

# URL(UNIFORM RESOURCE LOCATOR)

The address of a unique resource on the internet

## **What is a URL?**

This article discusses Uniform Resource Locators (URLs), explaining what they are and how they're structured.

**Prerequisites:** You need to first know [how the Internet works](#), [what a Web server is](#) and [the concepts behind links on the Web](#).

**Objective:** You will learn what a URL is and how it works on the Web.

## Summary

A **URL** (Uniform Resource Locator) is the address of a unique resource on the internet. It is one of the key mechanisms used by [browsers](#) to retrieve published resources, such as HTML pages, CSS documents, images, and so on.

In theory, each valid URL points to a unique resource. In practice, there are some exceptions, the most common being a URL pointing to a resource that no longer exists or that has moved. As the resource represented by the URL and the URL itself are handled by the Web server, it is up to the owner of the web server to carefully manage that resource and its associated URL.

## Basics: anatomy of a URL

Here are some examples of URLs:

`https://developer.mozilla.org`

`https://developer.mozilla.org/en-US/docs/Learn/`

`https://developer.mozilla.org/en-US/search?q=URL`

Any of those URLs can be typed into your browser's address bar to tell it to load the associated resource, which in all three cases is a Web page.

A URL is composed of different parts, some mandatory and others optional. The most important parts are highlighted on the URL below (details are provided in the following sections):

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## **How is a URL structured?**

The URL contains the name of the [protocol](#) needed to access a resource, as well as a resource name. The first part of a URL identifies what protocol to use as the primary access medium. The second part identifies the [IP address](#) or domain name -- and possibly subdomain -- where the resource is located.

URL protocols include [HTTP](#) (Hypertext Transfer Protocol) and [HTTPS](#) (HTTP Secure) for web resources, [mailto](#) for email addresses, [FTP](#) for files on a File Transfer Protocol server and [telnet](#) for a session to access remote computers. A colon and two forward slashes follow most URL protocols, but only a colon follows the [mailto](#) protocol.

URLs can also specify the following optional information after the domain:

- A path to a specific page or file within a domain.
- A network [port](#) to use to make the connection.
- A specific reference point within a file, such as a named anchor in an HTML file.
- A query or search parameters used -- commonly found in URLs for search results.

### Importance of URL design

URLs can only be sent over the internet using the [ASCII](#) character set. Because URLs often contain non-ASCII characters, the URL must convert into a valid ASCII format. URL encoding replaces unsafe ASCII characters with a percent sign (%) followed by two hexadecimal digits. URLs cannot contain spaces.

### URL examples

When designing URLs, there are different theories about how to make the syntax most usable for readers and archivists. For example, the URL's path can include dates, authors and topics in a section referred to as the *slug*. Consider the URL for this definition:

**<https://www.techtarget.com/searchnetworking/definition/URL>**

Look past the HTTPS protocol and the permalink ([www.techtarget.com](#)). The file includes two paths (*searchnetworking* and *definition*) and the definition title (*URL*). Though not present in this example, some URL designers choose to add the date of the post, usually as YYYY/MM/DD.

### Parts of a URL

Using the URL <https://www.techtarget.com/whatis/search/query?q=URL> as an example, components of a URL can include the following:

- **The protocol or scheme.** This is used to access a resource on the internet. Protocols include http, https, ftps, mailto and file. The [domain name system](#) name reaches the resource. In this example, the protocol is https.
- **Host name or domain name.** This is the unique reference that represents a webpage. For this example, it is techtarget.com.
- **Subdomain.** This precedes the main domain name. In this case, "www" denotes the World Wide Web. Other subdomain options include "blog," "mail" and "support."
- **Port name.** These usually aren't visible in URLs, but they're necessary. Ports 80 and 443 are the default ports for web servers, but there are other options. In a URL, ports always follow a colon. For this example, https://www.techtarget.com:443.
- **Path.** A path refers to a file or location on the web server. For this example, the path is whatis/search/query.
- **Query.** Found in the URL of dynamic pages, the query consists of a question mark, followed by parameters or the query string. In this example, "?" marks the beginning of the query.
- **Parameters.** These are pieces of information in a query string of a URL. Multiple parameters can be separated by ampersands (&). In this example, the parameter is "q=URL."
- **Fragment.** This is an internal page reference, which refers to a section within the webpage. It appears at the end of a URL and begins with a pound sign (#). Although not in the example above, an example could be #history in the URL https://en.wikipedia.org/wiki/Internet#History.

Other examples of parts of a URL can include the following:

- The URL **mailto:president@whitehouse.gov** initiates a new email addressed to the mailbox "president" in the whitehouse.gov domain.
- The URL **ftp://www.companyname.com/whitepapers/widgets.ps** specifies FTP use to download a file.

## HTTP vs. HTTPS

Computers use both HTTP and HTTPS to retrieve data from web servers to view content in a browser. One difference between them is that HTTPS uses a [Secure Sockets Layer](#) certificate to encrypt the end-user and server connection. Another difference is that HTTPS uses [TCP/IP](#) port number 443 by default, whereas HTTP uses port 80.

[HTTPS is vital to protecting sensitive information](#) -- such as passwords, credit card numbers and identity data -- from unauthorized access.

## URL vs. URI

Uniform Resource Identifiers ([URIs](#)) are strings of characters used to identify a resource over a network. A URL is the most common type of URI. URLs are essential to navigating the internet.

## URL shorteners

URL shortening is a technique to make a URL substantially shorter in length and still direct to the required page. Shorteners use a redirect on a domain name that is short to achieve this.

Many URL shortener services are available. While many are free, those that offer additional capabilities, such as web analytics, cost money. Companies offering URL shorteners include Rebrandly, Bitly, Short.io, TinyURL and Bl.ink.

Some website hosts, such as GoDaddy.com, offer URL shorteners. Other service providers, including [search engines](#), might not offer URL shorteners. This is because they are often subject to abuse by spammers hiding [malware](#) inside shortened URLs.

## URL history

Data retention related to web usage is a huge privacy concern. Recently, public demand increased for search engine and application service providers to be transparent in what information they collect, retain and sell.

For example, Google Chrome's [privacy policy](#) notes that in basic browser mode, the search engine stores information locally on the system. This information includes browsing history and URLs of pages visited. It also stores a cache of text, images and other resources from those pages.

Google also collects and retains data for various lengths of time. Users can delete some data whenever they want. However, Google deletes some data automatically and retains other data for longer periods of time when necessary.

**Editor's note:** *This definition was updated to improve the reader experience.*

This was last updated in August 2024

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- [Are long URLs better for security than short URLs?](#)
- [What is a vanity URL \(vanity uniform resource locator\)?](#)
- [Naming and addressing: URIs, URLs](#)

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A personal area network (PAN) is a small network that interconnects technology devices within a limited range of just a few ... [See complete definition](#)

### [What is a unique identifier \(UID\)?](#)

A unique identifier (UID) is a numeric or alphanumeric string that is associated with a single entity within a given system. [See complete definition](#)

### [What is asynchronous?](#)

In general, asynchronous -- from Greek asyn- ('not with/together') and chronos ('time') -- describes objects or events not ... [See complete definition](#)

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By: Raghu Karan Adapala

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vanity URL (vanity uniform resource locator)



By: Robert Sheldon

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Secure Sockets Layer certificate (SSL certificate)



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## DNS over HTTPS (DoH)



By: Brien Posey