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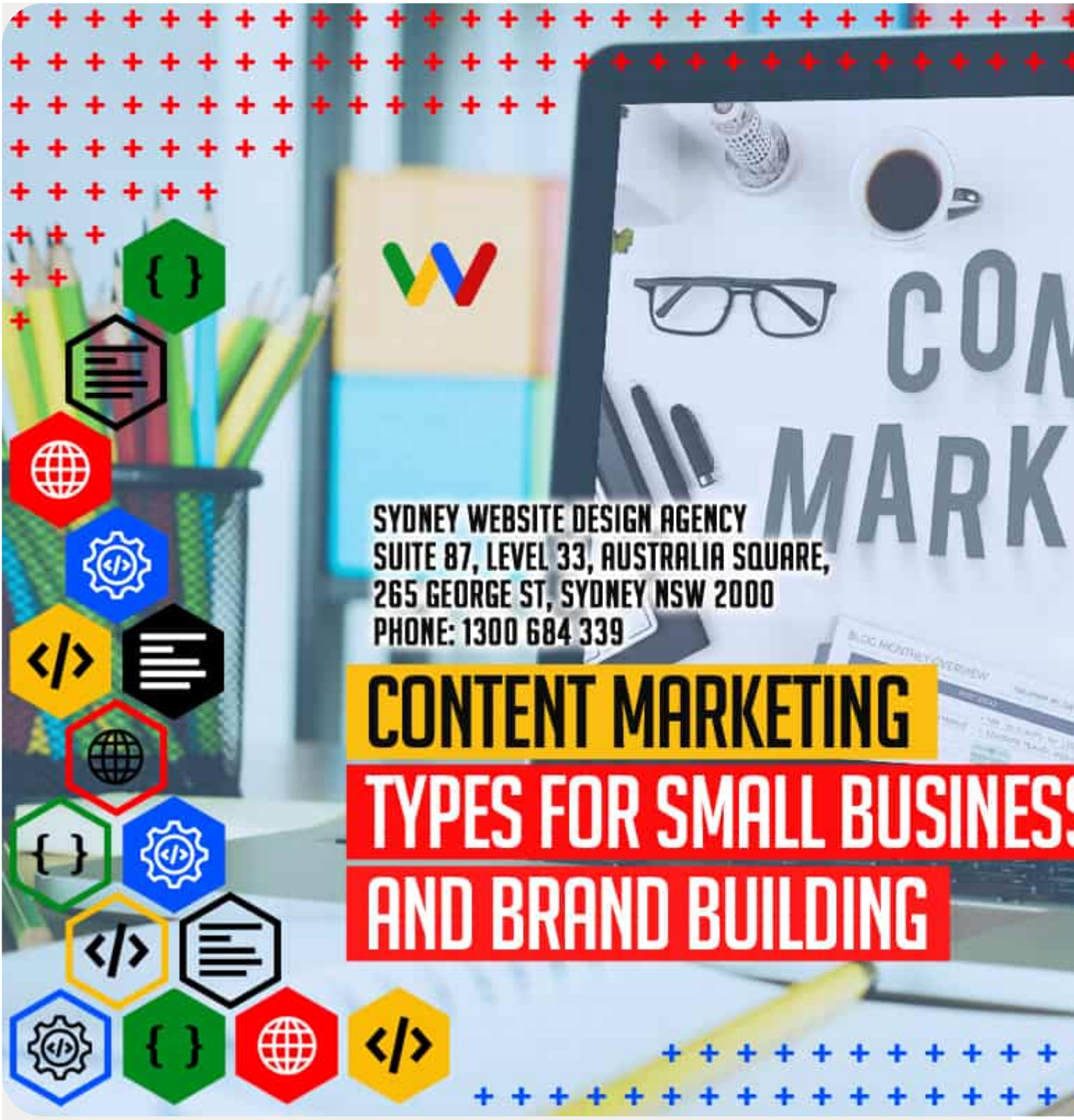
KEY ADVANTAGE
LOCAL SEO S
28



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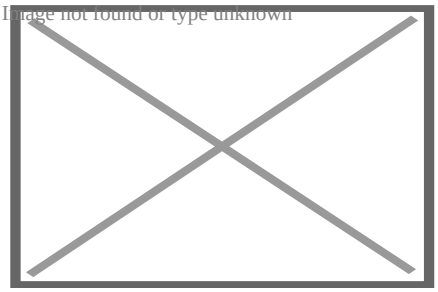
About Web design

Web design encompasses many different skills and disciplines in the production and maintenance of websites. The different areas of web design include web graphic design; user

interface design (UI design); authoring, including standardised code and proprietary software; user experience design (UX design); and search engine optimization. Often many individuals will work in teams covering different aspects of the design process, although some designers will cover them all.[1] The term "web design" is normally used to describe the design process relating to the front-end (client side) design of a website including writing markup. Web design partially overlaps web engineering in the broader scope of web development. Web designers are expected to have an awareness of usability and be up to date with web accessibility guidelines.

History

[edit]
See also: History of the World Wide Web



Web design books in a store

1988–2001

[edit]

Although web design has a fairly recent history, it can be linked to other areas such as graphic design, user experience, and multimedia arts, but is more aptly seen from a technological standpoint. It has become a large part of people's everyday lives. It is hard to imagine the Internet without animated graphics, different styles of typography, backgrounds, videos and music. The web was announced on August 6, 1991; in November 1992, CERN was the first website to go live on the World Wide Web. During this period, websites were structured by using the <table> tag which created numbers on the website. Eventually, web designers were able to find their way around it to create more structures and formats. In early history, the structure of the websites was fragile and hard to contain, so it became very difficult to use them. In November 1993, ALIWEB was the first ever search engine to be created (Archie Like Indexing for the WEB).[2]

The start of the web and web design

[edit]

In 1989, whilst working at CERN in Switzerland, British scientist Tim Berners-Lee proposed to create a global hypertext project, which later became known as the World Wide Web. From 1991 to 1993 the World Wide Web was born. Text-only HTML pages could be viewed using a simple

line-mode web browser.[3] In 1993 Marc Andreessen and Eric Bina, created the Mosaic browser. At the time there were multiple browsers, however the majority of them were Unix-based and naturally text-heavy. There had been no integrated approach to graphic design elements such as images or sounds. The Mosaic browser broke this mould.[4] The W3C was created in October 1994 to "lead the World Wide Web to its full potential by developing common protocols that promote its evolution and ensure its interoperability."[5] This discouraged any one company from monopolizing a proprietary browser and programming language, which could have altered the effect of the World Wide Web as a whole. The W3C continues to set standards, which can today be seen with JavaScript and other languages. In 1994 Andreessen formed Mosaic Communications Corp. that later became known as Netscape Communications, the Netscape 0.9 browser. Netscape created its HTML tags without regard to the traditional standards process. For example, Netscape 1.1 included tags for changing background colours and formatting text with tables on web pages. From 1996 to 1999 the browser wars began, as Microsoft and Netscape fought for ultimate browser dominance. During this time there were many new technologies in the field, notably Cascading Style Sheets, JavaScript, and Dynamic HTML. On the whole, the browser competition did lead to many positive creations and helped web design evolve at a rapid pace.[6]

Evolution of web design

[edit]

In 1996, Microsoft released its first competitive browser, which was complete with its features and HTML tags. It was also the first browser to support style sheets, which at the time was seen as an obscure authoring technique and is today an important aspect of web design.[6] The HTML markup for tables was originally intended for displaying tabular data. However, designers quickly realized the potential of using HTML tables for creating complex, multi-column layouts that were otherwise not possible. At this time, as design and good aesthetics seemed to take precedence over good markup structure, little attention was paid to semantics and web accessibility. HTML sites were limited in their design options, even more so with earlier versions of HTML. To create complex designs, many web designers had to use complicated table structures or even use blank spacer .GIF images to stop empty table cells from collapsing.[7] CSS was introduced in December 1996 by the W3C to support presentation and layout. This allowed HTML code to be semantic rather than both semantic and presentational and improved web accessibility, see tableless web design.

In 1996, Flash (originally known as FutureSplash) was developed. At the time, the Flash content development tool was relatively simple compared to now, using basic layout and drawing tools, a limited precursor to ActionScript, and a timeline, but it enabled web designers to go beyond the point of HTML, animated GIFs and JavaScript. However, because Flash required a plug-in, many web developers avoided using it for fear of limiting their market share due to lack of compatibility. Instead, designers reverted to GIF animations (if they did not forego using motion graphics altogether) and JavaScript for widgets. But the benefits of Flash made it popular enough among specific target markets to eventually work its way to the vast majority of browsers, and powerful

enough to be used to develop entire sites.[7]

End of the first browser wars

[edit]
Further information: Browser wars § First Browser War (1995–2001)

In 1998, Netscape released Netscape Communicator code under an open-source licence, enabling thousands of developers to participate in improving the software. However, these developers decided to start a standard for the web from scratch, which guided the development of the open-source browser and soon expanded to a complete application platform.[6] The Web Standards Project was formed and promoted browser compliance with HTML and CSS standards. Programs like Acid1, Acid2, and Acid3 were created in order to test browsers for compliance with web standards. In 2000, Internet Explorer was released for Mac, which was the first browser that fully supported HTML 4.01 and CSS 1. It was also the first browser to fully support the PNG image format.[6] By 2001, after a campaign by Microsoft to popularize Internet Explorer, Internet Explorer had reached 96% of web browser usage share, which signified the end of the first browser wars as Internet Explorer had no real competition.[8]

2001–2012

[edit]

Since the start of the 21st century, the web has become more and more integrated into people's lives. As this has happened the technology of the web has also moved on. There have also been significant changes in the way people use and access the web, and this has changed how sites are designed.

Since the end of the browsers wars[*when?*] new browsers have been released. Many of these are open source, meaning that they tend to have faster development and are more supportive of new standards. The new options are considered by many[*weasel words*] to be better than Microsoft's Internet Explorer.

The W3C has released new standards for HTML (HTML5) and CSS (CSS3), as well as new JavaScript APIs, each as a new but individual standard.[*when?*] While the term HTML5 is only used to refer to the new version of HTML and *some* of the JavaScript APIs, it has become common to use it to refer to the entire suite of new standards (HTML5, CSS3 and JavaScript).

2012 and later

[edit]

With the advancements in 3G and LTE internet coverage, a significant portion of website traffic shifted to mobile devices. This shift influenced the web design industry, steering it towards a

minimalist, lighter, and more simplistic style. The "mobile first" approach emerged as a result, emphasizing the creation of website designs that prioritize mobile-oriented layouts first, before adapting them to larger screen dimensions.

Tools and technologies

[edit]

Web designers use a variety of different tools depending on what part of the production process they are involved in. These tools are updated over time by newer standards and software but the principles behind them remain the same. Web designers use both vector and raster graphics editors to create web-formatted imagery or design prototypes. A website can be created using WYSIWYG website builder software or a content management system, or the individual web pages can be hand-coded in just the same manner as the first web pages were created. Other tools web designers might use include markup validators[9] and other testing tools for usability and accessibility to ensure their websites meet web accessibility guidelines.[10]

UX Design

[edit]

One popular tool in web design is UX Design, a type of art that designs products to perform an accurate user background. UX design is very deep. UX is more than the web, it is very independent, and its fundamentals can be applied to many other browsers or apps. Web design is mostly based on web-based things. UX can overlap both web design and design. UX design mostly focuses on products that are less web-based.[11]

Skills and techniques

[edit]

Marketing and communication design

[edit]

Marketing and communication design on a website may identify what works for its target market. This can be an age group or particular strand of culture; thus the designer may understand the trends of its audience. Designers may also understand the type of website they are designing, meaning, for example, that (B2B) business-to-business website design considerations might differ greatly from a consumer-targeted website such as a retail or entertainment website. Careful consideration might be made to ensure that the aesthetics or overall design of a site do not clash with the clarity and accuracy of the content or the ease of web navigation,[12] especially on a B2B website. Designers may also consider the reputation of the owner or business the site is representing to make sure they are portrayed favorably. Web designers normally oversee all the websites that are made on how they work or operate on things. They constantly are updating and

changing everything on websites behind the scenes. All the elements they do are text, photos, graphics, and layout of the web. Before beginning work on a website, web designers normally set an appointment with their clients to discuss layout, colour, graphics, and design. Web designers spend the majority of their time designing websites and making sure the speed is right. Web designers typically engage in testing and working, marketing, and communicating with other designers about laying out the websites and finding the right elements for the websites.[13]

User experience design and interactive design

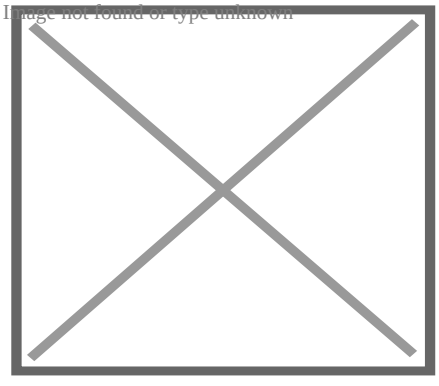
[edit]

User understanding of the content of a website often depends on user understanding of how the website works. This is part of the user experience design. User experience is related to layout, clear instructions, and labeling on a website. How well a user understands how they can interact on a site may also depend on the interactive design of the site. If a user perceives the usefulness of the website, they are more likely to continue using it. Users who are skilled and well versed in website use may find a more distinctive, yet less intuitive or less user-friendly website interface useful nonetheless. However, users with less experience are less likely to see the advantages or usefulness of a less intuitive website interface. This drives the trend for a more universal user experience and ease of access to accommodate as many users as possible regardless of user skill.[14] Much of the user experience design and interactive design are considered in the user interface design.

Advanced interactive functions may require plug-ins if not advanced coding language skills. Choosing whether or not to use interactivity that requires plug-ins is a critical decision in user experience design. If the plug-in doesn't come pre-installed with most browsers, there's a risk that the user will have neither the know-how nor the patience to install a plug-in just to access the content. If the function requires advanced coding language skills, it may be too costly in either time or money to code compared to the amount of enhancement the function will add to the user experience. There's also a risk that advanced interactivity may be incompatible with older browsers or hardware configurations. Publishing a function that doesn't work reliably is potentially worse for the user experience than making no attempt. It depends on the target audience if it's likely to be needed or worth any risks.

Progressive enhancement

[edit]



The order of progressive enhancement

Main article: Progressive enhancement

Progressive enhancement is a strategy in web design that puts emphasis on web content first, allowing everyone to access the basic content and functionality of a web page, whilst users with additional browser features or faster Internet access receive the enhanced version instead.

In practice, this means serving content through HTML and applying styling and animation through CSS to the technically possible extent, then applying further enhancements through JavaScript. Pages' text is loaded immediately through the HTML source code rather than having to wait for JavaScript to initiate and load the content subsequently, which allows content to be readable with minimum loading time and bandwidth, and through text-based browsers, and maximizes backwards compatibility.[15]

As an example, MediaWiki-based sites including Wikipedia use progressive enhancement, as they remain usable while JavaScript and even CSS is deactivated, as pages' content is included in the page's HTML source code, whereas counter-example Everipedia relies on JavaScript to load pages' content subsequently; a blank page appears with JavaScript deactivated.

Page layout

[edit]

Part of the user interface design is affected by the quality of the page layout. For example, a designer may consider whether the site's page layout should remain consistent on different pages when designing the layout. Page pixel width may also be considered vital for aligning objects in the layout design. The most popular fixed-width websites generally have the same set width to match the current most popular browser window, at the current most popular screen resolution, on the current most popular monitor size. Most pages are also center-aligned for concerns of aesthetics on larger screens.

Fluid layouts increased in popularity around 2000 to allow the browser to make user-specific layout adjustments to fluid layouts based on the details of the reader's screen (window size, font size relative to window, etc.). They grew as an alternative to HTML-table-based layouts and grid-based design in both page layout design principles and in coding technique but were very slow to be adopted.[note 1] This was due to considerations of screen reading devices and varying windows sizes which designers have no control over. Accordingly, a design may be broken down into units (sidebars, content blocks, embedded advertising areas, navigation areas) that are sent to the browser and which will be fitted into the display window by the browser, as best it can. Although such a display may often change the relative position of major content units, sidebars may be displaced below body text rather than to the side of it. This is a more flexible display than a hard-coded grid-based layout that doesn't fit the device window. In particular, the relative position of content blocks may change while leaving the content within the block unaffected. This also minimizes the user's need to horizontally scroll the page.

Responsive web design is a newer approach, based on CSS3, and a deeper level of per-device specification within the page's style sheet through an enhanced use of the CSS @media rule. In March 2018 Google announced they would be rolling out mobile-first indexing.[16] Sites using responsive design are well placed to ensure they meet this new approach.

Typography

[edit]
Main article: typography

Web designers may choose to limit the variety of website typefaces to only a few which are of a similar style, instead of using a wide range of typefaces or type styles. Most browsers recognize a specific number of safe fonts, which designers mainly use in order to avoid complications.

Font downloading was later included in the CSS3 fonts module and has since been implemented in Safari 3.1, Opera 10, and Mozilla Firefox 3.5. This has subsequently increased interest in web typography, as well as the usage of font downloading.

Most site layouts incorporate negative space to break the text up into paragraphs and also avoid center-aligned text.[17]

Motion graphics

[edit]

The page layout and user interface may also be affected by the use of motion graphics. The choice of whether or not to use motion graphics may depend on the target market for the website. Motion graphics may be expected or at least better received with an entertainment-oriented website. However, a website target audience with a more serious or formal interest (such as business, community, or government) might find animations unnecessary and distracting if only for entertainment or decoration purposes. This doesn't mean that more serious content couldn't be enhanced with animated or video presentations that is relevant to the content. In either case, motion graphic design may make the difference between more effective visuals or distracting visuals.

Motion graphics that are not initiated by the site visitor can produce accessibility issues. The World Wide Web consortium accessibility standards require that site visitors be able to disable the animations.[18]

Quality of code

[edit]

Website designers may consider it to be good practice to conform to standards. This is usually done via a description specifying what the element is doing. Failure to conform to standards may

not make a website unusable or error-prone, but standards can relate to the correct layout of pages for readability as well as making sure coded elements are closed appropriately. This includes errors in code, a more organized layout for code, and making sure IDs and classes are identified properly. Poorly coded pages are sometimes colloquially called tag soup. Validating via W3C[9] can only be done when a correct DOCTYPE declaration is made, which is used to highlight errors in code. The system identifies the errors and areas that do not conform to web design standards. This information can then be corrected by the user.[19]

Generated content

[edit]

There are two ways websites are generated: statically or dynamically.

Static websites

[edit]
Main article: Static web page

A static website stores a unique file for every page of a static website. Each time that page is requested, the same content is returned. This content is created once, during the design of the website. It is usually manually authored, although some sites use an automated creation process, similar to a dynamic website, whose results are stored long-term as completed pages. These automatically created static sites became more popular around 2015, with generators such as Jekyll and Adobe Muse.[20]

The benefits of a static website are that they were simpler to host, as their server only needed to serve static content, not execute server-side scripts. This required less server administration and had less chance of exposing security holes. They could also serve pages more quickly, on low-cost server hardware. This advantage became less important as cheap web hosting expanded to also offer dynamic features, and virtual servers offered high performance for short intervals at low cost.

Almost all websites have some static content, as supporting assets such as images and style sheets are usually static, even on a website with highly dynamic pages.

Dynamic websites

[edit]
Main article: Dynamic web page

Dynamic websites are generated on the fly and use server-side technology to generate web pages. They typically extract their content from one or more back-end databases: some are

database queries across a relational database to query a catalog or to summarise numeric information, and others may use a document database such as MongoDB or NoSQL to store larger units of content, such as blog posts or wiki articles.

In the design process, dynamic pages are often mocked-up or wireframed using static pages. The skillset needed to develop dynamic web pages is much broader than for a static page, involving server-side and database coding as well as client-side interface design. Even medium-sized dynamic projects are thus almost always a team effort.

When dynamic web pages first developed, they were typically coded directly in languages such as Perl, PHP or ASP. Some of these, notably PHP and ASP, used a 'template' approach where a server-side page resembled the structure of the completed client-side page, and data was inserted into places defined by 'tags'. This was a quicker means of development than coding in a purely procedural coding language such as Perl.

Both of these approaches have now been supplanted for many websites by higher-level application-focused tools such as content management systems. These build on top of general-purpose coding platforms and assume that a website exists to offer content according to one of several well-recognised models, such as a time-sequenced blog, a thematic magazine or news site, a wiki, or a user forum. These tools make the implementation of such a site very easy, and a purely organizational and design-based task, without requiring any coding.

Editing the content itself (as well as the template page) can be done both by means of the site itself and with the use of third-party software. The ability to edit all pages is provided only to a specific category of users (for example, administrators, or registered users). In some cases, anonymous users are allowed to edit certain web content, which is less frequent (for example, on forums - adding messages). An example of a site with an anonymous change is Wikipedia.

Homepage design

[edit]

Usability experts, including Jakob Nielsen and Kyle Soucy, have often emphasised homepage design for website success and asserted that the homepage is the most important page on a website.[21] *Nielsen, Jakob; Tahir, Marie (October 2001), Homepage Usability: 50 Websites Deconstructed, New Riders Publishing, ISBN 978-0-7357-1102-0*[22][23] However practitioners into the 2000s were starting to find that a growing number of website traffic was bypassing the homepage, going directly to internal content pages through search engines, e-newsletters and RSS feeds.[24] This led many practitioners to argue that homepages are less important than most people think.[25][26][27][28] Jared Spool argued in 2007 that a site's homepage was actually the least important page on a website.[29]

In 2012 and 2013, carousels (also called 'sliders' and 'rotating banners') have become an extremely popular design element on homepages, often used to showcase featured or recent content in a confined space.[30] Many practitioners argue that carousels are an ineffective design element and hurt a website's search engine optimisation and usability.[30][31][32]

Occupations

[edit]

There are two primary jobs involved in creating a website: the web designer and web developer, who often work closely together on a website.[33] The web designers are responsible for the visual aspect, which includes the layout, colouring, and typography of a web page. Web designers will also have a working knowledge of markup languages such as HTML and CSS, although the extent of their knowledge will differ from one web designer to another. Particularly in smaller organizations, one person will need the necessary skills for designing and programming the full web page, while larger organizations may have a web designer responsible for the visual aspect alone.

Further jobs which may become involved in the creation of a website include:

- Graphic designers to create visuals for the site such as logos, layouts, and buttons
- Internet marketing specialists to help maintain web presence through strategic solutions on targeting viewers to the site, by using marketing and promotional techniques on the internet
- SEO writers to research and recommend the correct words to be incorporated into a particular website and make the website more accessible and found on numerous search engines
- Internet copywriter to create the written content of the page to appeal to the targeted viewers of the site[1]
- User experience (UX) designer incorporates aspects of user-focused design considerations which include information architecture, user-centred design, user testing, interaction design, and occasionally visual design.

Artificial intelligence and web design

[edit]

Chat GPT and other AI models are being used to write and code websites making it faster and easier to create websites. There are still discussions about the ethical implications on using artificial intelligence for design as the world becomes more familiar with using AI for time-consuming tasks used in design processes.[34]

See also

[edit]

- icon Internet portal

Image not found or type unknown

- Aesthetics
- Color theory
- Composition (visual arts)
- Cross-browser
- Design education
- Drawing
- Dark pattern
- European Design Awards
- First Things First 2000 manifesto
- Graphic art software
- Graphic design occupations
- Graphics
- Information graphics
- List of graphic design institutions
- List of notable graphic designers
- Logotype
- Outline of web design and web development
- Progressive Enhancement
- Style guide
- Web 2.0
- Web colors
- Web safe fonts
- Web usability
- Web application framework
- Website builder
- Website wireframe

Related disciplines

[edit]

- Communication design
- Copywriting
- Desktop publishing
- Digital illustration
- Graphic design
- Interaction design
- Information design
- Light-on-dark color scheme
- Marketing communications
- Motion graphic design
- New media
- Search engine optimization (SEO)
- Technical Writer
- Typography
- User experience
- User interface design
- Web development
- Web animations

Notes

[edit]

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[edit]

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25. ^ *Chapman, Cameron (15 September 2010), 10 Usability Tips Based on Research Studies, Six Revisions, archived from the original on 2 September 2013*
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31. ^ *Jones, Harrison (19 June 2013), Homepage Sliders: Bad For SEO, Bad For Usability, archived from the original on 22 November 2013*
32. ^ *Laja, Peep (8 June 2019), Image Carousels and Sliders? Don't Use Them. (Here's why.), CXL, archived from the original on 10 December 2019*
33. ^ *Oleksy, Walter (2001). Careers in Web Design. New York: The Rosen Publishing Group, Inc. pp. 9–11. ISBN 978-0-8239-3191-0.*
34. ^ Visser, Larno, et al. *ChatGPT for Web DesignÃƒÆ’Ã†â€™Ãƒâ€ Ã¢â‚¬â„¢ÃƒÆ’Ã¢â‚¬Â ÃƒÂ¢Ã¢â€šÂ¬Ã¢â€žÂ¢ÃƒÆ’Ã†â€™ÃƒÂ¢Ã¢â€šÃ Create Amazing Websites*. [First edition]., PACKT Publishing, 2023.

External links

[edit]

- W3C consortium for web standards

Web design at Wikipedia's sister projects:

- Image not found or type unknown **Media** from Commons
- Image not found or type unknown **Resources** from Wikiversity

Authority control databases: National Image not found or type unknown **Edit this at Wikidata**

- United States
- France
- BnF data
- Japan
- Czech Republic
- Israel

- **v**
- **t**
- **e**

Design

- Outline
- Designer

	Disciplines

Communication design	○ Advertising
	○ Book design
	○ Brand design
	○ Exhibit design
	○ Film title design
	○ Graphic design
	  ○ Motion
	  ○ Postage stamp design
	  ○ Print design
	○ Illustration
	○ Information design
	○ Instructional design
	○ News design
	○ Photography
	○ Retail design
	○ Signage / Traffic sign design
	○ Typography / Type design
	○ Video design
	○ Visual merchandising

Environmental design	○ Architecture
	○ Architectural lighting design
	○ Building design
	  ○ Passive solar
	○ Ecological design
	○ Environmental impact design
	○ Garden design
	  ○ Computer-aided
	○ Healthy community design
	○ Hotel design
	○ Interior architecture
	○ Interior design
	  ○ EID
	○ Keyline design
	○ Landscape architecture
	  ○ Sustainable
	○ Landscape design
	○ Spatial design
	○ Urban design

	○ Automotive design ○ Automotive suspension design ○ CMF design ○ Corrugated box design

Approaches

- Active
- Activity-centered
- Adaptive web
- Affective
- Brainstorming
- By committee
- By contract
- C-K theory
- Closure
- Co-design
- Concept-oriented
- Configuration
- Contextual
- Continuous
- Cradle-to-cradle
- Creative problem-solving
- Creativity techniques
- Critical
  - Design fiction
- Defensive
- Design–bid–build
- Design–build
  - architect-led
- Diffuse
- Domain-driven
- Ecological design
- Energy neutral
- Engineering design process
  - Probabilistic design
- Ergonomic
- Error-tolerant
- Evidence-based
- Fault-tolerant
- Framework-oriented
- For assembly
- For behaviour change
- For manufacturability
- For Six Sigma
- For testing
- For the environment
- For X
- Functional
- Generative
- Geodesign
- HCD
- High-level

- **Tools**
- **Intellectual property**
- **Organizations**
- **Awards**

Tools

- AAD
- Architectural model
- Blueprint
- Comprehensive layout
- CAD
  - CAID
  - Virtual home design software
- CAutoD
- Design quality indicator
- Electronic design automation
- Flowchart
- Mockup
- Design specification
- Prototype
- Sketch
- Storyboard
- Technical drawing
- HTML editor
- Website wireframe

Intellectual property

- Clean-room design
- Community design
- Design around
- Design infringement
- Design patent
- Fashion design copyright
- *Geschmacksmuster*
- Industrial design rights
  - European Union

Organizations

- American Institute of Graphic Arts
- Chartered Society of Designers
- Design and Industries Association
- Design Council
- International Forum Design
- Design Research Society

- European Design Award
- German Design Award

Related topics

- Agile
- Concept art
- Conceptual design
- Creative industries
- Cultural icon
- .design
- Dominant design
- Enterprise architecture
- Form factor
- Futures studies
- Indie design
- Innovation management
- Intelligent design
- Lean startup
- New product development
- OODA loop
- Philosophy of design
- Process simulation
- Reference design
- Slow design
- STEAM fields
- Unintelligent design
- Visualization
- Wicked problem

- Design attributes
- brief
- change
- classic
- competition
  - architectural
  - student
- director
- education
- elements
- engineer
- firm
- history
- knowledge
- language
- life
- load
- museum
- optimization
- paradigm
- principles
- rationale

About MediaWiki

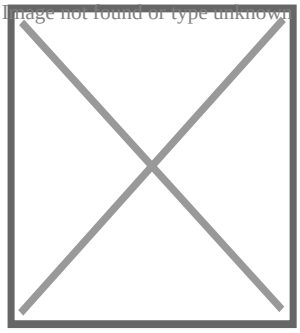
Not to be confused with Wikimedia.

This article **relies excessively on references to primary sources**. Please improve this article by adding secondary or tertiary sources.
Find sources: "MediaWiki" – news · newspapers · books · scholar · JSTOR *(January 2025) (Learn how and when to remove this message)*

- gerrit.wikimedia.org/g/mediawiki/core/

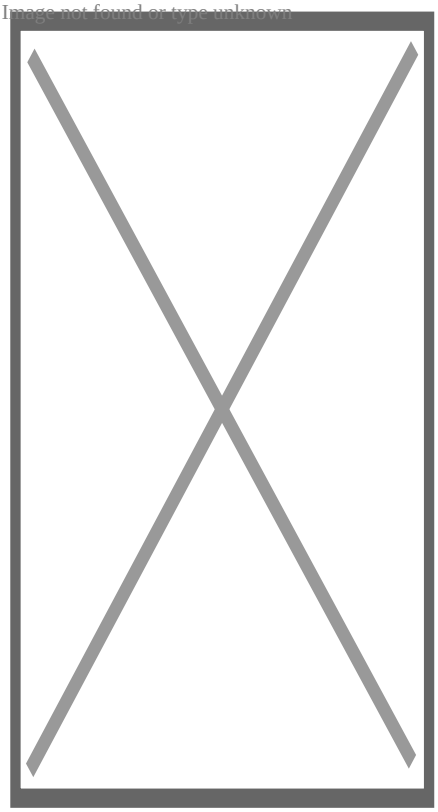
Edit this at Wikidata

MediaWiki



Screenshot

Image not found or type unknown



The Main Page of the English Wikipedia running an alpha version of MediaWiki 1.40

Original author(s)	○ Magnus Manske ○ Lee Daniel Crocker
Developer(s)	Wikimedia Foundation
Initial release	January 25, 2002; 23 years ago
Stable release	1.43.0[1] / 21 December 2024; 2 months ago
Repository	
Written in	PHP[2]
Operating system	Windows, macOS, Linux, FreeBSD, OpenBSD, Solaris

Image not found or type unknown Edit this on Wikidata

Size	79.05 MiB (compressed)
Available in	459[3] languages
Type	Wiki software
License	GPLv2+[4]
Website	mediawiki.org Image not found or type unknown Edit this at Wikidata

MediaWiki is free and open-source wiki software originally developed by Magnus Manske for use on Wikipedia on January 25, 2002, and further improved by Lee Daniel Crocker,[5][6] after which development has been coordinated by the Wikimedia Foundation. It powers several wiki hosting websites across the Internet, as well as most websites hosted by the Wikimedia Foundation including Wikipedia, Wiktionary, Wikimedia Commons, Wikiquote, Meta-Wiki and Wikidata, which define a large part of the set requirements for the software.[7] Besides its usage on Wikimedia sites, MediaWiki has been used as a knowledge management and content management system on websites such as Fandom, wikiHow and major internal installations like Intellipedia and Diplopedia.

MediaWiki is written in the PHP programming language and stores all text content into a database. The software is optimized to efficiently handle large projects, which can have terabytes of content and hundreds of thousands of views per second.[7][8] Because Wikipedia is one of the world's largest and most visited websites, achieving scalability through multiple layers of caching and database replication has been a major concern for developers. Another major aspect of MediaWiki is its internationalization; its interface is available in more than 400 languages.[9] The software has hundreds of configuration settings[10] and more than 1,000 extensions available for enabling various features to be added or changed.[11]

Key features

[edit]

MediaWiki provides a rich core feature set and a mechanism to attach extensions to provide additional functionality.

Internationalization and localisation

[edit]

> Niklas Laxström explains the features that allowed translatewiki.net to provide MediaWiki with more than 400 locales.

Due to the strong emphasis on multilingualism in the Wikimedia projects, internationalization and localization has received significant attention by developers. The user interface has been fully or partially translated into more than 400 languages on translatewiki.net,[9] and can be further customized by site administrators (the entire interface is editable through the wiki).

Several extensions, most notably those collected in the MediaWiki Language Extension Bundle, are designed to further enhance the multilingualism and internationalization of MediaWiki.

Installation and configuration

[edit]

Installation of MediaWiki requires that the user have administrative privileges on a server running both PHP and a compatible type of SQL database. Some users find that setting up a virtual host is helpful if the majority of one's site runs under a framework (such as Zope or Ruby on Rails) that is largely incompatible with MediaWiki.[12] Cloud hosting can eliminate the need to deploy a new server.[13]

An installation PHP script is accessed via a web browser to initialize the wiki's settings. It prompts the user for a minimal set of required parameters, leaving further changes, such as enabling uploads,[14] adding a site logo,[15] and installing extensions, to be made by modifying configuration settings contained in a file called LocalSettings.php.[16] Some aspects of MediaWiki can be configured through special pages or by editing certain pages; for instance, abuse filters can be configured through a special page,[17] and certain gadgets can be added by creating JavaScript pages in the MediaWiki namespace.[18] The MediaWiki community publishes a comprehensive installation guide.[19]

Markup

[edit]

One of the earliest differences between MediaWiki (and its predecessor, UseModWiki) and other wiki engines was the use of "free links" instead of CamelCase. When MediaWiki was created, it was typical for wikis to require text like "WorldWideWeb" to create a link to a page about the World Wide Web; links in MediaWiki, on the other hand, are created by surrounding words with double square brackets, and any spaces between them are left intact, e.g. [[World Wide Web]]. This change was logical for the purpose of creating an encyclopedia, where accuracy in titles is important.

MediaWiki uses an extensible[20] lightweight wiki markup designed to be easier to use and learn than HTML. Tools exist for converting content such as tables between MediaWiki markup and HTML.[21] Efforts have been made to create a MediaWiki markup spec, but a consensus seems to have been reached that Wikicode requires context-sensitive grammar rules.[22][23] The following side-by-side comparison illustrates the differences between wiki markup and HTML:

MediaWiki synt
(the "behind the scene
used to add formatting

====A dialogue====
"Take some more [[tea]]," the March Hare said to Alice, very earnestly.

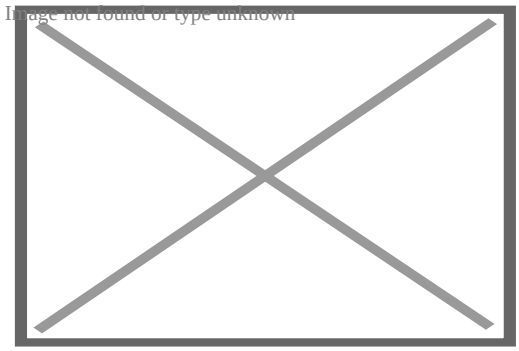
"I've had nothing yet," Alice replied in an offended tone: "so I can't take more."

"You mean you can't take "less"," said the Hatter: "it's "'very"' easy to take "more" than nothing."

(Quotation above from *Alice's Adventures in Wonderland* by Lewis Carroll)

Editing interface

[edit]
See also: VisualEditor



Editing interface of MediaWiki 1.44.0-wmf.4 with syntax highlighting, showing the edit toolbar of 2017 wikitext editor and some examples of wiki syntax

MediaWiki's default page-editing tools have been described as somewhat challenging to learn.[24] A survey of students assigned to use a MediaWiki-based wiki found that when they were asked an open question about main problems with the wiki, 24% cited technical problems with formatting, e.g. "Couldn't figure out how to get an image in. Can't figure out how to show a link with words; it inserts a number."[25]

To make editing long pages easier, MediaWiki allows the editing of a subsection of a page (as identified by its header). A registered user can also indicate whether or not an edit is minor. Correcting spelling, grammar or punctuation are examples of minor edits, whereas adding paragraphs of new text is an example of a non-minor edit.

Sometimes while one user is editing, a second user saves an edit to the same part of the page. Then, when the first user attempts to save the page, an edit conflict occurs. The second user is then given an opportunity to merge their content into the page as it now exists following the first user's page save.

MediaWiki's user interface has been localized in many different languages. A language for the wiki content itself can also be set, to be sent in the "Content-Language" HTTP header and "lang" HTML attribute.

VisualEditor has its own integrated wikitext editing interface known as 2017 wikitext editor, the older editing interface is known as 2010 wikitext editor.

Application programming interface

[edit]

MediaWiki has an extensible web API (application programming interface) that provides direct, high-level access to the data contained in the MediaWiki databases. Client programs can use the API to log in, get data, and post changes. The API supports thin web-based JavaScript clients and end-user applications (such as vandal-fighting tools). The API can be accessed by the backend of another web site.[26] An extensive Python bot library, Pywikibot,[27] and a popular semi-automated tool called AutoWikiBrowser, also interface with the API.[28] The API is accessed via URLs such as https://en.wikipedia.org/w/api.php?action=query&list=recentchanges. In this case, the query would be asking Wikipedia for information relating to the last 10 edits to the site. One of the perceived advantages of the API is its language independence; it listens for HTTP connections from clients and can send a response in a variety of formats, such as XML, serialized PHP, or JSON.[29] Client code has been developed to provide layers of abstraction to the API.[30]

Tracking edits

[edit]

Among the features of MediaWiki to assist in tracking edits is a Recent Changes feature that provides a list of recent edits to the wiki. This list contains basic information about those edits such as the editing user, the edit summary, the page edited, as well as any tags (e.g. "possible vandalism")[31] added by customizable abuse filters and other extensions to aid in combating unhelpful edits.[32] On more active wikis, so many edits occur that it is hard to track Recent Changes manually. Anti-vandal software, including user-assisted tools,[33] is sometimes employed on such wikis to process Recent Changes items. Server load can be reduced by sending a continuous feed of Recent Changes to an IRC channel that these tools can monitor, eliminating their need to send requests for a refreshed Recent Changes feed to the API.[34][35]

Another important tool is watchlisting. Each logged-in user has a watchlist to which the user can add whatever pages he or she wishes. When an edit is made to one of those pages, a summary

of that edit appears on the watchlist the next time it is refreshed.[36] As with the recent changes page, recent edits that appear on the watchlist contain clickable links for easy review of the article history and specific changes made.

There is also the capability to review all edits made by any particular user. In this way, if an edit is identified as problematic, it is possible to check the user's other edits for issues.

MediaWiki allows one to link to specific versions of articles. This has been useful to the scientific community, in that expert peer reviewers could analyse articles, improve them and provide links to the trusted version of that article.[37]

Navigation

[edit]

Wikilinks

[edit]

Navigation through the wiki is largely through internal wikilinks. MediaWiki's wikilinks implement page existence detection, in which a link is colored blue if the target page exists on the local wiki and red if it does not. If a user clicks on a red link, they are prompted to create an article with that title. Page existence detection makes it practical for users to create "wikified" articles—that is, articles containing links to other pertinent subjects—without those other articles being yet in existence.

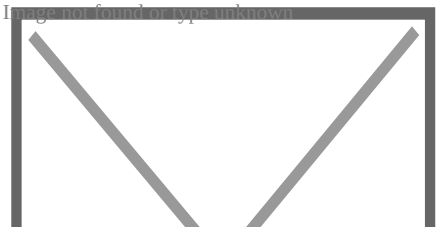
Interwiki links

[edit]
"Inter-wiki link" redirects here. For help with interwiki linking on Wikipedia, see Help:Interwiki linking.

Interwiki links function much the same way as namespaces. A set of interwiki prefixes can be configured to cause, for instance, a page title of wikiquote:Jimbo Wales to direct the user to the Jimbo Wales article on Wikiquote.[38] Unlike internal wikilinks, interwiki links lack page existence detection functionality, and accordingly there is no way to tell whether a blue interwiki link is broken or not.

Interlanguage links

[edit]



An example of interlanguage links

Interlanguage links are the small navigation links that show up in the sidebar in most MediaWiki skins that connect an article with related articles in other languages within the same Wiki family. This can provide language-specific communities connected by a larger context, with all wikis on the same server or each on its own server.[39]

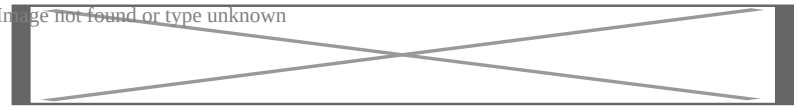
Previously, Wikipedia used interlanguage links to link an article to other articles on the same topic in other editions of Wikipedia. This was superseded by the launch of Wikidata.[40]

Content organization

[edit]

Page tabs and associated pages

[edit]



MediaWiki page tabs, using the "Vector 2010" skin. The red coloration of the "discussion" tab indicates that the article does not yet have a talk page. As with any other red wikilink, clicking on it prompts the user to create the page.

Page tabs are displayed at the top of pages. These tabs allow users to perform actions or view pages that are related to the current page. The available default actions include viewing, editing, and discussing the current page. The specific tabs displayed depend on whether the user is logged into the wiki and whether the user has sysop privileges on the wiki. For instance, the ability to move a page or add it to one's watchlist is usually restricted to logged-in users. The site administrator can add or remove tabs by using JavaScript or installing extensions.[41]

Each page has an associated history page from which the user can access every version of the page that has ever existed and generate diffs between two versions of his choice. Users' contributions are displayed not only here, but also via a "user contributions" option on a sidebar. In a 2004 article, Carl Challborn and Teresa Reimann noted that "While this feature may be a slight deviation from the collaborative, 'ego-less' spirit of wiki purists, it can be very useful for educators who need to assess the contribution and participation of individual student users."[42]

Namespaces

[edit]
"Talk page" redirects here. For talk pages on Wikipedia, see Help:Talk pages.

MediaWiki provides many features beyond hyperlinks for structuring content. One of the earliest such features is *namespaces*. One of Wikipedia's earliest problems had been the separation of encyclopedic content from pages pertaining to maintenance and communal discussion, as well as personal pages about encyclopedia editors. Namespaces are prefixes before a page title (such as "User:" or "Talk:") that serve as descriptors for the page's purpose and allow multiple pages with different functions to exist under the same title. For instance, a page titled "[[The Terminator]] ", in the default namespace, could describe the 1984 movie starring Arnold Schwarzenegger, while a page titled "[[User:The Terminator]]" could be a profile describing a user who chooses this name as a pseudonym. More commonly, each namespace has an associated "Talk:" namespace, which can be used to discuss its contents, such as "User talk:" or "Template talk:". The purpose of having discussion pages is to allow content to be separated from discussion surrounding the content.[43][44]

Namespaces can be viewed as folders that separate different basic types of information or functionality. Custom namespaces can be added by the site administrators. There are 16 namespaces by default for content, with 2 "pseudo-namespaces" used for dynamically generated "Special:" pages and links to media files. Each namespace on MediaWiki is numbered: content page namespaces have even numbers and their associated talk page namespaces have odd numbers.[45]

Category tags

[edit]

Users can create new categories and add pages and files to those categories by appending one or more category tags to the content text. Adding these tags creates links at the bottom of the page that take the reader to the list of all pages in that category, making it easy to browse related articles.[46] The use of categorization to organize content has been described as a combination of:

- Collaborative tagging systems like del.icio.us and
- Hierarchical classifications like the Dewey Decimal Classification.[47]

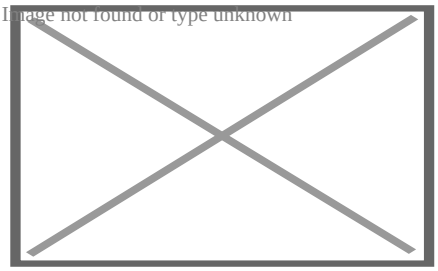
Subpages

[edit]

In addition to namespaces, content can be ordered using *subpages*. This simple feature provides automatic breadcrumbs of the pattern [[Page title/Subpage title]] from the page after the slash (in this case, "Subpage title") to the page before the slash (in this case, "Page title").

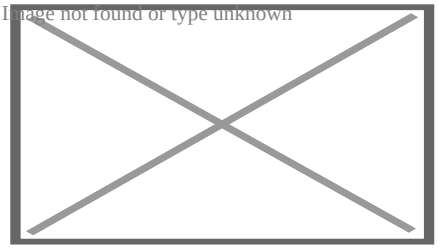
Customization

[edit]



Users can configure custom JavaScript that is executed on every pageview. This has led to JavaScript tools that users can "install", the "navigation popups" tool shown here displays a small preview of an article when hovering over a link title.

If the feature is enabled, users can customize their stylesheets and configure client-side JavaScript to be executed with every pageview. On Wikipedia, this has led to a large number of additional tools and helpers developed through the wiki and shared among users. For instance, *navigation popups* is a custom JavaScript tool that shows previews of articles when the user hovers over links and also provides shortcuts for common maintenance tasks.[48]



A screenshot of a wiki using MediaWiki with a customized skin

The entire MediaWiki user interface can be edited through the wiki itself by users with the necessary permissions (typically called "administrators"). This is done through a special namespace with the prefix "MediaWiki:", where each page title identifies a particular user interface message. Using an extension,[49] it is also possible for a user to create personal scripts, and to choose whether certain sitewide scripts should apply to them by toggling the appropriate options in the user preferences page.

Templates

[edit]

The "MediaWiki:" namespace was originally also used for creating custom text blocks that could then be dynamically loaded into other pages using a special syntax. This content was later moved into its own namespace, "Template:".

Templates are text blocks that can be dynamically loaded inside another page whenever that page is requested. The template is a special link in double curly brackets (for example "Disputed "), which calls the template (in this case located at Template:Disputed) to load in place of the template call.

Templates are structured documents containing attribute–value pairs. They are defined with parameters, to which are assigned values when transcluded on an article page. The name of the parameter is delimited from the value by an equals sign. A class of templates known as infoboxes is used on Wikipedia to collect and present a subset of information about its subject, usually on the top (mobile view) or top right-hand corner (desktop view) of the document.

Pages in other namespaces can also be transcluded as templates. In particular, a page in the main namespace can be transcluded by prefixing its title with a colon; for example, :MediaWiki transcludes the article "MediaWiki" from the main namespace. Also, it is possible to mark the portions of a page that should be transcluded in several ways, the most basic of which are:[50]

- <noinclude>...</noinclude>, which marks content that is not to be transcluded;
- <includeonly>...</includeonly>, which marks content that is not rendered unless it is transcluded;
- <onlyinclude>...</onlyinclude>, which marks content that is to be the *only* content transcluded.

A related method, called template *substitution* (called by adding subst: at the beginning of a template link) inserts the contents of the template into the target page (like a copy and paste operation), instead of loading the template contents dynamically whenever the page is loaded. This can lead to inconsistency when using templates, but may be useful in certain cases, and in most cases requires fewer server resources (the actual amount of savings can vary depending on wiki configuration and the complexity of the template).

Templates have found many different uses. Templates enable users to create complex table layouts that are used consistently across multiple pages, and where only the content of the tables gets inserted using template parameters. Templates are frequently used to identify problems with a Wikipedia article by putting a template in the article. This template then outputs a graphical box stating that the article content is disputed or in need of some other attention, and also categorize it so that articles of this nature can be located. Templates are also used on user pages to send users standard messages welcoming them to the site,[51] giving them awards for outstanding contributions,[52][53] warning them when their behavior is considered inappropriate,[54] notifying them when they are blocked from editing,[55] and so on.

Groups and restriction of access

[edit]

MediaWiki offers flexibility in creating and defining user groups. For instance, it would be possible to create an arbitrary "ninja" group that can block users and delete pages, and whose edits are hidden by default in the recent changes log. It is also possible to set up a group of "autoconfirmed" users that one becomes a member of after making a certain number of edits and waiting a certain number of days.[56] Some groups that are enabled by default are bureaucrats and sysops. Bureaucrats have the power to change other users' rights. Sysops have power over page protection and deletion and the blocking of users from editing. MediaWiki's available

controls on editing rights have been deemed sufficient for publishing and maintaining important documents such as a manual of standard operating procedures in a hospital.[57]

MediaWiki comes with a basic set of features related to restricting access, but its original and ongoing design is driven by functions that largely relate to content, not content segregation. As a result, with minimal exceptions (related to specific tools and their related "Special" pages), page access control has never been a high priority in core development and developers have stated that users requiring secure user access and authorization controls should not rely on MediaWiki, since it was never designed for these kinds of situations. For instance, it is extremely difficult to create a wiki where only certain users can read and access some pages.[58] Here, wiki engines like Foswiki, MoinMoin and Confluence provide more flexibility by supporting advanced security mechanisms like access control lists.

Extensibility

[edit]

The MediaWiki codebase contains various hooks using callback functions to add additional PHP code in an extensible way. This allows developers to write extensions without necessarily needing to modify the core or having to submit their code for review. Installing an extension typically consists of adding a line to the configuration file, though in some cases additional changes such as database updates or core patches are required.

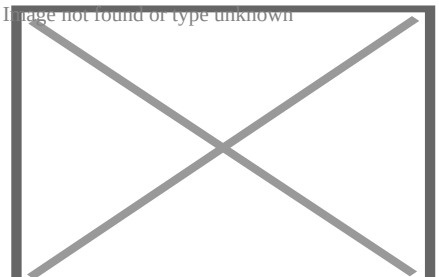
Five main extension points were created to allow developers to add features and functionalities to MediaWiki. Hooks are run every time a certain event happens; for instance, the ArticleSaveComplete hook occurs after a save article request has been processed.[59] This can be used, for example, by an extension that notifies selected users whenever a page edit occurs on the wiki from new or anonymous users.[60] New tags can be created to process data with opening and closing tags (<newtag>...</newtag>).[61] Parser functions can be used to create a new command (#if:...).[62] New special pages can be created to perform a specific function. These pages are dynamically generated. For example, a special page might show all pages that have one or more links to an external site or it might create a form providing user submitted feedback.[63] Skins allow users to customize the look and feel of MediaWiki.[64] A minor extension point allows the use of Amazon S3 to host image files.[65]

Extensions

[edit]

Text manipulation

[edit]



Tim Starling in 2008

Among the most popular extensions is a parser function extension, ParserFunctions, which allows different content to be rendered based on the result of conditional statements.[66] These conditional statements can perform functions such as evaluating whether a parameter is empty, comparing strings, evaluating mathematical expressions, and returning one of two values depending on whether a page exists. It was designed as a replacement for a notoriously inefficient template called Qif.[67] Schindler recounts the history of the ParserFunctions extension as follows:[68]

> In 2006 some Wikipedians discovered that through an intricate and complicated interplay of templating features and CSS they could create conditional wiki text, i.e. text that was displayed if a template parameter had a specific value. This included repeated calls of templates within templates, which bogged down the performance of the whole system. The developers faced the choice of either disallowing the spreading of an obviously desired feature by detecting such usage and explicitly disallowing it within the software or offering an efficient alternative. The latter was done by Tim Starling, who announced the introduction of parser functions, wiki text that calls functions implemented in the underlying software. At first, only conditional text and the computation of simple mathematical expressions were implemented, but this already increased the possibilities for wiki editors enormously. With time further parser functions were introduced, finally leading to a framework that allowed the simple writing of extension functions to add arbitrary functionalities, like e.g. geo-coding services or widgets. This time the developers were clearly reacting to the demand of the community, being forced either to fight the solution of the issue that the community had (i.e. conditional text), or offer an improved technical implementation to replace the previous practice and achieve an overall better performance.

Another parser functions extension, StringFunctions, was developed to allow evaluation of string length, string position, and so on. Wikimedia communities, having created awkward workarounds to accomplish the same functionality,[69] clamored for it to be enabled on their projects.[70] Much of its functionality was eventually integrated into the ParserFunctions extension,[71] albeit disabled by default and accompanied by a warning from Tim Starling that enabling string functions would allow users "to implement their own parsers in the ugliest, most inefficient programming language known to man: MediaWiki wikitext with ParserFunctions."[72]

Since 2012 an extension, Scribunto, has existed that allows for the creation of "modules"—wiki pages written in the scripting language Lua—which can then be run within templates and standard wiki pages. Scribunto has been installed on Wikipedia and other Wikimedia sites since 2013 and is used heavily on those sites. Scribunto code runs significantly faster than corresponding wikitext code using ParserFunctions.[73]

For footnotes and academic-related display

[edit]

Another very popular extension is a citation extension that enables footnotes to be added to pages using inline references.[74] This extension has, however, been criticized for being difficult to use and requiring the user to memorize complex syntax. A gadget called RefToolbar attempts to make it easier to create citations using common templates. MediaWiki has some extensions that are well-suited for academia, such as mathematics extensions[75] and an extension that allows molecules to be rendered in 3D.[76]

Integration

[edit]

A generic Widgets extension exists that allows MediaWiki to integrate with virtually anything. Other examples of extensions that could improve a wiki are category suggestion extensions[77] and extensions for inclusion of Flash Videos,[78] YouTube videos,[79] and RSS feeds.[80] Metavid, a site that archives video footage of the U.S. Senate and House floor proceedings, was created using code extending MediaWiki into the domain of collaborative video authoring.[81]

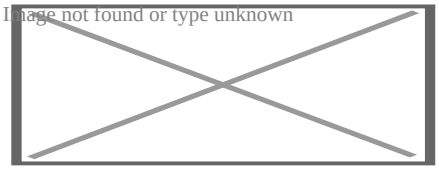
Combating linkspam

[edit]

There are many spambots that search the web for MediaWiki installations and add linkspam to them, despite the fact that MediaWiki uses the nofollow attribute to discourage such attempts at search engine optimization.[82] Part of the problem is that third party republishers, such as mirrors, may not independently implement the nofollow tag on their websites, so marketers can still get PageRank benefit by inserting links into pages when those entries appear on third party websites.[83] Anti-spam extensions have been developed to combat the problem by introducing CAPTCHAs,[84] blacklisting certain URLs,[85] and allowing bulk deletion of pages recently added by a particular user.[86]

Searches and queries

[edit]



A search box showing a drop-down list

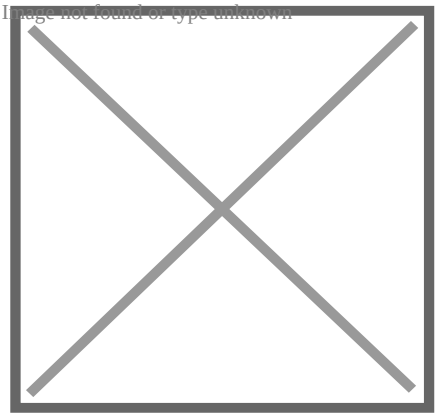
MediaWiki comes pre-installed with a standard text-based search. Extensions exist to let MediaWiki use more sophisticated third-party search engines, including Elasticsearch (which

since 2014 has been in use on Wikipedia), Lucene[87] and Sphinx.[88]

Various MediaWiki extensions have also been created to allow for more complex, faceted search, on both data entered within the wiki and on metadata such as pages' revision history.[89][90] Semantic MediaWiki is one such extension.[91][92]

Rich content

[edit]



Images can be arranged in galleries, a feature that is used extensively for Wikimedia's media archive, Wikimedia Commons.

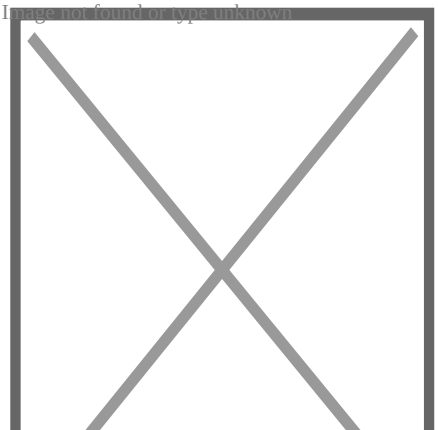
Various extensions to MediaWiki support rich content generated through specialized syntax. These include mathematical formulas using LaTeX, graphical timelines over mathematical plotting, musical scores and Egyptian hieroglyphs.

The software supports a wide variety of uploaded media files, and allows image galleries and thumbnails to be generated with relative ease. There is also support for Exif metadata. MediaWiki operates the Wikimedia Commons, one of the largest free content media archives.

For WYSIWYG editing, VisualEditor is available to use in MediaWiki which simplifying editing process for editors and has been bundled since MediaWiki 1.35.[93] Other extensions exist for handling WYSIWYG editing to different degrees.[94]

Database

[edit]



A schematic of the MediaWiki database structure

MediaWiki can use either the MySQL/MariaDB, PostgreSQL or SQLite relational database management system. Support for Oracle Database and Microsoft SQL Server has been dropped since MediaWiki 1.34.[95] A MediaWiki database contains several dozen tables, including a page table that contains page titles, page ids, and other metadata;[96] and a revision table to which is added a new row every time an edit is made, containing the page id, a brief textual summary of the change performed, the user name of the article editor (or its IP address the case of an unregistered user) and a timestamp.[97][98]

In a 4½ year period prior to 2008, the MediaWiki database had 170 schema versions.[99] Possibly the largest schema change was done in 2005 with MediaWiki 1.5, when the storage of metadata was separated from that of content, to improve performance flexibility. When this upgrade was applied to Wikipedia, the site was locked for editing, and the schema was converted to the new version in about 22 hours. Some software enhancement proposals, such as a proposal to allow sections of articles to be watched via watchlist, have been rejected because the necessary schema changes would have required excessive Wikipedia downtime.[100]

Performance and storage

[edit]

Because it is used to run one of the highest-traffic sites on the Web, Wikipedia, MediaWiki's performance and scalability have been highly optimized.[101] MediaWiki supports Squid, load-balanced database replication, client-side caching, memcached or table-based caching for frequently accessed processing of query results, a simple static file cache, feature-reduced operation, revision compression, and a job queue for database operations. MediaWiki developers have attempted to optimize the software by avoiding expensive algorithms, database queries, etc., caching every result that is expensive and has temporal locality of reference, and focusing on the hot spots in the code through profiling.[102]

MediaWiki code is designed to allow for data to be written to a read-write database and read from read-only databases, although the read-write database can be used for some read operations if the read-only databases are not yet up to date. Metadata, such as article revision history, article relations (links, categories etc.), user accounts and settings can be stored in core databases and cached; the actual revision text, being more rarely used, can be stored as append-only blobs in external storage. The software is suitable for the operation of large-scale wiki farms such as Wikimedia, which had about 800 wikis as of August 2011. However, MediaWiki comes with no built-in GUI to manage such installations.

Empirical evidence shows most revisions in MediaWiki databases tend to differ only slightly from previous revisions. Therefore, subsequent revisions of an article can be concatenated and then compressed, achieving very high data compression ratios of up to 100×.[102]

For more information on the architecture, such as how it stores wikitext and assembles a page, see *External links*.

Limitations

[edit]

The parser serves as the *de facto* standard for the MediaWiki syntax, as no formal syntax has been defined. Due to this lack of a formal definition, it has been difficult to create WYSIWYG editors for MediaWiki, although several WYSIWYG extensions do exist, including the popular VisualEditor.

MediaWiki is not designed to be a suitable replacement for dedicated online forum or blogging software,[103] although extensions do exist to allow for both of these.[104][105]

It is common for new MediaWiki users to make certain mistakes, such as forgetting to sign posts with four tildes (~~~~),[106] or manually entering a plaintext signature,[107] due to unfamiliarity with the idiosyncratic particulars involved in communication on MediaWiki discussion pages. On the other hand, the format of these discussion pages has been cited as a strength by one educator, who stated that it provides more fine-grain capabilities for discussion than traditional threaded discussion forums. For example, instead of 'replying' to an entire message, the participant in a discussion can create a hyperlink to a new wiki page on any word from the original page. Discussions are easier to follow since the content is available via hyperlinked wiki page, rather than a series of reply messages on a traditional threaded discussion forum. However, except in few cases, students were not using this capability, possibly because of their familiarity with the traditional linear discussion style and a lack of guidance on how to make the content more 'link-rich'.[108]

MediaWiki by default has little support for the creation of dynamically assembled documents, or pages that aggregate data from other pages. Some research has been done on enabling such features directly within MediaWiki.[109] The Semantic MediaWiki extension provides these features. It is not in use on Wikipedia, but in more than 1,600 other MediaWiki installations.[110] The Wikibase Repository and Wikibase Repository client are however implemented in Wikidata and Wikipedia respectively, and to some extent provides semantic web features, and linking of centrally stored data to infoboxes in various Wikipedia articles.

Upgrading MediaWiki is usually fully automated, requiring no changes to the site content or template programming. Historically troubles have been encountered when upgrading from significantly older versions.[111]

Security

[edit]

MediaWiki developers have enacted security standards, both for core code and extensions.[112] SQL queries and HTML output are usually done through wrapper functions that handle validation, escaping, filtering for prevention of cross-site scripting and SQL injection.[113] Many security issues have had to be patched after a MediaWiki version release,[114] and accordingly

MediaWiki.org states, "The most important security step you can take is to keep your software up to date" by subscribing to the announcement mailing list and installing security updates that are announced.[115]

Support

[edit]

Support for MediaWiki users consists of:

- MediaWiki.org, including the Support Desk.
- An official mailing list, Mediawiki-l.
- Several books have been written about MediaWiki administration,[116] including some free online books.[117][118]

License

[edit]

MediaWiki is free and open-source and is distributed under the terms of the GNU General Public License version 2 or any later version. Its documentation, located at its official website at www.mediawiki.org, is released under the Creative Commons BY-SA 4.0 license, with a set of help pages intended to be freely copied into fresh wiki installations and/or distributed with MediaWiki software in the public domain instead to eliminate legal issues for wikis with other licenses.[119][120] MediaWiki's development has generally favored the use of open-source media formats.[121]

Development

[edit]

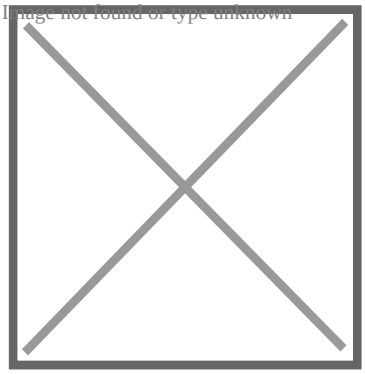
MediaWiki has an active volunteer community for development and maintenance. MediaWiki developers are spread around the world, though with a majority in the United States and Europe. Face-to-face meetings and programming sessions for MediaWiki developers have been held once or several times a year since 2004.[122]

Anyone can submit patches to the project's Git/Gerrit repository.[123] There are also paid programmers who primarily develop projects for the Wikimedia Foundation. MediaWiki developers participate in the Google Summer of Code by facilitating the assignment of mentors to students wishing to work on MediaWiki core and extension projects.[124] During the year prior to November 2012, there were about two hundred developers who had committed changes to the MediaWiki core or extensions.[125] Major MediaWiki releases are generated approximately every six months by taking snapshots of the development branch, which is kept continuously in a runnable state;[126] minor releases, or point releases, are issued as needed to correct bugs (especially security problems). MediaWiki is developed on a continuous integration development

model, in which software changes are pushed live to Wikimedia sites on regular basis.[126] MediaWiki also has a public bug tracker, *phabricator.wikimedia.org*, which runs Phabricator. The site is also used for feature and enhancement requests.

History

[edit]



Magnus Manske in 2012

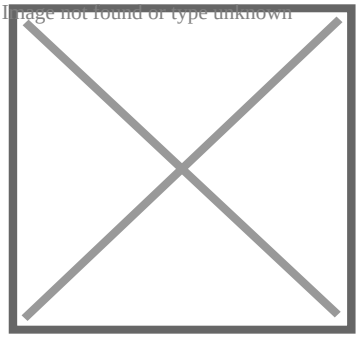
When Wikipedia was launched in January 2001, it ran on an existing wiki software system, UseModWiki. UseModWiki is written in the Perl programming language, and stores all wiki pages in text (.txt) files. This software soon proved to be limiting, in both functionality and performance. In mid-2001, Magnus Manske—a developer and student at the University of Cologne, as well as a Wikipedia editor—began working on new software that would replace UseModWiki, specifically designed for use by Wikipedia. This software was written in the PHP scripting language, and stored all of its information in a MySQL database. The new software was largely developed by August 24, 2001, and a test wiki for it was established shortly thereafter.

The first full implementation of this software was the new Meta Wikipedia on November 9, 2001. There was a desire to have it implemented immediately on the English-language Wikipedia.[127] However, Manske was apprehensive about any potential bugs harming the nascent website during the period of the final exams he had to complete immediately prior to Christmas;[128] this led to the launch on the English-language Wikipedia being delayed until January 25, 2002. The software was then, gradually, deployed on all the Wikipedia language sites of that time. This software was referred to as "the PHP script" and as "phase II", with the name "phase I", retroactively given to the use of UseModWiki.

Increasing usage soon caused load problems to arise again, and soon after, another rewrite of the software began; this time being done by Lee Daniel Crocker, which became known as "phase III". This new software was also written in PHP, with a MySQL backend, and kept the basic interface of the phase II software, but with the added functionality of a wider scalability. The "phase III" software went live on Wikipedia in July 2002.

The Wikimedia Foundation was announced on June 20, 2003. In July, Wikipedia contributor Daniel Mayer suggested the name "MediaWiki" for the software, as a play on "Wikimedia".[129]

The MediaWiki name was gradually phased in, beginning in August 2003. The name has frequently caused confusion due to its (intentional) similarity to the "Wikimedia" name (which itself is similar to "Wikipedia").[130] The first version of MediaWiki, 1.1, was released in December 2003.



MediaWiki logo until April 1, 2021

The old product logo was created by Erik Möller, using a flower photograph taken by Florence Nibart-Devouard, and was originally submitted to the logo contest for a new Wikipedia logo, held from July 20 to August 27, 2003.[131][132] The logo came in third place, and was chosen to represent MediaWiki rather than Wikipedia, with the second place logo being used for the Wikimedia Foundation.[133] The double square brackets (**[[ ]]**) symbolize the syntax MediaWiki uses for creating hyperlinks to other wiki pages; while the sunflower represents the diversity of content on Wikipedia, its constant growth, and the wilderness.[134]

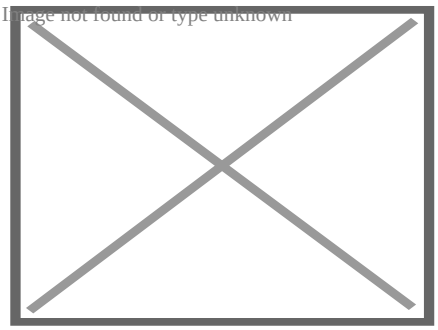
Later, Brooke Vibber, the chief technical officer of the Wikimedia Foundation,[135] took up the role of release manager.[136][101]

Major milestones in MediaWiki's development have included: the categorization system (2004); parser functions, (2006); Flagged Revisions, (2008);[68] the "*ResourceLoader*", a delivery system for CSS and JavaScript (2011);[137] and the VisualEditor, a "what you see is what you get" (WYSIWYG) editing platform (2013).[138]

The contest of designing a new logo was initiated on June 22, 2020, as the old logo was a bitmap image and had "high details", leading to problems when rendering at high and low resolutions, respectively. After two rounds of voting, the new and current MediaWiki logo designed by Serhio Magpie was selected on October 24, 2020, and officially adopted on April 1, 2021.[139]

Sites using MediaWiki

[edit]
See also: Category:MediaWiki websites



Fandom also makes use of MediaWiki.

MediaWiki's most famous use has been in Wikipedia and, to a lesser degree, the Wikimedia Foundation's other projects. Fandom, a wiki hosting service formerly known as Wikia, runs on MediaWiki. Other public wikis that run on MediaWiki include wikiHow and SNPedia. WikiLeaks began as a MediaWiki-based site, but is no longer a wiki.

A number of alternative wiki encyclopedias to Wikipedia run on MediaWiki, including Citizendium, Metapedia, Scholarpedia and Conservapedia. MediaWiki is also used internally by a large number of companies, including Novell and Intel.[140][141]

Notable usages of MediaWiki within governments include Intellipedia, used by the United States Intelligence Community, Diplopedia, used by the United States Department of State, and milWiki, a part of milSuite used by the United States Department of Defense. United Nations agencies such as the United Nations Development Programme and INSTRAW chose to implement their wikis using MediaWiki, because "this software runs Wikipedia and is therefore guaranteed to be thoroughly tested, will continue to be developed well into the future, and future technicians on these wikis will be more likely to have exposure to MediaWiki than any other wiki software."[142]

The Free Software Foundation uses MediaWiki to implement the LibrePlanet site.[143]

Comparison to other online collaboration software

[edit]
Main article: Comparison of wiki software

Users of online collaboration software are familiar with MediaWiki's functions and layout due to its noted use on Wikipedia. A 2006 overview of social software in academia observed that "Compared to other wikis, MediaWiki is also fairly aesthetically pleasing, though simple, and has an easily customized side menu and stylesheet."[144] However, in one assessment in 2006, Confluence was deemed to be a superior product due to its very usable API and ability to better support multiple wikis.[76]

A 2009 study at the University of Hong Kong compared TWiki to MediaWiki. The authors noted that TWiki has been considered as a collaborative tool for the development of educational papers and technical projects, whereas MediaWiki's most noted use is on Wikipedia. Although both platforms allow discussion and tracking of progress, TWiki has a "Report" part that MediaWiki lacks. Students perceived MediaWiki as being easier to use and more enjoyable than TWiki. When asked whether they recommended using MediaWiki for knowledge management course group project, 15 out of 16 respondents expressed their preference for MediaWiki giving answers of great certainty, such as "of course", "for sure".[145] TWiki and MediaWiki both have flexible plug-in architecture.[146]

A 2009 study that compared students' experience with MediaWiki to that with Google Docs found that students gave the latter a much higher rating on user-friendly layout.[147]

A 2021 study conducted by the Brazilian Nuclear Engineering Institute compared a MediaWiki-based knowledge management system against two others that were based on DSpace and Open Journal Systems, respectively.[148] It highlighted ease of use as an advantage of the MediaWiki-based system, noting that because the Wikimedia Foundation had been developing MediaWiki for a site aimed at the general public (Wikipedia), "its user interface was designed to be more user-friendly from start, and has received large user feedback over a long time", in contrast to DSpace's and OJS's focus on niche audiences.[148]

See also

[edit]

- Image not found or type unknown Free and open-source software portal

- List of content management systems
- List of wiki software
- BlueSpice
- Semantic MediaWiki
- XOWA – for viewing Wikipedia and other wikis offline
- PHP – a programming language that powers MediaWiki

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External links

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MediaWiki at Wikipedia's sister projects

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- Image not found or type unknown Media from Commons
- Image not found or type unknown Quotations from Wikiquote
- Image not found or type unknown Textbooks from Wikibooks
- Image not found or type unknown Resources from Wikiversity
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- MediaWiki homepage Image not found or type unknown Edit this at Wikidata

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- Esra'a Al Shafei
- Lee Daniel Crocker
- Florence Devouard
- Sue Gardner
- David Gerard
- James Heilman
- Maryana Iskander
- Dariusz Jemielniak
- Rebecca MacKinnon
- Katherine Maher
- Magnus Manske
- Erik Möller
- Jason Moore
- Raju Narisetti
- Steven Pruitt
- Annie Rauwerda
- Larry Sanger
- María Sefidari
- Lisa Seitz-Gruwell
- Rosie Stephenson-Goodknight

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- *Wikipedia Monument*

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- LGBTQ and Wikipedia
- *Magna Carta (An Embroidery)*
- People imprisoned for editing Wikipedia
- Print Wikipedia
- Wiki rabbit hole
- Wikimedia Foundation
- Wikimedia movement
- Wikipedia for World Heritage
- Wikipedia in India
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- Image not found or type unknown **Category**

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Wiki software

.NET	FlexWiki SharePoint
Java	Confluence Jive Traction TeamPage XWiki
JavaScript	TiddlyWiki Wiki.js
Perl	Foswiki ikiwiki TWiki UseModWiki WikiBase
PHP	BlueSpice BookStack DokuWiki MediaWiki PhpWiki Phriction PmWiki PukiWiki Tiki
Python	Allura Bloodhound Kallithea Kuma MoinMoin Trac Zim

Ruby

- Gollum
- Redmine

Other languages

- CLiki
  - Common Lisp
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  - CoffeeScript
  - Haskell

- Image not found or type unknown **Comparison**
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Wikimedia Foundation

Projects

- Wikipedia community (Wikipedians)

People

Current

- Maryana Iskander
- Lisa Seitz-Gruwell
- Dariusz Jemielniak
- Rebecca MacKinnon
- Raju Narisetti
- Rosie Stephenson-Goodknight
- Esra'a Al Shafei
- Jimmy Wales

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- Hampton Lintorn-Catlin
- Danese Cooper
- Bishakha Datta
- Florence Devouard
- Oscar van Dillen
- Sue Gardner
- Arnnon Geshuri
- Mike Godwin
- Aaron Halfaker
- James Heilman
- Guy Kawasaki
- Patricio Lorente
- Katherine Maher
- Erik Möller
- Larry Sanger
- María Sefidari
- Lila Tretikov
- Luis Villa

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- Wikimedia Commons
- Wikidata
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  - Deutschland
  - Israel
  - Polska
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  - Ukraine
- Wikimania
- Wiki Indaba
- WikiConference India
- WikiConference North America
- MediaWiki
- Litigation
  - Monkey selfie copyright dispute
  - *Wikimedia Foundation v. NSA*
- Knowledge Engine

Related

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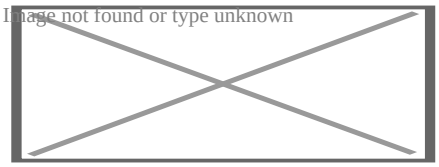
- *Wikipedia Monument*
- Wikimedian of the Year
- Tides Foundation
- Artificial intelligence in Wikimedia projects
- Google and Wikipedia
- Wikipedia for World Heritage

Authority control databases Image not found or type unknown **Edit this at Wikidata**

International	○ VIAF ○ FAST
National	○ Germany ○ United States ○ France ○ BnF data ○ Israel
Other	○ IdRef

About Domain name

This article is about domain names in the Internet. For other uses, see Domain (disambiguation).



An annotated example of a domain name

In the Internet, a **domain name** is a string that identifies a realm of administrative autonomy, authority or control. Domain names are often used to identify services provided through the Internet, such as websites, email services and more. Domain names are used in various networking contexts and for application-specific naming and addressing purposes. In general, a domain name identifies a network domain or an Internet Protocol (IP) resource, such as a personal computer used to access the Internet, or a server computer.

Domain names are formed by the rules and procedures of the Domain Name System (DNS). Any name registered in the DNS is a domain name. Domain names are organized in subordinate levels (*subdomains*) of the DNS root domain, which is nameless. The first-level set of domain names are the *top-level domains* (TLDs), including the *generic top-level domains* (gTLDs), such as the prominent domains com, info, net, edu, and org, and the *country code top-level domains* (ccTLDs). Below these top-level domains in the DNS hierarchy are the second-level and third-level domain names that are typically open for reservation by end-users who wish to connect local area networks to the Internet, create other publicly accessible Internet resources or run websites, such as "wikipedia.org". The registration of a second- or third-level domain name is

usually administered by a domain name registrar who sell its services to the public.

A *fully qualified domain name* (FQDN) is a domain name that is completely specified with all labels in the hierarchy of the DNS, having no parts omitted. Traditionally a FQDN ends in a dot (**.**) to denote the top of the DNS tree.[1] Labels in the Domain Name System are case-insensitive, and may therefore be written in any desired capitalization method, but most commonly domain names are written in lowercase in technical contexts.[2] A *hostname* is a domain name that has at least one associated IP address.

Purpose

[edit]

Domain names serve to identify Internet resources, such as computers, networks, and services, with a text-based label that is easier to memorize than the numerical addresses used in the Internet protocols. A domain name may represent entire collections of such resources or individual instances. Individual Internet host computers use domain names as host identifiers, also called hostnames. The term *hostname* is also used for the leaf labels in the domain name system, usually without further subordinate domain name space. Hostnames appear as a component in Uniform Resource Locators (URLs) for Internet resources such as websites (e.g., en.wikipedia.org).

Domain names are also used as simple identification labels to indicate ownership or control of a resource. Such examples are the realm identifiers used in the Session Initiation Protocol (SIP), the Domain Keys used to verify DNS domains in e-mail systems, and in many other Uniform Resource Identifiers (URIs).

An important function of domain names is to provide easily recognizable and memorizable names to numerically addressed Internet resources. This abstraction allows any resource to be moved to a different physical location in the address topology of the network, globally or locally in an intranet. Such a move usually requires changing the IP address of a resource and the corresponding translation of this IP address to and from its domain name.

Domain names are used to establish a unique identity. Organizations can choose a domain name that corresponds to their name, helping Internet users to reach them easily.

A generic domain is a name that defines a general category, rather than a specific or personal instance, for example, the name of an industry, rather than a company name. Some examples of generic names are *books.com*, *music.com*, and *travel.info*. Companies have created brands based on generic names, and such generic domain names may be valuable.[3]

Domain names are often simply referred to as *domains* and domain name registrants are frequently referred to as *domain owners*, although domain name registration with a registrar does not confer any legal ownership of the domain name, only an exclusive right of use for a particular duration of time. The use of domain names in commerce may subject them to trademark law.

History

[edit]
Main article: List of the oldest currently registered Internet domain names

The practice of using a simple memorable abstraction of a host's numerical address on a computer network dates back to the ARPANET era, before the advent of today's commercial Internet. In the early network, each computer on the network retrieved the hosts file (*host.txt*) from a computer at SRI (now SRI International),[4][5] which mapped computer hostnames to numerical addresses. The rapid growth of the network made it impossible to maintain a centrally organized hostname registry and in 1983 the Domain Name System was introduced on the ARPANET and published by the Internet Engineering Task Force as RFC 882 and RFC 883.

The following table shows the first five .com domains with the dates of their registration:[6]

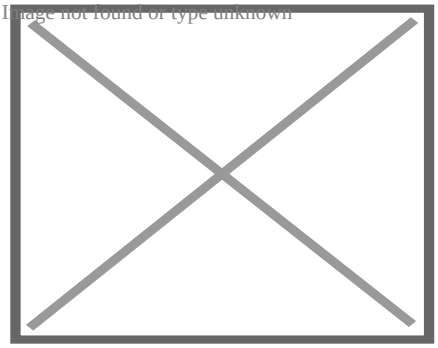
Domain name	Registration date
symbolics.com	15 March 1985
bbn.com	24 April 1985
think.com	24 May 1985
mcc.com	11 July 1985
dec.com	30 September 1985

and the first five .edu domains:[7]

Domain name	Registration date
berkeley.edu	24 April 1985
cmu.edu	24 April 1985
purdue.edu	24 April 1985
rice.edu	24 April 1985
ucla.edu	24 April 1985

Domain name space

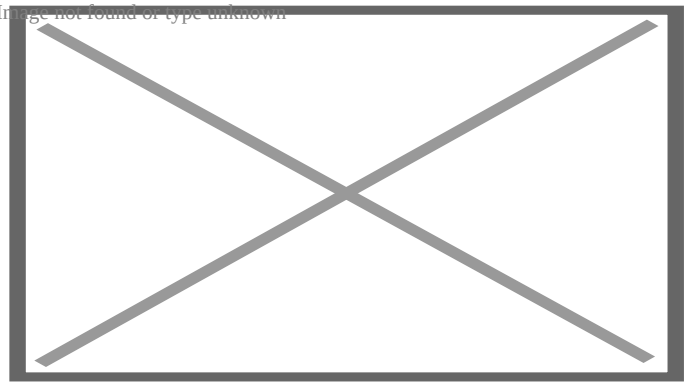
[edit]



The hierarchical domain name system, organized into zones, each served by domain name servers

Today, the Internet Corporation for Assigned Names and Numbers (ICANN) manages the top-level development and architecture of the Internet domain name space. It authorizes domain name registrars, through which domain names may be registered and reassigned.

Image not found or type unknown



The hierarchy of labels in a fully qualified domain name

The domain name space consists of a tree of domain names. Each node in the tree holds information associated with the domain name. The tree sub-divides into *zones* beginning at the DNS root zone.

Domain name syntax

[edit]

A domain name consists of one or more parts, technically called *labels*, that are conventionally concatenated, and delimited by dots, such as *example.com*.

- The right-most label conveys the top-level domain; for example, the domain name *www.example.com* belongs to the top-level domain *com*.
- The hierarchy of domains descends from the right to the left label in the name; each label to the left specifies a subdivision, or subdomain of the domain to the right. For example: the label *example* specifies a node *example.com* as a subdomain of the *com* domain, and *www* is a label to create *www.example.com*, a subdomain of *example.com*. Each label may contain from 1 to 63 octets. The empty label is reserved for the root node and when fully qualified is expressed as the empty label terminated by a dot. The full domain name may not exceed a total length of 253 ASCII characters in its textual representation.[8]
- A hostname is a domain name that has at least one associated IP address. For example, the domain names *www.example.com* and *example.com* are also hostnames, whereas the *com* domain is not. However, other top-level domains, particularly country code top-level domains, may indeed have an IP address, and if so, they are also hostnames.
- Hostnames impose restrictions on the characters allowed in the corresponding domain name. A valid hostname is also a valid domain name, but a valid domain name may not necessarily be valid as a hostname.

Top-level domains

[edit]

When the Domain Name System was devised in the 1980s, the domain name space was divided into two main groups of domains.[9] The country code top-level domains (ccTLD) were primarily based on the two-character territory codes of ISO-3166 country abbreviations. In addition, a group of seven generic top-level domains (gTLD) was implemented which represented a set of categories of names and multi-organizations.[10] These were the domains gov, edu, com, mil, org, net, and int. These two types of top-level domains (TLDs) are the highest level of domain names of the Internet. Top-level domains form the DNS root zone of the hierarchical Domain Name System. Every domain name ends with a top-level domain label.

During the growth of the Internet, it became desirable to create additional generic top-level domains. As of October 2009, 21 generic top-level domains and 250 two-letter country-code top-level domains existed.[11] In addition, the ARPA domain serves technical purposes in the infrastructure of the Domain Name System.

During the 32nd International Public ICANN Meeting in Paris in 2008,[12] ICANN started a new process of TLD naming policy to take a "significant step forward on the introduction of new generic top-level domains." This program envisions the availability of many new or already proposed domains, as well as a new application and implementation process.[13] Observers believed that the new rules could result in hundreds of new top-level domains to be registered.[14] In 2012, the program commenced, and received 1930 applications.[15] By 2016, the milestone of 1000 live gTLD was reached.

The Internet Assigned Numbers Authority (IANA) maintains an annotated list of top-level domains in the DNS root zone database.[16]

For special purposes, such as network testing, documentation, and other applications, IANA also reserves a set of special-use domain names.[17] This list contains domain names such as example, local, localhost, and test. Other top-level domain names containing trade marks are registered for corporate use. Cases include brands such as BMW, Google, and Canon.[18]

Second-level and lower level domains

[edit]

Below the top-level domains in the domain name hierarchy are the second-level domain (SLD) names. These are the names directly to the left of .com, .net, and the other top-level domains. As an example, in the domain *example.co.uk*, *co* is the second-level domain.

Next are third-level domains, which are written immediately to the left of a second-level domain. There can be fourth- and fifth-level domains, and so on, with virtually no limitation. Each label is separated by a full stop (dot). An example of an operational domain name with four levels of

domain labels is *sos.state.oh.us*. 'sos' is said to be a sub-domain of 'state.oh.us', and 'state' a sub-domain of 'oh.us', etc. In general, subdomains are domains subordinate to their parent domain. An example of very deep levels of subdomain ordering are the IPv6 reverse resolution DNS zones, e.g., 1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa, which is the reverse DNS resolution domain name for the IP address of a loopback interface, or the localhost name.

Second-level (or lower-level, depending on the established parent hierarchy) domain names are often created based on the name of a company (e.g., *bbc*.co.uk), product or service (e.g. *hotmail*.com). Below these levels, the next domain name component has been used to designate a particular host server. Therefore, *ftp.example.com* might be an FTP server, *www.example.com* would be a World Wide Web server, and *mail.example.com* could be an email server, each intended to perform only the implied function. Modern technology allows multiple physical servers with either different (cf. load balancing) or even identical addresses (cf. anycast) to serve a single hostname or domain name, or multiple domain names to be served by a single computer. The latter is very popular in Web hosting service centers, where service providers host the websites of many organizations on just a few servers.

The hierarchical DNS labels or components of domain names are separated in a fully qualified name by the full stop (dot, .).

Internationalized domain names

[edit]
Main article: Internationalized domain name

The character set allowed in the Domain Name System is based on ASCII and does not allow the representation of names and words of many languages in their native scripts or alphabets. ICANN approved the Internationalized domain name (IDNA) system, which maps Unicode strings used in application user interfaces into the valid DNS character set by an encoding called Punycode. For example, københavn.eu is mapped to xn--kbenhavn-54a.eu. Many registries have adopted IDNA.

Domain name registration

[edit]

History

[edit]

The first commercial Internet domain name, in the TLD *com*, was registered on 15 March 1985 in the name symbolics.com by Symbolics Inc., a computer systems firm in Cambridge, Massachusetts.

By 1992, fewer than 15,000 *com* domains had been registered.

In the first quarter of 2015, 294 million domain names had been registered.[19] A large fraction of them are in the *com* TLD, which as of December 21, 2014, had 115.6 million domain names,[20] including 11.9 million online business and e-commerce sites, 4.3 million entertainment sites, 3.1 million finance related sites, and 1.8 million sports sites.[21] As of July 15, 2012, the *com* TLD had more registrations than all of the ccTLDs combined.[22]

As of December 31, 2023, 359.8 million domain names had been registered.[23]

Administration

[edit]

The right to use a domain name is delegated by domain name registrars, which are accredited by the Internet Corporation for Assigned Names and Numbers (ICANN), the organization charged with overseeing the name and number systems of the Internet. In addition to ICANN, each top-level domain (TLD) is maintained and serviced technically by an administrative organization operating a registry. A registry is responsible for maintaining the database of names registered within the TLD it administers. The registry receives registration information from each domain name registrar authorized to assign names in the corresponding TLD and publishes the information using a special service, the WHOIS protocol.

Registries and registrars usually charge an annual fee for the service of delegating a domain name to a user and providing a default set of name servers. Often, this transaction is termed a sale or lease of the domain name, and the registrant may sometimes be called an "owner", but no such legal relationship is actually associated with the transaction, only the exclusive right to use the domain name. More correctly, authorized users are known as "registrants" or as "domain holders".

ICANN publishes the complete list of TLD registries and domain name registrars. Registrant information associated with domain names is maintained in an online database accessible with the WHOIS protocol. For most of the 250 country code top-level domains (ccTLDs), the domain registries maintain the WHOIS (Registrant, name servers, expiration dates, etc.) information.

Some domain name registries, often called *network information centers* (NIC), also function as registrars to end-users. The major generic top-level domain registries, such as for the *com*, *net*, *org*, *info* domains and others, use a registry-registrar model consisting of hundreds of domain name registrars (see lists at ICANN[24] or VeriSign).[25] In this method of management, the registry only manages the domain name database and the relationship with the registrars. The *registrants* (users of a domain name) are customers of the registrar, in some cases through additional layers of resellers.

There are also a few other alternative DNS root providers that try to compete or complement ICANN's role of domain name administration, however, most of them failed to receive wide recognition, and thus domain names offered by those alternative roots cannot be used universally on most other internet-connecting machines without additional dedicated configurations.

Technical requirements and process

[edit]

In the process of registering a domain name and maintaining authority over the new name space created, registrars use several key pieces of information connected with a domain:

- *Administrative contact*. A registrant usually designates an administrative contact to manage the domain name. The administrative contact usually has the highest level of control over a domain. Management functions delegated to the administrative contacts may include management of all business information, such as name of record, postal address, and contact information of the official registrant of the domain and the obligation to conform to the requirements of the domain registry in order to retain the right to use a domain name. Furthermore, the administrative contact installs additional contact information for technical and billing functions.
- *Technical contact*. The technical contact manages the name servers of a domain name. The functions of a technical contact include assuring conformance of the configurations of the domain name with the requirements of the domain registry, maintaining the domain zone records, and providing continuous functionality of the name servers (that leads to the accessibility of the domain name).
- *Billing contact*. The party responsible for receiving billing invoices from the domain name registrar and paying applicable fees.
- *Name servers*. Most registrars provide two or more name servers as part of the registration service. However, a registrant may specify its own authoritative name servers to host a domain's resource records. The registrar's policies govern the number of servers and the type of server information required. Some providers require a hostname and the corresponding IP address or just the hostname, which must be resolvable either in the new domain, or exist elsewhere. Based on traditional requirements (RFC 1034), typically a minimum of two servers is required.

A domain name consists of one or more labels, each of which is formed from the set of ASCII letters, digits, and hyphens (a–z, A–Z, 0–9, -), but not starting or ending with a hyphen. The labels are case-insensitive; for example, 'label' is equivalent to 'Label' or 'LABEL'. In the textual representation of a domain name, the labels are separated by a full stop (period).

Business models

[edit]

Domain names are often seen in analogy to real estate in that domain names are foundations on which a website can be built, and the highest *quality* domain names, like sought-after real estate, tend to carry significant value, usually due to their online brand-building potential, use in advertising, search engine optimization, and many other criteria.

A few companies have offered low-cost, below-cost or even free domain registration with a variety of models adopted to recoup the costs to the provider. These usually require that domains be hosted on their website within a framework or portal that includes advertising wrapped around the domain holder's content, revenue from which allows the provider to recoup the costs. Domain registrations were free of charge when the DNS was new. A domain holder may provide an infinite number of subdomains in their domain. For example, the owner of *example.org* could provide subdomains such as *foo.example.org* and *foo.bar.example.org* to interested parties.

Many desirable domain names are already assigned and users must search for other acceptable names, using Web-based search features, or WHOIS and dig operating system tools. Many registrars have implemented **domain name suggestion** tools which search domain name databases and suggest available alternative domain names related to keywords provided by the user.

Resale of domain names

[edit]
Main article: List of most expensive domain names

The business of resale of registered domain names is known as the domain aftermarket. Various factors influence the perceived value or market value of a domain name. Most of the high-prize domain sales are carried out privately.[26] Also, it is called confidential domain acquiring or anonymous domain acquiring.[27]

Domain name confusion

[edit]

Intercapping is often used to emphasize the meaning of a domain name, because DNS names are not case-sensitive. Some names may be misinterpreted in certain uses of capitalization. For example: *Who Represents*, a database of artists and agents, chose *whorepresents.com*,[28] which can be misread. In such situations, the proper meaning may be clarified by placement of hyphens when registering a domain name. For instance, Experts Exchange, a programmers' discussion site, used *expertsexchange.com*, but changed its domain name to *experts-exchange.com*.[29]

Uses in website hosting

[edit]

The domain name is a component of a uniform resource locator (URL) used to access websites, for example:

- URL: http://www.example.net/index.html
- Top-level domain: net

- Second-level domain: example
- Hostname: www

A domain name may point to multiple IP addresses to provide server redundancy for the services offered, a feature that is used to manage the traffic of large, popular websites.

Web hosting services, on the other hand, run servers that are typically assigned only one or a few addresses while serving websites for many domains, a technique referred to as virtual web hosting. Such IP address overloading requires that each request identifies the domain name being referenced, for instance by using the HTTP request header field *Host:*, or Server Name Indication.

Abuse and regulation

[edit]

Critics often claim abuse of administrative power over domain names. Particularly noteworthy was the VeriSign Site Finder system which redirected all unregistered .com and .net domains to a VeriSign webpage. For example, at a public meeting with VeriSign to air technical concerns about Site Finder,[30] numerous people, active in the IETF and other technical bodies, explained how they were surprised by VeriSign's changing the fundamental behavior of a major component of Internet infrastructure, not having obtained the customary consensus. Site Finder, at first, assumed every Internet query was for a website, and it monetized queries for incorrect domain names, taking the user to VeriSign's search site. Other applications, such as many implementations of email, treat a lack of response to a domain name query as an indication that the domain does not exist, and that the message can be treated as undeliverable. The original VeriSign implementation broke this assumption for mail, because it would always resolve an erroneous domain name to that of Site Finder. While VeriSign later changed Site Finder's behaviour with regard to email, there was still widespread protest about VeriSign's action being more in its financial interest than in the interest of the Internet infrastructure component for which VeriSign was the steward.

Despite widespread criticism, VeriSign only reluctantly removed it after the Internet Corporation for Assigned Names and Numbers (ICANN) threatened to revoke its contract to administer the root name servers. ICANN published the extensive set of letters exchanged, committee reports, and ICANN decisions.[31]

There is also significant disquiet regarding the United States Government's political influence over ICANN. This was a significant issue in the attempt to create a .xxx top-level domain and sparked greater interest in alternative DNS roots that would be beyond the control of any single country.[32]

Additionally, there are numerous accusations of domain name front running, whereby registrars, when given whois queries, automatically register the domain name for themselves. Network Solutions has been accused of this.[33]

Truth in Domain Names Act

[edit]

In the United States, the Truth in Domain Names Act of 2003, in combination with the PROTECT Act of 2003, forbids the use of a misleading domain name with the intention of attracting Internet users into visiting Internet pornography sites.

The Truth in Domain Names Act follows the more general Anticybersquatting Consumer Protection Act passed in 1999 aimed at preventing typosquatting and deceptive use of names and trademarks in domain names.

Seizures

[edit]

In the early 21st century, the US Department of Justice (DOJ) pursued the seizure of domain names, based on the legal theory that domain names constitute property used to engage in criminal activity, and thus are subject to forfeiture. For example, in the seizure of the domain name of a gambling website, the DOJ referenced 18 U.S.C. § 981 and 18 U.S.C. § 1955(d).[34][1] In 2013 the US government seized Liberty Reserve, citing 18 U.S.C. § 982(a)(1).[35]

The U.S. Congress passed the Combating Online Infringement and Counterfeits Act in 2010. Consumer Electronics Association vice president Michael Petricone was worried that seizure was a *blunt instrument* that could harm legitimate businesses.[36][37] After a joint operation on February 15, 2011, the DOJ and the Department of Homeland Security claimed to have seized ten domains of websites involved in advertising and distributing child pornography, but also mistakenly seized the domain name of a large DNS provider, temporarily replacing 84,000 websites with seizure notices.[38]

In the United Kingdom, the Police Intellectual Property Crime Unit (PIPCU) has been attempting to seize domain names from registrars without court orders.[39]

- Seizure notices absolutepoker.com
- Image not found or type unknown

absolutepoker.com
channelsurfing.net

- Image not found or type unknown

channelsurfing.net
libertyreserve.com

- Image not found or type unknown

libertyreserve.com

Suspensions

[edit]

PIPCU and other UK law enforcement organisations make domain suspension requests to Nominet which they process on the basis of breach of terms and

conditions. Around 16,000 domains are suspended annually, and about 80% of the requests originate from PIPCU.[40]

Property rights

[edit]

Because of the economic value it represents, the European Court of Human Rights has ruled that the exclusive right to a domain name is protected as property under article 1 of Protocol 1 to the European Convention on Human Rights.[41]

IDN variants

[edit]

ICANN Business Constituency (BC) has spent decades trying to make IDN variants work at the second level, and in the last several years at the top level. Domain name variants are domain names recognized in different character encodings, like a single domain presented in traditional Chinese and simplified Chinese. It is an Internationalization and localization problem. Under Domain Name Variants, the different encodings of the domain name (in simplified and traditional Chinese) would resolve to the same host.[42][43]

According to John Levine, an expert on Internet related topics, "Unfortunately, variants don't work. The problem isn't putting them in the DNS, it's that once they're in the DNS, they don't work anywhere else."[42]

Fictitious domain name

[edit]

A *fictitious domain name* is a domain name used in a work of fiction or popular culture to refer to a domain that does not actually exist, often with invalid or unofficial top-level domains such as ".web", a usage exactly analogous to the dummy 555 telephone number prefix used in film and other media. The canonical fictitious domain name is "example.com", specifically set aside by IANA in RFC 2606 for such use, along with the *.example* TLD.

Domain names used in works of fiction have often been registered in the DNS, either by their creators or by cybersquatters attempting to profit from it. This phenomenon prompted NBC to purchase the domain name Hornymanatee.com after talk-show host Conan O'Brien spoke the name while ad-libbing on his show. O'Brien subsequently created a website based on the concept and used it as a running gag on the show.[44] Companies whose works have used fictitious domain names have also employed firms such as MarkMonitor to park fictional domain names in order to prevent misuse by third parties.[45]

Misspelled domain names

[edit]

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Misspelled domain names, also known as typosquatting or URL hijacking, are domain names that are intentionally or unintentionally misspelled versions of popular or well-known domain names. The goal of misspelled domain names is to capitalize on internet users who accidentally type in a misspelled domain name, and are then redirected to a different website.

Misspelled domain names are often used for malicious purposes, such as phishing scams or distributing malware. In some cases, the owners of misspelled domain names may also attempt to sell the domain names to the owners of the legitimate domain names, or to individuals or organizations who are interested in capitalizing on the traffic generated by internet users who accidentally type in the misspelled domain names.

To avoid being caught by a misspelled domain name, internet users should be careful to type in domain names correctly, and should avoid clicking on links that appear suspicious or unfamiliar. Additionally, individuals and organizations who own popular or well-known domain names should consider registering common misspellings of their domain names in order to prevent others from using them for malicious purposes.

Domain name spoofing

[edit]

The term **Domain name spoofing** (or simply though less accurately, **Domain spoofing**) is used generically to describe one or more of a class of phishing attacks that depend on falsifying or misrepresenting an internet domain name.[46][47] These are designed to persuade unsuspecting users into visiting a web site other than that intended, or opening an email that is not in reality from the address shown (or apparently shown).[48] Although website and email spoofing attacks are more widely known, any service that relies on domain name resolution may be compromised.

Types

[edit]

There are a number of better-known types of domain spoofing:

- Typosquatting, also called "URL hijacking", a "sting site", or a "fake URL", is a form of cybersquatting, and possibly brandjacking which relies on mistakes such as typos made by Internet users when inputting a website address into a web browser or composing an email address. Should a user accidentally enter an incorrect domain name, they may be led to any URL (including an alternative website owned by a cybersquatter).[49]

The typosquatter's URL will usually be one of five kinds, all *similar to* the victim site address:
    - A common misspelling, or foreign language spelling, of the intended site
    - A misspelling based on a typographical error
    - A plural of a singular domain name
    - A different top-level domain: (i.e. .com instead of .org)
    - An abuse of the Country Code Top-Level Domain (ccTLD) (.cm, .co, or .om instead of .com)

- IDN homograph attack. This type of attack depends on registering a domain name that is similar to the 'target' domain, differing from it only because its spelling includes one or more characters that come from a different alphabet but look the same to the naked eye. For example, the Cyrillic, Latin, and Greek alphabets each have their own letter A, each of which has its own binary code point. Turkish has a dotless letter i (ÃƒÆ'Ã†â€™Ãƒâ€ Ã¢â‚¬â„¢ÃƒÆ'Ã¢â‚¬Â ÃƒÂ¢Ã¢â€šÂ¬Ã¢â€žÃ¢ÃƒÆ'Ã†â€™ÃƒÂ¢Ã¢â€šÂ¬Ã‚Â) that may not be perceived as different from the ASCII letter i. Most web browsers warn of 'mixed alphabet' domain names,[50][51][52][53] Other services, such as email applications, may not provide the same protection. Reputable top level domain and country code domain registrars will not accept applications to register a deceptive name but this policy cannot be presumed to be infallible.
- DNS spoofing – Cyberattack using corrupt DNS data
- Website spoofing – Creating a website, as a hoax, with the intention of misleading readers
- Email spoofing – Creating email spam or phishing messages with a forged sender identity or address

Risk mitigation

[edit]

- Domain Name System Security Extensions – Suite of IETF specifications
- Sender Policy Framework – Simple email-validation system designed to detect email spoofing
- DMARC – System to prevent email fraud ("Domain-based Message Authentication, Reporting and Conformance")
- DomainKeys Identified Mail – Email authentication method designed to detect email spoofing
- Public key certificate – Electronic document used to prove the ownership of a public key (SSL certificate)

Legitimate technologies that may be subverted

[edit]

- URL redirection – Technique for making a Web page available under more than one URL address
- Domain fronting – Technique for Internet censorship circumvention

See also

[edit]

- Domain hack
- Domain hijacking
- Domain name registrar
- Domain name speculation
- Domain name warehousing
- Domain registration
- Domain tasting
- Geodomain
- List of Internet top-level domains
- Reverse domain hijacking
- Reverse domain name notation

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- (domain bias in web search) a research by Microsoft
- Top Level Domain Bias in Search Engine Indexing and Rankings
- Icann New gTLD Program Factsheet - October 2009 (PDF)
- IANA Two letter Country Code TLD
- ICANN - Internet Corporation for Assigned Names and Numbers
- Internic.net, public information regarding Internet domain name registration services
- Internet Domain Names: Background and Policy Issues Congressional Research Service
- RFC 1034, Domain Names — Concepts and Facilities, an Internet Protocol Standard
- RFC 1035, Domain Names — Implementation and Specification, an Internet Protocol Standard
- UDRP, Uniform Domain-Name Dispute-Resolution Policy
- Special use domain names

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Website management

Concepts

Web hosting

- Clustered
- Peer-to-peer
- Self-hosting
- Virtual

Web analytics

- Click analytics
- Mobile web analytics
- Web tracking
  - Click tracking

- Overselling
- Web document
- Web content
- Web content lifecycle
- Web server
- Web cache
- Webmaster
- Website governance

Web hosting control panels (comparison)

- AlternC
- cPanel
- DirectAdmin
- Domain Technologie Control
- Froxlor
- i-MSCP
- InterWorx
- ISPConfig
- Ispmanager
- Kloxo
- Plesk
- Usermin
- Webmin

Top-level domain registries

- AFNIC
- auDA
- DNS Belgium
- CentralNic
- CIRA
- CNNIC
- CZ.NIC
- DENIC
- EURid
- Freenom
- GoDaddy
- Google Domains
- Identity Digital
- IPM
- JPRS
- KISA
- NIC México
- Nominet
- PIR
- Tucows
- Verisign

Domain name managers and registrars

- Bluehost
- Domainz
- DreamHost
- Dynadot
- Enom
- Epik
- Gandi
- GlowHost
- GMO Internet
- GoDaddy
- Google Domains
- Hover
- Infomaniak
- Jimdo
- Name.com
- Namecheap
- Hostinger
- NameSilo
- NearlyFreeSpeech
- Network Solutions
- OVH
- Register.com
- Squarespace
- Tucows
- UK2
- Webcentral
- Web.com
- Wix.com

Web content management system

- Document management system
- Wiki software
- Blog software

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