needs to be kind of working in conjunction like an orchestra—between all of these three elements that deliver that kind of beautiful metaverse. It'll take time."

Just how much time isn't exactly clear, but Intel is already working on the problem. And while software will undoubtedly play a big role, don't count out the hardware aspect. Something tells me we're not going to be joining the Metaverse on current generation smartphones and PCs, no matter how bullish Meta and Intel might seem.

[Metaverse VR clipart \(Shutterstock\)](#)

Document TOMHA00020211214ehce000dz

PC/ Laptops

Intel's First Foray Into the Metaverse Will Be Software to Use Others' Chips

Reuters

379 words

14 December 2021

14:42

NDTV

NDTVIN

English

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In their first public comments on its strategy for tapping into the "metaverse," Intel executives said the firm is working on software that will help laptops tap into computing power from other devices, including chips from its rivals. While the definition of "metaverse" is broad, it generally refers to immersive virtual worlds that will be accessed via the internet and a variety of devices, like virtual reality headsets.

The trend is expected to require vastly more computing power, and firms like [Nvidia](#), which makes chips and software used to construct the virtual world, and [Qualcomm](#), which makes chips used in virtual reality headsets, have both gained value in recent months on investor enthusiasm about the metaverse.

At a news conference after a presentation at the RealTime Conference on metaverse technologies on Monday, Raja Koduri, head of [Intel's](#) accelerated computing systems and graphics group, said the company's first technology push into the [metaverse](#) will be software that helps devices take advantage of computing power that already exists and is unused. For example, if a gamer is playing a graphics-heavy title on a laptop that would tax the system's chips but has an unused gaming PC in another room, the software could detect the spare power sitting idle on the PC and tap into it over a home network to make the laptop game run better.

Koduri said the software will work with chips from competitors. The software is designed to solve technical challenges for users, and not just to generate major revenue for Intel. Some of it will be shared, Koduri said. "The way we are architecting all the layers is that it is going to work with everybody's hardware, as long as they are on industry-standard specifications," Koduri told reporters. "There'll be a lot of open sourcing involved with everything that we build", he added.

[Click here to view video](#) Will Snapdragon's new 2022 chips make it more prominent as a brand? We discuss this on [Orbital](#), the Gadgets 360 podcast. [Orbital](#) is available on [Spotify](#), [Gaana](#), [JioSaavn](#), [Google Podcasts](#), [Apple Podcasts](#), [Amazon Music](#) and wherever you get your podcasts.

[Click here to view video](#)

Document NDTVIN0020211214ehce0008o

Intel is ready to talk about the metaverse

Scott Nover

1,742 words

13 December 2021

Quartz

QUARTZ

English

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Among Silicon Valley's hottest buzzwords, [the metaverse](#) reigns supreme. Coined by Neal Stephenson in the 1992 novel *Snow Crash*, the metaverse is a next-generation immersive internet experienced through augmented and virtual reality (AR and VR).

The concept of the metaverse has inspired the tech industry for decades. Long after the virtual world *Second Life* popped up in the mid-2000s, gaming companies like Epic Games (maker of *Fortnite*) and Roblox have started describing their worlds as an early version of the metaverse. Facebook founder Mark Zuckerberg changed Facebook's parent [company name](#) to Meta signaling his intention to [design the new immersive internet in its image](#).

Yet few chip companies have gotten in the game. They're crucial to making the metaverse a reality. Relative to the enormous computing demand for fully immersive virtual worlds, today's chip are underpowered. They're also in short supply: supply chain woes mean the semiconductor industry is months behind on delivering enough chips for everything from video game consoles to cars.

So far, only one chip manufacturer, NVIDIA, has announced that it is building a platform for metaverse. Called [Omniverse](#), its chips are designed for "connecting 3D worlds into a shared virtual universe."

Now Intel is entering the conversation. Intel will release a new series of graphics processors starting in the first quarter of 2022, which it [announced](#) in August 2021, and says will power the metaverse. Intel's Raja Koduri, who leads Intel's Accelerated Computing Systems and Graphics Group, said in an exclusive interview that the computing power of today's chips will need to improve 1000-fold to power the metaverse.

Koduri spoke about the path to the metaverse, his vision for what it will look like, and how Intel wants to help build it ahead of his public remarks at the [RealTime Conference](#) on Dec. 13.

This interview has been edited for clarity and length.

What are you telling the world today about the metaverse?

One foundational thing we always knew is that for what we imagined in *Snow Crash*, what we imagined in *Ready Player One*, for those experiences to be delivered, the computational infrastructure that is needed is 1000 times more than what we currently have.

So the [personal computers] are getting better, the phone is amazing these days, you've got a two-teraflop GPU [graphics processors] in the phone... and then you have cloud. There's lots of progress made, but it is not enough.

Your thesis is that there's a lot of hype around the metaverse, who's going to build it, and what's going to look like. But before we get to that, chipmakers need to build the infrastructure layer.

Yes, exactly... What I have been in pursuit of for the last five years is preparing the computational framework necessary for the metaverse. You need to access to petaflops [one thousand teraflops] of computing in less than a millisecond, less than ten milliseconds for real-time uses.

We've been working in the background on the roads and highways and the train lines you need, assuming this civilization is going to happen. When roads are being built it's exciting but after that, nobody cares about it. And that's where we want to get to. Once this is all built, you'll have your fun in the metaverse.

Why is this the first time that Intel is talking about the metaverse publicly?

Because the first building blocks—the high-performance graphics—are within a few months of launching. Before it was speculative. If we started talking about stuff that is still a year-plus away, it's like, 'Too much PowerPoint!' We will start rolling out in 2022. But this is a four- or five-year journey to get everybody to have access to better, faster compute. We'll be laying out their first set of roads, if we use that analogy, next year and actually have launches coming up in early [2022].

What is what's Intel's vision of the metaverse? Is it one cohesive space? Is it a series of different metaverses?

We envision it as multiverses that may be connected to each other with accounts or something like that. One version of the metaverse I personally aspire to is the ability to have this conversation that you and I are having in a full immersive environment where I see video of you and you see a video of me and it's photo-real, maybe beyond photo-real. Maybe it's the Superman version of Scott, but where we can interact and collaborate with people across the world in more three-dimensional reality. That's one I'm banking on—kind of Zoom on steroids.

The other one is gaming experiences where we are having fun, earning points, and doing quests. Then there is the social stuff that that is beyond just kind of having a meeting. It's a continual social space with avatars and creators. Being able to have people collaboratively work on things, but they're all remote. You don't have to be physically on location to create stuff, whether it is the creation for storytelling or movies or even physical objects. It's a wealth of possibilities.

Gaming creation, collaboration, social—they all can have different metaverses. And they may connect, but we see the underlying technology framework as being common.

The path to the metaverse

How far out are we from this vision for the metaverse?

You see the first instances in many shapes and forms already. Our infrastructure today with broadband and 5G rolling out is pretty good in pockets, but it's not consistent, as you know. And I live in the San Francisco Bay Area and I go from the South Bay to San Francisco and my signal quality and my bandwidth is all over the place. Even in the heart of the Silicon Valley, it's not consistent. One thing about the metaverse to me is that it's a continual experience. If I'm in the world, I'm in the world. It's smooth. Especially if you are wearing a headset, if it drops it would be like a punch in the gut.

The compute that you need to render a photo-realistic you of me or your environment needs to be continued anywhere. That means that your PCs, your phones, your edge networks, your cell stations that have some compute, and your cloud computing needs to be kind of working in conjunction like an orchestra—between all of these three elements that deliver that kind of beautiful metaverse. It'll take time. Facebook, Microsoft, Google, us, NVIDIA are getting this infrastructure to be kind of omnipresent, but it will take time and effort.

How do we get there: is it just better chips and better broadband and better cloud? How much does the architecture of the internet need to change to support this?

I don't think it takes fundamental change, because you see in video delivery that's been happening—Netflix has centers not too far from you that are streaming video. So the disaggregation of the compute has been happening. We use the word edge computing. So the formation of edge has been happening for the last 40 years, slowly and steadily. I'd say we are still at the one percent of that prevalence. But, the amazing thing, when stuff like this happens, it grows exponentially. So from one percent getting to 90% over the next five or six years—it'll happen.

Where do Web3 [a decentralized vision of the web] and the metaverse intersect? Is decentralization actually important in building something like this?

That's also a kind of buzzy topic. But I do believe the decentralization of compute and mechanisms where we can much more easily do transactions between us will help proliferate the metaverse. So that element of web3, the decentralization, and also whether we leverage crypto as it exists today or some other form, some form of microtransaction payment system that is being integrated into the protocols, will be amazing.

You think blockchains will play a role?

Yeah, I believe that they will, and I believe they'll also find ways to optimize them that they can use blockchain without burning a ton of compute cycles, right? Because you need those compute cycles to render your metaverse, not waste on doing ledger validation.

On the environment and the chip shortage

How do you build the metaverse in a way that is environmentally conscious?

That's the biggest technological challenge and an exciting thing for us as engineers, because this 1000x that I referred to at the beginning, it has to be the same or even lower energy consumption levels than today. So we have to deliver that 1000x increase at the same energy consumption. We believe that a standard kind of

Moore's law curve [which outlines exponential computing growth over time] is only going to get us to about eight or 10x growth over the next five years.

So algorithms, architectures, neural net algorithms—some of this stuff has to play a role in increasing their efficiency. And that's one of the things we have been working on as well. Algorithms will have to play a big role in getting the 1000x. We can do brute force. We can put more compute, like these Bitcoin farms. They throw a ton of [computing power] at it, but that's not energy efficient, as you rightly pointed out. So it has to be that balance where we do energy-efficient compute and hardware, some better algorithms, better architectures. That's the path to 1000x.

How do the chip shortage and supply chain problems affect your vision and timeline?

They do. The positive side of it from being a semiconductor person is that the demand is exploding and metaverse needs even more. So the burden is put on us is that we have to be even more efficient in leveraging our fabrication capacity. We need to be able to get your metaverse experiences without needing big chips that take up a lot of fab capacity.

We need to be much more efficient. Just like the environmental consciousness—don't waste water, don't waste electricity, don't waste heat—it applies to semiconductors as well.

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Technology

HP Omen 16 2021 gaming laptop with 11th-Gen Intel Core processor, up to 165Hz display launched in India

FE Online

406 words

7 December 2021

Financial Express Online

FIEXON

English

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HP launched the 2021 edition of the Omen 16 gaming laptop in India on Tuesday, December 7th. The Omen 16 will come in two configurations—an entry-level b0360TX model with 1080p 144Hz display and Nvidia GeForce RTX 3060 graphics and the high-end b0370TX with a 1440p 165Hz display and GeForce RTX 3070 Max-Q graphics. Rest of the hardware from design to processor, to RAM and storage, and battery capacity are standard.

The entry-level HP Omen 16 2021 b0360TX will cost Rs 1,39,999. The top-of-the-line HP Omen 16 2021 b0370TX will set buyers back by Rs 1,74,999.

Also Read | HP Pavilion Gaming 16 review: Challenging the status quo

The new HP Omen 16 is available to buy across HP world stores, HP online store, other leading large format retail, and online stores at the time of filing of this report.

HP Omen 16 2021 specs, features

The Omen 16 comes with a 16.1-inch IPS LCD panel with matte/anti-glare finish, 300nits peak brightness, and up to a maximum of 1440p 165Hz. Under the hood, the laptop packs an 11th-Gen Intel Core processor—more specifically, the 8-core/16 thread i7-11800H—which is paired with up to RTX 3070 Max-Q graphics, 16 GB DDR4-3200 MHz RAM, and 1TB SSD storage. The laptop runs Windows 11 (Home edition) right out of the gate.

Connectivity options include 1 Thunderbolt 4 with USB Type-C 40Gbps signaling rate (DisplayPort 1.4/charging), 1 SuperSpeed USB Type-A 5Gbps signaling rate (charging), 2 SuperSpeed USB Type-A 5Gbps signaling rate, 1 HDMI 2.1, 1 mini-DisplayPort, 1 RJ-45, 1 AC smart pin, and headphone/microphone combo. There is also an SD card reader and support for Wi-Fi 6 and Bluetooth 5.

Also Read | HP Pavilion Laptop 13 (BB0075TU) review: Classy looks, reliable performance at an affordable price

The Omen 16 is backed by an 83Wh Li-ion polymer battery and is rated to deliver up to 9-hour usage on a single charge.

For cooling, the laptop features HP's in-house Tempest technology that uses a fan design that's said to be 2.5X slimmer and has twice the number of fan blades over the Omen 15.

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HP Omen 16 gaming laptop with Intel Core processor launched in India, price starts at Rs 1.4 lakh

527 words

7 December 2021

India Today Online

INTYON

English

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HP Omen 16 gaming notebook has been launched in India as the latest addition to the company's gaming portfolio in the country. Poised to be a machine capable of running the latest AAA titles, the new HP gaming laptop comes with an 11th Gen Intel Core processor and a 16.1-inch immersive display. HP also claims that the Omen 16 is "one of the lightest gaming laptops available today," with a weight of just 2.3 kg.

Announcing the launch of the new gaming laptop, HP mentions that the new Omen 16 comes with "class-leading thermals," thanks to an improved fan design. Other than this, the company also sticks to its environmental commitments with the new device, promising a PC design made with ocean-bound plastics and recycled materials.

HP Omen 16 has been launched with a starting price of Rs 1,39,999, with more options for increased performance costing higher. The gaming laptop will be available at HP world stores, HP online store and other leading large format retail and online stores. Here is a look at what the new HP gaming laptop has to offer.

HP Omen 16 specifications [Click to view image](#)

The new gaming notebook by HP comes with a 16.1-inch screen that sports 16:9 aspect ratio and a QHD resolution with 165Hz refresh rate or a 144Hz FHD resolution. It is equipped with up to 11th Gen Intel Core i7-11800H3 series processors and up to an 8 GB NVIDIA GeForce RTX 3070 GPU to boost gaming performance. There is also up to 16 GB of DDR4 RAM and an option of up to one 1TB PCIe Gen 4x4 SSD for storage.

HP says that the laptop runs all games at 1080p and 60fps. It comes with Omen Tempest Cooling Technology, which features an upgraded new fan design which is 2.5X slimmer and has twice the number of fan blades as the previous generation. This helps to achieve a significant increase in thermal efficiency on the device while gaming.

HP Omen 16 comes with a battery capacity starting from 52.5Whr and going up to 83Whr. With this, HP claims up to 9 hours of battery life on the gaming laptop. There is further an Omen Dynamic Power Technology which can accurately identify real-time CPU and GPU capacity and dynamically allocate power between the two for optimised performance, irrespective of the task being handled by it.

Connectivity options on the device include a Thunderbolt 3 with USB Type-C port, a USB Type-A with HP Sleep and Charge support, two regular USB Type-A, one RJ-45, one AC Smart pin, one headphone and microphone combo jack, one Mini DisplayPort, and a HDMI 2.0a.

Also read: | [2021 MacBook Pro reportedly giving users SD card reader issues, Apple yet to confirm](#) Also read: | [Sony to challenge Xbox Game Pass with similar subscription service for PlayStation](#) Also read: | [Apple's 2022 lineup leaked: From iPhone SE 5G to mixed reality headset, everything to expect](#)

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Intel Core i9-12900K and Core i5-12600K Review: Retaking the Gaming Crown

Paul Alcorn
11,749 words
5 December 2021
Tom's Hardware
TOMHA
English

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We put Intel's new Core i9-12900K and Core i5-12600K through the wringer in Windows 10 and 11 testing with DDR4 and DDR5 memory.

Intel's \$589 [Alder Lake](#) Core i9-12900K and \$289 Core i5-12600K come to market with a powerful combination of competitive pricing and impressive performance, taking the lead in gaming over comparable [Ryzen 5000](#) models and assuring a position on our list of [Best CPUs for gaming](#). Intel's newest chips are also incredibly competitive in productivity work, ranking among the top chips on our [CPU benchmark](#) hierarchy, and provide the biggest gains in overclocking performance that we've seen in the last several chip generations. Combine that with Alder Lake's new next-gen connectivity technologies that bring big increases in throughput via DDR5 memory and PCIe 5.0 interfaces, outstripping AMD's venerable AM4 platform, and Intel has a winner on its hands.

With up to 16 cores and 24 threads on the flagship Core i9-12900K, Intel has finally achieved a comparable core count to AMD's halo mainstream PC chips that have held the core count lead since the first 16-core 32-thread Ryzen 9 landed back in 2019. In fact, the \$589 Core i9-12900K even beats the ultra-impressive \$799 Ryzen 9 5950X in many threaded applications that have become Ryzen's uncontested stomping grounds, like Cinebench.

That's enabled by a first for desktop PCs — Intel's new hybrid x86 design represents the company's most disruptive architectural shift in a decade. Alder Lake combines big and fast Performance cores (P-cores) with a smattering of small and powerful Efficiency cores (E-cores) that chew through background processes with surprising speed. The [Golden Cove architecture](#) powers the 'big' P-cores while the 'little' E-cores come with the [Gracemont architecture](#), with both providing much-needed IPC improvements to Intel's core designs.

Intel etches those cores on its 'Intel 7' process, finally ending the misery of the 14nm node after six long years that ultimately cost the company its performance lead over AMD in desktop PCs. We previously knew this 'Intel 7' manufacturing tech as [10nm Enhanced SuperFin](#), but [Intel recently renamed its process nodes](#) to match industry nomenclature. Technically, this is the second generation of Intel's 10nm process, but it's a first for desktop PCs.

U.S. PriceCores | ThreadsP-Core Base/BoostE-Core Base/BoostTDP / PBP / MTPDDR4-3200L3 CacheCore
i9-12900K / KF\$589 (K) - \$564 (KF)8P + 8E | 16 Cores / 24 threads3.2 / 5.2 GHz2.4 / 3.9 GHz125W /
241WDDR4-3200 / DDR5-480030MBCore i7-12700K / KF\$409 (K) - \$384 (KF)8P + 4E | 12 Cores / 20
threads3.6 / 5.0 GHz2.7 / 3.8 GHz125W / 190WDDR4-3200 / DDR5-480025MBCore i5-12600K / KF\$289 (K)
- \$264 (KF)6P + 4E | 10 Cores / 16 threads3.7 / 4.9 GHz2.8 / 3.6 GHz125W / 150WDDR4-3200 /
DDR5-480016MB

Intel released three high-end overclockable K-series models today, along with their graphics-less KF counterparts that are slightly less expensive. The P-cores are hyper-threaded, while the E-cores only have a single thread, leading to what we would normally consider as non-standard thread counts. As a result, the chips stretch from a 10-core 16-thread Core i5-12600K up to the 16-core 24-thread Core i9-12900K.

The hybrid design is old hat for Arm processors, but it's groundbreaking for the desktop PC. Unfortunately, that comes with some baggage. The new heterogeneous design requires special accommodations to unlock the best performance: High-priority tasks execute best on the P-cores, while the background and threaded workloads should run on the E-cores. That requires operating system intervention.

The Alder Lake chips work with both newer and older versions of Windows, but Windows 11 unlocks the best of Alder Lake because it supports Intel's new Thread Director. The tech provides the operating system with information that assists in assigning work to the correct cores. Alder Lake's performance is still competitive in Windows 10, but you might encounter wayward performance and/or variability, meaning some workloads will be slower at times due to unoptimized thread scheduling. We have plenty of evidence of that in our tests below.

Intel's chips are competitively priced, but PCIe 5.0 and DDR5 are also significant cost-adders for motherboards. All signs point to DDR5 kits being expensive in the early days, so it's good that some motherboards support the more affordable DDR4.

You'll also need a new motherboard for an Alder Lake chip, and for now, Z690 boards are the only option on the menu (lower-end B- and H-Series boards won't come until later). According to our tests, most users will be fine with DDR4-equipped motherboards (especially if you're sticking with Windows 10), but that restricts you to lower-end Z-Series motherboards. Either way, you'll pay a hefty platform premium to access Alder Lake's leading gaming performance, at least until B- and H-series motherboards arrive.

Alder Lake takes the lead over Ryzen in most workloads, but it isn't a slam dunk in every regard — we ran into several odd performance trends with Windows 10, and a few programs even refused to run correctly. We do expect those issues to be fixed sooner rather than later, though, as the industry adapts to the hybrid architecture.

Conversely, Alder Lake is incredibly impressive in Windows 11 and takes the lead over AMD in gaming and performance in most types of workloads. Overall, the Core i5-12600K is now the best gaming CPU on the market, while the Core i9-12900K slots in as the best high-end processor for mainstream platforms.

We have plenty of testing with both Windows 10 and 11 below, not to mention DDR4 vs. DDR5, as we take a closer look at the next chapter in the [AMD vs Intel](#) rivalry. We've also included in-depth overclocking testing, which unearthed the biggest gains we've seen from recent Intel chip generations — we certainly haven't seen double-digit percentage increases in gaming performance from overclocking in several chip generations.

Intel Alder Lake-S Core i9-12900K and i5-12600K Specifications and Pricing

Intel is only bringing its most expensive chips from the Core i9, i7, and i5 families to the retail market for now, but it is also shipping 28 more models to OEMs for prebuilt systems that arrive early next year. Intel isn't sharing details yet, but those models will eventually come to retail at an unspecified time.

We have deep-dive coverage of the Alder Lake [SoC design and core microarchitectures here](#), along with a broader overview in our [Alder Lake all we know article](#). Additionally, Intel has removed its 'TDP' (Thermal Design Point) nomenclature from the spec sheets, and now assigns a Processor Base Power (PBP) value in its place. The company also added a secondary Maximum Turbo Power (MTP) value to the spec sheets to represent the highest power level during boost activity. You can [read more about that change here](#).

U.S. PriceCores | ThreadsP-Core Base/BoostE-Core Base/BoostTDP / PBP / MTPDDR4-3200L3
CacheRyzen 9 5950X\$79916P | 32 threads3.4 / 4.9 GHz-105WDDR4-320064MB (2x32)Core i9-12900K /
KF\$589 (K) - \$564 (KF)8P + 8E | 16 Cores / 24 threads3.2 / 5.2 GHz2.4 / 3.9 GHz125W / 241WDDR4-3200 /
DDR5-480030MBRyzen 9 5900X\$54912P | 24 threads3.7 / 4.8 GHz-105WDDR4-320032MB (1x32)Core
i9-11900K\$5498P | 16 threads3.5 / 5.3 GHz-125WDDR4-320016MBCore i7-12700K / KF\$409 (K) - \$384
(KF)8P + 4E | 12 Cores / 20 threads3.6 / 5.0 GHz2.7 / 3.8 GHz125W / 190WDDR4-3200 /
DDR5-480025MBCore i7-11700K\$4098P | 16 threads3.6 / 5.0 GHz-125WDDR4-320016MBRyzen 7
5800X\$4498P | 16 threads3.8 / 4.7 GHz-105WDDR4-320032MBCore i5-12600K / KF\$289 (K) - \$264 (KF)6P
+ 4E | 10 Cores / 16 threads3.7 / 4.9 GHz2.8 / 3.6 GHz125W / 150WDDR4-3200 / DDR5-480016MBCore
i5-11600K\$2726P | 12 threads3.9 / 4.9 GHz-95WDDR4-320012MBRyzen 5 5600X\$2996P | 12 threads3.7 /
4.6 GHz-65WDDR4-320032MB

All Alder Lake chips support DDR4-3200 or up to DDR5-4800 memory, but caveats apply. Alder Lake chips expose up to 16 lanes of PCIe 5.0 (technically for storage and graphics only, no networking devices) and an additional four lanes of PCIe 4.0 from the chip for M.2 storage. We'll cover those details further below.

Intel's \$589 16-core Core i9-12900K comes with eight P-cores that support hyper-threading, and eight single-threaded E-cores for a total of 24 threads. That's a 33% increase in thread count over the previous-gen [Core i9-11900K](#). The P-cores have a 3.2 GHz base, and peak frequencies reach 5.2 GHz with Turbo Boost Max 3.0 (this feature is only active on P-cores).

This chip comes with 125W PBP (base) and 241W MTP (peak) power rating, but be aware that Intel has also changed its default boost duration for all K-series chips from the 56-second duration with Rocket Lake to an unlimited value. This means the chip will effectively always operate at the 241W MTP when it is under load.

The 12900K has a 100 MHz reduction in peak clock frequency compared to the 11900K, but that isn't too important given the entirely new hybrid architecture — the P-cores process ~19% more instructions per cycle and the SoC realizes performance gains from using different core types for different tasks. Speaking of which, the E-cores have a 2.4 GHz base and stretch up to 3.9 GHz via the standard Turbo Boost 2.0 algorithms. The chip is also equipped with 30MB of L3 cache and 14MB of L2.

At \$589, the Core i9-12900K comes at a \$40 premium over its prior-gen counterpart, squeezing in between the \$799 16-core Ryzen 9 5950X and \$549 [Ryzen 9 5900X](#). That leaves a sizeable \$185 gap between the Core i9 and i7 families that Intel inadequately plugs with the graphics-less \$564 Core i9-12900KF. It's logical to expect a filler product between Core i7 and i9 in the future (possibly like the [Core i9-10850K](#)).

The Core i5-12600K's \$289 price point remains the same as the prior-gen [Core i5-11600K](#), meaning it lands right smack dab in gamer country, going toe-to-toe with the \$299 six-core twelve-thread Ryzen 5 5600X and representing the lowest point of entry to the Alder Lake family (at least for now).

The 12600K comes with six threaded P-cores that operate at 3.7 / 4.9 GHz and four E-cores that run at 2.8 / 3.6 GHz, for a total of 16 threads. That's paired with 20MB of L3 and 9.5MB of L2 cache.

The \$409 [Core i7-12700K](#) comes with the same \$409 tray pricing as the previous-gen [Core i7-11700K](#) and has eight P-cores and four E-cores, for a total of 20 threads. The P-cores run at a 3.6 / 5.0 GHz base/boost, while the E-cores weigh in at 2.7 / 3.8 GHz, all fed by 25MB of L3 cache and 12MB of L2. The graphics-less \$384 Core i7-12700KF comes with a \$25 price reduction.

[Click to view image \(Image credit: Tom's Hardware\)](#)

* The Alder Lake SoC will span from desktop PCs to ultramobile devices with TDP ratings from 9W to 125W, all built on the Intel 7 process. The desktop PC comes with up to eight Performance (P) cores and eight Efficient (E) cores for a total of 16 cores and 24 threads and up to 30 MB of L3 cache for a single chip.

* Alder Lake supports either DDR4 or DDR5 (LP4x/LP5, too). Desktop PC supports x16 PCIe Gen 5 and x4 PCIe Gen 4.

* Intel's new hyper-threaded Performance (P) core, which comes with the Golden Cove microarchitecture designed for low-latency single-threaded performance, comes with an average of 19% more IPC than the Cypress Cove architecture in Rocket Lake.

* Intel's new single-threaded Efficiency (E) core comes with the Gracemont microarchitecture to improve multi-threaded performance and provide exceptional area efficiency (small footprint) and performance-per-watt. Four small cores fit in roughly the same area as a Skylake core and deliver 80% more performance in threaded work (at the same power). A single E core also delivers 40% more performance than a single-threaded Skylake core (at the same power) in single-threaded work (caveats apply to both).

* Intel's Thread Director is a hardware-based technology that assures threads are assigned to either the P or E cores in an optimized manner. This is the sleeper tech that enables the hybrid architecture.

Intel Alder Lake Z690 Motherboards

Intel's Alder Lake drops into Socket 1700 motherboards with the Z690 chipset. You can read about the chipset and some of the first [60+ motherboards in our Z690 motherboard roundup here](#).

Because the new LGA1700 socket is physically larger and has a lower Z-height, existing air and water coolers for LGA1200 and LGA115x motherboards won't work with 600-series motherboards. As a result, upgraders will need to acquire a conversion kit from the cooler-maker or buy a new cooler.

Image 1 of 3

[Click to view image \(Image credit: Intel\)](#)

Image 2 of 3

[Click to view image \(Image credit: Intel\)](#)

Image 3 of 3

[Click to view image \(Image credit: Intel\)](#)

Alder Lake chips expose up to 16 lanes of PCIe 5.0 and an additional four lanes of PCIe 4.0 from the chip for M.2 storage. Those lanes are split into x16 or x8 for GPUs, or x4/x4 for storage slots. [PCIe AICs \(Add-In Cards\) that support PCIe 5.0 M.2 SSDs](#) (which don't exist yet) are already in the works.

Just like Z590, the 14nm Z690 chipset sports 16 lanes of PCIe 3.0, but Intel also added 12 lanes of PCIe 4.0, which is a nice boost to overall connectivity. Intel also doubled the throughput of the DMI connection between the chip and chipset from an x8 DMI 3.0 pipe, which clocks in at 7.88 GB/s, to an x8 DMI 4.0 connection that delivers 15.66 GB/s. This much-needed bandwidth improvement allows for more throughput from attached RAID arrays.

In that vein, Intel also added support for the Volume Management Device feature that supports creating and managing PCIe storage volumes, including bootable PCIe RAID configurations. The increased DMI throughput is also beneficial for Z690's bolstered connectivity options, like the new second USB 3.2 Gen 2x2 20 Gbps connection.

Intel Alder Lake DDR4 and DDR5 Support

Alder Lake chips support both DDR4 and DDR5 memory, but there are several caveats tied to DDR5. As a default, DDR5 runs in Gear 2 mode, resulting in higher latency. Additionally, standard motherboards only support DDR5-4800 if the motherboard has only two physical slots. Therefore, at stock settings, Alder Lake only supports DDR5-4400 on any motherboard with four slots — even if only two slots are populated. Support drops as low as DDR5-3600 if four slots are filled with dual-rank memory DIMMs. Here are the population rules for DDR5:

[Click to view image \(Image credit: Intel\)](#)

In contrast, Alder Lake supports DDR4-3200 in Gear 1 mode for all processors. That can yield latency and performance advantages for the tried and true memory.

There is a wide selection of DDR5 motherboards spread among the various motherboard makers' Z690 families, but it appears that you'll only find DDR4 support on lower-end Z690 boards. Also, unlike previous generations, no motherboard supports both DDR4 and DDR5, which is probably due to DDR5's much tighter signal integrity requirements and onboard power control circuitry.

Alder Lake's memory bus has four 32-bit DDR5 channels that create a 128-bit interface. Additionally, unlike DDR4, DDR5 DIMMs come with PMIC (Power Management ICs) chips that control three on-DIMM voltage rails – VDD, VDDQ, and VPP.

DDR5 supports the new XMP 3.0 standard that supports up to five memory profiles (SPDs) to define unique frequency, voltage, and latency parameters, and XMP 3.0 also lets you write and name two of the profiles. That means you can adjust the frequencies and all the timings and voltages to your liking, assign a profile name, and save the settings directly to the XMP profile stored in the SPD.

The new XMP profiles can also control the PMICs now present on DDR5 DIMMs. Intel has defined a common set of PMIC standards among the vendors to align maximum voltages and voltage steps, among other parameters. Naturally, there are variances in PMIC designs and quality, adding yet another variable to watch out for when selecting the [Best RAM](#) for overclocking.

Intel has also [posted a new certification page on its website](#) to help assure that each kit is compatible with certain motherboards and firmware revisions. You can read more about [DDR5's new features here](#). We expect pricing for DDR5 to be substantially higher than DDR4, currently [projected to be a 50 to 60% markup](#), for some time.

Intel Alder Lake Thread Director and Windows 10 Performance Problems

Alder Lake comes with a mix of both performance and efficiency cores, so it's important that the workloads land on the correct cores. It's easy to see that having a core that excels at high-performance workloads isn't much help if the high-performance workloads often land in the slower cores. It's not quite as bad if lighter workloads to land on the high-performance cores — they'll still run fine — but that could potentially burn extra power and slow down other tasks. Unfortunately, the current Windows 10 thread scheduling system is based entirely on static rules (priority, foreground, background) that are inefficient and create software programming overhead.

Intel's Thread Director technology is the quiet star of the Alder Lake show. This technology works by feeding the Windows 11 operating system with low-level telemetry data collected from within the processor itself, thus informing the scheduler about the state of the cores, be it power, thermal, or otherwise, and the type of workload being executed by any given thread. The Windows scheduler then uses this additional information to make real-time intelligent decisions about thread placement.

You can read the [in-depth details of the Thread Director tech here](#), but it's important to know that this feature is only supported on Windows 11.

As you'll soon see, the lack of optimized thread scheduling can greatly impact performance with Windows 10 systems, at least in some situations. To be clear, Windows 10 does have limited support for hybrid-optimized thread scheduling due to optimizations for Intel's [Lakefield](#) chips. However, while Windows 10 is aware of hybrid topologies, meaning it knows the difference between the performance and efficiency of the different core types, it doesn't have access to the thread-specific telemetry provided by Intel's hardware-based solution.

As a result, threads can and will land on the incorrect cores under some circumstances, which Intel warned could result in higher run-to-run variability in benchmarks. It will also impact the chips during normal use with Windows 10, too.

Additionally, we found that performance can be inconsistent on Windows 10, with some programs running faster some times, but slower at others. This seems to become more prevalent during multitasking, but we're still working to fully quantify the impact — its variable nature makes it hard to pin down. Toying with various settings, like assigning the priority of background tasks through the standard Windows settings, can help, but it isn't a cure-all.

Some programs may also need to be forced to run in the foreground for optimal performance, which Intel advises you can accomplish via the command line using `powercfg` commands. There's also the more user-friendly [Process Lasso](#) that is designed with Alder Lake optimization in mind. That type of intervention isn't ideal for all users, though, especially the casual type, so be aware that Windows 10 could require extra babysitting if you're searching for every last bit of performance. For most users planning on buying an Alder Lake CPU, Windows 11 is the best option.

And with that, let's take a look at performance in both Windows 10 and 11 on the following pages.

* MORE: [Best CPUs for Gaming](#)

* MORE: [CPU Benchmark Hierarchy](#)

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Intel Core i9-12900K Overclocking, Power and Thermals

The Alder Lake chips are easily the best overclocking chips we've seen from Intel in several generations. As you'll see on our gaming page, that results in up to double-digit performance increases in gaming performance in our test suite.

Unless stated otherwise, our overclocking settings are always geared to emulate what we expect a standard enthusiast can achieve with a reasonable type of conventional cooling for 24/7 use (we use a 280mm Corsair H115i AIO as our default cooler). As such, you can tune more aggressively or employ better cooling solutions to attain even higher results, but as always with overclocking, your mileage may vary.

We initially tuned the Core i9-12900K's P-Cores to 5.2 GHz and set the E-Cores to 4.0 GHz (all-core on both), but while these settings proved perfectly stable, the chip overwhelmed our 280mm Corsair H115i under certain heavy loads — a single core sporadically reached 100C. We feel that a 360mm AIO water cooler, or a custom loop, could handle the thermal output of a 5.2 GHz overclock. There could also be slightly more frequency headroom as well: Thermals, not silicon quality or ability, are the bottleneck with this chip.

To keep temperatures in check, we dialed in a 5.1 GHz P-Core and 3.9 GHz E-Core overclock with a 1.29V CPU vCore. We also assigned a -2 GHz AVX offset to align with the same all-core AVX clock speeds we observed with the chip at stock settings. This means the chip runs at 4.9 GHz when it encounters AVX workloads, allowing us to reach higher with other, more common types of work (like gaming) while staying within a comfortable thermal envelope during taxing AVX-heavy work.

We also dialed in a 4.2 GHz fabric clock, which is a whopping 1.6 GHz above the stock setting of 2.6 GHz. This is also 200 MHz beyond what we've been able to achieve with Intel's prior-gen chips, marking a big improvement to fabric capabilities. Finally, we assigned memory to DDR4-3800 with 14-14-14-34 timings in Gear 1 mode. Experience has taught us that staying in Gear 1 mode provides the best overall performance in most applications. It is noteworthy that we've seen several results with DDR4-4000 in Gear 1 for everyday usage, which is a significant improvement over the Rocket Lake chips that tapped out at DDR4-3800 in Gear 1. You might have to adjust the VccIn (or equivalent) to enable this slightly higher level of performance, but we stuck with DDR4-3800 to emulate a bog-standard overclock.

[Click to view image \(Image credit: Tom's Hardware\)](#)

As you can see above, the chip easily ran at a 5.1 GHz all-core overclock while staying under the 100C threshold through a series of Handbrake, POV-Ray, Y-cruncher, and Blender runs (these are our most stressful real-world applications, and all but Blender employ heavy AVX workloads). Notably, the 12900K can hit 5.3 GHz on two 'preferred' cores during normal operation, so we're sacrificing 100 MHz of peak clock speeds with this config. That manifests as a slight performance decline in a few entirely single-threaded workloads, but the impact was rare. It's also worth mentioning that very few modern workloads are truly single-threaded.

The 12900K peaked at 277 Watts, but we only saw those peaks during the multi-threaded y-cruncher tests that heavily employ taxing AVX instructions. Temperatures peaked at 97C for a brief moment, but largely hovered in the low-90's during the most stressful workloads. Again, thermals are the limiting factor, but you can do more complicated overlocks that prioritize a few cores with higher peak frequencies or step up to a beefier cooler to unlock higher overclocking potential.

Intel Core i5-12600K Overclocking, Power and Thermals

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The Core i5-12600K is a tuner's delight: Core i5-12600K comes with quite a bit more thermal headroom due to its lower core count, meaning there's more room to play, and it also has plenty of frequency headroom.

We dialed in an all-core 5.0 GHz P-core and 3.9 GHz E-Core overclock with a 1.33V vCore (notably, that's slightly higher than the 1.29V we used for the 12900K). We also employed a -3 GHz AVX offset, 4.2 GHz fabric, and dialed in a DDR4-3800 Gear 1 memory overclock with 14-14-14-34 timings.

With our H115i 280mm watercooler, albeit with the fans cranking away at full speed, we peaked at 96C for a single one-second measurement during our stress tests. The chip hovered in the 75C to 85C range during the majority of the tasks. We could absolutely wring more out of this chip, and the 5.0 GHz overclock is above the 12600K's peak 4.9 GHz speed at stock settings, which is becoming increasingly rare with newer chips.

Test Setup

Alder Lake's Thread Director technology works best with Windows 11, so we tested with a fresh install in addition to our standard Windows 10 test image. We updated to newer versions of our benchmarks for Windows 11, where applicable, and also added a few new application and gaming benchmarks.

In accordance with AMD's official guidance, we assured that our clean-install Windows 11 test system had all patches for a recent AMD L3 cache bug that impacted AMD processors. AMD says [the patches resolve the L3 issues](#), and our own in-depth testing has also confirmed that [the patches are successful](#). As an additional level of caution, we re-installed the chipset drivers every time we swapped chips and retested L3 cache latency for each chip both before and after each series of tests.

We also tested with secure boot, virtualization support, and fTPM/PTT active to reflect a properly configured Windows 11 install. This can drop performance as well, on both AMD and Intel CPUs.

Given that Alder Lake will also be used with the less-than-optimal Windows 10, we also tested with our existing test image (build 19041.450). This version of Windows isn't the latest, but Intel confirmed that it has the same Lakefield scheduling optimizations as newer versions of Windows 10, meaning that our testing is representative of trends you'll see in the real world. However, even though we have a few identical tests with both operating systems, you shouldn't interpret our results as being fully indicative of Windows 10 versus Windows 11 performance.

Our historical Windows 10 gaming results for Ryzen processors were dated. Several of the games have since had performance-impacting updates, not to mention that numerous chipset and BIOS updates have been issued in the interim. As such, we updated the chipset drivers and motherboard BIOS to reflect the current state of play and then retested all of the game benchmarks.

With both Windows 10 and 11 covered, we also wanted to measure the difference between DDR4 and DDR5 performance on both operating systems. We used the [MSI Z690 Carbon WiFi](#) as our DDR5 platform and the decidedly lower-end [MSI Z690-A WiFi for DDR4](#) testing.

We're sticking with our standard policy of allowing the motherboard to exceed Intel's recommended power limits, provided the chip remains within warrantied operating conditions. Our tests use the default lifted PL1 and PL2 restrictions. Almost all enthusiast-class motherboards come with similar settings, so this reflects the out-of-box experience with a high-end motherboard. Naturally, these lifted power limits equate to more power consumption, and thus more heat, as we'll cover in detail later in the review. We also have a full breakdown of the test system configurations at the end of the article.

Core i9-12900K and Core i5-12600K Test System Configurations

Intel Socket 1700 DDR5 (Z690)Core i9-12900K, Core i5-12600KMSI Z690 Carbon WiFi2 x16GB G.Skill Ripjaws S5, DDR5-5200 @ DDR5-4400 36-36-36-72Intel Socket 1700 DDR4 (Z690)Core i9-12900K, Core i5-12600KMSI Z690A WiFi DDR42x 8GB Trident Z Royal DDR4-3600 - Stock: DDR4-3200 14-14-14-36Intel Socket 1200 (Z590)Core i9-11900K, Core i7-11700K, Core i5-10600KMSI Z590 Godlike2x 8GB Trident Z Royal DDR4-3600 - Stock DDR4-3200/2933 Gear 1AMD Socket AM4 (X570)AMD Ryzen 9 5950X, Ryzen 9 5900X, Ryzen 7 5800X, Ryzen 5 5600X

MSI MEG X570 Godlike2x 8GB Trident Z Royal DDR4-3600 - Stock: DDR4-3200 14-14-14-36All
SystemsGigabyte GeForce RTX 3090 Eagle - Gaming and ProViz applicationsNvidia GeForce RTX 2080 Ti
FE - Application tests

2TB Sabrent Rocket 4 Plus

Silverstone ST1100-TIOpen BenchtableArctic MX-4 TIM

Windows 10 Pro version 2004 (build 19041.450)Windows 11 ProCoolingCorsair H115i, Custom loop

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Intel Alder Lake Core i9-12900K and i5-12600K Power Consumption, Efficiency, and Thermals

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Yes, Alder Lake still sucks more power than AMD's Ryzen 5000 series chips, but the arrival of the Intel 7 process does mark a big improvement. As we can see, the Alder Lake chips consume far less power than the Rocket Lake chips — we measured a peak of 238W with the 12900K, while the previous-gen 11900K drew nearly 100W more during the same Blender workload.

Overall, Intel has reduced its power consumption from meme-worthy to an acceptable level. Besides, Alder Lake is much faster than its predecessor, earning it some leeway.

For instance, as you can see in our renders-per-day measurements, the Core i9-12900K and 12600K are both twice as efficient as their predecessors, which is commendable. This lower power consumption results in lower cooling requirements, too.

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Here we take a slightly different look at power consumption by calculating the cumulative amount of energy required to perform Blender and x264 and x265 HandBrake workloads, respectively. We plot this 'task energy' value in Kilojoules on the left side of the chart.

These workloads are comprised of a fixed amount of work, so we can plot the task energy against the time required to finish the job (bottom axis), thus generating a really useful power chart.

Bear in mind that faster compute times, and lower task energy requirements, are ideal. That means processors that fall the closest to the bottom left corner of the chart are best.

As you can see, Intel's chips have descended from the undesirable upper right of the chart down to the lower left hand, nearly matching AMD's chips in power consumption while actually being faster. That's an outstanding improvement after six years of power-guzzling 14nm chips.

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Windows 11: Core i9-12900K and i5-12600K Gaming Benchmarks — The TLDR

Below you can see the geometric mean of our gaming tests at 1080p and 1440p, with each resolution split into its own chart to give us a decent overall view of the current landscape. As usual, we're testing with an Nvidia GeForce RTX 3090 to reduce GPU-imposed bottlenecks as much as possible, and differences between test subjects will shrink with lesser cards or higher resolutions. You'll find further game-by-game breakdowns below. Most of the titles below show little meaningful differentiation at higher resolutions, so we only tested four of the seven titles at 1440p to analyze performance scaling. Additionally, it's easy to overwhelm the charts with multiple DDR4 and DDR5 results for each chip, so in an attempt to keep the charts as decipherable as possible, we're only presenting our DDR4 overclock performance results in this article. We'll post the DDR5 overclocking results to our [CPU Benchmark](#) hierarchy.

Due to Alder Lake's hybrid architecture, there will be teething pains with some games. As we reported, [Denuvo DRM falsely identified Intel's E-cores as a separate system](#), and thus 91 Denuvo-enabled game titles wouldn't work with Alder Lake chips. Intel has worked with Denuvo, and the software maker issued a flurry of game patches to fix the issue. However, some titles are still not patched, though more patches are incoming. [EDIT: As of December 2021, only three games remain unpatched] Intel says that all games should eventually work with Alder Lake. We didn't encounter any issues with Denuvo in our testing, thanks to our gaming test suite

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The \$549 12-core Ryzen 9 5900X is AMD's fastest gaming chip, but the \$589 Core i9-12900K is 8.7% faster in the cumulative 1080p gaming measurement across our entire test suite. And that's with both the DDR4 and DDR5 memory configurations, so you won't have to drop serious cash on a DDR5 kit to get there.

Stepping down \$300, the \$289 Core i5-12600K with DDR5 memory is ~2.7% faster than the \$299 Ryzen 5 5600X, but that gap widens slightly with less expensive DDR4 memory. The Core i5-12600K also effectively ties the Ryzen 7 5800X, but for \$161 less.

Rocket Lake buyers will be plenty disappointed. The Core i9-11900K landed a mere six months ago at \$539, but the 12900K is ~11% faster in gaming. It's also much faster in the threaded workloads that we'll see later in our application testing. We see a similar story unfold with the Core i5-11600K compared to the 12600K, with 9% more performance in gaming coming for \$27 more.

Naturally, moving over to 1440p brings a GPU bottleneck into the equation, so the performance deltas between the chips shrink tremendously. Here the Core i5-12600K effectively ties the 5600X and 5800X, while the 12900K is a mere 3.6% faster than the Ryzen 9 5950X.

Flipping through the 99th percentile charts shows larger deltas, but we have to view those with caution as Windows 11 is still young and seems to suffer from more framerate variability than our Windows 10 test platform. This could result from yet-to-be-updated game code, the relatively new graphics drivers for Windows 11, or some other combination of factors that could be smoothed out in the future.

The Alder Lake chips profit more from overclocking than the AMD Ryzen models. After tuning, the Core i9-12900K with DDR4 was 9.7% faster than the stock configuration at 1080p. Meanwhile, the Core i5-12600K jumped 15%, which is more than we would expect from the gains we see with new chip generations. In fact, it's been a long time since we've seen double-digit overclocking performance gains in gaming from easily-attainable frequencies.

Overall, the Alder Lake chips are a boon for enthusiasts. By comparison, the overclocked Ryzen chips were anywhere from 3.7% to 6.6% faster after tuning. You can read more about our overclock settings on the [overclocking page](#).

Intel's Alder Lake carves out a win in Windows 11, but large performance deltas in a few of the game titles can heavily impact these types of cumulative measurements. For instance, Intel enjoys a sizeable lead in Hitman 3, but that game is specifically tuned to leverage the E-cores effectively by offloading low-priority tasks like physics to the small cores. That can be seen as an advantage by some because more game devs could take this approach, or as a fluke by others that think this type of optimization will only come to Intel-sponsored titles.

The competition between Intel and AMD is absolutely closer now, so it's best to make an informed decision based on the types of titles you play frequently. Be sure to check out the individual tests below.

Windows 11: 3DMark, VRMark, Chess Engines on Intel Core i9-12900K

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Synthetic benchmarks don't tend to translate well to real-world gaming, but they do show us the raw amount of compute power exposed to game engines. It's too bad most games don't fully exploit it.

The Core i9-12900K is a whopping 41% faster than the Ryzen 9 5950X in the 3DMark Time Spy CPU test, but as we've seen with most of the Windows 11 gaming benchmarks, it doesn't pick up too much additional performance by using DDR5.

We can't say the same for the 12600K, at least in this benchmark. The 12600K with DDR5 is 21% faster than it is with DDR4, and it easily leads the Ryzen 5 5600X in both configurations. Surprisingly, the DDR4 configurations yield tangible performance gains in the DX11 Fire Strike physics benchmark, with the 12900K with DDR4 being ~10% faster than the DDR5 config.

We've added the open-source neural network-based Leela chess engine to our benchmark roster. As evidenced by the DDR5 test results, this AI-powered engine obviously scales better with more memory throughput than the Stockfish engine.

Far Cry 6 on Core i9-12900K and Core i5-12600K

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F1 2021 on Core i9-12900K and Core i5-12600K

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Hitman 3 on Core i9-12900K and Core i5-12600K

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Horizon Zero Dawn on Core i9-12900K and Core i5-12600K

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Microsoft Flight Simulator 2021 on Core i9-12900K and Core i5-12600K

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Red Dead Redemption 2 on Core i9-12900K and Core i5-12600K

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Watch Dogs Legion on Core i9-12900K and Core i5-12600K

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Windows 10: Core i9-12900K and i5-12600K Gaming Benchmarks — The TLDR

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Bear in mind that we're using different game titles in Windows 10 than we did in Windows 11, but it's clear that the race between Intel and AMD certainly narrows when we test the Alder Lake chips on the older operating system. We also must caution that we noticed much more variability in our Alder Lake test runs on Windows 10 than we see with other types of chips, so Intel's warnings that you can experience performance variability from poor thread scheduling in Windows 10 are warranted.

Naturally, unoptimized thread scheduling can lead to latency-sensitive threads running on the E-cores, but this occurs unpredictably and seems to increase during multi-tasking. That means you could see far more or far less of an impact in different types of gaming scenarios, like streaming while gaming or using chat clients. Due to time constraints and the sporadic nature of the variations, we haven't fully quantified the increased deviation yet, but we'll continue to look into this issue. Also, it's worth noting that we only see these variations in our detailed test outputs — we didn't notice any outwardly-visible signs of rough gameplay.

You'll also notice right away that the DDR5 configurations lose some steam in Windows 10 compared to the DDR4-equipped setup. This isn't ideal, as the DDR5-equipped motherboard we used for testing was much more handsomely equipped than the low-end DDR4 board. However, after a bit of follow-up, we're told that this isn't an entirely unexpected result.

The 12900K with DDR4 is 7% faster at 1080p, which naturally impacts its competitive footing. With DDR5, the 12900K is 2.4% faster than the Ryzen 9 5900X, which expands to a 9.5% advantage with DDR4 memory. That isn't the best result given the expected eye-watering pricing for DDR5.

The 12600K is also roughly 8% faster with DDR4 than with DDR5, which is the difference between beating the Ryzen 5 5600X or losing to it.

Once again, flipping to the 1440p results finds slimmer deltas between the chips, but the reduced gaming performance with DDR5 in Windows 10 is an undeniable trend here, at least in our test environment.

Again, remember that our cumulative results above are impacted by some sizeable Intel leads in specific titles, which we'll cover below, so be sure to check out the individual results.

Borderlands 3 on Core i9-12900K and Core i5-12600K

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Far Cry 5 on Core i9-12900K and Core i5-12600K

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Hitman 2 on Core i9-12900K and Core i5-12600K

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Project CARS 3 on Core i9-12900K and Core i5-12600K

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Red Dead Redemption 2 on Core i9-12900K and Core i5-12600K

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Shadow of the Tomb Raider on Core i9-12900K and Core i5-12600K

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Windows 11: Core i9-12900K and i5-12600K Application Benchmarks — The TLDR

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We can boil down productivity application performance into two broad categories: single- and multi-threaded. These slides show the geometric mean (equal weighting to all tests) of performance in several of our most important tests in each category, but be sure to look at the expanded results below.

Alder Lake delivers a few stunning wins in the threaded workloads that Ryzen has dominated for so long, highlighting the advantages of the x86 hybrid architecture. It is quite surprising to see the 24-thread Core i9-12900K with DDR5 memory tie the 32-thread Ryzen 9 5950X in the multi-threaded ranking, but even more surprising to see it take a 3% lead with DDR4. That's pretty impressive in light of the 5950X's \$800 price tag.

The Core i5-12600K is equally impressive in its price range as it is 38% faster in threaded work than the comparably-priced 5600X, and 7% faster than the 5800X that costs \$161 more.

Shifting gears to overclocking, the Core i9-12900K was a scant 1.5% faster in lightly-threaded work and 3.2% faster in multi-threaded, while the Core i5-12600K was

4% and 8.8% faster, respectively, in the geometric mean of our workloads. Notably, you'll see larger gains in individual applications below, while others only see a muted impact.

The deltas in favor of Alder Lake are even more convincing in the single-threaded metric, but you shouldn't put undue importance on this metric because it is comprised of a few very specific workloads. You can see a broader spate of lightly-threaded workloads below. Needless to say, Alder Lake dominates those types of workloads.

Be sure to check the following page for the ugly side of Alder Lake — application benchmarks in Windows 10 encounter plenty of snags.

Windows 11: Rendering Benchmarks on Core i9-12900K and i5-12600K

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Image 13 of 13

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This series of tests, conducted within the Alder Lake-friendly confines of Windows 11, is nothing short of impressive. Here we can see the 16-core 24-thread 12900K battle toe-to-toe with the Ryzen 9 5950X in what used to be its uncontested turf.

You'll notice that two of the applications that performed so badly in Windows 10, Corona and POV-Ray, run flawlessly in Windows 11. These are the same versions of the benchmarks, too, so this is entirely the work of Intel's Thread Director tech in tandem with the optimized Windows 11 scheduler.

The Core i9-12900K is 3.9% faster than the Ryzen 9 5950X in the threaded Cinebench test and 17% faster in POV-Ray, showing that the hybrid architecture exposes exceptionally strong performance despite the lesser thread count. On the other hand, the 5950X takes the lead in a few of the other threaded applications, but by surprisingly slim deltas given its much higher price tag. Remember, the 12900K's pricing is closer to the 5900X.

The 12900K and the 12600K lead the entire Ryzen lineup in the single-threaded tasks, showing that the Thread Director works perfectly to ensure those tasks run on the fastest cores.

Windows 11: Encoding Benchmarks on Core i9-12900K and i5-12600K

Image 1 of 10

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Here we can see that Handbrake x264, which struggled in Windows 10, runs on the P-cores perfectly in Windows 11. This program is coded to deprioritize its threads, and here we can see that Thread Director works in tandem with the Windows 11 scheduler to rectify the issue.

Alder Lake dominates encoding workloads, be they lightly- or multi-threaded.

Windows 11: Web Browsing on Intel Core i9-12900K and Core i5-12600K

Image 1 of 4

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Image 4 of 4

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The ubiquitous web browser is one of the most frequently used applications, and here we can see yet another commanding performance from the Alder Lake chips.

Windows 11: Adobe Premiere Pro, Photoshop, Lightroom on Core i9-12900K

Image 1 of 6

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Image 2 of 6

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We've integrated the UL Benchmarks Procyon tests into our suite to replace the aging PCMark 10. This new benchmark runs on Adobe Premiere Pro, Photoshop, and Lightroom. Here we can see that these types of workloads clearly prize the increased memory throughput from DDR5.

You'll notice that the Core i9-12900K and Core i5-12600K are actually slower in the Adobe Premiere Pro workload after overclocking. We're investigating these results, as they are repeatable.

Windows 11: Office and Productivity on Core i9-12900K and i5-12600K

Image 1 of 10

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Intel's Alder Lake dominates the Microsoft Office testing and delivers the snappiest application load times. Meanwhile, AMD's Ryzen chips continue to lead in the GIMP benchmark suite.

Windows 11: Compilation, Compression, AVX Benchmarks

Image 1 of 14

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This grab bag of various tests finds Alder Lake notching several more important wins. From the exceedingly branchy code in the LLVM compilation workload to the massively parallel molecular dynamics simulation code in NAMD, the Alder Lake chips impress.

Notably, Intel chose to ax AVX-512 support in Alder Lake chips, but the increased throughput of DDR5 helps the chips step forward past their AVX-512 equipped Rocket Lake predecessors in some vectorized work, like the multi-threaded y-cruncher benchmark. However, Rocket Lake still keeps the lead for the single-core y-cruncher test. AMD continues to benefit in the SHA3, AES, and HASH benchmarks from its cryptographic optimizations.

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Windows 10: Application Benchmarks — The Ugly Side

Image 1 of 7

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And then there's the gotcha, at least if you plan on using Windows 10.

We planned on presenting an overall geometric mean of our Windows 10 application testing here, just like we did with Windows 11, but we use several of these applications to generate those results. Unfortunately, as you can see in the charts, these applications absolutely did not respond well to Alder Lake and delivered what can only be described as terrible performance. However, as you'll see below, these same applications ran absolutely perfectly in Windows 11, even beating AMD's comparable chips. That shows that Intel's Thread Director is a powerful tool.

There is an answer for this type of condition, at least in some cases. Intel's reviewer guide cited a similar condition, present in HandBrake x264 (but not x265), where the software developers assigned the program a lower priority that forces it to run on the E-cores only. Intel says that the software developers could update the code to fix the issue, but it appears that this condition (or a similar one) isn't confined to just Handbrake. We saw similar trends in y-cruncher, Corona, POV-Ray, and even Intel's own Open Image Denoise benchmark.

Intel's recommendation is to use the in-built Windows [powercfg](#) command-line utility to prevent the process from lowering its priority, which resolves the issue. This is a simple process for experienced users, but most average folks would struggle with these types of alterations, and that could be a real downside to using Alder Lake with Windows 10 during the early days. If you tend to use older programs that won't be updated, this type of problem may never be fixed via a software update, but there are third-party software tools that could help. Additionally, we use an expansive selection of benchmarks, but our entire test suite is a speck compared to the universe of different software in the real world. That means these types of errata are inevitably going to pop up with other types of software.

We could have applied the fix and retested the Alder Lake chips, but it's important that you understand that you could encounter this type of reduced performance. Additionally, we also wonder if changing the thread priority on the AMD and last-gen Intel systems would impact performance there, too, meaning the adjustment could give Alder an unfair advantage. Unfortunately, retesting all of these systems to assure a level playing field wasn't possible within the tight NDA timeline. As such, we'll revisit these tests in the future.

For now, let's move on to the Windows 11 benchmarks below, and then see how the remainder of the Windows 10 benchmarks look.

Windows 10: Rendering Benchmarks on Core i9-12900K and i5-12600K

Image 1 of 10

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Aside from the tests that refused to cooperate, many of these tests simply repeat the same themes that we've seen in Windows 11. We're including these tests for completeness, but we'll skip over commentary until we hit the power consumption section.

Windows 10: Encoding Benchmarks on Core i9-12900K and i5-12600K

Image 1 of 6

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Windows 10: Office and Productivity on Core i9-12900K and i5-12600K

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Windows 10: Compilation, Compression, AVX Benchmarks

Image 1 of 10

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Intel's decision to adopt a hybrid x86 architecture was risky, but despite the early hiccups with Windows 10, the performance that we've seen today shows it has paid off. The Alder Lake processors mark a massive

generational leap forward for Intel in nearly all facets, including gaming, performance in lightly- and heavily-threaded work, power consumption, overclocking, and platform connectivity options.

Intel has coupled Alder Lake's expansive list of advantages with very aggressive pricing that gives them the overall lead against AMD's competing Ryzen 5000 chips. The competitive pricing could also take at least a little of the sting out of the inevitable high platform costs associated with the Z690 motherboards that are currently the only option for Alder Lake systems.

Below, we have the geometric mean of our gaming test suite at 1080p and 1440p and a cumulative measure of performance in single- and multi-threaded applications. Bear in mind that we conducted the gaming tests with an RTX 3090, so performance deltas will shrink with lesser cards and higher resolution and fidelity settings.

Image 1 of 6

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Overall, it's easy to recommend an Alder Lake chip for a Windows 11 system, but much like we encountered in our own testing, there could be initial hiccups with Windows 10 systems. As we outlined above, those problems could include performance variability or programs that don't operate to their full potential. If you're averse to working around those types of problems, it might be best to either use Windows 11 or wait for the software ecosystem to adapt to the hybrid architecture. We do expect these problems to be fixed sooner rather than later, though.

Surprisingly, Intel hasn't worked up a piece of software to provide more granular control over scheduling priority for both Windows 10 and 11, but third-party tools can assist with priority management ([Process Lasso](#) comes to mind). We'll certainly be experimenting over the coming weeks.

Alder Lake's advantages also include platform connectivity. Leading-edge DDR5 and PCIe 5.0 interfaces will add some cost in the early days, but support for DDR4 can help reduce that overhead. Unfortunately, we haven't seen any flagship DDR4 motherboards yet; the highest-end models appear to be confined to DDR5.

Alder Lake delivers impressive gaming performance in both Windows 10 and 11, though the gains are more substantial in the latter. In either case, the chips outpaced AMD's competing models throughout both of our gaming test suites. It's also clear that enthusiasts won't need to adopt pricey DDR5 memory to unlock the best gaming performance — unless you have a very specific need for DDR5 throughput, it's probably best to skip it until it matures further. That applies doubly so for Windows 10, which appears to favor the more mature DDR4.

Don't believe the hype — overclocking is certainly not dead. After tuning, the Core i9-12900K with DDR4 was 9.7% faster than the stock configuration at 1080p gaming. Meanwhile, the Core i5-12600K was 15% faster, which is more of a gain than we would expect from stepping up to a new chip generation. In fact, it's been a long time since we've seen double-digit overclocking performance gains in gaming from easily-attainable frequencies. Overall, the Alder Lake chips are a boon for enthusiasts. By comparison, the overclocked Ryzen chips were anywhere from 3.7% to 6.6% faster after tuning, so it's clear Intel holds the lead here.

Intel still consumes more power than AMD's competing chips, but the new 'Intel 7' process reduces power consumption by up to a third and nearly doubles power efficiency, reducing AMD's massive advantage in that key area.

For now, Alder Lake is the new gaming champion. AMD's next step is to fire back with its 3D V-Cache processors that will come with up to 192MB of L3 cache per chip, imparting up to 15% more gaming performance. Those chips arrive next year, and while the impact on gaming in a broad spate of titles is unknown, AMD has confirmed that the chips will drop into the AM4 platform. In the meantime, we could see some pricing adjustments on Ryzen 5000 series processors.

The Core i9-12900K delivers incredible levels of threaded performance, often rivaling or beating the Ryzen 9 5950X, but at a much lower price point. That type of performance will pay off in all manner of productivity applications, and if you're looking for snappy performance in lighter fare, it's also the uncontested leader in x86 single-threaded performance.

Alder Lake marks the return of meaningful segmentation between the Core i7 and i9 lineups. With an additional four efficiency cores and class-leading gaming performance, the Core i9-12900K is a good choice for a Windows 11 system, but if you're only interested in gaming, the [Core i7-12700K](#) is a far better deal — it provides roughly the same gaming performance as the Core i9-12900K, but at a much lower price point. That makes the Core i9-12900K more suited for those with more expansive needs, such as more heft in multi-threaded productivity workloads.

The \$289 Core i5-12600K is also an easy recommendation with up to 38% more threaded performance than the Ryzen 5 5600X and 7% more performance than the Ryzen 7 5800X. Coupled with its pricing, snappy single-threaded performance, and superb gaming performance, the Core i5-12600K is the gaming chip to beat.

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[Intel Alder Lake \(Tom's Hardware\)](#)

Document TOMHA00020211205ehc500003



Fintech

Metaverse may hold potential for investors; META ETF holds around 40 stocks, including Roblox, chip companies **Intel** and Nvidia, and tech giants Microsoft and Apple

By Meghan Bobrowsky

867 words

3 December 2021

12:54

Financial News

LONFIN

English

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Virtual realms known as the metaverse that have become the hot topic for tech companies also are winning a new fan base among investors.

SoftBank Group on 3 December said it was investing \$150m in a South Korean metaverse platform. A cadre of metaverse-themed, exchange-traded funds have launched in recent months — some showing gains. Shares have also surged in companies making early bets on what some tech executives have described as the next phase of the internet, while others say it is a hyped vision that will take years to realise.

"As the physical world integrates with the digital world at an accelerated pace, we want to be invested in companies that are best positioned to capitalise from this digital transformation," said Frank Balas, director of investment strategy at the GM Advisory Group, which has invested in a metaverse-focused fund.

Mark Zuckerberg said in October that Facebook was being rebranded as Meta Platforms and that the company was pouring billions of dollars into developing the online world. Metaverse-related businesses drew increased investments in the ensuing weeks.

The metaverse is loosely defined as an online world where individuals can participate in immersive experiences like virtual concerts, purchase digital goods and hang out with each other as avatars, in some cases using virtual and augmented-reality headsets. Tech companies like Microsoft and Nvidia have announced plans to develop metaverse platforms or the tools to help create those spaces.

Consumer-goods companies including Chipotle Mexican Grill, Verizon Communications and Nike are also buying into the metaverse's potential. It is also sparked a digital real-estate boom.

Sonu Kalra, a portfolio manager at Fidelity Investments, called the metaverse another avenue of growth that gives added reason to invest in successful tech names. The BlueChip Growth Fund he manages has holdings in companies like Nvidia, Meta and Microsoft.

But he also urges caution, suggesting that in many cases the jury is out on what the concrete business opportunities for companies will be. "I think it's very easy to get caught up in the hype of the metaverse, but what does it really mean in terms of cash flows to businesses at the end of the day?" he said.

Doubts aside, enthusiasts have been promoting new funds to capitalise on the metaverse zeal. On the day of Zuckerberg's Meta name-change announcement, Fount Investment launched a metaverse ETF that has since grown to more than \$8m in net assets. Metaverse-themed ETFs have also launched in South Korea and Canada.

"Investors are excited about the theme," said Matthew Ball, a venture capitalist who teamed up with investment firm Roundhill Financial in June to launch a fund known as META ETF.

It has grown to more than \$800m in assets and was up roughly 11% at its peak about two weeks ago, rallying in the wake of Zuckerberg's announcements, before retreating in recent days in a widespread market sell-off amid concerns about the Omicron Covid-19 variant.

The META ETF holds around 40 stocks, including videogame company Roblox, chip companies Intel and Nvidia, and tech giants Microsoft and Apple. Ball says that ultimately the metaverse will represent 10% to 20% of the world economy.

Shares in individual companies also enjoyed a boost from the growing interest in the metaverse. Many of the investments have been into larger tech companies that already have seen pandemic-era bumps. Shares in

Meta rose roughly 11% after its rebranding before the Omicron selloff hit. Roblox and Unity Software had logged double-digit gains that also came after they posted strong earnings last month.

Lesser-known companies like Matterport, a software provider that helps businesses digitise the physical world, and Glimpse Group, a virtual- and augmented-reality platform company, advanced even more following the Meta announcement. Matterport shares rose roughly 80%. Glimpse's stock advanced about 76% before the selloff. The Nasdaq was up about 5% over that period, and is roughly up 1% through 2 December's close.

Dave Egan, a senior research analyst at money-management firm Columbia Threadneedle Investments, says he is bullish particularly on the chip industry and what he calls "picks-and-shovels" companies—the ones that build the tools being used to create the metaverse.

Those investments, he says, are less risky than those into companies catering more to creating consumer experiences whose potential returns are harder to pin down and track. "We want to make bets — no doubt about that," Egan said. "But we also don't want to throw money away."

Shares of graphics-chip maker Nvidia are up more than 30% since Meta unveiled its investment plans. Nvidia Chief Executive Jensen Huang last month outlined near-term opportunities in hardware and software sales from the metaverse as the company posted bumper quarterly results. "This is really going to be one of the largest graphics opportunities that we've ever seen," Huang said.

Write to Meghan Bobrowsky at Meghan.Bobrowsky@wsj.com

This article was published by Dow Jones Newswires

[Metaverse may hold potential for investors](#)

Document LONFIN0020211203ehc30002t

Intel Alder Lake hasn't dented AMD's gains in gaming PC market – yet

John Loeffler

191 words

2 December 2021

TechRadar

TECHR

English

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AMD CPU adoption continues to grow in the gaming PC market despite the arrival of Intel Alder Lake, according to Steam's November Hardware Survey.

Steam's November Hardware Survey has just been released, and it's not good news for Team Blue.

Despite the successful release of [Intel Alder Lake](#), which shows Intel's chips going toe-to-toe with or besting rival AMD's [best processors](#), AMD still made gains in Steam's monthly survey.

In November, 31.53% of Steam users were using an AMD processor, compared to 68.45% for Intel chips. That's a month over month increase of 0.69%, which is a nice gain for AMD.

Intel Alder Lake processors first went on sale on November 4, so it might be too early yet for most gamers to upgrade to the new processors, especially given that the new processors also require new motherboards to run, increasing the upgrade cost beyond just the processor.

[The top and bottom of an engineering sample of an Intel Alder Lake processor \(harukaze5719\)](#)

Document TECHR00020211202ehc2000s0

Intel Corporation; Patent Issued for Virtual reality apparatus and method including prioritized pixel shader operations, alternate eye rendering, and/or augmented timewarp (USPTO 11170564)

1,922 words

26 November 2021

Investment Weekly News

INVWK

4006

English

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2021 DEC 4 (VerticalNews) -- By a News Reporter-Staff News Editor at Investment Weekly News -- From Alexandria, Virginia, VerticalNews journalists report that a patent by the inventors Insko, Brent E. (Portland, OR, US), Surti, Prasoonkumar (Folsom, CA, US), filed on February 26, 2020, was published online on November 9, 2021.

The patent's assignee for patent number 11170564 is Intel Corporation (Santa Clara, California, United States).

News editors obtained the following quote from the background information supplied by the inventors:

"BACKGROUND ART

"For accelerated rendering, it is common to perform a depth prepass, sometimes referred to as "Z-prepass." The reason for this is that the GPU or graphics processor should ideally perform pixel shading only for visible surfaces. When a scene is rendered without a Z-prepass, a triangle that is far away may be rendered first and hence pixel shading will be performed, and later a closer triangle may overwrite that far-away triangle with the pixel shading of the closer triangle. Hence, the work done on the far-away triangle was done in vain since it did not contribute to the image. Instead, it is common to render the scene twice using a Z-prepass as a first pass. In the first pass, the scene is rendered but only depth is written to the depth buffer and no pixel shading is performed nor is anything written to the color buffer. As a result, when the first pass has ended, the depth buffer contains the depth of the closest surface at each pixel. The second pass renders all the triangles with pixel shading on, depth writes turned off and the depth test as EQUAL, i.e., color is only written if the fragment has the same depth as the depth in the depth buffer. This means that all fragments of rendered triangles that are farther away than the depths in the depth buffer will NOT perform any pixel shading, i.e., pixel shading will only be performed on the closest surface in each pixel, resulting in more efficient pixel shading. In addition, all graphics architectures have some form of hierarchical depth buffer with culling, such as the HiZ buffer, and the first pass will "prime" the HiZ-buffer (typically a Zmin and Zmax value per 8 x 8 pixels) and hence, occlusion culling can be done efficiently in the second pass using the HiZ buffer. In the example above, it is assumed that all geometry/triangles are opaque.

"In addition, current virtual reality (VR) systems render separate image streams for the user's left and right eyes, thereby consuming roughly twice the graphics processing resources and/or requiring twice the amount of time as would be required to process a single image stream.

"Time warping is a technique used to improve performance in current virtual reality (VR) systems. According to this technique, each image frame is rendered in accordance with the current orientation of the user's head and/or eyes (i.e., as read from an eye tracking device and/or other sensors on the head mounted display (HMD) to detect the motion of the user's head). Just before displaying the next image frame, the sensor data is captured again and used to transform the scene to fit the most recent sensor data (i.e., "warping" the current image frame). By taking advantage of the depth maps (i.e., Z Buffers) which have already been generated, time warping can move objects in 3D space with relatively low computational requirements."

As a supplement to the background information on this patent, VerticalNews correspondents also obtained the inventors' summary information for this patent: "In the following description, for the purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the embodiments of the invention described below. It will be apparent, however, to one skilled in the art that the embodiments of the invention may be practiced without some of these specific details. In other instances, well-known structures and devices are shown in block diagram form to avoid obscuring the underlying principles of the embodiments of the invention.

"Exemplary Graphics Processor Architectures and Data Types

"System Overview"

The claims supplied by the inventors are:

"1. A method comprising: performing an early depth test on blocks of pixels to determine whether all pixels in each block of pixels can be resolved by the early depth test; scheduling the blocks of pixels for the pixel shading operations, wherein the scheduling is to prioritize the blocks of pixels in accordance with the determination as to whether all pixels in the block of pixels can be resolved by the early depth test; and executing the pixel shading operations on the blocks of pixels in an order determined by the prioritization, wherein those blocks of pixels which cannot be resolved by the early depth test are prioritized ahead of blocks of pixels which can be resolved by the early depth test.

"2. The method as in claim 1 wherein blocks of pixels which can be resolved by the early depth test includes blocks of pixels which are fully occluded.

"3. The method as in claim 2 further comprising: updating a depth cache during the pixel shading operations and/or by a conservative depth test circuit following the pixel shading operations.

"4. The method as in claim 3 further comprising: updating a hierarchical Z (HiZ) buffer with hierarchical depth information when the depth cache is updated.

"5. The method as in claim 4 wherein the hierarchical depth information is to be used to perform coarse depth tests on subsequent pixel blocks.

"6. The method as in claim 1 wherein a high priority flag is set for a pixel block which cannot be resolved by the early depth test, the high priority flag indicating that the pixel block is to be prioritized ahead of pixel blocks which do not have a high priority flag set.

"7. A non-transitory machine-readable medium having program code stored thereon which, when executed by a machine, causes the machine to perform the operations of: performing an early depth test on blocks of pixels to determine whether all pixels in each block of pixels can be resolved by the early depth test; scheduling the blocks of pixels for the pixel shading operations, wherein the scheduling is to prioritize the blocks of pixels in accordance with the determination as to whether all pixels in the block of pixels can be resolved by the early depth test; and executing the pixel shading operations on the blocks of pixels in an order determined by the prioritization, wherein those blocks of pixels which cannot be resolved by the early depth test are prioritized ahead of blocks of pixels which can be resolved by the early depth test.

"8. The non-transitory machine-readable medium as in claim 7 wherein blocks of pixels which can be resolved by the early depth test includes blocks of pixels which are fully occluded.

"9. The non-transitory machine-readable medium as in claim 8 further comprising program code to cause the machine to perform the operations of: updating a depth cache during the pixel shading operations and/or by a conservative depth test circuit following the pixel shading operations.

"10. The non-transitory machine-readable medium as in claim 9 further comprising program code to cause the machine to perform the operations of: updating a hierarchical Z (HiZ) buffer with hierarchical depth information when the depth cache is updated.

"11. The non-transitory machine-readable medium as in claim 10 wherein the hierarchical depth information is to be used to perform coarse depth tests on subsequent pixel blocks.

"12. The non-transitory machine-readable medium as in claim 7 wherein a high priority flag is set for a pixel block which cannot be resolved by the early depth test, the high priority flag indicating that the pixel block is to be prioritized ahead of pixel blocks which do not have a high priority flag set.

"13. An apparatus comprising: means for performing an early depth test on blocks of pixels to determine whether all pixels in each block of pixels can be resolved by the early depth test; means for scheduling the blocks of pixels for the pixel shading operations, wherein the scheduling is to prioritize the blocks of pixels in accordance with the determination as to whether all pixels in the block of pixels can be resolved by the early depth test; and means for executing the pixel shading operations on the blocks of pixels in an order determined by the prioritization, wherein those blocks of pixels which cannot be resolved by the early depth test are prioritized ahead of blocks of pixels which can be resolved by the early depth test.

"14. The apparatus as in claim 13 wherein blocks of pixels which can be resolved by the early depth test includes blocks of pixels which are fully occluded.

"15. The apparatus as in claim 14 further comprising: updating a depth cache during the pixel shading operations and/or by a conservative depth test circuit following the pixel shading operations.

MSI launches 12th Gen Intel Alder Lake Gaming Desktops with next-gen DDR5 memory included

Jason R. Wilson

424 words

26 November 2021

Wccfttech.com

NEWAGAE

English

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MSI [introduces](#) new gaming desktop PCs with new Intel 12th Gen Alder Lake CPUs and DDR5 memory onboard. Utilizing Intel's hybrid architecture found in the next-gen CPUs from Intel, both Performance cores and Efficiency cores will be maximized to increase multi-thread performance up to 55%, with gaming performance increasing by 13% when compared to the previous generation.

Three new gaming desktops from MSI incorporate 12th Gen Core Intel Alder Lake CPUs and next-gen DDR5 memory options

MSI's Alder Lake Series gaming desktops utilize DDR5 memory, producing increased read speeds of 60% higher than the 11th Gen Intel CPUs that used DDR4 memory. Added with the support for PCIe 5.0 and Wi-Fi 6, the three new MSI gaming desktops will usher in a new age of gaming PCs to handle any game played on the devices.

[Click to view image.](#)

MEG Aegis Ti5 12th – Path to the Future

Being the flagship segment, the MEG Aegis Ti 5 12th is equipped with the latest Intel Core i9-12900K processor and NVIDIA RTX 3090 graphics card. The Silent Storm Cooling 4 features a separated chamber design to ensure that the system maintains superior cooling at high performance. MSI also had strengthened the Gaming Dial function allowing users to switch various (gaming) utilities rapidly.

[Click to view image.](#)

MEG Trident X 12th – The Centerpiece of Gaming

MEG Trident X 12th is the best for gamers who prefers small form factor and mobility. The compact desktop is only 10 liters in volume which comes with the latest 12th Gen Intel processor and Nvidia GeForce RTX 3090 graphics. With the latest DDR5-4800 memory and exclusive Silent Storm Cooling to optimize airflow, the new standard will take your gaming experience to the next level.

[Click to view image.](#)

MAG Codex X5 12th

The MAG Codex X5 12th is based on Nvidia's GeForce GPUs and Intel's 12th-generation processors. It features a powerful heat dissipation system to help you achieve maximum cooling performance. The water cooling and optimized airflow prevent the system from the potential slowdown caused by overheating. The tempered glass panel design and Mystic lights allow for a full view of the personalized configuration.

To purchase any of MSI's line of new gaming PCs, head over to the company's website where you can find details on availability, specifications, pricing, and purchasing locations to suit your needs.

[Click to view image.](#)

Document NEWAGAE020211126ehbq000gr

Black Friday Gaming PC Deals 2021: AMD & Intel Powered Gaming Computer Savings Identified by Saver Trends

626 words

25 November 2021

20:25

Business Wire

BWR

English

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Save on gaming PC deals at the Black Friday 2021 sale, together with the best NZXT gaming accessories deals

BOSTON--(BUSINESS WIRE)--November 25, 2021--

Black Friday researchers at Saver Trends have reviewed the best gaming desktop computer deals for Black Friday, featuring discounts on iBUYPOWER, CyberPowerPC, Alienware and HP computers. Check out the latest deals in the list below.

Best Gaming PC Deals:

- Save up to \$500 on top-rated gaming PCs from MSI, iBUYPOWER, HP, Dell & CyberPowerPC at Walmart - including savings on Intel Core i7, pre-built & Legion by Lenovo gaming machines
- Save up to \$300 on high-powered gaming PCs at HP.com - check for live prices on best-selling HP OMEN 25L & OMEN 30L gaming machines
- Save up to 30% on gaming PCs including Dell, Alienware & XPS at Dell.com - check the latest deals on top-rated gaming desktops
- Shop the latest Razer Tomahawk gaming PC at Razer.com
- Save up to \$400 on top-rated gaming PCs at Amazon.com - check deals on pre-built gaming computers, laptops and monitors from top-rated brands like MSI, iBUYPOWER, CyberPowerPC and HP
- Save up to \$815 on best-selling iBUYPOWER gaming desktop PCs at Walmart.com - get the latest deals on iBUYPOWER PCs with high-end AMD Ryzen processors
- Save up to \$100 on HP Omen gaming PCs at HP.com - up to Intel Core i9-11900K or AMD Ryzen 9 5900X, NVIDIA GeForce RTX 3090, comes preloaded with Windows 11 Pro or Home
- Save on Alienware Aurora R10 & R11 gaming desktop PCs at Dell.com
- Save on the latest iBUYPOWER Gaming PCs & Desktops at Amazon.com - check the latest savings on iBUYPOWER desktops including the iBUYPOWER Element MR 9320
- Save up to 33% on a wide range of pre-built gaming desktops at Walmart - save on Alienware, Lenovo, Dell, HP and MSI pre-built gaming PCs with powerful Core i7 processors
- Save up to \$500 on CyberPowerPC gaming PCs at Walmart - check the latest deals on CyberPowerPC Gamer Master, Supreme & Xtreme tower PCs
- Save up to \$100 on HP Pavilion gaming desktops at HP.com

- Save up to \$150 on NZXT custom gaming PCs and cases at NZXT.com
- Save up to 32% on NZXT Gaming PC cases at Amazon.com - click the link for deals on NZXT cases including mid-tower cases with tempered side panels & integrated RGB lighting

Best Gaming Laptop Deals:

- Save up to 46% on high performance gaming laptops from MSI, Razer, ASUS, Lenovo, Acer & HP at Walmart
- Save up to \$200 on top-rated HP gaming laptops at HP.com - experience the convenience of power and portability with HP's OMEN series 15 & 17 inch gaming laptops
- Save up to 34% on Dell gaming laptops at Dell.com - click the link for the latest deals on a wide selection of gaming laptops
- Save on a wide range of Razer gaming laptops at Razer.com - get the best deals on Razer Blade Stealth 13, Blade 14, Blade 15 & Blade 17 gaming laptops equipped with Intel 11th gen CPUs
- Save up to 30% on a wide range of Razer gaming keyboards, mice, headsets & laptops at Walmart

Searching for more deals? Check out Walmart's Black Friday deals and Amazon's Black Friday page to view hundreds more savings right now. Saver Trends earns commissions from purchases made using the links provided.

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Andy Mathews (andy@nicelynetwork.com)

SOURCE: Saver Trends
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(END)

Document BWR0000020211125ehbp000dw

How Disney, Intel, and Other Old Reliables Stand to Gain From the Metaverse -- Barrons.com

658 words

25 November 2021

00:48

Dow Jones Institutional News

DJDN

English

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Daren Fonda

You might want to buy shares of Walt Disney, Cisco Systems, and Intel if you believe in the metaverse.

That might seem counterintuitive since the metaverse goes way beyond those tech and media stalwarts. The idea is that consumers and businesses will interact on new virtual reality platforms -- playing videogames, socializing, and doing business in an interconnected way. Some have dubbed it Web 3.0.

Facebook's reinvention as Meta Platforms (ticker: FB) highlights the trend. But plenty of tech, media, and e-commerce companies stand to benefit, according to a new Metaverse Index of stocks from Bespoke Investment Group.

"Development of the metaverse will involve many players," Bespoke said in a report on Tuesday. "This 'next generation internet' will require cloud infrastructure, data processing, content origination, cyber security, and much more."

As Bespoke sees it, 30 companies offer exposure to the trend, spread across seven broad categories: content production, virtualization software, cybersecurity, e-commerce, advertising, hardware, and data.

Some of the names would be obvious winners if the concept takes off: Meta Platforms, Roblox (RBLX), Nvidia (NVDA), Activision Blizzard (ATVI), Take-Two Interactive (TTWO), and Unity Software (U), a virtual-reality software platform.

Several chip-makers aside from Nvidia made the cut, too, including Broadcom (AVGO), Advanced Micro Devices (AMD), and Taiwan Semiconductor (TSM).

Coinbase (COIN), the large cryptocurrency exchange, could benefit as well. "Digital property and currencies will likely have real value through the use of nonfungible tokens (NFTs)," Bespoke said, noting that Coinbase rolled out an NFT platform not long ago.

Other index components include tech and media stalwarts like Microsoft (MSFT), Cisco (CSCO), Intel (INTC), and Walt Disney (DIS), and Alphabet (GOOGL).

Early in November, Microsoft announced a "Mesh" platform for online work using holographic technology. Cisco is developing holographic systems for meetings. Intel is working on chips designed to be 1,000 times faster than today's processors -- capitalizing on real-time processing demands, Bespoke said. Alphabet, for its part, has a hand in everything from digital advertising to augmented-reality hardware.

As for Disney, it's trying to build metaverse concepts into theme parks. The company also owns entertainment content and gaming assets that could gain traction in new virtual worlds.

A few other winners aren't so apparent. Bespoke sees consulting giant Accenture (ACN) benefiting from "uncertainty" as companies struggle to digitize and implement metaverse strategies. Cognizant Technology Solutions (CTSH), another tech outsourcing firm, could play a role as companies implement metaverse strategies.

More under-the-radar winners include Immersion (IMMR), a touch-feedback technology company; Matterport (MTTR), a special-data software platform; and Okta (OKTA), an identity-management and corporate apps platform.

Investors don't have to buy these stocks individually. You can find many of the Bespoke's index components in the SPDR Technology Select Sector SPDR exchange-traded fund (XLK). Indeed, Bespoke's metaverse index has slightly underperformed that ETF and the broader tech sector this year, though it has outperformed the S&P 500.

The Roundhill Metaverse ETF (META) holds many of these stocks, too, plus others like Amazon.com (AMZN), Tencent Holdings (700.HK), and Qualcomm (QCOM). It also has trailed the tech sector and broader S&P 500 since launching on June 30.

Investors do seem to like the concept overall -- pushing up shares of Meta by 7% since the company announced its rebranding on Oct. 28, beating the broader tech market.

But high valuations are now built into companies with even a whiff of metaverse exposure. Scores of companies are mentioning it on earnings calls and meetings with analysts, aiming to gin up excitement.

Appealing as the metaverse may be, it remains an aspiration of Silicon Valley, vulnerable to the hype that come with dreaming big.

Write to Daren Fonda at daren.fonda@barrons.com

(END) Dow Jones Newswires

November 24, 2021 14:18 ET (19:18 GMT)

Document DJDN000020211124ehbo002ks

Daily

How Disney, Intel, and Other Old Reliables Stand to Gain From the Metaverse

Daren Fonda

656 words

25 November 2021

00:48

Barron's Online

BON

English

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Write to Daren Fonda at daren.fonda@barrons.com

[How Disney, Intel, and Other Old Reliables Stand to Gain From the Metaverse](#)

Document BON0000020211124ehbo002gx

Press Release: ORIGIN Begins Shipping First Intel 12th Generation, DDR5 Equipped Gaming Systems

816 words

23 November 2021

19:30

Dow Jones Institutional News

DJDN

English

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ORIGIN Begins Shipping First Intel 12th Generation, DDR5 Equipped Gaming Systems

First customers receive systems just three weeks after announcement

FREMONT, Calif., Nov. 23, 2021 (GLOBE NEWSWIRE) -- ORIGIN PC, a subsidiary of Corsair Gaming, Inc. (NASDAQ: CRSR), and leading provider of custom PCs for gamers, enthusiasts, and professionals, today announced the first shipments to customers of its new range of ORIGIN NEURON, MILLENNIUM, GENESIS, M-Class, and L-Class desktops, putting today's most powerful DDR5-equipped PCs in the hands of customers weeks ahead of the competition.

Ideally placed within the CORSAIR group to access the latest components and technology, ORIGIN PC has benefitted from early access to high-performance CORSAIR DDR5 memory and the latest Intel Z690-chipset motherboards through close cooperation with industry partners such as Asus and MSI.

This has resulted in an accelerated development and quality assurance process, combining proven CORSAIR hardware such as PC cases, coolers, and power supplies with cutting edge DDR5 memory and the latest Intel 12th generation processors, putting the most powerful ORIGIN PC systems in the hands of gamers weeks ahead of many competitors.

"The integration of the complete array of CORSAIR hardware and DDR5 memory into ORIGIN PCs has allowed us go from specs to finished systems in record time," said Kevin Wasielewski, Senior Director of DIY Marketing at CORSAIR and co-founder of ORIGIN PC. "Our ability to leverage partnerships and expertise from across the CORSAIR group is helping us put our best-ever systems in gamers' hands faster."

High-quality and superior performing CORSAIR DDR5 memory is at the heart of every Intel 12th generation processor-powered system ORIGIN PC makes, with CORSAIR DDR5 production rapidly ramping up to keep pace with fervent consumer demand. With early adopters quickly jumping on the new platform, CORSAIR DDR5 memory will ship in high volumes beginning in December 2021, and continue to expand into 2022 as new platforms and systems launch.

Availability, Warranty, and Pricing

All ORIGIN PC systems can be ordered directly from the ORIGIN PC website and are shipped worldwide. Every ORIGIN PC is also backed by Free 24/7 Lifetime U.S. Based Support and Lifetime labor for extra peace of mind.

For up-to-date pricing on ORIGIN PC desktops, please refer to the ORIGIN PC website or contact ORIGIN PC sales for more information.

Web Pages

To learn more about ORIGIN PC NEURON, MILLENNIUM and GENESIS Desktops, please visit:

<https://www.originpc.com/gaming/desktops/>

To learn more about ORIGIN PC L-Class and M-Class Desktops, please visit:

<https://www.originpc.com/workstation/desktops/>

Product Images

High-resolution images of ORIGIN PC's Desktops can be found at the link below:

https://drive.google.com/drive/folders/1yC1s_yME2oiJ6FJmu3Bk8CM3SS0V2lio

About CORSAIR

CORSAIR (NASDAQ:CRSR) is a leading global developer and manufacturer of high-performance gear and technology for gamers, content creators, and PC enthusiasts. From award-winning PC components and peripherals, to premium streaming equipment, smart ambient lighting, and esports coaching services, CORSAIR delivers a full ecosystem of products that work together to enable everyone, from casual gamers to committed professionals, to perform at their very best.

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About ORIGIN PC

ORIGIN PC builds custom, high-performance desktops, laptops, workstations, and servers for hardware enthusiasts, digital/graphics artists, professionals, government agencies and gamers. ORIGIN PCs are hand built, tested, and serviced by knowledgeable gaming enthusiasts, industry veterans, and award-winning system integrators. Every ORIGIN PC comes with free lifetime 24/7 support based in the United States. The ORIGIN PC staff is comprised of award-winning enthusiasts, experienced in the gaming and PC markets who want to share their passion with others. ORIGIN PC is located in Miami, FL and ships worldwide. For more information, please visit <https://www.ORIGINPC.com> or call 1-877-ORIGIN-Ø. (674-4460)

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A photo accompanying this announcement is available at

<https://www.globenewswire.com/NewsRoom/AttachmentNg/f62d34f0-4d64-42bc-9c87-6754390f6988>

(END) Dow Jones Newswires

November 23, 2021 09:00 ET (14:00 GMT)

Document DJDN000020211123ehbn003oj

KLEVV Launches DDR5 Memory for Home and Gaming PCs With Intel Alder Lake Compatibility

Jason R. Wilson

418 words

13 November 2021

Wccfttech.com

NEWAGAE

English

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First introduced by Essencore, KLEVV is an up-and-coming brand creating memory solutions for next-gen systems. A few days ago, KLEVV revealed their DDR5 offerings for the Intel Alder Lake platforms. With an assurance of QVL testing with some of the top-of-the-line Z690 motherboard brands, KLEVV's new DDR5 will compete with brands such as PNY, Western Digital, and others.

KLEVV reveals DDR5 desktop and laptop memory options with a wide variety of compatibility with leading motherboard manufacturers

KLEVV's DDR5 U-DIMM desktop memory utilizes SK Hynix chipsets and will begin to launch with a memory capacity of 16 GB and JEDEC frequencies up to 4800MHz CL40-40-40 and efficiently powered by 1.1V. Leading partners of KLEVV are ASRock, ASUS, Gigabyte, and MSI, meaning the company will have a wide variety of compatibility with a large amount of Z690 motherboards currently on the market and in the near future. KLEVV is in the manufacturing process of 32GB SO-DIMM memory capacity modules for laptops and will release their laptop memory in the coming months.

* [Click to view image.](#)

* [Click to view image.](#)

Next year, KLEVV will release their DDR5 focused on gaming and overclocking using an extremely unique design based on the CRAS XR RGB, along with a sleek white tone of color to the RGB lighting effects. This new addition is perfect for those enthusiasts that are not only looking for super-fast speeds but also a color that stands out in their personal PC builds. KLEVV DDR5 overclocking/gaming memory options will showcase speeds of as high as 6400MHz. Currently, there are no further specifications, but further information will be available at launch.

DDR5 is the latest memory standard soon to be adopted by the PC ecosystem. Its key upgrades are larger capacities and considerably faster speeds compared to previous generation DDR technologies. The new standard incorporates Power Management Integrated Circuit (PMIC) and On-Die Error Correcting Code (ODECC) technology on the DIMM for the first time, allowing KLEVV to tailor its memory designs for improved power efficiency, stability, and better overclocking effectiveness.

[Click to access link.](#)

KLEVV will begin full-scale production on their standard DDR5 memory line during this last quarter of 2021 and will launch the DDR5 for gamers and overclocking enthusiasts in early 2022. They will be available on [Amazon's US website.](#)

[Click to view image.](#)

Document NEWAGAE020211113ehbd000dx

PC/ Laptops

Intel Core i9-12900K, Core i5-12600K, Asus TUF Gaming Z690-Plus Wifi D4 Review

Jamshed Avari

4,890 words

11 November 2021

23:10

NDTV

NDTVIN

English

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There's a lot to talk about regarding Intel's 12th Gen 'Alder Lake' processors. The company says this is its biggest architectural change in a decade, and if anything, that's an understatement. Intel frankly hasn't had anything this new or intriguing to talk about in many years (one decade ago is when the much-loved 'Sandy Bridge' generation debuted), and it's almost like wiping the slate clean. Now, the company gets to start fresh after years upon years of problems that snowballed into each other even as sole rival AMD has been notching up success after success. The 12th Gen Core family pulls off a jump in performance thanks to the combined strengths of two different types of cores, a native design for a 10nm manufacturing process, and a brand new platform that leverages new high-speed interconnect standards.

Intel is kicking off the [12th Gen product roadmap](#) with [flagship desktop CPUs](#) for gamers and enthusiasts – a big departure from the company's focus on thin-and-light laptops for the past several years. All the CPUs that have launched so far are unlocked and overclockable, which tells you who they're aimed at. More mainstream options for everyday work will be announced early next year.

We've come a long way from [quad-core CPUs at the top end](#) just a few years ago, and it's all thanks to competition. With up to 16 cores (and 24 threads), Intel might now seem to be competitive with AMD's 16-core desktop flagship, the [Ryzen 9 5950X](#). Things aren't quite that simple though, since heterogeneous cores can't really be compared. Still, Intel is promising an impressive 19 percent performance gain compared to the previous generation and there are benefits with regard to power efficiency to be explored as well.

Here's an in-depth look at the 12th Gen Core 'Alder Lake' CPU architecture as well as our benchmark test results and analysis of Intel's new push into the performance and gaming enthusiast PC market.

12th Gen Intel Core CPUs are physically larger than their predecessors, requiring a new LGA1700 socket

Intel 12th Gen Core 'Alder Lake' architecture and specifications

The [14nm node saga](#), which has [stretched on](#) since the introduction of the [Broadwell \(5th Gen Core\)](#) die shrink in 2014, is finally over and done with, at least as far as Intel's desktop CPUs go. The [11th Gen 'Rocket Lake' family](#) was a [10nm design backported to 14nm](#) in order to get it into customers' hands amid ongoing 10nm production constraints, and now hopefully those have been solved for good.

Intel calls its current 10nm process implementation 'Intel 7', which is a pretty blunt attempt to position it as technologically on par with [competitors' mature 7nm efforts](#). At this scale, the sizes of individual transistors aren't necessarily reflected by such names, and with a move to modular tile-based CPU designs, they don't all have to be the same size anyway. Nevertheless, 'Intel 7' tells us that the company has renewed [confidence in its own fabs and foundries](#), even as we see news that the [next-generation node will also be delayed](#).

The bigger news is that Intel has now [separated its architecture and manufacturing efforts](#) to the point that it can [mix and match different bits](#) of a CPU's components such as cores, the integrated GPU, cache memory, IO logic, security subsystems, and more. Different implementations of 'Alder Lake' for different target markets, ie desktop PCs, laptops, and ultra-mobile devices, will have different combinations of these components.

All six 12th Gen Core CPUs launched so far are unlocked and overclockable

For now, we have the top-of-the-line Core i9-12900K desktop CPU with eight "Performance" cores (with their own codename, 'Golden Cove') and eight "Efficient" cores ('Gracemont'). The P-cores, in Intel's shorthand, are what we're familiar with – Golden Cove is the successor to 'Willow Cove' which all 11th Gen 10nm CPUs were based on. Gracemont is the current derivative of the former Intel Atom CPU lineup – although the Atom name has been retired, '-mont' cores have been the basis of many of Intel's embedded CPU offerings as well

as low-end Pentium Silver and Celeron CPUs over the years. Most recently, Intel's first hybrid offering, 'Lakefield', also [combined previous-gen '-cove' and '-mont' cores](#).

That's a lot of codenames, and Intel is studiously avoiding [the term 'big.LITTLE'](#) which is rival Arm's trademark, and goes back at least a decade. This of course refers to exactly the same concept – dividing work between a group of high-performance but power-hungry cores as well as low-power cores based on which are more suitable, in order to maximise power as well as efficiency. Intel itself had rejected the idea of doing so on several occasions in the past, saying that it's possible to design one type of core that can scale adequately in terms of power consumption as well as performance. Clearly, though, the company has changed its mind.

In order for an operating system to know which cores to target and when to migrate threads from one type of core to another, Intel says it has developed a more robust and responsive real-time scheduler, called [Thread Director](#). As of now, this works only with Windows 11, and neither Intel nor Microsoft have plans to bring it to Windows 10. A solution for Linux is currently in development. According to Intel, you should expect a slight performance drop with Windows 10, but Alder Lake CPUs will still be perfectly usable.

One huge change with Alder Lake hybrid CPUs is that only the P-cores support Hyper-Threading, which is the ability to run a second simultaneous thread when resources allow for it. Therefore, the 16-core Core i9-12900K is capable of executing 24 threads, not 32. Interestingly, while the P-cores get top priority, the E-cores come next, and only if they are saturated will a P-core be assigned a second thread. Windows 11 can leverage Thread Director to decide what gets priority where – for example you could be encoding media in the background while getting on with other tasks.

It doesn't seem as though users will be able to override this and manually specify whether any particular program or task should be given preference for each core type. It will be interesting to see how upcoming 12th Gen laptop CPUs add battery life to the list of variables that are being juggled by Windows 11. What's also odd is that Intel says heavily multi-threaded workflows such as video encoding will prefer E-cores, though conventional logic suggests that P-cores should be able to muscle through such tasks quicker.

There's one more issue at play here – some older software doesn't recognise the heterogeneous cores as all belonging to the same CPU. You [might encounter some compatibility issues](#) – the Denuvo game DRM scheme has recently been flagged as incompatible, locking people out of at least 50 older games because it thinks system specs have changed due to piracy. In such cases, you can lock the E-cores out completely through your motherboard BIOS (and Intel says you can even assign the Scroll Lock key on your keyboard to toggle this).

Intel has also maintained that the AVX-512 instruction set, a feature heavily touted since Ice Lake for its use in accelerating AI workloads, has been disabled. This was purportedly because only the P-cores can support it and there needs to be instruction parity between core types. However, it now seems that disabling E-cores in your motherboard BIOS will [allow AVX-512 to be enabled](#) – so there's a tradeoff there too.

Platform-level connectivity gets a boost with the Z690 chipset

While each P-core has 1.25MB of L2 cache memory, the E-cores are arranged in clusters of four, each with a shared 2MB L2 cache. These feed into a common L3 cache. Intel also publishes different base and turbo speeds for each core type, and higher-tier CPU models additionally support Intel's Turbo Boost Max feature that assigns "favoured cores" which can be boosted even higher. That means clock speed is now extremely muddled and not necessarily a useful metric when it comes to comparing specifications. We have a 125W base TDP, and for the first time Intel is also publishing power target figures for sustained load, which can go up to 241W for the Core i9. If you have a capable enough thermal solution, you'll be able to run at Turbo speeds indefinitely – not just in bursts.

On the Core i9-12900K, the eight E-cores run between 2.4GHz and 3.9GHz, while the eight P-cores run between 3.2GHz and 5.1GHz (all cores) or 5.2GHz (favoured cores). There's 14MB of L2 cache and 30MB of L3 cache memory.

The Core i7-12700K loses four E-cores so you get eight P-cores and four E-cores (totalling 20 threads). Peak power usage is rated at 190W. The Core i5-12600K has six P-cores and four E-cores, with a 150W peak power draw rating.

All three CPU models feature integrated Intel UHD Graphics 770 integrated GPUs, based on the [Xe-LP architecture](#). Nothing is new compared to the 11th Gen's integrated UHD 750 GPU, except for lower base and higher boost clocks. All three CPUs also have [-F suffix variants](#) which lack integrated graphics and are priced a little lower on paper.

Many cooler manufacturers offer retrofit kits for the LGA1700 socket so you can reuse existing ones

Intel 12th Gen Core 'Alder Lake' Z690 platform

Considering how much has changed with Alder Lake, it's no surprise that a new socket and new motherboards will be required. These CPUs are physically larger than most previous mainstream Intel desktop CPUs, and are now rectangular rather than square. The pad count has jumped to 1700 (from 1200) and so there's a new LGA1700 socket. Hopefully, this should last for at least one more generation. Most coolers designed for previous-gen motherboards should work, but you will most likely need a retrofit kit – most brands will update their offerings or offer a simple adapter kit. It would be best to check with your cooler's manufacturer, since there could be rare exceptions due to differences in the contact surface area.

The biggest news for most users will be the introduction of DDR5 RAM. This promises significant jumps in bandwidth, maximum capacity, and power efficiency. DDR4 has been entrenched for a very long time but also isn't likely to disappear anytime soon – DDR5 RAM kits are currently hard to find and quite expensive, especially in India. You'll be able to buy Z690 motherboards with either DDR4 or DDR5 slots (dual-channel in either case) – no manufacturer has shown off a hybrid board yet. That means you'll have to commit to one standard or the other upfront.

Intel has also managed to be the first to introduce PCIe 5.0, which doubles internal IO bandwidth compared to PCIe 4.0. There aren't any components such as SSDs that can take advantage of this yet, but at least you get to share that bandwidth between devices so more can operate at high speed. Motherboards can have one PCIe 5.0 x16 slot or route that bandwidth to two PCIe 5.0 x8 slots, and these connect directly to the CPU. That's in addition to four PCIe 4.0 lanes that can now be dedicated to an SSD, plus the Z690 controller itself hosts 12 PCIe 4.0 lanes and another 16 PCIe 3.0 lanes for various components. Bandwidth between the CPU and the Z690 has doubled as well.

Also on the connectivity front, there's now support for up to four USB 3.2 Gen2x2 (20Gbps) – this shouldn't be confused with USB4 Gen3 which can also achieve 20Gbps with the same Type-C connector. You can have up to 10 USB 3.2 Gen2 (10Gbps) ports as well, between the rear panel and additional headers. PCIe and M.2 slot configurations will depend on motherboard manufacturers. Intel has implemented a Wi-Fi 6E controller, which is a step up from Wi-Fi 6, and there's still integrated Gigabit Ethernet. Of course things like [Intel Optane](#) are supported, and all Z-series motherboards are overclocking-friendly.

Lower-end platforms will be introduced when Intel launches non-K 12th Gen CPUs, and we don't yet know how they will be differentiated and whether certain features will be exclusive to the top-tier Z690. Obviously with the split between DDR4 and DDR5, there will be a huge variety of Z690 motherboards to choose from. Asus, Gigabyte, MSI, ASRock, and some smaller brands have already introduced a variety in the Indian market.

Components used for the review of the Core i9-12900K and Core i5-12600K

Asus TUF Gaming Z690-Plus WiFi D4 motherboard and Strix LC II 360 ARGB AIO cooler

For this review, [Asus](#) sent across one of its more affordable Z690 motherboards, the TUF Gaming Z690-Plus WiFi D4, as well as a Strix LC II 360 ARGB AIO cooler with an LGA1700 adapter. The D4 suffix indicates that this board will only work with DDR4 RAM, which is fitting given the segment it targets. While not quite as tricked-out as flagship models that sell for as much as Rs. 65,000, this motherboard should be able to take care of most of what enthusiasts need, at a far more approachable price of Rs. 25,000.

The board layout has no big surprises. It has four slots for a maximum of 128GB of RAM with overclocking support going up to DDR4-5333. There are chunky VRM heatsinks around the CPU socket, which might interfere with extremely large air coolers, and you'll want to be careful of a few sharp corners.

I did note a lack of little conveniences like an LED diagnostic display and surface-mount power and reset buttons, which make initial assembly and working on an open bench easier. You also don't get a secondary BIOS as a failsafe. On the plus side, Asus has developed an M.2 latch system that dispenses with the usual tiny screws, and you get heatsinks on all four M.2 slots.

The integrated rear IO shield is much appreciated and will make installation easier. There's one USB 3.2 Gen2x2 (20Gbps) Type-C port, two USB 3.2 Gen2 (10Gbps) Type-A ports, and five USB 3.2 Gen1 (5Gbps) ports, one of which is Type-C and four Type-A. This board also has HDMI 2.1 and DisplayPort 1.4 video outputs, 2.5Gbps Ethernet, two terminals for the included Wi-Fi 6 antenna, optical S/PDIF audio output, and the standard five analogue 3.5mm audio jacks. Unfortunately you don't get Thunderbolt at this price point, or external BIOS reset and update buttons. Bluetooth 5.2 is an invisible bonus.

The rear IO panel of the TUF Gaming Z690-Plus Wifi D4 offers a lot of connectivity

Internal headers will allow for up to four USB 2.0 ports plus high-speed front panel Type-A and Type-C ports. There are multiple ARGB control headers and four chassis fan connection points in addition to independent

CPU fan and AIO pump headers. You do get RGB lighting but the tiny accents on one edge of the board and under the Z690 heatsink are actually quite easy to miss. There are only four SATA ports; two facing upwards and two facing sideways off the board's edge.

There are four M.2 slots, all but one of which have heatsinks. The primary slot is fed by the CPU directly. Only one slot can work with an M.2 SATA SSD; the other three including the primary one are NVMe-only. The first PCIe slot is also wired to the CPU, and gets a full 16 lanes of PCIe 5.0 bandwidth. The second x16 slot as well as the one x4 and two x1 slots might have to share bandwidth with the M.2 slots depending on which ones you populate.

The UEFI BIOS is quite easy to navigate. You can see an overview in "easy mode" or dig deep into the menus, where you'll find an array of options for controlling onboard features and considerable manual overclocking controls. Overall, the Asus TUF Gaming Z690-Plus WiFi D4 does lack some conveniences, but delivers plenty considering its price. If you aren't an avid overclocker with an elaborate liquid cooling setup, and are planning to stick with DDR4 RAM, this could be a solid base to build upon.

Asus says that the Strix LC II 360 ARGB cooler (priced at Rs. 18,950 in India) will work with LGA1700 processors just fine as they are. Even so, new units will ship with a redesigned bracket, so you might want to make sure of this if you're buying a new one. Everything comes neatly packaged in the box, and it's easy to put the parts together. The instruction leaflet doesn't cover things like push/pull orientation for the fans, or which way the radiator should be oriented depending on where you want to place it in your cabinet. Asus also could have used resealable bags with clearer labels for all the brackets, screws, and washers since several are included for both AMD and Intel mounts. On the bright side, there's no separate controller unit for fan or RGB control and the wiring to your motherboard headers is straightforward.

You'll need an adequate cooler if you want the Core i9-12900K to run at its highest speeds for sustained periods

Intel Core i9-12900K and Core i5-12600K performance

Both CPUs were tested with the same set of components, starting with the Asus TUF Gaming Z690-Plus WiFi D4 motherboard and Strix LC II 360 ARGB AIO cooler. The rest of the rig was comprised of a 2x16GB Corsair Dominator Platinum RGB DDR4-3600 RAM kit, a [Sapphire Nitro+ Radeon RX 590](#) graphics card (removed when testing the CPUs' integrated GPUs), a 2TB Kingston KC3000 PCIe 4.0 NVMe SSD and a [1TB Samsung SSD 860 EVO SSD](#), a Corsair RM850 power supply, and an Asus PB287Q 4K monitor.

All tests were run using a [fresh installation of Windows 11](#), with all available patches installed and all drivers updated. This, plus the use of DDR4 RAM, and the fact that not all tests might be updated to recognise and exploit heterogeneous cores, might reflect in some benchmark results. We have the previous-gen [Core i9-11900K and Core i5-11600K](#) to compare test results with, as well as some previous-gen and HEDT Intel and AMD CPUs (lockdown-related restrictions mean we don't have Ryzen 5000 series scores to compare against yet). Click through to our previous reviews to see even more points of reference. Intel Core i9-1200K Intel Core i5-12600K Intel Core i9-11900K Intel Core

i5-11600K AMD Ryzen 9

3900X Intel Core i9-10980XE AMD Ryzen Threadripper 3970X CPU tests Cinebench R20 CPU single-threaded 760 732 628 595 495 452 515 Cinebench R20 CPU multi-threaded 10,324 6,664 5,927 4,292 6,785 8,729 17,069 Cinebench R23 CPU single-threaded (10 mins) 1,982 1,909 1,676 1,542 NA NA NA Cinebench R23 CPU multi-threaded (10 mins) 26,820 17,395 15,373 11,094 NA NA NA PCMark 10 standard 8,174 7,645 7,474 5,036 6,597 6,914 6,637 PCMark 10 extended 9,121 8,608 8,466 8,137 6,807 7,967 7,681 3DMark Fire Strike Ultra (physics) 40,355 28,824 26,716 22,328 27,471 28,111 22,010 3DMark Time Spy (CPU) 13,016 10,329 11,000 8,446 NA NA NA Geekbench 5 single-threaded 1,749 1,827 1,777 1,654 NA NA NA Geekbench 5 multi-threaded 11,219 10,329 9,536 7,582 NA NA NA POVRay* 29 seconds 44 seconds 55 seconds 1 minute, 16 seconds 41 seconds 35 seconds 18 seconds VRAY CPU* 32 seconds 49 seconds 54 seconds 1 minute, 14 seconds 48 seconds 37 seconds 20 seconds Corona Renderer Benchmark* 1 minute, 18 seconds 1 minute, 37 seconds 1 minute, 35 seconds 2 minutes, 11 seconds 1 minute, 19 seconds 57 seconds 29 seconds WebXprt 360 335 308 310 260 237 256 Jetstream 2 236.138 233.186 209.32 196.946 NA NA NA Speedometer 231 251 216 201.8 NA NA NA SiSoft SANDRA CPU arithmetic 520.59GOPS 362.87GOPS 313.18GOPS 224.44GOPS 366GOPS 496GOPS 940.69GOPS SiSoft SANDRA CPU multimedia 1.55GPix/s 1GPix/s 1.3GPix/s 948.64MPix/s 1.26GPix/s 2.13GPix/s 3.31GPix/s SiSoft SANDRA CPU cryptography 18.35GBps 15.74GBps 14GBps 16.88GBps 18.09GBps 25.65GBps 41.42GBps SiSoft SANDRA cache bandwidth 485GBps 332.25GBps 429GBps 351GBps 589.9GBps 701.53GBps 1.73TBps 7Zip file compression* 1 minute, 51 seconds 1 minute, 52 seconds 1 minute, 37 seconds 1 minute, 40 seconds 1 minute, 33 seconds 1 minute, 8 seconds 56 seconds Handbrake video encoding* 25 seconds 30 seconds 32 seconds 41 seconds 35 seconds 37 seconds 30 seconds Civilization VI AI benchmark (average) 8.72 seconds 8.76 seconds 8.83 seconds 8.87s NA NA NA Integrated GPU tests Unigine Superposition

1080p Medium 1,445 1,366 1,188 1,207 3DMark Time Spy 874 819 698 702 3DMark Night Raid 11,778 10,859 9,423 9,448 Discrete GPU tests 3DMark Fire Strike Ultra 3,789 3,708 3,638 3,746 3DMark Time Spy 5,439 5,326 5,290 5,200 Far Cry 5 1080p Ultra 81fps 77fps 82fps 81fps Far Cry 5 1440p Ultra 56fps 54fps 58fps 57fps Assassin's Creed Odyssey 1080p Very High 57fps 62fps 61fps 62fps Assassin's Creed Odyssey 1440p Very High 41fps 45fps 45fps 44fps *lower is better

The thing that jumps out first and foremost is how much of a jump there is in tests that can scale to any number of cores and threads. While the previous generation Core i9 flagship topped out at 8 cores and 16 threads, there's obviously a lot to be gained just by having those counts go up to 16 and 24 respectively, irrespective of architecture. We see significant scaling in 3D rendering and ray tracing benchmarks, and although the Windows 11 Task Manager doesn't distinguish between core types, it did show all 24 threads on the Core i9-12900K fully saturated during such tests.

Single-threaded performance also benefits tremendously, which means games will get a nice boost if you aren't bottlenecked by your GPU. The Core i5-12600K strikes an interesting balance here – lots of cores, plus the architectural advantages that benefit lightly-threaded tasks. It's expensive, by mid-range CPU standards, but could even be an upgrade over Core i7 and Core i9 models from the past few generations. This model is likely to be a hit with gamers.

One thing that does have to be noted is power consumption. Intel's TDP rating system has changed to acknowledge that power draw is far higher than the rated level under stress, and now a CPU can run at turbo speed virtually unrestricted as long as your cooling solution is adequate. If you stress these CPUs for extended periods, you'll be pulling a lot of power from your PSU (but also getting a lot done).

Automatic overclocking with the Asus TUF Gaming Z690-Plus Wifi D4 motherboard is as easy as selecting a few options in the BIOS and letting the system test its own limits. You could also use Intel's Extreme Tuning Utility or Asus' AI Suite 3 utilities through Windows. I was able to push the Core i9-12900K up to 5.3GHz on the P-cores and 4GHz on the E-cores in under a minute. The system ran perfectly stable and benchmarks ran fine, though the Strix cooler did run noticeably louder and ramp up to full speed much quicker.

After this minor overclock, CineBench R20's single-core score rose from 760 to 791, and the multi-core score from 10,324 to 10,795. POV-Ray's render time was cut from 29 seconds to 27 seconds, and the Corona rendering benchmark ran in 57 seconds, down from 1 minute, 18 seconds. An additional benchmark, NeroScore, which measures AI-powered photo tagging, produced a score of 2,584 before the overclock and 3,284 after. If you get into manual tweaking on a top-tier motherboard with DDR5 RAM, there's sure to be more headroom to exploit.

There isn't much to be said about Intel's UHD 770 integrated GPU – performance gains over the previous generation are marginal. Even if you won't get much use out of it, an integrated GPU is nice to have for troubleshooting and assembling. It could even be a lifesaver, considering the consumer-unfriendly GPU market we're dealing with right now. For that reason, I'd always prefer a CPU with an iGPU over an -F variant – unless there's a huge price difference.

The 12th Gen Core i9-12900K and Core i5-12600K excel when faced with a variety of workloads

Verdict

When the 11th Gen 'Rocket Lake' Core CPU family was [launched in March this year](#), I called it a placeholder, since we already had a good idea of what Alder Lake was shaping up to be and when it would launch. [Intel strongly refuted that characterisation](#), and the company's logic was that those were the best CPUs for certain workloads available at the time – which, to be fair, was true. Ultimately, I advised people to hold off on a purchase if they could, since a lot was about to change.

If you have waited this long, you'll be very glad. The 12th Gen is a considerable improvement in nearly all aspects of performance. This is the launch that will convince many people to upgrade from their current setups. It's a roaring success for Intel after years of lacklustre updates, first because of a lack of competition and later because of its own internal problems. The advent of DDR5, PCIe 5.0, Windows 11, and heterogenous-core CPUs have injected new life into the PC market.

As far as content creation and multitasking go, you can't go wrong with the new Alder Lake generation. The best news for buyers is that these unlocked 12th Gen Core CPUs aren't priced out of reach – performance at mainstream prices in many cases exceeds that of the [18-core Core i9-10980XE](#), which was at one point considered a bargain at around Rs. 70,000, and that too was half the price of its predecessor. The Core i9-12900K puts Intel's X-series out of commission, and it's no surprise that a refresh hasn't happened for the HEDT segment this year. If you want to do better, you'll want to look at something like the [Ryzen Threadripper series](#) for massive brute-force all-core performance – but that's a whole different market segment and pricing reflects that.

Intel hasn't quite pulled off a decisive victory over AMD's Ryzen 5000 series though – there are workloads that will still favour the Zen architecture with lots of cores, and we'll have a new generation from the green team soon enough. Also keep in mind that you'll need an expensive Z690 motherboard and DDR5 RAM to get the most out of the unlocked enthusiast SKUs released so far – when you add up all these prices, AMD could easily come out ahead for many people.

Intel Core i9-12900K

Price (approximate MOP):Rs. 60,000

Pros

- * Excellent single- and multi-threaded performance
- * DDR5, PCIe 5.0, fast platform-level IO
- * Overclockable

Cons

- * High platform cost
- * Basic integrated graphics
- * Power-hungry
- * Potential compatibility issues

Ratings (out of 5)

- * Performance: 4.5
- * Value for Money: 4
- * Overall: 4.5

Intel Core i5-12600K

Price (MOP):Rs. 31,500

Pros

- * Excellent single- and multi-threaded performance
- * DDR5, PCIe 5.0, fast platform-level IO
- * Overclockable

Cons

- * Expensive, high platform cost
- * Basic integrated graphics
- * Potential compatibility issues

Ratings (out of 5)

- * Performance: 4
- * Value for Money: 3.5
- * Overall: 4

Asus TUF Gaming Z690-Plus Wifi D4

Price (MOP):Rs. 25,000

Pros

- * Simple design, integrated IO shield, M.2 clamps

- * Four M.2 slots, PCIe 5.0 x16 slot, USB 3.2x2 (20Gbps)

- * Stable performance, easy auto overclocking

- * Well-designed UEFI BIOS

Cons

- * No BIOS failsafe or diagnostic display

Ratings (out of 5)

- * Features: 4

- * Performance: 4.5

- * Value for Money: 4

- * Overall: 4

Document NDTVIN002021112ehbb00006

Asus's latest **Intel gaming** motherboard might be leaving PCIe Gen5 support in the dust

Allisa James

195 words

10 November 2021

TechRadar

TECHR

English

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New rumors suggest that some Intel B660 motherboards may be forgoing PCIe Gen5 support altogether, sticking with PCIe Gen4 instead.

In a surprising move from Asus, it seems that its latest [Intel Alder Lake](#) B660 [gaming motherboard](#) may not have PCIe 5.0 support like a Z690 motherboard would.

The upcoming Prime B660 Plus D4 motherboard might only be supporting up to PCIe Gen4, according to an image from [Videocardz](#) of a Z690 motherboard shipped in the wrong box. The decision is also a confusing one, as Gen5 lanes aren't attached to the chipset but to the CPU itself. Though motherboard manufacturers still have to include the hardware for the faster interface.

[Click to view image \(Image credit: Videocardz\)](#)

Naturally, this is an unconfirmed image, so take the news with a grain of salt until Asus officially reveals the full details. We should start hearing official word on B660 motherboards in the next few weeks, as the budget motherboards typically follow a couple weeks after the mainstream Z-series chipset.

[Intel optane drive on a motherboard \(Intel\)](#)

Document TECHR00020211110ehba0018I

At a secret amount Intel acquires cloud gaming service RemoteMyApp

AnimationXpress Team

Distributed by Contify.com

167 words

10 November 2021

AnimationXpress

ATANIX

English

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Intel has acquired cloud gaming solution provider RemoteMyApp for an undisclosed amount. RemoteMyApp CEO Andreas Hestbeck revealed the information to Polish media later Intel spokesperson confirmed to VentureBeat .

As per the VentureBeat spokesperson said, "We acquired RemoteMyApp for its leading team of cloud services designers and engineers, and we are excited to welcome the RemoteMyApp team to Intel. Intel will continue to support RemoteMyApp's key customers per their contracts."

Prior to the acquisition RemoteMyApp raised over \$4.7 million partners with companies to create game streaming experiences for their customers.

Intel hasn't signaled that it's planning to launch a cloud gaming service on its own — seems with acquisition RemoteMyApp's products with its existing hardware as a combined chips and services bundle. Cloud gaming requires GPUs as well as CPUs, and RemoteMyApp provides an especially compelling use case for Intel's recently announced Intel Server GPU, reads the report.

Document ATANIX0020211110ehba0002x

MSI will outfit its gaming PCs with Intel's 12th-gen CPUs and Nvidia's RTX 30-series

Allisa James

378 words

9 November 2021

TechRadar

TECHR

English

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MSI's upcoming gaming PC lineup will be using the power of Intel's Alder Lake CPUs and Nvidia's RTX 30-series GPUs.

MSI is best known for its wide assortment of [gaming laptops](#), and it's looking to beef up its gaming PCs with [Intel 12th Gen Alder Lake](#) processors and Nvidia GeForce RTX 30-series [graphics cards](#).

MSI revealed three new gaming PCs: MEG Aegis Ti5 12th, MEG Trident X 12th, and Aegis RS 12th.

The MEG Aegis Ti5 12th is MSI's flagship PC, as it runs on an Intel Core i9-12900K and [Nvidia RTX 3090](#) as well as features MSI's Silent Storm Cooling 4 system. The MEG Trident X 12th uses an Intel Core i7-12700K and an Nvidia RTX 3090, with an emphasis on cooling thanks to the Silent Storm 3 cooling system and enlarged heatsink it packs. Finally, the Aegis RS 12th is a pre-build that's meant for easy upgrading with the potential to use up to an Intel i9-12900K and up to an Nvidia RTX 3090.

The desktops all ship with [Windows 11](#), meaning that they have access to the new gaming features like Direct Storage and Auto HDR. Though MSI unveiled the full build details, no pricing or availability has been shared as of now.

Analysis: Why Intel Alder Lake?

MSI has clearly outfitted this new line of desktops with some premium hardware, as both Intel Alder Lake and [Nvidia Ampere](#) are some of the best components on the market.

In particular, using Alder Lake processors is a stroke of genius thanks to the big.LITTLE architecture powering them. This tech features a mix of performance and efficiency cores to better manage power usage but also improve performance. This means that for more intensive activities, such as gaming, Alder Lake will be using Golden Cove cores while lower priority tasks and apps will use less powerful Gracemont cores instead.

The chips themselves are built with the Intel 7 process, are 13% better in gaming performance than previous-gen chips, and support DDR5.

Via [Windows Central](#)

[MSI lucky Dragon and Godzilla with mystery graphics card \(Future\)](#)

Document TECHR00020211109ehb90018k

Asus launches new Intel ROG motherboards, gaming gear

223 words

8 November 2021

Telecompaper World

TELWOR

English

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Asus Republic of Gamers (ROG) announced the launch of a new generation of Intel-based motherboards, power supplies, monitors and more at its 'Break All Limits' event. The new range of premium motherboards has been redesigned from the ground up to feature as many as 16 cores and 24 threads, said Asus. They include the ROG Maximus Z690 Extreme, Extreme Glacial, Apex, Formula and Hero, all of which come with power delivery that can react in split seconds to changes in voltage and frequencies introduced by the Intel Alder Lake platform.

The top-of-the-range ROG Maximus Z690 Extreme features DDR5 support, 24+1 teamed power stages ready for up to 105 amps, MicroFine alloy chokes and premium-grade capacitors cooled by a cold-forged heatsink to reach new heights of performance and clock speeds, said Asus.

Additional gaming-oriented devices unveiled by the company include new ROG Strix Z690 and ROG Thor gaming Wi-Fi motherboards, new ROG Strix gaming monitors and the ROG Delta S Animate gaming headset with customisable AniMe Matrix displays on the outside of each ear cup. These feature mini LEDs that can be programmed with custom lighting designs and live audio visualizations as well as soundwave lighting effects that flash to the sound of a person's voice.

Document TELWOR0020211108ehb800001

online news

MSI unveils 12th Gen Intel Core gaming desktop and definition the new standard of gaming monitor

1,037 words

5 November 2021

ETMAG.com

FMETMA

English

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For those who do not familiar with PC DIY users, MSI also offers pre-built systems. The only thing that customers should worry about is what games you should play and MSI will take over the rest parts. MSI desktop line-up fully implements the concept of G.A.M.E. unlimited into the products, including performance, aesthetics, connectivity, and experience. A prebuild PC user only just enjoys the plug-and-play experience, the rest of the software and hardware integrated MSI will help you to complete the processing, while you get the product.

The new MSI gaming desktops are equipped with Intel's latest 12th Gen Alder Lake processors. The advanced Intel 7 process technology with hybrid architecture combining P-Core (Performance) and E-Core (Efficiency) increases multi-thread performance by up to 47%. The gaming performance also has more than 13% increase compared to the previous generation. The full lineup of K Series gaming desktops adopted DDR5 memory with read speed up to 60% higher than the previous generation equipped with DDR4. This can provide players with faster data reading. In addition, the MSI 12th Gen gaming desktops are all equipped with Windows 11. The Direct Storage technology can help players quickly read the games while the Auto HDR function can even improve SDR game scenes to HDR quality. This time MSI launched the all new 12th Gen Series Intel unlocked processors models including MEG Aegis Ti5, MEG Trident X and MAG Codex X5. All of these models embody the G.A.M.E. Unlimited spirit to bring gamers to the new era of gaming.

MEG Aegis Ti5 12th - Path to the Future Our flagship model MEG Aegis Ti5 12th is equipped with an Intel Core i9-12900K processor and NVIDIA RTX 3090 graphics card. Its ultimate performance is matched with MSI's exclusive Silent Storm Cooling 4 cooling technology, which can fully match the performance of the i9K processor and RTX 3090 graphics card. The world's first HMI Gaming Dial not only allows players to quickly switch system performance settings but also allows players to customize their favorite animation on the LCD.

MEG Trident X 12th - The centerpiece of gaming For the compact sizes Trident series, MSI breaks through the difficulties in cooling performance and continues to equip MEG Trident X 12th with improved CPU performance. The system's heat dissipation capacity is better-improved thanks to the exclusive "Silent Storm" 3 heat dissipation technology and the enlarged heatsink. The heat dissipation surface is increased by 26% compared to the previous generation, allowing players to experience the smoothest gaming experience.

MAG Codex X5 12th - Rule your gaming empire with minimalist style The Codex Series is popular in the mainstream market. The MAG Codex X5 12th has an aggressive appearance, large glass side panel, and RGB lighting effects that players can freely adjust with software. The MAG Codex X5 12th is equipped with up to Intel Core i9-12900K processor and NVIDIA RTX 3090 graphics card. 3A games can easily be run and with the 2.5G Ethernet and WiFi 6E network, players can experience the games without delay.

Color is a Matter With new intel 12th gen CPU and windows 11 release, MSI foresees that more and more users will care picture color and picture quality since personal PC and notebook provide more powerful performance with next-gen CPU. According to our online volume research, customer did care about response time and refresh rate in the past but now things are changing. People are beginning to care more about color performance because of the prolonged time spent with these monitors.

QD Premium Color - New Standard of Gaming Monitor "The largest color gamut we've measured to date" - Tom's hardware review of MAG274QRF-QD. MSI QD series are well-known and received many awards but MSI will not just stop here. MSI announce the latest update of QD series and it is a new standard of gaming monitor. QD premium color doesn't only equipped Quantum dot film in the monitor but also made software optimization that help improve color calibration. These designs are made so that gamers can have the best in-game colors. The first batch of QD premium color support monitors are MPG Artymis 273CQRX-QD and MPG Artymis 273CQR-QD. And new MEG 341 Mini LED.

MSI announced the collaboration with world famous panel manufacturer. This time, MSI unveiled the world first 34 inch monitor with mini led technology by AUO AmLED solution. This monitor also featured 800R center curved rate and up to 1000nits to meet HDR 1000 performance. Of course, this monitor is also listed

on QD Premium Color, the highest color standard of gaming monitor, that will offer best gaming experience to you.

Console gaming Besides current curved and Esports gaming monitor segment, MSI announced that will provide console gaming line-up to console lovers since the latest console device has supported high refresh rate and 4K resolution. More console gamers are looking for best monitor with their new console. MSI already made console mode with small scaling to users that can capture 4K signal to 2K monitor. Now, MSI provides a beast - tailored for console gamers. Our unique KVM 3.0 feature is a good example that allow console gamers to using console controller to access monitor OSD setting menu and Macro keys settings. Console gamers can easily switch signal input or setting up monitor without an additional remote controller or stop gaming then drop controller to use their hand to touch physical buttons on the back of monitor. If you are a console gamer who is looking for a 4K 144hz monitor, MSI Optix MPG321UR-QD is a great choice at this moment. Optix MPG321UR-QD offers fast response time and support 144hz at 4K resolution by latest HDMI 2.1. This monitor is also the first MSI monitor with KVM 3.0 unique features.

For those who prefer bigger screen like TV, MSI will also release a new OLED 55 inch monitor in the 2022. Please keep following us and stay-tuned for latest updates.

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Intel Core i9-12900K and Core i5-12600K Review: Retaking the Gaming Crown

Paul Alcorn

9,813 words

4 November 2021

Tom's Hardware

TOMHA

English

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We put Intel's new Core i9-12900K and Core i5-12600K through the wringer in Windows 10 and 11 testing with DDR4 and DDR5 memory.

Intel's \$589 [Alder Lake](#) Core i9-12900K and \$289 Core i5-12600K come to market with a powerful combination of competitive pricing and impressive performance, taking the lead in gaming over comparable [Ryzen 5000](#) models and assuring a position on our list of [Best CPUs for gaming](#). Intel's newest chips are also incredibly competitive in productivity work, ranking among the top chips on our [CPU benchmark](#) hierarchy. Combine that with Alder Lake's new next-gen connectivity technologies that bring big increases in throughput via DDR5 memory and PCIe 5.0 interfaces, outstripping AMD's venerable AM4 platform, and Intel has a winner on its hands.

With up to 16 cores and 24 threads on the flagship Core i9-12900K, Intel has finally achieved a comparable core count to AMD's halo mainstream PC chips that have held the core count lead since the first 16-core 32-thread Ryzen 9 landed back in 2019. In fact, the \$589 Core i9-12900K even beats the ultra-impressive \$799 Ryzen 9 5950X in many threaded applications that have become Ryzen's uncontested stomping grounds, like Cinebench.

That's enabled by a first for desktop PCs — Intel's new hybrid x86 design represents the company's most disruptive architectural shift in a decade. Alder Lake combines big and fast Performance cores (P-cores) with a smattering of small and powerful Efficiency cores (E-cores) that chew through background processes with surprising speed. The [Golden Cove architecture](#) powers the 'big' P-cores while the 'little' E-cores come with the [Gracemont architecture](#), with both providing much-needed IPC improvements to Intel's core designs.

Intel etches those cores on its 'Intel 7' process, finally ending the misery of the 14nm node after six long years that ultimately cost the company its performance lead over AMD in desktop PCs. We previously knew this 'Intel 7' manufacturing tech as [10nm Enhanced SuperFin](#), but [Intel recently renamed its process nodes](#) to match industry nomenclature. Technically, this is the second generation of Intel's 10nm process, but it's a first for desktop PCs.

U.S. PriceCores | ThreadsP-Core Base/BoostE-Core Base/BoostTDP / PBP / MTPDDR4-3200L3 CacheCore
i9-12900K / KF\$589 (K) - \$564 (KF)8P + 8E | 16 Cores / 24 threads3.2 / 5.2 GHz2.4 / 3.9 GHz125W /
241WDDR4-3200 / DDR5-480030MBCore i7-12700K / KF\$409 (K) - \$384 (KF)8P + 4E | 12 Cores / 20
threads3.6 / 4.9 GHz2.7 / 3.8 GHz125W / 190WDDR4-3200 / DDR5-480025MBCore i5-12600K / KF\$289 (K)
- \$264 (KF)6P + 4E | 10 Cores / 16 threads3.7 / 4.9 GHz2.8 / 3.6 GHz125W / 150WDDR4-3200 /
DDR5-480016MB

Intel released three high-end overclockable K-series models today, along with their graphics-less KF counterparts that are slightly less expensive. The P-cores are hyper-threaded, while the E-cores only have a single thread, leading to what we would normally consider as non-standard thread counts. As a result, the chips stretch from a 10-core 16-thread Core i5-12600K up to the 16-core 24-thread Core i9-12900K.

The hybrid design is old hat for Arm processors, but it's groundbreaking for the desktop PC. Unfortunately, that comes with some baggage. The new heterogeneous design requires special accommodations to unlock the best performance: High-priority tasks execute best on the P-cores, while the background and threaded workloads should run on the E-cores. That requires operating system intervention.

The Alder Lake chips work with both newer and older versions of Windows, but Windows 11 unlocks the best of Alder Lake because it supports Intel's new Thread Director. The tech provides the operating system with information that assists in assigning work to the correct cores. Alder Lake's performance is still competitive in Windows 10, but you might encounter wayward performance and/or variability, meaning some workloads will be slower at times due to unoptimized thread scheduling. We have plenty of evidence of that in our tests below.

Intel's chips are competitively priced, but PCIe 5.0 and DDR5 are also significant cost-adders for motherboards. All signs point to DDR5 kits being expensive in the early days, so it's good that some motherboards support the more affordable DDR4.

Alder Lake takes the lead over Ryzen in most workloads, but it isn't a slam dunk in every regard — we ran into several odd performance trends with Windows 10, and a few programs even refused to run correctly. We do expect those issues to be fixed sooner rather than later, though, as the industry adapts to the hybrid architecture.

We have plenty of testing with both Windows 10 and 11 below, not to mention DDR4 vs. DDR5, as we take a closer look at the next chapter in the [AMD vs Intel](#) rivalry.

Intel is only bringing its most expensive chips from the Core i9, i7, and i5 families to the retail market for now, but it is also shipping 28 more models to OEMs for prebuilt systems that arrive early next year. Intel isn't sharing details yet, but those models will eventually come to retail at an unspecified time.

U.S. PriceCores | ThreadsP-Core Base/BoostE-Core Base/BoostTDP / PBP / MTPDDR4-3200L3
CacheRyzen 9 5950X\$79916P | 32 threads3.4 / 4.9 GHz-105WDDR4-320064MB (2x32)Core i9-12900K /
KF\$589 (K) - \$564 (KF)8P + 8E | 16 Cores / 24 threads3.2 / 5.2 GHz2.4 / 3.9 GHz125W / 241WDDR4-3200 /
DDR5-480030MBRyzen 9 5900X\$54912P | 24 threads3.7 / 4.8 GHz-105WDDR4-320032MB (1x32)Core
i9-11900K\$5498P | 16 threads3.5 / 5.3 GHz-125WDDR4-320016MBCore i7-12700K / KF\$409 (K) - \$384
(KF)8P + 4E | 12 Cores / 20 threads3.6 / 4.9 GHz2.7 / 3.8 GHz125W / 190WDDR4-3200 /
DDR5-480025MBCore i7-11700K\$4098P | 16 threads3.6 / 5.0 GHz-125WDDR4-320016MBRyzen 7
5800X\$4498P | 16 threads3.8 / 4.7 GHz-105WDDR4-320032MBCore i5-12600K / KF\$289 (K) - \$264 (KF)6P
+ 4E | 10 Cores / 16 threads3.7 / 4.9 GHz2.8 / 3.6 GHz125W / 150WDDR4-3200 / DDR5-480016MBCore
i5-11600K\$2726P | 12 threads3.9 / 4.9 GHz-95WDDR4-320012MBRyzen 5 5600X\$2996P | 12 threads3.7 /
4.6 GHz-65WDDR4-320032MB

Intel's \$589 16-core Core i9-12900K comes with eight P-cores that support hyper-threading, and eight single-threaded E-cores for a total of 24 threads. That's a 33% increase in thread count over the previous-gen [Core i9-11900K](#). The P-cores have a 3.2 GHz base, and peak frequencies reach 5.2 GHz with Turbo Boost Max 3.0 (this feature is only active on P-cores).

The 12900K has a 100 MHz reduction in peak clock frequency compared to the 11900K, but that isn't too important given the entirely new hybrid architecture — the P-cores process ~19% more instructions per cycle and the SoC realizes performance gains from using different core types for different tasks. Speaking of which, the E-cores have a 2.4 GHz base and stretch up to 3.9 GHz via the standard Turbo Boost 2.0 algorithms. The chip is also equipped with 30MB of L3 cache and 14MB of L2.

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The Core i5-12600K's \$289 price point remains the same as the prior-gen [Core i5-11600K](#), meaning it lands right smack dab in gamer country, going toe-to-toe with the \$299 six-core twelve-thread Ryzen 5 5600X and representing the lowest point of entry to the Alder Lake family (at least for now).

The 12600K comes with six threaded P-cores that operate at 3.7 / 4.9 GHz and four E-cores that run at 2.8 / 3.6 GHz, for a total of 16 threads. That's paired with 20MB of L3 and 9.5MB of L2 cache.

The \$409 Core i7-12700K comes with the same \$409 tray pricing as the previous-gen [Core i7-11700K](#) and has eight P-cores and four E-cores, for a total of 20 threads. The P-cores run at a 3.6 / 5.0 GHz base/boost, while the E-cores weigh in at 2.7 / 3.8 GHz, all fed by 25MB of L3 cache and 12MB of L2. The graphics-less \$384 Core i7-12700KF comes with a \$25 price reduction.

[Click to view image \(Image credit: Tom's Hardware\)](#)

* The Alder Lake SoC will span from desktop PCs to ultramobile devices with TDP ratings from 9W to 125W, all built on the Intel 7 process. The desktop PC comes with up to eight Performance (P) cores and eight Efficient (E) cores for a total of 16 cores and 24 threads and up to 30 MB of L3 cache for a single chip.

* Alder Lake supports either DDR4 or DDR5 (LP4x/LP5, too). Desktop PC supports x16 PCIe Gen 5 and x4 PCIe Gen 4.

* Intel's new hyper-threaded Performance (P) core, which comes with the Golden Cove microarchitecture designed for low-latency single-threaded performance, comes with an average of 19% more IPC than the Cypress Cove architecture in Rocket Lake.

* Intel's new single-threaded Efficiency (E) core comes with the Gracemont microarchitecture to improve multi-threaded performance and provide exceptional area efficiency (small footprint) and performance-per-watt. Four small cores fit in the same area as a Skylake core and deliver 80% more performance in threaded work (at the same power). A single E core also delivers 40% more performance than a single-threaded Skylake core (at the same power) in single-threaded work (caveats apply to both).

* Intel's Thread Director is a hardware-based technology that assures threads are assigned to either the P or E cores in an optimized manner. This is the sleeper tech that enables the hybrid architecture.

* Alder Lake does not support AVX-512 under any condition (fused off in P cores, not supported in E cores) to ensure an even ISA application.

Intel Alder Lake Z690 Motherboards

Intel's Alder Lake drops into Socket 1700 motherboards with the Z690 chipset. You can read about the chipset and some of the first [60+ motherboards in our Z690 motherboard roundup here](#).

Because the new LGA1700 socket is physically larger and has a lower Z-height, existing air and water coolers for LGA1200 and LGA115x motherboards won't work with 600-series motherboards. As a result, upgraders will need to acquire a conversion kit from the cooler-maker or buy a new cooler.

Image 1 of 3

[Click to view image \(Image credit: Intel\)](#)

Image 2 of 3

[Click to view image \(Image credit: Intel\)](#)

Image 3 of 3

[Click to view image \(Image credit: Intel\)](#)

Alder Lake chips expose up to 16 lanes of PCIe 5.0 and an additional four lanes of PCIe 4.0 from the chip for M.2 storage. Those lanes are split into x16 or x8 for GPUs, or x4/x4 for storage slots. [PCIe AICs \(Add-In Cards\) that support PCIe 5.0 M.2 SSDs](#) (which don't exist yet) are already in the works.

Just like Z590, the 14nm Z690 chipset sports 16 lanes of PCIe 3.0, but Intel also added 12 lanes of PCIe 4.0, which is a nice boost to overall connectivity. Intel also doubled the throughput of the DMI connection between the chip and chipset from an x8 DMI 3.0 pipe, which clocks in at 7.88 GB/s, to an x8 DMI 4.0 connection that delivers 15.66 GB/s. This much-needed bandwidth improvement allows for more throughput from attached RAID arrays. In that vein, Intel also added support for the Volume Management Device feature that supports creating and managing PCIe storage volumes, including bootable PCIe RAID configurations. The increased

DMI throughput is also beneficial for Z690's bolstered connectivity options, like the new second USB 3.2 Gen 2x2 20 Gbps connection.

Intel Alder Lake DDR4 and DDR5 Support

Alder Lake chips support both DDR4 and DDR5 memory, but there are several caveats tied to DDR5. As a default, DDR5 runs in Gear 2 mode, resulting in higher latency. Additionally, standard motherboards only support DDR5-4800 if the motherboard has only two physical slots. Therefore, at stock settings, Alder Lake only supports DDR5-4400 on any motherboard with four slots — even if only two slots are populated. Support drops as low as DDR5-3600 if four slots are filled with dual-rank memory DIMMs. Here are the population rules for DDR5:

[Click to view image \(Image credit: Intel\)](#)

In contrast, Alder Lake supports DDR4-3200 in Gear 1 mode for all processors.

There is a wide selection of DDR5 motherboards spread among the various motherboard makers' Z690 families, but it appears that you'll only find DDR4 support on lower-end Z690 boards. Also, unlike previous generations, no motherboard supports both DDR4 and DDR5, which is probably due to DDR5's much tighter signal integrity requirements and onboard power control circuitry.

Alder Lake's memory bus has four 32-bit DDR5 channels that create a 128-bit interface. Additionally, unlike DDR4, DDR5 DIMMs come with PMIC (Power Management ICs) chips that control three on-DIMM voltage rails – VDD, VDDQ, and VPP.

DDR5 supports the new XMP 3.0 standard that supports up to five memory profiles (SPDs) to define unique frequency, voltage, and latency parameters, and XMP 3.0 also lets you write and name two of the profiles. That means you can adjust the frequencies and all the timings and voltages to your liking, assign a profile name, and save the settings directly to the XMP profile stored in the SPD.

The new XMP profiles can also control the PMICs now present on DDR5 DIMMs. Intel has defined a common set of PMIC standards among the vendors to align maximum voltages and voltage steps, among other parameters. Naturally, there are variances in PMIC designs and quality, adding yet another variable to watch out for when selecting the [Best RAM](#) for overclocking.

Intel has also [posted a new certification page on its website](#) to help assure that each kit is compatible with certain motherboards and firmware revisions. You can read more about [DDR5's new features here](#). We expect pricing for DDR5 to be substantially higher than DDR4, currently [projected to be a 50 to 60% markup](#), for some time.

Intel Alder Lake Thread Director and Windows 10 Performance Problems

Alder Lake comes with a mix of both performance and efficiency cores, so it's important that the workloads land on the correct cores. It's easy to see that having a core that excels at high-performance workloads isn't much help if the high-performance workloads often land in the slower cores, or vice versa. Unfortunately, the current Windows thread scheduling system is based entirely on static rules (priority, foreground, background) that are inefficient and create software programming overhead.

Intel's Thread Director technology is the quiet star of the Alder Lake show. This technology works by feeding the Windows 11 operating system with low-level telemetry data collected from within the processor itself, thus informing the scheduler about the state of the cores, be it power, thermal, or otherwise, and the type of workload being executed by any given thread. The Windows scheduler then uses this additional information to make real-time intelligent decisions about thread placement.

You can read the [in-depth details of the Thread Director tech here](#), but it's important to know that this feature is only supported on Windows 11.

As you'll soon see, the lack of optimized thread scheduling can greatly impact performance with Windows 10 systems, at least under some circumstances. To be clear, Windows 10 does have limited support for hybrid-optimized thread scheduling due to optimizations for Intel's [Lakefield](#) chips. However, while Windows 10 is aware of hybrid topologies, meaning it knows the difference between the performance and efficiency of the different core types, it doesn't have access to the thread-specific telemetry provided by Intel's hardware-based solution.

As a result, threads can and will land on the incorrect cores under some circumstances, which Intel warned could result in run-to-run variability in benchmarks. It will also impact the chips during normal use with Windows 10, too.

Additionally, we found that performance can be inconsistent on Windows 10, with some programs running faster at times, but slower at others. This seems to become more prevalent during multitasking, but we're still working to fully quantify the impact — its variable nature makes it hard to pin down. Tying with various settings, like assigning the priority of background tasks through the standard Windows settings, can help, but it isn't a cure-all.

Additionally, some programs could need to be forced to run in the foreground for optimal performance, which Intel advises you can accomplish via the command line using `powercfg` commands. We'll cover that a bit later in the article. That type of intervention isn't ideal for all users, though, especially the casual type, so be aware that Windows 10 could require extra babysitting if you're searching for every last bit of performance. For most users, Windows 11 is the best option.

Test Setup

Alder Lake's Thread Director technology works best with Windows 11, so we tested with a fresh install in addition to our standard Windows 10 test image. We updated to newer versions of our benchmarks for Windows 11, where applicable, and also added a few new application and gaming benchmarks.

In accordance with AMD's official guidance, we assured that our clean-install Windows 11 test system had all patches for a recent AMD L3 cache bug that impacted AMD processors. AMD says [the patches resolve the L3 issues](#), and our own in-depth testing has also confirmed that [the patches are successful](#). As an additional level of caution, we re-installed the chipset drivers every time we swapped chips and retested L3 cache latency for each chip both before and after each series of tests.

Additionally, we tested with secure boot, virtualization support, and fTPM/PTT active to reflect a properly configured Windows 11 install.

Given that Alder Lake will also be used with the less-than-optimal Windows 10, we also tested with our existing test image (build 19041.450). This version of Windows isn't the latest, but Intel confirmed that it has the same Lakefield scheduling optimizations as newer versions of Windows 10, meaning that our testing is representative of trends you'll see in the real world. However, even though we have a few identical tests with both operating systems, you shouldn't interpret our results as indicative of Windows 10 versus 11 performance.

Our historical Windows 10 gaming results for Ryzen processors were dated. Several of the games have since had performance-impacting updates, not to mention that numerous chipset and BIOS updates have been issued in the interim. As such, we updated the chipset drivers and motherboard BIOS to reflect the current state of play and then retested all of the game benchmarks. All our gaming results for current-gen Intel and AMD processors were conducted within the last seven days.

With both Windows 10 and 11 covered, we also wanted to measure the difference between DDR4 and DDR5 performance on both operating systems. We used the [MSI Z690 Carbon WiFi](#) as our DDR5 platform and the decidedly lower-end [MSI Z690-A WiFi for DDR4](#) testing.

We're sticking with our standard policy of allowing the motherboard to exceed Intel's recommended power limits, provided the chip remains within warrantied operating conditions. Our tests use the default lifted PL1 and PL2 restrictions. Almost all enthusiast-class motherboards come with similar settings, so this reflects the out-of-box experience with a high-end motherboard. Naturally, these lifted power limits equate to more power consumption, and thus more heat, as we'll cover in detail later in the review. We also have a full breakdown of the test system configurations at the end of the article.

Windows 11: Core i9-12900K and i5-12600K Gaming Benchmarks — The TLDR:

Below you can see the geometric mean of our gaming tests at 1080p and 1440p, with each resolution split into its own chart to give us a decent overall view of the current landscape. As per usual, we're testing with an Nvidia GeForce RTX 3090 to reduce GPU-imposed bottlenecks as much as possible, and differences between test subjects will shrink with lesser cards or higher resolutions. You'll find the game-by-game breakdowns further below.

Due to Alder Lake's hybrid architecture, there will be teething pains with some games. As we reported, [Denuvo DRM falsely identified Intel's E-cores as a separate system](#), and thus 91 Denuvo-enabled game titles wouldn't work with Alder Lake chips. Intel has worked with Denuvo, and the software maker issued a flurry of game patches to fix the issue. However, some titles are still not patched, though more patches are incoming. Intel says that all games should eventually work with Alder Lake. We didn't encounter any issues with Denuvo in our testing.

Image 1 of 4

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Image 2 of 4

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Image 3 of 4

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Image 4 of 4

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The \$549 12-core Ryzen 9 5900X is AMD's fastest gaming chip, but the \$589 Core i9-12900K is 8.7% faster in the cumulative 1080p gaming measurement across our entire test suite. And that's with both the DDR4 and DDR5 memory configurations, so you won't have to drop serious cash on a DDR5 kit to get there.

Stepping down \$300, the \$289 Core i5-12600K with DDR5 memory is ~2.7% faster than the \$299 Ryzen 5 5600X, but that gap widens slightly with less expensive DDR4 memory. The Core i5-12600K also effectively ties the Ryzen 7 5800X, but for \$161 less.

Rocket Lake buyers will be plenty disappointed — the Core i9-11900K landed a mere six months ago at \$539, but the 12900K is ~11% faster in gaming. It's also much faster in the threaded workloads that we'll see later in our application testing. We see a similar story unfold with the Core i5-11600K compared to the 12600K, with 9% more performance in gaming coming for \$27 more.

Naturally, moving over to 1440p brings a GPU bottleneck into the equation, so the performance deltas between the chips shrink tremendously. Here the Core i5-12600K effectively ties the 5600X and 5800X, while the 12900K is a mere 3.6% faster than the Ryzen 9 5950X.

Flipping through the 99th percentile charts shows larger deltas, but we have to view those with caution as Windows 11 is still young and seems to suffer from more frame rate variability than our Windows 10 test platform. This could result from yet-to-be-updated game code, the relatively new graphics drivers for Windows 11, or some other combination of factors that could be smoothed out in the future.

Intel's Alder Lake carves out a win in Windows 11, but large performance deltas in a few of the game titles can heavily impact these types of cumulative measurements. For instance, Intel enjoys a sizeable lead in Hitman 3, but that game is specifically tuned to leverage the E-cores effectively by offloading low-priority tasks like physics to the small cores. That can be seen as an advantage by some because more game devs could take this approach, or as a fluke by others that think this type of optimization will only come to Intel-sponsored titles.

The competition between Intel and AMD is absolutely closer now, so it's best to make an informed decision based on the types of titles you play frequently. Be sure to check out the individual tests below.

Windows 11: 3DMark, VRMark, Chess Engines on Intel Core i9-12900K

Image 1 of 5

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Image 5 of 5

[Click to view image \(Image credit: Tom's Hardware\)](#)

Synthetic benchmarks don't tend to translate well to real-world gaming, but they do show us the raw amount of compute power exposed to game engines — It's too bad they don't fully exploit it.

The Core i9-12900K is a whopping 41% faster than the Ryzen 9 5950X in the 3DMark Time Spy CPU test, but as we've seen with most of the Windows 11 gaming benchmarks, it doesn't pick up too much additional performance by using DDR5.

We can't say the same for the 12600K, at least in this benchmark. The 12600K with DDR5 is 21% faster than it is with DDR4 as it easily leads the Ryzen 5 5600X in both configurations. Surprisingly, the DDR4 configurations yield tangible performance gains in the DX11 Fire Strike physics benchmark, with the 12900K with DDR4 being ~10% faster than the DDR5 config.

We've added the open-source neural network-based Leela chess engine to our benchmark roster. As evidenced by the DDR5 test results, this AI-powered engine obviously scales better with more memory throughput than the Stockfish engine.

Windows 11: 1080p Gaming on Intel Core i9-12900K and Core i5-12600K

Image 1 of 7

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Image 4 of 7

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Image 5 of 7

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 6 of 7

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 7 of 7

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Windows 11: 1440p Gaming on Intel Core i9-12900K and Core i5-12600K

Image 1 of 4

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Image 3 of 4

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 4 of 4

[Click to view image \(Image credit: Tom's Hardware\)](#)

Windows 10: Core i9-12900K and i5-12600K Gaming Benchmarks — The TLDR:

Image 1 of 4

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Image 4 of 4

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Bear in mind that we're using different game titles in Windows 10 than we did in Windows 11, but it's clear that the race between Intel and AMD certainly narrows when we test the Alder Lake chips on the older operating system. We also must caution that we noticed much more variability in our Alder Lake test runs on Windows 10 than we see with other types of chips, so Intel's warnings that you can experience performance variability from poor thread scheduling in Windows 10 are warranted.

Naturally, unoptimized thread scheduling can lead to latency-sensitive threads running on the E-cores, but this occurs unpredictably and seems to increase during multi-tasking. That means you could see far more or far less of an impact in different types of gaming scenarios, like streaming while gaming or using chat clients. Due to time constraints and the sporadic nature of the variations, we haven't fully quantified the increased deviation yet, but we'll continue to look into this issue. Also, it's worth noting that we only see these variations in our detailed test outputs — we didn't notice any outwardly-visible signs of rough gameplay.

You'll also notice right away that the DDR5 configurations lose some steam in Windows 10 compared to the DDR4-equipped setup. This isn't ideal, as the DDR5-equipped motherboard we used for testing was much more handsomely equipped than the low-end DDR4 board. However, after a bit of follow-up, we're told that this isn't an entirely unexpected result.

The 12900K with DDR4 is 7% faster at 1080p, which naturally impacts its competitive footing. With DDR5, the 12900K is 2.4% faster than the Ryzen 9 5900X, which expands to a 9.5% advantage with DDR4 memory. That isn't the best result given the expected eye-watering pricing for DDR5.

The 12600K is also roughly 8% faster with DDR4 than with DDR5, which is the difference between beating the Ryzen 5 5600X or losing to it.

Once again, flipping to the 1440p results finds slimmer deltas between the chips, but the reduced gaming performance with DDR5 in Windows 10 is an undeniable trend here, at least in our test environment.

Again, remember that our cumulative results above are impacted by some sizeable Intel leads in specific titles below, so be sure to check out the individual results.

Windows 10: 1080p Gaming on Intel Core i9-12900K and Core i5-12600K

Image 1 of 6

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Image 2 of 6

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Windows 10: 1440p Gaming on Intel Core i9-12900K and Core i5-12600K

Image 1 of 5

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Image 4 of 5

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Image 5 of 5

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Windows 11: Core i9-12900K and i5-12600K Application Benchmarks — The TLDR:

Image 1 of 2

[Click to view image \(Image credit: Tom's Hardware\)](#)

Image 2 of 2

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We can boil down productivity application performance into two broad categories: single- and multi-threaded. These slides have a geometric mean of performance in several of our most important tests in each category, but be sure to look at the expanded results below.

Alder Lake delivers a few stunning wins in the threaded workloads that Ryzen has dominated for so long, highlighting the advantages of the x86 hybrid architecture. It is quite surprising to see the 24-thread Core i9-12900K with DDR5 memory tie the 32-thread Ryzen 9 5950X in the multi-threaded ranking, but even more surprising to see it take a 3% lead with DDR4. That's pretty impressive in light of the 5950X's \$800 price tag.

The Core i5-12600K is equally impressive in its price range as it is 38% faster in threaded work than the comparably-priced 5600X, and 7% faster than the 5800X that costs \$161 more.

The deltas in favor of Alder Lake are even more convincing in the single-threaded metric, but you shouldn't put undue importance on this metric because it is comprised of a few very specific workloads. You can see a broader spate of lightly-threaded workloads below. Needless to say, Alder Lake dominates those types of workloads.

Windows 10: Application Benchmarks — The Ugly Side

Image 1 of 7

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Image 7 of 7

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And then there's the gotcha, at least if you plan on using Windows 10.

We planned on presenting an overall geometric mean of our Windows 10 application testing here, just like we did with Windows 11, but we use several of these applications to generate those results. Unfortunately, as you can see in the charts, these applications absolutely did not respond well to Alder Lake and delivered what can only be described as terrible performance. However, as you'll see below, these same applications ran absolutely perfectly in Windows 11, even beating AMD's comparable chips. That shows that Intel's Thread Director is a powerful tool.

There is an answer for this type of condition, at least in some cases. Intel's reviewer guide cited a similar condition, present in HandBrake x264 (but not x265), where the software developers assigned the program a lower priority that forces it to run on the E-cores only. Intel says that the software developers could update the code to fix the issue, but it appears that this condition (or a similar one) isn't confined to just Handbrake. We saw similar trends in y-cruncher, Corona, POV-Ray, and even Intel's own Open Image Denoise benchmark.

Intel's recommendation is to use the in-built Windows [powercfg](#) command-line utility to prevent the process from lowering its priority, which resolves the issue. This is a simple process for experienced users, but most average folks would struggle with these types of alterations, and that could be a real downside to using Alder Lake with Windows 10 during the early days. If you tend to use older programs that won't be updated, this type of problem may never be fixed via a software update, but there are third-party software tools that could help. Additionally, we use an expansive selection of benchmarks, but our entire test suite is a speck compared to the universe of different software in the real world. That means these types of errata are inevitably going to pop up with other types of software.

We could have applied the fix and retested the Alder Lake chips, but it's our job to show you that you could encounter this type of reduced performance. Additionally, we also wonder if changing the thread priority on the AMD and last-gen Intel systems would impact performance there, too, meaning the adjustment could give Alder an unfair advantage. Unfortunately, retesting all of these systems to assure a level playing field wasn't possible within the tight NDA timeline. As such, we'll revisit these tests in the future.

For now, let's move on to the Windows 11 benchmarks below, and then see how the remainder of the Windows 10 benchmarks look.

Windows 11: Rendering Benchmarks on Core i9-12900K and i5-12600K

Image 1 of 13

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Image 12 of 13

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Image 13 of 13

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This series of tests, conducted within the Alder Lake-friendly confines of Windows 11, is nothing short of impressive. Here we can see the 16-core 24-thread 12900K battle toe-to-toe with the Ryzen 9 5950X in what used to be its uncontested turf.

You'll notice that two of the applications that performed so badly in Windows 10, Corona and POV-Ray, run flawlessly in Windows 11. These are the same versions of the benchmarks, too, so this is entirely the work of Intel's Thread Director tech in tandem with the optimized Windows 11 scheduler.

The Core i9-12900K is 3.9% faster than the Ryzen 9 5950X in the threaded Cinebench test and 17% faster in POV-Ray, showing that the hybrid architecture exposes exceptionally strong performance despite the lesser thread count. On the other hand, the 5950X takes the lead in a few of the other threaded applications, but by surprisingly slim deltas given its much higher price tag. Remember, the 12900K's pricing is closer to the 5900X.

The 12900K and the 12600K lead the entire Ryzen lineup in the single-threaded tasks, showing that the Thread Director works perfectly to ensure those tasks run on the fastest cores.

Windows 11: Encoding Benchmarks on Core i9-12900K and i5-12600K

Image 1 of 10

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Here we can see that Handbrake x264, which struggled in Windows 10, runs on the P-cores perfectly in Windows 11. This program is coded to deprioritize its threads, and here we can see that Thread Director works in tandem with the Windows 11 scheduler to rectify the issue.

Alder Lake dominates encoding workloads, be they lightly- or multi-threaded.

Windows 11: Web Browsing on Intel Core i9-12900K and Core i5-12600K

Image 1 of 3

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Image 2 of 3

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The ubiquitous web browser is one of the most frequently used applications, and here we can see yet another commanding performance from the Alder Lake chips.

Windows 11: Adobe Premiere Pro, Photoshop, Lightroom on Core i9-12900K

Image 1 of 6

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We've integrated the UL Benchmarks Procyon tests into our suite to replace the aging PCMark 10. This new benchmark runs on Adobe Premiere Pro, Photoshop, and Lightroom. Here we can see that these types of workloads clearly prize the increased memory throughput from DDR5.

Windows 11: Office and Productivity on Core i9-12900K and i5-12600K

Image 1 of 10

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Intel's Alder Lake dominates the Microsoft Office testing and delivers the snappiest application load times. Meanwhile, AMD's Ryzen chips continue to lead in the GIMP benchmark suite.

Windows 11: Compilation, Compression, AVX Benchmarks

Image 1 of 14

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Image 14 of 14

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This grab bag of various tests finds Alder Lake notching several more important wins. From the exceedingly branchy code in the LLVM compilation workload to the massively parallel molecular dynamics simulation code in NAMD, the Alder Lake chips impress.

Notably, Intel chose to ax AVX-512 support in Alder Lake chips, but the increased throughput of DDR5 helps the chips step forward past their AVX-512 equipped Rocket Lake predecessors in some vectorized work, like the multi-threaded y-cruncher benchmark. However, Rocket Lake still keeps the lead for the single-core y-cruncher test. AMD continues to benefit in the SHA3, AES, and HASH benchmarks from its cryptographic optimizations.

Windows 10: Rendering Benchmarks on Core i9-12900K and i5-12600K

Image 1 of 10

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We're back in the Windows 10 portion of our application testing now. Aside from the tests that refused to cooperate, many of these tests simply repeat the same themes that we've seen in Windows 11. We're including these tests for completeness, but we'll skip over commentary until we hit the power consumption section.

Windows 10: Encoding Benchmarks on Core i9-12900K and i5-12600K

Image 1 of 6

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Windows 10: Office and Productivity on Core i9-12900K and i5-12600K

Image 1 of 14

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Windows 11: Compilation, Compression, AVX Benchmarks

Image 1 of 10

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Intel Alder Lake Core i9-12900K and i5-12600K Power Consumption, Efficiency, and Thermals

Image 1 of 10

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Yes, Alder Lake still sucks more power than AMD's Ryzen 5000 series chips, but the arrival of the Intel 7 process does mark a big improvement. As we can see, the Alder Lake chips consume far less power than the Rocket Lake chips — we measured a peak of 238W with the 12900K, while the previous-gen 11900K drew nearly 100W more during the same Blender workload.

Overall, Intel has reduced its power consumption from meme-worthy to an acceptable level. Besides, Alder Lake is much faster than its predecessor, earning it some leeway.

For instance, as you can see in our renders-per-day measurements, the Core i9-12900K and 12600K are both twice as efficient as their predecessors, which is commendable. This lower power consumption results in lower cooling requirements, too.

Image 1 of 4

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Here we take a slightly different look at power consumption by calculating the cumulative amount of energy required to perform Blender and x264 and x265 HandBrake workloads, respectively. We plot this 'task energy' value in Kilojoules on the left side of the chart.

These workloads are comprised of a fixed amount of work, so we can plot the task energy against the time required to finish the job (bottom axis), thus generating a really useful power chart.

Bear in mind that faster compute times, and lower task energy requirements, are ideal. That means processors that fall the closest to the bottom left corner of the chart are best.

As you can see, Intel's chips have descended from the undesirable upper right of the chart down to the lower left hand, nearly matching AMD's chips in power consumption while actually being faster. That's an outstanding improvement after six years of power-guzzling 14nm chips.

Putting 14nm in the Rearview

Intel's decision to adopt a hybrid x86 architecture was risky, but despite the early hiccups with Windows 10, the performance that we've seen today shows it has paid off. The Alder Lake processors mark a massive generational leap forward for Intel in nearly all facets, including gaming, performance in lightly- and heavily-threaded work, power consumption, and platform connectivity options.

Intel has coupled Alder Lake's expansive list of advantages with very aggressive pricing that gives them the overall lead against AMD's competing Ryzen 5000 chips. The competitive pricing could also take at least a little of the sting out of the inevitable high platform costs associated with the Z690 motherboards that are currently the only option for Alder Lake systems.

Below, we have the geometric mean of our gaming test suite at 1080p and 1440p and a cumulative measure of performance in single- and multi-threaded applications. Bear in mind that we conducted the gaming tests with an RTX 3090, so performance deltas will shrink with lesser cards and higher resolution and fidelity settings.

Image 1 of 6

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Overall, it's easy to recommend an Alder Lake chip for a Windows 11 system, but much like we encountered in our own testing, there could be initial hiccups with Windows 10 systems. As we outlined above, those problems could include performance variability or programs that don't operate to their full potential. If you're averse to working around those types of problems, it might be best to either use Windows 11 or wait for the software ecosystem to adapt to the hybrid architecture. We do expect these problems to be fixed sooner rather than later, though.

It is surprising that Intel hasn't worked up a piece of software to provide more granular control over scheduling priority for both Windows 10 and 11, but it's possible that third-party tools could assist with priority management (Process Lasso comes to mind). We'll certainly be experimenting over the coming weeks.

Alder Lake's advantages also include platform connectivity. Leading-edge DDR5 and PCIe 5.0 interfaces will add some cost in the early days, but support for DDR4 can help reduce that overhead. Unfortunately, we haven't seen any flagship DDR4 motherboards yet; the highest-end models appear to be confined to DDR5.

Alder Lake delivers impressive gaming performance in both Windows 10 and 11, though the gains are more substantial in the latter. In either case, the chips outpaced AMD's competing models throughout both of our gaming test suites. It's also clear that enthusiasts won't need to adopt pricey DDR5 memory to unlock the best gaming performance — unless you have a very specific need for DDR5 throughput, it's probably best to skip it until it matures further. That applies doubly so for Windows 10, which appears to favor the more mature DDR4.

Intel still consumes more power than AMD's competing chips, but the new 'Intel 7' process reduces power consumption by up to a third and nearly doubles power efficiency, reducing AMD's massive advantage in that key area.

For now, Alder Lake is the new gaming champion. AMD's next step is to fire back with its 3D V-Cache processors that will come with up to 192MB of L3 cache per chip, imparting up to 15% more gaming

performance. Those chips arrive next year, and while the impact on gaming in a broad spate of titles is unknown, AMD has confirmed that the chips will drop into the AM4 platform. In the meantime, we could see some pricing adjustments on Ryzen 5000 series processors.

The Core i9-12900K delivers incredible levels of threaded performance, often rivaling or beating the Ryzen 9 5950X, but at a much lower price point. That type of performance will pay off in all manner of productivity applications, and if you're looking for snappy performance in lighter fare, it's also the uncontested leader in x86 single-threaded performance.

We would typically shy away from recommending the Core i9-12900K until we had a chance to evaluate the Core i7-12700K, but Alder Lake marks the return of meaningful segmentation between the Core i7 and i9 lineups. With an additional four efficiency cores and class-leading gaming performance, the Core i9-12900K is a good choice for a Windows 11 system.

The \$289 Core i5-12600K is also an easy recommendation with up to 38% more threaded performance than the Ryzen 5 5600X and 7% more performance than the Ryzen 7 5800X. Coupled with the snappy single-threaded performance, this is the gaming chip to beat.

We aren't done with our Alder Lake testing, either. Time constraints prevented us from completing our overclocking tests, but we'll add the results to the article soon. Stay tuned.

Core i9-12900K and Core i5-12600K Test System Configurations

Intel Socket 1700 DDR5 (Z690)Core i9-12900K, Core i5-12600KMSI Z690 Carbon WiFi2 x16GB G.Skill Ripjaws S5, DDR5-5200 @ DDR5-4400 36-36-36-72Intel Socket 1700 DDR4 (Z690)Core i9-12900K, Core i5-12600KMSI Z690A WiFi DDR42x 8GB Trident Z Royal DDR4-3600 - Stock: DDR4-3200 14-14-14-36Intel Socket 1200 (Z590)Core i9-11900K, Core i7-11700K, Core i5-10600KMSI Z590 Godlike2x 8GB Trident Z Royal DDR4-3600 - Stock DDR4-3200/2933 Gear 1AMD Socket AM4 (X570)AMD Ryzen 9 5950X, Ryzen 9 5900X, Ryzen 7 5800X, Ryzen 5 5600X

MSI MEG X570 Godlike2x 8GB Trident Z Royal DDR4-3600 - Stock: DDR4-3200All SystemsGigabyte GeForce RTX 3090 Eagle - Gaming and ProViz applicationsNvidia GeForce RTX 2080 Ti FE - Application tests

2TB Intel DC4510 SSD

EVGA Supernova 1600 T2, 1600WOpen Benchtable

Windows 10 Pro version 2004 (build 19041.450)Windows 11 Pro versionCoolingCorsair H115i, Custom loop

* MORE: [Best CPUs for Gaming](#)

* MORE: [CPU Benchmark Hierarchy](#)

* MORE: [AMD vs Intel](#)

* MORE: [All CPUs Content](#)

[Alder Lake \(Tom's Hardware\)](#)

Document TOMHA00020211104ehb4000b8

Intel Corporation; Patent Issued for Cloud based distributed single game calculation of shared computational work for multiple cloud gaming client devices (USPTO 11145106)

1,034 words

2 November 2021

Information Technology Newsweekly

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2021 NOV 2 (VerticalNews) -- By a News Reporter-Staff News Editor at Information Technology Newsweekly -- A patent by the inventors Appu, Abhishek R. (El Dorado Hills, CA, US), Boles, Jeffery S. (Folsom, CA, US), Grajewski, Slawomir (Gdansk, PL), Kennedy, Jonathan (Bristol, GB), Koker, Altug (El Dorado Hills, CA, US), Kwiatkowski, Jacek (Santa Clara, CA, US), Liktov, Gabor (San Francisco, CA, US), Ray, Joydeep (Folsom, CA, US), Schluessler, Travis T. (Hillsboro, OR, US), Shah, Ankur N. (Folsom, CA, US), Vembu, Balaji (Folsom, CA, US), filed on April 11, 2019, was published online on October 12, 2021, according to news reporting originating from Alexandria, Virginia, by VerticalNews correspondents.

Patent number 11145106 is assigned to Intel Corporation (Santa Clara, California, United States).

The following quote was obtained by the news editors from the background information supplied by the inventors: "BACKGROUND OF THE DESCRIPTION

"Current cloud-gaming includes a server to perform multiple graphics calculations per graphic application. Frame characteristics such as, for example, frame geometry for a graphical scene, is to be calculated individually for each client device participating in a gaming session."

In addition to the background information obtained for this patent, VerticalNews journalists also obtained the inventors' summary information for this patent: "In the following description, numerous specific details are set forth to provide a more thorough understanding of the present invention. However, it will be apparent to one of skill in the art that the present invention may be practiced without one or more of these specific details. In other instances, well-known features have not been described in order to avoid obscuring the present invention.

"System Overview"

The claims supplied by the inventors are:

"1. An apparatus, comprising: a graphics processor of a cloud server, the graphics processor to identify, from graphics data in a graphics application, redundant graphics calculations relating to common frame characteristics of one or more graphical scenes to be shared between client game devices of a plurality of users participating in a gaming session by analyzing the graphics data to detect view-independent graphics calculations, and perform, in response to the identified redundant graphics calculations, a single calculation for common frame characteristics relating to the one or more graphical scenes to be shared by the client devices during the gaming session.

"2. The apparatus of claim 1, wherein the graphics processor is to send the calculation of the common frame characteristics to the client game devices to be visually presented as rendered visual content in a 3D virtual space.

"3. The apparatus of claim 1, wherein the graphics processor is to detect, prior to identifying redundant graphics calculations, an initiation of the gaming session.

"4. The apparatus of claim 1, wherein the common frame characteristics comprises frame geometry.

"5. The apparatus of claim 1, wherein the common frame characteristics comprises frame lighting.

"6. An apparatus, comprising: a graphics processor of a cloud server, the graphics processor to identify, from graphics data in the graphics application, redundant texture maps relating to common frame characteristics of one or more graphical scenes to be shared between client devices participating in a gaming session, and generate, in response to the identified redundant texture maps, a single calculation for texture maps relating to the common frame characteristics of the one or more graphical scenes which are to be shared between the client devices during the gaming session.

"7. The apparatus of claim 6, wherein the graphics processor is to send the generated texture maps to the client game devices to be visually presented as rendered visual content in a 3D virtual space.

"8. The apparatus of claim 6, wherein the graphics processor is to detect, prior to identifying redundant texture maps, an initiation of the gaming session.

"9. The apparatus of claim 6, wherein identifying redundant texture maps comprises analyzing the graphics data to detect view-independent texture maps.

"10. The apparatus of claim 6, wherein rasterization and pixel shading operations are to be conducted at each respective client game device.

"11. At least one computer readable medium, comprising a set of instructions, which when executed by a graphics processor of a cloud server, cause the computing device to: identify, from graphics data in a graphics application, redundant graphics calculations relating to common frame characteristics of one or more graphical scenes to be shared between client game devices of a plurality of users participating in a gaming session by analyzing the graphics data to detect view-independent graphics calculations, and perform, in response to the identified redundant graphics calculations, a single calculation for common frame characteristics relating to the one or more graphical scenes to be shared by the client devices during the gaming session.

"12. The at least one non-transitory computer readable medium of claim 11, wherein the computing device is to send the calculation of the common frame characteristics to the client game devices to be visually presented as rendered visual content in a 3D virtual space.

"13. The at least one non-transitory computer readable medium of claim 11, wherein the computing device is to detect, prior to identifying redundant texture maps, an initiation of the gaming session.

"14. The at least one non-transitory computer readable medium of claim 11, wherein the common frame characteristics comprises frame geometry.

"15. The at least one non-transitory computer readable medium of claim 11, wherein the common frame characteristics comprises frame lighting."

URL and more information on this patent, see: Appu, Abhishek R. Cloud based distributed single game calculation of shared computational work for multiple cloud gaming client devices. U.S. Patent Number 11145106, filed April 11, 2019, and published online on October 12, 2021. Patent URL: <http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahhtml%2FPTO%2Fsrchnum.htm&r=1&f=G&f=50&s1=11145106.PN.&OS=PN/11145106RS=PN/11145106>

Keywords for this news article include: Business, Computers, Cloud Computing, Intel Corporation, Technology Companies, Information Technology, Semiconductor Companies, Semiconductor - Broad Line Companies.

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Document INTEWK0020211102ehb2000jd

Intel Xe-HPG GPU: Aiming The Gaming & Visual Cloud-Based Segment With a Focus on AI & Superior Performance

Jason R. Wilson

651 words

31 October 2021

Wccftech.com

NEWAGAE

English

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Last week, Raja Koduri went to [Twitter](#) to explain Intel's intent to discontinue the focus on [Intel Xe-HP](#) and implement that technology to the newer Intel Xe-HPG GPUs, a newer and more focused ecosystem that they have a five-year plan of growth for developments in AI, gaming and visual cloud-based technology, and higher optimization and performance. This was surprising to a large audience due to the amount of time spent on discussing Intel Xe-HP publicly.

Intel Focuses Its Xe-HPG At The Gaming & Visual Cloud / AI Inference GPU Segment After Xe-HP's Cancellation

Intel's Xe-HP GPU was originally announced during the middle of 2020, advertised as a "multi-tile graphics series designed for data centers, with the main purpose as media super-computer accelerators." Intel has even gone as far as creating three separate offerings with between "1 to 4 tiles." It will now help Intel for utilizing the Intel Xe-HPs for their own in-house cloud servers.

We leveraged Xe HP to build developer ecosystem for HPC, AI and Visual cloud. It's being used on-site at Argonne and other customers.

We'll have Xe HPG based data center products for visual cloud/AI Inference and Xe HPC based products for HPC/AI Training [@intelgraphicspic.twitter.com/iHZa2dMLqd](#)

— Raja Koduri (@Rajaontheedge) [October 30, 2021](#)

Koduri went on to further explain that Xe-HP GPU would help develop the "ecosystem for Ponte Vecchio's architecture." As far as product lines go, the Xe-HPG lines will replace Xe-HP, adding "AI interference and visual cloud" technology, which was the original intent of Xe-HP.

It is speculated that, due to the focus of Intel Xe-HPG on media in terms of analytics, processing, immersion, and cloud technology, such as cloud gaming and cloud graphics, that Intel is beginning to compete with GeForce NOW, Google Stadia, or Amazon Luna.

What is interesting to note, however, is the usage of media conversion servers/video content providers. Intel was one of the largest hardware providers for the last World Olympics held in Tokyo, Japan. Intel's Xeon servers were the primary utilization to help stream an unbelievable 8K 60fps HDR video that was transferred and implemented directly to the cloud to televisions everywhere. Even though a large group of consumers was unable to access the full resolution capabilities of the signal, the fact that this technology is now available is proof that we have evolved yet again to what is possible.

Lastly, Koduri also discussed Intel Xe-HPG is planned to support high-end applications such as 3DS Max, extending their Xe-HPG to the high-end workstation sections. It could be implied at some point that the Xe-HPG microarchitecture will be accessible for to up to three different markets, just as the same as their competitors NVIDIA and AMD with their Ampere and RDNA2 architectures, respectably.

GPU Family	Intel Xe-LP (1st Gen)		Intel Xe-HPG (1st Gen)	
	Intel Xe-HP (1st Gen)	Intel Xe-HP (2nd Gen)	Intel Xe-HPG	Intel Xe-HPC
(1st Gen)				
GPU Segment	Entry-Level (Integrated + Discrete)		Mainstream / High-End	
Gaming (Discrete)	Datacenter & Workstation		Datacenter & Workstation	
Performance Computing			High	
GPU Gen	Gen 12		Gen 12	
	Gen 12	Gen 13		Gen 12
Process Node	Intel 7		TSMC 6nm	
	Intel 7	TBA		Intel 7 (Base
Tile)	TSMC 5nm (Compute Tile)		TSMC 7nm (Xe Link Tile)	
GPU Products	Tiger Lake DG1/SG1 Cards		ARC Alchemist GPUs	
	Arctic Sound		Jupiter Sound	Ponte Vecchio

Specs / Design	96 EUs / 1 Tile /1 GPU	512 EUs / 1 Tile / 1 GPU
	2048 EUs / 4 Tiles Per GPU TBA	8192 EUs / 16
Tiles per GPU		
Memory Subsystem	LPDDR4/GDDR6	GDDR6
	HBM2e	HBM2e
Launch	2020	2022
	Cancelled	2022
	2023?	

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Document NEWAGAE020211101ehav0002u

Intel Demos XeSS Super Resolution In Hitman 3 & The Riftbreaker, Talks How Alder Lake E-Cores Can Help Boost Gaming Performance

Hassan Mujtaba

732 words

28 October 2021

Wccftech.com

NEWAGAE

English

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Intel announced new partnerships with game studios to utilize the XeSS Super Resolution tech in the latest AAA titles during the Innovation 2021 event. The company also talked about a few key topics concerning how efficiency cores will help developers to extract more performance out of games.

Intel Demos XeSS Super Resolution In New AAA Titles, XeSS Early Access Now Available To Game Devs

The two new Intel XeSS demos were shown by include IO Interactive's Hitman 3 and Exor Studio's The Riftbreaker, both of which are fairly new AAA titles. Intel showcased both games running on an undisclosed Xe-HPG ARC Alchemist GPU. Both games were compared on 1080p resolution and 4K XeSS upscaling. Although the videos are of 1080p quality, you can still see that 4K XeSS really helps enhance the visual quality in both titles.

Intel ARC Alchemist 4K XeSS Super Resolution Demo In Hitman 3:

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Intel ARC Alchemist 4K XeSS Super Resolution Demo In Riftbreakers:

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The upscaled images are both sharp, less blurry and show the textures on various objects in more detail. We have a very [in-depth interview](#) with the principal engineer of XeSS here which talks about how the company plans on expanding the technology in their future updates. You can also see an [internal 4K XeSS demo here](#) along with further [XeSS tech details here](#).

[Click to access link.](#)

[Click to access link.](#)

In addition to XeSS support, Intel also showed a brief demo of raytracing running in Metro Exodus on its own ARC Alchemist GPUs. Another key technology Intel talked about is XeGTAO which is the brand new Ground-Truth Ambient Occlusion method, an advanced form of screen-space ambient occlusion, that delivers greater accuracy for higher image quality.

[Click to view image.](#)

Intel ARC Alchemist Raytracing Demo In Metro Exodus:

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Intel ARC Alchemist Internal XeGTAO Demo:

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Intel also announced that devs will have access to their XeSS technology through the DevMesh program and anyone from indie to AAA developers can submit a form from the official [Intel DevMesh site](#). Intel is touting up to 2x FPS with their XeSS Super Resolution technology so it will be great to have more options for gamers & the tech also will be workable on both NVIDIA and AMD GPUs.

[Click to view image.](#)

Moving away from GPUs for a bit, Intel also discussed how they can leverage their hybrid design introduced in 12th Gen Alder Lake CPUs within game engines. Intel and IO Interactive have been optimizing both the GPU and CPU sides of things. It is stated that developers can leverage back-ground tasks such as AI acceleration, Character Animation, Physics, Collisions, audio-processing, and more, leaving the performance cores with their leading single-threaded performance to be available for the more demanding tasks.

Intel DeepLink Demo Using ARC Alchemist & Iris Xe GPUs:

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* [Click to view image.](#)

The last most interesting thing shared by Intel was their DeepLink technology which will help Xe-HPG ARC Alchemist GPUs work alongside Iris Xe to boost performance in creation applications. A demo showcasing a standalone ARC Alchemist GPU and another system with DeepLink where the same ARC Alchemist GPU is working alongside an Iris Xe GPU integrated on Intel's CPUs is shown. The DeepLink system ended up with 40% faster transcoding in Handbrake as it was able to utilize more performance out of the Iris Xe chip.

Other than that, Intel reaffirmed that their flagship ARC Alchemist GPU will feature 32 Xe-cores as [we detailed here](#) and will be launching in Q1 2022 though it was not confirmed if they are talking about desktop or mobility SKUs.

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Document NEWAGAE020211028ehas000rt

Intel Unveils 12th Gen Intel Core, Launches World's Best Gaming Processor, i9-12900K

1,331 words

28 October 2021

ENP Newswire

ENPNEW

English

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Release date - 27102021

SAN FRANCISCO - At Intel Innovation, Intel unveiled the 12th Gen Intel Core processor family with the launch of six new unlocked desktop processors, including the world's best gaming processor, the 12th Gen Intel Core i9-12900K. With a max turbo boost of up to 5.2 GHz and as many as 16 cores and 24 threads, the new desktop processors reach new heights of multi-threaded performance for enthusiast gamers and professional creators.

The full 12th Gen Intel Core family will include 60 processors, set to power more than 500 designs from a broad set of partners. As detailed during Intel Architecture Day 2021, the new performance hybrid architecture, the first built on Intel 7 process, delivers scalable performance from 9 to 125 watts to enable every PC segment from ultra-thin-and-light laptops to enthusiast desktops and out to the edge.

MORE: Press Kits: Intel Innovation 2021 | 12th Gen Intel Core ... Product Briefs: 12th Gen Intel Core Desktop Processors | The Intel Z690 Chipset with Unlocked 12th Gen Intel Core Desktop Processors ... Webcast: Intel Innovation Keynote ... News Release: Intel Innovation Spotlights New Products, Technology and Tools for Developers ... Intel Innovation Topic News: Developer/oneAPI | Ubiquitous Computing | Artificial Intelligence | Cloud-to-Edge Infrastructure | Pervasive Connectivity

'The performance hybrid architecture of 12th Gen Intel Core processors is an architectural shift made possible by close co-engineering of software and hardware that will deliver new levels of leadership performance for generations,' said Gregory Bryant, Intel executive vice president and general manager of the Client Computing Group. 'This begins with the arrival of our flagship Core i9-12900K - the world's best gaming processor - and you will see even more incredible experiences as we ship the rest of the 12th Gen family and beyond.'

Game, Create and Overclock with Unlocked 12th Gen Desktop Processors

The six unlocked desktop processors launched today are the first based on Intel's performance hybrid architecture featuring a combination of Performance-cores (P-cores), the highest performing CPU core Intel has built, and Efficient-cores (E-cores), designed for scalable multi-threaded workload performance.

Intel Thread Director enables the two new core microarchitectures to work seamlessly together by guiding the operating system (OS) to place the right thread on the right core at the right time. Intel has worked with the ecosystem on extensive testing to optimize performance and compatibility, and as part of the company's reinforced investments in the developer community, has published white papers for developers with guidance on how independent software vendors can optimize applications for performance hybrid platforms.

'We're at the beginning of a new era for the PC led by the introduction of Windows 11,' said Panos Panay, executive vice president and chief product officer, Microsoft. 'With Windows 11 and Intel's new Thread Director technology, users will see their PC performance reach new heights on the new 12th Gen Intel Core family of processors.'

The combination of Intel's new performance hybrid architecture and new Intel 7 process technology delivers improved single-threaded and multi-threaded performance to enable:

The World's Best Gaming Processor: Available with up to 16 cores and 24 threads, the new 12th Gen Intel Core processor family includes the world's best gaming processor, the Core i9-12900K, unleashing gaming experiences across top titles. The Core i9-12900K provides amazing gen-over-gen performance increases, including up to 25% more FPS on *Troy: A Total War Saga*, up to 28% more FPS on *Hitman 3*, and up to 23% more FPS on *Far Cry 6*. Enhanced by Intel Killer Wi-Fi 6E for up to 75% less latency while gaming when multitasking⁴, high-frequency P-cores paired with E-cores for offloading parallel tasks enable up to 84% more frames per second for simultaneous gaming, streaming, and recording⁵.

A Leap in Content Creation Performance: Advancements in multi-threaded performance, the responsive performance of the P-cores and the ability to move data at incredible speeds with DDR5 enable leadership across all types of content creation experiences, including:

Up to 36% faster photo editing performance⁶

Up to 32% faster video editing performance⁷

Up to 37% faster 3D modeling performance⁸

Up to 100% faster multi-frame rendering⁹

The Best Overclocking Experience¹⁰: The new processors offer industry-leading overclocking tools for the ultimate performance customization, including the ability to overclock Efficient-cores and DDR5 memory. Enthusiasts and gamers can try these new platform overclocking features as part of the latest Intel Extreme Tuning Utility (XTU) 7.5. Starting with the Core i9-12900K, XTU will also support one-click overclocking with Intel Speed Optimizer for unlocked 12th Gen processors. Further, Intel introduced the latest Intel Extreme Memory Profile (XMP) 3.0 with support for DDR5, offering additional profiles, including new rewriteable custom profiles and flexible tuning for memory overclocking.

Enabling Desktop Platforms with Industry-Leading Features

12th Gen Intel Core desktop processors empower people with the performance and industry-leading features for exceptional experiences across gaming, content, and play for today and tomorrow.

Key platform advancements include:

The first processors in the industry to offer DDR5 memory for up to 4800MT/s.

The first processors in the industry to offer PCIe 5.0 (up to 16 lanes), which offers up to 2X I/O throughput over PCIe 4.0, with up to an additional four lanes of PCIe 4.0 support.

Up to 30MB Intel Smart Cache (L3) and 14MB L2 cache for increased memory capacity with reduced latency.

Integrated high-speed wireless with Intel Killer Wi-Fi 6E, which combines industry-leading Wi-Fi 6E connectivity with powerful gaming network technology to minimize lag, latency, and packet loss¹⁰.

Discrete Thunderbolt 4 universal cable connectivity for external device expansion.

All-New Intel 600 Series Chipset

Alongside the 12th Gen Intel Core desktop processors, Intel is launching the new Intel 600 Series Chipset with advanced features for increased reliability and performance. New PCIe Gen 4.0 lanes make for 28 total lanes off the chipset, integrated USB 3.2 Gen 2x2 provides up to double the bandwidth, DMI Gen 4.0 increases the chipset to CPU throughput for fast access to peripheral devices and networking.

For the first time, Intel is bringing Intel Volume Management Device (VMD) to PC chipsets to simplify storage control by allowing direct control and management of NVMe-based SSDs from the PCIe bus without additional RAID controllers or other hardware adapters.

Availability

Unlocked 12th Gen Intel Core desktop processors are available now for pre-order from participating OEMs, channel partners, and retailers. Broad availability will start Nov. 4 with more than 140 customers in more than 30 countries expected to add the new processors to their lineups by the end of the year. Pricing starts at \$264 to \$589 for the unlocked desktop processors.

Intel expects to ship hundreds of thousands of 12th Gen Intel Core desktop 'K' processors by end of year and more than 2 million by the end of March 2022. To enable the expanded offerings for desktop, mobile and commercial segments expected in early 2022, Intel is also shipping 28 of the processor SKUs in the 12th Gen Intel Core processor family to OEM partners.

About Intel

Intel (Nasdaq: INTC) is an industry leader, creating world-changing technology that enables global progress and enriches lives. Inspired by Moore's Law, we continuously work to advance the design and manufacturing of semiconductors to help address our customers' greatest challenges. By embedding intelligence in the cloud, network, edge and every kind of computing device, we unleash the potential of data to transform

business and society for the better. To learn more about Intel's innovations, go to newsroom.intel.com and intel.com.

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[Editorial queries for this story should be sent to newswire@enpublishing.co.uk]

Document ENPNEW0020211028ehas0007g

ASRock Shows Off Its Z690 Motherboard Lineup Featuring Taichi, Steel Legend, Phantom Gaming, & More – Base Frequency Boost For Intel Alder Lake CPUs

Hassan Mujtaba

666 words

27 October 2021

Wccftech.com

NEWAGAE

English

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ASRock has also [unveiled](#) its full range of Z690 motherboards which includes 11 designs for Intel's [Alder Lake CPU lineup](#).

ASRock Z690 Motherboard Lineup With Base Frequency Boost Technology Detailed - Includes Taichi, Extreme, Phantom Gaming, Steel Legend, More

The ASRock Z690 motherboards will continue to excel upon the design foundation set by the last-generation Z590 motherboards. Doing so, the motherboards will also continue to support the base frequency boost or BFB technology that ASRock pioneered a few generations ago. The ASRock BFB technology will allow users to raise the power limit, allowing CPUs to receive more power than their standard PL1 rating (125W for Unlocked SKUs). With the extra juice, the CPUs will be able to run at higher base frequencies than what they feature out of the box.

[Click to view image.](#)

The BFB configuration for each Z690 motherboard varies based on its VRM and cooling config. The high-end motherboards have an unlimited setting which will allow them to deliver maximum power to the CPU while the rest of the lineup ranges from 150W and up to 280W. Again, cooling & overall power delivery matters a lot while this feature is activated so make sure you got your check marks on both.

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Coming to the lineup itself, ASRock is going all out with its flagship Z690 Taichi motherboard which comes with the same gear theme that we have known the Taichi series for but this time, the gear is actually going to rotate which is a nice feature. The motherboard also features some great cooling in the form of heat pipe cooling for the PCH and large heatsinks covering the 20 phase (105A) VRM.

The Taichi is followed by the Z690 PG Velocita which rocks gaming aesthetic with black, red, and silver accents. The motherboard also carries a high-end heatsink design for the VRMs that comes with an active cooling solution like the Taichi. The Z690 Extreme, Steel Legend, and Pro RS feature the same 12+1 phase design but the extreme rocks 60A SPS stages while the rest rock 50A DrMOS power stages. Each motherboard has its own unique aesthetic and set of features.

The Z690 Phantom Gaming-ITX TB4 is a powerful ITX option with a 10+1 (105A) power delivery with a butt load of features. Lastly, we have the ASRock Z690 PG Riptide, Z690M-ITX, Z690M & Z690 PG 4 motherboards which aim at the entry-level segment.

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As for pricing, they are listed below:

- * ASRock Z690 Taichi DDR5 (TBD)
- * ASRock Z690 PG Velocita DDR5 (TBD)
- * ASRock Z690 Phantom Gaming-ITX TB4 DDR4 (TBD)
- * ASRock Z690 Extreme WiFi 6E DDR4 (\$289.99 US)
- * ASRock Z690 Extreme DDR4 (\$269.99 US)
- * ASRock Z690 Steel Legend WiFi 6E DDR4 (\$269.99 US)
- * ASRock Z690 Steel Legend DDR4 (\$189.99 US)
- * ASRock Z690 PG Riptide DDR4 (TBD)
- * ASRock Z690 PRO RS DDR4 (\$189.99 US)
- * ASRock Z690 Phantom Gaming 4 DDR4 (\$179.99 US)
- * ASRock Z690M Phantom Gaming 4 DDR4 (\$169.99 US)
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We will be posting the specifications sheet for each specific motherboard in a bit so stay tuned for more information to be updated in this article.

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Document NEWAGAE020211027ehar000e6

AMD Doesn't See Intel's China Gaming Headwind -- Market Talk

1,285 words

27 October 2021

03:10

Dow Jones Institutional News

DJDN

English

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1740 ET - AMD reports strong data-center chip sales in 3Q and says that came across geographical regions. Intel last week said restrictions the Chinese government imposed on videogaming had caused some cloud customers to adjust plans, while noting it was particularly exposed. AMD CEO Lisa Su says that wasn't a factor for her company. "We saw a pretty normal environment for demand." AMD shares rise slightly after hours. (robert.wall@wsj.com)

1737 ET - Alphabet slips after hours in part because of disappointment over its cloud-computing division's performance, analysts say. Google Cloud posts sales of \$4.99B, short of Wall Street projections for \$5.19B in revenue. The company reports its cloud unit had an operating loss of \$644M for the unit. YouTube's sales of \$7.21B also fall short of analysts' projections. Additionally, CFO Ruth Porat also faces questions about the company's operating margins, which rose to 32% during the quarter from 24% a year ago. She says the company was spending to build out its cloud business and add staff in engineering, marketing and sales. Shares fall 0.8% postmarket. (tripp.mickle@wsj.com)

1709 ET - Microsoft says strong hardware sales led 16% year-over-year growth for its gaming category overall in F1Q. Xbox content and services revenue inched up 2%, while Xbox console sales more than doubled, driven by high demand for the newest versions of the machine, which are in low supply due to supply-chain challenges. However, the company says Xbox sales were low a year ago. (sarah.needleman@wsj.com; @saraheneedleman)

1657 ET - Freight broker CH Robinson Worldwide beats expectations with a 48% gain in 3Q revenue to \$6.3B and profit jumps 81% to \$247.1M. The \$1.85 diluted EPS outpaces estimates of \$1.42 for the largest US business matching freight loads to trucks. The biggest growth comes in the global freight forwarding segment, with overall revenue more than doubling from a year ago to \$1.98B and operating profit reaching \$165.2M from \$46.3M last year. Robinson says constrained transportation capacity should keep driving earnings growth. "We expect capacity to remain tight and to perform well in that environment," CEO Bob Biesterfeld says. (paul.page@wsj.com)

1657 ET - Activision Blizzard cancels its annual BlizzCon event, as the company grapples with lawsuits and investigations related to its treatment of female employees. BlizzCon started 16 years ago and offered a way for fans of games made by Activision's Blizzard Entertainment unit to hear from developers about upcoming games. Activision is being sued by a California regulator over allegations of enabling a workplace culture that is hostile to women. The Securities and Exchange Commission has subpoenaed Activision and several of its senior executives, and the Communications Workers of America recently filed charges with the National Labor Relations Board against the company, alleging worker intimidation. Activision says it is reimagining BlizzCon for the future. (sarah.needleman@wsj.com; @saraheneedleman)

1646 ET - US cigarette sales rose in 2020 for the first time in two decades, according to a Federal Trade Commission report. The number of cigarettes that the largest US cigarette makers sold to wholesalers and retailers increased to 203.7B in 2020 from 202.9B the previous year, the FTC says. After the pandemic hit, Americans smoked more because they were spending less on travel and entertainment and had more opportunities to light up, WSJ has reported. They also switched back to traditional cigarettes from vaping devices because of concerns about the health effects of vaping. (jennifer.maloney@wsj.com; @maloneyfiles)

1643 ET - Alphabet tallied historic sales growth and nearly doubled its profit in 3Q, as smaller businesses poured money into digital ads aimed at customers whose purchases have shifted online. The company said revenue increased 41% to \$65.12B, its largest in 14 years. It posted a profit of \$21.03B, three times what it reported before the pandemic. The red-hot digital ad market helped the company's ad business post \$53.13B in sales from advertising, a 43% increase. Shares are off 2% in after-hours trading. (tripp.mickle@wsj.com)

1626 ET - Advanced Micro Devices posts \$4.31B in 3Q sales that beat forecasts while also issuing revenue guidance of \$4.5B for the current quarter that's ahead of Wall Street expectations. The chipmaker lifts its

full-year sales outlook to 65% growth from 60%. Shares rise 1.1% in after-hours trading.
(robert.wall@wsj.com)

1604 ET - US stocks extend records on continued strength in earnings and as the Conference Board says consumer confidence rose in October, breaking a three-month decline. The Commerce Department's home-sales figures rise, beating analyst expectations. Facebook falls 3.9% after saying yesterday afternoon changes to Apple's privacy rules hurt sales growth. UPS gains 6.9% after saying it was profitable even as it shipped fewer packages. Lockheed Martin sinks 12% as revenue missed and profit fell. The Dow gains 15 points to 35756 and the S&P 500 advances nearly 0.2% to 4574, both at all-time highs. The Nasdaq adds 9 points to 15235. Microsoft, Google and Visa will report earnings after the close. (jonathan.vuocolo@wsj.com; @jonvuocolo)

1534 ET - Teva Pharmaceutical stock fell 6.7% on Tuesday, a drop analysts pinned to Novartis reporting weak results for its generic drug business Sandoz in the third quarter. Sandoz's sales dropped 20% in the US. Generic drug makers have struggled with falling prices in the US in recent years. Teva, the world's largest generic drugmaker, is due to report its third quarter earnings on Wednesday.
(felicia.schwartz@wsj.com; @felschwartz)

1502 ET - DraftKings shares are up today after the sports-betting company backed away from plans for a \$22B acquisition of Entain. Investors had never really gotten on board with the transaction because they were unsure it was a good fit for DraftKings, JPMorgan analyst Joseph Greff tells WSJ. The deal would have represented international expansion for DraftKings, says Greff, adding, "That's something I don't think was viewed as a strategic priority by investors." Investors may have also been caught by surprise, says Graff. "I don't think investors thought DraftKings was considering any kind of large-scale M&A," he says. "It wasn't completely clear what DraftKings was trying to do." More info could come on the company's 3Q earnings call next week. (matt.grossman@wsj.com; @mattgrossman)

1357 ET - Top ranking creditors of Sears Holding, including vendors who kept the retailer's shelves stocked during its bankruptcy, are owed \$58M, according to a court filing last week. The shortfall is expected to come from proceeds from litigation. Sears' 2019 bankruptcy case remains open, even though its remaining stores were sold out of bankruptcy to ESL Investments Inc., Eddie Lampert's hedge fund or shuttered more than two years ago because the estate lacked the funds to pay off senior creditors. Lawyers and advisors have racked up over \$42M in fees in the two years since Judge Robert Drain, who presided over Sears' bankruptcy, approved the retailer's restructuring plan, according to the court filing from last week. "Any creditor is free to settle...I don't see a need for a dramatic change in the path the debtors are on at this point," Judge Drain said at a court hearing on the estate's unpaid bills on Tuesday. (soma.biswas@wsj.com)

(END) Dow Jones Newswires

October 26, 2021 17:40 ET (21:40 GMT)

Document DJDN000020211026ehaq0046p

Parts Shortages, China Crackdown On Gaming Dent Intel's Earnings -- WSJ

By Meghan Bobrowsky

788 words

22 October 2021

12:02

Dow Jones Institutional News

DJDN

B2

English

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Intel Corp. disappointed investors even as it posted stronger third-quarter earnings as component shortages weighed on computer shipments and China's crackdown on computer gaming hurt server-chip sales.

The world-wide chip shortage has caused car makers to idle plants and has led to higher prices on some electronics. Laptop makers have enjoyed strong demand for their devices, but have said shortages of some components have weighed on shipments, causing backlogs to swell.

Intel, which powers many personal computers, Thursday reported third-quarter sales of \$19.2 billion, up 5% from the year-ago period, generating net income of \$6.8 billion. Adjusted sales, stripping out revenue from memory operations Intel is selling to South Korea's SK Hynix Inc., came in at \$18.1 billion, below the \$18.2 billion Wall Street forecast.

Intel shares, which closed Thursday up 1.14%, fell more than 8% in after-hours trading on the results.

Analysts, ahead of results, warned PC sales would suffer because parts shortages held back computer sales.

Intel Chief Executive Pat Gelsinger said there are "inventory challenges and supply challenges" for power controllers and Ethernet components that are limiting its customers' ability to shop for more laptops and servers despite a big backlog.

Sales fell 10% for the unit that includes chips that go into notebooks. The impact was offset partly by strength in Intel's desktop business and higher prices amid strong demand as vendors shipped higher-value devices.

The chip maker said sales in its data-center unit rose 10% to \$6.5 billion, in part driven by the recovery from the economic effects of the pandemic. The result fell short of Wall Street forecasts, though.

Mr. Gelsinger said some data-center customers serving China's videogaming market were adjusting their business after the country began a crackdown on the time children spend playing videogames. China in August said it was imposing limits on young gamers to fight what it characterized as a youth videogame addiction.

"We do expect that will recover," Mr. Gelsinger said.

The chip shortage should slowly start improving next year, Mr. Gelsinger said, even as he stuck with his projection it would possibly drag into 2023.

The lag between a company ordering a chip and its delivery has soared to an average of 22 weeks, said Susquehanna analyst Christopher Rolland, adding that the duration is the longest since he started tracking the data in 2013.

Mr. Gelsinger last month pledged to invest up to \$95 billion in new chip production capacity in Europe, adding to more than \$20 billion in U.S. factory investments he detailed earlier as Intel tries to cater to increased demand for semiconductors and become a leading contract chip maker. Taiwan Semiconductor Manufacturing Co., the world's leading contract chip maker, this month said it would build a new chip-manufacturing plant in Japan, and Samsung Electronics Co. and memory-chip maker Micron Technology Inc. are among others with expansion plans.

To provide some near-term relief, Mr. Gelsinger has said Intel is working with auto makers that have been particularly hard hit by the shortage. The company, he said, would dedicate manufacturing capacity at one of its factories in Ireland to the auto-chip sector and is creating a chip-design team to help others adapt their designs to be able to use Intel's manufacturing capabilities.

Intel, for the current quarter, said it expects sales of \$19.2 billion. Wall Street is forecasting sales of \$19.4 billion in the period. Full-year sales should reach \$77.7 billion, Intel said.

Intel also said Chief Financial Officer George Davis plans to retire in May. The company said it was shifting an investor day planned for November to next year to await the arrival of a new financial chief.

Mr. Davis, on the call, said adjusted sales next year should reach at least \$74 billion, above analysts' expectations, with revenue growth accelerating in subsequent years. Profitability, he said, would affect margins over the next two to three years as the company invests before growing again. Capital expenditure could reach \$28 billion in 2022, he said, and potentially increase further in following years.

Write to Meghan Bobrowsky at Meghan.Bobrowsky@wsj.com

Corrections & Amplifications Intel shares closed Thursday up 1.14%. An earlier version of this article incorrectly said Wednesday. (Corrected on Oct. 21)

This article is being republished as part of our daily reproduction of WSJ.com articles that also appeared in the U.S. print edition of The Wall Street Journal (October 22, 2021).

(END) Dow Jones Newswires

October 22, 2021 02:32 ET (06:32 GMT)

Document DJDN000020211022eham000fp

China Gaming Crackdown Hurts Intel -- Market Talk

1,405 words

22 October 2021

02:52

Dow Jones Institutional News

DJDN

English

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1722 ET - China's gaming crackdown is causing Intel customers to adjust their business, holding back otherwise strong sales for the semiconductor maker's data-center chip sales, CEO Pat Gelsinger says. Sales for the unit came in shy of Wall Street forecasts, sending shares sharply lower. "We do expect that will recover," Gelsinger says. Intel sinks 8% in after-hours trading. (meghan.bobrowsky@wsj.com)

1639 ET - Nucor says it's spoken to the Biden administration about replacing tariffs on imported steel with a carbon tax on foreign steel made from production processes with high carbon dioxide emissions. Most domestic steel is now produced in electric furnaces that have lower CO2 emissions than most steel mills elsewhere in the world. "Absolutely, there have been discussions," Nucor CEO Leon Topalian told analysts. "There's a significant advantage. Nucor has provided commentary and analysis on what a border adjustment tax must include." Shares finished down 2.9% at 102.07. (rober.tita@wsj.com; @bob_tita)

1619 ET - Mattel may not be able to have all its products available to everyone ahead of the holidays, but it's going to do its best. "I can't say that we will meet all of the demand because it is strong but we are doing what we can, working hard," CEO Ynon Kreiz tells WSJ. Most of the inventory is already where it needs to be but the work isn't finished yet. "We have a lot of inventory already in our distribution centers," Kreiz says. "There is more work to do but we believe that we have the inventory and the capacity to meet the increased guidance," for the year. (paul.ziobro@wsj.com; @pziobro)

1614 ET - Mattel raises its full-year sales outlook after posting better than expected 3Q results, with strong sales continuing for key brands like Barbie and Hot Wheels. It appears to set Mattel up well ahead of the key holiday season, when about half of the industry's sales are logged. The toy maker was able to overcome supply chain challenges across the globe by accelerating purchase of raw materials, contracting shipping rates well in advance and shipping goods to more ports around the globe. "This is where our scale, expertise and new supply chain operating model worked to our advantage," CEO Ynon Kreiz tells WSJ. Mattel shares up 5% in after-hours trading. (paul.ziobro@wsj.com; @pziobro)

1604 ET - The S&P 500 extends its winning streak to seven sessions, rising to a fresh high as initial jobless claims hit a pandemic low. Jobless claims fell to 290,000 last week, signaling that layoffs are staying low as companies wrestle with hiring workers. September existing home sales rise 7% sequentially. IBM falls 9.6% after its revenue missed expectations, weighing on the DJIA which falls 6 points to 35603. The S&P 500 gains 0.3 to 4549, while the Nasdaq gains 0.6% to 15215. Chipotle and Whirlpool are set to report earnings after the bell. (jonathan.vuocolo@wsj.com; @jonvuocolo)

1538 ET - Nucor says elevated shipments of its steel to various subsidiary businesses in September caused the company's 3Q EPS to come in below the steelmaker's earnings guidance. Nucor says it ramped up shipments to these businesses late in the quarter after keeping inventories for them lower than usual earlier in the year because of elevated steel demand from outside customers. Nucor estimates these in-house shipments trimmed about 16 cents off Nucor's EPS for the quarter, which came in at \$7.28. "We view the fact that over 20% of our steel is consumed by in-house businesses as a strategic advantage," CFO Jim Frias told analysts. Shares are off 3.2%. (robert.tita@wsj.com; @bob_tita)

1526 ET - House Transportation Committee Chairman Peter DeFazio said he was pleased with FAA Administrator Steve Dickson's update Thursday on the agency's efforts to make changes to how it oversees Boeing and other aerospace manufacturers after two 737 MAX crashes. DeFazio, an Oregon Democrat, has been a chief congressional critic of the FAA and its oversight of Boeing. In a brief interview, Mr. DeFazio said he was reserving judgement on whether he thought Dickson, a Trump appointee, should finish his term during the Biden administration. "I liked what I heard today," DeFazio said. "If he's getting it, he's finally shaping that agency up and breaking down the stovepipes and rooting out any bad bureaucrats he has, then good on him." (andrew.tangel@wsj.com; @AndrewTangel)

1514 ET - Boeing's chief engineer for the 737 MAX went on to become the top engineer in the plane maker's development of its newest jet, the 777X. Asked during a House panel hearing about Boeing's culture and that

senior engineer's new role despite two MAX crashes, FAA Administrator Steve Dickson said the agency was pushing for broader changes within Boeing that would trump any individual assignments. "Our oversight of Boeing has fundamentally changed," Dickson said Thursday. "These are systematic improvements so that an individual or a failure in an individual process cannot result in a consequential safety impact."
(andrew.tangel@wsj.com; @AndrewTangel)

1437 ET - US benchmark oil prices finish 1.1% lower at \$82.50 a barrel, marking the first decline in the past six sessions. "The market was in an 'overbought' condition," says The University of Tulsa's Tom Seng, noting the air came out of the market on the first day of front-month trading for the December delivery contract. "This had to happen eventually. November 2021 WTI [which expired yesterday] ran out of time to make this correction." But bullish investors remain hopeful, as WTI had fallen more than 3% to as low as \$80.79 mid-morning, only to recoup most of those declines ahead of the afternoon close. (dan.molinski@wsj.com)

1428 ET - MetLife has asked Chilean officials "to start a formal consultation and negotiation process," to avert potential "serious damage" from pending legislation that would allow further withdrawals of pension funds and "unearned annuity benefits" by people participating in its private pension and annuity businesses. MetLife is the latest of at least a handful of insurers from the US and internationally seeking help under a US-Chilean free-trade agreement. In a statement, MetLife said the legislation currently being discussed implies "a breach of Chile's obligations," under the trade agreement "including its obligation not to directly or indirectly expropriate an investment." MetLife didn't detail any of its particular financial details in the matter. A recent Evercore ISI report said that MET's earnings from its Chilean ventures contribute about 2% to 3% of total company normalized earnings. (leslie.scism@wsj.com)

1417 ET - Brazilian aircraft maker Embraer's sales of executive planes and firm orders increased in the third quarter from the second, but still disappointed, according to brokerage Ativa Investimentos. The company's shares fall 5.6%. Embraer said Thursday that it delivered 21 executive jets in the quarter, up from 20 in the second quarter, while the firm order backlog increased to 313 from 306. The company delivered 9 of its regional commercial aircraft, down from 14 in the second quarter. (jeffrey.lewis@wsj.com)

1414 ET - Raymond James sees more tailwinds forming for Knight-Swift, whose 3Q results beat analyst expectations Wednesday. "Big picture, while we are heartened by yet another 'beat and raise' quarter (driven in large part by excellent pricing), we continue to believe the KNX story is so much bigger than 'just another [truckload] pricing cycle'," Raymond James says. Between factors like rising momentum in the less-than-truckload segment, intermodal expansion efforts and appetite for M&A "we continue to see a slew of forming nonTL centric tailwinds that we surmise could prove additive to estimates and KNX's valuation" the analysts say. Raymond James says "we suspect the recent entrance into the LTL space [through the AAA Cooper acquisition] and accompanied accelerating profit levers (geographic expansion, margin levers) could make KNX one of the more unique stories in transports." Shares rise 3.6% to \$56.28, a new all-time high. (michael.dabaie@wsj.com)

(END) Dow Jones Newswires

October 21, 2021 17:22 ET (21:22 GMT)

Document DJDN000020211021ehal004uc

Corsair Gaming Inc. - Get the Best Out of Your CPU – CORSAIR Launches New PRO Custom Cooling CPU Water Blocks Ready For Intel® Alder Lake

Corsair Gaming Inc. published this content on 21 Oct 2021 and is solely responsible for the information contained herein. Distributed by PUBT, unedited and unaltered, on 21 Oct 2021 14:10:35 UTC.

1,148 words

21 October 2021

Public Companies News and Documents via PUBT

LCDVP

English

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* [Click here to view this document in its original format](#)

Get the Best Out of Your CPU - CORSAIR Launches New PRO Custom Cooling CPU Water Blocks Ready For Intel® Alder Lake

FREMONT, CA, October 21st, 2021 - CORSAIR® (NASDAQ: CRSR), a world leader in enthusiast components for gamers, creators, and PC builders, today announced a new PRO generation of performance custom cooling CPU water blocks in the award-winning Hydro X Series: the XC5 RGB PRO and XC7 RGB PRO. Equipped with more than 110 high-efficiency micro-cooling fins and an innovative quad-split flow design, these new water blocks deliver extraordinary cooling paired with vibrant RGB lighting at the heart of your loop. With compatibility across the entire range of modern CPUs from Intel® and AMD®, including the upcoming Intel® LGA 1700 socket, the Hydro X Series delivers the cooling you need to help your next stunning PC build run at its full potential.

Thanks to new precision-machined copper cold plates and a quad-split flow design with multiple inlet channels, the XC5 RGB PRO and XC7 RGB PRO achieve fantastic cooling performance, up to 4°C lower than their previous generation counterparts. Their durable construction with reinforced standard G1/4" threads will keep your CPU running at its best for years to come.

The XC5 RGB PRO shines with 16 RGB LEDs customizable across eight lighting zones and a solid top for a refined and minimalist appearance. RGB lighting can be controlled and synchronized across all CORSAIR iCUE-compatible RGB devices with a CORSAIR iCUE Controller (sold separately) and iCUE software, or controlled via compatible motherboards with an included 5V ARGB adapter cable. The XC5 RGB PRO is available with either Intel or AMD brackets, for easy installation on LGA (1700, 1200, 115X) or Socket AM4, respectively.

The XC7 RGB PRO ups the ante with nickel-plated copper cold plates and a transparent flow chamber to further show off your coolant and lighting, in addition to its 110 high-efficiency micro-cooling fins and quad-split flow design. Its 16 RGB LEDs are all individually addressable for even more intricate lighting effects. The XC7 RGB PRO includes brackets to fit both Intel LGA (1700, 1200, 115X) and AMD Socket AM4.

Whether you're building a new custom cooled powerhouse or looking to improve the performance of your current system, the new PRO Series water blocks will help you get the best out of your CPU.

Availability, Warranty, and Pricing

The CORSAIR Hydro X Series XC5 RGB PRO and XC7 RGB PRO are available immediately from the CORSAIR webstore and the CORSAIR worldwide network of authorized retailers and distributors.

The CORSAIR Hydro X Series XC5 RGB PRO and XC7 RGB PRO are backed by a first-rate three-year warranty, alongside the CORSAIR worldwide customer service and technical support network.

For up-to-date pricing of the CORSAIR Hydro X Series XC5 RGB PRO and XC7 RGB PRO, please refer to the CORSAIR website or contact your local CORSAIR sales or PR representative.

Web Pages

To learn more about the CORSAIR Hydro X Series XC5 RGB PRO, please visit:

<https://www.corsair.com/hydro-x-series-xc5-rgb-pro>

To learn more about the CORSAIR Hydro X Series XC7 RGB PRO, please visit:

<https://www.corsair.com/hydro-x-series-xc7-rgb-pro>

For a complete list of all CORSAIR Hydro X Series parts, please visit:

<https://www.corsair.com/hydro-x-series>

For a complete list of all CORSAIR Hydro X Series parts, please visit: <https://forum.corsair.com>

Product Images

High-resolution images of the CORSAIR Hydro X Series XC5 RGB PRO can be found at the link below:

<https://corsair.sharepoint.com/:f/s/MarketingCommunications/EiGHh6qe1YdNurOJ5NDLcqsBTiO5r2pRFkCqG71ozGzBPQ?e=9pXrNj>

High-resolution images of the CORSAIR Hydro X Series XC7 RGB PRO can be found at the link below:

https://corsair.sharepoint.com/:f/s/MarketingCommunications/Eiy1QOr9WXpFj57NI_vSwKsBXDXBGRwflwB2BIKasXi9QQ?e=8yd3b5

About CORSAIR

CORSAIR (NASDAQ:CRSR) is a leading global developer and manufacturer of high-performance gear and technology for gamers, content creators, and PC enthusiasts. From award-winning PC components and peripherals, to premium streaming equipment and smart ambient lighting, CORSAIR delivers a full ecosystem of products that work together to enable everyone, from casual gamers to committed professionals, to perform at their very best.

CORSAIR also includes subsidiary brands Elgato, which provides premium studio equipment and accessories for content creators, SCUF Gaming, which builds custom-designed controllers for competitive gamers, and ORIGIN PC, a builder of custom gaming and workstation desktop PCs and laptops.

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Document LCDVP00020211021ehal00dfi

ASUS Teases Z690 ROG STRIX, PRIME, ProArt & TUF Gaming Motherboards For Intel Alder Lake CPUs

Hassan Mujtaba

392 words

20 October 2021

Wccftech.com

NEWAGAE

English

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ASUS has just teased its next-generation Z690 motherboards within its ROG STRIX, PRIME, ProArt, and TUF Gaming lineups. The motherboards are expected to be unveiled during the [ASUS's 'Break All Limits' Livestream](#) on 27th October at 13:00 NYT.

ASUS Teases Its Next-Gen Z690 ROG STRIX, PRIME, ProArt & TUF Gaming Motherboards

The teasers show us a glimpse of what to expect from the next-generation ASUS Z690 boards. So starting off with the ROG STRIX lineup, we are looking at a dual 8-pin connector configuration on the motherboard and a nice I/O plate covering the VRM heatsink with embedded Aura Sync LEDs.

Something is coming. And it's out of this world.

[#ASUSNextGenMotherboard#ASUSPrimepic.twitter.com/jyMkZfhJcR](#)

— ASUS North America (@ASUSUSA) [October 18, 2021](#)

There's a teaser video of the ASUS Z690 PRIME series motherboards too which showcases what seems to be the flagship PRIME Z690-A motherboard. The board rocks a brand new heatsink and power delivery design and comes with an RGB accent bar running through the I/O cover. Since this is just a teaser, we can barely make out the details but the PRIME Z690 lineup got [leaked](#) yesterday, and expect lots of DDR5 and DDR4 motherboard options in the \$150 - \$300 US segment.

Are you TUF enough for what's next? [#ASUSNextGenMotherboard#TUFGamingpic.twitter.com/ux8dz8p2bX](#)

— ASUS North America (@ASUSUSA) [October 19, 2021](#)

The Z690 TUF Gaming motherboard also received a small teaser video in which you can see the board with its black color theme with silver and yellow accents. The motherboard seems to carry at least four M.2 slots with three of them covered by TUF Armor heatsinks. You can clearly see the 'Z690' label on the motherboard within the video.

[Click to view image.](#)

Lastly, we have a look at the Z690 ProArt which is aimed at professionals and creators. The board carries at least four M.2 slots, all covered by heatsinks, 8 SATA III ports, and four DDR5 DIMM slots. Overall, ASUS will have a very diverse lineup of Z690 motherboards for Intel's 12th Gen Alder Lake Desktop CPUs at launch so stay tuned for more information next week.

[Click to view image.](#)

Document NEWAGAE020211020ehak0002t

Intel Core i9-12900H Alder Lake-P Laptop CPU With 14 Cores & 20 Threads Spotted, Coming To High-End Gaming Laptops Soon

Hassan Mujtaba

440 words

19 October 2021

Wccftech.com

NEWAGAE

English

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Alongside the Alder Lake-S Desktop lineup, Intel is also readying its Alder Lake-P Laptop CPU lineup which will feature both high-end and mainstream chips. It looks like one of the fastest chips within the lineup has leaked out within Ashes of The Singularity benchmark, the Core i9-12900H.

Intel Core i9-12900H 14 Core and 20 Thread Alder Lake-P High-End Laptop CPU Spotted

The Intel [Alder Lake-P lineup](#) will be replacing the Tiger Lake-H45, Tiger Lake-H35, & the Tiger Lake-UP3 series, processors. As such, both high-end and mainstream chips fall within the same segment but will be identified with their 'H' and 'U' series naming. It can easily be told that the i9-12900H is a high-end chip and will be one of the fastest laptop CPUs around if not the fastest of all.

[Intel's Core i9-12900H Laptop CPU with 14 cores has been spotted within the AOTS benchmark. \(Image Credits: Benchleaks\)](#)

The Intel Core i9-12900H appeared within the AOTS benchmark and features 14 cores (6 P-Cores + 8 E-Cores) and 20 threads. The AOTS benchmark being old and not including support for Alder Lake CPUs shows that it can only read the maximum threads but not the cores so it treats the threads as cores too hence why both metrics are listed as 20. The 14 core configuration is the highest that we are going to get on the Alder Lake-P platform. Other specifications include 16 GB of memory and a NVIDIA GeForce RTX 3080 Laptop GPU.

No core clocks, cache, or memory specs are listed by AOTS benchmark, and making a performance comparison is pointless due to various versions and not knowing the exact hardware configuration used. But it is important to see that the Intel Alder Lake-P Core i9-12900H laptop was paired with a NVIDIA GPU which means that most high-end laptops in 2022 will still feature an Intel & NVIDIA pair but as Intel starts producing its own GPUs by the end of Q1 2022, we will see more all-Intel laptops in the market paired with [ARC Alchemist GPUs](#).

[Click to view image.](#)

Intel Alder Lake-P CPUs are expected to hit production between November 2021 - March 2022 while Alder Lake-M CPUs will hit production by January 2022 - April 2022. We would definitely hear Intel talk about its mobility chips in its upcoming 'ON' & CES 2022 event showcases.

[Click to view image.](#)

Document NEWAGAE020211019ehaj000gq



Revealed: The first Intel 12th-gen 'Alder Lake' gaming rig

Gordon Mah Ung

222 words

14 October 2021

PC World (Australia)

IDGPCW

English

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Acer just claimed the prize for announcing the first Intel 12th-gen Alder Lake gaming rig with its feature-filled Predator Orion 7000. Your wait is almost over.

Sure, it's been no secret that Intel's Alder Lake desktop processors are in the works, but the reveal of the Acer Predator Orion 7000 confirms the new CPUs are truly imminent, since companies don't like to tell people to stop buying what they currently sell. (Though there is value to being the first to post first too.)

And yes, we mean feature-filled, because how else can you describe a gaming PC that will come with Intel's much-hyped 12th-gen Alder Lake CPU, Nvidia's juggernaut GeForce RTX 3090 graphics card, PCIe Gen 5, and up to 64GB of DDR5/4000 RAM?

If you don't want to take it to the next level, you can dial it down to a GeForce RTX 3080 as well. The Orion 7000 features RGB fans, an all-in-one liquid cooler, Killer E3100G 2.5G Ethernet, and WiFi 6E. The Acer Predator Orion 7000 will be available in Australia in Q2 2022 with a recommended retail price of AU\$6999

Sign me up for this gaming setup. Image: Acer

Document IDGPCW0020211015ehae00007

Corsair Gaming Inc. - Keeping Your CPU Cooler on the Cutting-Edge – CORSAIR All-in-One Coolers are Ready for LGA 1700 and Intel® Alder Lake Processors

Corsair Gaming Inc. published this content on 14 Oct 2021 and is solely responsible for the information contained herein. Distributed by PUBT, unedited and unaltered, on 14 Oct 2021 13:05:02 UTC.

1,184 words

14 October 2021

Public Companies News and Documents via PUBT

LCDVP

English

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Keeping Your CPU Cooler on the Cutting-Edge - CORSAIR All-in-One Coolers are Ready for LGA 1700 and Intel® Alder Lake Processors

FREMONT, CA, October 14th, 2021 - CORSAIR® (NASDAQ: CRSR), a world leader in enthusiast components for gamers, creators, and PC builders, today announced additional mounts for owners of its range of all-in-one liquid CPU coolers to support the new LGA 1700 CPU socket and Intel® Alder Lake processors.

The new CORSAIR Intel LGA 1700 Retrofit Kit supports a wide range of currently shipping and past all-in-one CPU coolers, including the full award-winning ELITE CAPELLIX range, RGB PRO XT range, H100x, and more. Customers can order the kit from CORSAIR for just \$2.99/€2.99/£1.99 and receive free shipping anywhere in the United States or Europe. The standoffs easily adapt the existing 115x/1200 bracket to be fully compatible with the new LGA 1700 bracket, ensuring owners are ready-to-go for the next generation of CPU performance.

"We're excited to offer these easy-to-use kits to help CORSAIR customers get ready for the new LGA 1700 socket," said Aaron Neal, Director of DIY Product Marketing. "Given the sheer power and performance of Intel Alder Lake processors, CPU coolers are poised to play a critical role in PC builders' new systems, and this kit makes that positioning possible."

In addition to offering the LGA 1700 bracket separately, CORSAIR CPU coolers with LGA 1700 support out-of-the-box are currently in production and will be available later this year. All future new CORSAIR CPU cooler launches will also support LGA 1700 out-of-the-box. For those who may no longer have all the necessary mounting hardware from their original purchase, a complete mounting kit for all CPU brackets, including LGA 1700, is also available.

Availability, Warranty, and Pricing

The CORSAIR Intel LGA 1700 Retrofit Kit and CORSAIR Complete CPU Bracket Kit are available immediately from the CORSAIR webstore only in the United States and Europe. For availability in Asia and other regions, please reach out to your local resellers and distributors. For up-to-date availability information, please refer to the CORSAIR website or contact your local CORSAIR sales or PR representative.

The CORSAIR LGA 1700 kit is available on the CORSAIR webstore for \$2.99/€2.99/£1.99 with free shipping. The complete mounting kit is available for \$14.99 on the CORSAIR webstore.

Compatibility

The following CORSAIR liquid CPU coolers are compatible with the LGA 1700 kit:

CW-9060055-WW	iCUE H170i ELITE CAPELLIX Liquid CPU Cooler
CW-9060051-WW	iCUE H150i ELITE CAPELLIX Liquid CPU Cooler - White
CW-9060048-WW	iCUE H150i ELITE CAPELLIX Liquid CPU Cooler
CW-9060047-WW	iCUE H115i ELITE CAPELLIX Liquid CPU Cooler
CW-9060050-WW	iCUE H100i ELITE CAPELLIX Liquid CPU Cooler - White
CW-9060046-WW	iCUE H100i ELITE CAPELLIX Liquid CPU Cooler
CW-9060045-WW	iCUE H150i RGB PRO XT Liquid CPU Cooler
CW-9060044-WW	iCUE H115i RGB PRO XT Liquid CPU Cooler
CW-9060043-WW	iCUE H100i RGB PRO XT Liquid CPU Cooler

CW-9060049-WW	iCUE H60i RGB PRO XT Liquid CPU Cooler
CW-9060038-WW	Hydro Series™ H115i RGB PLATINUM 280mm Liquid CPU Cooler
CW-9060039-WW	Hydro Series™ H100i RGB PLATINUM 240mm Liquid CPU Cooler
CW-9060041-WW	Hydro Series™ H100i RGB PLATINUM SE 240mm Liquid CPU Cooler
CW-9060042-WW	Hydro Series™ H100i RGB PLATINUM SE 240mm Liquid CPU Cooler
CW-9060040-WW	Hydro Series H100x High Performance Liquid CPU Cooler
CW-9060036-WW	Hydro Series™ H60 (2018) 120mm Liquid CPU Cooler

Web Pages

To learn more about the CORSAIR LGA 1700 Kit, please visit:

<http://corsair.com/lga1700-kit>

For a complete list of all CORSAIR coolers, please visit:

<http://corsair.com/cpu-coolers>

Join the discussion on the CORSAIR forums at <https://forum.corsair.com/>

About CORSAIR

CORSAIR (NASDAQ:CRSR) is a leading global developer and manufacturer of high-performance gear and technology for gamers, content creators, and PC enthusiasts. From award-winning PC components and peripherals, to premium streaming equipment and smart ambient lighting, CORSAIR delivers a full ecosystem of products that work together to enable everyone, from casual gamers to committed professionals, to perform at their very best.

CORSAIR also includes subsidiary brands Elgato, which provides premium studio equipment and accessories for content creators, SCUF Gaming, which builds custom-designed controllers for competitive gamers, and ORIGIN PC, a builder of custom gaming and workstation desktop PCs and laptops.

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Document LCDVP00020211014ehae00fth

Insights on the Virtual Reality Global Market to 2027 - Featuring Intel, Jaunt and Unity Technologies Among Others - ResearchAndMarkets.com

951 words

14 October 2021

15:33

Business Wire

BWR

English

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DUBLIN--(BUSINESS WIRE)--October 14, 2021--

The "Virtual Reality (VR) - Global Market Trajectory & Analytics" report has been added to ResearchAndMarkets.com's offering.

Amid the COVID-19 crisis, the global market for Virtual Reality (VR) estimated at US\$9.2 Billion in the year 2020, is projected to reach a revised size of US\$89.1 Billion by 2027, growing at a CAGR of 38.2% over the analysis period 2020-2027.

Consumer Electronics, one of the segments analyzed in the report, is projected to record a 31% CAGR and reach US\$28 Billion by the end of the analysis period. After an early analysis of the business implications of the pandemic and its induced economic crisis, growth in the Aerospace segment is readjusted to a revised 37.6% CAGR for the next 7-year period.

The U.S. Market is Estimated at \$2.8 Billion, While China is Forecast to Grow at 36.4% CAGR

The Virtual Reality (VR) market in the U.S. is estimated at US\$2.8 Billion in the year 2020. China, the world's second largest economy, is forecast to reach a projected market size of US\$14.6 Billion by the year 2027 trailing a CAGR of 36.4% over the analysis period 2020 to 2027. Among the other noteworthy geographic markets are Japan and Canada, each forecast to grow at 33.8% and 33% respectively over the 2020-2027 period. Within Europe, Germany is forecast to grow at approximately 26.5% CAGR.

Industrial Segment to Record 45.9% CAGR

In the global Industrial segment, USA, Canada, Japan, China and Europe will drive the 45.8% CAGR estimated for this segment. These regional markets accounting for a combined market size of US\$1 Billion in the year 2020 will reach a projected size of US\$14.7 Billion by the close of the analysis period. China will remain among the fastest growing in this cluster of regional markets. Led by countries such as Australia, India, and South Korea, the market in Asia-Pacific is forecast to reach US\$11.3 Billion by the year 2027.

Select Competitors (Total 126 Featured):

--
Advanced Micro Devices, Inc.

-- AppReal-VR

-- Barco N. V

-- Crytek GmbH

-- Cubicle Ninjas

-- EON Reality Inc.

-- Epic Games, Inc.

-- Erminesoft

-- Firsthand Technology Inc.

- Google Inc.
- HTC Corporation
- Hyperlink Infosystem
- Immersive Robotics
- Intel Corporation
- Jaunt, Inc.
- Kopin Corporation, Inc.
- Leap Motion, Inc.
- Lenovo (China)
- MindMaze Holding SA
- NVIDIA Corporation
- Oculus VR, LLC
- Pimax Technology (Shanghai) Co., Ltd.
- Pixvana, Inc.
- Qualcomm Technologies, Inc.
- Samsung Electronics Co., Ltd.
- Sensics, Inc.
- Sixense Enterprises Inc.
- Sony Interactive Entertainment
- StarVR Corporation
- Unigine Corp.
- Unity Technologies, Inc.
- Varjo Technologies
- Virtualis Limited
- VirtaMed AG
- VRgineers, Inc.
- WorldViz

Key Topics Covered:

I. METHODOLOGY

II. EXECUTIVE SUMMARY

1. MARKET OVERVIEW

- Influencer Market Insights
- World Market Trajectories

- Age of Digital Immersion: The Foundation for the Growing Business Interest in Virtual Reality
- The First Wave of VR Unleashes the Power of VR as a Training, Simulation & Gaming Tool
- The Second Wave of VR Will Unleash VR as a Communication System/Interface
- Recent Market Activity
- From a Fictional Concept to a Multi-Billion Dollar Opportunity, the VR Market is Ripe for the Picking
- Investments Scenario: Venture Capitalists Get Ready to Surf the Giant VR Wave
- A Peek Into Active AR & VR Investors & the Companies Funded by Them
- Crowdfunding, Emerges as the New Way Forward
- Participants across the Value Chain Bet Big on Virtual Reality
- VR Value Chain Participants
- Impact of Covid-19 and a Looming Global Recession

2. FOCUS ON SELECT PLAYERS

3. MARKET TRENDS & DRIVERS

- The Rise & Fall of Mobile VR: The Insider Story of Why Consumer VR is Falling
- The Rise of VR Arcades: The Last Ditch Attempt to Revive the Consumer Gaming Market
- Non-Consumer Applications: The Future of VR
- Value of VR in Advertising Rises InSync With the Importance of Immersive & Interactive Visualization in Digital Marketing
- VR Ready for Fishing Opportunities in the US\$1.5 Trillion Aerospace Industry
- VR's Room-Scale Immersive Experience to Revolutionize Real Estate and Architecture
- Educational VR Experiences to Complement Traditional Teaching Methods
- VR Technology Promotes Immersive and Cost-effective Simulation Based Training
- Future of VR Lies in the Hardware Design: A Review
- A Peek Into the Latest Headset Innovations in the Market
- HTC Vive Pro's Features Improved Visual Fidelity and Room Scale Experience to Attract Enterprise Users
- Upgrades Propel Affordable Oculus Rift and Sony PSVR to Compete With HTC Vive in Immersive Gameplay
- Standalone VR Headsets Promote Untethered VR Experience: Oculus Go Stands Out Among Pricier Competitors
- Pimax 8K VR Premium Headset Provides Widest FOV to Increase Immersive

Effect

- Increased Focus on Innovations in Mobile VR Headsets in a Bid to Battle the Threat of Standalone VR Headsets
- Innovations in VR Accessories to Enhance Immersive Experience
- VR Content/Apps Rise in Significance On Par With Hardware to Influence the Commercial Success of VR Technology
- List of Leading VR Apps Classified by End Use Application
- Issues & Challenges
- Yet to be Resolved Technology Issues - A Major Concern
- Low Resolution of HMDs
- Performance Issues from Display Latency of VR Devices
- Massive Size of HMDs

4. GLOBAL MARKET PERSPECTIVE

III. MARKET ANALYSIS

IV. COMPETITION

For more information about this report visit <https://www.researchandmarkets.com/r/swzxop>

View source version on businesswire.com: <https://www.businesswire.com/news/home/20211014005532/en/>

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SOURCE: Research and Markets
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Document BWR0000020211014ehae0002d

More Intel Core i9-12900K Alder CPU Synthetic & Gaming Benchmarks Leak Out

Hassan Mujtaba

726 words

14 October 2021

Wccftech.com

NEWAGAE

English

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More Intel Core i9-12900K Alder Lake CPU synthetic and gaming benchmarks have leaked out in widely used tests. The CPU has been getting [new benchmarks](#) ever since the qualification samples were released in public.

Intel Core i9-12900K Alder Lake CPU Benchmarked In Synthetic & Gaming Tests, Faster Than AMD Ryzen 9 5950X

The first benchmarks come from Bilibili's member, Enthusiast Citizen, who has actively been bench-marking the Intel Core i9-12900K retail unit for a while now. The leaker has provided several Alder Lake benchmarks and now, he submitted a [review of the Radeon RX 6600](#) on a Core i9-12900K test bench. Now it doesn't make any sense to submit a review on an unreleased platform with bugs but that's what the leaker did.

[Intel's Core i9-12900K CPU has been tested on the Z690 platform along with the newly released Radeon RX 6600 graphics card. \(Image Credits: Bilibili\)](#)

The test platform featured what looks to be an ASRock Z690 Steel Legend motherboard based on the heatsink design and white/silver colors. It was running ZADAK's DDR5-3866 memory in Gear 1 mode with CL14-14-14-34-2T timings. A standard tower heatsink cooler was used to cool to the i9-12900K and tested on an open-air bench.

Intel Core i9-12900K Alder Lake Flagship CPU Specifications

Intel's Core i9-12900K Alder Lake-S CPU will rock 16 cores and 24 threads. That's arranged in 8 P-Core (with 16 threads) and 8 E-Core (with 8 threads). The CPU features 30 MB of L3 cache which is arranged in 3 MB per core partitions on the P-Core (Golden Cove) and 3 MB per cluster on the E-Core (Gracemont). That's 8 P-Cores for 24 MB from the P-Cores and 6 MB from the two clusters comprising 4 E-Cores each. There's also 1.25 MB of L2 cache for a total of 12.5 MB on the entire chip.

As for clock speeds, the Intel Core i9-12900K is expected to feature a P-Core base and boost clocks of 3.2 GHz / 5.3 GHz and E-Core base and boost clocks of 3.0 / 3.9 GHz. These boost clocks are for a single-core. The all-core boost frequencies are expected to be 5.0 GHz for the P-Core and 3.7 GHz for the E-Core. The upper speeds will be achieved only when TVB (Thermal Velocity Boost) has been activated so normal boost speeds might be a little lower.

Intel Core i9-12900K Alder Lake Flagship CPU Performance

In terms of performance, the leaker first shows off the synthetic performance of the Intel Core i9-12900K in 3DMark Time Spy and Fire Strike benchmarks. The performance metrics are provided below:

* [Click to view image.](#)

* [Click to view image.](#)

* [Click to view image.](#)

* [Click to view image.](#)

As for gaming benchmarks, the only comparative performance benchmark was done in Forza Horizon 4. The Intel Core i9-12900K scored 193 FPS at 1080p while running on Windows 11 & AMD's Ryzen 9 5950X scored 189 FPS with the same settings but running on Windows 10. The Windows 10 OS for AMD CPUs makes sense since Ryzen chips have performance degradation issues related to the L3 cache which adversely affects gaming performance and hence the best performance is only measurable in Windows 10. This is a small 2% lead over the Ryzen 9 5950X.

* [Click to view image.](#)

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Other benchmarks for the Intel Core i9-12900K included Rainbow Six Siege which scored 252 FPS at 1080p and Shadow of The Tomb Raider which scored 112 FPS at 1080p. Unfortunately, the leaker did not provide any comparisons in these gaming tests.

Intel's Alder Lake Desktop CPUs will feature both DDR5 and DDR4 memory controllers and 600-series motherboards will also come with DDR5/DDR4 specific options. High-end motherboards will retain DDR5 while the more mainstream offerings will open up DDR4 support too. The Intel Alder Lake CPU lineup is [expected to launch in November](#) along with the respective Z690 platform and DDR5 memory kits.

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Document NEWAGAE020211014ehae0002t

online news

Acer Announces Predator Orion 7000 Gaming PC Powered by Intel 12th Generation Core "Alder Lake" CPUs

789 words

13 October 2021

ETMAG.com

FMETMA

English

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Acer today announced the expansion of its Predator gaming portfolio with new Predator Orion 7000 series desktops, featuring powerful performance in a stunning design, and two smart 4K gaming projectors. Further enhancing the gaming experience is the Predator gaming desk, which offers two practical surface options and a convenient storage rack.

"Predator Orion 7000-series desktops are premium, powerful rigs for serious players who demand incredible performance from even the most demanding titles," said Jeff Lee, General Manager, Stationary Computing, IT Product Business, Acer Inc. "In order to offer that next-level performance, we're excited to be among the first companies bringing the new 12th Gen Intel Core CPUs to our product portfolio." "12th Gen Intel Core desktop processors are a huge innovative leap forward for game performance and industry leading memory, I/O and connectivity," said Marcus Kennedy, General Manager of Gaming and Esports, Intel. "Powering the pinnacle of its performance is the new performance hybrid architecture that combines two all-new compute cores to deliver blistering performance for high frame rates and multi-tasking performance that modern gamers expect."

The powerful new Predator Orion 7000 series (P07-640) gaming desktops provide users with everything necessary to take on the latest generation games—and the next. Designed for hard-core gaming enthusiasts, these new upgradeable gaming PCs will be equipped with the latest 12th Gen Intel Core overclockable processors, up to NVIDIA GeForce RTX 3090 series GPUs[1], and up to 64 GB DDR5-4000 RAM.

The stunning, EMI-compliant chassis features transparent, tempered glass side panels showcasing two 140 mm (5.5-inch) Predator FrostBlade 2.0 front fans and a third 120 mm (4.7-inch) Predator FrostBlade 2.0 rear fan that can be lit with a dazzling array of ARGB colors. The top of the Orion 7000's case features an opening, making it possible for users to replace this 120 mm (4.7-inch) fan with a 240 mm (9.45-inch) one, while integrated PredatorSense software lets gamers control the ARGB lighting, fan speed and overclocking. Accenting the bold lighting and design are an illuminated teal blue Predator logo on the chassis' front and an easily accessible teal prism-refraction power button on the system's top. Beyond these eye-catching aesthetics is exceptional thermal management, with the three aforementioned Predator FrostBlade 2.0 fans in addition to an AIO liquid CPU cooler and advanced airflow management to effectively cool system components. The FrostBlade fan's thin and curved blades are designed to smoothly increase airflow without causing turbulence and to quickly dissipate heat. In addition, the fan's wear-resistant and fully-sealed rifle bearings prevent lubricant leaks and the ingress of dust in order to maintain stability and extend the computer's lifespan.

Intel Killer 2.5G LAN gives gamers a competitive edge by detecting and prioritizing game traffic over other network traffic, resulting in smoother and faster connectivity for online games and streaming media. Intel WiFi 6E (AX211) and 2x2 MU-MIMO technology provide fast and secure wireless connectivity. A gaming beast, the Predator Orion 7000 provides plenty of ports for leveraging the latest gaming accessories. On the chassis' front for quick access are three USB 3.2 Gen 1 Type A, one USB 3.2 Gen 1 Type C, and two audio jacks. On the back, there are three USB 3.2 Gen 2 Type-A, one USB 3.2 Gen 2x2 Type-C, two USB 2.0 ports, and three audio jacks.

Featuring ample storage, the rig includes a 2.5-inch USB 3.2 Gen2 Type-C hotswap drive bay, 2x M.2 PCIe 4.0 NVMe SSDs (up to 1 TB each) and two 3.5-inch SATA 3 HDD (up to 3 TB each).

Pricing and Availability The Predator Orion 7000 (P07-640) will be available in North America in Q2'22; in EMEA in Q1'22 starting at EUR 2,199; and in China in Q1'22, starting at RMB 20,000. The Predator GD711 Projector (GD711) will be available in EMEA in December starting at EUR 1,499; and in China in November, starting at 11,999. The Predator GM712 Projector (GM712) will be available in EMEA in January 2022 starting at EUR 1,399; and in China in November, starting at 10,999. The Predator Gaming Desk (PGD110) will be available in EMEA in December starting at EUR 229. Exact specifications, prices, and availability

will vary by region. To learn more about availability, product specifications and prices in specific markets, please contact your nearest Acer office via www.acer.com.

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Intel ARC Alchemist Reference Gaming Graphics Card Pictured In Latest Renders – Dual Slot & Dual Fan Design With Sleek Silver Finish

Hassan Mujtaba

1,125 words

2 October 2021

Wccftech.com

NEWAGAE

English

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The first renders of Intel's ARC Alchemist reference graphics cards have been pictured in the latest leak by [Moore's Law is Dead](#). The renders show us what Intel's own reference design will look like & a few tidbits regarding the launch of the desktop ARC lineup.

Intel's ARC Alchemist Gaming Reference Graphics Cards Pictured In Latest Renders

The Intel ARC Alchemist graphics card reference design for high-end variants has been pictured on several occasions before. We saw a [prototype leak](#) out by MLID back in April 2021 & Intel [confirmed](#) the design in its ARC marketing campaign in August. We also recently came to know how Intel plans to brand its upcoming gaming graphics card lineup, [more on that here](#).

[Click to view image.](#)

Moore's Law is Dead decided to ask his friend to render an animation of the reference graphics card based on the information he knows from his sources. The resultant render is very detailed and sheds light on almost every aspect of the reference graphics card, giving us a detailed look at what might be Intel's first and very own dedicated design for its first desktop discrete gaming card.

In the renders, we can see the card is based on a high-end ARC Alchemist GPU, probably the DG2-512 (Xe-HPG) chip which will power the upper echelon of Alchemist graphics cards. The card comes in a dual-slot and dual-fan design. Each fan incorporates a 9-blade fan design and there also seems to be RGB embedded around the fans giving a nice touch in blue. The cooler shroud has a circular patterning around the edges which gives a unique touch to the card. There's also the 'Intel' logo on the side accent plate that is made out of acrylic and also embeds RGB LEDs. The card rocks a large aluminum finned heatsink and MLID points out the possibility of a vapor chamber-based cooling solution under the hood.

Intel ARC Alchemist Reference Gaming Graphics Card Renders (Image Credits: MLID):

* [Click to view image.](#)

* [Click to view image.](#)

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* [Click to view image.](#)

Other than these, the card rocks a backplate that extends beyond the PCB. There are large vents on the backplate through which the second fan can vent air out. The card receives power through an 8+6 pin connector configuration while display outputs include a single HDMI and triple DP ports. In the renders, we can only see the outsides of the card so we might have to wait for a PCB render for later on. But despite that, Intel's reference and 1st Gen ARC Alchemist design looks great & credit to MLID and his friend for providing an early glimpse of the design, once again!

[Click to access link.](#)

Intel Xe-HPG 512 EU ARC Alchemist Graphics Card

The top Alchemist 512 EU variant has just one configuration listed so far and that utilizes the full die with 4096 cores, 256-bit bus interface, and up to 16 GB GDDR6 memory featuring a 16 Gbps clock though 18 Gbps cannot be ruled out as per the rumor.

The Alchemist 512 EU chip is expected to measure at around 396mm² which makes it bigger than the AMD RDNA 2 and NVIDIA Ampere offerings. The Alchemist -512 GPU will come in the BGA-2660 package which measures 37.5mm x 43mm. NVIDIA's Ampere GA104 measures 392mm² which means that the flagship Alchemist chip is comparable in size while the Navi 22 GPU measures 336mm² or around 60mm² less. This isn't the final die size of the chip but it should be very close.

[Click to view image.](#)

NVIDIA packs in tensor cores and much bigger RT/FP32 cores in its chips while AMD RDNA 2 chips pack a single ray accelerator unit per CU and Infinity Cache. Intel will also have dedicated hardware onboard its Alchemist GPUs for Raytracing & AI-assisted super-sampling tech.

The Xe-HPG Alchemist 512 EU chip is suggested to feature clocks of around 2.2 - 2.5 GHz though we don't know if these are the average clocks or the maximum boost clocks. Let's assume that it's the max clock speed and in that case, the card would deliver up to 18.5 TFLOPs FP32 compute which is 40% more than the RX 6700 XT but 9% lower than the NVIDIA RTX 3070.

[Expected performance and FLOPs of Intel's ARC Alchemist top GPU die compared to RTX 3070 & RX 6700 XT. \(Image Source: MLID\)](#)

In a speculative measure of performance, MLID states that the TFLOPs make no sense for comparison as performance scales differently respective to the architecture, not the FLOPs performance. The gaming graphics card is pretty much expected to be [faster than the RX 6700 XT & RTX 3070](#) at this point but with work ongoing on the driver suite, the performance is expected to improve further.

Also, it is stated that Intel's initial TDP target was 225-250W but that's been upped to around 275W now. We can expect a 300W variant with dual 8-pin connectors too if Intel wants to push its clocks even further. In either case, we can expect the final model to rock an 8+6 pin connector config. There're also talks about a custom lineup being worked upon by Intel's AIB partners. The first Intel ARC products are launching in Q1 2022.

Intel ARC Alchemist vs NVIDIA GA104 & AMD Navi 22 GPUs

GPU Name	Alchemist DG-512		
NVIDIA GA104		AMD Navi 22	
Architecture	Xe-HPG		Ampere
RDNA 2			
Process Node	TSMC 6nm		Samsung 8nm
TSMC 7nm			
Flagship Product	ARC (TBA)		GeForce RTX 3070 Ti
Radeon RX 6700 XT			
Raster Engine	8	6	2
FP32 Cores	32 Xe Cores	48 SM Units	40
Compute Units			
FP32 Units	4096	6144	
2560			
FP32 Compute	~16 TFLOPs	21.7 TFLOPs	
12.4 TFLOPs			
TMUs	256	192	
160			
ROPs	128	96	64
RT Cores	32 RT Units	48 RT Cores (V2)	40
RA Units			
Tensor Cores	512 XMX Cores	192 Tensor Cores (V3)	
N/A			
Tensor Compute	~131 TFLOPs FP16 50 TOPs INT8	87 TFLOPs FP16 174 TOPs INT8	25
L2 Cache	TBA	4 MB	3
MB			
Additional Cache	16 MB Smart Cache?	N/A	96
MB Infinity Cache			
Memory Bus	256-bit	256-bit	
192-bit			
Memory Capacity	16 GB GDDR6	8 GB GDDR6X	16
GB GDDR6			
Launch	Q1 2022	Q2 2021	Q1
2021			

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Document NEWAGAE020211002eha200002

Lenovo announces the first gaming PC with Intel Alder Lake processors, DDR5 RAM and PCIe 5.0 support

196 words

1 October 2021

Ma'an News Agency

MANEWS

English

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Lenovo has unveiled the Legion 9000K 2022 on Chinese social media. While the company does not refer to the machine as featuring Intel processors, the mention of 12th Gen CPUs is a strong nod towards the Alder Lake architecture. Presumably, Lenovo has left out any Intel branding to avoid violating embargoes.

According to ITHome, Lenovo will start selling the Legion 9000K on October 29, likely the date when Alder Lake processors will become available. October 29 is a day after Intel's inaugural Innovation event ends, which commences on October 27. Hence, Intel will probably reveal all remaining details about its Alder Lake processors in just under a month's time.

The Legion 9000K will then launch on November 4, a probable shipping date for pre-orders. Lenovo's announcement also confirms that the Legion 9000K has DDR5 RAM, PCIe 5.0 support and an RTX 3080 Ti, one of NVIDIA's most powerful consumer GPUs behind the RTX 3090. Seemingly, the Legion 9000K has a Z690 motherboard, with other chipsets set to arrive at a later date.

Document MANEWS0020211001eha10008h

Intel ARC Alchemist Graphics Card Allegedly Pictured – DG2-128 GPU & 6GB Memory For Entry-Level Gaming

Jason R. Wilson

587 words

27 September 2021

Wccftech.com

NEWAGAE

English

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A blurry image of what appears to be an Intel ARC Alchemist graphics card featuring the DG2-128 GPU has been leaked over at [Chiphell](#).

Intel ARC Alchemist Graphics Card PCB With DG2-128 GPU & 6 GB Memory Pictured

The designs of the DG2-128EU are not new. Intel has released die shots and information about the new DG2 series, as well as the 512EU model. The GPU pictured below is definitely the smaller chip that would max out at 128 Execution Units or 1024 ALUs. What's interesting however is the VRAM configuration which points out to more memory than what was previously expected.

[Click to view image.](#)

The user who leaked the picture on Chiphell states the card is extremely small compared to other models by Intel and other manufacturers, and consumes 65 watts of power, much lower than leaked slides showing the card was a SOC2 with around 75 watts of power consumption. A few days ago, Moore's Law Is Dead also stated that the entry-level SKUs will feature very low TDP, more on that here.

The leaker also states the Intel ARC Alchemist graphics card features a 6 GB GDDR6 memory. To get there, a card will most likely have to feature a 96-bit bus interface considering the 192-bit bus interface is designed for higher-end variants.

In a detailed die dissection of the DG2-128 chip by [Locuza](#), it seems like 96-bit is correct since the GPU offers a single 64-bit and a single 32-bit controller for the memory. This would mean that we can expect several configurations starting at 3 GB and going up to 4/6/8 GB for the smallest of the two ARC Alchemist GPUs. But considering that 4 GB has become the bare minimum these days, it looks like the minimum amount would be kept at 4 GB.

Intel DG2-128 EU ARC Alchemist GPU Die Shot (Image Credits: [Locuza](#)):

[Click to view image.](#)

With the leaked image being very hard to discern exact specifications or spot-on speculations, the user leaking the image to Chiphell did outline the locations of both the GPU and the memory in the picture provided to the website. With the mounting holes being present in the photo, it can be easily determined that this is for desktop models and not other variants, such as the mobile version of the Alchemist series.

Intel Xe-HPG Based Discrete Alchemist GPU Configurations:

GPU Variant	Graphics Card Variant	GPU Die	Execution Units	Shading Units
(Cores)	Memory Capacity	Memory Bus	TGP	
Xe-HPG 512EU	ARC A***		Alchemist-512EU	512 EUs
	16/8 GB GDDR6	256-bit	225-275W?	4096
Xe-HPG 384EU	ARC A***		Alchemist-512EU	384 EUs
	12/6 GB GDDR6	192-bit	225-275W?	3072
Xe-HPG 256EU	ARC A***		Alchemist-512EU	256 EUs
	8/4 GB GDDR6	128-bit	150-200W?	2048
Xe-HPG 192EU	ARC A***		Alchemist-512EU	192 EUs
	4 GB GDDR6	128-bit	150-200W?	1536
Xe-HPG 128EU	ARC A***		Alchemist-128EU	128 EUs
	8/6/4 GB GDDR6	96/64-bit	50-75W?	1024
Xe-HPG 96EU	ARC A***		Alchemist-128EU	86 EUs
	8/6/4 GB GDDR6	96/64-bit	50-75W?	768

The Intel ARC Alchemist desktop models are to showcase [three different SKUs](#), while their mobile versions are to have up to five different SKUs.

[Click to view image.](#)

Document NEWAGAE020210928eh9r00001

Redmi G 2021 gaming laptop launched with Intel and AMD options, 144Hz display

482 words

22 September 2021

India Today Online

INTYON

English

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Xiaomi has launched the successor to its Redmi G gaming laptop that debuted last year. Called Redmi G 2021, the new model comes with few upgrades over the previous iteration, which are mostly centred around performance. It now also comes in AMD variants, alongside a line of upgraded Intel Core processor options.

The new Redmi G even carries a look similar to its predecessor. The design on the back panel seems new but the front look retains the chamfered keyboard and a large, central trackpad. It also features the same 16.1-inch display with up to 144 Hz refresh rate and a thick bezel at the bottom.

Redmi G 2021 comes in different specifications depending upon the processor option you choose. Here is a look at these configurations and the prices they will retail at.

Redmi G 2021 price and availability

Redmi G 2021 will start retailing at CNY 5,699 (roughly Rs 64,900) with the 11th-Generation Intel Core i5 processor. This is an upgrade over the 10th-Generation Intel Core i5 seen on last year's Redmi G. AMD Ryzen 7 variant has been priced at CNY 6,999 (roughly Rs 79,700).

For now, the gaming laptops will be available only in China. The Intel option is on sale already but the AMD variants will start retailing from September 28. Xiaomi is yet to reveal its plans for the global markets.

Redmi G 2021 specifications

The new Redmi G gaming laptop comes with a 16.1-inch display that promises up to 144Hz refresh rate. It is powered by an 11th Gen Intel Core i5 processor that features Nvidia GeForce RTX 3050 graphics card, another upgrade over the 2020 model. The AMD option comes with AMD Ryzen 7 processor and Nvidia GeForce RTX 3060 graphics.

Both the Intel and AMD options come with 16GB RAM and 512GB internal storage. The laptop runs Windows 10, which will be upgradeable to Windows 11 once available. Xiaomi has also used Hurricane Cooling 3.0 cooling system on the gaming laptop that uses large dual fans and four outlets to prevent it from heating up while gaming.

Connectivity options on the laptop include Wi-Fi 6, Thunderbolt 4 and USB Type-C for charging. Redmi G 2021 also comes with a three-level backlit keyboard, DTS:X Ultra 3D surround sound and Xiao AI digital assistant. The AMD variant retails with a faster 230W power adapter, while the Intel option gets a 180W adapter.

Also read: | [Xiaomi launches new Redmi Smart TV in two screen sizes with Android TV 11, price starts at Rs 15,999](#) Also read: | [Motorola expected to launch a new TV along with Moto Tab 8 in India](#) Also read: | [Facebook launches Portal Go, New Portal+ to take on Amazon Echo smart devices](#)

Document INTYON0020210922eh9m001e1



PC/ Laptops

Redmi G 2021 **Gaming** Laptop With 144Hz Display, 11th Gen **Intel** Core i5 and AMD Ryzen 7 Processors Launched

Jagmeet Singh

464 words

22 September 2021

10:57

NDTV

NDTVIN

English

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Redmi G 2021 gaming laptop was launched as an upgrade to last year's Redmi G on Wednesday, September 22. The new model comes in Intel and AMD variants that both feature a 144Hz display and 16GB of RAM. The laptop also carries 512GB of storage and is upgradeable to Windows 11. On the distinction front, the Intel variant of the Redmi G 2021 houses an 11th Gen Intel Core i5 processor, whereas the AMD option has an AMD Ryzen 7 processor. Both versions include Xiaomi's Hurricane Cooling 3.0 heat dissipation system that brings large dual fans.

Redmi G 2021 price, availability

[Redmi G 2021](#) price has been set at CNY 5,699 (roughly Rs. 64,900) for the Intel Core i5 model, while the AMD Ryzen 7 variant is priced at CNY 6,999 (roughly Rs. 79,700). The Intel variant will be [available for purchase](#) in China starting Thursday, September 23. However, the AMD option will go on sale from September 28. Details about whether the Redmi G 2021 will be available in global markets are yet to be revealed.

The original [Redmi G](#) was [launched](#) in August last year at a starting price of CNY 5,299 (roughly Rs. 60,300) with an Intel Core i5-10200H CPU and a 60Hz display.

Redmi G 2021 specifications

The Redmi G 2021 runs on [Windows 10](#) (upgradeable to [Windows 11](#)) and features a 16.1-inch display with an up to 144Hz refresh rate along with TÜV Rheinland certification for low blue light emission. The Intel variant of the laptop is powered by an 11th Gen Intel Core i5-11260H processor, along with an Nvidia GeForce RTX 3050 graphics card. The AMD option features an AMD Ryzen 7 5800 processor coupled with Nvidia GeForce 3060 graphics.

Both Intel and AMD versions of the Redmi G 2021 carry 16GB of RAM and 512GB of storage. The laptop brings Wi-Fi 6 connectivity and a DTS:X Ultra 3D surround sound experience. There are also features including USB Type-C charging, a three-level backlit keyboard, and Xiao AI digital assistant.

The Intel variant comes with a 180W power adapter and includes a proprietary heat dissipation system with dual fans. However, the AMD model includes a 230W power adapter and carries the same heat dissipation system with dual 12V fans, four air outlets, and five all-copper heat pipes. Windows 11 has been unveiled, but do you need it? We discussed this on [Orbital](#), the Gadgets 360 podcast. [Orbital](#) is available on [Apple Podcasts](#), [Google Podcasts](#), [Spotify](#), [Amazon Music](#) and wherever you get your podcasts.

[Click here to view video](#)

Document NDTVIN0020210922eh9m0008o

Intel Goes on Game Dev Hiring Spree Before Alchemist Gaming GPU Launch

Francisco Pires

805 words

17 September 2021

Tom's Hardware

TOMHA

English

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Intel has been on a hiring spree for its gaming developer relations team ahead of its high-performance Alchemist GPU release. The idea is to facilitate the development and optimization of games and software for the new, third player in the discrete GPU market.

Intel announced that it has hired four leading game developer advocates as it prepares to launch its first high-performance discrete gaming GPUs, the [Arc Alchemist](#). Developing and launching a new hardware product is a strenuous process with millions of moving parts - both with the hardware development and qualification side of the equation, as well as developing the software stack that actually allows the hardware to be tapped into by developers and finally enjoyed by users. While Intel is yet to throw its hat on the high-performance discrete gaming GPU market with its [Alchemist and future products](#), the company knows what it needs to do to increase the chances of a successful launch. As [Steve Balmer](#) so eloquently put it, it's all about developers.

One requirement is pretty simple: Intel's GPUs will not be deployed in a vacuum. While Intel is most certainly building upon its iGPU driver stack, its discrete graphics implementation provides a wholly new architecture. To further these types of efforts, companies like AMD and NVIDIA both maintain developer outreach and support programs. This can sometimes translate to the mere sending of documentation and remote collaboration, but sometimes also implies the allocation of engineers to developers to help with game performance optimization and compatibility. And judging from Intel's recent hires, the company feels that it still has work to do with developer outreach.

Over the last four days, Intel, via one of its official Twitter channels, announced that it had hired four senior positions related to developer outreach, developer relations, and developer-facing tool development.

The first hire announcement (dated [September 14th](#)) was André Bremer, who joined Intel as the new Vice President (VP) and General Manager (GM) of Gaming and Graphics Workload Engineering (all of these positions are more than a mouthful). Bremer brings decades of experience in the gaming and developer industry, having previously worked at Prime Gaming, Amazon Web Services' Game Tech, Zynga, EA, and LucasArts.

[Click to view image \(Image credit: Intel\)](#)

A day later, on [September 15th](#), Intel announced it has hired Michael Heilemman (CTO of Maxis and Electronic Arts) for the position of Senior Director of Game Developer Tools and Technologies. According to Intel, Heilemman has been involved with the development of no less than 60 AAA games - this is a person who is perfectly acquainted with developer culture, bringing years of experience to the grueling task of making lives as easy as possible for developers in integrating and optimizing for Intel's high-performance graphics architecture.

[Click to view image \(Image credit: Intel\)](#)

The next hire, announced [September 16th](#), was Ritchie Corpus - an AMD veteran of 15 years - for the position of VP & GM for the Game Ecosystem Business Development & Developer Relations. Ritchie Corpus brings a wealth of connections to Intel, having previously been involved with the PC Gaming Alliance as a part of its Board of Directors and as Treasurer. His resume points towards a strong software inclination.

[Click to view image \(Image credit: Intel\)](#)

Finally, Intel today also announced the hiring of Steve Bell for the position of Senior Director of Gaming Developer Relations. This is one of those cases where a company's gain is another's loss - Steve Bell goes to Intel straight from AMD, after more than 13 years in exactly the same capacity as he now joins the Blue Giant.

[Click to view image \(Image credit: Intel\)](#)

Hardware doesn't work without the software, and the difference between a good user experience and good hardware performance rests mostly on competent software solutions. Through these hires, Intel is extending its reach throughout the developer community, without whom the high-performance graphics architecture for Alchemist (and its future iterations) would translate as little less than expensive paperweights.

Judging by the general perception of the NVIDIA vs AMD driver quality debate, and the number of consumers who claim to prefer the former over the latter, Intel will probably do everything it can to avoid a bad public perception. It's great to have your graphics cards earning the "fine wine" label due to performance improvements that come over a long period of time, but it's even better to hit the ground running with a great developer and public perception. Intel has the money, and it is clearly willing to hire people for the job. We'll see how all this translates on Alchemist's actual launch.

[Headshots for Intel's latest hires. Intel's Arc Alchemist promotional render. \(Intel\)](#)

Document TOMHA00020210917eh9h0002t

Schenker Intros Its **Gaming** Focused XMG APEX 'AMD Ryzen 5000' & Entry-Level XMG FOCUS 'Intel 11th Gen' Laptops – Feature RTX 3050 Ti & Up To RTX 3070 GPUs

Hassan Mujtaba

1,583 words

16 September 2021

Wccftech.com

NEWAGAE

English

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Schenker is today announcing the launch of its brand new [XMG](#) APEX and XMG FOCUS series gaming laptops that aim at the mainstream and entry-level segment, powered by AMD's Ryzen 5000 & Intel's 11th Gen CPUs.

Schenker Unveils XMG APEX 'AMD Ryzen 5000' & XMG FOCUS 'Intel 11th Gen' Gaming Laptops Featuring RTX 3050 Ti & Up To RTX 3070 GPUs

The XMG APEX and FOCUS lineups are brand new additions to the XMG family. With the XMG APEX, the company plans to offer a new mainstream lineup below its high-end NEO and PRO series while featuring AMD Ryzen 5000H 'Cezanne' CPUs and up to GeForce RTX 3070 GPUs. The Intel-powered XMG FOCUS series will be aimed at the entry-level segment with Core i7 H-Series CPUs & up to RTX 3070 graphics.

XMG APEX (M21): AMD Ryzen 5000H CPUs With Up To NVIDIA GeForce RTX 3070 Graphics

So starting off with the full specification's disclosure, the XMG APEX lineup is designed around the AMD Ryzen 5000H platform and will be available in two laptop configurations, a 17-inch, and a 15-inch variant.

[Click to view image.](#)

For CPU options, you get to select from the AMD Ryzen 7 5800H (45W) or the AMD Ryzen 9 5900HX (54W TDP). Both CPUs are 8 core and 16 thread variants with the Ryzen 7 operating at 3.2 GHz base and 4.4 GHz boost clocks while the Ryzen 9 operates at 3.3 GHz base and 4.6 GHz boost clocks and also offers overclocking support which is offered on the 'HX' series chips. Both CPUs feature 16 MB L3 & 4 MB L2 cache along with an integrated Vega GPU with 8 Compute Units.

For GPU options, you get to select from an NVIDIA GeForce RTX 3070 (125W + 15W Dynamic Boost 2.0) or the NVIDIA GeForce RTX 3060 (115W + 15W Dynamic Boost 2.0). The RTX 3070 features 8 GB of GDDR6 memory while the RTX 3060 features 6 GB of GDDR6 memory. Other specifications such as memory and IO include up to two SODIMM slots with up to 64 GB DDR4-3200 capacities, 2 M.2 PCIe 3.0 NVMe slots (x4 lanes each), 49Wh exchangeable battery and a 144 Hz IPS display on both variants that run up to 1920x1080p resolution (300 nits brightness / 90% sRGB coverage). The 15-inch model measures 361 x 258 x 29 mm and weighs 2.2 kg while the 17-inch model measures 396 x 262 x 32.4 mm and weighs 2.5 kg.

In terms of I/O, you will be getting Mini DisplayPort, HDMI, and a DisplayPort via USB-C, a 2.5G LAN port, a combo headphone jack, a separate mic port, and WiFi6 connectivity. The laptops feature full sized keyboards with Numpad and multi-color backlighting (15 colors).

XMG APEX Laptops Gallery:

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XMG APEX Laptops Teardown:

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XMG FOCUS (M21): Intel 11th Gen Core i7-11800H With NVIDIA's GeForce RTX 3050 Ti Graphics

Moving over to the XMG FOCUS, the new lineup will be aiming at the entry-level segment and come in a single CPU/GPU option but two laptop variants, a 17-inch and a 15-inch version. The processor is going to be the Intel Core i7-11800H which is an 8 core and 16 thread model which operates at a base clock of 2.30 GHz and boosts up to 4.60 GHz at its 45W+ TDP.

[Click to view image.](#)

Since this is an entry-level option, the GPU side is configured with the NVIDIA GeForce RTX 3050 Ti discrete graphics chip. This chip is set with a TGP of up to 75W (60W + 15 Dynamic Boost 2.0). Both laptop variants will feature a 144 Hz IPS display with a 1080p resolution, 300 nits brightness, and a 90% sRGB color space. The XMG FOCUS 15 will measure 359.5 x 238 x 21.9 mm and weigh less than 2 kg while the XMG FOCUS 17 will measure 369.9 x 262 x 23.5 mm and weigh 2.4 kg.

Other specifications include two SODIMM slots for up to 64 GB DDR4-3200 capacities, an M.2 NVMe slot for PCIe 3.0 SSDs, a 2.5" SATA SSD/HDD, and a full-format keyboard. The battery is a standard 49Wh design. I/O includes three USB-A ports, one USB-C 3.2 Gen 2 port, Mini DisplayPort, an HDCP-capable HDMI port, a Gigabit Ethernet LAN port, and WiFi6. The display outputs are connected to the Intel Xe integrated graphics through NVIDIA's Optimus technology and can disable the dGPU for higher battery times in standard office workloads.

	XMG FOCUS (M21)	XMG APEX (M21)	XMG APEX
(M21) Sensor			
CPU Benchmarks	Intel Core i7-11800H	Ryzen 7 5800H	
CPU Sustained All-Core Power Limit	55 Watt	54 Watt	CPU
Package Power			
Cinebench R20 Multi Score	4641	4887	
GPU Benchmarks	RTX 3050 Ti	RTX 3060	RTX 3070

GPU Sustained Power Limit	75 Watt	130 Watt	140 Watt
GPU Power			
GPU Sustained Temperature	81° C	86° C	87° C
GPU Temperature			
3DMark Time Spy Score	5991	8499	10622
3DMark Time Spy CPU Score	5609	7756	9574
3DMark Time Spy Graphics	9766	8646	10832
3DMark Time Spy Stress Test	97.4%	97.9%	97.5%

XMG FOCUS Laptops Gallery:

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XMG FOCUS Laptops Teardown:

[Click to view image.](#)

Price and availability

The starting configuration of the [XMG APEX 15 \(M21\)](#) and [XMG APEX 17 \(M21\)](#), which can be freely configured at [bestware.com](#), features AMD's Ryzen 7 5800H, an NVIDIA GeForce RTX 3060, 8 GB

DDR4-3200 RAM, a 250 GB Kingston A2000 SSD and a Full HD IPS display running at 144 Hz. Prices are starting from € 1.439 (APEX 15) and € 1.479 (APEX 17) incl. 19% VAT (in some countries different tax rates apply). Upgrades such as the AMD Ryzen 9 5900HX (€ 95, expected to be available from mid-November) or an NVIDIA GeForce RTX 3070 (€ 287) are available for an additional charge. Pre-orders are immediately available, with delivery expected from the beginning of October.

XMG APEX Series Laptops Links:

* <https://bestware.com/en/xmg-apex-15.html>

* <https://bestware.com/en/xmg-apex-17.html>

* <https://www.xmg.gg/en/xmg-apex-15>

* <https://www.xmg.gg/en/xmg-apex-17>

XMG FOCUS Series Laptops Links:

* <https://bestware.com/en/xmg-focus-15.html>

* <https://bestware.com/en/xmg-focus-17.html>

* <https://www.xmg.gg/en/xmg-focus-15>

* <https://www.xmg.gg/en/xmg-focus-17>

In contrast, the starting configuration of the [XMG FOCUS 15 \(M21\)](#) and [XMG FOCUS 17 \(M21\)](#), which can be freely configured at bestware.com, includes Intel's Core i7-11800H, an NVIDIA GeForce RTX 3050 Ti, 8 GB DDR4-3200 RAM, a 250 GB Kingston A2000 SSD and a Full HD IPS display running at 144 Hz. Prices are starting from € 1.199 (FOCUS 15) and € 1.239 (FOCUS 17) incl. 19% VAT (in some countries different tax rates apply). Both laptops are available for order and delivery as of today.

[Click to view image.](#)

Document NEWAGAE020210916eh9g000b5



Intel's most powerful Arc GPU could be coming to gaming laptops

456 words

11 September 2021

Mehr News Agency

MENEAG

English

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An unidentified Intel Xe graphics card which has just been spotted in a leaked benchmark looks like its a laptop version of Intels Arc Alchemist discrete GPU, teasing the possibility that we might see the beefiest flagship solution in gaming notebooks next year perhaps.

PC Gamer spotted the Geekbench 5 result as flagged up on Twitter by a less familiar source for us, though still one which has provided previous spillage, namely Benchleaks, so plenty of salt here as ever but its a very interesting sighting.

[GB5 GPU] Unknown GPU CPU: Intel Core i7-11800H (8C 16T)Min/Max/Avg: 4547/4581/4575 MHzCodename: Tiger LakeCPUID: 806D1 (GenuineIntel)GPU: Intel XeAPI: Open CLScore: 34360, -59.6% vs RTX 2070VRAM: 12.64 GB<https://t.co/Ux8hj3mwuO>September 7, 2021

As you can see, the GPU is only named as an Intel Xe discrete graphics card running in a Tiger Lake laptop, but it has 512 EUs (Execution Units) meaning it certainly isnt a current Xe laptop card, and that EU count corresponds with Alchemist, and the top-end configuration of Intels incoming Arc gaming GPUs. Its shown with a clock speed of 1.8GHz, though that could be pushed higher with the release version.

Remember that Alchemist isnt expected to debut until early in 2022, and weve no idea yet when laptop versions of these discrete cards will figure into the mix, so this is obviously still an early sample chip.

Due to that, the result of 34,360 for the OpenCL score isnt something we can draw any real conclusions from, save that it seems to be in the right ballpark for such an early pre-release product. Besides, Geekbench is far from the best place to be evaluating a GPUs performance, anyway (theres much better benchmarking software out there for that job).

Analysis: Great news for gaming on the go?

Obviously we need to be careful here, but this certainly looks like a tantalizing hint that before long well have some seriously powerful new gaming laptops. If a notebook can pack an Intel Alder Lake CPU with its major design innovations on the mobile front, with the hybrid architecture offering clear advantages for laptops alongside a flagship Alchemist GPU, the potential performance leap in gaming during 2022 (maybe relatively early in 2022) is something to get excited about that.

Think of it this way: weve got what could hopefully be a seriously powerful Arc GPU driving frame rates, coupled with all the battery benefits Alder Lake promises to bring to laptops, and that should make for not just gaming notebooks with more grunt, but models which can last for a bit longer on the move too.

Document MENEAG0020210911eh9b0008d

Intel Corporation; Patent Issued for Virtual reality (VR) system with nearsightedness optometry adjustment (USPTO 11099385)

1,436 words

10 September 2021

Investment Weekly News

INVWK

10172

English

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2021 SEP 18 (VerticalNews) -- By a News Reporter-Staff News Editor at Investment Weekly News -- According to news reporting originating from Alexandria, Virginia, by VerticalNews journalists, a patent by the inventors Han, Ke (Shanghai, CN), Yu, Yu (Shanghai, CN), Zhou, Zhen (Shanghai, CN), filed on December 30, 2016, was published online on August 24, 2021.

The assignee for this patent, patent number 11099385, is Intel Corporation (Santa Clara, California, United States).

Reporters obtained the following quote from the background information supplied by the inventors:

"Nearsightedness is the most common ailment in the world. More than 1 in four people worldwide are estimated to suffer from nearsightedness or myopia. Some places have higher incidence of the condition than others. For example, it is estimated that approximately 40% of the total population of the People's Republic of China has myopia. While there are many vision correction options for people with myopia, for a very significant number of those people with myopia, glasses are the best option. However, glasses are not generally compatible with virtual reality (VR) headsets.

"While there are a significant number of handheld VR systems and VR headsets on the market, the current options for dealing with myopia are mechanical adjustments, such as adjusting the distance of a VR screen to the user's eyes, using a mechanical gear that the user turns, or having a user choose and plug in adjustment lenses into the VR system. Manual adjustment based on current options results in deviation from proper correction. Additionally, the setup and overall user experience suffers as a result of requiring manual adjustments. Finally, the current adjustment mechanisms often result in reduced comfort (e.g., pressure or pain or eye strain or other discomfort) for the user, or can result in scratches on a user's glasses or the VR headset lens or both.

"Descriptions of certain details and implementations follow, including a description of the figures, which may depict some or all of the embodiments described below, as well as discussing other potential embodiments or implementations of the inventive concepts presented herein."

In addition to obtaining background information on this patent, VerticalNews editors also obtained the inventors' summary information for this patent: "As described herein, a virtual reality (VR) headset system includes a vision correction module. The vision correction system can detect a degree of myopia of a user of the VR system, and then adjust a vision correction lens to adjust for user myopia. An implementation of the vision correction module can adjust right and left lenses separately. A VR system can include additional elements compared to traditional systems. Namely, the VR system can include one or more elements to detect a need for vision correction, and one or more elements to apply vision correction.

"Descriptions throughout refer to myopia or nearsightedness. Seeing that nearsightedness is a most common vision ailment, examples and descriptions are made in reference to myopia. However, the vision correction is not limited to correction for myopia. In one embodiment, vision correction can include correction for myopia. In one embodiment, vision correction can include correction for hyperopia. In one embodiment, vision correction can include correction for amblyopia. In one embodiment, vision correction can include correction for presbyopia. In one embodiment, the vision correction can include correction for a combination of these. Thus, it will be understood that vision correction operations that include an adjustment of one or more lenses can refer to an adjustment of the lenses to adjustment or movement for purposes of vision correction for any of these conditions or a combination."

The claims supplied by the inventors are:

"1. An apparatus for a virtual reality (VR) interaction, comprising: a housing to position in front of a user's eyes, the housing including a mount for a virtual reality image source to display images for the VR interaction; separately adjustable right and left lenses; and a focus unit to automatically initiate a vision-correction

adjustment measurement in response to initiation of the VR interaction by the user, including to separately adjust a position of the right lens and a position of the left lens with respect to the mount, to provide separate right vision and left vision correction adjustments image for a user, the focus unit including an infrared (IR) source to transmit an IR signal toward the user's eyes, when worn by the user, and to adjust the adjustable right and left lenses in response to measure reflections of the IR signal from the user's eyes to generate the vision-correction measurement in response to initiation of the VR interaction by the user, the focus unit to automatically initiate a vision-correction adjustment based on the vision-correction measurement, including to separately adjust a position of the right lens and a position of the left lens with respect to the mount.

"2. The apparatus of claim 1, wherein the adjustable lens comprises a lens of the housing to display the VR image.

"3. The apparatus of claim 1, wherein the adjustable lens comprises a lens separate from a lens of the housing to display the VR image.

"4. The apparatus of claim 1, further comprising a dedicated virtual reality image source mounted in the mount.

"5. The apparatus of claim 1, wherein the mount is to receive a mobile device as the virtual reality image source.

"6. The apparatus of claim 1, wherein the adjustable lens and the focus unit are included on an optometry unit mounted to the housing.

"7. The apparatus of claim 1, further comprising: a micro axis stepper motor to adjust the adjustable lens; and a motor driver to provide a control signal to the stepper motor.

"8. The apparatus of claim 1, wherein the focus unit is to adjust the position of the adjustable lens to provide vision correction for myopia, hyperopia, amblyopia, presbyopia, or a combination.

"9. The apparatus of claim 1, wherein the focus unit is to measure reflections of the IR signal including to measure how much IR light is captured from reflections from the user's eyes.

"10. A method for a virtual reality (VR) interaction, comprising: detecting initiation of the VR interaction; automatically initiating a vision-correction measurement to detect a degree of myopia of eyes of a user of a VR system with an automatic optometry unit of the VR system in response to detection of initiation of the VR interaction by the user, including transmitting an infrared (IR) signal toward the user's eyes, when the VR system is worn by the user and measuring reflections of the IR signal from the user's eyes to generate the vision-correction measurement; and automatically initiating a vision-correction adjustment based on the vision correction measurement in response to the initiation of the VR interaction by the user, including separately adjusting a position of a left vision correction lens and a position of a right vision correction lens of the VR system to provide a vision-corrected image based on the degree of myopia detected.

"11. The method of claim 10, wherein separately adjusting a position of a left vision correction lens and a position of a right vision correction lens comprises adjusting vision correction lenses that are separate from a lens of the VR system to display a VR image.

"12. The method of claim 10, wherein adjusting the position of the vision correction lens comprises providing a control signal to a micro axis stepper motor from a motor driver.

"13. The method of claim 10, wherein adjusting the position of the vision correction lens comprises adjusting the position of the adjustable lens to provide vision correction for myopia, hyperopia, amblyopia, presbyopia, or a combination.

"14. The method of claim 10, wherein measuring the reflections of the IR signal comprises measuring how much IR light is captured from reflections from the user's eyes."

For more information, see this patent: Han, Ke. Virtual reality (VR) system with nearsightedness optometry adjustment. U.S. Patent Number 11099385, filed December 30, 2016, and published online on August 24, 2021. Patent URL:

<http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetacgi%2FPTO%2Fsrchnum.htm&r=1&f=G&I=50&s1=11099385.PN.&OS=PN/11099385RS=PN/11099385>

Keywords for this news article include: Myopia, Business, Ophthalmology, Nearsightedness, Intel Corporation, Refractive Errors, Health and Medicine, Technology Companies, Semiconductor Companies, Eye Diseases and Conditions, Semiconductor - Broad Line Companies.

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Document INVWK00020210910eh9a000on

Intel Presents NUC X15 Reference Gaming Laptop Kit – Features Tiger Lake-H CPUs & GeForce RTX 30 Series GPUs

Jason R. Wilson

472 words

9 September 2021

Wccftech.com

NEWAGAE

English

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Intel has released its newest reference gaming laptop kit, the [NUC X15](#). The Intel NUC X15 follows the release of the NUC M15 laptop kit released last year. Intel's new reference laptop kit for gaming showcases two models—the Intel Core i5-11400H and Intel Core i7-11800H CPU versions, utilizing the [Tiger Lake-H architecture](#) with NVIDIA GeForce RTX 30 series GPUs.

Intel's NUC X15 Reference Gaming Laptop Launched With 11th Gen Tiger Lake CPUs & GeForce RTX 30 GPUs

The NUC X15 with Intel Core i5-11400H utilizes the NVIDIA GeForce RTX 3060 with a 144 Hz refresh rate on their 15.6" FullHD panel display while the Intel Core i7-11800H comes in both GeForce RTX 3070 and RTX 3060 flavors.

[Click to view image.](#)

The Intel i5 series model utilizes six cores, while the i7 model uses 8 cores. The i7 core model also presents a 240 HZ FullHD panel, along with a 165 Hz QHD 15.6" panel option. It also has 64 gigabytes of DDR4-3200-RAM as well as PCIe 4.0 SSD capability in the two M.2 slots available.

The Intel i7 NUC X15 laptop features WiFi 6 and up to 2.5 Gbps networking speeds through its ethernet port. It also has three USB ports, a Thunderbolt 4 compatible port, and USB 3.2 Gen 2 ports. An HDMI 2.1 port allows for high-resolution output on the 15.6" screen. An SDXC card reader is present as well.

The laptop sports a mechanical keyboard with anti-ghosting, N-key rollover, and optical switches. The keyboard also presents RGB backlighting for long hours of use in any lighting situation. The new NUC X15 series gaming notebook is a powerful lightweight gaming laptop weighing less than 2 kg and measuring 357 x 235 x 21.65 mm, making it a worthy competitor in the notebook market.

* [Click to view image.](#)

* [Click to view image.](#)

No pricing has become released yet by Intel. However, due to the gaming laptops utilizing Tiger Lake architecture, it is possible that there will be a higher cost than entry-level gaming laptops. There is also no word on who will be partnering with Intel out of the gate. During the release of the NUC M15 laptop kit released last year, ADATA was the first company to partner with the manufacturer to create their own brand-named version, showcasing Intel's NUC M15 gaming laptop kit at the time. It is possible that with the need for more gaming options available now during this time in the market that the list of partners might be in higher quantities.

Source: [Golem](#), [Computer Base](#)

[Click to view image.](#)

Document NEWAGAE020210909eh990002t

Asus TUF Gaming F15 Laptop 11th Gen Intel Core i3-1115G4 Integrated 8GB 256GB SSD Windows 10 - K513EA-BN333TS

168 words

7 September 2021

Kuwait Times

MEWKUT

English

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Asus TUF Gaming F15 K513EA-BN333TS Laptop 11th Gen Intel Core i3-1115G4 Integrated 8GB 256GB SSD Windows 10 laptop has a 15.6 Inches display for your daily needs. This laptop is powered by 11th Gen Intel Core i3-1115G4 processor, coupled with 8GB of RAM and has 256GB SSD storage at this price point.

It runs on undefined operating system. As far as the graphics card is concerned this notebook has a undefined Integrated graphics card to manage the graphical functions. To keep it alive, it has a 3 cell Li-Ion battery and weighs 3.5 Kg.

Asus TUF Gaming F15 K513EA-BN333TS Laptop 11th Gen Intel Core i3-1115G4 Integrated 8GB 256GB SSD Windows 10 Price In India

Asus TUF Gaming F15 K513EA-BN333TS Laptop 11th Gen Intel Core i3-1115G4 Integrated 8GB 256GB SSD Windows 10 laptop price in India is Rs 46,490.

Document MEWKUT0020210907eh970008g

Best Intel Gamer Day Deals: Big Savings on Gaming PCs, Laptops and CPUs

Jason England

949 words

3 September 2021

Tom's Hardware

TOMHA

English

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We are into the final few days of the [Intel Gamer Days 2021](#) sale. This is your last chance to save big on gaming PCs and laptops, and Intel CPUs.

As part of the event, retailers are taking up to \$500 off gaming PCs and laptops, and up to \$60 off the latest 11th Gen Intel Core CPUs. Participating stores include [Amazon](#), [Newegg](#), [B&H](#), [ABS](#), [Best Buy](#) and more.

Here are the standout deals worth your hard-earned money.

Best Intel Gamer Days 2021 deals: Gaming PCs

[toCheeeek](#)

ABS Master Gaming PC: [was \\$1,599, now \\$1,499 at Newegg](#)

Packed with plenty of power, this configuration of ABS' Master sports an Intel Core i7-11700F CPU, GeForce RTX 3060 GPU, 16GB DDR4 RAM and a 1TB NVMe SSD.

[toCheeeek](#)

Alienware Aurora R12: [was \\$2,489.99, now \\$2,155.99 at Dell](#)

This powerful configuration of Alienware's Aurora R12 features an Intel Core i7-11700F CPU, Nvidia GeForce RTX 3080 GPU, 16GB DDR4 XMP RAM and a 512GB M.2 NVMe SSD + 1TB 7,200RPM HDD.

[toCheeeek](#)

CyberPower PC Gamer Supreme: [was \\$2,349, now \\$2,069 at Adorama](#)

Stuffed full of bleeding edge components, CyberPower has outdone itself with this impressive \$280 discount. This PC sports an 11th Gen Intel Core i9 processor, RTX 3070 graphics, 16GB DDR4 RAM and a storage pairing of 1TB NVMe SSD and 2TB HDD.

[toCheeeek](#)

ABS Master Gaming PC: [was \\$3,299, now \\$2,799 at Newegg](#)

Need the GPU cream of the crop? This ABS Legend rig comes with an RTX 3080 Ti GPU, alongside 10th Gen Intel Core i7, 16GB RAM and a 1TB SSD.

Best Intel Gamer Days 2021 deals: Gaming Laptops

[toCheeeek](#)

MSI Katana: [was \\$1,049, now \\$879 at Adorama](#)

This RTX 3050-armed powerhouse features an 11th Gen Intel Core i5 CPU, 8GB RAM and a 512GB SSD — all the power you need for a great entry-level gaming laptop.

[toCheeeek](#)

Alienware m15 R4: [was \\$3,309 now \\$2,400 @ Dell](#)

This configuration of Alienware's gaming laptop features an Intel Core i9-10980HK CPU, Nvidia GeForce RTX 3080 GPU with 8GB GDDR6, a massive 32GB of DDR4 RAM and 1.5TB of SSD storage.

[toCheeeek](#)

Acer Predator Helios 300 w/ RTX 3060 GPU: [was \\$1,299, now \\$1,144 at Amazon](#)

This configuration packs a FHD 15.6-inch display with 144Hz refresh rate, 10th Gen Intel Core i7-11800H 8-core CPU, 16GB of RAM and a 512B SSD. RTX 3060 handles the graphics requirements of the latest games with ease.

[toCheeeek](#)

Alienware m15 R4: [was \\$1,899, now \\$1,699 at Amazon](#)

Elsewhere, other Alienware machines usually come with a price premium, but not with this deal! This specced-out m15 R4 features an RTX 3060, 10th Gen Intel Core i7, 16GB DDR4 RAM and a 512GB SSD.

[toCheeeek](#)

Gigabyte Aero 15 OLED (RTX 3060): [was \\$1,899, now \\$1,499 at Best Buy](#)

Technically not a gaming laptop, but with enough power to be one. Gigabyte's Aero 15 creator's machine packs an 11th Gen Intel Core i7 CPU, RTX 3060 GPU, 16GB RAM and a 1TB SSD — all with a gorgeous 4K OLED display up top.

[toCheeeek](#)

\$1,000 off an RTX 3080 laptop

Gigabyte Aero 15 OLED YD (RTX 3080): [was \\$2,999, now \\$1,999 @ Newegg](#)

Get \$1,000 off this stunner of a machine, which uses a 4K Samsung AMOLED panel that covers 100 percent of the DCI-P3 gamut and supports DisplayHDR 400. This system also has a Core i7-11800H CPU, 16GB of RAM and a 1TB SSD. Its RTX 3080 has a boost clock of 1,245 MHz and a maximum graphics power of 105W.

[toCheeeek](#)

Razer Blade Pro 17: [was \\$3,199, now \\$2,499 at Amazon](#)

If you don't need the latest RTX 30-series GPU, you can find some huge savings amongst hardware that packs a whole lot of power. This Razer Blade Pro 17 features an Intel Core i7-10875 CPU, RTX 2080 SUPER Max-Q graphics, 16GB RAM and a 512GB SSD, alongside a gorgeous 17.3-inch FHD display with 300Hz refresh rate.

Best Intel Gamer Days 2021 deals: CPUs

[toCheeeek](#)

Intel Core i9-11900K: [was \\$549, now \\$519 at Newegg with code GMEDAYS36](#)

This top-of-the-line consumer CPU from Intel packs 8 cores, 16 threads and a max clock speed of a blistering 5.3 GHz. Alongside this, you've got PCIe Gen 4 support, a 125W TDP and Intel's Turbo Boost Max technology.

[toCheeeek](#)

Intel Core i7-11700K: [was \\$419, now \\$359 at Newegg with code GMEDAYS37](#)

A huge discount on this CPU which offers solid gaming and application performance, as you can read in our [review](#). This 14nm Rocket Lake CPU offers a max speed of 5 GHz.

[toCheeeek](#)

Intel Core i7-10700K: [was \\$319, now \\$299 at Newegg with code GMEDAYS35](#)

Step back a generation to the more-than-capable Intel Core i7-10700K CPU and get a deeper discount. Enjoy stellar real world performance on the cheap with this max clock speed of 5.3 GHz.

[toCheeeek](#)

Intel Core i5-10600KA Avengers Edition: [was \\$229, now \\$189 at Newegg with code 96LBRDAY87](#)

This Avengers special edition of the Intel Core i5-10600KA offers one-of-a-kind packaging for this powerful CPU. With 8 cores, 16 threads and a max clock speed of 4.8 GHz, this is a great addition to any build.

Intel Gamer Day deals will be available through September 5.

[Click to view image](#)

Document TOMHA00020210903eh930008m

Intel Gamer Days brings discounts galore on gaming laptops, PCs and more

Jenae Sitzes
915 words
30 August 2021
CNET News.com
CNEWSN
English

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One of PC gaming's biggest weeks is in full swing: [Intel Gamer Days 2021](#) kicked off on Aug. 27 and runs through [Labor Day](#), Sept. 6. In addition to tournaments and giveaways, the celebration also brings a wave of steep discounts on gaming laptops, PCs and other gaming-related tech. As usual, all the big PC gaming brands are getting in on the action, from Razer and Corsair to MSI and HP. Big retailers like Walmart, Amazon and Best Buy have their own collections of Intel Gamer Days deals as well. With all of the hubbub around Intel Gamer Days this year, it can be difficult to dig through it all and find what you need, but if you're looking to invest in a new gaming laptop or PC, we've got you covered with some of the best Intel Gamer Days deals and sales happening this week.

Razer Blade 15 Advanced Gaming Laptop

Save \$900

[Click to view image.](#)

Amazon

Razer's spotlight deal for Intel Gamer Days 2021 is on its Blade 15 Advanced gaming laptop, which has dropped from \$2,600 to \$1,700 with a very nice bonus: free codes for [Humankind](#) and [Crysis Remastered Trilogy](#). This is an awesome deal on a fantastic laptop that comes equipped with Nvidia's GeForce RTX 2070 Super MaxQ graphics card, a 10th-gen Intel Core i7 processor and an OLED 4K touch display. Competitive players can take advantage of refresh rates up to 300Hz and a max 3ms response time. This laptop also has a thin and compact design made of sturdy CNC aluminum and a finish designed to resist minor scratches and scuffs.

As usual, the Razer Blade 15 Advanced's main drawback is its hefty list price, but at \$1,700 during Intel Gamer Days, it's well worth considering. We haven't tested this particular model, but you can check out our [review of 2019's Razer Blade Advanced \(RTX 2060\)](#) for our thoughts on a similar laptop.

[\\$1,700.00 AT AMAZON](#)

- * [Save \\$700 on the Razer Pro 17 Gaming Laptop](#)
- * [Save \\$335 on the Razer Blade 15 Base Gaming Laptop](#)
- * [Save \\$250 on the MSI GF65 Thin Gaming Laptop after \\$100 rebate](#)
- * [Save \\$250 on the MSI Sword 15 Gaming Laptop](#)
- * [Save \\$169 on the MSI Katana GF66](#)
- * [Save \\$75 on the Asus TUF F17 Gaming Laptop](#)

CyberPowerPC Gamer Supreme

Save \$280

[Click to view image.](#)

Adorama

Gaming PCs are a major focus of Intel Gamer Days this year, with components and prebuilt PCs seeing discounts across the board. Adorama has a wide range of gaming PCs on sale, including this configuration from CyberPowerPC that boasts an Nvidia GeForce RTX 3070, an Intel Core i9-11900KF processor, 16GB of

RAM, a 1TB PCIe NVMe SSD and more. With an instant rebate, you can get the entire build for just over \$2,000.

[\\$2,070.00 AT ADORAMA](#)

- * [CLX: Save up to \\$400 on Intel-based CLX gaming PCs](#)
- * [Dell: Save up to \\$500 on XPS and Alienware desktops](#)
- * [Newegg: Save up to \\$500 on Intel-based gaming PCs](#)
- * [iBuyPower: Save on gaming PCs and components](#)
- * [Adorama: Save up to \\$430 on gaming PCs](#)

Intel Core i9-11900K CPU

Save \$30

[Click to view image.](#)

Newegg

Released earlier this year, [Intel's Core i9-11900K](#) is one of the top gaming CPUs on the market today, and though still a pricey upgrade, it's \$30 off with code GMEDAYS36 at checkout. The 11th-gen desktop CPU features a max 5.3GHz clock speed, eight cores, 16 threads, PCIe Gen 4 support and more.

[\\$520.00 AT NEWEGG](#)

MSI Optix Ultrawide Gaming Monitor

Save \$250

[Click to view image.](#)

Amazon

If you're looking for a curved, ultrawide display, MSI's 34-inch Optix MPG341CQR is a great pick at just \$550 today. This 1440p, 144Hz VA monitor has both [FreeSync and G-Sync compatibility](#) to prevent tearing and stuttering, a 1ms response time, and RGB lights along the bottom that are reactive to certain in-game features (you can also turn these off if you find them distracting). It also features adaptive brightness to automatically tune your screen's brightness to the appropriate level based on the room you're in.

[\\$550.00 AT AMAZON](#)

Razer Kishi Mobile Controller for iOS

Save \$35

[Click to view image.](#)

Amazon

Microsoft's [Xbox Cloud Gaming arrived on iOS](#) earlier this summer, and right now, you can snag one of the [best phone controllers](#) for a fraction of its usual price. The [Razer Kishi](#) for iOS tends to be pricier than its Android counterpart, but it's on sale for \$64.49 during Intel Gamer Days, a notable drop from its \$100 list price. The Kishi doesn't connect via Bluetooth like many other phone controllers; instead, it plugs directly into your phone's charging port for zero-latency gaming (you can also continue charging your phone while using the controller). The Kishi also features a traditional controller layout with clickable thumbsticks, a D-pad, left and right triggers, and ABXY buttons; overall, it gives you a much more comfortable, ergonomic grip compared to using your phone on its own. Another perk of the Kishi is that it's compatible with a wide range of phones -- you can [check Razer's compatibility list](#) to confirm your phone will work with the Kishi.

[\\$64.00 AT AMAZON](#)

Document CNEWSN0020210831eh8u0000h

Intel Gamer Days: \$900 off gaming laptop deals end today on Razer, Alienware, and more

Alex Whitelock

1,252 words

27 August 2021

TechRadar

TECHR

English

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The Intel Gamer Days event is now live and it includes some fantastic gaming laptop deals - here are our top picks.

The Intel Gamer Days event has launched today, and with it, a ton of excellent gaming laptop deals at Amazon, Newegg, Best Buy, and other leading retailers.

We've been excitedly rummaging through the various listings today, and so far, our top picks are this gorgeous RTX 2070 Razer Blade 15 [for \\$1,399.99 \(was \\$2,299.99\)](#) and this great RTX 3060-equipped MSI GF65 [for \\$919.99 \(was \\$1,099.99\)](#). Huge savings aside, both of these are listed at the lowest prices we've seen yet and are the best bang-for-the-buck gaming laptop deals you'll find in the mid to upper price brackets right now.

Amazon's gaming laptop deals on Razer machines are ending today - so don't leave it too long if you're interested in these stunning, premium machines.

While those are our two top picks for today's Intel Gamer Days gaming laptop deals, you'll find a few more worthy additions just down below with full savings, specs, and our thoughts on each machine. The Intel Gamer Days event also lasts for 10 days, so we'll be sure to update this page if we spot any more worthy picks.

Before you jump in, know that most of these machines are pretty pricey indeed. Most are from premium brands like Razer and Alienware and are packing the latest Nvidia RTX graphics cards. While you'll definitely get some rather slick aesthetics and more power than you could ever need with these machines, those on a budget should see our page on this week's [best cheap gaming laptop deals](#).

Intel Gamer Days gaming laptop deals

Our top picks for today

[toCheeeek](#)

MSI GF65 15.6-inch gaming laptop: [\\$1,099.99 \\$919.99 at Best Buy](#)

Save \$180 - We've seen this RTX 3060 equipped MSI GF65 on sale before at Best Buy, but never at a price this low before. A combination of that RTX 3060, 8GB of RAM, 512GB SSD, and Intel Core i5-10500H make this one very capable mid-range machine indeed. Don't turn your nose up at that i5 CPU either - it's a fairly recent addition for Intel and one that's capable of nearly matching a Core i7-10750H in performance.

[toCheeeek](#)

Razer Blade 15 Base (2020): [\\$2,299.99 \\$1,399.99 at Amazon](#)

Save \$900 - A 4K OLED display, RTX 2070, 16GB RAM, 512GB SSD, and Intel Core i7-10750H make this gorgeous Mercury White Razer Blade 15 a fantastic buy, even though it's a little older spec now. It's worth noting that the 4K display here is touchscreen and 60Hz, which isn't the speediest for gaming, but it'll easily blow away most laptop displays when it comes to colors that really pop. Plus, all your games will look absolutely amazing.

More Intel Days gaming laptop deals

[toCheeeek](#)

Razer Blade Stealth 13 (2021): [\\$1,799.99 \\$1,449.99 at Amazon](#)

Save \$350 - Amazon's Intel Gamer Days sale includes the lowest price we've ever seen on the new Razer Blade Stealth 13. This 2021 model features a GTX 1650 Ti, Intel Core i7-1165G7, 16GB of RAM, and 512GB SSD - insanely great specs for a 13-inch machine. While not super powerful like the other Razer laptops above, this is a great choice if mobility is your number one priority.

[toCheeeek](#)

Razer Blade 15 Advanced (2020): [\\$2,599.99 \\$1,699.99 at Amazon](#)

Save \$900 - And, the 2020's Razer Blade 15 Advanced model is also included in today's gaming laptop deals at Amazon. This one's still rocking that RTX 2060, 16GB of RAM, and 512GB SSD, but ups the processor to an Intel Core i7-10875H and also features a 300Hz display. In short, it's not quite as good of a deal as the baseline version with an OLED panel above, but it's slightly more powerful and features a screen that's capable of rendering more frames per second.

[toCheeeek](#)

Razer Blade 17 Pro (2020): [\\$3,199.99 \\$2,249.99 at Amazon](#)

Save \$950 - The biggest, meanest Razer Blade on our list is this insanely spec'ed out Razer Blade 17 Pro with an RTX 2080, Intel Core i7-10875H, 16GB of RAM, and 512GB SSD. While pretty damn pricey, the saving here at Amazon is absolutely huge today and well worth considering if you're looking for that truly premium mobile gaming experience.

[toCheeeek](#)

Alienware m15 R4 15.6-inch gaming laptop: [\\$1,899.99 \\$1,549.98 at Amazon](#)

Save \$350 - An Intel Core i7-10870H, 16GB of RAM, 512GB SSD, and RTX 3060 makes this 2021 Alienware M15 R4 capable of pushing out some serious performance at 1080p. Like our featured Razer deals, these machines are exceptionally premium builds with not just specs in mind, but cooling performance and style too.

[toCheeeek](#)

Alienware m17 R4 17.3-inch gaming laptop: [\\$2,239 \\$2,039.98 at Amazon](#)

Save \$200 - With an Intel Core i7-10870H, 16GB of RAM, 1TB SSD, and RTX 3060, you'll have plenty of power to render your games in all their full glory on this larger 17.3-inch Alienware m17. It's worth noting that this m17 doesn't just come with a larger display, but one that runs at 360Hz with an insanely low 5ms response rate. In short, this is one excellent option for a desktop replacement.

[toCheeeek](#)

Gigabyte Aero 15.6-inch gaming laptop: [\\$1,899.99 \\$1,299.99 at Best Buy](#)

Save \$600 - This Gigabyte Aero features an RTX 3060, Intel Core i7-11800H, 16GB of RAM, a 1TB SSD, and a 4K OLED display - absolutely insane specs for this price. The CPU especially is very high-end here, and the 4K OLED display makes this machine a sort of halfway house between a gaming laptop and a design laptop. Bear in mind the display won't be as high refresh rate as some cheaper LED panels, but it will render a gorgeous picture.

[toCheeeek](#)

Gigabyte Aorus 15P YD gaming laptop: [\\$2,399 \\$2,349 at Newegg](#)

Save \$50 - Our RTX 3080 pick from today's gaming laptop deals is this Gigabyte Aorus at Newegg - a machine packing not just that beefy GPU, but an Intel Core i7-11800H, 32GB of RAM, and a 1TB SSD. There's no other way to put it - these are some absolutely eye-watering specs that will absolutely demolish any game you throw at it.

More Intel Gamer Days sales and links

* Intel Gamer Days - [see the main page for this 10-day deals and giveaways event](#)

* Amazon - [see Amazon's main Intel Gamer Days page](#)

* Adorama - [exclusive deals on gaming PCs, accessories, and peripherals](#)

* Best Buy - [excellent sales on gaming laptops now live](#)

* B&H Photo - [prizes and giveaways on gaming laptops and components](#)

* Microsoft - [savings on HyperX and Kingston peripherals](#)

* Newegg - [good prices on high-end RTX 3000 series machines](#)

* Razer - [exclusive giveaways on peripherals plus discounted Blade laptops](#)

Also, while you're here, why not read our page on the upcoming [Labor Day sales](#) - an event that's sure to have plenty to check out for gamers.

[Intel Gamer Days gaming laptop deals here \(Future\)](#)

Document TECHR00020210827eh8r000ul

Best Intel Gamer Day Deals: Big Savings on Gaming PCs, Laptops and CPUs

Jason England

783 words

27 August 2021

Tom's Hardware

TOMHA

English

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From gaming rigs to CPUs, we're rounding up the best Intel Gamer Day deals of the moment.

Forget back-to-school season. Intel is celebrating PC gamers during its first ever [Intel Gamer Days 2021](#). The ten-day celebration includes limited-time savings on all things related to gaming.

As part of the event, retailers are taking up to \$500 off gaming PCs and laptops, and up to \$60 off the latest 11th Gen Intel Core CPUs. Participating stores include [Amazon](#), [Newegg](#), [B&H](#), [ABS](#), [Best Buy](#) and more.

Here are the standout deals worth your hard-earned money.

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[toCheeeek](#)

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[toCheeeek](#)

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[toCheeeek](#)

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Best Intel Gamer Days 2021 deals: Gaming Laptops

[toCheeeek](#)

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[toCheeeek](#)

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[toCheeeek](#)

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Best Intel Gamer Days 2021 deals: CPUs

[toCheeeek](#)

Intel Core i9-11900K: [was \\$549, now \\$519 at Newegg with core GMEDAYS36](#)

This top-of-the-line consumer CPU from Intel packs 8 cores, 16 threads and a max clock speed of a blistering 5.3 GHz. Alongside this, you've got PCIe Gen 4 support, a 125W TDP and Intel's Turbo Boost Max technology.

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Intel Core i7-11700K: [was \\$419, now \\$359 at Newegg with code AFMW824E](#)

A huge discount on this CPU which offers solid gaming and application performance, as you can read in our [review](#). This 14nm Rocket Lake CPU offers a max speed of 5 GHz.

[toCheeeek](#)

Intel Core i7-10700K: [was \\$319, now \\$299 at Newegg with code GMEDAYS35](#)

Step back a generation to the more-than-capable Intel Core i7-10700K CPU and get a deeper discount. Enjoy stellar real world performance on the cheap with this max clock speed of 5.3 GHz.

[toCheeeek](#)

Intel Core i5-10600KA Avengers Edition: [was \\$229, now \\$194 at Newegg with code GMEDAYS34](#)

This Avengers special edition of the Intel Core i5-10600KA offers one-of-a-kind packaging for this powerful CPU. With 8 cores, 16 threads and a max clock speed of 4.8 GHz, this is a great addition to any build.

Intel Gamer Day deals will be available through September 5.

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Document TOMHA00020210827eh8r0005s

Intel ARC Gaming Graphics Cards With Xe-HPG GPU Will Be Ready To Overclock Through Driver UI At Launch

Hassan Mujtaba

574 words

24 August 2021

Wccftech.com

NEWAGAE

English

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Intel's VP & GM of Client Graphics Products & Solutions has highlighted that [ARC high-performance gaming graphics cards](#) will be ready for overclocking at launch through the driver UI. He talked more about the Xe-HPG powered Alchemist GPU lineup in an article published on [Medium](#), shedding light on the ARC branding, Xe-HPG architecture, and what sort of features to expect from the lineup at launch.

Intel ARC Gaming Graphics Cards Will Support Overclocking Through Driver UI at Launch, Full DirectX 12 Ultimate Compliancy

The Intel ARC series will be a brand new graphics lineup in the PC industry and will also feature a brand new GPU architecture. Currently, AMD and NVIDIA graphics cards can be overclocked with almost any overclocking utility with the most common ones being MSI Afterburner or the in-driver UI itself.

Overclocking utilities offer far more control in terms of clock tuning, voltage adjustments, fan RPM configurations, and setting a custom power plan/power limit. Generally, the first GPU overclocking support always comes within Driver UI unless AIBs are getting the graphics cards too so they can optimize their overclocking software and utilities around the new GPU architecture. It is unclear if Intel will have the same level of AIB support for their graphics card lineup at launch so their first OC support for ARC gaming graphics cards will come directly within the Driver UI.

Many gamers are also creators, so we're developing robust capture capabilities that leverage our powerful encoding hardware. These include a virtual camera with AI assist and recorded game highlights that save your best moments. We're even integrating overclocking controls into the driver UI to give enthusiasts the tools they need to push the hardware to the limit.

[via Intel](#)

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Additionally, Intel has a nice driver suite that lets you overclock their recent discrete & integrated graphics solutions. We can expect a revamp of the Intel Driver UI suite once the ARC graphics cards launch like the major overhaul AMD did with their Catalyst and Adrenalin suites prior to moving to RDNA graphics architecture. In addition to overclocking support, Intel has also confirmed [full DX12 Ultimate compliance](#) on their ARC series of graphics cards powered by the Xe-HPG Alchemist GPU.

Drivers are an important part of the experience. We've made big strides recently with our integrated graphics, improving throughput for CPU-bound titles, accelerating load times by enhancing shader compiling, and implementing major changes affecting over 100 games.

For the past three years, we've also been working closely with Microsoft to co-engineer DirectX 12 Ultimate. In addition to supporting ray tracing effects via DXR, Intel ARC graphics products will be capable of boosting performance with variable rate shading tier 2 and unlocking greater geometry details with mesh shading.

[via Intel](#)

Mark this on your calendars! <https://t.co/OohjfxL4sR>

— Intel Graphics (@IntelGraphics) [August 23, 2021](#)

The post also talks about other features such as [XeSS](#) which is going to be a major game-changer for Intel against NVIDIA's DLSS and AMD's FSR. We already have an interview lined up featuring Intel's Principal Engineer, Karthik Vaidyanathan, who was instrumental to XeSS development and will be published in a few hours so make sure you check that out.

[Click to view image.](#)

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Lenovo IdeaPad Gaming 3i Upgraded With Intel Core i7-11370H CPU, Nvidia GeForce RTX 3050 GPU in India

406 words

24 August 2021

Khaleej Times

KHALEJ

English

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Lenovo IdeaPad Gaming 3i laptop has been refreshed in India and it comes with the latest Intel 11th Gen H-series processors and Nvidia GeForce RTX 30 series GPU. The gaming laptop comes with a high refresh rate display with slim bezels on the side and thick bezels on the top and bottom. It also offers the latest connectivity options, including Wi-Fi 6 and Thunderbolt 4. The laptop also has a backlit keyboard and slim form factor. Lenovo IdeaPad Gaming 3i comes with Windows 10 Home pre-installed.

Lenovo IdeaPad Gaming 3i price in India, availability

Lenovo IdeaPad Gaming 3i starts at Rs. 89,990 in India and will go on sale starting August 24, as per a press release. It will be available to purchase via Amazon and Lenovo website at first, with Flipkart and other offline channels following soon. As of now, there is only one configuration available for Lenovo IdeaPad Gaming 3i.

Epic Games Says Google Paid Phone, Game Makers to Avoid App Store Hit

Lenovo IdeaPad Gaming 3i specifications, features

Lenovo IdeaPad Gaming 3i runs Windows 10 Home out-of-the-box. The gaming laptop features a 15.6-inch full-HD (1,920x1,080 pixels) IPS anti-glare display with 120Hz refresh rate, 250 nits of peak brightness, 45 percent NTSC coverage, and DC dimming. Under the hood, it is powered by an Intel Core i7-11370H processor, paired with 8GB of RAM and 512GB of M.2 2280 PCIe 3.0x4 NVMe SSD storage. It also sports an Nvidia GeForce RTX 3050 GPU with 4GB GDDR6 VRAM and 90W maximum Total Graphics Power (TGP).

Lenovo Rides Work-From-Home Demand to Beat Q1 Profit Expectations

Audio is handled by two 2W stereo speakers with Nahimic Audio. They use a High Definition (HD) Audio chip with Realtek ALC3287 codec. The laptop has a 720p webcam with a shutter and connectivity options include Wi-Fi 6, Bluetooth, Thunderbolt 4, and more. There is a 45Whr battery on Lenovo IdeaPad Gaming 3i with support for Rapid Charge Pro, that can provide 50 percent battery power in just 30 minutes of charging. The keyboard is backlit with white lighting and there is a dedicated number pad as well. In terms of dimensions, Lenovo IdeaPad Gaming 3i measures 359.6x251.9x24.2mm and weighs 2.25kg.

Document KHALEJ0020210824eh8o00109

Intel's Alder Lake CPUs could be gaming powerhouses (eventually)

Darren Allan

501 words

23 August 2021

TechRadar

TECHR

English

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Here's why Intel Alder Lake processors could be great news for gamers.

Intel has disclosed more about how Alder Lake [processors](#) will work for gamers, and as we've heard in the past via the rumor mill, the power-efficient ("little") cores should more than pull their weight even for gaming on a desktop PC – in certain scenarios.

Team Blue has already explained how these 12th-gen CPUs, with their mix of performance (normal) and efficient (low-power) cores, [will work with Windows 11](#) to get the most out of the processor's abilities. Alder Lake will have a Thread Director, a hardware-based scheduler to work in tandem with Windows 11's thread scheduler, enabling the operating system to fully optimize CPU performance for different workloads.

* Here are the [best gaming PCs](#)

* We've picked out all the [best processors](#)

* And [the best cheap RAM](#) prices and deals

And when it comes to gaming workloads, as PC Gamer [reports](#), Intel's Ran Berenson, GM of Core and Client Development Group, laid out the advantages of [Alder Lake](#) in no uncertain terms: "The best example that we have in the lab is gaming in parallel to whatever other workloads that you're running. Can be streaming, can be web browsing."

Intel gives an example of playing and recording a game, a scenario in which the beefy powerful cores are running the actual game, with the low-power cores providing the wherewithal to tackle recording duties. Similarly, if you're running Discord during a gaming session, the small cores could handle that.

Alder Lake's little cores won't just be about dealing with tasks on the side for gamers, though, and separately Intel detailed the way in which these cores – which are shaping up to be surprisingly powerful, beating out a Skylake (6th-gen) core in terms of IPC (instructions per clock), but with better power-efficiency – could boost gaming frame rates.

Games will have to be optimized for Alder Lake silicon to do so, of course, and to take advantage of the full amount of threads on offer, which will be 24-threads with the flagship (8 full-power cores, amounting to 16-threads with hyperthreading, with a further 8 low-power cores without hyperthreading).

Berenson [told](#) PC Gamer: "If the game is optimized to use a lot of threads and it's not the old old games today, yes, it will be very beneficial for the game, you know, to run physics on a specific core and run audio announcements on the other core."

So, while existing games won't be able to squeeze the full potential from the 24-threads of the Alder Lake flagship, titles coming down the line will – providing the developer optimizes for them.

Intel makes it clear that there's a "lot of room for optimization" when it comes to gaming on 12th-gen CPUs.

[Happy PC gamer celebrating \(Shutterstock / Gorodenkoff\)](#)

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Intel Core i9-12900K 16 Core Alder Lake CPU Benchmarked on ASUS ROG STRIX Z690-E Gaming WIFI Motherboard, Faster Than Core i9-11900K

Hassan Mujtaba

837 words

22 August 2021

Wccftech.com

NEWAGAE

English

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A brand new benchmark of Intel's Core i9-12900K [Alder Lake-S Flagship Desktop CPU](#) has popped up within the [Puget System benchmark database](#) along with the first entry of ASUS's upcoming ROG STRIX Z690-E Gaming WIFI motherboard.

Intel Core i9-12900K Alder Lake CPU Benchmarked With ASUS ROG STRIX Z690-E Gaming WIFI Motherboard, Faster Than AMD Ryzen 9 5950X And i9-11900K

Two entries for the Intel Core i9-12900K Desktop CPU were made within the Puget Systems data-base. Based on the new benchmarks, this chip looks to be a qualification sample with much higher clock speeds than what we have seen on early engineering samples. The CPU was tested on ASUS's ROG STRIX Z690-E Gaming WIFI motherboard which is part of the next-gen ROG lineup & this entry seems to be made by accident by someone at ASUS's HQ. The test setup was running 64 GB DDR5-4800 (2 x 32 GB) memory and an NVIDIA GeForce RTX 3090 graphics card on the Windows 10 OS.

[Click to view image.](#)

Coming straight to the performance numbers, the Intel Core i9-12900K scored 1575 points which put it ahead of the Core i9-11900K in the same benchmark. The AMD Ryzen 9 5950X scores an overall 1581 points whereas the Intel Core i9-11900K scores 1548 points. The Intel Core i9-11900K is an 8 core chip whereas the AMD Ryzen 9 5950X features 16 cores which means this benchmark (After Effects 0.93.2) isn't really optimized for high-core count processors. But this is the [2nd leaked benchmark](#) that shows the Core i9-12900K sitting ahead of the Ryzen 9 5950X.

[Click to view image.](#)

Despite all, the Core i9-12900K coming close to the Core i9-11900K and Ryzen 9 5950X in its current state is a big feat. We have to remember that Alder Lake CPUs, even in QS state, won't deliver full performance capability until they receive proper BIOS and OS support. We have previously seen this with Intel's Rocket Lake chips which didn't receive proper BIOS support till a few days prior to their launch. Furthermore, Intel's Alder Lake CPUs are based on a [hybrid architecture](#) & will require extensive updates through Windows 11 to fully unlock their performance and multi-threaded core potential.

[Click to access link.](#)

A crucial element to this was announced by Intel during its Architecture Day 2021 & is known as '[Thread Director](#)'. It is a hardware-based scheduler that finally has visibility into the type of threads being scheduled. The technology would first be available in Alder Lake CPUs where it will work with Windows 11 to prioritize tasks to the various cores based on their nature. For the first time, a hardware scheduler can send background tasks to the small cores and performance-requiring tasks to the performance cores.

Intel Core i9-12900K 16 Core / 24 Thread Desktop CPU

The Intel Core i9-12900K will be the flagship chip in the 12th Gen Alder Lake Desktop CPU lineup. It will feature 8 Golden Cove cores and 8 Gracemont cores for a total of 16 cores (8+8) and 24 threads (16+8). The P-cores (Golden Cove) will operate at a maximum boost frequency of up to 5.3 GHz with 1-2 active cores and 5.0 GHz with all-cores active while the E-cores (Gracemont) will operate at 3.90 GHz across 1-4 cores and up to 3.7 GHz when all cores are loaded. The CPU will feature 30 MB of L3 cache and TDP values are maintained at 125W (PL1) and 228W (PL2).

[Click to view image.](#)

Intel 12th Gen Alder Lake Desktop CPU Specs "Rumored"

CPU Name	P-Core Count	E-Core Count	Total Core / Thread	P-Core Base / Boost (Max)	P-Core Boost (All-Core)	E-Core Base / Boost	E-Core Boost (All-Core)
Cache TDP	Price						
Intel Core i9-12900K	8		16 / 24	TBA / 5.3 GHz			
5.0 GHz (All Core)					TBA / 3.9 GHz	3.7 GHz (All Core)	
30 MB 125W (PL1) 228W (PL2) TBA							
Intel Core i7-12700K	8		16 / 20	TBA / 5.0 GHz			
4.7 GHz (All Core)					TBA / 3.8 GHz	3.6 GHz (All Core)	
25 MB 125W (PL1) 228W (PL2) TBA							
Intel Core i5-12600K	6		12 / 16	TBA / 4.9 GHz			
4.5 GHz (All Core)					TBA / 3.6 GHz	3.4 GHz (All Core)	
20 MB 125W (PL1) 228W (PL2) TBA							

The [Intel Alder Lake Desktop CPUs](#) are expected to launch in Q4 2021 and will be the first mainstream consumer platform to utilize PCIe5.0 and DDR5 technologies along with a new hybrid architecture approach, something that Microsoft has optimized for its [Windows 11 operating system](#).

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online news

Intel Xe HPC Architecture Detailed, Has Dual-Use as Compute and Cloud-Gaming Accelerator

623 words

20 August 2021

ETMAG.com

FMETMA

English

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Intel's Xe HPC (high performance compute) architecture powers the company's most powerful vector compute device to date, codenamed "Ponte Vecchio." The processor is designed for massive HPC and AI compute applications, but also features raster graphics and real-time raytracing hardware, giving it a dual-use as a cloud gaming GPU. Our Xe HPG architecture article covers the basics of how Intel is laying its client discrete GPUs out. The Xe HPC architecture both scales-up and scales-out from that. The Xe-core, the basic indivisible sub-unit, of the Xe HPC architecture is different from that of Xe HPG. While Xe HPG cores contain sixteen 256-bit vector engines alongside sixteen 1024-bit matrix engines; the Xe HPC cores features eight 512-bit vector engines, besides eight 4096-bit matrix engines. It also features higher load/store throughput, and a larger 512 KB L1 cache.

The Xe HPC core vector unit is designed for full FP64 performance, of 256 ops per clock, which is identical to its FP32 throughput. It also offers 512 ops/clock FP16. The matrix unit, on the other hand, packs a punch—2,048 TF32 ops/cycle, up to 4,096 FP16 and BF16 ops/cycle, and 8,192 INT8 ops/cycle. Things get interesting as we scale up from here. The Xe HPC Slice is a grouping of 16 Xe HPC cores, along with 16 dedicated Raytracing Units that are just as capable as the ones on the Xe HPG (calculating ray traversal, bounding box intersection, and triangle intersection). The Xe HPC Slice cumulatively has 8 MB of L1 cache on its own. A Xe HPC compute tile, or Xe HPC Stack, contains four such Xe HPC Slices, 64 Xe HPC cores, 64 Raytracing Units, 4 hardware contexts, sharing a large 144 MB L2 cache. The uncore components include a PCI-Express 5.0 x16 interface, a 4096-bit wide HBM2E memory interface, a media-acceleration engine with fixed-function hardware to accelerate decode (and possibly encode) of popular video formats, and Xe Link, an interconnect designed to interface with up to 8 other Xe HPC dual-stacks, for a total of up to 16 stacks. Each dual-stack uses a low-latency stack-to-stack interconnect. A dual-stack hence ends up to 128 Xe HPC cores, 128 Raytracing Units, two media engines, and an 8192-bit wide HBM2E interface. The dual-stack is a relevant grouping here, as the "Ponte Vecchio" processor features two compute tiles (two Xe HPG Stacks), and eight HBM2E memory stacks. It's important to note here, that the Xe HPC Slices sit in specialized dies called compute tiles that are fabricated TSMC's 5 nm N5 node, while the rest of the hardware sits on a base die that's built on the Intel 7 node (10 nm Enhanced SuperFin). The two dies are Foveros-stacked with 36-micron bumps. The Xe Link tile is a separate piece of silicon dedicated for networking with neighboring packages. This die is built on TSMC 7 nm node, and consists mainly of SerDes (serializer-deserializer) components. Each "Ponte Vecchio" OAM with two Xe HPC stacks (one MCM) a combined memory bandwidth of over 5 TB/s, and Xe Link connectivity bandwidth of over 2 TB/s. A "Ponte Vecchio" x4 Subsystem holds four such OAMs, and is designed for a 1U node with two Xeon "Sapphire Rapids" processors. The four "Ponte Vecchio" and two "Sapphire Rapids" packages are each liquid-cooled. Hardware is only part of the story, Intel is investing considerably on OneAPI, a collective programming environment for both the CPU and GPU.

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