

The Internet

The Internet is the global system of interconnected computer networks that use the Internet protocol suite (TCP/IP) to link devices worldwide. It is a *network of networks* that consists of private, public, academic, business, and government networks of local to global scope, linked by a broad array of electronic, wireless, and optical networking technologies. The Internet carries a vast range of information resources and services, such as the inter-linked hypertext documents and applications of the World Wide Web (WWW), electronic mail, telephony, and file sharing.

The origins of the Internet date back to research commissioned by the federal government of the United States in the 1960s to build robust, fault-tolerant communication with computer networks. The primary precursor network, the ARPANET, initially served as a backbone for interconnection of regional academic and military networks in the 1980s. The funding of the National Science Foundation Network as a new backbone in the 1980s, as well as private funding for other commercial extensions, led to worldwide participation in the development of new networking technologies, and the merger of many networks.

The linking of commercial networks and enterprises by the early 1990s marks the beginning of the transition to the modern Internet, and generated a sustained exponential growth as generations of institutional, personal, and mobile computers were connected to the network. Although the Internet was widely used by academia since the 1980s, the commercialization incorporated its services and technologies into virtually every aspect of modern life.

Most traditional communications media, including telephony, radio, television, paper mail and newspapers are reshaped, redefined, or even bypassed by the Internet, giving birth to new services such as email, Internet telephony, Internet television, online music, digital newspapers, and video streaming websites. Newspaper, book, and other print publishing are adapting to website technology, or are reshaped into blogging, web feeds and online news aggregators.

The Internet has enabled and accelerated new forms of personal interactions through instant messaging, Internet forums, and social networking. Online shopping has grown exponentially both for major retailers and small businesses and entrepreneurs, as it enables firms to extend their "brick and mortar" presence to serve a larger market or even sell goods and services entirely online. Business-to-business and financial services on the Internet affect supply chains across entire industries.

The Internet has no centralized governance in either technological implementation or policies for access and usage; each constituent network sets its own policies. Only the overreaching definitions of the two principal name spaces in the Internet, the Internet Protocol address (IP address) space and the Domain Name System (DNS), are directed by a maintainer organization, the Internet Corporation for Assigned Names and Numbers (ICANN). The technical underpinning and standardization of the core protocols is an activity of the Internet Engineering Task Force (IETF), a non-profit organization of loosely affiliated international participants that anyone may associate with by contributing technical expertise.

History

Research into packet switching, one of the fundamental Internet technologies started in the early 1960s in the work of Paul Baran, and packet switched networks such as the NPL network by Donald Davies, ARPANET, Tymnet, the Merit Network, Telenet, and CYCLADES, were developed in the late 1960s and 1970s using a variety of protocols. The ARPANET project led to the development of protocols for internetworking, by which multiple separate networks could be joined into a network of networks.

ARPANET development began with two network nodes which were interconnected between the Network Measurement Centre at the University of California, Los Angeles (UCLA) Henry Samueli School of Engineering and Applied Science directed by Leonard Kleinrock, and the NLS system at SRI International (SRI) by Douglas Engelbart in Menlo Park, California, on 29 October 1969. The third site was the Culler-Fried Interactive Mathematics Centre at the University of California, Santa Barbara, followed by the University of Utah Graphics Department. In an early sign of future growth, fifteen sites were connected to the young ARPANET by the end of 1971. These early years were documented in the 1972 film *Computer Networks: The Heralds of Resource Sharing*.

Early international collaborations on the ARPANET were rare. European developers were concerned with developing the X.25 networks. Notable exceptions were the Norwegian Seismic Array (NORSAR) in June 1973, followed in 1973 by Sweden with satellite links to the Tanum Earth Station and Peter T. Kirstein's research group in the United Kingdom, initially at the Institute of Computer Science, University of London and later at University College London. In December 1974, RFC 675 (*Specification of Internet Transmission Control Program*), by Vinton Cerf, Yogen Dalal, and Carl Sunshine, used the term *internet* as a shorthand for *internetworking* and later RFCs repeated this use. Access to the ARPANET was expanded in 1981 when the National Science Foundation (NSF) funded the Computer Science Network (CSNET). In 1982, the Internet Protocol Suite (TCP/IP) was standardized, which permitted worldwide proliferation of interconnected networks.

TCP/IP network access expanded again in 1986 when the National Science Foundation Network (NSFNet) provided access to supercomputer sites in the United States for researchers, first at speeds of 56 Kbit/s and later at 1.5 Mbit/s and 45 Mbit/s.^[27] Commercial Internet service providers (ISPs) emerged in the late 1980s and early 1990s. The ARPANET was decommissioned in 1990. By 1995, the Internet was fully commercialized in the U.S. when the NSFNet was decommissioned, removing the last restrictions on use of the Internet to carry commercial traffic.

The Internet rapidly expanded in Europe and Australia in the mid to late 1980s and to Asia in the late 1980s and early 1990s. The beginning of dedicated transatlantic communication between the NSFNET and networks in Europe was established with a low-speed satellite relay between Princeton University and Stockholm, Sweden in December 1988. Although other network protocols such as UUCP had global reach well before this time, this marked the beginning of the Internet as an intercontinental network.

Public commercial use of the Internet began in mid-1989 with the connection of MCI Mail and CompuServe's email capabilities to the 500,000 users of the Internet. Just months later on 1 January 1990, PSInet launched an alternate Internet backbone for commercial use; one of the networks that would grow into the commercial Internet we know today. In March 1990, the first high-speed T1 (1.5 Mbit/s) link between the NSFNET and Europe was installed between Cornell University and CERN, allowing much more robust communications than were capable with satellites. Six months later Tim Berners-Lee would begin writing WorldWideWeb, the first web browser after two years of lobbying CERN management.

By Christmas 1990, Berners-Lee had built all the tools necessary for a working Web: the HyperText Transfer Protocol (HTTP) 0.9, the HyperText Markup Language (HTML), the first Web browser (which was also a HTML editor and could access Usenet newsgroups and FTP files), the first HTTP server software (later known as CERN httpd), the first web server, and the first Web pages that described the project itself. In 1991 the Commercial Internet eXchange was founded, allowing PSInet to communicate with the other commercial networks CERFnet and AlterNet.

Since 1995 the Internet has tremendously impacted culture and commerce, including the rise of near instant communication by email, instant messaging, telephony (Voice over Internet Protocol or VoIP), two-way interactive video calls, and the World Wide Web with its discussion forums, blogs, social networking, and online shopping sites. Increasing amounts of data are transmitted at higher and higher speeds over fiber optic networks operating at 1-Gbit/s, 10-Gbit/s, or more.

Worldwide Internet users			
	2005	2010	2016
World population	6.5 billion	6.9 billion	7.3 billion
Users worldwide	16%	30%	47%
Users in the developing world	8%	21%	40%
Users in the developed world	51%	67%	81%

The Internet continues to grow, driven by ever greater amounts of online information and knowledge, commerce, entertainment and social networking. During the late 1990s, it was estimated that traffic on the public Internet grew by 100 per cent per year, while the mean annual growth in the number of Internet users was thought to be between 20% and 50%. This growth is often attributed to the lack of central administration, which allows organic growth of the network, as well as the non-proprietary nature of the Internet protocols, which encourages vendor interoperability and prevents any one company from exerting too much control over the network.

As of 31 March 2011, the estimated total number of Internet users was 2.095 billion (30.2% of world population). It is estimated that in 1993 the Internet carried only 1% of the information flowing through two-way telecommunication, by 2000 this figure had grown to 51%, and by 2007 more than 97% of all telecommunicated information was carried over the Internet.

Uses

1. Large volume of Information: Internet can be used to collect and store information from around the world. This information could relate to education, medicine, literature, technology, business, entertainment, tourism, and leisure. People can search for information by visiting various search engines such as Google, Yahoo, Bing, etc.
2. Teaching (Virtual classes): Internet has completely changed the way of teaching. Instead of physically going to the classroom, students can study at the comfort of their home. They simply need to either subscribe to a teacher for a fee or watch educational lectures that are available free on internet.
3. News and Journals: All the newspapers, magazines and journals of the world are available on the Internet. With the introduction of broadband and advanced mobile telecommunication technologies such as 3G (third generation), 4G (fourth generation), and VoLTE (voice over Long Term Evaluation), the speed of internet service has increased tremendously. A person can get the latest news about the world in a matter of few seconds.
4. Read books: We can buy e-books and read online. There is no need to earmark large wardrobes for keeping books. Nor, do we need to visit library. A single Mobile device such as a tablet can make available thousands of books at fingertips.
5. Electronic Mode of Communication: Internet has given the most exciting mode of communication to all. We can send an E-mail (the short form of Electronic Mailing System) to any corner of the world.
6. Chatting: There are many chatting software & apps that can be used to send and receive real-time messages over the internet.
7. Blogging: Today, many Internet users are into blogging. Using their blogs to express their views and opinions to others. People blog mainly for fun and to use it as their personal diary.
8. Social Networking: People can connect with friends on social networking sites. They can even chat with them when they are online. Social networking sites also allow us to share pictures with others. We can share pictures with our loved ones, while we are on a vacation. People are even concluding business deals over these social networking sites such as Facebook.
9. Online Banking (Net-Banking): The use of internet can also be seen in the field of banking transactions. Many banks such as HSBC, SBI, Axis Bank, HDFC Bank, etc. offers online banking facilities to its customers in India. They can transfer funds from one account to another using the net-banking facility.
10. Online reservations: We can book our plane tickets, train tickets, bus and even movie tickets using web portals such as MakeMyTrip, IRCTC, and BookMyShow.
11. E-commerce: Internet is also used for carrying out business operations and that set of operations is known as Electronic Commerce (E-commerce). Flipkart is the largest e-commerce company in India. The rival, Amazon, is giving stiff competition to Flipkart.

- 12.Mobile commerce: Mobile commerce (also M-Commerce) refers to the commercial transaction that takes place over the mobile internet. Using the mobile internet technology, many companies have introduced mobile version of websites and mobile apps, to promote and sell their products. Customers can simply browse several through the products and buy online through mobile internet.
- 13.Mobile wallet: Many companies offer the service of mobile wallet to its customers. Users must have a smart-phone and internet connection to use this service. Users can pay an amount into their mobile wallet, which they can use to make online payment such as bill payments, recharges, etc.
- 14.Entertainment: Apart from a major source of knowledge and information, the utility of Internet in the field of entertainment cannot be undermined. We can visit various video sites and watch movies and serials at our convenient time.
- 15.Technology of the Future: Internet is the technology of future. In the times to come, offices would be managed at distant places through Internet.

Advantages

- 1) Information, Knowledge & Learning: The Internet contains an endless supply of knowledge and information that allows you to learn about almost any topic and can question that you may have. Using a search engine like Google, you can ask virtually any question and find a web page with an answer to that question. There are also millions of videos on sites like YouTube that help explain various topics and even online courses that can be taken to help teach you about many different subjects.
- 2) Connectivity & Communication: In the past, it would take days and sometimes even months to receive a letter from someone else. Today, with the Internet, you can send an e-mail to anyone in the world and often have it delivered in less than a minute. Other forms of communication, such as chat and VoIP, also allow you to have instant communication with anyone in the world.
- 3) Mapping: With the help of the GPS technology, the Internet can help map and direct you to almost every place in the world. You can quickly route to your location or find businesses in your area that may sell or provide you with a service you need.
- 4) Contact Information: Today's search engines are also smart enough to know your location and help give you the most relevant searches for your area. For example, if you needed a plumber and did a search for "plumber", you would be given information only about the local plumbers in your area.
- 5) Banking, Bill Payments: The Internet gives you access to your bank account to view your balance, make transactions, and send money. Also, many services enable you to view and pay your bills such as water & electricity bills online.
- 6) Shopping: Online shopping is another huge advantage of the Internet, giving anyone with Internet access the ability to find products that interest them and buy them without having to visit a store. The Internet gives everyone easy access to compare prices between companies and even see what others think about a product through online reviews to help make better purchasing decisions.
- 7) Selling and Making money: If you are a business or want to sell anything, the Internet is a perfect place to sell most goods because anyone in the world with Internet access can find your website letting you have access to more people than you ever could with a local retail store. The Internet is always on and always available, which means you have the potential of selling goods 24/7.
- 8) Collaboration: The Internet is the perfect place to work with other people from around the world. There are dozens of online services that allow you to work with other people and, with the ability to have instant communication; it can even make producing new products and services faster.
- 9) Entertainment: The Internet gives everyone access to an endless supply of entertainment, with access to watch videos, watch movies, listen to music, and even play games online.

- 10) Work from Home: An Internet connection provides many people with the ability to work from home or have a virtual office. Today, many businesses allow their employees to work from home using their computers and Internet connection. Working from home can help save people money by not having to pay for child care and save them money and time by eliminating the daily commute to and from work every day.
- 11) Access to a Global Workforce: If you are a business that needs employees, many services online can give you access to people looking for a job all around the world. Having the ability to hire someone from another part of the country or world allows you to get access to a much wider talent pool and may also allow you to hire someone at a much cheaper rate.
- 12) Donations & Funding: With access to a much wider audience, anyone with an Internet connection can quickly make a donation to their favourite charity or help fund projects and ideas that interest them. Also, those looking for charity can find many online services that help make it easier to help donate or support their causes.
- 13) Internet of Things (IoT): The Internet helps make devices in your home connected and smarter by giving them access to the Internet. For example, the Nest thermostat can be connected to the Internet to help control the heating and cooling in your home. Also, once these devices are connected, they can be controlled remotely using your computer or smartphone. These devices are more efficient and help save energy, money, and time.
- 14) Cloud Computing: The Internet connects your computers and Internet-enabled devices to cloud services, like cloud computing and cloud storage. With cloud computing, a device can have access to more powerful computers and even supercomputers to perform complex tasks while you or your business works on other tasks.
- 15) Cloud Storage: Cloud storage allows all of your Internet-connected devices to have access to an endless supply of storage and also makes backing up information easier and safer by automatically making backups to another location.

Disadvantages

- 1) Bullying: Anyone who has spent time on the Internet would have encountered trolls or abusive people. With the highly-social nature of the modern Internet, the instances of cyber bullying are sadly not uncommon.
- 2) Stalkers: With people sharing information on the Internet, it's also easier for stalkers to find personal information about someone or use online services to help them find information about someone.
- 3) Criminal Activities: Hidden places on the Internet and the deep web can also be a place for criminals to conduct their illegal businesses without as much fear of being caught. A global audience also gives criminals more ways to solicit their goods.
- 4) Exploitation: With the speed and ease of communicating on the Internet, it also makes it much easier for those who prey on others to find people to exploit. It also makes it much easier for someone to pretend they are someone else, the opposite sex, or younger than they are to find others to exploit.
- 5) Addiction: The Internet and games played on the Internet can become very addictive and are often designed to be addictive. With how addictive games can be and how much entertainment is on the Internet, it is easy to spend a lot of time on the Internet without doing anything productive.
- 6) Identity Theft: With access to billions of computers, it makes it easier for computer hackers and malicious users to hack accounts and steal personal information that could be used for identity theft.
- 7) Hacking: The Internet also connects all computers to each other, which makes it easier for hackers to scan millions of computers and quickly identifies what computers are vulnerable to attack.
- 8) Excessive Advertising: It's great that the Internet can be an easy way to reach a much wider audience than traditional advertising methods (e.g., Newspaper, TV, and Radio). However, because it is so easy and cheap, it can mean that you will see more advertising and get more spam advertisements in your e-mail Inbox than you may in real life.
- 9) Depression: Social networking sites can also lead to depression with many people when all you see is the best of all your friend's lives you may start to wonder why your life is not as good as theirs.
- 10) Social Isolation: The Internet and online games make it easier to communicate with others, and although you may find new connections around the world, it's easy to disconnect from those in your real life.
- 11) Health Issues: As with watching too much TV, spending too much time on the computer surfing the Internet or playing games can also lead to obesity and an unhealthy lifestyle. A computer also requires a lot of repetitive movement such as moving your hand from your keyboard to a mouse and typing that could lead to Carpal Tunnel Syndrome (CTS).

- 12) Affects Focus & Patience: The sites we use on the Internet every day have an "instant gratification" effect. They also present an infinite menu of things to think about and experience at any moment, on demand. Getting information this way rewards fast-paced thinking that shifts focus quickly, which affects your interactions in general, making you more impatient and less focused in your activities.
- 13) Fake News & Rumours: Some fake YouTube channels, websites & news portals publish wrong news on the internet to become famous increasing their website's network traffic.
- 14) Accuracy of Information: A lot of information about particular topics is stored on the websites. Some information may be incorrect or not authentic. So, it becomes difficult to select the correct information. Sometimes you may be confused.
- 15) Frauds: Many people and websites on the Internet are fake and can fraud you for money and other things. There are a lot of unscrupulous businesses that have sprung up on the internet to take advantage of people.