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American multinational technology company For other uses, see AMD (disambiguation). Not to be confused with Advanced Micro Foundry or Applied Materials. Advanced Micro Devices, Inc.Headquarters in Santa Clara, California, in 2020Trade nameAMDCompany typePublicTraded asNasdaq: AMDNasdaq-100 componentS&P 100 componentS&P 500 componentIndustrySemiconductorsFoundedMay 1, 1969; 56 years ago (1969-05-01)FounderTeam led by Jerry SandersHeadquartersSanta Clara, California, United States37°22′56″N 121°58′15″W / 37.38222°N 121.97083°W / 37.38222; -121.97083 (Advanced Micro Devices Headquarters)Area servedWorldwideKey peopleLisa Su (chair & CEO)Mark Papermaster (CTO)Products AMD CPUs AMD GPUs BrandsRyzenRadeonAthlonEpycThreadripperVirtexVivadoSempronDuronAMD InstinctRevenue US$25.79 billion (2024)Operating income US$1.900 billion (2024)Net income US$1.641 billion (2024)Total assets US$69.23 billion (2024)Total equity US$57.57 billion (2024)Number of employeesc. 28,000 (2024)Websiteamd.comFootnotes / references[1] Advanced Micro Devices, Inc. (AMD) is an American multinational corporation and technology company headquartered in Santa Clara, California and maintains significant operations in Austin, Texas. AMD is a hardware and fabless company that designs and develops central processing units (CPUs), graphics processing units (GPUs), field-programmable gate arrays (FPGAs), system-on-chip (SoC), and high-performance computer solutions. AMD serves a wide range of business and consumer markets, including gaming, data centers, artificial intelligence (AI), and embedded systems. AMD's main products include microprocessors, motherboard chipsets, embedded processors, and graphics processors for servers, workstations, personal computers, and embedded system applications. The company has also expanded into new markets, such as the data center, gaming, and high-performance computing[2] markets. AMD's processors are used in a wide range of computing devices, including personal computers, servers, laptops, and gaming consoles. While it initially manufactured its own processors, the company later outsourced its manufacturing, after GlobalFoundries was spun off in 2009. Through its Xilinx acquisition in 2022, AMD offers field-programmable gate array (FPGA) products. AMD was founded in 1969 by Jerry Sanders and a group of other technology professionals. The company's early products were primarily memory chips and other components for computers. In 1975, AMD entered the microprocessor market, competing with Intel, its main rival in the industry. In the early 2000s, it experienced significant growth and success, thanks in part to its strong position in the PC market and the success of its Athlon and Opteron processors. However, the company faced challenges in the late 2000s and early 2010s, as it struggled to keep up with Intel in the race to produce faster and more powerful processors. In the late 2010s, AMD regained market share by pursuing a penetration pricing strategy[3] and building on the success of its Ryzen processors, which were considerably more competitive with Intel microprocessors in terms of performance whilst offering attractive pricing.[4] In 2022, AMD surpassed Intel by market capitalization for the first time.[5][6] AMD's former headquarters in Sunnyvale, California (demolished in 2019) AMD's campus in Markham, Ontario, Canada, formerly ATI headquarters AMD's LEED-certified Lone Star campus in Austin, Texas Advanced Micro Devices was formally incorporated by Jerry Sanders, along with seven of his colleagues from Fairchild Semiconductor, on May 1, 1969.[7][8] Sanders, an electrical engineer who was the director of marketing at Fairchild, had, like many Fairchild executives, grown frustrated with the increasing lack of support, opportunity, and flexibility within the company. He later decided to leave to start his own semiconductor company,[9] following the footsteps of Robert Noyce (developer of the first silicon integrated circuit at Fairchild in 1959)[10] and Gordon Moore, who together founded the semiconductor company Intel in July 1968.[11] In September 1969, AMD moved from its temporary location in Santa Clara to Sunnyvale, California.[12] To immediately secure a customer base, AMD initially became a second source supplier of microchips designed by Fairchild and National Semiconductor.[13][14] AMD first focused on producing logic chips.[15] The company guaranteed quality control to United States Military Standard, an advantage in the early computer industry since unreliability in microchips was a distinct problem that customers – including computer manufacturers, the telecommunications industry, and instrument manufacturers – wanted to avoid.[13][16][17][18] In November 1969, the company manufactured its first product: the Am9300, a 4-bit MSI shift register, which began selling in 1970.[18][19] Also in 1970, AMD produced its first proprietary product, the Am2501 logic counter, which was highly successful.[20][21] Its bestselling product in 1971 was the Am2505, the fastest multiplier available.[20][22] In 1971, AMD entered the RAM chip market, beginning with the Am3101, a 64-bit bipolar RAM.[22][23] That year AMD also greatly increased the sales volume of its linear integrated circuits, and by year-end the company's total annual sales reached US$4.6 million.[20][24] AMD went public in September 1972.[13][25][26] The company was a second source for Intel MOS/LSI circuits by 1973, with products such as Am14/1506 and Am14/1507, dual 100-bit dynamic shift registers.[27][28] By 1975, AMD was producing 212 products – of which 49 were proprietary, including the Am9102 (a static N-channel 1024-bit RAM)[29] and three low-power Schottky MSI circuits: Am25LS07, Am25LS08, and Am25LS09.[30] Intel had created the first microprocessor, its 4-bit 4004, in 1971.[31][32] By 1975, AMD entered the microprocessor market with the Am9080, a reverse-engineered clone of the Intel 8080,[33][34][35] and the Am2900 bit-slice microprocessor family.[34] When Intel began installing microcode in its microprocessors in 1976, it entered into a cross-licensing agreement with AMD, which was granted a copyright license to the microcode in its microprocessors and peripherals, effective October 1976.[30][36][37][38][39] In 1977, AMD entered into a joint venture with Siemens, a German engineering conglomerate wishing to enhance its technology expertise and enter the American market.[40] Siemens purchased 20% of AMD's stock, giving the company an infusion of cash to increase its product lines.[40][41][42] The two companies also jointly established Advanced Micro Computers (AMC), located in Silicon Valley and in Germany, allowing AMD to enter the microcomputer development and manufacturing field,[40][43][44][45] in particular based on AMD's second-source Zilog Z8000 microprocessors.[46][47] When the two companies' vision for Advanced Micro Computers diverged, AMD bought out Siemens' stake in the American division in 1979.[48][49] AMD closed Advanced Micro Computers in late 1981 after switching focus to manufacturing second-source Intel x86 microprocessors.[46][50][51] Total sales in fiscal year 1978 topped $100 million,[43] and in 1979, AMD debuted on the New York Stock Exchange.[21] In 1979, production also began on AMD's new semiconductor fabrication plant in Austin, Texas;[21] the company already had overseas assembly facilities in Penang and Manila,[52] and began construction on a fabrication plant in San Antonio in 1981.[53] In 1980, AMD began supplying semiconductor products for telecommunications, an industry undergoing rapid expansion and innovation.[54] Intel had introduced the first x86 microprocessors in 1978.[55] In 1981, IBM created its PC, and wanted Intel's x86 processors, but only under the condition that Intel would also provide a second-source manufacturer for its patented x86 microprocessors.[16] Intel and AMD entered into a 10-year technology exchange agreement, first signed in October 1981[50][56] and formally executed in February 1982.[39] The terms of the agreement were that each company could acquire the right to become a second-source manufacturer of semiconductor products developed by the other; that is, each party could "earn" the right to manufacture and sell a product developed by the other, if agreed to, by exchanging the manufacturing rights to a product of equivalent technical complexity. The technical information and licenses needed to make and sell a part would be exchanged for a royalty to the developing company.[38] The 1982 agreement also extended the 1976 AMD–Intel cross-licensing agreement through 1995.[38][39] The agreement included the right to invoke arbitration of disagreements, and after five years the right of either party to end the agreement with one year's notice.[38] The main result of the 1982 agreement was that AMD became a second-source manufacturer of Intel's x86 microprocessors and related chips, and Intel provided AMD with database tapes for its 8086, 80186, and 80286 chips.[39] However, in the event of a bankruptcy or takeover of AMD, the cross-licensing agreement would be effectively canceled.[57] Beginning in 1982, AMD began volume-producing second-source Intel-licensed 8086, 8088, 80186, and 80188 processors, and by 1984, its own Am286 clone of Intel's 80286 processor, for the rapidly growing market of IBM PCs and IBM clones.[16][58] It also continued its successful concentration on proprietary bipolar chips.[59] The company continued to spend greatly on research and development,[60] and created the world's first 512K EPROM in 1984.[61] That year, AMD was listed in the book The 100 Best Companies to Work for in America,[53][62] and later made the Fortune 500 list for the first time in 1985.[63][64] By mid-1985, the microchip market experienced a severe downturn, mainly due to long-term aggressive trade practices (dumping) from Japan, but also due to a crowded and non-innovative chip market in the United States.[65] AMD rode out the mid-1980s crisis by aggressively innovating and modernizing,[66] devising the Liberty Chip program of designing and manufacturing one new chip or chipset per week for 52 weeks in fiscal year 1986,[53][67] and by heavily lobbying the U.S. government until sanctions and restrictions were put in place to prevent predatory Japanese pricing.[68] During this time, AMD withdrew from the DRAM market,[69] and made some headway into the CMOS market, which it had lagged in entering, having focused instead on bipolar chips.[70] AMD had some success in the mid-1980s with the AMD7910 and AMD7911 "World Chip" FSK modem, one of the first multi-standard devices that covered both Bell and CCITT tones at up to 1200 baud half duplex or 300/300 full duplex.[71] Beginning in 1986, AMD embraced the perceived shift toward RISC with their own AMD Am29000 (29k) processor;[72] the 29k survived as an embedded processor.[73][74] The company also increased its EPROM memory market share in the late 1980s.[75] Throughout the 1980s, AMD was a second-source supplier of Intel x86 processors. In 1991, it introduced its 386-compatible Am386, an AMD-designed chip. Creating its own chips, AMD began to compete directly with Intel.[76] AMD had a large, successful flash memory business, even during the dotcom bust.[77] In 2003, to divest some manufacturing and aid its overall cash flow, which was under duress from aggressive microprocessor competition from Intel, AMD spun off its flash memory business and manufacturing into Spansion, a joint venture with Fujitsu, which had been co-manufacturing flash memory with AMD since 1993.[78][79] In December 2005, AMD divested itself of Spansion to focus on the microprocessor market, and Spansion went public in an IPO.[80] On July 24, 2006, AMD announced its acquisition of the Canadian 3D graphics card company ATI Technologies. AMD paid $4.3 billion and 58 million shares of its capital stock, for approximately $5.4 billion. The transaction was completed on October 25, 2006.[81] On August 30, 2010, AMD announced that it would retire the ATI brand name for its graphics chipsets in favor of the AMD brand name.[82][83] In October 2008, AMD announced plans to spin off manufacturing operations in the form of GlobalFoundries Inc., a multibillion-dollar joint venture with Advanced Technology Investment Co., an investment company formed by the government of Abu Dhabi. The partnership and spin-off gave AMD an infusion of cash and allowed it to focus solely on chip design.[84] To assure the Abu Dhabi investors of the new venture's success, AMD's CEO Hector Ruiz stepped down in July 2008, while remaining executive chairman, in preparation for becoming chairman of GlobalFoundries in March 2009.[85][86] President and COO Dirk Meyer became AMD's CEO.[87] Recessionary losses necessitated AMD cutting 1,100 jobs in 2009.[88] In August 2011, AMD announced that former Lenovo executive Rory Read would be joining the company as CEO, replacing Meyer.[89] In November 2011, AMD announced plans to lay off more than 10% (1,400) of its employees from across all divisions worldwide.[90] In October 2012, it announced plans to lay off an additional 15% of its workforce to reduce costs in the face of declining sales revenue.[91] The inclusion of AMD chips into the PlayStation 4 and Xbox One were later seen as saving AMD from bankruptcy.[92][93] AMD acquired the low-power server manufacturer SeaMicro in early 2012, with an eye to bringing out an Arm64 server chip.[94] On October 8, 2014, AMD announced that Rory Read had stepped down after three years as president and chief executive officer.[95] He was succeeded by Lisa Su, a key lieutenant who had been chief operating officer since June.[96] On October 16, 2014, AMD announced a new restructuring plan along with its Q3 results. Effective July 1, 2014, AMD reorganized into two business groups: Computing and Graphics, which primarily includes desktop and notebook processors and chipsets, discrete GPUs, and professional graphics; and Enterprise, Embedded, and Semi-Custom, which primarily includes server and embedded processors, dense servers, semi-custom SoC products (including solutions for gaming consoles), engineering services, and royalties. As part of this restructuring, AMD announced that 7% of its global workforce would be laid off by the end of 2014.[97] After the GlobalFoundries spin-off and subsequent layoffs, AMD was left with significant vacant space at 1 AMD Place, its aging Sunnyvale headquarters office complex. In August 2016, AMD's 47 years in Sunnyvale came to a close when it signed a lease with the Irvine Company for a new 220,000 sq. ft. headquarters building in Santa Clara.[98] AMD's new location at Santa Clara Square faces the headquarters of archrival Intel across the Bayshore Freeway and San Tomas Aquino Creek. Around the same time, AMD also agreed to sell 1 AMD Place to the Irvine Company.[99] In April 2019, the Irvine Company secured approval from the Sunnyvale City Council of its plans to demolish 1 AMD Place and redevelop the entire 32-acre site into townhomes and apartments.[99] In October 2020, AMD announced that it was acquiring Xilinx, one of the market leaders in field programmable gate arrays and complex programmable logic devices (FPGAs and CPLDs) in an all-stock transaction. The acquisition was completed in February 2022, with an estimated acquisition price of $50 billion.[100][101] In October 2023, AMD acquired an open-source AI software provider, Nod.ai, to bolster its AI software ecosystem.[102][103] In January 2024, AMD announced it was discontinuing the production of all complex programmable logic devices (CPLDs) acquired through Xilinx.[104] In March 2024, a rally in semiconductor stocks pushed AMD's valuation above $300B for the first time.[105] In July 2024, AMD announced that it would acquire the Finnish-based artificial intelligence startup company Silo AI in a $665 million all-cash deal in an attempt to better compete with AI chip market leader Nvidia.[106] In August 2024, AMD sign a deal to acquire ZT Systems for $4.9 billion. The company creates custom computing infrastructure that is used for AI tasks.[107] Name Years Position, education Jerry Sanders 1969–2002 Founder, electrical engineer Hector Ruiz 2002–2008 Electrical engineer Dirk Meyer 2008–2011 Computer engineer Rory Read 2011–2014 Information Systems Lisa Su 2014–present Electrical engineer See also: List of AMD processors AMD microprocessors Am2900 series (1975) AMD 29000 series (1987–1995) Am386 Amx86 series (1991–1995) K5 architecture (1996) K6 architecture (1997–2001) Bulldozer Series CPUs Bulldozer, Piledriver, Steamroller, Excavator (2011–2017) Bobcat series APUs Bobcat, Jaguar, Puma (2011–present) Zen core architecture (2017) Zen 2 series (released 2019) Zen 3 series (released 2020) Zen 4 series (released 2022) Zen 5 series (released 2024) Main articles: Am286, Am386, Am486, and Am5x86 In February 1982, AMD signed a contract with Intel, becoming a licensed second-source manufacturer of 8086 and 8088 processors. IBM wanted to use the Intel 8088 in its IBM PC, but its policy at the time was to require at least two sources for its chips. AMD later produced the Am286 under the same arrangement. In 1984, Intel internally decided to no longer cooperate with AMD in supplying product information to shore up its advantage in the marketplace, and delayed and eventually refused to convey the technical details of the Intel 80386.[108] In 1987, AMD invoked arbitration over the issue, and Intel reacted by canceling the 1982 technological-exchange agreement altogether.[109][110] After three years of testimony, AMD eventually won in arbitration in 1992, but Intel disputed this decision. Another long legal dispute followed, ending in 1994 when the Supreme Court of California sided with the arbitrator and AMD.[111][112] In 1990, Intel countersued AMD, renegotiating AMD's right to use derivatives of Intel's microcode for its cloned processors.[113] In the face of uncertainty during the legal dispute, AMD was forced to develop clean room designed versions of Intel code for its x386 and x486 processors, the former long after Intel had released its own x386 in 1985.[114] In March 1991, AMD released the Am386, its clone of the Intel 386 processor.[53] By October of the same year it had sold one million units.[53] In 1993, AMD introduced the first of the Am486 family of processors,[21] which proved popular with a large number of original equipment manufacturers, including Compaq, which signed an exclusive agreement using the Am486.[13][115][116] The Am5x86, another Am486-based processor, was released in November 1995, and continued AMD's success as a fast, cost-effective processor.[117][118] Finally, in an agreement effective 1996, AMD received the rights to the microcode in Intel's x386 and x486 processor families, but not the rights to the microcode in the following generations of processors.[119][120] Main articles: AMD K5, AMD K6, Athlon, Duron, and Sempron AMD's first in-house x86 processor was the K5, launched in 1996.[121] The "K" in its name was a reference to Kryptonite, the only substance known to harm comic book character Superman. This itself was a reference to Intel's hegemony over the market, i.e., an anthropomorphization of them as Superman.[122] The number "5" was a reference to the fifth generation of x86 processors; rival Intel had previously introduced its line of fifth-generation x86 processors as Pentium because the U.S. Trademark and Patent Office had ruled that mere numbers could not be trademarked.[123] In 1996, AMD purchased NexGen, specifically for the rights to their Nx series of x86-compatible processors. AMD gave the NexGen design team their own building, left them alone, and gave them time and money to rework the Nx686. The result was the K6 processor, introduced in 1997. Although it was based on Socket 7, variants such as K6-III/450 were faster than Intel's Pentium II (sixth-generation processor). The K7 was AMD's seventh-generation x86 processor, making its debut under the brand name Athlon on June 23, 1999. Unlike previous AMD processors, it could not be used on the same motherboards as Intel's, due to licensing issues surrounding Intel's Slot 1 connector, and instead used a Slot A connector, referenced to the Alpha processor bus. The Duron was a lower-cost and limited version of the Athlon (64 KB instead of 256 KB L2 cache) in a 462-pin socketed PGA (socket A) or soldered directly onto the motherboard. Sempron was released as a lower-cost Athlon XP, replacing Duron in the socket A PGA era. It has since been migrated upward to all new sockets, up to AM3. On October 9, 2001, the Athlon XP was released. On February 10, 2003, the Athlon XP with 512 KB L2 Cache was released.[124] Main articles: Athlon 64, Opteron, and Phenom The K8 was a major revision of the K7 architecture, with the most notable features being the addition of a 64-bit extension to the x86 instruction set (called x86-64, AMD64, or x64), the incorporation of an on-chip memory controller, and the implementation of an extremely high-performance point-to-point interconnect called HyperTransport, as part of the Direct Connect Architecture. The technology was initially launched as the Opteron server-oriented processor on April 22, 2003.[125] Shortly thereafter, it was incorporated into a product for desktop PCs, branded Athlon 64.[126] On April 21, 2005, AMD released the first dual-core Opteron, an x86-based server CPU.[127] A month later, it released the Athlon 64 X2, the first desktop-based dual-core processor family.[128] In May 2007, AMD abandoned the string "64" in its dual-core desktop product branding, becoming Athlon X2, downplaying the significance of 64-bit computing in its processors. Further updates involved improvements to the microarchitecture, and a shift of the target market from mainstream desktop systems to value dual-core desktop systems. In 2008, AMD started to release dual-core Sempron processors exclusively in China, branded as the Sempron 2000 series, with lower HyperTransport speed and smaller L2 cache. AMD completed its dual-core product portfolio for each market segment. In September 2007, AMD released the first server Opteron K10 processors,[129] followed in November by the Phenom processor for desktop. K10 processors came in dual-core, triple-core,[130] and quad-core versions, with all cores on a single die. AMD released a new platform codenamed "Spider", which used the new Phenom processor, and an R770 GPU and a 790 GX/FX chipset from the AMD 700 chipset series.[131] However, AMD built the Spider at 65nm, which was uncompetitive with Intel's smaller and more power-efficient 45nm. In January 2009, AMD released a new processor line dubbed Phenom II, a refresh of the original Phenom built using the 45 nm process.[132] AMD's new platform, codenamed "Dragon", used the new Phenom II processor, and an ATI R770 GPU from the R700 GPU family, and a 790 GX/FX chipset from the AMD 700 chipset series.[133] The Phenom II came in dual-core, triple-core and quad-core variants, all using the same die, with cores disabled for the triple-core and dual-core versions. The Phenom II resolved issues that the original Phenom had, including a low clock speed, a small L3 cache, and a Cool'n'Quiet bug that decreased performance. The Phenom II cost less but was not performance-competitive with Intel's mid-to-high-range Core 2 Quads. The Phenom II also enhanced its predecessor's memory controller, allowing it to use DDR3 in a new native socket AM3, while maintaining backward compatibility with AM2+, the socket used for the Phenom, and allowing the use of the DDR2 memory that was used with the platform. In April 2010, AMD released a new Phenom II Hexa-core (6-core) processor codenamed "Thuban".[134] This was a totally new die based on the hexa-core "Istanbul" Opteron processor. It included AMD's "turbo core" technology, which allows the processor to automatically switch from 6 cores to 3 faster cores when more pure speed is needed. The Magny Cours and Lisbon server parts were released in 2010.[135] The Magny Cours part came in 8 to 12 cores and the Lisbon part in 4 and 6 core parts. Magny Cours is focused on performance while the Lisbon part is focused on high performance per watt. Magny Cours is an MCM (multi-chip module) with two hexa-core "Istanbul" Opteron parts. This will use a new socket G34 for dual and quad-socket processors and thus will be marketed as Opteron 61xx series processors. Lisbon uses socket C32 certified for dual-socket use or single socket use only and thus will be marketed as Opteron 41xx processors. Both will be built on a 45 nm SOI process. Main articles: AMD APU and AMD mobile platform Following AMD's 2006 acquisition of Canadian graphics company ATI Technologies, an initiative codenamed Fusion was announced to integrate a CPU and GPU together on some of AMD's microprocessors, including a built in PCI Express link to accommodate separate PCI Express peripherals, eliminating the northbridge chip from the motherboard. The initiative intended to move some of the processing originally done on the CPU (e.g. floating-point unit operations) to the GPU, which is better optimized for some calculations. The Fusion was later renamed the AMD APU (Accelerated Processing Unit).[136] Llano was AMD's first APU built for laptops. Llano was the second APU released,[137] targeted at the mainstream market.[136] It incorporated a CPU and GPU on the same die, and northbridge functions, and used "Socket FM1" with DDR3 memory. The CPU part of the processor was based on the Phenom II "Deneb" processor. AMD suffered an unexpected decrease in revenue based on production problems for the Llano.[138] More AMD APUs for laptops running Windows 7 and Windows 8 OS are being used commonly. These include AMD's price-point APUs, the E1 and E2, and their mainstream competitors with Intel's Core i-series: The Vision A- series, the A standing for accelerated. These range from the lower-performance A4 chipset to the A6, A8, and A10. These all incorporate next-generation Radeon graphics cards, with the A4 utilizing the base Radeon HD chip and the rest using a Radeon R4 graphics card, with the exception of the highest-model A10 (A10-7300) which uses an R6 graphics card. Main articles: Bulldozer microarchitecture, Piledriver microarchitecture, Steamroller microarchitecture, and Excavator microarchitecture Bulldozer was AMD's microarchitecture codename for server and desktop AMD FX processors, first released on October 12, 2011. This family 15h microarchitecture is the successor to the family 10h (K10) microarchitecture design. Bulldozer was a clean-sheet design, not a development of earlier processors.[139] The core was specifically aimed at 10–125 W TDP computing products. AMD claimed dramatic performance-per-watt efficiency improvements in high-performance computing (HPC) applications with Bulldozer cores. While hopes were high that Bulldozer would bring AMD to be performance-competitive with Intel once more, most benchmarks were disappointing. In some cases the new Bulldozer products were slower than the K10 models they were built to replace.[140][141][142] The Piledriver microarchitecture was the 2012 successor to Bulldozer, increasing clock speeds and performance relative to its predecessor.[143] Piledriver would be released in AMD FX, APU, and Opteron product lines.[144][145][146][147] Piledriver was subsequently followed by the Steamroller microarchitecture in 2013. Used exclusively in AMD's APUs, Steamroller focused on greater parallelism.[148][149] In 2015, the Excavator microarchitecture replaced Piledriver.[150] Expected to be the last microarchitecture of the Bulldozer series,[151][152] Excavator focused on improved power efficiency.[153] Main articles: Bobcat microarchitecture, Jaguar microarchitecture, and Puma microarchitecture The Bobcat microarchitecture was revealed during a speech from AMD executive vice-president Henri Richard in Computex 2007 and was put into production during the first quarter of 2011.[137] Based on the difficulty competing in the x86 market with a single core optimized for the 10–100 W range, AMD had developed a simpler core with a target range of 1–10 watts.[154] In addition, it was believed that the core could migrate into the hand-held space if the power consumption can be reduced to less than 1 W.[155] Jaguar is a microarchitecture codename for Bobcat's successor, released in 2013, that is used in various APUs from AMD aimed at the low-power/low-cost market.[156] Jaguar and its derivates would go on to be used in the custom APUs of the PlayStation 4,[157][158] Xbox One,[159][160] PlayStation 4 Pro,[161][162][163] Xbox One S,[164] and Xbox One X.[165][166] Jaguar would be later followed by the Puma microarchitecture in 2014.[167] In 2012, AMD announced it was working on ARM products, both as a semi-custom product and server product.[168][169][170] The initial server product was announced as the Opteron A1100 in 2014, an 8-core Cortex-A57-based ARMv8-A SoC,[171][172] and was expected to be followed by an APU incorporating a Graphics Core Next GPU.[173] However, the Opteron A1100 was not released until 2016, with the delay attributed to adding software support.[174] The A1100 was also criticized for not having support from major vendors upon its release.[174][175][176] In 2014, AMD also announced the K12 custom core for release in 2016.[177] While being ARMv8-A instruction set architecture compliant, the K12 was expected to be entirely custom-designed, targeting the server, embedded, and semi-custom markets. While ARM architecture development continued, products based on K12 were subsequently delayed with no release planned. Development of AMD's x86-based Zen microarchitecture was preferred.[178][179] Main article: Zen microarchitecture Zen is an architecture for x86-64 based Ryzen series of CPUs and APUs, introduced in 2017 by AMD and built from the ground up by a team led by Jim Keller, beginning with his arrival in 2012, and taping out before his departure in September 2015. One of AMD's primary goals with Zen was an IPC increase of at least 40%, however in February 2017 AMD announced that they had actually achieved a 52% increase.[180] Processors made on the Zen architecture are built on the 14 nm FinFET node and have a renewed focus on single-core performance and HSA compatibility.[181] Previous processors from AMD were either built in the 32 nm process ("Bulldozer" and "Piledriver" CPUs) or the 28 nm process ("Steamroller" and "Excavator" APUs). Because of this, Zen is much more energy efficient. The Zen architecture is the first to encompass CPUs and APUs from AMD built for a single socket (Socket AM4). Also new for this architecture is the implementation of simultaneous multithreading (SMT) technology, something Intel has had for years on some of their processors with their proprietary hyper-threading implementation of SMT. This is a departure from the "Clustered MultiThreading" design introduced with the Bulldozer architecture. Zen also has support for DDR4 memory. AMD released the Zen-based high-end Ryzen 7 "Summit Ridge" series CPUs on March 2, 2017,[182] mid-range Ryzen 5 series CPUs on April 11, 2017, and entry level Ryzen 3 series CPUs on July 27, 2017.[183] AMD later released the Epyc line of Zen derived server processors for 1P and 2P systems.[184] In October 2017, AMD released Zen-based APUs as Ryzen Mobile, incorporating Vega graphics cores.[185] In January 2018 AMD has announced their new lineup plans, with Ryzen 2.[186] AMD launched CPUs with the 12nm Zen+[187] microarchitecture in April 2018, following up with the 7nm Zen 2 microarchitecture in June 2019, including an update to the Epyc line with new processors using the Zen 2 microarchitecture in August 2019, and Zen 3 slated for release in Q3 2020. As of 2019, AMD's Ryzen processors were reported to outsell Intel's consumer desktop processors.[188] At CES 2020 AMD announced their Ryzen Mobile 4000, as the first 7 nm x86 mobile processor,[vague] the first 7 nm 8-core (also 16-thread) high-performance mobile processor, and the first 8-core (also 16-thread) processor for ultrathin laptops.[189] This generation is still based on the Zen 2 architecture. In October 2020, AMD announced new processors based on the Zen 3 architecture.[190] On PassMark's Single thread performance test the Ryzen 5 5600x bested all other CPUs besides the Ryzen 9 5950X.[191] In April 2020, AMD launched three new SKUs which target commercial HPC workloads & hyperconverged infrastructure applications. The launch was based on Epyc's 7 nm second-generation Rome platform and supported by Dell EMC, Hewlett Packard Enterprise, Lenovo, Supermicro, and Nutanix. IBM Cloud was its first public cloud partner.[192] In August 2022, AMD announced their initial lineup of CPUs based on the new Zen 4 architecture.[193] The Steam Deck,[194][195] PlayStation 5, Xbox Series X and Series S all use chips based on the Zen 2 microarchitecture, with proprietary tweaks and different configurations in each system's implementation than AMD sells in its own commercially available APUs.[196][197] In March 2025 AMD announced Instella an open source large language model.[198] Main articles: Radeon, Radeon Pro, Radeon Instinct, and list of AMD graphics processing units AMD graphics processing units Radeon R200 series (2001) Radeon R500 (2005) Radeon HD 2000 series (2007a) Radeon HD 3000 series (2007b) Radeon HD 4000 series (2008) Radeon HD 5000 series (2009) Radeon HD 6000 series (2010) Radeon HD 7000 series (2012) Radeon Rx 200 series (2013) Radeon RX 400 series (2016) Radeon RX 500 series (2016) Radeon RX Vega series (2017) Radeon RX 5000 series (2019) Radeon RX 6000 series (2020) Radeon RX 7000 series (2022) Main article: ATI Technologies Lee Ka Lau,[199] Francis Lau, Benny Lau, and Kwok Yuen Ho[200] founded ATI in 1985 as Array Technology Inc.[201] Working primarily in the OEM field, ATI produced integrated graphics cards for PC manufacturers such as IBM and Commodore. By 1987, ATI had grown into an independent graphics-card retailer, introducing EGA Wonder and VGA Wonder card product lines that year.[202] In the early nineties, they released products able to process graphics without the CPU: in May 1991, the Mach8, in 1992 the Mach32, which offered improved memory bandwidth and GUI acceleration. ATI Technologies Inc. went public in 1993, with shares listed on NASDAQ and on the Toronto Stock Exchange. ATI's former Silicon Valley office at 4555 Great America Pkwy, Santa Clara, CA ATI "Graphics Solution Rev 3" from 1985/1986, supporting Hercules graphics. As the PCB reveals, the layout dates from 1985, whereas the marking on the central chip CW16800-A says "8639"—meaning that chip was manufactured in week 39, 1986. Notice UM6845E CRT controller. This card uses the ISA 8-bit interface. ATI VGA Wonder with 256 KB RAM In 1994, the Mach64 accelerator debuted, powering the Graphics Xpression and Graphics Pro Turbo, offering hardware support for YUV-to-RGB colour space conversion in addition to hardware zoom; early techniques of hardware-based video acceleration. ATI introduced its first combination of 2D and 3D accelerator under the name 3D Rage. This chip was based on the Mach 64, but it featured elemental 3D acceleration. The ATI Rage line powered almost the entire range of ATI graphics products. In particular, the Rage Pro was one of the first viable 2D-plus-3D alternatives to 3dfx's 3D-only Voodoo chipset. 3D acceleration in the Rage line advanced from the basic functionality within the initial 3D Rage to a more advanced DirectX 6.0 accelerator in 1999 Rage 128. The All-in-Wonder product line, introduced in 1996, was the first combination of integrated graphics chip with TV tuner card and the first chip that enabled display of computer graphics on a TV set.[203] The cards featured 3D acceleration powered by ATI's 3D Rage II, 64-bit 2D performance, TV-quality video acceleration, analogue video capture, TV tuner functionality, flicker-free TV-out and stereo TV audio reception. ATI entered the mobile computing sector by introducing 3D-graphics acceleration to laptops in 1996. The Mobility product line had to meet requirements different from those of desktop PCs, such as minimized power usage, reduced heat output, TMDS output capabilities for laptop screens, and maximized integration. In 1997, ATI acquired Tseng Labs's graphics assets, which included 40 engineers. The Radeon line of graphics products was unveiled in 2000. The initial Radeon graphics processing unit offered an all-new design with DirectX 7.0 3D acceleration, video acceleration, and 2D acceleration. Technology developed for a specific Radeon generation could be built in varying levels of features and performance in order to provide products suited for the entire market range, from high-end to budget to mobile versions. In 2000, ATI acquired ArtX, which engineered the Flipper graphics chip used in the GameCube video game console. They also created a modified version of the chip (codenamed Hollywood) for the successor of the GameCube, the Wii. Microsoft contracted ATI to design the graphics core (codenamed Xenos) for the Xbox 360. Later in 2005, ATI acquired Terayon's cable modem silicon intellectual property, strengthening their lead in the consumer digital television market.[204] K. Y. Ho remained as Chairman of the Board until he retired in November 2005. Dave Orton replaced him as the President and CEO of the organization. On July 24, 2006, a joint announcement revealed that AMD would acquire ATI in a deal valued at $5.6 billion.[205] The acquisition consideration closed on October 25, 2006,[206] and included over $2 billion financed from a loan and 56 million shares of AMD stock.[207] ATI's operations became part of the AMD Graphics Product Group (GPG),[208] and ATI's CEO Dave Orton became the Executive Vice President of Visual and Media Businesses at AMD until his resignation in 2007.[209] The top-level management was reorganized with the Senior Vice President and General Manager, and the Senior Vice President and General Manager of Consumer Electronics Group, both of whom would report to the CEO of AMD.[210] On 30 August 2010, John Trikola announced that AMD would retire the ATI brand for its graphics chipsets in favour of the AMD name.[211] Main article: Radeon In 2007, the ATI division of AMD released the TeraScale microarchitecture implementing a unified shader model. This design replaced the previous fixed-function hardware of previous graphics cards with multipurpose, programmable shaders. Initially released as part of the GPU for the Xbox 360, this technology would go on to be used in Radeon branded HD 2000 parts. Three generations of TeraScale would be designed and used in parts from 2007 to 2015. In a 2009 restructuring, AMD merged the CPU and GPU divisions to support the company's APUs, which fused both graphics and general purpose processing.[212][213] In 2011, AMD released the successor to TeraScale, Graphics Core Next (GCN).[214] This new microarchitecture emphasized GPGPU compute capability in addition to graphics processing, with a particular aim of supporting heterogeneous computing on AMD's APUs. GCN's reduced instruction set ISA allowed for significantly increased compute capability over TeraScale's very long instruction word ISA. Since GCN's introduction with the HD 7970, five generations of the GCN architecture have been produced from 2011 through at least 2018.[215] In September 2015, AMD separated the graphics technology division of the company into an independent internal unit called the Radeon Technologies Group (RTG) headed by Raja Koduri.[216] This gave the graphics division of AMD autonomy in product design and marketing.[217][218] The RTG then went on to create and release the Polaris and Vega microarchitectures released in 2016 and 2017, respectively.[219][220] In particular the Vega, or fifth-generation GCN, microarchitecture includes a number of major revisions to improve performance and compute capabilities.[221][222] In November 2017, Raja Koduri left RTG[223] and CEO and President Lisa Su took his position. In January 2018, it was reported that two industry veterans joined RTG, namely Mike Rayfield as senior vice president and general manager of RTG, and David Wang as senior vice president of engineering for RTG.[224] In January 2020, AMD announced that its second-generation RDNA graphics architecture was in development, with the aim of competing with the Nvidia RTX graphics products for performance leadership. In October 2020, AMD announced their new RX 6000 series[225] series GPUs, their first high-end product based on RDNA2 and capable of handling ray-tracing natively, aiming to challenge Nvidia's RTX 3000 GPUs. In 2012, AMD's then CEO Rory Read began a program to offer semi-custom designs.[226][227] Rather than AMD simply designing and offering a single product, potential customers could work with AMD to design a custom chip based on AMD's intellectual property. Customers pay a non-recurring engineering fee for design and development, and a purchase price for the resulting semi-custom products. In particular, AMD noted their unique position of offering both x86 and graphics intellectual property. These semi-custom designs would have design wins as the APUs in the PlayStation 4 and Xbox One and the subsequent PlayStation 4 Pro, Xbox One S, Xbox One X, Xbox Series X/S, and PlayStation 5.[228][229][230][163][166][231] Financially, these semi-custom products would represent a majority of the company's revenue in 2016.[232][233] In November 2017, AMD and Intel announced that Intel would market a product combining in a single package an Intel Core CPU, a semi-custom AMD Radeon GPU, and HBM2 memory.[234] See also: Comparison of AMD chipsets Before the launch of Athlon 64 processors in 2003, AMD designed chipsets for their processors spanning the K6 and K7 processor generations. The chipsets include the AMD-640, AMD-751, and the AMD-761 chipsets. The situation changed in 2003 with the release of Athlon 64 processors, and AMD chose not to further design its own chipsets for its desktop processors while opening the desktop platform to allow other firms to design chipsets. This was the "Open Platform Management Architecture" with ATI, VIA and SiS developing their own chipset for Athlon 64 processors and later Athlon 64 X2 and Athlon 64 FX processors, including the Quad FX platform chipset from Nvidia. The initiative went further with the release of Opteron server processors as AMD stopped the design of server chipsets in 2004 after releasing the AMD-8111 chipset, and again opened the server platform for firms to develop chipsets for Opteron processors. As of today,[when?] Nvidia and Broadcom are the sole designing firms of server chipsets for Opteron processors. As the company completed the acquisition of ATI Technologies in 2006, the firm gained the ATI design team for chipsets which previously designed the Radeon Xpress 200 and the Radeon Xpress 3200 chipsets. AMD then renamed the chipsets for AMD processors under AMD branding (for instance, the CrossFire Xpress 3200 chipset was renamed as AMD 580X CrossFire chipset). In February 2007, AMD announced the first AMD-branded chipset since 2004 with the release of the AMD 690G chipset (previously under the development codename RS690), targeted at mainstream IGP computing. It was the industry's first to implement a HDMI 1.2 port on motherboards, shipping for more than a million units. While ATI had aimed at releasing an Intel IGP chipset, the plan was scrapped and the inventories of Radeon Xpress 1250 (codenamed RS600, sold under ATI brand) was sold to two OEMs, Abit and ASRock. Although AMD stated the firm would still produce Intel chips

module (two cores), and cooled with liquid helium.[312] The previous record was 8.308 GHz, with an Intel Celeron 352 (one core). On November 1, 2011, geek.com reported that Andre Yang, an overclocker from Taiwan, used an FX-8150 to set another record: 8.461 GHz.[313] On November 19, 2012, Andre Yang used an FX-8350 to set another record: 8.794 GHz.[314] Date Company Integration or division Price January 16, 1996 NexGen AMD K6 $857 million in AMD shares[315] February 6, 2002 Alchemy Semiconductor[316] Processors (embedded CPUs) Undisclosed August 6, 2003 Coatue[317] Memory (non-volatile polymer-based memory) Undisclosed July 24, 2006 ATI Technologies[318] Graphics and 3D software (Radeon GPUs) $5,400 million February 29, 2012 SeaMicro[319] Data center platform $334 million June 29, 2016 HiAlgo[320][321] Gaming experience (Radeon Chill, Radeon Boost and Radeon Swift) Undisclosed April 10, 2017 Nitero[322][323] 60 GHz wireless IP (headset AR and VR) Undisclosed October 27, 2020 Xilinx[324] Custom chips (FPGA, adaptive SoCs, system on modules, IA accelerator) $49,000 million April 4, 2022 Pensando[325] Data center, cloud solutions and DPUs $1,900 million August 29, 2023 Mipsology[326] AI inference software Undisclosed October 10, 2023 Nod.ai[102][103] Open-source AI software Undisclosed July 10, 2024 Silo AI[327] AI software $665 million August 19, 2024 ZT Systems[328] Data center hardware $4,900 million In its 2022 report, AMD stated that it aimed to embed environmental sustainability across its business, promote safe and responsible workplaces in its global supply chain and advance stronger communities.[329] In 2022, AMD achieved a 19 percent reduction in its Scope 1 and 2 GHG emissions compared to 2020. Based on AMD calculations that are third-party verified (limited level assurance).[330] The Green Grid,[331] founded by AMD together with other founders, such as IBM, Sun and Microsoft, to seek lower power consumption for grids. The AMD-logo on the rear spoiler of Michael Schumacher's F2005 from Ferrari, showing AMD's sponsorship at the 2005 German Grand Prix. AMD's sponsorship of Formula 1 racing began in 2002 and since 2020 has sponsored the Mercedes-AMG Petronas team.[332] AMD was also a sponsor of the BMW Sauber and Scuderia Ferrari Formula 1 teams together with Intel, Vodafone, AT&T, Pernod Ricard and Diageo.[333] On 18 April 2018, AMD began a multi-year sponsorship with Scuderia Ferrari.[334] In February 2020, just prior to the start of the 2020 race season, the Mercedes Formula 1 team announced it was adding AMD to its sponsorship portfolio.[335] AMD began a sponsorship deal with Victory Five (V5) for the League of Legends Pro League (LPL) in 2022.[336] AMD was a sponsor of the Chinese Dota Pro Circuit together with Perfect World.[337] In February 2024, AMD was a Diamond sponsor for the World Artificial Intelligence Cannes Festival (WAICF).[338] AMD was a Platinum sponsor for the HPE Discover 2024, an event hosted by Hewlett Packard Enterprise to showcase technology for government and business customers. The event was held from 17 to 20 June 2024 in Las Vegas.[339][340] Companies portalSan Francisco Bay Area portalUnited States portal 3DNow! Cool'n'Quiet Bill Gaede List of AMD accelerated processing units List of AMD chipsets List of AMD graphics processing units List of AMD processors List of ATI chipsets PowerNow! ^ "AMD 2024 Annual Report (Form 10-K)". U.S. Securities and Exchange Commission. February 5, 2025. ^ Ware, Ana (November 20, 2023). "AMD Delivers High Performance, High Efficiency CPUs and GPUs for All HPC Use Cases". HPCwire. Retrieved February 16, 2024. ^ "AMD's Extremely Successful Price Strategy Could Burden AMD And Intel Investors Long Term". seekingalpha.com. October 22, 2019. Retrieved August 23, 2024. ^ "AMD ascending: How Ryzen CPUs snatched the computing crown from Intel". PCWorld. March 31, 2020. Retrieved March 31, 2020. ^ "AMD's Market Cap Surpasses Intel for the First Time in History". Tom's Hardware. February 16, 2022. 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Join our visual experts and special guests for an info-packed hour of insights to elevate your next video project. Tune in on June 24 at 11am ET.Register NowEnjoy sharper detail, more accurate color, lifelike lighting, believable backgrounds, and more with our new model update. Your generated images will be more polished than ever.See What's NewExplore how consumers want to see climate stories told today, and what that means for your visuals.Download Our Latest VisualGPS ReportWant to give your brand videos a cinematic edge? Join our visual experts and special guests for an info-packed hour of insights to elevate your next video project. Tune in on June 24 at 11am ET.Register NowEnjoy sharper detail, more accurate color, lifelike lighting, believable backgrounds, and more with our new model update. Your generated images will be more polished than ever.See What's NewExplore how consumers want to see climate stories told today, and what that means for your visuals.Download Our Latest VisualGPS ReportIn this blog post, we will explore the compatibility of AMD motherboards with Intel processors and provide some insights into what you can expect if you decide to use an AMD motherboard with an Intel processor. The CPU socket on an AMD motherboard is typically compatible with both Intel and AMD processors, allowing you to easily install an Intel CPU and use it with your AMD motherboard. Whether you're building a new computer or upgrading your existing system, an AMD motherboard can be a great choice if you want to take advantage of the performance and features offered by Intel processors. Do AMD motherboards support Intel processors? This is a question that has been asked by many enthusiasts who are interested in building their own computers. In this blog post, we will explore the compatibility of AMD motherboards with Intel processors and provide some insights into what you can expect if you decide to use an AMD motherboard with an Intel processor. Stay tuned! Absolutely! AMD motherboards are specifically designed to support Intel processors. The CPU socket on an AMD motherboard is typically compatible with both Intel and AMD processors, allowing you to easily install an Intel CPU and use it with your AMD motherboard. However, it's important to note that while AMD motherboards can support Intel processors, they may not offer the same level of performance or compatibility as an Intel motherboard specifically designed for Intel processors. In addition, some features or compatibility issues may arise depending on the specific AMD motherboard and Intel processor combination you are using. To ensure optimal performance and compatibility, it's always a good idea to check the specifications of your AMD motherboard and Intel processor before making a purchase. You can also consult the motherboard manufacturer's website or technical support for more information about the compatibility and support for your specific configuration. Overall, AMD motherboards offer a great solution for users who want to install an Intel processor on their system. Whether you're building a new computer or upgrading your existing system, an AMD motherboard can be a great choice if you want to take advantage of the performance and features offered by Intel processors. 1. Increased performance: AMD motherboards often offer better performance than Intel motherboards, especially when paired with an Intel processor. 2. Better value for money: AMD motherboards typically cost less than Intel motherboards, making them a good option for those looking to save money on their build. 3. More features: AMD motherboards often come with more features than Intel motherboards, such as more USB ports, more RAM slots, and more overclocking options. 4. Compatibility: AMD motherboards are compatible with a wider range of processors than Intel motherboards, so they're a good option for those who want to use multiple processors in their build. 5. Future-proofing: AMD motherboards often support newer technologies than Intel motherboards, so they're a good option for those who want to build a future-proof system. An AMD motherboard with an Intel processor may seem like an odd combination, but there are some potential drawbacks to consider. Compatibility Issues: The motherboard and processor need to work together seamlessly, and not all motherboards are compatible with all processors. This can lead to compatibility issues, such as the computer not booting up or experiencing frequent crashes. Performance Issues: The motherboard and processor need to work together to achieve optimal performance. When they're not compatible, you may experience performance issues, such as slower processing speeds or decreased graphics capabilities. Limited Features: AMD motherboards often have more features than Intel motherboards, such as more USB ports, better audio support, and more advanced overclocking capabilities. If you're using an Intel processor with an AMD motherboard, you may miss out on some of these features. Compatibility with Existing Components: If you're building a computer from scratch, it may not be an issue, but if you're upgrading an existing computer, you may have compatibility issues with your existing components. For example, some motherboards only support certain generations of processors, so you may not be able to use your existing RAM or graphics card. Limited Upgrade Options: If you're using an Intel processor with an AMD motherboard, you may be limited in your ability to upgrade in the future. For example, you may not be able to upgrade to a newer AMD processor, or you may not be able to use certain Intel-specific features. So, if you're considering using an AMD motherboard with an Intel processor, it's important to weigh the pros and cons carefully. In some cases, it may be a better option to stick with a motherboard and processor from the same manufacturer. Yes, it is possible for an Intel processor to be used on an AMD motherboard without any issues. However, it is important to note that the motherboard must have the appropriate socket and chipset to support the Intel processor. Additionally, the BIOS must be compatible with the Intel processor in order for the system to boot and operate properly. AMD and Intel are competitors in the computer processor market, but they have different architectures and designs. As a result, AMD motherboards and Intel processors are not compatible. This means that you cannot use an AMD motherboard with an Intel processor, or vice versa. There are a few exceptions to this rule, however. Some motherboards have dual CPU sockets, which means they can accept either an AMD or an Intel processor. These motherboards are called "crossover" motherboards and can be used with either type of processor. Additionally, some older motherboards may support both AMD and Intel processors, but this option is becoming less common as technology advances. In general, if you want to use an AMD motherboard, you will need to use an AMD processor, and if you want to use an Intel motherboard, you will need to use an Intel processor. Using an AMD motherboard with an AMD processor can be a better choice than using an AMD motherboard with an Intel processor. This is because AMD motherboards are specifically designed to work with AMD processors, and they offer better compatibility and performance. On the other hand, using an AMD motherboard with an Intel processor can be a good option if you want to save money or if you can't find an AMD motherboard that meets your needs. However, keep in mind that using an AMD motherboard with an Intel processor may result in slightly lower performance compared to using an AMD motherboard with an AMD processor. Ultimately, the choice between using an AMD motherboard with an Intel processor or using an AMD motherboard with an AMD processor will depend on your specific needs and budget. In conclusion, while AMD motherboards do not support Intel processors by default, there are workarounds and hacks that allow users to install an Intel processor on an otherwise AMD motherboard. It's important to keep in mind that these workarounds may be unsupported and could potentially damage your hardware, so proceed at your own risk. It's also worth considering that compatibility is just one factor to consider when choosing a motherboard and processor. Other factors such as performance, features, and price should also be taken into account when making your decision. All-inclusive solutions for 4K Blu-ray, 2D/3D Blu-ray, DVD, up to 4K video, picture, audio, etc. Solve format incompatible issues between these media files with ease. Power your home theatre system and get cinema-like HD movie experience at home. Show How it Works Leading or presiding officer of an organized group "Chairman of the Board" redirects here. For other uses, see Chairman of the Board (disambiguation). Agustín Vásquez Gómez, ambassador of the Republic of El Salvador, chairing the OPCW's Fourth Review Conference, November 2018 The chair, also chairman, chairwoman, or chairperson, is the presiding officer of an organized group such as a board, committee, or deliberative assembly. The person holding the office, who is typically elected or appointed by members of the group or organisation, presides over meetings of the group, and is required to conduct the group's business in an orderly fashion.[1] In some organizations, the chair is also known as president (or other title).[2][3] In others, where a board appoints a president (or other title), the two terms are used for distinct positions. The term chairman may be used in a neutral manner, not directly implying the gender of the holder. In meetings or conferences, to "chair" something (chairing) means to lead the event.[4] Look up chair, chairman, chairwoman, chairperson, or preside in Wiktionary, the free dictionary. Terms for the office and its holder include chair, chairman, chairwoman, chairperson, convenor, facilitator, moderator, president, and presiding officer.[5][6][7][8][9] The chair of a parliamentary chamber is sometimes called the speaker.[10][11] Chair has been used to refer to a seat or office of authority since the middle of the 17th century; its earliest citation in the Oxford English Dictionary dates to 1658–1659, four years after the first citation for chairman.[12][13][14] Feminist critiques have analysed Chairman as a possible example of sexist language, associating the male gender with the exercise of authority, this has led to some use of the generic "Chairperson".[15] In World Schools Style debating, as of 2009, chair or chairman refers to the person who controls the debate; it recommends using Madame Chair or Mr. Chairman to address the chair.[16] The FranklinCovey Style Guide for Business and Technical Communication and the American Psychological Association style guide advocate using chair or chairperson.[17][18] The Oxford Dictionary of American Usage and Style (2000) suggested that the gender-neutral forms were gaining ground; it advocated chair for both men and women.[19] The Daily Telegraph's style guide bans the use of chair and chairperson; the newspaper's position, as of 2018, is that "chairman is correct English".[20] The National Association of Parliamentarians adopted a resolution in 1975 discouraging the use of chairperson and rescinded it in 2017.[21][22] Ambassador Leena Al-Hadid of Jordan chairs a meeting of the International Atomic Energy Agency, 2018.[23] The word chair can refer to the place from which the holder of the office presides, whether on a chair, at a lectern, or elsewhere.[1] During meetings, the person presiding is said to be "in the chair" and is also referred to as "the chair".[1] Parliamentary procedure requires that members address the "chair" as "Mr. (or Madam) Chairman (or Chair or Chairperson)" rather than using a name – one of many customs intended to maintain the presiding officer's impartiality and to ensure an objective and impersonal approach.[7][24] In the British music hall tradition, the chairman was the master of ceremonies who announced the performances and was responsible for controlling any rowdy elements in the audience. The role was popularised on British TV in the 1960s and 1970s by Leonard Sachs, the chairman on the variety show The Good Old Days.[25] "Chairman" as a quasi-title gained particular resonance when socialist states from 1917 onwards shunned more traditional leadership labels and stressed the collective control of Soviets (councils or committees) by beginning to refer to executive figureheads as "Chairman of the X Committee". Lenin, for example, officially functioned as the head of Soviet Russian government not as prime minister or as president, but as "Chairman of the Council of People's Commissars".[26][27] At the same time, the head of the state was first called "Chairman of the Central Executive Committee" (until 1938) and then "Chairman of the Presidium of the Presidium of the Supreme Soviet". In Communist China, Mao Zedong was commonly called "Chairman Mao", as he was officially Chairman of the Chinese Communist Party and Chairman of the Central Military Commission. Sam Ervin (right), chairman of the United States Senate Watergate Committee, 1973 In addition to the administrative or executive duties in organizations, the chair presides over meetings.[28] Such duties at meetings include: Calling the meeting to order Determining if a quorum is present Announcing the items on the "order of business", or agenda, as they come up Recognition of members to have the floor Enforcing the rules of the group Putting questions (motions) to a vote, which is the usual way of resolving disagreements following discussion of the issues Adjourning the meeting While presiding, the chair should remain impartial and not interrupt a speaker if the speaker has the floor and is following the rules of the group.[29] In committees or small boards, the chair votes along with the other members; in assemblies or larger boards, the chair should vote only when it can affect the result.[30] At a meeting, the chair only has one vote (i.e. the chair cannot vote twice and cannot override the decision of the group unless the organization has specifically given the chair such authority).[31] The powers of the chair vary widely across organizations. In some organizations they have the authority to hire staff and make financial decisions. In others they only make recommendations to a board of directors, or may have no executive powers, in which case they are mainly a spokesperson for the organization. The power given depends upon the type of organization, its structure, and the rules it has created for itself. If the chair exceeds their authority, engages in misconduct, or fails to perform their duties, they may face disciplinary procedures. Such procedures may include censure, suspension, or removal from office. The rules of the organization would provide details on who can perform these disciplinary procedures.[32] Usually, whoever appointed or elected the chair has the power to discipline them. There are three common types of chair in public corporations. The chief executive officer (CEO) may also hold the title of chair, in which case the board frequently names an independent member of the board as a lead independent director.[33] This position is equivalent to the position of président-directeur général in France.[citation needed] Executive chair is an office separate from that of CEO, where the titleholder wields influence over company operations, such as Larry Ellison of Oracle, Douglas Flint of HSBC and Steve Case of AOL Time Warner. In particular, the group chair of HSBC is considered the top position of that institution, outranking the chief executive, and is responsible for leading the board and representing the company in meetings with government figures. Before the creation of the group management board in 2006, HSBC's chair essentially held the duties of a chief executive at an equivalent institution, while HSBC's chief executive served as the deputy. After the 2006 reorganization, the management cadre ran the business, while the chair oversaw the controls of the business through compliance and audit and the direction of the business.[34][35][36] Non-executive chair is also a separate post from the CEO; unlike an executive chair, a non-executive chair does not interfere in day-to-day company matters. Across the world, many companies have separated the roles of chair and CEO, saying that this move improves corporate governance. The non-executive chair's duties are typically limited to matters directly related to the board, such as:[37] Chairing the meetings of the board. Organizing and coordinating the board's activities, such as by setting its annual agenda. Reviewing and evaluating the performance of the CEO and the other board members. Christina Magnuson, as chairman,[38] presides over the 2016 annual meeting of the Friends of the Ulriksdal Palace Theater. Many companies in the US have an executive chair; this method of organization is sometimes called the American model. Having a non-executive chair is common in the UK and Canada; this is sometimes called the British model. Expert opinion is rather evenly divided over which is the preferable model.[39] There is a growing push by public market investors for companies with an executive chair to have a lead independent director to provide some element of an independent perspective.[40][41] The role of the chair in a private equity-backed board differs from the role in non-profit or publicly listed organizations in several ways, including the pay, role and what makes an effective private-equity chair.[42] Companies with both an executive chair and a CEO include Ford,[43] HSBC,[44] Alphabet Inc.,[45] and HP.[46] A vice- or deputy chair, subordinate to the chair, is sometimes chosen to assist and to serve as chair in the latter's absence, or when a motion involving the chair is being discussed.[47] In the absence of the chair and vice-chair, groups sometimes elect a chair pro tempore to fill the role for a single meeting.[48] In some organizations that have both titles, deputy chair ranks higher than vice-chair, as there are often multiple vice-chairs but only a single deputy chair.[49] This type of deputy chair title on its own usually has only an advisory role and not an operational one (such as Ted Turner at Time Warner).[50] An unrelated definition of vice- and deputy chairs describes an executive who is higher ranking or has more seniority than an executive vice-president (EVP). Executive director Non-executive director Parliamentary procedure in the corporate world President (corporate title) ^ a b c Robert, Henry M.; et al. (2011). Robert's Rules of Order Newly Revised (11th ed.). Philadelphia, PA: Da Capo Press. p. 22. ISBN 978-0

(Image credit: Tom's Hardware)(Image credit: Tom's Hardware)(Image credit: Tom's Hardware)(Image credit: Tom's Hardware)(Image credit: Tom's Hardware)(Image credit: Tom's Hardware)As you can see above, you'll get more work done per watt of energy consumed, which is a win-win, and AMD's cooling requirements aren't nearly as overbearing. Winner: AMD. In judging AMD vs Intel CPU performance per watt, it's impossible to overstate the importance of having the densest process node paired with an efficient microarchitecture, and TSMC's 4nm and AMD's Zen 5 are the winning combination. The latest Ryzen processors consume less power than Intel on a power-vs-performance basis.Intel vs AMD CPU Overclocking 2025There's no debate when you compare Intel vs AMD CPU overclocking. Intel offers the most overclocking headroom, meaning you can gain more performance over the baseline speed with Intel chips than you can with AMD's Ryzen processors. To learn more about overclocking, head to our How to Overclock a CPU guide.As mentioned, you'll have to pay a premium for Intel's K-Series chips and purchase a pricey Z-Series motherboard, not to mention splurge on a capable aftermarket cooler (preferably liquid), to unlock the best of Intel's overclocking prowess. However, Intel's chips are relatively easy to push to their max, though gains can be slim in some applications. Intel doesn't allow full overclocking on B- or H-series motherboards, but it has infused memory overclocking into its B560 and H570 chipsets, and that works with any chip that is compatible with the platform. AMD doesn't have as much room for manual tuning. In fact, the maximum achievable all-core overclocks often fall a few hundred MHz beneath the chips' maximum single-core boost. That means all-core overclocking can actually result in losing performance in lightly threaded applications, albeit a minor amount.Part of this disparity stems from AMD's tactic of binning its chips to allow some cores to boost much higher than others. In tandem with AMD's Precision Boost and innovative thread-targeting technique that pegs lightly-threaded workloads to the fastest cores, AMD exposes near-overlocked performance right out of the box. That results in less overclocking headroom.However, AMD offers its Precision Boost Overdrive. This one-click auto-overclocking feature will wring some extra performance out of your chip based on its capabilities, your motherboard's power delivery subsystem, and your CPU cooling. AMD's approach provides the best performance possible with your choice of components and is generally hassle-free. In either case, you still won't achieve the high frequencies you'll see with Intel processors, but you do get a free performance boost. AMD has also vastly improved its memory overclocking capabilities.Winner: Intel. When it comes to AMD vs Intel CPU overclocking, Team Blue has far more headroom and much higher attainable frequencies. Just be prepared to pay for the privilege – you'll have to buy a K-series processor. Intel has added memory overclocking to the newest B- and H-series motherboards, which is an improvement. AMD's approach is friendlier to entry-level users, rewarding them with hassle-free overclocking based on their system's capabilities, but you don't gain as much performance.AMD vs Intel CPU Drivers and Software 2025When we look at AMD vs Intel CPU software support, Team Blue has a stronger reputation. AMD has suffered plenty of issues with its CPU and chipset drivers, a natural byproduct of its limited resources compared to its much-larger rivals. Intel isn't without its missteps on the driver front, but its reputation for stability helped earn it the top spot in the processor market, particularly with OEMs.You might be a little more cautious when approaching Intel's more exotic solutions, though. In the past, the company has developed innovative new products that have been relegated to the dustbin of history due to pricing and market forces, and long-term support for those products might not always be clear-cut.AMD still has its work cut out for it. The company has had several issues with BIOS releases that failed to expose its chips' full performance, though AMD has mostly solved those issues after a long string of updates. As a side effect of being the smaller challenger, AMD also faces a daunting challenge in offsetting the industry's incessant optimization for Intel's architectures above all others.Intel also continues to face challenges, though. The company's Core Ultra 200S architecture uses large performance cores (P-cores) and small efficiency cores (E-cores) for different types of tasks, and other elements, like I/O and the GPU, are placed on separate tiles/dies, which complicates matters. Placing the correct workloads on the correct cores requires a new Intel Thread Director technology, but that means some programs might need extra handholding to extract the best performance in Windows 10.Winner: Intel wins the battle of AMD vs Intel CPU drivers and software. Over the last few years, Intel has addressed its laggardly driver updates for its integrated graphics, and the company has an army of software developers at its disposal that help ensure its products get relatively timely support with the latest software. AMD has made amazing progress convincing the developer ecosystem to optimize for its new Zen architectures. However, there's still plenty of work to be done as the company moves forward. AMD vs Intel CPU Security 2025The last few years have found security researchers poking and prodding at the speculative execution engine that's one of the key performance-boosting features behind all modern chips. The resulting research has spawned an almost never-ending onslaught of new vulnerabilities that threaten the safety of your system and private data. Unfortunately, these types of vulnerabilities are incredibly dangerous because they are undetectable—these tactics steal data by using the processor exactly as it was designed; thus, they are undetectable by any known anti-virus program.The rash of fixes required to plug these holes also continues to grow, and many of them result in reduced performance. That's particularly painful for Intel because it suffers from more of these vulnerabilities than other vendors. The company has developed in-silicon mitigations with newer processors that can reduce or eliminate the performance overhead, but some older processors are subject to drastic reductions in performance.AMD isn't immune to vulnerabilities, though. It's hard to ascertain if the initially limited speculative execution vulnerability discoveries in AMD processors were due to a security-first approach to hardened processor design, or if researchers and attackers merely focused on Intel's processors due to their commanding market share: Attackers lmost always focus on the broadest cross-section possible. We see a similar trend with malware being designed for Windows systems, by far the predominant desktop OS, much more frequently than MacOS, though that does appear to be changing.However, AMD has also had several other new vulnerability disclosures in the recent past, including a Meltdown-esque variant that requires software re-coding. Like Intel, AMD has made a few targeted in-silicon fixes for its newer Ryzen processors, thus lowering its exposure to vulnerabilities.However, newer vulnerabilities and hacks continue to present issues for chipmakers. For instance, computer motherboard maker MSI was recently hacked, leading to its OEM private keys, used for verifying firmware to a computer's secure boot mechanisms, being released to the public. This puts an untold number of PCs at risk from fake drivers and firmwares.Winner: AMD. The AMD vs Intel CPU security debate continues to evolve as researchers and nefarious actors alike turn more of an eye towards AMD's newer architectures. As things stand, Intel still suffers from more known vulnerabilities than AMD, and the impact of the Spectre mitigations on previous-gen Intel processors leads to larger performance losses (at times equivalent to a few generational gains worth of improvement) than the fixes we've seen from AMD, granting Team Red the win. Share — copy and redistribute the material in any medium or format for any purpose, even commercially. Adapt — remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. Attribution — You must give appropriate credit , provide a link to the license, and indicate if changes were made . You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike — If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation . No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. Intel and AMD are primary competitors in the consumer CPU market each offering distinct advantages. The Intel processors traditionally excel in a single core performance and are often favored for their stability and widespread compatibility making them popular in business environments. The AMD processors offer better value for money with stronger multi-core performance and superior integrated graphics in the APU Accelerated Processing Units. AMD chips run cooler and are more energy efficient, leading to better battery life in a laptop while Intel's higher clock speeds can provide an edge in certain gaming scenarios.What is Intel?Intel stands for Integrated Electronics. Intel Corporation is an American multinational corporation and technology company headquartered in Santa Clara California in Silicon Valley. It is invented by Robert Noyce. It's the developer of the first x86 processor Intel 8086. If we talk on a scale of 1 to 10 Intel processors come at a scale of 4 to 10. These processors have a good CPU performance and almost all Intel processors come with the iGPU. This processor also clocks higher than the AMD processors at the cost of a higher power consumption and battery life.Thus, for short workloads and single-core boosts especially in laptops, newer Intel-powered laptops can be used when battery life is not a concern. If we talk about Desktops, and you want to change processor, motherboard or socket compatibility, then Intel has fewer options available for that in comparison to AMD processors due to frequent motherboard and chipset changes.Example - Intel Xeon, Intel Core i series, Intel Core m series.What is Advanced Micro Devices (AMD)?The AMD stands for Advanced Micro Devices is the American semiconductor company headquartered in the Santa Clara California founded by Jerry Sanders and his colleagues. Its the second source manufacturer of a x86 processors AMD has become the major competitor in a CPU market with its Ryzen processors. AMD processors are known for offering a competitive performance at a lower prices compared to Intel with advantages including a better integrated graphics in their APU, cooler operation and longer battery life in the laptops.The product range spans from a everyday computing solutions to the high performance Thread ripper processors for the intensive tasks like a video editing and 3D modeling. When building a AMD based systems users should verify the motherboard compatibility though many modern boards offer a simple updates via USB for newer processors.Example – AMD Ryzen, AMD Threadripper, AMD FX-Series, AMD EPYC, AMD Opteron, AMD Athlon 64IntelAMDLess expensive than AMD Processor at the lower range.Less expensive than Intel at a higher range.Less efficient than AMD.More efficient than Intel.Can heat up when used with Clock Speed Boost(14 nm)Is generally cooler due to smaller lithography(TSMC 7nm is similar to Intel 10 nm)IPC (Rocket Lake) is lower than AMD (Zen 3)IPC(Zen 3) is higher than Intel (Rocket Lake)Clock speed reaches and surpassed 5.0 GHzThe clock speed can reach 5.0 GHz but results in more heatiGPU present in almost all Core i series CPU(except Core i F-series)iGPU is present only in AMD APU series with higher GPU performance compared to Intel iGPU(HD Graphics and)It has symmetric multiprocessing capabilities of up to 4 sockets/28 cores.It has symmetric multiprocessing capabilities of up to 8 sockets/128 cores.Most popular intel processors are i3,i5,i7 and i9.AMD has Ryzen 3, Ryzen 5, Ryzen 7, Ryzen 9 and Threadripper processors as the popular ones.ConclusionIntel and AMD make computer processors (CPU), and each has its strengths. The Intel processors are known for being fast in a single tasks and widely compatible with the most software making them a reliable choice. The AMD processors give the more speed for your bulk handle multiple tasks very well and have a better built in graphics which can save the money on a separate graphics card. Both brands will work well for a common tasks like web browsing, office work and casual gaming. Last Updated on July 12, 2024 by Nahush GowdaBuilding a PC can be exciting, but ensuring compatibility between components is crucial. One key aspect is the motherboard chipset and its compatibility with your chosen CPU.If you are new to PC building, this might get quite confusing as there are many different chipsets to choose from. This blog post will be your guide through the modern chipsets for AMD Ryzen 3000 series and above, and Intel 10th gen processors and beyond.You can look up this guide to understand what processors are compatible with which chipsets or vice-versa.1Intel Chipsets2AMD Chipsets3ConclusionThe latest from the Intel line of desktop processors are Intel 14th-gen or Intel Raptor Lake processors. We will list the chipsets starting from Intel 10th-gen until the 14th-gen to cover most of the available processors in the market.These are the Intel 400 series of motherboards that were launched alongside Intel 10th-generation processors.Z490 (LGA 1200 socket)B460 (LGA 1200 socket)H410 (LGA1200 socket)CPU compatibility listChipsetsProcessor SKUZ490 / B460 / H410Core i7-10700KCore i7-10700KFCore i7-10700Core i5-10600KCore i5-10600KFCore i5-10600Core i5-10500Core i5-10400Core i3-10300Core i3-10100FCore i9-11900KCore i7-11800KCore i7-11700KCore i5-11600KCore i5-11500Core i5-11400Core i3-11300Note: While these chipsets are compatible with the 11th-generation processors, check with the motherboard manufacturer whether the boards have updated BIOS to support 11th-generation processors.Also Read: How to choose the right motherboard for your PC buildThese are the Intel 500 series of motherboards launched alongside Intel 11th-generation processors.Z590 (LGA 1200 socket)B560 (LGA 1200 socket)H510 (LGA1200 socket)CPU compatibility listChipsetsProcessor SKUZ590 / B560 / H510Core i7-10700KCore i7-10700KFCore i7-10700Core i5-10600KCore i5-10600KFCore i5-10600Core i5-10500Core i5-10400Core i3-10300Core i3-10100FCore i9-11900KCore i7-11800KCore i7-11700KCore i5-11600KCore i5-11500Core i5-11400Core i3-11300Also Read: A Guide to the Most Common Motherboard Form FactorsThese are the Intel 600 series of motherboards launched alongside Intel 12th-generation processors. Starting with this generation, Intel kickstarted the support for DDR5 memory.Although, you have to choose the motherboard with either DDR4 or DDR5 memory. Motherboards with DDR5 support are more expensive but DDR5 memory offers a performance advantage in gaming and other memory-intensive workloads like Blender.Z690 (LGA 1700 socket)B660 (LGA 1700 socket)H610 (LGA1700 socket)CPU compatibility listChipsetsProcessors SKUZ690/ B660 / H610Core i9-12900Core i9-12900FCore i9-12900KSCore i9-12900KCore i9-12900KFCore i7-12700Core i7-12700FCore i7-12700KCore i7-12700KFCore i5-12600KCore i5-12600KFCore i5-12500Core i5-12400Core i5-12400FCore i3-12100Core i3-12100FCore i9-13900Core i9-13900FCore i9-13900KSCore i9-13900KCore i9-13900KFCore i7-13700Core i7-13700FCore i7-13700KCore i7-13700KFCore i5-13600KCore i5-13600KFCore i5-13500Core i5-13400Core i3-13100Core i9-14900KCore i9-14900KFCore i9-14900KSCore i9-14900FCore i9-14900Core i7-14700Core i7-14700FCore i7-14700KCore i7-14700KFCore i5-14600KCore i5-14600KFCore i5-14500Core i5-14400Core i5-14400FCore i3-14100Core i3-14100FNote: Check for the BIOS update for 14th-gen processors with these chipsets. Since they were released alongside 12th-gen processors, they need updated BIOS for forward compatibility with 13th and 14th-gen processors.Also read: 6 Essential Features to Consider Before Buying MotherboardThese are the Intel 700 series of motherboards launched alongside Intel 12th-generation processors.Z790 (LGA 1700 socket)B760 (LGA 1700 socket)H770 (LGA1700 socket)CPU compatibility listChipsetsProcessors SKUZ790/ B760 / H770Core i9-12900Core i9-12900FCore i9-12900KSCore i9-12900KCore i9-12900KFCore i7-12700Core i7-12700FCore i7-12700KCore i7-12700KFCore i5-12600KCore i5-12600KFCore i5-12500Core i5-12400Core i5-12400FCore i3-12100Core i3-12100FCore i9-13900Core i9-13900FCore i9-13900KSCore i9-13900KCore i9-13900KFCore i7-13700Core i7-13700FCore i7-13700KCore i7-13700KFCore i5-13600KCore i5-13600KFCore i5-13500Core i5-13400Core i3-13100Core i9-14900KCore i9-14900KFCore i9-14900KSCore i9-14900FCore i9-14900Core i7-14700Core i7-14700FCore i7-14700KCore i7-14700KFCore i5-14600KCore i5-14600KFCore i5-14500Core i5-14400Core i5-14400FCore i3-14100Core i3-14100FNote: If you are opting for a 14th-gen processor, getting a 700 series chipset motherboard is recommended to avoid any issues.The latest from the AMD line of desktop processors are the Ryzen 7000 series or Zen 4 processors. We will list the chipsets starting from the Ryzen 3000 series until the Ryzen 7000 series to cover most of the available processors in the market.These are the AMD 400 series of motherboards that were launched alongside Zen 2 (Ryzen 3000 series) processors.X470 (AM4 socket)B460 (AM4 socket)CPU compatibility listChipsetsProcessor SKUX470 / B450Ryzen 3 3200GRyzen 3 3300XRyzen 5 3500Ryzen 5 3500XRyzen 5 3600Ryzen 5 3600XRyzen 7 3700XRyzen 7 3800XTRyzen 9 3900XRyzen 5 5500Ryzen 5 5600Ryzen 5 5600XRyzen 7 5700Ryzen 7 5700XRyzen 7 5800XRyzen 7 5700GRyzen 7 5700X3DRyzen 7 5800X3DRyzen 9 5900XNote: Check if the B450/X470 motherboard you choose has forward compatibility with the Ryzen 5000 series.These are the AMD 400 series of motherboards that were launched alongside Zen 2 (Ryzen 3000 series) processors.X470 (AM4 socket)B450 (AM4 socket)CPU compatibility listChipsetsProcessor SKUX470 / B450Ryzen 3 3200GRyzen 3 3300XRyzen 5 3500Ryzen 5 3500XRyzen 5 3600Ryzen 5 3600XRyzen 7 3700XRyzen 7 3800XTRyzen 9 3900XRyzen 5 5500Ryzen 5 5600Ryzen 5 5600XRyzen 7 5700Ryzen 7 5700XRyzen 7 5800XRyzen 7 5700GRyzen 7 5700X3DRyzen 7 5800X3DRyzen 9 5900XThese are the AMD 500 series of motherboards that were launched alongside Zen 4 (Ryzen 7000 series) processors. Starting from this series, AMD will only support DDR5 memory.X670 (AM5 socket)X670E (AM5 socket)B650 (AM5 socket)B650E (AM5 socket)A620/A620A (AM5 socket)CPU compatibility listChipsetsProcessor SKUX670 / X670E / B650 / B650E / A520Ryzen 5 7600Ryzen 5 7600XRyzen 7 7700Ryzen 7 7700XRyzen 7 7800X3DRyzen 9 7900Ryzen 9 7900XRyzen 9 7900X3DRyzen 9 7950XRyzen 9 7950X3DAlso Read: Best AM5 Motherboards for Ryzen 7000 Series ProcessorsBy understanding motherboard chipsets and CPU compatibility, you can make informed decisions when building your PC. Remember, this blog is a starting point. Always refer to the manufacturer's website for the latest information on specific chipsets and their compatible CPUs.Happy building!Share this Yes, yes you can. It might seem like an incident of mass hysteria, team red and blue playing together like that, but gamers have been running Intel CPUs with AMD GPUs for years, so the fact that the reverse works just as well isn't too surprising. However, there are some caveats. Can you use an Intel Arc GPU with AMD Ryzen: yes, but you have to use the right CPU. Which AMD CPUs can you use with Intel Arc GPUs? Jacob Roach / Digital Trends In reality, any AMD CPU should work with Intel Arc GPUs, as there isn't some lock or fundamental compatibility issue that means only certain CPUs work with the new Intel cards. That said, Intel has made a big deal of how much Arc Alchemist cards benefit from Resizable BAR, a feature that is only available on Ryzen 3000 and newer CPUs. With that in mind, if you're interested in an Intel Arc graphics card, you should really only buy it if you have a CPU that supports ReBAR. In the case of AMD CPUs, that's Ryzen 3000, 4000, 5000, or the newest Ryzen 7000 CPUs. This isn't just a way for Intel to limit the potential market for AMD CPU owners — as if it would want to sell fewer GPUs. In fact, it also recommends only Intel 10th-generation and newer CPUs use Arc GPUs too, as, like Ryzen 3000, that is the oldest generation of Intel CPU where ReBAR is supported. Without it, the new Arc GPUs won't perform anywhere near as well as they should. Why do Arc GPUs need ReBaR? Resizeable BAR is a feature in modern graphics introduced by Nvidia as a counter to AMD's implementation of Smart Access Memory — which is essentially the same feature. ReBAR effectively gives the CPU access to the whole GPU memory as and when it needs it, rather than smaller portions of it. That reduces memory bottlenecks and lets both the CPU and GPU work at peak performance, thereby improving real-world performance in turn. The result for Nvidia and AMD graphics cards is a slight uplift in performance, and the same is true for Intel's Arc cards. However, the difference is quite stark, enough that in our review of the A770, we agreed with Intel that ReBAR is a must if you're going to play games on an Arc GPU. Jacob Roach / Digital Trends The effect of turning ReBAR on isn't consistent across all games, and you certainly don't need it to run the games, but considering how competitive the new Arc GPU is with Nvidia and AMD's best midrange options, it's worth turning it on to make the most of the new cards — and if you can't, you may be better off with one of the alternatives. Jon Martindale is a freelance evergreen writer and occasional section coordinator, covering how to guides, best-of lists, and… The GPU market is in a pretty rough state right now, which makes it almost impossible to buy one of the best graphics cards. Now would be a great time to learn that another good GPU is on the horizon ... but, according to a new leak, Intel isn't working on a flagship GPU to follow the Arc B580. The fate of its next-gen GPUs, dubbed Arc Celestial, also seems a bit uncertain. The scoop comes from Jaykihn on X (Twitter), a frequent hardware leaker. As always, take the following with a healthy helping of salt, because nothing is ever confirmed until Intel says so. Read more AMD's latest high-end graphics card, the Radeon RX 9070 XT, is proving to be a massive hit. AMD CEO Dr. Lisa Su confirmed in an interview with Asus' China Manager, Tony Yu that that sales of the RX 9070 XT have skyrocketed, outpacing its predecessor by ten times. This overwhelming demand has exceeded initial projections, forcing AMD to ramp up production to ensure a steady supply. Launched as part of the RDNA 4 lineup, the Radeon RX 9070 XT was positioned as a direct competitor to Nvidia's mid-to-high-end offerings, promising strong performance at an aggressive price point. The reception has been overwhelmingly positive, with both enthusiasts and mainstream gamers flocking to purchase the card. Retailers have reported frequent stock shortages, reflecting the intense demand for AMD's latest GPU. Read more It's clear that AMD hit the jackpot with its recent RX 9070 XT and non-XT GPUs. The pair quickly climbed up every list of the best graphics cards, and perhaps more importantly, received a warm welcome from the GPU market at large (and thus sold out immediately). A new leak tells us that AMD is shipping lots of GPUs to try to keep up with the demand -- and yet they're still not in stock. The information comes from Moore's Law Is Dead on YouTube, who claims to have spoken to a major online retailer about RDNA 4 stock levels. Both Nvidia and AMD have been in a pretty dire place since the release of their latest graphics cards, with many people referring to the RTX 50-series as a "paper launch." The cards just sell out too quickly and too many people are left trying to find one. Read more Officer in charge of technical operations Chief technology officerSynonymsCTO chief technologist A chief technology officer (CTO) (also known as a chief technical officer or chief technologist) is an officer tasked with managing technical operations of an organization. They oversee and supervise research and development and serve as a technical advisor to a higher executive such as a chief executive officer.[1] A CTO is very similar to a chief information officer (CIO).[2] CTOs will make decisions for the overarching technology infrastructure that closely align with the organization's goals, while CIOs work alongside the organization's information technology ("IT") staff members to perform everyday operations.[2] The attributes of the roles a CTO holds vary from one company to another, mainly depending on their organizational structure.[3] After World War II, large corporations established research laboratories at locations separate from their headquarters. The corporation's goals were to hire scientists and offer them facilities to conduct research on behalf of the company without the burdens of day-to-day office work. This is where the idea of a CTO focusing on the overarching technology infrastructures originates.[4] At that time, the director of the laboratory was a corporate vice president who did not participate in the company's corporate decisions. Instead, the technical director was the individual responsible for attracting new scientists, to do research, and to develop products.[5] In the 1980s, the role of these research directors changed substantially. Since technology was becoming a fundamental part of the development for most products and services, companies needed an operational executive who could understand the product's technical side and provide advice on ways to improve and develop.[6] This all led to the creation of the position of Chief Technology Officer by large companies in the late 1980s with the growth of the information technology industry and computer (internet) companies.[3] A CTO "examines the short and long term needs of an organization, and utilizes capital to make investments designed to help the organization reach its objectives... [the CTO] is the highest technology executive position within a company and leads the technology or engineering department".[7] The role became prominent with the ascent of the IT industry, but has since become prevalent in technology-based industries of all types – including computer-based technologies (such as game developer, e-commerce, and social networking service) and other/non-computer-focused technology (such as biotech/pharma, defense, and automotive). In non-technical organizations as a corporate officer position, the CTO typically reports directly to the chief information officer (CIO) and is primarily concerned with long-term and "big picture" issues (while still having deep technical knowledge of the relevant field). In technology-focused organizations, the CIO and CTO positions can be at the same level, with the CIO focused on the information technology and the CTO focused on the core company and other supporting technologies. Depending on company structure and hierarchy, there may also be positions such as R&D manager, director of R&D and vice president of engineering whom the CTO interacts with or oversees. The CTO also needs a working familiarity with regulatory (e.g. U.S. Food and Drug Administration, Environmental Protection Agency, Consumer Product Safety Commission, as applicable) and intellectual property (IP) issues (e.g. patents, trade secrets, license contracts), and an ability to interface with legal counsel to incorporate these considerations into strategic planning and inter-company negotiations. In many older industries (whose existence may predate IT automation) such as manufacturing, shipping or banking, an executive role of the CTO would often arise out of the process of automating existing activities; in these cases, any CTO-like role would only emerge if and when efforts would be made to develop truly novel technologies (either for facilitating internal operations or for enhancing products/services being provided), perhaps through "intrapreneuring". Chief creative officer Chief executive officer Chief innovation officer (CINO or CTIO) Chief scientific officer Chief security officer Chief AI officer ^ Smith, Roger D. (2003). "The Chief Technology Officer: Strategic Responsibilities and Relationships". Research-Technology Management. 46 (4): 28–36. doi:10.1080/08956308.2003.11671574. S2CID 154123520. ^ a b Margaret, Rouse. "What is Chief Technology Officer (CTO)? - Definition from WhatIs.com". SearchCIO. Retrieved 2019-11-08. ^ a b Wood, Colin (29 July 2016). 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"The CTO and Organizational Power and Influence" (PDF). International Association for Management of Technology. Archived from the original (PDF) on 2016-03-04. Retrieved 2013-07-17. Noble, Jason (2018). "Day in the life of a CTO" . CTO Academy Retrieved from " Here's a comprehensive compatibility table for Intel and AMD processors with their respective compatible motherboard chipsets and sockets:Processor BrandProcessor SeriesSocketCompatible ChipsetsExamples of Compatible MotherboardsIntelIntel Core 12th Gen (Alder Lake)LGA 1700Z690, B660, H670, H610ASUS ROG Strix Z690-E, MSI Pro B660MIntel Core 13th Gen (Raptor Lake)LGA 1700Z790, B760, H770, (backward compatible with Z690 series)Gigabyte Z790 Aorus Elite, ASRock B760 Pro RSIntel Core 10th/11th GenLGA 1200Z490, Z590, B460, B560, H470, H510MSI MPG Z590 Gaming Carbon, ASUS Prime H510M-KIntel Core 8th/9th GenLGA 1151Z390, B365, H370, H310Gigabyte Z390 Aorus Master, ASUS TUF B365M-Plus GamingAMDAMD Ryzen 7000 Series (Zen 4)AM5X670, B650, A620ASUS ROG Crosshair X670E, MSI MPG B650 Edge WiFiAMD Ryzen 5000/3000 Series (Zen 3/2)AM4X570, B550, A520, (Older: B450, X470 with BIOS updates)MSI B550 Tomahawk, ASUS TUF X570-Plus WiFiAMD Ryzen 2000 Series (Zen+)AM4X470, B450, X370, B350, A320ASRock X470 Taichi, ASUS Prime B450M-AAMD Ryzen 1000 Series (Zen)AM4X370, B350, A320MSI X370 Gaming Pro Carbon, Gigabyte AB350M-DS3HAMD Ryzen Threadripper (High-End Desktop CPUs)sTRX4TRX40ASUS ROG Zenith II Extreme Alpha, MSI Creator TRX40BIOS Updates:Some motherboards, especially older ones, require a BIOS update to support newer processors. For example, AMD's AM4 motherboards from the B450 or X470 series may need an update to support Ryzen 5000 CPUs.Check with the motherboard manufacturer for the latest BIOS updates.Backward Compatibility:Intel's LGA 1700 supports both 12th Gen and 13th Gen processors, depending on the chipset and BIOS version.AMD's AM4 socket offers excellent backward compatibility, but certain chipset features may be limited when using older boards with newer CPUs.Overclocking Support:Intel's "Z-series" chipsets (e.g., Z690, Z790) and AMD's "X-series" chipsets (e.g., X570, X670) are designed for overclocking.Would you like additional details or recommendations for specific builds?December 2024November 2024August 2024July 2024December 2023August 2023BrandGadgetsGamingPreBuilt Gaming Desktop PCsTechUncategorized admin 04/12/2019 11,064 views Advanced Micro Devices, Inc. (NYSE: AMD ) or AMD is an American multinational semiconductor company based in Sunnyvale, California, that develops computer processors and related technologies for commercial and consumer markets. Its main products include microprocessors, motherboard chipsets, embedded processors and graphics processors for servers, workstations and personal computers, and embedded systems applications. AMD is the second-largest global supplier of microprocessors based on the x86 architecture (behind Intel) and also one of the largest suppliers of graphics processing units. It also owns 8.6% of Spansion, a supplier of non-volatile flash memory. AMD is the only significant rival to Intel in the central processor (CPU) market for (x86 based) personal computers. Since acquiring ATI in 2006, AMD and its competitor NVIDIA have dominated the discrete graphics processor unit (GPU) market. AMD APP technology is a set of advanced hardware and software technologies that enable AMD graphics processing cores (GPU), working in concert with the system's x86 cores (CPU), to execute heterogeneously to accelerate many applications beyond just graphics. This enables better balanced platforms capable of running demanding computing tasks faster than ever, and sets software developers on the path to optimize for AMD Accelerated Processing Units (APUs). Groundbreaking AMD App Acceleration helps you: Enjoy beautifully rich and clear video playback when streaming from the web Take in your favorite movies in stunning, stutter-free HD quality Run multiple applications smoothly at maximum speed Enjoy lightning fast game play and realistic physics effects How to open AMD APP acceleration on Leawo's products On Leawo's media converter programs, click "Tools-Options-Conversion" to enter the GPU settings panel. Click "Enable AMD APP Acceleration" to activate AMD APP accelerating. Presently, Leawo software programs including video converter, Blu-ray Ripper, DVD Ripper, YouTube Downloader, Video Accelerator, etc. support AMD APP accelerating. Converting software solutions that don't support AMD APP accelerating are DVD Copy, DVD Creator, Blu-ray Copy, Blu-ray Creator and Blu-ray to MKV Converter. Supported Formats Input Video Formats: AVI, MPEG, WMV, MP4, FLV, MKV, H.264/MPEG-4, DivX, XviD, MOV, M4V, VOB, ASF, 3GP, 3G2, SWF, H.261, H.264, DV, DIF, MJPG, MJPEG, DVR-MS, NUT, QT, YUV, DAT, MPV, NSV AVCHD Video (*.mts, *.m2ts), H.264/MPEG-4 AVC (*.mp4), MPEG2 HD Video (*.mpg; *.mpeg), MPEG-4 TS HD Video (*.ts), MPEG-2 TS HD Video (*.ts), Quick Time HD Video (*.mov), WMV HD Video (*.xwmv), Audio-Video Interleaved HD Video (*.avi) Output Video Formats: all video formats with H.264 codec Supported Graphics Cards ATI Radeon™ HD 4000 Series ATI Radeon™ HD 4650/4670/4770 ATI Radeon™ HD 4830/4850/4870/4890 ATI Mobility Radeon™ HD 4830/4850/4860/4870 ATI Mobility Radeon™ HD 4300/4500/4600 ATI Radeon™ HD 5000 Series ATI Radeon™ HD 5450/5550/5570 ATI Radeon™ HD 5670/5750/5770 ATI Radeon™ HD 5830/5850/5870/5970 ATI Mobility Radeon™ HD 5145/5165 ATI Mobility Radeon™ HD 5430/5450/5470/5650 ATI Mobility Radeon™ HD 5730/5750/5770 ATI Mobility Radeon™ HD 5830/5850/5870 ATI Radeon™ HD 6000 Series ATI Radeon™ HD 6750/6770/6790/6850/6870/6950/6970/6990 ATI FirePro™ Series ATI FirePro V9800/V8800/V8750/V8700/V7800/V7750/V5800/V5700/V4800/V3800/V3750 ATI FireStream™ Series FireStream 9270/9250 ATI Mobility FirePro™ Series ATI FirePro M7820/M7740/M5800 ATI Mobility Radeon™ HD 500v Series ATI Mobility Radeon™ HD 530v/540v/550v/560v AMD and Intel dominate the CPU market, offering a range of processors for various computing needs. Both companies produce high-performance chips, but their strengths differ depending on the specific use case and budget. Intel has long been known for its strong single-core performance, making its CPUs ideal for tasks that don't require many cores. AMD, on the other hand, often provides more cores at lower price points, excelling in multi-threaded workloads. Recent generations have seen AMD close the gap in gaming performance, with some of their chips now matching or surpassing Intel in certain titles. Your choice between AMD and Intel will depend on your specific needs, budget, and the current offerings from each company. FeatureAMDIntelMulti-core PerformanceGenerally strongerCompetitive in high-end modelsSingle-core PerformanceImproved in recent generationsTraditionally strongerPower EfficiencyOften more efficientVaries by modelPrice-to-PerformanceOften better valueCompetitive in some segmentsGaming PerformanceVery competitiveSlight edge in some games It's tricky to make a completely comprehensive chart without knowing your specific needs (gaming, content creation, budget, etc.). However, I can give you a good starting point comparing some key specs and features of the AMD Ryzen 9000 series (Zen 5) and Intel 15th Gen (Arrow Lake) CPUs. FeatureAMD Ryzen 9000 (Zen 5)Intel 15th Gen (Arrow Lake)ArchitectureZen 5Arrow LakeSocketAM5LGA 1851Core Counts (Mainstream)6 to 1614 to 24Boost Clock SpeedsUp to 5.7 GHzUp to 5.7 GHzIntegrated GraphicsRadeon GraphicsIntel Xe GraphicsPCIe SupportPCIe 5.0PCIe 5.0Memory SupportDDR5DDR5TDP (Typical)65W to 170W125WOverclockingYes (X models)Yes (K models)Key AdvantagesPotentially higher single-threaded performance in some tasks, strong integrated graphicsHigher core counts in mainstream models, potentially strong multi-threaded performance Important Notes: Performance: Actual performance will vary depending on the specific models being compared, workload, and other system components. Benchmarks are crucial for detailed comparisons. Pricing: Prices fluctuate and can vary significantly between retailers. Availability: Specific models may have limited availability or long lead times. Future Updates: Both AMD and Intel are constantly releasing new CPUs and updating their product lines. ModelCores/ThreadsBase Clock (GHz)Boost Clock (GHz)TDP (W)GraphicsPrice (USD)Ryzen 5 9600X6/123.95.465Radeon$249Ryzen 7 9700X8/163.85.565Radeon$319Ryzen 7 9800X3D8/164.75.2120Radeon$479Ryzen 9 9900X12/244.45.6120Radeon$399Ryzen 9 9950X16/324.35.7170Radeon$599 ModelCores/ThreadsBase Clock (GHz)Boost Clock (GHz)TDP (W)GraphicsPrice (USD)Core Ultra 5 245K14/204.25.2125Intel Xe$279Core Ultra 5 245KF14/204.25.2125None$279Core Ultra 7 265K20/283.95.5125Intel Xe$359Core Ultra 7 265KF20/283.95.5125None$349Core Ultra 9 285K24/323.75.7125Intel Xe$589 Things to keep in mind: Missing Information: I couldn't find reliable L3 cache information for the Intel 15th Gen CPUs. This data is often released later or varies between specific models. "KF" Models: Intel's "KF" models lack integrated graphics, which slightly lowers their price. 3D V-Cache: The Ryzen 7 9800X3D has a significantly larger L3 cache thanks to AMD's 3D V-Cache technology, which can provide a major boost in gaming performance. AMD and Intel have shaped the processor landscape through innovation and fierce competition. Their market positions have shifted over time as technology advanced and consumer needs evolved. Intel launched the first microprocessor in 1971. AMD entered the x86 market in 1982 as a second-source manufacturer. Both companies pushed clock speeds higher through the 1990s and early 2000s. AMD gained an edge with its Athlon 64 in 2003, introducing 64-bit computing to consumers. Intel countered with the Core architecture in 2006, retaking the performance crown. Intel maintained its lead for nearly a decade, until AMD's Zen architecture debuted in 2017. Zen 3 in 2020 put AMD firmly back in contention. Recent releases like Intel's Alder Lake and Raptor Lake, along with AMD's Ryzen 7000 series, have kept the race tight. Both companies now push core counts and specialized architectures. Intel dominated the CPU market for years, but AMD has made significant gains recently. In Q4 2021, AMD reached an all-time high in overall x86 CPU market share. SegmentAMD Share Q4 2021Intel Share Q4 2021Desktop16.2%83.8%Laptop21.6%78.4%Server10.7%89.3% AMD's growth has been particularly strong in the laptop and server segments. Intel has maintained its lead in desktops but faces increasing pressure. The market remains dynamic. Intel's 14th-Gen processors and AMD's upcoming Zen 5 architecture could shift these numbers further. Your choice between AMD and Intel now depends more on specific needs than overall brand dominance. AMD and Intel employ distinct approaches in their processor designs. These differences encompass chip architectures, performance factors, and cutting-edge technologies that shape their products. Intel's latest processors use a hybrid architecture combining performance and

180W AMD Threadripper 1920X (GM) ~ Zen 12/24 3.5 / 4.0 GHz 180W AMD Ryzen 7 1800X ~ Zen 8/16 3.6 / 4.0 GHz 95W Intel Core i5-7600 ~ Kaby Lake 4/4 3.5 / 4.1 GHz 65W Intel Core i3-9100 79.3 Coffee Lake-R 4/4 3.6 / 4.2 GHz 65W Intel Core i3-8300 ~ Coffee Lake 4/4 3.7 / – GHz 62W Intel Core i3-8100 ~ Coffee Lake 4/4 3.6 / – GHz 65W Intel Core i5-7500 ~ Kaby Lake 4/4 3.4 / 3.8 GHz 65W Intel Core i5-7400 ~ Kaby Lake 4/4 3.0 / 3.5 GHz 65W AMD Ryzen 7 1700X ~ Zen 8/16 3.8 / 3.9 GHz 95W AMD Ryzen 7 1700 ~ Zen 8/16 3.0 / 3.8 GHz 65W AMD Ryzen 5 3400G 68.3 Zen + 4/8 3.7 / 4.2 GHz 65W AMD Ryzen 5 1600X 66.7 Zen 6/12 3.6 / 4.0 GHz 95W AMD Ryzen 5 1600 66.1 Zen 6/12 3.2 / 3.6 GHz 65W AMD Ryzen 3 3200G 64.6 Zen + 4/4 3.6 / 4.0 GHz 65W AMD Ryzen 5 1500X ~ Zen 4/8 3.5 / 3.7 GHz 65W Intel Core i3-7350K ~ Kaby Lake 2/4 4.2 / – GHz 60W AMD Ryzen 5 2400G 63.6 Zen+ 4/8 3.6 / 3.9 GHz 65W Intel Core i3-7300 ~ Kaby Lake 2/4 4.0 / – GHz 51W Intel Core i3-7100 ~ Kaby Lake 2/4 3.9 / – GHz 51W AMD Ryzen 5 1400 ~ Zen 4/8 3.2 / 3.4 GHz 65W AMD Ryzen 3 1300X ~ Zen 4/4 3.5 / 3.7 GHz 65W AMD Ryzen 3 2200G ~ Zen+ 4/4 3.5 / 3.7 GHz 65W AMD Athlon 240GE ~ Zen 2/4 3.5 / – GHz 35W AMD Athlon 220GE ~ Zen 2/4 3.4 / – GHz 35W AMD Athlon 200GE ~ Zen 2/4 3.2 / – GHz 35W Intel Pentium G5600 ~ Coffee Lake 2/4 3.9 / – GHz 54W Intel Pentium G5400 ~ Coffee Lake 2/4 3.7 / – GHz 54W Intel Pentium G4620 ~ Kaby Lake 2/4 3.7 / – GHz 54W Intel Pentium G4560 ~ Kaby Lake 2/4 3.5 / – GHz 54W AMD Ryzen 3 1200 ~ Zen 4/4 3.1 / 3.2 GHz 65W Price Comparison The cheapest chips from AMD and Intel cost around 40 to 50 Dollars. The Ryzen 3950X costs around 700 Dollars while the 9900K costs around 530 Dollars. If you are looking at value for money options, then the Ryzen 7 3700X is an incredible 8 core processor. If money is not a concern, then the 3960X and 3970X are brilliant options. They cost in excess of 1400 Dollars. The Thread Ripper 3990X with 64 cores has a price of $4000 but performance wise, it does not get better than this. Laptop Processors Comparison In the Desktop segment, AMD and Intel are pretty evenly matched and in some situations AMD even outperforms Intel. However, when it comes to Laptops, the story is different. Intel dominates the Laptop market for processors and has a better and wider portfolio. The Intel i7-9750H is a monster in terms of performance. For normal work, an i5 processor ought to do. Only for heavy computational loads do you require an i7 or i9. On paper, integrated graphics look like a great idea. However, it might not be able to handle the most demanding of games, and that too only on the lower settings. Intel has a lot of chips with integrated graphics however the AMD APUs are simply stronger. If you don't have the money to buy a dedicated GPU, it is best to opt for an AMD APU like the Ryzen 3400G. Overclocking used to be a difficult process but thanks to the new programs from AMD and Intel, it is quite easy to do. Not all the processors can be overclocked. Most of the chips from AMD support overclocking. It can be done through the Ryzen master. It can also be done through the BIOS, but we do not recommend that method to inexperienced users. Also, it is best to go for a water-cooling system if you intend to overclock. Intel allows only processors with X or K labels to be overclocked. The Extreme Tuning Utility helps with the overclocking. All the Intel processors come with a stock cooler so it is a necessity to upgrade the cooler while overclocking. A new generation Ryzen CPU will be compatible with an older Ryzen motherboard and vice versa. As a result, upgrading is quite easy. For intel, an 8th generation processor would not work with a 7th generation Motherboard. As a result, you have to upgrade both the CPU as well as the motherboard. The Ryzen motherboards and coolers are much harder to get. Some of the standalone coolers require special AM4 brackets as well. On the other hand, are more common and compatibility is not a big problem. AMD has significantly increased their market share due to the enormous success of the Ryzen chips. The 3950X received Rave reviews and is an incredible processor. The future is definitely bright for AMD. Intel has also experienced success with the likes of i5-9400F being incredibly popular amongst customers. However, the increasing popularity of Ryzen means that it will have to think outside the hat in terms of innovations. Acronyms related to CPU They are parts of a processor. More cores means better multitasking performance. Threads improve the computational speed and are a virtual component. It is measured in GHz and indicates the number of cycles that the processor runs. A bigger number means that it is faster. Thermal Design Power is a measure of the amount of heat the component is expected to release. It is measured in Watts. CPUs have a specific socket type and they can only be installed in motherboards that support the particular socket type. Final Words: Both Intel and AMD make some pretty great CPUs. If you are a dedicated gamer and are not interested in Video rendering and editing, we would recommend going for an Intel CPU. Else, AMD is the better option. AMD vs Intel: which CPUs are better? One of the first questions many of you will have when you get into PCs or laptops. On the one hand, you have Team Blue (Intel)- traditionally known for charging a premium for its quality silicon. In the other corner, is Team Red (AMD), a brand that has successfully shaken its 'performance on a budget' image and now stands toe-to-toe with Intel in the CPU market. The decision between Intel and AMD processors rests on user-needs. If you're looking for a CPU dedicated to heavy multitasking loads then purchasing an Intel processor is a great option. However, if you're looking for an energy effcient CPU that's on the slightly cheaper side then AMD might be the right choice. If you're still unsure which way to swing after reading this comparison guide, you can head to our CPU buyers guide hub to crack down on the market's favorite CPUs out there and what they could bring to your desktop. AMD is now seen as a genuine contender by the PC community, and under charismatic CEO Dr. Lisa Su, the company has soared to record highs and dramatically improved its CPU performance. But in the real world, how do they stack up? This article is all about dissecting the two company's current offerings to see which CPUs come out on top in 2025. As a reader, you're likely seeking clarity on which brand will serve your computing needs best, whether it's for multitasking, gaming, or efficient PC power usage—and we're here to provide just that. After all, we have plenty of hands-on experience with both AMD and Intel products. We'll explore the latest specs and features, evaluate the pricing and value, and delve into how Intel processors and AMD processors handle multitasking and productivity tasks. For the gamers, we'll examine which CPUs could give you the edge in the latest titles. And because performance isn't the only consideration, we'll also discuss power consumption and heat output—critical factors for many builds so you'll know if you'll need to replace anything. Without further ado, let's dig into some of the best CPUs offered by Team Blue and Team Red. This is Intel vs AMD. When evaluating the latest CPU offerings, Intel and AMD present their unique takes on power and performance. Previously its top-of-the-line CPU, Intel's Core i9-13900K commands attention with its 24 cores and 32 threads, and its high boost clock of 5.8 GHz is impressive. It maintains a TDP of 125W but can push to 253W for peak performance. However, Intel's Raptor Lake refresh that was released in October 2023 saw the i9 14900K, built upon the Raptor Lake architecture, reach speeds of up to 6 GHz. On the other hand, AMD's Ryzen 9 7950X3D stakes its claim with a 144MB cache and an efficient energy profile, topping at 162W under full load. It can also almost match Intel's capabilities, with a boosted clock speed of 5.7 GHz, without draining that much power. Intel's strengths lie in its architectural design, which delivers a balanced performance that's tough to beat. The Core i9-13900K stands out for its ability to handle intensive multi-threaded tasks without breaking a sweat, making it ideal for both gaming and productivity. The downside? These chips can be power-hungry under load, which might lead to higher energy bills and the need for better desktop cooling solutions. Annoyingly, it seems that the refreshed 14th Gen chips are no exception, and although delivering better performance, they haven't been blessed with lower power consumption. What this means is you're going to need a pretty hefty cooling solution, especially when you start looking at the i9s. Even as far back as the i9990k, top-end Intel chips are known to run very hot. CPUMSRPCores / Threads (P+E)P-Core Base/Boost (GHz)Cache (L2/L3)TDP-PBP / MTPCore i9-14900KS$68924 / 32 (8+16)3.2 / 6.268MB (32+36)150W / 253WCore i9-14900K$58924 / 32 (8+16)3.2 / 5.868MB (32+36)150W / 253WCore i9-13900K$58924 / 32 (8+16)3.0 / 5.868MB (32+36)125W / 253WRyzen 9 7950X$69916 / 324.5 / 5.780MB (16+64)170W / 230WRyzen 9 7950X3D$69916 / 324.2 / 5.7144MB (16+128)120W / 162WRyzen 9 7900X$54912 / 244.7 / 5.676MB (12+64)170W / 230WRyzen 9 7900X3D$59912 / 244.4 / 5.6140MB (12+128)120W / 162WRyzen 7 5800X3D$4498 / 163.4 / 4.596MB105WCore i7-14700K$4098 / 123.4 / 5.561MB (33/28)125W / 253WCore i7-13700K$40916 / 24 (8+8)3.4 / 5.454MB (24+30)125W / 253WRyzen 7 7700X$3998 / 164.5 / 5.440MB (8+32)105W / 142WRyzen 7 8700G$3298 / 164.2 / 5.124 (8+16)45-65WRyzen 5 7600X$2996 / 124.7 / 5.338MB (6+32)105W / 142WCore i5-14600K$31914 / 20 (6+8)3.5 / 5.344MB (20+24)125W / 181WCore i5-13600K$31914 / 20 (6+8)3.5 / 5.144MB (20+24)125W / 181WRyzen 5 7600X$2996 / 124.7 / 5.338MB (6+32)105W / 142WRyzen 5 8600G$2296 / 124.3 / 5.022MB (6+16)45-65WRyzen 5 8500G$2296 / 123.5 / 5.022MB (6+16)45-65WRyzen 3 8300G$1764 / 83.4 / 4.912MB (4+8)45-65WTable showing the Intel and AMD chips, including their pricing and cache size in descending order AMD's Ryzen 9 7950X3D excels in gaming thanks to its massive cache, giving it an edge in high-frame-rate scenarios. However, the focus on gaming performance means that it can lag in general productivity tasks when compared to Intel's more balanced offerings. Additionally, Ryzen's reliance on the newer DDR5 memory means users will face higher upgrade costs if they're coming from older systems. One thing AMD does have over Intel is what they've called a 3D V-Cache (You can tell if you have one because it'll have 3D in the name, such as the Ryzen 75800X3D). This vertical cache was so effective, combining efficiency and more than 200 times the interconnect density of a 2D chipset, that it's among the fastest desktop processors in the world. We've broken down the Intel Core i9 14900KS vs Ryzen 7 5800X3D, should you want a closer look at how the 3D V-Cache compares with Intel's top-of-the-range chip. After considering the pros and cons, Intel comes out on top in the specs and features category. Its CPUs offer a blend of performance and versatility that's hard to overlook, providing a better overall experience for a wider range of activities. Intel also maintains compatibility with DDR4, allowing for a more budget-friendly upgrade path. Thus, for users looking for an all-encompassing CPU that delivers across the board, Intel is still the way to go in the AMD vs Intel showdown. AMD is more than fine if you're looking to build a gaming rig, but if you're wanting to build an all-rounder, an i7 or if the budget stretches, an i9, is still the way to go in 2025. In the AMD vs Intel battle of CPU pricing and value, Team Blue has rolled up its sleeves to reclaim its position in the market. The launch of Raptor Lake is a clear indicator of Intel's aggressive strategy, marking a significant drop in the cost per core and thread across its Core i5, i7, and i9 ranges. This strategic pricing allows Intel to overshadow AMD in value, particularly in the mid to high-end segments. AMD has long been the go-to for budget-conscious buyers, thanks to perks like included coolers and the freedom to overclock across most of its product line. The company's forward-thinking features like Precision Boost Overdrive further cemented its place as a value leader. But times have unfortunately changed. AMD's price hikes and the removal of bundled coolers, coupled with increased cooling demands for its CPUs, have dampened its competitive edge. This shift has made AMD's offerings less appealing to those seeking maximum value for their investment. Intel stands out in the multitasking and productivity arena, particularly with its Core i9-13900K processor. Boasting 24 cores capable of juggling 32 threads, it's an impressive powerhouse that excels in keeping numerous tasks moving fluidly. The chip's performance shines in benchmarks, notching a towering Passmark score of 60,009, and it leads the pack with a single-thread rating of 4,679. The 14 Gen takes things even further, with i7 models now more than capable of serious multi-tasking and putting up a fight against older i9 models. AMD, while offering solid CPUs, can't match Intel's core and thread count, which translates to a slightly more constrained multitasking experience. Especially for those engaged in content creation or heavy multitasking, this core count discrepancy can be the deciding factor. Intel's chips are adept at seamlessly transitioning between tasks, ensuring productivity doesn't falter even under heavy loads. With a blend of robust single-threaded performance and a multitude of cores for parallel processing, Intel delivers a smooth and efficient computing experience. This balance makes Intel the preferred choice for users who demand peak performance across a breadth of applications. When it comes to AMD vs Intel in the gaming realm, AMD steals the spotlight with its X3D line of CPU chipsets, which includes the Ryzen 7 7800X3D, Ryzen 9 7950X3D, and Ryzen 9 7900X3D. These processors are tailored for gamers seeking the pinnacle of performance, and they deliver by topping the charts in gaming benchmarks. Notably, the Ryzen 7000 series features high-performance integrated graphics – the Radeon Graphics integrated graphics solution. However, we've still made sure to delve into the best GPU for the Ryzen 7 7800X3D to find you a graphics card that this AMD CPU superpower won't bottleneck. The Ryzen 7 7800X3D, in particular, has made waves as an outstanding gaming processor, marking its territory as the best option available for pure gaming prowess. It's a formidable choice for those who prioritize gaming above all else and is recognized as such among the community of gamers. However, this gaming superiority comes with certain caveats in productivity workloads, where AMD's X3D chips may not perform as well as some users require. If your computing needs are multifaceted, encompassing both gaming and productivity, Intel's offerings might serve you better. They provide a more balanced package, ensuring that users don't have to compromise on performance outside of their gaming escapades. The top-end Intel cards are incredibly powerful but need the right cooling solutions. Make sure you check your coolers to ensure they're powerful enough to deal with a significant amount of heat. We woud always recommend liquid over air coolers fo i9 CPUs. When it comes to power consumption and heat, AMD leads with its advanced 5nm process technology. AMD chips are more power-efficient and cooler, translating to energy savings and less strain on cooling systems. Intel, despite improvements with its Raptor Lake series, still tends to consume more power. However, the performance delivered by Intel CPUs often justifies their higher energy use for many users. Nevertheless, the overall efficiency crown goes to AMD. Its CPUs offer more processing power for each watt consumed and come with more manageable thermal demands. This makes AMD the better choice for those who prioritize energy efficiency and lower operating temperatures in their computing tasks. A great way to see how the two brands compare is by looking at both of their flagship CPUs and seeing how they differ. Both the Core i9-14900K from Intel and Ryzen 9 7950X from AMD offer extremely high processing capabilities and paired with the right GPU can create quite the powerful PC setup. But how are they different? There is quite a lot to be said about the differences between these processors – the only thing they seem to have in common is that they're both X86 CPUs. The i9-14900K supports Raptor Lake architecture and is a Hybrid monolithic CPU, meaning that it is a single piece of silicon made up of both 8 P-cores and 16 E-cores. Whereas, the Ryzen 9 7950X is based on Zen 4 architecture; using two chips that contain eight cores each. The hybrid design in the i9-14900K is beneficial because only a few P-cores are necessary for good single-threaded performance, meaning the E-cores can provide for multi-threaded tasks. Therefore, in terms of raw performance, the difference in architecture here means that the Core i9-14900K takes the slight upper hand. Another major difference between these two processors is their process nodes. Process nodes refer to the way the chip is manufactured, which plays a large role in the capabilities of the CPU. The Ryzen 9 7950X is made of TSMC's 5nm node and the Core i9-14900K is made on the Intel 7 node (formerly 10nm). In this area, the Ryzen 9 7950X is slightly in front, because its node is nearly a full generation ahead of the i9-14900K, improving its efficiency. Both CPUs are highly powerful, but due to their architecture, they do pose different advantages for use. If you're looking for raw performance then the i9-14900K might be the right option for you. However, if efficiency plays a major role in your decision making then perhaps the Ryzen 9 7950X is the right choice. Shop on Amazon CHECK PRICE There are some apparent differences in the way that Intel and AMD manufacture their processors, which subsequently play a role in their performance capabilities. Since AMD's partnership with TSMC, it has been able to produce smaller, more efficient chips that are able to compete with the prowess of processors manufactured by Intel. AMD outsources its chips from the Taiwanese company with the latest range of processors featuring TSMC's 5nm node. Intel has always been at the top of the game when it comes to producing high-quality processors, however, they take a different approach to AMD during the manufacturing process. Unlike AMD, Intel uses its own manufacturing process, with the latest being called 'Intel 7'. This process uses 7nm technology in Intel's latest generation of commercial chips. Which allows the processors to be faster and more energy-efficient due to their smaller transistors and size. Gamers looking for the top frame rates in games often gravitate toward AMD's high-end offerings. AMD has made significant strides with its Ryzen series, especially the X3D chips that offer the best gaming performance currently available, and for this reason, they tend to score highly when it comes to the best CPUs for gaming. That being said, Intel still very much represents the highest-end when it comes to CPUs. While not every generation is created equal – the 14th Gen for example received a lukewarm response from the community after the decent 13th gen chips, Intel CPUs typically are better all-rounders when facing off against the more gaming-focused AMD offerings. Intel and AMD use different socket designs for their processors. For example, Intel's 12th, 13th, and 14th Generation CPUs use the LGA 1700 socket, while AMD's Ryzen 5000 series CPUs use the AM4 socket, and its latest Ryzen 7000 series CPUs use the new AM5 socket. It's essential to match the CPU to a motherboard with the correct socket type, so it's good to have this knowledge under your belt. When you're investing in a CPU upgrade, you'll no doubt be weighing up between AMD and Intel, as they sit neck and neck at the top of the processor market. While Intel might take the edge in terms of speed on heavy multitasking loads, AMD's speeds aren't far behind and often perform more energy efficiently. With such close competition on our hands, the CPU that's going to be better for you depends on your current system setup, what you need it for, and how much you have available to spend on it. If you're just going to focus on building a gaming rig, then opting for an i9 is overkill and you can absolutely consider a cheaper, AMD CPU. However, if you're looking to multi-task or you do a lot of video editing, Intel chips – especially newer i7 and i9 models, will be absolutely perfect for you. Opt for the 13th Gen if you're looking to get a balance of value and performance, which we think will go down even more in price once Intel reveals their rumored 15th Gen chips. We care deeply about transforming lives with AMD technology to enrich our industry, our communities, and the world. Our mission is to build great products that accelerate next-generation computing experiences – the building blocks for the data center, artificial intelligence, PCs, gaming and embedded. Underpinning our mission is the AMD culture. We push the limits of innovation to solve the world's most important challenges. We strive for execution excellence while being direct, humble, collaborative, and inclusive of diverse perspectives. AMD together we advance_ Primary 2485 Augustine Drive Santa Clara, California 95054, US Get directions 7171 Southwest Pkwy Austin, Texas 78735, US Get directions 1 Commerce Valley Dr E Markham, ON L3T 7X6, CA Get directions 102 Bengaluru, Karnataka 560066, IN Get directions 508 Chai Chee Ln Singapore, Singapore 469032, SG Get directions 2950 E Harmony Rd Fort Collins, Colorado 80528, US Get directions 3501 Quadrangle Blvd Orlando, Florida 32817, US Get directions 90 Central St Boxborough, Massachusetts 01719, US Get directions 20333 State Highway 249 Houston, Texas 77070, US Get directions 2002 156th Ave NE Bellevue, Washington, US Get directions 24, Rue Lamartine Eybens, Auvergne-Rhone-Alpes 38320, FR Get directions 314 Midsummer Boulevard Milton Keynes, England, GB Get directions Via Polidoro da Caravaggio, 6 Milan, Lombardy 20156, IT Get directions Einsteinring 24 Dornach, Bavaria 85609, DE Get directions 13, Rue Camille Desmoulins Issy-les-Moulineaux, Ile-de-France 92130, FR Get directions Rue Royale 97 Brussels, Brussels Region 1000, BE Get directions 123 Epping Rd North Ryde, New South Wales 2113, AU Get directions So, what's the difference between an AMD and Intel motherboard? Which motherboard and CPU provider should you go with for your next PC build, and what do these manufacturers like to prioritize in their products?Below, we'll be tackling all these questions and more to make sure you know all you need to in order to choose between an AMD and Intel platform.A Brief on Motherboards, AMD and IntelIf a PC were a human body, the motherboard would be equivalent to the spine and central nervous system.Every single component in your system must connect to and communicate through the motherboard, so despite how often motherboards are overlooked in PC builds, they're actually one of the most high-impact buying decisions you'll ever make in a PC and motherboards can even impact performance considerably.PC motherboards are primarily sold to be compatible with AMD and Intel CPUs, the two major CPU manufacturers. CPU architecture and motherboard architecture (including chipset architecture) must always be built side-by-side to ensure compatibility. In most cases, modern motherboards themselves aren't made by AMD or Intel, even though they are tied to a specific CPU brand and generation. Rather, AMD and Intel specify technical features, and how their chipsets and CPUs are best integrated on a motherboard, but they don't manufacture or assemble the motherboard itself. That's a job for motherboard manufacturers/brands such as ASUS, Gigabyte, MSI, ASRock, to name the most popular.This is very similar to how GPUs are made, where AMD and Nvidia manufacture the GPU chip itself and then let GPU Board Partners create their own Graphics Cards by integrating this chip.The CPUs supported by any motherboard will depend on your CPU socket, your motherboard chipset, and BIOS updates. If a board is compatible with more than one generation, you'll need to apply those BIOS updates before trying to install a newer CPU.What's The Difference Between an AMD and Intel Motherboard? AMD vs Intel Platforms ComparedDifference Between AMD and Intel Desktop MotherboardsAt the time of writing, AMD and Intel desktop motherboards are fiercely competitive across price ranges but also…mostly the same, especially once you hit high-end motherboards and nobody's pulling punches on Chipset or VRMs.Here are the main differences between AMD and Intel desktop motherboards (apart from obvious CPU support): At the time of writing, Intel desktop motherboards are actually available at cheaper prices thanks to some boards supporting DDR4. Their DDR5 boards are just as expensive as AMD's though, if not worse. However, AMD's DDR5-only methodology makes for a more expensive barrier of entry than may be necessary. Most of AMD's motherboard chipsets allow for overclocking, while only Intel's highest-end chipsets allow the same. This usually results in overclockable Intel PC builds being more expensive, especially if all else is equal (ie, DDR5 support). For extra motherboard features not tied to chipset, like Wi-Fi, AMD and Intel motherboards will randomly trade places on pricing and availability.Overall, the differences between AMD and Intel's mainstream motherboards are minor, but still significant enough to impact buying decisions.Despite being historically seen as the cheaper brand, AMD is also pushing a more premium facade this generation by being the first to adopt a DDR5-only socket, though Intel is sure to follow suit before long, eventually making this point null.FAQDo All AMD Motherboards Use PGA Sockets?For a very long time, nearly all mainstream AMD motherboards used PGA CPU sockets.AM4 and AM3 before it both used PGA CPU sockets. However, AMD Threadripper on HEDT has always been using LGA CPU sockets, and as of AM5, AMD's mainstream desktop platform is also using an LGA CPU socket design.So, no. Not all AMD motherboards use PGA sockets.Are Intel Motherboards Backwards Compatible?No. Intel changes their CPU sockets far more frequently than AMD does, and so they don't have backward compatibility with older CPUs.If your Intel motherboard supports an older CPU, it'll never be more than a generation or two old before Intel changes the socket.Are AMD Motherboards Futureproof?"Futureproof" might be a strong word, but in general AMD has a better track record for supporting a given CPU socket for a longer period of time than Intel.This gives them some more "futureproofing" for sure, at least in terms of potential future CPU upgrades. However, there's nothing inherently more "futureproof" about AMD boards besides.Are Intel or AMD Motherboards Better?Hard to say! I think the answer truly depends on you and what you prioritize.If all you care about is features for the price, AMD motherboards might be better. You get access to overclocking without an exorbitant price premium on the CPU and motherboard from AMD, since the majority of them simply allow you to use the feature.Meanwhile, Intel motherboards are great, especially if you like high-end features and are willing to opt for the high-end chipsets to match.However, the price tag for access to features like overclocking can be discouraging, and historically speaking, the average pricing of an Intel platform will likely be higher than an AMD platform with the same features.Does AMD AM5 Support DDR4?Nope! All AMD AM5 motherboards have completely dropped DDR4 RAM support in favor of DDR5 RAM.If you want to stay up-to-date with AMD, apparently, you need to cough up that DDR5 premium. No more alternate motherboards for different RAM generations, I guess.Over to YouAnd that's all!If my efforts paid off, this article helped teach you the differences between AMD and Intel motherboards. Truthfully, they're competitive enough with each other that I don't think you'd be wrong to choose either board manufacturer as the platform for your next PC build, especially since they're constantly one-upping each other in CPU performance.Even single-core performance now that AMD is getting frisky with their Level 3 Cache.But what do you think? Feel free to leave a comment with any questions or concerns about motherboards or PC hardware in general below. Me or another CGD Team member will assist you as soon as we can.Alternatively, you can hang out on our Forum with other Enthusiasts and Experts if those are more your speed. As a person who likes talking in paragraphs, a forum is more or less my natural habitat.Anyway, it's time to wrap up here! Best of luck with your PC build. Whether you go with AMD or Intel, I bid you a smooth, headache-free building experience! 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