Click to verify

What does the error message 'java: error: release version 17 not supported' mean and how can I resolve it in IntelliJ? The error message 'java: error: release version 17 not supported' typically indicates that your Java Development Kit (JDK) settings in IntelliJ IDEA are pointing to a version that does not support the specified Java version in your project settings. This issue often arises after updating your IDE or your project configuration without aligning your SDK settings. Copied // Example of setting the Project SDK in IntelliJ: // Step 1: Go to 'File' > 'Project Structure' > 'Project'// Step 2: Set 'Project SDK' to the desired JDK version (e.g., 17)// Step 3: Set 'Project language level' to the corresponding level (e.g., 17 - 'Sealed types, patterns'). // You can add a JDK under 'File' > 'Project Structure' > 'SDKs' if it's not already listed. Causes The project SDK is set to a version lower than the version specified in the project settings. The IntelliJ IDEA IDE does not support the selected SDK version due to being outdated. The JDK installation might be incorrect or incomplete, leading to compatibility issues. Solutions Check your project settings to ensure the language level is set to a supported version (e.g., Java 16 if that's your SDK). Go to `File > Project Structure > Project` and adjust the 'Project SDK' and 'Project language level'. Update your IntelliJ IDEA to a version that supports JDK 17 or higher. This can be done by downloading the latest version from the official JetBrains website. Install the correct version of the JDK that matches your project settings. Ensure that JDK 17 or the required version is installed and properly configured in IntelliJ. You can add a new JDK via `File > Project Structure > SDKs`. Mistake: Not updating IntelliJ IDEA after installing a new JDK version. Solution: Ensure you have the latest version of IntelliJ compatible with the JDK version you intend to use. Mistake: Failure to set the correct JDK in Project Structure. Solution: Double-check 'File > Project Structure > Project', to ensure the selected SDK matches your code requirements. Mistake: Assuming JDK installation has been completed without verification. Solution: Verify the JDK installation through terminal or command prompt with `java -version` to confirm the version. java error release version 17 not supported IntelliJ JDK version error fix release version 17 error IntelliJ Java SDK configuration in IntelliJ IntelliJ IDEA JDK update Copyright 2025 - CodingTechRoom.com This is because you are building for target version of Java 1.8 Depending what you are using, Maven or Gradle, you set the target version of java with: Gradle sourceCompatibility = '1.8' targetCompatibility = '1.8' Docs: Maven 1.8 1.8 Docs: You can change this version to 12 or JavaVersion.VERSION_12 to use your build JDK, but then you would lose the compatibility and won't be able to run the application jar with Java 1.8. You can also change the build SDK version, on macOS press command + ; and go to Project Settings -> Project and change the Project SDK to the one you want to build it with. Proprietary software whose full use is limited in timeShareware is a type of proprietary software that is initially shared by the owner for trial use at little or no cost.[1] Often the software has limited functionality or incomplete documentation until the user sends payment to the software developer.[2] Shareware is often offered as a download from a website. Shareware differs from freeware, which is fully-featured software distributed at no cost to the user but without source code being made available; and free and open-source software, in which the source code is freely available for anyone to inspect and alter.There are many types of shareware and, while they may not require an initial up-front payment, many are intended to generate revenue in one way or another. Some limit use to personal non-commercial purposes only, with purchase of a license required for use in a business enterprise. The software itself may be time-limited, or it may remind the user that payment would be appreciated.Trialware or demoware is a program that limits the time that it can be effectively used, commonly via a built-in time limit, number of uses, or only allowing progression up to a certain point (e.g. in video games, see Game demo).[3] The user can try out the fully featured program until the trial period is up, and then most trialware reverts to either a reduced-functionality (freemium, nagware, or crippleware) or non-functional mode, unless the user purchases a full version.[4] Trialware has become normalized for online Software as a Service (SaaS).[citation needed] WinRAR is a notable example of an unlimited trialware, i.e. a program that retains its full functionality even after the trial period has ended.The rationale behind trialware is to give potential users the opportunity to try out the program to judge its usefulness before purchasing a license. According to industry research firm Softletter, 66% of online companies surveyed had free-trial-to-paying-customer conversion rates of 25% or less. SaaS providers employ a wide range of strategies to nurture leads, and convert them into paying customers.Main article: FreemiumFreemium works by offering a product or service free of charge (typically digital offerings such as software, content, games, web services or other) while charging a premium for advanced features, functionality, or related products and services. For example, a fully functional feature-limited version may be given away for free, with advanced features disabled until a license fee is paid. The word freemium combines the two aspects of the business model: "free" and "premium".[5] It has become a popular model especially in the antivirus industry.Main article: AdwareAdware, short for "advertising-supported software", is any software package which automatically renders advertisements in order to generate revenue for its author. Shareware is often packaged with adware to lower the shareware fees or eliminate the need to charge users a fee. The advertisements may take the form of a banner on an application window. The functions may be designed to analyze which websites the user visits and to present advertising pertinent to the types of goods or services featured there. The term is sometimes used to refer to software that displays unwanted advertisements, which typically are more intrusive and may appear as pop-ups, as is the case in most ad-oriented spyware.[6] During the installation of the intended software, the user is presented with a requirement to agree to the terms of click through an end-user license agreement or similar licensing which governs the installation of the software.[7]Main article: CripplewareCrippleware has vital features of the program, such as printing or the ability to save files, disabled or unwanted features like watermarks on screencasting and video editing software[8] until the user buys the software. This allows users to take a close look at the features of a program without being able to use it to generate output. The distinction between freemium and crippleware is that an unlicensed freemium program has useful functionality, while crippleware demonstrates its potential but is not useful on its own.Main article: DonationwareDonationware is a licensing model that supplies fully operational unrestricted software to the user and requests an optional donation be paid to the programmer or a third-party beneficiary (usually a non-profit).[9] The amount of the donation may also be stipulated by the author, or it may be left to the discretion of the user, based on individual perceptions of the software's value. Since donationware comes fully operational (i.e. not crippleware) with payment optional, it is a type of freeware. In some cases, there is a delay to start the program or "nag screen" reminding the user that they haven't donated to the project. This nag feature and/or delayed start is often removed in an update once the user has donated to (paid for) the software.Nagware (also known as begware, annoyware or a nagscreen) is a pejorative term for shareware that persistently reminds the user to purchase a license.[10] It usually does this by popping up a message when the user starts the program, or intermittently while the user is using the application. These messages can appear as windows obscuring part of the screen, or as message boxes that can quickly be closed. Some nagware keeps the message up for a certain time period, forcing the user to wait to continue to use the program. Unlicensed programs that support printing may superimpose a watermark on the printed output, typically stating that the output was produced by an unlicensed copy.Some titles display a dialog box with payment information and a message that paying will remove the notice, which is usually displayed either upon startup or after an interval while the application is running. These notices are designed to annoy the user into paying.Postcardware, also called just cardware, is a style of software distribution similar to shareware, distributed by the author on the condition that users send the author a postcard. A variation of cardware, emailware, uses the same approach but requires the user to send the author an email. Postcardware, like other novelty software distribution terms, is often not strictly enforced. Cardware is similar to beerware.The concept was first used by Aaron Giles, author of JPEGView.[11] Another well-known piece of postcardware is the roguelike game Ancient Domains of Mystery, whose author collects postcards from around the world. Orbitron is distributed as postcardware. Exifer is a popular application among digital photographers that has been postcardware.[12] Caledos Automatic Wallpaper Changer is a "still alive" project cardware. "Empathy" is a postcardware for password-protected executables. Dual Module Player and Linux were also postcardware for a long time.[13] An example for emailware is the video game Jump 'n Bump.[14] Another popular postcardware company is the Laravel package developers from Spatie, which has released over 200 open-source packages to the Laravel framework, which are postcardware licensed, and all shown at their website.[15]In 1982, Andrew Fluegelman created a program for the IBM PC called PC-Talk, a telecommunications program, and used the term freeware; he described it "as an experiment in economics more than altruism".[16] About the same time, Jim "Button" Knopf released PC-File, a database program, calling it user-supported software.[17] Not much later, Bob Wallace produced PC-Write, a word processor, and called it shareware. Appearing in an episode of Horizon titled Psychedelic Science originally broadcast 5 April 1998, Bob Wallace said the idea for shareware came to him "to some extent as a result of my psychedelic experience".[18]Fluegelman said that his experience as a book publisher and author discouraged him from finding a traditional software publisher. KQED pledge drives inspired his distribution method, as well as his not knowing how to implement copy protection.[19]In 1983 Jerry Pournelle wrote of "an increasingly popular variant" of free software "that has no name, but works thus: 'If you like this, send me (the author) some money. I prefer cash.'"[20] In 1984, Softalk-PC magazine had a column, The Public Library, about such software. Public domain is a misnomer for shareware, and Freeware was trademarked by Fluegelman and could not be used legally by others, and User-Supported Software was too cumbersome. So columnist Nelson Ford had a contest to come up with a better name.The most popular name submitted was Shareware, which was being used by Wallace. However, Wallace acknowledged that he got the term from an InfoWorld magazine column by that name in the 1970s[failed verification][citation needed], and that he considered the name to be generic,[21] so its use became established over freeware and user-supported software.[22]By 1984 Knopf reported receiving about $1,000 a day for PC-File,[23] and by 1985 Fluegelman was receiving "dozens of $35 checks" daily. He had two employees to fulfill orders and answer questions for PC-Talk.[19] He, Knopf, and Wallace clearly established shareware as a viable software distribution model by becoming wealthy.[24][25]Prior to the popularity of the World Wide Web and widespread Internet access, shareware was often the only economical way for independent software authors to get their product onto users' desktops. Those with Internet or BBS access could download software and distribute it amongst their friends or user groups, who would then be encouraged to send the registration fee to the author, usually via postal mail. During the late 1980s and early 1990s, shareware software was widely distributed over online services, bulletin board systems and on diskettes. Contrary to commercial developers who spent millions of dollars urging users "Don't Copy That Floppy", shareware developers encouraged users to upload the software and share it on disks.Commercial shareware distributors such as Educorp and Public Domain Inc printed catalogs describing thousands of public domain and shareware programs that were available for a small charge on floppy disk. These companies later made their entire catalog available on CD-ROM. One such distributor, Public Software Library (PSL), began an order-taking service for programmers who otherwise had no means of accepting credit card orders. Meanwhile major online service provider CompuServe enabled people to pay (register) for software using their CompuServe accounts. When AOL bought out CompuServe, that part of CompuServe called SWREG (Shareware Registration) was sold to UK businessman Stephen Lee of Atlantic Coast PLC who placed the service on to the internet and enabled over 3,000 independent software developers to use SWREG as a back office to accept various payment methods including credit, debit and charge cards, Paypal and other services in multiple currencies. This worked in realtime so that a client could pay for software and instantly download it which was novel at the time. SWREG was eventually bought by Digital River, Inc. Also, services like Kagi started offering applications that authors could distribute along with their products that would present the user with an onscreen form to fill out, print, and mail along with their payment. Once telecommunications became more widespread, this service also expanded online. Toward the beginning of the Internet era, books compiling reviews of available shareware were published, sometimes targeting specific niches such as small business. These books would typically come with one or more floppy disks or CD-ROMs containing software from the book.[26]As Internet use grew, users turned to downloading shareware programs from FTP or web sites. This spelled the end of bulletin board systems and shareware disk distributors. At first, disk space on a server was hard to come by, so networks like Info-Mac were developed, consisting of non-profit mirror sites hosting large shareware libraries accessible via the web or ftp. With the advent of the commercial web hosting industry, the authors of shareware programs started their own sites where the public could learn about their programs and download the latest versions, and even pay for the software online. This erased one of the chief distinctions of shareware, as it was now most often downloaded from a central "official" location instead of being shared samizdat-style by its users. To ensure users would get the latest bug-fixes as well as an install untainted by viruses or other malware, some authors discouraged users from giving the software to their friends, encouraging them to send a link instead.Major download sites such as VersionTracker and CNet's Download.com began to rank titles based on quality, feedback, and downloads. Popular software was sorted to the top of the list, along with products whose authors paid for preferred placement.If features are disabled in the freely accessible version, paying may provide the user with a license key or code they can enter into the software to disable the notices and enable full functionality. Some pirate web sites publish license codes for popular shareware, leading to a kind of arms race between the developer and the pirates where the developer disables pirated codes and the pirates attempt to find or generate new ones. Some software publishers have started accepting known pirated codes, using the opportunity to educate users on the economics of the shareware model.[27]Some shareware relies entirely on the user's honesty and requires no password. Simply checking an "I have paid" checkbox in the application is all that is required to disable the registration notices.[28][29]Main article: Game demoThis article needs additional citations for verification. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.Find sources:"Shareware"news newspapers books scholar JSTOR (December 2016) (Learn how and when to remove this message)In the early 1990s, shareware distribution was a popular method of publishing games for smaller developers, including then-fledgling companies Apogee Software (also known as 3D Realms), Epic MegaGames (now Epic Games), Ambrosia Software and id Software. It gave consumers the chance to play the game before investing money in it, and it gave them exposure that some products would be unable to get in the retail space.With the Kroz series, Apogee introduced the "episodic" shareware model that became the most popular incentive for buying a game.[30] While the shareware game would be a truly complete game, there would be additional "episodes" of the game that were not shareware and could only be legally obtained by paying for the shareware episode. In some cases these episodes were neatly integrated and would feel like a longer version of the game, and in other cases the later episodes would be stand-alone games. Sometimes the additional content was completely integrated with the unregistered game, such as in Ambrosia's Escape Velocity series, in which a character representing the developer's pet parrot, equipped with an undefeatable ship, would periodically harass and destroy the player after they reached a certain level representing the end of the trial period.Racks of games on single 51/4-inch and later 3.5-inch floppy disks were common in retail stores. However, computer shows[citation needed] and bulletin board systems (BBS) such as Software Creations BBS were the primary distributors of low-cost software. Free software from a BBS was the motivating force for consumers to purchase a computer equipped with a modem, so as to acquire software at no cost. The success of shareware games, including id Software hits Commander Keen and Doom, depended in part on the BBS community's willingness to redistribute them from one BBS to another across North America. The reasons for redistribution included allowing modem users who could not afford long-distance calls the opportunity to view the games.[31]The important distinguishing feature between a shareware game and a game demo is that the shareware game is (at least in theory) a complete working software program albeit with reduced content compared to the full game, while a game demo omits significant functionality as well as content. Shareware games commonly offered both single player and multiplayer modes plus a significant fraction of the full game content such as the first of three episodes, while some even offered the entire product as shareware while unlocking additional content for registered users. By contrast a game demo may offer as little as one single-player level or consist solely of a multiplayer map, this makes them easier to prepare than a shareware game.There are several widely accepted standards and technologies that are used in the development and promotion of shareware.FILE_ID.DIZ is a descriptive text file often included in downloadable shareware distribution packages.Portable Application Description (PAD) is used to standardize shareware application descriptions. PAD file is an XML document that describes a shareware or freeware product according to the PAD specification.[32]DynamicPAD extends the Portable Application Description (PAD) standard by allowing shareware vendors to provide customized PAD XML files to each download site or any other PAD-enabled resource. DynamicPAD is a set of server-side PHP scripts distributed under a GPL license and a freeware DynamicPAD builder for 32-bit Windows. The primary way to consume or submit a DynamicPAD file is through the RoboSoft application by Rudenko Software, the DynamicPAD author. DynamicPAD is available at the DynamicPAD web site.Code signing is a technology that is used by developers to digitally sign their products. Versions of Microsoft Windows since Windows XP Service Pack 2 show a warning when the user installs unsigned software. This is typically offered as a security measure to prevent untrusted software from potentially infecting the machine with malware. However, critics see this technology as part of a tactic to delegitimize independent software development by requiring hefty upfront fees and a review process before software can be distributed.[33]Association of Software ProfessionalsCarewareKeygen^ Bink, Thomas (April 4, 1996). "Shareware Profitable and Popular". The Kingston Whig-Standard (Kingston, Ontario, Canada). p. 17.^ Gnoffo Jr., Anthony (July 4, 1993). "The Shareware Computer Industry, A Growing World Of Innovation, Trust". Night-Ridder Newspapers. Rutland Daily Herald (Rutland, Vermont). p. 8D.^ Alvarez, Julian; Michaud, Laurent (July 2008). Serious Games: Advergaming, edugaming, training and more (PDF). IDATE. p.45. ISBN978-2-84822-169-4. Retrieved June 4, 2022.^ Flynn, Laurie (November 14, 1993). "Cheap, Easy Shareware Big Business". Knight-Ridder Newspapers. Sun Herald (Biloxi, Mississippi). p. C7.^ Jepson, Anna; Lundin, Elin (April 3, 2009). Freemium for large enterprises (Thesis). KTH Royal Institute of Technology. p.14. urn:nbn:se:kth:diva-99781.^ Wang, Wallace (2006). "Adware and Spyware". Steal This Computer Book 4.0: What They Won't Tell You About the Internet. No Starch Press. p.285. ISBN1-59327-105-0. Retrieved June 4, 2022.^ Sipior, Janice C.; Ward, Burke T.; Roselli, Georgina R. (Spring 2005). "The Ethical and Legal Concerns of Spyware". Information Systems Management. 22 (2): 43. doi:10.1201/1078/45099.22.2.20050301/87276.5. S2CID26291227.^ Franceschetti, Donald R. (2016). Principles of Computer Science. Salem Press. pp.112114. ISBN978-1-68217-139-4.^ Milian, Mark (June 13, 2011). "Reading apps sell subscriptions to fuzzy feelings". CNN. Archived from the original on May 22, 2014. Retrieved May 22, 2014.^ Parberry, Ian (June 1995). "The Internet and the Aspiring Games Programmer" (PDF). Proceedings of DAGS 95, "Electronic Publishing and the Information Superhighway". Boston: Birkhauser. p.2. Archived (PDF) from the original on March 4, 2016.^ Giles, Aaron. "Aaron's Computing History". Archived from the original on March 16, 2012. Retrieved August 7, 2006.^ "Exifer for Windows". www.friedemann-schmidt.com. Archived from the original on November 12, 2006. Retrieved January 18, 2016.^ Torvalds, Linus (May 2001). Just for Fun. New York: HarperCollins Publishers. ISBN0-06-662072-4.^ Jump 'n Bump (Archived 2015-12-22 at the Wayback Machine). readme.txt: "JUMP 'N BUMP by Brainchild Design in 1998 Jump 'n Bump is e-mailware. That means you're supposed to send us an e-mail. Write for example where you're from and what you thought about this game. If you do that, you will greatly encourage us to make more games for you!"^ "Postcards".^ Magid, Lawrence J. (August 1982). "PC-Talk". PC Magazine. p.143. Archived from the original on May 26, 2021. Retrieved October 21, 2013.^ Callahan, Michael E. "The History of Shareware". Paul's Picks. Archived from the original on February 2, 2008. Retrieved May 13, 2008.^ Horizon: Psychedelic science by Bill Eagles, (about 41 mins into programme)^ a b Erokan, Dennis (May 1985). "Andrew Fluegelman - PC-Talk and Beyond". MicroTimes. pp.1926. Retrieved March 12, 2025.^ Pournelle, Jerry (July 1983). "Interstellar Drives, Osborne Accessories, DEDICATE/32, and Death Valley". BYTE. p.323. Retrieved August 28, 2016.^ Markoff, John (September 26, 2002). "Bob Wallace, 53, Software Pioneer, Dies". The New York Times. Archived from the original on June 25, 2016. Retrieved May 26, 2016.^ "Association of Software Professionals - A community of real people using real names running real software businesses". www.asp-shareware.org. Archived from the original on April 2, 2010. Retrieved April 28, 2018.^ Watt, Peggy (June 11, 1984). "Software for a Donation". InfoWorld. Vol.6, no.24. p.36. ISSN0199-6649.^ "Bob Wallace Timeline". Erowid. January 12, 2004. Archived from the original on March 2, 2013. Retrieved March 7, 2013.^ Article about Jim "Button" Knopf Archived 2007-02-10 at the Wayback Machine, from Dr. Dobb's Journal^ "PC Mag Nov 24, 1992". November 24, 1992. Archived from the original on August 17, 2021. Retrieved April 1, 2015.^ "Software That is both Shareware and Guiltyware". Archived from the original on May 24, 2014.^ "FTP". Archived from the original on February 21, 2016.^ "Anarchie v1.1.3 1993-94 Peter N Lewis". Archived from the original on October 28, 2015. If you purchase a site license, contact me for information on how to make Anarchie automatically set the I Paid flag in the Preferences dialog (for those who are interested, I leave the I Paid checkbox off on my machine to ensure that the About box is not too annoying and it doesnt trouble me, so live with it:-)^ Hague, James (February 8, 1999). "Gimme Your Money: A Half-Baked History of Shareware". Loonygames. Archived from the original on February 23, 2020. Retrieved February 23, 2020.^ Driscoll 2022, pp.117120.^ "PAD specification". Archived from the original on June 12, 2007. Retrieved May 12, 2006.{{cite web}}: CS1 maint: bot: original URL status unknown (link)^ "Code Signing and You". rogueamoeba.com. Archived from the original on October 18, 2016. Retrieved April 28, 2018.Driscoll, Kevin (2022). The Modem World: A Prehistory of Social Media. Yale University Press. ISBN978-0-300-24814-2. Retrieved June 4, 2022.Look up shareware in Wiktionary, the free dictionary.Independent Software Developers Forum (ISDEF)Retrieved from " 2Video game publisher"Apogee Software" redirects here. For the company founded in 2008, see Apogee Entertainment.3D Realms Entertainment ApSFormerlyApogee Software ProductionsApogee Software, Ltd.Company typeSubsidiaryIndustryVideo gamesFounded1987; 38years ago(1987) in Garland, Texas, USFounderScott MillerHeadquartersAalborg, DenmarkKey peopleFrederik Schreiber (CEO)ProductsList of 3D Realms gamesParentSaber Interactive (2021present)Website3drealms.com3D Realms Entertainment ApS is a video game publisher based in Aalborg, Denmark. Scott Miller founded the company in his parents' home in Garland, Texas, in 1987 as Apogee Software Productions to release his game Kingdom of Kroz. In the late 1980s and early 1990s, the company popularized a distribution model where each game consists of three episodes, with the first given away free as shareware and the other two available for purchase. Duke Nukem was a major franchise created by Apogee to use this model, and Apogee published Commander Keen and Wolfenstein 3D the same way.Apogee began using the brand name 3D Realms for its 3D games in 1994, and in 1996 rebranded the company itself to 3D Realms to focus on traditionally-published 3D titles. Duke Nukem 3D (1996) was released under this name to great success. 3D Realms largely ceased its publishing and development operations afterwards to focus on two extensively delayed games: Prey (2006), which was under development until being taken over by another studio in 2001, and Duke Nukem Forever (2011), which remained under development until 2009. The "Apogee Software" name, library, and logo were licensed to Terry Nagy in 2008, who established Apogee Software LLC to develop and publish ports and spinoffs of Apogee titles.In 2009, 3D Realms, citing financial issues, laid off its development team and the majority of its staff, effectively ceasing operations. In March 2014, the company was acquired by SDN Invest, a Danish holding company and part-owner of Interceptor Entertainment, and relaunched later that year as 3D Realms Entertainment ApS, headquartered in Denmark. 3D Realms Entertainment has since served as a games publisher. Miller remained an advisor for the company until 2021, when he and Nagy acquired the Apogee brand and relaunched Apogee Software LLC as Apogee Entertainment, an independent games publisher. In August 2021, 3D Realms Entertainment was acquired by Embracer Group subsidiary Saber Interactive, which was spun off from Embracer in March 2024.In the early 1980s, Scott Miller often spent time in the computer lab of the high school he was attending, programming text adventures on the facility's Apple II and getting to know fellow student George Broussard.[1] Following graduation, both of them took jobs at local amusement arcade The Twilight Zone, allowing Miller to attend college and increase his interest in video games at the same time.[1] Following his sophomore year, Miller dropped out of the University of Dallas to focus entirely on video games, including participating in tournaments as well as programming his own games.[1] At that time, he found a special interest in the Turbo Pascal programming language and its easy integration on IBM Personal Computers.[2] Miller subsequently figured that his knowledge on video games should earn him more money than he made at The Twilight Zone, wherefore he, with assistance by Broussard, wrote a manual-style book on "how to beat video games".[1] The book fell into obscurity due to an oversaturated market but landed Miller a job as a video game critic for The Dallas Morning News and minor game-centric papers.[1] After four years of writing for the newspaper, he decided that he was capable of creating games that were better than those that he had to review and quit his job. Miller acquired a 16.5k modem, which he installed in his parents' house in Garland, Texas, and started operating as a full-time independent game developer.[1]The Apogee Software logoMost games developed by Miller at the time used extended ASCII characters as graphics.[1][3] The format appeared popular to him but ultimately proved unsuccessful when pitching them to publishers, adding to him not having a college degree or any professional experience in game development.[1] As such, he considered self-printing copies of his games, or distributing them freely through bulletin board systems (BBS), where the boards' users make voluntary donations, a model known as shareware distribution.[1] As the prior option seemed too expensive to Miller, he had to choose the latter, despite being urged not to by friends and colleagues.[1] Miller released Beyond the Titanic and Supernova as shareware games in 1986 and 1987, respectively, but income was low, at roughly US$10,000 donated in a year for both games combined.[1] Miller's next game, Kingdom of Kroz, was developed to include 60 levels, more than what he wanted to release to the public for no cost.[1] As such, he developed a new distribution model, dubbed the "Apogee model", in which only a fraction of the game would be made available to play for free on BBS, which, upon completion, would display Miller's mailing address to the player and ask them to contact him to buy the rest of the game.[1] He applied this model to Kingdom of Kroz by breaking it up into three parts, named episodes, and sharing the first one over BBS while retaining the other two for sale.[1][2] Released on November 26, 1987, Kingdom of Kroz was the first game to bear the name of Miller's one-man company, Apogee Software Productions.[2] The game proved successful, with checks sent to Miller amounting to roughly US$80,000US$100,000 and him receiving between US$100 and US$500 every single day.[2] Broussard later joined Apogee, merging his own, lesser-known game company Micro-FX into it.[4]In 1994, Apogee decided to launch different brand names for each genre of games they published; it created 3D Realms for 3D games, publishing Terminal Velocity in 1995 and developing the 1996 Duke Nukem 3D under the name, with the other titles released in those years still under Apogee.[5] In late 1996, however, Apogee renamed the company itself to 3D Realms to associate their brand with newer, 3D titles, and stopped using the Apogee brand name.[6] The last game to be published under the Apogee name was Stargunner in 1996. Most of the proposed brands were never used, as 3D games like Duke Nukem became the company's focus. 3D Realms launched a brand for pinball games, Pinball Wizards, in February 1997, but only published Balls of Steel (1997) under the name.[5] Beginning in 1997 3D Realms shifted from episodic MS-DOS titles to non-episodic console and personal computer games. In the process it abandoned the shareware model in favor of a traditional publishing model; it also largely ceased its activities as a developer that same year, releasing only Shadow Warrior (1997).[7] The sole exceptions were Prey (2006), which stayed in development until 2001 when it was transferred to Human Head Studios, and Duke Nukem Forever (2011), which famously stayed in development at 3D Realms as vaporware until 2009.[7][8]The "Apogee Software" name, library, and logo were licensed to Terry Nagy in 2008, who formed Apogee Software, LLC as a separate company that would handle distribution, remakes, and other developments related to older Apogee games. 3D Realms retained the corporate name of Apogee Software, Ltd. Apogee Software, LLC was renamed Apogee Entertainment in 2021.[6]After Prey was transferred away from 3D Realms in 2001, the only project under development at the company was Duke Nukem Forever, originally announced in 1997. The release date of the game was "when it's done."[9] 3D Realms continued some operations as a publisher as part of the Gathering of Developers publishing group, but otherwise served only as the publisher and licensee of Duke Nukem-related spinoffs and mobile games for the next few years. On May 6, 2009, the development of Duke Nukem Forever was halted, and major staff cuts were initiated with the entire development team and most other employees laid off.[10][11] According to Miller, the development was using up much of the company's funds as they struggled to bring in new 3D rendering technology for the game, leading to the decision to cut their staff and sell the company.[12]On May 14, 2009, Take-Two, holders of the publishing rights of Duke Nukem Forever, filed a breach of contract suit against 3D Realms over failing to deliver the game.[13] Take-Two Interactive asked for a restraining order and a preliminary injunction, to make 3D Realms keep the Duke Nukem Forever assets intact during proceedings.[14][15] On May 18, 2009, 3D Realms key executives announced that "3D Realms has not closed and is not closing", but that due to lack of funds development operations were ceasing and the company would continue to "license and co-create games based upon the Duke Nukem franchise." They accused Take-Two of trying to acquire the Duke Nukem franchise in a "fire sale".[11]On September 3, 2010, Take-Two Interactive announced that development of Duke Nukem Forever had been shifted over to Gearbox Software, effectively ending 3D Realms' association with the game after 12 years of development. 3D Realms remained credited as a co-developer on Duke Nukem Forever, due to their involvement in developing most of the game. The rights and intellectual property were sold to Gearbox, however, who became the owners of the Duke Nukem franchise.[16]An external developer, Interceptor Entertainment, started work on a fan-project remake of Duke Nukem 3D in 2010. They received a limited authorization from Gearbox to proceed with the game, which was named Duke Nukem 3D: Reloaded. However, after Duke Nukem Forever's release and negative reception in 2011, Duke Nukem 3D: Reloaded was put on hold indefinitely.In an interview conducted with Scott Miller in April 2011, Miller specified that 3D Realms was involved with several projects: "we have several projects underway, all fairly smallnot any big console games. Once [Duke Nukem Forever] comes out we'll be definitely looking to invest into other projects, and maybe other up-n-coming [sic] teams who are blazing new trails on smaller platforms, like smart phones and XBLA."[17] 3D Realms did not publish any released titles over the next few years, however.In June 2013, 3D Realms sued Gearbox for unpaid royalties as well as unpaid money for selling the Duke Nukem intellectual property.[18] The lawsuit was dropped in September 2013 with 3D Realms apologizing with an announcement that they had resolved any differences they had with Gearbox. In February 2014, Gearbox sued 3D Realms, Interceptor Entertainment and Apogee Software, LLC for developing a new game called Duke Nukem: Mass Destruction. Gearbox stated that it was still the rights holder of the Duke Nukem franchise, and permission had not been granted by them to develop the game. 3D Realms soon after released a statement admitting its wrongdoing.[19] The lawsuit was settled in August 2015, with Gearbox stressing that it was still the lawful owner of the Duke Nukem intellectual property.[20]In March 2014, SDN Invest, the part-owner of Interceptor Entertainment, acquired 3D Realms for an undisclosed sum.[21] Mike Nielsen, the founder and chairman of SDN Invest, became the new chief executive officer of 3D Realms,[22] headquartered in Aalborg, Denmark and incorporated in 2015 as 3D Realms Entertainment ApS.[23][24] Miller remained with the company as a creative consultant,[25] while Apogee Software LLC retained the license to the Apogee brand and library.[26]In May 2014, 3D Realms announced they were to publish Bombshell by Interceptor Entertainment,[27] and in October 2014 the company returned to distributing its own titles with a digital anthology collection.[28][29] Bombshell was released on January 29, 2016, as 3D Realms' first published title since 2005.On February 28, 2018, 3D Realms announced the game Ion Maiden, a prequel to Bombshell, developed by Voidpoint and using Ken Silverman's Build Engine. In May 2019, the company was hit with a $2 million trademark infringement lawsuit by heavy metal group Iron Maiden who claimed Ion Maiden was "nearly identical to the Iron Maiden trademark in appearance, sound and overall commercial impression" and was "attempting to trade off on Iron Maiden's notoriety."[30] In July 2019, 3D Realms and Voidpoint changed the name of Ion Maiden to Ion Fury to end to the lawsuit. Ion Fury was released on August 15, 2019. Since then, 3D Realms published Ghostrunner (2020) and announced several projects which have been under development for multiple years without further notice.[31]In April 2021, Miller and Nagy acquired the Apogee name from 3D Realms and relaunched Apogee Software LLC as Apogee Entertainment.[32] In 2022, Miller stated in a blog post that he was now uninvolved with 3D Realms and that "[the company] no longer has any link to the past, other than in name only" because he was no longer there to help design and fund games.[33]In August 2021, Embracer Group announced that they acquired the company through Saber Interactive, which will be the parent company.[34] 3D Realms published Cultic on October 13 (2022).In March 2023, 3D Realms announced that they hired Justin Burnham (formerly of Devolver Digital, Good Shepherd) to the position of CCO.[35]On September 30, 2023, 3D Realms held its 4th annual Realms Deep event modernizing the company's branding and announcing release dates for several previously-unreleased titles. Two days later on October 2, they published Ion Fury: Aftershock in collaboration with developer Voidpoint.[36] On October 24, 2023, 3D Realms published Ripout into early access in collaboration with developer Pet Project Games.[37] On November 16, 3D Realms published The Kindeman Remedy in collaboration with developer Troglobyte Games.[38] On December 5, 2023, 3D Realms co-published (with Interplay) the Slipgate Ironworks-developed Kingpin Reloaded.[39] In mid-December, "at least half" of 3D Realms and Slipgate Ironworks was laid off as part of Embracer's restructuring.[40] Layoffs continued into January 2024.[41]On January 24, 2024, 3D Realms co-published (with Fulqrum Publishing) the Slipgate Ironworks-developed Graven out of early access.[42] On February 27, 3D Realms co-published (with Fulqrum Publishing) the Slipgate Ironworks and Killpixel Games-developed Wrath: Aeon of Ruin out of early access.[43]In March 2024, Saber Interactive was sold to Beacon Interactive, a new company from Saber co-founder Matthew Karch. Many of Saber's studios, including 3D Realms, were included in the sale.[44]Main article: List of 3D Realms games^ a b c d e f g h i j k l m n Plante, Chris (October 26, 2017). "Apogee: Where Wolfenstein got its start". Polygon. Archived from the original on October 26, 2017. Retrieved March 5, 2018.^ a b c d Edwards, Benj (August 21, 2009). "20 Years Of Evolution: Scott Miller And 3D Realms, Page 4 of 10". Gamasutra. Archived from the original on May 9, 2012. Retrieved March 5, 2018.^ Edwards, Benj (August 21, 2009). "20 Years Of Evolution: Scott Miller And 3D Realms, Page 2 of 10". Gamasutra. Archived from the original on May 9, 2012. Retrieved March 5, 2018.^ Keefer, John (March 31, 2006). "GameSpy Retro: Developer Origins, Page 10 of 19". GameSpy. Archived from the original on June 9, 2007.^ a b "3D Realms Site: Company History". 3D Realms. Archived from the original on October 17, 2016. Retrieved July 18, 2017.^ a b Plante, Chris (September 27, 2013). "Apogee: The one-man online game publisher of 1987". Polygon. Vox Media. Archived from the original on October 18, 2016. Retrieved July 11, 2017.^ a b "3D Realms Site: History". 3D Realms. Archived from the original on October 17, 2016. Retrieved June 4, 2017.^ Calore, Michael (December 7, 2009). "Vaporware 2009: A Call for Submissions". Wired. Cond Nast. Archived from the original on December 26, 2016. Retrieved July 18, 2017.^ "3D Realms Site: Duke Nukem Forever". 3D Realms. Archived from the original on November 10, 2014. Retrieved January 13, 2007.^ Breckon, Nick & Faylor, Chris (May 6, 2009). "Duke Nukem Developer 3D Realms Shuts Down (Updated)". Shacknews. Archived from the original on May 7, 2009. Retrieved May 6, 2009.^ a b "3D Realms: We're not closing, Spent $20M on Duke Nukem Forever". Kotaku Australia. May 18, 2009. Archived from the original on May 22, 2009. Retrieved May 19, 2009.^ Boudreau, Ian (May 10, 2022). "Duke Nukem Forever 'destroyed 3D Realms' Apogee founder says". PCGamesN. Retrieved May 25, 2022.^ Breckon, Nick (May 14, 2009). "Take-Two Sues 3D Realms for Failing to Deliver Duke Nukem Forever (Updated)". Shacknews. Archived from the original on May 16, 2009. Retrieved May 16, 2009.^ Breckon, Nick (May 15, 2009). "Take-Two v. 3D Realms Court Documents Materialize, 3DR's Scott Miller Responds". Shacknews. Archived from the original on May 18, 2009. Retrieved May 16, 2009.^ Faylor, Chris (May 16, 2009). "No $30M Offer for Duke Nukem IP, Says 3D Realms". Shacknews. Archived from the original on May 18, 2009. Retrieved May 16, 2009.^ "Gearbox acquires Duke Nukem IP". GameSpot. September 7, 2010. Retrieved January 9, 2023.^ Green (April 15, 2011). "Our Five-Question Interview with 3D Realms CEO Scott Miller". Duke 4. Archived from the original on March 30, 2016. Retrieved July 5, 2016.^ Narcisse, Evan (June 13, 2013). "Duke Nukem Creators 3D Realms Suing Gearbox over Unpaid Royalties". Kotaku. Archived from the original on July 29, 2013. Retrieved August 10, 2013.^ Matulef, Jeffrey (February 24, 2014). "Gearbox sues 3D Realms over Duke Nukem: Mass Destruction". Eurogamer. Archived from the original on October 9, 2016. Retrieved October 6, 2016.^ Yin-Poole, Wesley (August 19, 2015). "Gearbox and 3D Realms settle Duke Nukem lawsuit". Eurogamer. Archived from the original on October 9, 2016. Retrieved October 6, 2016.^ Yin-Poole, Wesley (March 3, 2014). "Interceptor buys 3D Realms amid Gearbox lawsuit". Eurogamer. Archived from the original on March 6, 2014. Retrieved March 3, 2014.^ Handrahan, Matthew (March 3, 2014). "Interceptor Entertainment acquires 3D Realms". GamesIndustry.biz. Archived from the original on December 20, 2018. Retrieved January 21, 2020.^ Takashi, Dean (March 16, 2023). "3D Realms hires Justin Burnham as chief creative officer to level up action games". VentureBeat. Retrieved August 16, 2023.^ "3D Realms Entertainment ApS" (in Danish). Central Business Register. Retrieved August 16, 2023.^ Yin-Poole, Wesley (March 3, 2014). "Interceptor buys 3D Realms amid Gearbox lawsuit". Eurogamer. Retrieved August 16, 2023.^ Chalk, Andy (October 23, 2014). "3D Realms returns with 32-game anthology bundle". PC Gamer. Retrieved August 16, 2023.^ Purchese, Robert (May 15, 2014). "3D Realms reveals PC and PS4 action-RPG Bombshell". Eurogamer. Archived from the original on June 2, 2016. Retrieved October 6,