How does the Internet work?

This article discusses what the internet is and how it works

The Internet is the chief support of the Web, the technical infrastructure that makes the Web possible. At its most basic, the Internet is a large network of computers which communicate all together. Internet is a way to connect computers all together and ensure that, whatever happens, they find a way to stay connected.

In other words, The internet is a vast and complex network of interconnected computers and devices that allows for the exchange of data and information across the globe. It operates on a set of protocols and technologies that enable communication and data transmission between these devices.

When two computers need to communicate, you have to link them, either physically (usually with an [Ethernet cable](https://en.wikipedia.org/wiki/Ethernet_crossover_cable)) or wirelessly (for example with [Wi-Fi](https://en.wikipedia.org/wiki/WiFi) or [Bluetooth](https://en.wikipedia.org/wiki/Bluetooth) systems). All modern computers can sustain any of those connections.

Here's a simplified overview of how the internet works:

Devices: At the core of the internet are various devices, including computers, servers, routers, switches, and mobile devices. Each of these devices is assigned a unique numerical address called an IP (Internet Protocol) address.

Data Transmission: When you, as a user, request to access a website or send an email, your device sends data packets containing your request to your local network's router.

Local Network: Your router forwards these data packets to your Internet Service Provider (ISP), which is a company that provides you with access to the internet. Your ISP serves as the gateway between your local network and the broader internet.

ISP and Beyond: The ISP routes your data packets through its network, possibly passing through multiple routers and switches. Eventually, the data packets reach a larger-scale network known as the Internet Backbone. This backbone consists of high-speed, long-distance data connections provided by major telecommunication companies and internet infrastructure providers.

Routing: At various points along the way, routers examine the destination IP address in each data packet and decide how to forward it toward its intended destination. These routers use routing tables and algorithms to make these decisions.

Destination Server: Eventually, the data packets arrive at the destination server, which could be a web server hosting a website, an email server, or another type of server. The server processes the request and sends back the requested data (e.g., a web page or an email response) in the form of data packets.

Return Journey: The data packets containing the requested information follow a similar path in reverse, traveling through the internet backbone, ISP, local network, and router to reach your device.

Data Reassembly: Your device and the servers involved reassemble these data packets into a coherent message or web page that you can understand and interact with.

Protocols: The internet relies on a variety of communication protocols, including the Transmission Control Protocol (TCP) and Internet Protocol (IP). TCP ensures reliable and ordered delivery of data packets, while IP handles the addressing and routing of these packets. Other protocols like HTTP/HTTPS (for web browsing), FTP (for file transfer), and SMTP/POP3/IMAP (for email) govern specific types of internet communication.

DNS: The Domain Name System (DNS) plays a crucial role in translating human-friendly domain names (e.g., [www.example.com](http://www.example.com/)) into IP addresses. When you enter a URL in your web browser, DNS servers resolve it to the corresponding IP address, allowing your device to find the web server.

As you might notice, when we browse the Web with a Web browser, we usually use the domain name to reach a website. Does that mean the Internet and the Web are the same thing? It's not that simple. As we saw, the Internet is a technical infrastructure which allows billions of computers to be connected all together. Among those computers, some computers (called Web servers) can send messages intelligible to web browsers. The Internet is an infrastructure, whereas the Web is a service built on top of the infrastructure. It is worth noting there are several other services built on top of the Internet, such as email and [IRC](https://developer.mozilla.org/en-US/docs/Glossary/IRC).

[Intranets and Extranets](https://developer.mozilla.org/en-US/docs/Learn/Common_questions/Web_mechanics/How_does_the_Internet_work#intranets_and_extranets)

Intranets are private networks that are restricted to members of a particular organization. They are commonly used to provide a portal for members to securely access shared resources, collaborate and communicate. For example, an organization's intranet might host web pages for sharing department or team information, shared drives for managing key documents and files, portals for performing business administration tasks, and collaboration tools like wikis, discussion boards, and messaging systems.

Extranets are very similar to Intranets, except they open all or part of a private network to allow sharing and collaboration with other organizations. They are typically used to safely and securely share information with clients and stakeholders who work closely with a business. Often their functions are similar to those provided by an intranet: information and file sharing, collaboration tools, discussion boards, etc.

Both intranets and extranets run on the same kind of infrastructure as the Internet, and use the same protocols. They can therefore be accessed by authorized members from different physical locations.