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Second Life

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Second Life (*SL*) is an online virtual world developed by Linden Lab which was launched on June 23, 2003. A number of free client programs called Viewers^{[1][2]} enable Second Life users, called Residents, to interact with each other through avatars. Residents can explore the world (known as the grid), meet other residents, socialize, participate in individual and group activities, and create and trade virtual property and services with one another. Second Life is intended for people aged 13 and over,^[3] and as of 2011 has more than 20 million registered user accounts.^[*citation needed*]

Built into the software is a three-dimensional modeling tool based around simple geometric shapes that allows residents to build virtual objects. There is also an object oriented scripting language Linden Scripting Language which can be used to add interactivity to objects. More complex three-dimensional sculpted prims (colloquially known as sculpts), textures for clothing or other objects, and animations and gestures can be created using external software. The Second Life Terms of Service provide that users retain copyright for any content they create, and the server and client provide simple digital rights management functions.^[3]

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Second Life



Developer(s)	Linden Research, Inc
Engine	Proprietary, free, and open source software Physics: Havok 7 and 10 (beta) Audio: FMOD
Version	2.6.0.225006 March 29, 2011
Platform(s)	Microsoft Windows ■ Windows XP SP2 and SP3 ■ Windows Vista ■ Windows 7 Mac OS X (10.4.11 or higher) Linux i686
Release date(s)	June 23, 2003
Media/distribution	Download
System requirements	
Minimum	■ Broadband Internet access ■ 512 MB RAM ■ 50 MB HD space (1000 MB for Disk Cache) ■ 800 MHz x86 CPU or better (Windows, Linux) ■ 1 GHz G4 or better/Intel Core Processor (Mac)
Graphics	■ nVidia GeForce 6600 or better ■ ATI Radeon 8500, Radeon 9250 or better
Recommended	■ Broadband Internet access ■ 1 GB RAM ■ 50 MB HD space (1000 MB for Disk Cache)

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History

In 1999, Philip Rosedale (known as Philip Linden^[4] inworld) formed Linden Lab, developing computer hardware allowing people to immerse in a virtual world. In its earliest form, the company struggled to produce a commercial version of the hardware, known as "The Rig", which was realized in prototype form as a clunky steel contraption with computer monitors worn on shoulders.^[5] That vision changed into the software application Linden World, in which people participated in task-based games and socializing in a three-dimensional online environment.^[6] That effort would eventually transform into the better known, user-centered Second Life.^[7] Although he was familiar with the metaverse of Neal Stephenson's novel *Snow Crash*, Rosedale has said that his vision of virtual worlds predates that book, and that he conducted early virtual world experiments during college years at the University of California San Diego, where he studied physics.^[8]

- 1.5 GHz x86 CPU or better (Windows XP, Linux)
- 2 GHz x86 CPU or better (Windows Vista)
- 1.25 GHz G4 Processor (Mac) or better

Graphics

- nVidia GeForce 6800 or better
- ATI Radeon X1700, Radeon X1800 or better

On December 11, 2007, Cory Ondrejka, who helped program Second Life, was forced to resign as chief technology officer.^[9]

In January 2008, residents spent a total of 28,274,505 hours "inworld", and, on average, 38,000 residents were logged in at any particular moment. The maximum concurrency (number of avatars inworld) recorded is 88,200 in the 1st qtr. 2009^[10]

On March 14, 2008, Rosedale announced plans to step down from his position as Linden Lab CEO and to become chairman of Linden Lab's board of directors.^[11] Rosedale announced Mark Kingdon as the new CEO effective May 15, 2008.^[12] In 2010, Kingdon was replaced by Rosedale, who took over as Interim CEO. After four months though, Rosedale abruptly stepped down from the Interim CEO position. It was announced in October 2010, that Bob Komin, Linden Lab's chief financial officer and chief operating officer, will take over the CEO job for the immediate future.^[13]

In 2008, Second Life was honored at the 59th Annual Technology & Engineering Emmy Awards for advancing the development of online sites with user-generated content. Rosedale accepted the award.^[14]

In November 2010, 21.3 million accounts were registered, although there are no reliable figures for actual long-term consistent usage.^[15]

In May 2009 concurrent users averaged about 62,000.^[16] As of May 2010 concurrent users averaged about 54,000.^[17] The perceived decline in median concurrent users over this time correlates precisely with new policies implemented by Linden Lab reducing the number of bots and campers.^[18]

In June of 2010, Linden Labs announced layoffs of 30% of its workforce.^[19]

Classification

During a 2001 meeting with investors, Rosedale noticed that the participants were particularly responsive to the collaborative, creative potential of Second Life. As a result the initial objective-driven, gaming focus of Second Life was shifted to a more user-created, community-driven experience.^{[20][21]}

Second Life's status as a virtual world, a computer game, or a talker, is frequently debated. Unlike a traditional computer game, Second Life does not have a designated objective, nor traditional game play mechanics or rules. As it does not have any stipulated goals, it is irrelevant to talk about winning or losing in relation to Second Life. Likewise, unlike a traditional talker, Second Life contains an extensive world that can be explored and interacted with, and it can be used purely as a creative tool set if the user so chooses.

It also used to be for any age, but now requires users to be at least 18 years of age to access Adult areas, the users aged 16–17 may not have access to these areas.

Residents and avatars

Main article: Resident (Second Life)

There is no charge for creating a Second Life account or for making use of the world for any period of time. Linden Lab reserves the right to charge for the creation of large numbers of multiple accounts for a single person (5 per household, 2 per 24 hours)^[22] but at present does not do so. A Premium membership (US\$9.95/month, US\$22.50 quarterly, or US\$72/year.) extends access to an increased level of technical support, and also pays an automatic stipend of L\$300/week into the member's avatar account (down from an original stipend of L\$500, which is still paid to older accounts; certain accounts created during an earlier period may receive L\$400). This stipend, paid into the member's avatar account, means that the actual cost for the benefit of extended tech support for an annual payment of US\$72 is only US\$14. However, the vast majority of casual users of SL do not upgrade beyond the free "basic" account.

Avatars may take any form users choose (human, animal, vegetable, mineral, or a combination thereof) or residents may choose to resemble themselves as they are in real life,^[23] or they may choose even more abstract forms, given that almost every aspect of an avatar is fully customizable. See Second Life Culture for more details. A single resident account may have only one avatar at a time, although the appearance of this avatar can change between as many different forms as the Resident wishes. Avatar forms, like almost everything else in SL, can be either created by the user, or bought pre-made. A single person may also have multiple accounts, and thus appear to be multiple Residents (a person's multiple accounts are referred to as *alts*).

Avatars can communicate via local chat, group chat, global instant messaging (known as IM), and voice. Chatting is used for localized public conversations between two or more avatars, and is visible to any avatar within a given distance. IMs are used for private conversations, either between two avatars, or among the members of a group, or even between objects and avatars. Unlike chatting, IM communication does not depend on the participants being within a certain distance of each other. As of version 1.18.1.2, voice chat, both local and IM, is also available on both the main grid^[24] and teen grid.^[25] Instant messages may optionally be sent to a Resident's email when the Resident is logged off, although message length is limited to 4096 bytes.^[26]

Economy

Main article: Economy of Second Life

Second Life has an internal economy and internal currency, the Linden dollar (L\$). L\$ can be used to buy, sell, rent or trade land or goods and services with other users. Virtual goods include buildings, vehicles, devices of all kinds, animations, clothing, skin, hair, jewelry, flora and fauna, and works of art. Services include "camping", wage labor, business management, entertainment and custom content creation (which can be broken up into the following 6 categories: building, texturing, scripting, animating, art direction, and the position of producer/project funder). L\$ can be purchased using US Dollars and other currencies on the LindeX exchange provided by Linden Lab, independent brokers or other resident users. Money obtained from currency sales is most commonly used to pay Second Life's own subscription and tier fees; only a relatively small number of users earn large amounts of money from the world. According to figures published by Linden Lab, about 64,000 users made a profit in Second Life in February 2009, of whom 38,524 made less than US\$10, while 233 made more than US\$5000.^[27] Profits are derived from selling virtual goods, renting land, and a broad range of services.

The *Linden* can be exchanged for US dollars or other currencies on market-based currency exchanges. Linden Lab reports that the *Second Life* economy generated US\$3,596,674 in economic activity during the month of September 2005,^[28] and as of September 2006 Second Life was reported to have a GDP of \$64 Million.^[29] In 2009 the total size of the Second Life economy grew 65% to US\$567 million, about 25% of the entire U.S. virtual goods market. Gross Resident Earnings are \$55 million US Dollars in 2009 - 11% growth over 2008.^[30] In March 2009, it was revealed that there exist a few Second Life entrepreneurs, who have grossed in excess of 1 million US\$ per year.^[31]

Accessibility

Alternative user interfaces

Second Life has been criticized for its lack of accessibility, as users unable to use a mouse or unable to see are precluded from accessing it using the Second Life viewer.^[32] However, since the Second Life viewer was made open-source, a number of accessibility solutions have been developed (listed in chronological order):

- A modification of the Second Life viewer has been developed that allows users who are visually impaired to navigate their avatar using force feedback.^[33] Different object types are distinguished through different vibration frequencies.
- TextSL^[34] is a web based client developed by the University of Nevada that allows users who are visually impaired to access Second Life using built in speech synthesis. TextSL allows users who are visually impaired to navigate, communicate with avatars and interact with objects^[35] using a command based interface inspired by the Zork adventure game. This web interface is also accessible using a smartphone.
- IBM's Human Ability and Accessibility Center developed a Web based interface for Second Life^[36] that can be accessed with a screen reader. This client provides basic navigation, communication, and perception functions using hotkeys.
- Max, The Virtual Guidedog^[37] developed by Virtual Helping Hands^[38] offers a virtual guide dog object that can be "worn" by a user's avatar. The guidedog provides a number of functions such as navigation and querying the environment through a chat-like interface. Feedback is provided using synthetic speech.
- METAbolt (<https://web.archive.org/web/20110331154407/http://www.metabolt.net/>) is an open source text client developed by the METAbolt Development Team which is fully accessible and also compatible with accessibility client applications (Microsoft platforms only) such as JAWS.

A study showed one of the biggest barriers to making Second Life accessible to visually impaired users is its apparent lack of metadata, such as names and descriptions, for virtual world objects. This is a similar problem for the accessibility of the web where images may lack alternative tags. The study found that 32% of the objects in Second Life are simply named "object", and up to 40% lack accurate names.^[35]

Language localization

In 2007, Brazil became the first country to have its own independently-run portal to Second Life, operated by an intermediary—although the actual Second Life grid accessed through the Brazilian portal is the same as that used by the rest of the worldwide customer base. The portal, called "Mainland Brazil", is run by Kaizen Games, making Kaizen the first partner in Linden's "Global Provider Program".^[39] In October 2007, Linden Lab signed a second "Global Provider Program" with T-Entertainment Co., LTD., Seoul, South Korea and T-Entertainment's portal called "SERA Korea" serves as a gateway to Second Life Grid. Previously, starting in late 2005, Linden Lab had opened and run their own welcome area portals and regions for German, Korean and Japanese language speakers.^[40]

Public chat within the world supports many written languages and character sets, providing the ability for people to chat in their native languages. Several resident-created translation devices provide machine translation of public chat (using various online translation services), allowing for communication between residents who speak different languages. Some versions of the viewer (such as Catznip) have language translation built into them.

Land ownership

Main article: Real estate (Second Life)

Premium membership allows the Resident to own land, with the first 512 m² (of Main Land owned by a holder of a Premium account) free of the usual monthly Land Use Fee (referred to by residents as Tier, because it is charged in tiers). There is no upper limit on tier; at the highest level, the user pays US\$295 for their first 65536 m².^[41] Any land must first be purchased from either Linden Lab or a private seller.

There are four types of land regions; Mainland, Private Region, Homestead and Openspace. A region comprises an area of 65,536 m² (16.194 acres) in area, being 256 meters on each side. Mainland regions form one continuous land mass, while Private regions are islands. Openspace regions may be either Mainland or Private, but have lower prim limits and traffic use levels than Mainland regions. The owners of a Private region enjoy access to some additional controls that are not available to mainland owners; for example, they have a greater ability to alter the shape of the land. Residents must own a region (either Mainland or Private) to qualify for purchasing an Openspace region.

Linden Lab usually sells only complete 65,536 m² (16.194 acres) regions at auction (although smaller parcels are auctioned on occasion, typically land parcels abandoned by users who have left). Once a Resident buys land they may resell it freely and use it for any purpose that it is not prohibited by the Second Life Terms of Service.

Residents may also choose to purchase, or rent, land from another Resident (a Resident landlord) rather than from Linden Lab. On a Private region, the built-in land selling controls allow the landlord to sell land in the region to another Resident while still retaining some control. Residents purchasing, or renting, land from any other party than Linden Lab are not required to hold a Premium membership nor to necessarily pay a Tier fee, although typically the landlord will require some form of upfront and/or monthly fee to compensate them for their liability to pay the Land Use Fee charged by Linden Lab. However Linden Lab acknowledges only the landlord as the owner of the land, and will not intervene in disputes between Residents. This means, for example, that a landlord can withdraw a Resident's land from availability, without refunding their money, and Linden Lab will not arbitrate in the dispute.

Land types

Second Life Land Use^[42]

Additional Land	Parcel Size (m ²)	Square Equal Line Length (m)	Max Prims
$\frac{1}{128}$ Mainland Region	512	22×22 (16×32)	117
$\frac{1}{64}$ Mainland Region	1024	32×32	234
$\frac{1}{32}$ Mainland Region	2048	44×44 (32×64)	468
$\frac{1}{16}$ Mainland Region	4096	64×64	937
$\frac{1}{8}$ Mainland Region	8192	90×90 (64×128)	1875
$\frac{1}{4}$ Mainland Region	16,384	128×128	3750
OpenSpace	65,536	256×256	750
$\frac{1}{2}$ Mainland Region	32,768	181×181	7500
Homestead	65,536	256×256	3750
1 Mainland Region	65,536	256×256	15,000
+ $\frac{1}{2}$ Mainland Region (when already at US\$195 level)	32,768	181×181	7500
Private Island on pre-2007 server technology (second hand purchase only)	65,536	256×256	15,000
Private Island on current server technology	65,536	256×256	15,000

For Mainland fees, the fee determines only the area of land available; the number of prims available is determined by the land itself. Some mainland regions offer more prims in the same land area. For non-mainland fees, the fee sets both the land area and the prim count.

Grids

Prior to January 20, 2011, there were two age-differentiated grids. When it originally started, only people 18 years and over could join. However, after much controversy about underage people joining,^[*citation needed*] Linden Labs created the *Teen Grid*, which was for those ages 13–17. When a teen turned 18, providing documentation verifying their age, they would be transferred to the Main Grid. Linden Lab has received controversy for the lack of integration between teens and adults. Some parents protest that they cannot be on the grid together with their teenage children, and companies cannot market to both teens and adults in SL even if their products have universal appeal.^[*citation needed*] This grid merge was widely supported by teen grid residents, although some also oppose it. Linden Lab employees have also been in favor of merging the grids, most notably Blue Linden, former teen grid manager. As of January 20, 2011, there is only one grid. Users 16 and 17 years of age are allowed to visit any G-rated region until they turn 18 and verify their age, at which point they may visit any region, regardless of rating.. In addition, there are four regions only available to 16 and 17 year old residents, known as Chimp Labs 1, 2, 3, and 4.^[*citation needed*]

The Teen Grid and the Main Grid actually were of one grid called Agni (most grids in Second Life grids are named after Hindu gods).^[*citation needed*] However, Teen Grid residents could not see or access the Main Grid, and Main Grid residents could not see or access the Teen Grid.^[*citation needed*]

On January 19, 2009 Linden Lab, Philip Linden related an intent to merge the two grids into one.^[*citation needed*]

Users under 16 years of age are not allowed in Second Life, and anyone under reasonable suspicion of being underage may have their account suspended until their age can be verified. However, Linden Lab places burden of proof on alleged underage users, and does not check to verify anything themselves. As a result, false underage user reports are filed by some residents as a form of griefing or for revenge.^[*citation needed*]

Technology

Second Life comprises the *viewer* (also known as the *client*) executing on the user's personal computer, and several thousand servers operated by Linden Lab.

Client

Linden Lab provides official viewers for XP / Vista / 7, Mac OS X, and most distributions of Linux. A third-party version is available for Solaris and OpenSolaris. The viewer renders 3D graphics using OpenGL technology. Since the viewer is open source,^{[43][44]} users may recompile it to create their custom viewers; modified viewer software is available from third parties. One such example is the Nicholaz Edition. This viewer, produced by Nicholaz Beresford, includes bug fixes developed outside Linden Lab that are not in the Linden Lab code. More recently a client known as Phoenix,^[45] created by a group of residents who previously made their own clients yet have since banded together to work as one, has become popular among the user base of Second Life due to the large number of features they have added to the original client.

An independent project, libopenmetaverse,^[46] offers a function library for interacting with Second Life servers. libopenmetaverse has been used to create non-graphic third party viewers, including SLEEK,^[47] a text browser using .NET Framework, and Ajaxlife,^[47] a text viewer that runs in a web browser and TextSL^[34] a text client inspired by the Zork adventure game that allows users who are visually impaired to access Second Life using a screen reader.

In February 2008^[48] a partnership between Linden Lab and Vollee (<https://web.archive.org/web/20110331154407/http://www.vollee.com/>) was announced. In May,^[49] Vollee launched an open Beta trial for a Second Life mobile application that lets Residents travel and communicate in-world by logging in from a handset using an existing account. The service, introduced for free, requires downloading a thin client to a 3G or Wi-Fi enabled handset. As of June 2009, it seems Vollee no longer exists as their web sites are no longer available. However, there now exists a handful of mobile clients which allow users to login to various virtual worlds, including Second Life. While these applications do not provide a 3D virtual view of the world, residents are able to view their contacts, chat in IM or local and teleport to other locations."Third Party Viewer Directory" (https://web.archive.org/web/20110331154407/http://wiki.secondlife.com/wiki/Third_Party_Viewer_Directory) . Linden Lab. http://wiki.secondlife.com/wiki/Third_Party_Viewer_Directory. Retrieved 2011-02-22.

A special *beta viewer* is available, which has been updated and used for software testing by volunteers for special projects like COLLADA mesh. The beta client connects to a "beta grid" which consists of a limited number of regions running various releases of unstable test server code. The mirroring process overwrites any changes made on the beta grid, and thus actions taken within it are not stored by the servers; it is for testing purposes only.

Server

Each full region (an area of 256×256 meters) in the Second Life "grid" runs on a single dedicated core of a multi-core server. Homestead regions share 3 regions per core and Openspace Regions share 4 regions per core, running proprietary software on Debian Linux. These servers run scripts in the region, as well as providing communication between avatars and objects present in the region.

Every item in the *Second Life* universe is referred to as an *asset*. This includes the shapes of the 3D objects known as *primitives*, the digital images referred to as *textures* that decorate primitives, digitized audio clips, avatar shape and appearance, avatar skin textures, LSL scripts, information written on notecards, and so on. Each asset is referenced with a universally unique identifier or *UUID*.^[50]

Assets are stored on Isilon Systems storage clusters,^[51] comprising all data that has ever been created by anyone who has been in the SL world. Infrequently used assets are offloaded to S3 bulk storage.^[52] As of December 2007, the total storage was estimated to consume 100 terabytes of server capacity.^[53] The asset servers function independently of the region simulators, though the region simulators request object data from the asset servers when a new object loads into the simulator.^[citation needed]

Each server instance runs a physics simulation to manage the collisions and interactions of all objects in that region. Objects can be nonphysical and non moving, or actively physical and movable. Complex shapes may be linked together in groups of up to 255 separate primitives. Additionally, each player's avatar is treated as a physical object so that it may interact with physical objects in the world.^[54] As of 1 April 2008, *Second Life* simulators use the *Havok 4* physics engine for all in-world dynamics. This engine is capable of simulating thousands of physical objects at once.^[55]

Linden Lab pursues the use of open standards technologies, and uses free and open source software such as Apache, MySQL, Squid and Linux.^[56] The plan is to move everything to open standards by standardizing the *Second Life* protocol. Cory Ondrejka, former CTO^[57] of Second Life, has stated that a while after everything has been standardized, both the client and the server will be released as free and open source software.^[58]

OpenSimulator

Main article: OpenSimulator

In January 2007, OpenSimulator was founded as an open source simulator project. The aim of this project is to develop a full open source server software for Second Life clients. OpenSIM is BSD Licensed and it is written in C# and can run under Mono environment. In 2008 there were some alternative Second Life grids^[59] which are using OpenSimulator.

Virtual technology

The graphics, the Linden Scripting Language and the Havok physics enable the simulation of various real or imagined machines and devices. There are many light houses, some with detailed Fresnel lenses. Steam punk buoyant airships are common. There are combat weapons systems. A large part of the Linden Scripting Language Guide describes the features available for modeling vehicles. Popular uses of this include cars, boats, motor cycles and airplanes. Manned vehicles have advantages, but there can also be autonomous or remotely controlled vehicles.

A major obstacle is region (sim) border crossings, which unlike cell phone handoffs, are a problem, to users, even at walking speed, although following recent work by Linden Labs it has been greatly improved, and if the user in question has few resources assigned to him it can be almost seamless.

Applications

Education

Main article: Education in Second Life

Second Life is used as a platform for education by many institutions, such as colleges, universities, libraries and government entities.

Arts

Main article: Arts in Second Life

Second Life residents express themselves creatively through virtual world adaptations of art exhibits, live music, live theater.

Science

Second Life is used for scientific research, collaboration, and data visualization.^[60] Examples include SciLands, American Chemical Society's ACS Island, Genome, Virginia Tech's SLATE, and Nature Publishing Group's Elucian Islands Village.

Work solutions

Second Life gives companies the option to create virtual workplaces to allow employees to virtually meet, hold events, practice any kind of corporate communications, conduct training sessions in 3D immersive learning spaces, simulate business processes, and prototype new products.

Religion

Religious organizations have also begun to open virtual meeting places within *Second Life*. In early 2007, LifeChurch.tv, a Christian church headquartered in Edmond, Oklahoma, and with eleven campuses in the USA, created "Experience Island" and opened its twelfth campus in *Second Life*.^[61] The church reported "We find that this creates a less-threatening environment where people are much more willing to explore and discuss spiritual things".^[citation needed] In July 2007, an Anglican cathedral^[62] was established in Second Life; Mark Brown, the head of the group that built the cathedral, noted that there is "an interest in what I call depth, and a moving away from light, fluffy Christianity".^[63]

The Egyptian-owned news website Islam Online has purchased land in Second Life to allow Muslims and non-Muslims alike to perform the ritual of Hajj in virtual reality form, obtaining experience before actually making the pilgrimage to Mecca in person.^[64]

Second Life also offers several groups that cater to the needs and interests of Humanists, atheists, agnostics, and freethinkers. One of the most active groups is SL Humanism which has been holding weekly discussion meetings inside Second Life every Sunday since 2006.^[65]

Embassies

The Maldives was the first country to open an embassy in *Second Life*.^{[66][67]} The Maldives' embassy is located on *Second Life's* "Diplomacy Island", where visitors will be able to talk face-to-face with a computer-generated ambassador about visas, trade and other issues. "Diplomacy Island" also hosts Diplomatic Museum and Diplomatic Academy. The Island is established by DiploFoundation as part of the Virtual Diplomacy Project.^[68]

In May 2007^[69] Sweden became the second country to open an embassy in *Second Life*. Run by the Swedish Institute, the embassy serves to promote Sweden's image and culture, rather than providing any real or virtual services.^[70] The Swedish Minister for Foreign Affairs, Carl Bildt, stated on his blog that he hoped he would get an invitation to the grand opening.^[71]

In September 2007, Publicis Group announced the project of creating a Serbia island as a part of a project Serbia Under Construction. The project is officially supported by Ministry of Diaspora of Serbian Government. It was stated that the island will feature Nikola Tesla Museum, Guča trumpet festival and Exit festival.^[72] It was also planned on opening a virtual info terminals of Ministry of Diaspora.^[73]

On Tuesday December 4, 2007, Estonia became the third country to open an embassy in *Second Life*.^{[74][75]} In September 2007, Colombia and Serbia opened embassies.^[76] As of 2008, Macedonia and the Philippines have opened embassies in the "Diplomatic Island" of Second Life.^[77] In 2008, Albania opened an Embassy in the Nova Bay location. SL Israel was inaugurated in January 2008 in an effort to showcase Israel to a global audience, though without any connection to official Israeli diplomatic channels.^[78]

Malta and the African country Djibouti are also planning to open virtual missions in *Second Life*.^[79]

Competitive entertainment

Main article: Recreation in Second Life

A wide variety of recreational activities, both competitive and non-competitive, take place on the Second Life Grid, including both traditional sports and video game-like scenarios.

Relationships

Relationships are common in Second Life, including some couples that have gotten married online.^[80] In addition, sex is often encountered (see Second Life criticism#Sex).^[81] However, to access the adult sections requires age verification.^[82]

There is also a large BDSM community.^[83]

Criticism and controversy

Main article: Criticism of Second Life

Regulation

In the past, large portions of the Second Life economy comprised businesses that are now regulated or banned. Changes to Second Life's Terms of Service in this regard have largely had the purpose of bringing activity within Second Life into compliance with various international laws, even though the person running the business may be in full compliance with the law in his own country. Typically, Linden Lab offer no compensation for businesses that are damaged or destroyed by these rule changes, which can render significant expenditure or effort worthless.

On July 26, 2007, Linden Lab announced a ban on in-world gambling, in fear^[citation needed] that new regulations on Internet gambling could affect Linden Lab if it was permitted to continue. The ban was immediately met with in-world protests.^[84]

In August 2007, a \$750,000 in-world bank called Ginko Financial collapsed due to a bank run triggered by Linden Lab's ban on gambling, which halved the size of the Second Life economy. The aftershocks of this collapse caused severe liquidity problems for other virtual "banks", which critics had long asserted were scams. On Tuesday, January 8, 2008 Linden Lab announced the upcoming prohibition of payment of fixed interest on cash deposits in unregulated banking activities in-world.^[85] All banks without real-world charters closed or converted to virtual joint stock companies by January 22, 2008.^[86] After the ban, a few companies continue to offer non-interest bearing deposit accounts to residents, such as the e-commerce site XStreet, which had already adopted a zero-interest policy 3 months before the LL interest ban.

Technical issues

Due to Second Life's rapid growth rate, it has suffered from difficulties related to system instability. These include increased system latency, and intermittent client crashes. However, some faults are caused by the system's use of an "asset server" cluster, on which the actual data governing objects is stored separately from the areas of the world and the avatars that use those objects. The communication between the main servers and the asset cluster appears to constitute a bottleneck which frequently causes problems.^{[87][88][89]} Typically, when asset server downtime is announced, users are advised not to build, manipulate objects, or engage in business, leaving them with little to do but chat and generally reducing confidence in all businesses on the grid.

A more disturbing fact, believed to be caused by the same issue, is "inventory loss"^{[90][91][92]} in which items in a user's inventory, including those which have been paid for, can disappear without warning or permanently enter a state where they will fail to appear in-world when requested (giving an "object missing from database" error). Linden Lab offers no compensation for items that are lost in this way, although a policy change instituted in 2008 allows accounts to file support tickets when inventory loss occurs. Many in-world businesses will attempt to compensate for this or restore items, although they are under no obligation to do so and not all are able to do so. A recent change in how the company handles items which have "lost their parent directory" means that inventory loss is much less of a problem and resolves faster than in recent years. "Loss to recovery times" have gone from months (or never) to hours or a day or two for the majority of users, but inventory loss does still exist.

Second Life functions by streaming all data to the user live over the Internet with minimal local caching of frequently used data. The user is expected to have a minimum of 300 kilobits of Internet bandwidth for basic functionality, with 1000 kilobit providing better performance. Due to the proprietary communications protocols, it is not possible to use a network proxy/caching service to reduce network load when many people are all using the same location, such as when used for group activities in a school or business.

Needs to hold a meeting of more people than can be supported by a region's server, has prompted a behavior called "four-cornering", i.e. meeting where four regions with servers all meet; this is unwelcome, as it tends to put excessive load on the system sending object and texturing information and inter-user messages between those four regions' servers.

Fraud and intellectual property protection

Although Second Life's client and server incorporate Digital Rights Management technology, the visual data of an object must ultimately be sent to the client in order for it to be drawn; thus unofficial third-party clients can bypass them. One such program, CopyBot, was developed in 2006 as a debugging tool to enable objects to be backed up, but was immediately hijacked for use in copying objects; additionally, programs that generally attack client-side processing of data, such as GLIntercept, can copy certain pieces of data. Such use is prohibited under the Second Life TOS ^[93] and could be prosecuted under the DMCA.

Linden Lab may ban a user who is observed using CopyBot or a similar client, but it will not ban a user simply for uploading or even selling copied content; in this case, Linden Lab's enforcement of intellectual property law is limited to that required by the "safe harbor" provisions of the Digital Millennium Copyright Act, which requires filing a real-life lawsuit. Although a few high-profile businesses in Second Life have filed such lawsuits,^{[94][95][96][97][98]} none of the cases filed to date have gone to trial, and most have been dismissed pursuant to a settlement agreement reached between the parties.^{[99][100][101]} Overall, the majority of businesses in Second Life do not make enough money for a lawsuit to be worthwhile, or due to real-life work commitments, they cannot devote enough time to complete one. As a result, many Second Life businesses and their intellectual property remains effectively unprotected.

The exception to this trend of dismissal via settlement agreement may be found in the matter of Eros, LLC v. Linden Research, Inc. As of March 2010, the case is currently pending in the Northern District Court of California awaiting a determination of whether the matter may be certified as a class action.^[102]

There have also been issues with the use of false DMCA takedown notices.^[103] Once a DMCA takedown notice is served, reversing it requires an individual to expose his personal information to the filer (filing a notice does not require this); for the penalty of perjury to be enacted, a lawsuit is required (anything less, the false DMCA claimer can just claim it from a different account every week causing legitimate business unlimited losses). In addition, the technical process of removal and re-instatement of content on Second Life is subject to failure which can result in content becoming unusable to its owner. This does not effectively prevent content theft; a thief who is subject to a DMCA takedown notice will not challenge it, but will simply create a new account and re-upload the content, often releasing it with all permissions available to maximize propagation out of spite.

Most users in the world as paying, private individuals are, likewise, effectively unprotected. Common forms of fraud taking place in-world include bogus investment and pyramid schemes, fake or hacked vendors, and failure to honor land rental agreements. A group of virtual landowners online have filed a class action lawsuit against the company, claiming the company broke the law when it rescinded their ownership rights. The plaintiffs say a change in the terms of service forced them to either accept new terms that rescinded their virtual property ownership rights, or else be locked out of the site.^[104]

Unclear trading limit obtention

Business owners who used to cash L\$ currency into American dollars to obtain a paycheck have been stopped from doing so and reverted to selling L\$ limits of zero; the L\$ that was formerly in a xstreetsl.com account and thus convertible into American dollars have been turned back into second life account L\$, denying the conversion process for currency that was previously no longer owned by linden labs; the process for obtaining a trade limit other than zero again is unclear even after hours actively seeking that information in forums, wikis, phone support, knowledge base, and proper linden hours meetings; there is simply no way to know if people will be forced to buy L\$ with US\$ and build a higher trade limit over several months or years in order to cash in simple business paychecks (<https://jira.secondlife.com/browse/WEB-3370>) or if another way exists. Many residents report being in one of the 3 distinct form processes (lindex tier ticket, trade limit ticket, the non-linked-to-by-Linden-Labs request-review form) to get their trade limits reviewed for several months without feedback.

Third Party Viewers

The *Emerald* client, developed by a group of users based on an open-source branch of the Viewer, Snowglobe, became extremely popular and was used by a large proportion of the user base.^[*citation needed*] The authors of the Emerald client were strongly believed to have gained influence over Linden Lab [1] (<https://web.archive.org/web/20110331154407/http://brokentoys.org/2010/08/24/the-client-is-in-the-compiler-of-the-enemy/>) , to the point that a programmer fired from Linden Lab was immediately hired by Emerald.^[*citation needed*] Several groups alleged that the Emerald viewer contained trojan code which tracked user details and demographics in a way that the developers could later recover. One of these groups was banned from Second Life by Linden Lab after publishing their discovery [2] (<https://web.archive.org/web/20110331154407/http://brokentoys.org/2010/08/24/the-client-is-in-the-compiler-of-the-enemy/>) . The second group were attacked by the Emerald development team, who embedded code in the Emerald client to DDoS the whistleblower's site as the client started up. In response, Linden Lab revoked Emerald's third party viewer approval and permanently banned several of Emerald's developers. Many Emerald developers left to work on a new viewer project, Phoenix, which is essentially the same as Emerald, but it purportedly doesn't contain any malicious code.

References in popular culture

Main article: Second Life in popular culture

Since its debut in 2003, Second Life has been referenced increasingly by various popular culture media, including literature, television, film, and music. In addition, various famous people in such media have used or employed Second Life both in their work and for private purposes.^[*citation needed*]

Competitors

Second Life has many smaller competitors including Twinity, Smeet, Smallworlds, IMVU, Active Worlds, Onverse, Kaneva,^[*citation needed*] Uthervers and Blue Mars.^[105]

See also

- Virtual reality
- Simulated reality
- Social simulation
- Cyberformance
- Emerging Virtual Institutions
- Interactive online characters
- Active Worlds
- Smeet
- PlayStation Home
- Linden Scripting Language
- CyberTown

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External links

- Official website (<https://web.archive.org/web/20110331154407/http://secondlife.com/>)
- Second Life Wiki (https://web.archive.org/web/20110331154407/https://wiki.secondlife.com/wiki/Main_Page)
- List of Second Life regions (<https://web.archive.org/web/20110331154407/http://gridsurvey.com/>)
- Interpersonal haptic communication in second life (<https://web.archive.org/web/20110331154407/http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5623973>)
- Linden Lab - Makers of Second Life (<https://web.archive.org/web/20110331154407/http://lindenlab.com/>)
- Official Twitter page for Second Life (<https://web.archive.org/web/20110331154407/http://twitter.com/secondlife/>)

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